

# Los Alamos

Los Alamos National Laboratory  
Los Alamos, New Mexico 87545

## memorandum

TO: Roger B. Perkins, ABS  
FROM: John M. Buckett, HSE-DO  
SYMBOL: HSE-DO/341  
SUBJECT: LABORATORY INCINERATION STATUS, PLANS AND ISSUES

DATE: April 25, 1988  
MAIL STOP/TELEPHONE: K491/7-4218

TA-16  
This memorandum responds to your memo of March 29 that requested information on incinerators at the Laboratory. We have prepared descriptions of the Laboratory's five existing and proposed incinerators. This information is followed by specific responses to the issues you raised.

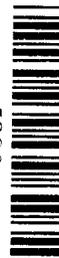
### I. Transuranic (TRU) Waste Incinerator - Waste Management Group (HSE-7)/TA-50.

Description. The controlled-air incinerator (CAI) at TA-50 is nominally a 1 million BTU/h process that has been extensively modified for volume reduction treatment of TRU wastes. An aqueous off-gas system provides for staged, high efficiency attenuation of particulates and acids generated by combustion. The unit is permitted under Toxic Substances Control Act (TSCA) regulations and has interim status under the Resource Conservation and Recovery Act (RCRA) with a final permit application in process.

History. The CAI system and the housing Treatment Development Facility (TDF) were originally constructed with AEC/ERDA/DOE waste management R&D appropriations. Demonstration of the original TRU volume reduction objective was completed in 1979. Subsequent development activities have included DOE low-level waste test burns, hazardous waste destruction studies for DOE/Environmental Protection Agency (EPA) sponsorship, and disposal testing for Class C explosives for the Department of Defense (DOD). The process has been used operationally to dispose of Rocky Flats Plant (RFP) Pu-contaminated polychlorinated biphenyls (PCBs), newly generated TRU wastes, and disposal of mixed waste (scintillation vials).

Purpose and Justification. The original purpose for the CAI was to serve as a test bed for DOE incineration applications related to both radioactive and chemical wastes. Currently, following a directive contained in the Defense Waste Management Plan, the long-term objective is to treat

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Laboratory generated TRU wastes. A more near-term objective is to process Laboratory mixed wastes and other problem wastes.

Status and Costs. At present, the CAI process is being modified from its original R&D configuration to one more compatible with long-term volume reduction requirements for Laboratory-generated TRU. These changes include simplifying and updating system instrumentation and replacing much of the off-gas equipment with similar components constructed of more durable materials. Although some design and facility construction delays have been encountered, the process is anticipated to be ready for resumption of operations early in FY 1989. Cost of the original process, built in the mid to late 70s was approximately \$2 million. Cost of the system upgrade is expected to total \$1 million.

## II. Low-level Waste/~~Hazardous~~ Mixed Waste Incinerator (LLW/HMW) - HSE-7/TA-50.

Description. The LLW/~~HMW~~ incinerator being designed for installation in an existing bay within TA-50-37 will be a 3 million BTU/h process designed to reduce the volume of LLW, thermally destroy hazardous chemical constituents in mixed waste, and serve as a disposal method for biological and other combustible problem wastes generated by the Laboratory.

History. Although the system is currently being designed, the proposal was developed to meet more stringent DOE requirements for LLW and ~~HMW~~ management, as well as EPA requirements for mixed waste management under RCRA regulations. A funding formula was developed with the participation of affected Laboratory and DOE/AL managers based on review of historical waste generation data contained in HSE-7 data bases.

Purpose and Justification. Revisions to DOE Order 5820.2 (Chapter III, Low-level Waste Management) and DOE Order 5840.2 (Hazardous and Mixed Waste Management) provided the impetus for design and construction of this system. A separate process was proposed for this purpose, because the existing TRU incinerator does not have adequate capacity for the LLW/~~HMW~~ streams and separation of TRU from the lower activity waste forms is ~~defensible~~ on both technical and economic grounds. The objective is to secure Laboratory treatment and disposal capabilities which comply with

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current and anticipated DOE and EPA waste management requirements.

Status and Costs. The LLW/~~HMW~~ process is currently in design and is projected to come on-line for LLW treatment in FY 1991. Process will require a RCRA <sup>permit</sup> for treatment of mixed wastes. Cost of the equipment and installation is estimated to total \$4 million: \$3 million Capital Equipment; \$1 million GPP.

### III. WX Division/S-Site Incinerator.

Description. A single-chamber, 1.8 million BTU/h incinerator has been installed at S-Site for disposal treatment of administratively controlled waste from high explosive (HE) operations. The system is operated in a batch mode, accepting 800-lb waste per charge. Operation is planned on a single charge per day, three cycles per week basis. A total of 50 tons of waste will be treated per year.

History. The incinerator is designed to replace the existing "burn cage" for which the open air burning permit from the state expires near the end of May 1988. "Administratively controlled waste" (i.e., HE-contaminated waste—such as Kimwipes, gloves—that WX Division will not permit to be handled outside WX Division because of the potential for an explosion) is currently burned in this burn cage and will be burned in the new S-Site incinerator. Proximity of the burn cage to other areas of regulatory importance focused state attention on this problem approximately 2 years ago.

Purpose and Justification. The S-Site incinerator is required to dispose of administratively-controlled combustible wastes generated within the area. Open pit burning will no longer be permitted by the State beyond May 1988.

Status and Cost. Final checkout and early operation of the incinerator is in progress and should be fully operational when the open pit burning permit expires. Final cost of the installation totalled some \$200K.

