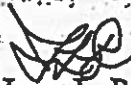




Albuquerque, New Mexico 87185-1148

date: February 20, 1997

to: Mark Jackson, MS-0184 DOE/KAO
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from:  Jerry L. Peace, MS-1148 (6685)

subject: Mixed Waste Landfill Classified Area Pit Contents

The Mixed Waste Landfill classified area corrective measures have been completed with the exception of four pits: Pits 35 and 36, SP-4 and SP-5. Pits 35 and 36 contain 1 and 3 cylindrical "cans" respectively. These cans are constructed of stainless steel and are estimated to be 9 inches in diameter and 16 feet long (actual diameter and length of each can is unknown). These cans are containment canisters which were constructed and used in TA 5 for experiments involving oxide nuclear reactor fuels. Shortly after the Three Mile Island incident, the U. S. government embarked on a program to study the effects of nuclear reactor meltdowns. The ACRR in TA 5 participated in this program. Nuclear oxide fuels were shipped to Sandia from reactors all over the world for simulated meltdown experiments. Oxide fuels were secured in primary containment canisters (cans) machined from stainless steel tubes. The primary can, with fuel in place, was slipped inside a secondary can of slightly larger diameter. This nested configuration was then lowered through a hole in the floor and placed next to the core of the ACRR for approximately one hour. The core generated temperatures of 2500°K which vaporized or melted the fuels in the primary can. The nested cans were then removed from the core and disassembled to study the source term of a simulated meltdown of oxide fuels.

The fuels consumed in the tests were removed from the primary can but both the primary and secondary cans became activated during the tests due to neutron capture. Contamination also may have occurred during disassembly of the nested configuration due to contaminated hands and fingers. If the cans were known to be contaminated or if time was not allowed for decontamination, they were mummified before disposal.

Verbal reports from Sandia employees involved in these tests confirmed that the cans in Pits 35 and 36 came from TA 5 and the source term tests. They mentioned that additional cans were disposed of at the landfill, usually in vertical, small-diameter holes drilled in the bottom of trenches. TA 5 employees were confused as to why the cans were in Pits 35 and 36 because these tests, as well as the cans, were not considered classified. The obvious reason is that the landfill was scheduled for closure, so all spent cans were hastily disposed of before the closure date. There was not enough time to contract a drilling rig to drill holes in the trenched area of the landfill so the cans were dropped in available classified area pits where they reside today.

* The cans in Pits 35 and 36 are not sources but activation products, specifically Co-60. There may be source term products (Cs, Na) associated with the oxide fuels consumed in the tests. One of the cans in Pit 36 is mummified, suggesting probable elevated levels of loose surface contamination. There are no doubt additional cans in the landfill but their location is unknown.

* Sources do exist, however, in SP-5. Twelve Co-60 sources, 1/2-inch in diameter, 1-foot long, and 26 Ci each (as of November 1986), were transported to the TA 3 landfill in June of 1987 from TA 1 and entombed in a lead burial cask. This burial cask was placed at the bottom of SP-5. The pit was capped with an 8-ton, removable concrete cap which is in place today. It is not known whether the pit was filled and compacted to grade before the concrete cap was placed or whether the pit was left unfilled, perhaps in anticipation of retrieving the sources at a later date. SP-4 contains what is purported to be reactor vessel plates. Very little is known about these plates, their origin, number, size, or configuration. This pit is also capped with an 8-ton, removable concrete cap, perhaps in anticipation of retrieving the plates for future use.

Based on the information obtained to date, I suggest that the cans in Pits 35 and 36 remain where they are and the pits filled and compacted to grade. The cans present no greater risk to human health or the environment than other radioactive waste buried at the landfill. I suggest that the concrete caps placed over SP-4 and SP-5 be lifted by crane and the pit contents examined. If the pit contents reveal no additional information and the contents present no threat to human health or the environment, SP-4 and SP-5 should also be filled and compacted to grade.

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