

NAVAL RADIATION LABORATORY
 SAN FRANCISCO NAVAL SHIPYARD
 SAN FRANCISCO 24, CALIFORNIA

S-S99-1(390)
 11LL/On

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SERIAL: 74

NR-LL-2

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MAR 11 1943

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MEMORANDUM

Classification changed to UNCLASSIFIED
 by authority of EMCO-R.D. Lancaster
 1-27-54

From: Leon Leventhal
 To : Dr. W. H Sullivan
 Subj: Deep Sea Disposal of Radioactive Waste

P. Hirschfeld

RECEIVING AND STORAGE

1. To the health chemist at the University of California Radiation Laboratory is delegated the responsibility for the disposal of liquid and dry radioactive waste as well as contaminated laboratory and plant equipment. Distinctly labelled wastes are collected throughout the laboratory, monitored, and classified as to degree and type of activity (alpha, beta or gamma) and as to ultimate disposition; the wastes are stored in a fenced area located near by.
2. All solutions are diluted with water to 10 mr/hr at the surface and made alkaline with lime. This procedure precipitates the alpha activities and prepares the liquids for the cement mix. One part Portland Cement to three parts aggregate, which can include active solids, are mixed with the alkaline liquid and poured into 53 gallon oil drums (50¢ each, surplus at Warehouse 3, Oakland Army Base) and permitted to set. Sufficient concrete is added to make up the weight to 600 pounds, about 4 cubic feet, to guarantee sinking.
3. In case of enclosed bodies, odd shapes or light structures it is essential that preliminary calculations indicating the volume of concrete necessary for complete submersion be arrived at beforehand. Concrete is then poured in or around the object and air holes bored to reduce buoyancy. The object is wrapped with double thickness water proof paper and sealed with scotch tape.
4. Clear large markings with Roman Violet paint, used only to designate radioactivity, are employed to serially label all material destined for jettisoning. In addition a 1" x 3" sticker is affixed to indicate the hazardous nature of the contents.



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5. The health chemist monitors the exterior surfaces for beta contamination and gamma level with an IDL meter, and for alpha contamination with a Model 4LA portable alpha detector. If no alpha or beta radiation is present and if the level of gamma activity at the surface is below 30 mr/hr, it is then believed ready for shipment. Approximately thirty drums are considered a full load.

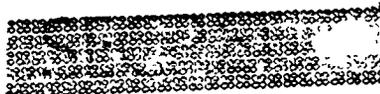
LOADING AND TRANSPORTATION

1. The day before sailing, the drums and other radioactive debris are loaded on a six by six truck provided by the Radiation Laboratory and convoyed by a Security Officer to the Oakland Army Base for removal to the ship. About two and one half hours are necessary to accomplish the transfer. The drums are lashed to the forward deck against the rail and supported by wooden planking. The ship is sailed to Fort Baker at which it is docked. The vessel, a mine planter attached to the Presidio Army Base, with its complement of 37 officers and men are assigned to this duty by directive from the Atomic Energy Commission through the Manhattan District. The army personnel have all been given an interim clearance by army intelligence.

2. An early morning start has been found desirable in order to return before sunset. The consignment is accompanied by a Security Officer and two health chemists. The vessel is navigated to destination 123° 25'W and 37° 38' or 39'N about fifty miles from the Golden Gate and hove to. The depth at this point is close to 1300 fathoms. The rails are removed and the drums and other contaminated materials, manually pushed overboard. There is a boom and winch available for remote handling of more active containers. The only special clothing the men wear are cotton gloves, destroyed after each operation. The deck is swept and hosed down. The health chemist monitors the area for alpha, beta and gamma contamination, and indicates whether it is radiologically safe. Deck contamination has never occurred. A check of the adjacent area is undertaken to ascertain if all material has submerged. Observed floating articles are sunk by rifle fire. If this device does not succeed, the object is recovered and returned to Berkeley.

COORDINATION OF FACILITIES

1. Mr. Jack Ward, the Security Officer in charge of the above operation has expressed the advisability of the AEC ultimately coordinating these activities for the entire Pacific Coast. Because of the responsibility of the AEC for radioactive wastes, it is possible that the Naval Laboratory can utilize the Berkeley facility for the disposition of its active residues. Due to the fact that transfer of the wastes to the Oakland Army Base via the Bay Bridge is not feasible because of existing laws forbidding the portage of hazardous materials across the



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span, it is suggested that the vessel be docked and loaded at Hunters Point.

2. By calling Mr. J. Ward or Mr. R. O'Dae on Ashberry 3-9395 at least a week in advance of the monthly voyages, arrangements can be made to allow the laboratory to employ this facility.

SUGGESTIONS

1. The men be required to wear special clothing when handling the active materials.
2. All personnel aboard the disposal ship be required to wear a pocket dosimeter and a film badge.
3. Metal sheeting, preferably stainless steel plate be used as shoring for the drums.
4. AEC clearance shall be required for all personnel.

Leon Leventhal

LEON LEVENTHAL

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