### IV. M Division/TA-36 Incinerator.

Description. A new incinerator to treat burnable shot debris, similar to those charged to the S-Site incinerator,

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has been proposed by M Division for installation at TA-36. A concept has not yet been selected but the unit will be required to process some 2200 ft<sup>3</sup> of potentially HE-contaminated combustible waste. The primary waste form is lumber but other burnable materials will be included.

Purpose and Justification. Traditional disposal methods of landfill and open pit burning will no longer be permitted under revised and proposed EPA and state regulations. Deactivation of the HE contamination or incineration appear to be the only two viable options for continued operation. The existing S-Site incinerator does not have the capacity to accept all the M Division waste, nor can it accept the lumber scrap without prior size reduction. Health, safety and logistical concerns regarding transfer of this waste form between sites must also be considered.

Status and Costs. A present, this unit is in the proposal stage with continuing consideration of alternatives. An FY 1990 GPP request of \$350K has been submitted to GPAC for consideration.

#### V. Solid Waste Fired Boiler (SWFB)/TA-16.

Although not a radioactive or hazardous waste treatment system, the SWFB project does address a Laboratory/County waste management problem and is included for completeness.

Description. The installation consists of two controlled-air incinerators capable of burning a maximum of 23,000 tons per year of solid waste generated by the Laboratory, Los Alamos County, and Bandelier National Monument. The hot flue gases are introduced into a heat recovery boiler for steam generation. Cooled flue gases pass through a dry scrubber system to remove particulates and acid gases, and through a bag house to remove particulates.

Purpose and Justification. Operation of the heat recovery incinerator will reduce the volume of waste presently committed to landfill within the county. Steam generated by the boiler will displace the need for burning some 200 million cubic feet of natural gas currently consumed by the existing boiler plant.

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Status and Cost: Title II design has been completed and an Request-for-Proposals has been issued for technical proposals. Request-for-Quotations will be issued to a shorter list of successful technical bidders. Total cost, including site preparation and road construction, is \$7.6 million.

## ISSUES

### A. Projected Incinerator Capacity vs. Waste Management Needs.

Decisions to fund waste incineration projects have been driven by regulatory compliance, energy and land conservation requirements and, in the case of newly-generated TRU, a DOE directive. The existing CAI at TA-50 has ample capacity to accept the MST-projected TRU and mixed TRU waste volumes. The LLW/HMW incinerator is being sized to accommodate anticipated combustible LLW, mixed, hazardous and biological waste generation rates. Capacity of the combined S-Site and TA-36 incinerators will be ample to dispose of HE-contaminated combustibles. Similarly, the solid waste fired boiler is sized to accept projected Laboratory, County and Bandelier non-hazardous solid waste generation rates through the year 2007.

Based on our knowledge of current waste generation and projections, the primary area of uncertainty relative to Laboratory incineration needs is limited to remedial action on formerly used sites (Environmental Restoration project). Currently available information indicates that the primary waste forms will be radionuclide and HE-contaminated soils. Neither of these are necessarily candidates for incineration treatment. The other major uncertainty is tied to future programmatic mixes at the Laboratory. If, as an example, alternative energy studies became a high priority, it is conceivable that the proposed incineration capacity would be exceeded and additional units could be required.

Therefore, we conclude that the current and proposed incinerators offer adequate capacity to meet current Laboratory waste management needs within the present and foreseeable regulatory structure.

### B. Disposal Status w/o Operational Incinerator.

The current condition of having no operational incinerators is causing problems at TA-54 where mixed waste is being

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stored. Inventories of mixed waste are growing and cannot do otherwise until the CAI becomes operational; there is no DOE or commercial alternative for management of mixed waste. The ongoing hiatus regarding regulation of mixed waste has avoided receipt of a Notice of Violation. However, state authorization to regulate mixed waste will bring the full force of compliance into effect in mid-CY 1989.

TRU waste also will be accumulated until the CAI resumes operation. The volume of this waste is small enough, however, that it can be accommodated in existing DOT 7A containers at TA-50.

M-8 has been accumulating a large inventory of combustible waste in a trench at TA-36 since pit burning operations were suspended. An interim pit burning permit will be sought from state authorities as soon as Laboratory commitment has been made to a long-term solution (e.g., the proposed incinerator).

For combustible RCRA-regulated wastes, a growing concern is the decreasing availability of commercial incineration capacity. As additional EPA land disposal bans for more chemicals go into effect, there has been a noticeable increase in cost and longer lead times required to ship the wastes off-site for disposal. The on-site disposal capability represented by the LLW/HMW incinerator will become more important as additional nation-wide bans go into effect.

### C. Cost and Schedule for Proposed Units.

A summary of cost and schedule information included in the attachment is as follows:

<u>Unit</u>	<u>Schedule</u>	<u>Cost</u>
CAI (TA-50)	1/89 - TRU & Mixed Waste Operation	\$1 million upgrade
LLW/HMW (TA-50)	CY 1991 LLW Operation CY 1992 Mixed Waste	\$4 million
S-Site	5/88	\$200K
TA-36	CY 1992	\$350K
SWFB (TA-16)	9/88 - Contract award 3/90 - Start up	\$7.6 million

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#### D. Operational Responsibility for HE Incinerators.

Historically, management of radioactive, chemical and mixed wastes has been the responsibility of HSE-7; disposal treatment of HE wastes has remained a line management responsibility of WX and M Divisions. Specialized handling and safety concerns with each of these hazardous materials, concerns regarding adverse synergistic effects, and logistics of managing each waste gave rise to this policy. The advent of increasingly complex environmental regulations and more complex treatment technology obviously mandates increased HSE involvement in both a technical and regulatory compliance advisory capacities. However, consideration of specialized HE training requirements and operational logistics at both test sites supports direct M and WX Division management of the incinerators, and that is what HSE Division recommends.

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