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Date: APR 0 6 2017
Symbol: EPC-DO: 17-142
LA-UR: 17-22522
Locates Action No.:

Mr. John E. Kieling, Chief
Hazardous Waste Bureau
New Mexico Environment Department
2905 Rodeo Park Drive East, Building 1
Santa Fe, NM 87505

Subject: Baseline Report--Alternative Inspections of Building 1028 at Technical Area 54, Area G, Pad 5 (TA-54-1028)

Dear Mr. Kieling:

The letter transmits a baseline report regarding alternative inspections for waste containers stored at a permitted unit at Technical Area (TA) 54 at the Los Alamos National Laboratory (LANL). This report is being submitted by the U.S. Department of Energy (DOE) and Los Alamos National Security, LLC (the Permittees) to the New Mexico Environment Department-Hazardous Waste Bureau (NMED-HWB), as required by NMED-HWB in its March 8, 2017 approval of a 365-day extension for alternative inspections at TA-54, Building 1028 (TA-54-1028).

With personnel safety as the priority, during the next 365 days, the Permittees will continue the alternative inspections described previously as a recovery plan is developed and finalized for the waste containers within TA-54-1028. In addition, as required by NMED-HWB in its March 8, 2017 letter, the Permittees will submit quarterly updates to this baseline report by July 7, 2017; October 6, 2017; and January 8, 2018.

As described in the enclosed baseline report, the Permittees are evaluating options for long-term safe storage and/or pressure mitigation of four containers within TA-54-1028, including a more robust container storage design currently being developed and analyzed in depth. This more robust containment system is being designed to withstand any potential hazard associated with the storage of these wastes. The Permittees are also evaluating hazard mitigation options for these waste containers that include venting within a containment vessel to allow for off-site disposal.

If you have comments/questions or would like to meet regarding this submittal, please contact Mark P. Haagenstad at (505) 665-2014 or Karen Armijo at (505) 665-7314.

Sincerely,

John C. Bretzke
Division Leader

Sincerely,

Karen E. Armijo
Permitting and Compliance Program Manager

JCB/KEA/MPH/TAD:am

Enclosure: Baseline Report: Alternative Inspections of Building 1028 at Technical Area 54, Area G, Pad 5 (TA-54-1028)

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ENCLOSURE 1

Baseline Report: Alternative Inspections of Building 1028 at Technical Area 54, Area G, Pad 5 (TA-54-1028)

EPC-DO-17-142

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Enclosure 1

Baseline Report

Alternative Inspections of Building 1028 at Technical Area 54, Area G, Pad 5 (TA-54-1028)

Introduction

As required by the New Mexico Environment Department-Hazardous Waste Bureau (NMED-HWB) in its March 8, 2017 approval letter, the purpose of this baseline report is to describe actions and analyses undertaken by the U.S. Department of Energy (DOE) and Los Alamos National Security, LLC (the Permittees) between September 2016 and March 2017 regarding four Flanged Tritium Waste Containers (FTWCs) stored in the permitted unit at TA-54, Building 1028 (TA-54-1028). These waste containers hold tritium waste with trace amounts of lead, making the contents Resource Conservation and Recovery Act (RCRA) regulated mixed low-level waste (MLLW).

The following sections of this baseline report describe the following activities:

1. The analyses of hazards and risks performed since September 2016 that culminated in the development and approval of the Evaluation of the Safety of the Situation (ESS) currently approved by DOE. This document established the set of safeguards and controls currently in place to maintain the stability and safety of the stored waste.
2. The Permittees' efforts to date to develop and finalize a recovery plan for the long-term safe storage of the four MLLW FTWCs.
3. The Permittees' efforts to date to develop and evaluate options for pressure mitigation that will enable off-site RCRA treatment and disposal of the four MLLW FTWCs.
4. Current and planned future activities during the upcoming reporting quarter.

The current controls in place as well as the recovery plan being prepared have been and will be developed in accordance with the nuclear facility safety requirements mandated by DOE for management of nuclear facilities such as TA-54, Area G.

Background

In May of 2007, four FTWCs were loaded with smaller shipping containers holding Atomic Energy Act (AEA) waste products in the form of tritiated water on absorbent material. These FTWCs also contain valves containing lead oxide, contaminated with tritium, and galvanized paint cans containing various tritium-contaminated wastes. The FTWCs were loaded into 49 CFR 178.504-compliant, stainless-steel 85-gallon over-pack drums and placed in RCRA-compliant storage at TA-54-1028.

Plans were developed to ship the four FTWCs offsite for RCRA treatment and disposal. The time and complexity involved with obtaining the necessary certifications and approvals for off-site shipment and disposal resulted in continued storage at TA-54-1028 and the addition of the containers as High-Activity Waste to the LANL Site Treatment Plan under the Federal Facility Compliance Order.

On August 25, 2016, LANS and DOE managers were notified of a potential safety concern related to these four containers. Analyses conducted as part of the process of obtaining approval of an appropriate certified shipping container identified that the FTWCs may have accumulated a gaseous oxygen and hydrogen mixture due to radiolysis above safe limits thereby posing an unsafe pressure risk. This has resulted in a DOE safety basis challenge. The gas pressure presents a DOE safety basis issue which requires remediation to enable off-site shipment for RCRA-compliant treatment and disposal.

1. Hazard Analyses and DOE Safety Assessments

Upon notification of the potential safety concern, LANL Safety Basis staff evaluated the safety concern and a standing order was issued at the facility as a compensatory measure, restricting personnel access within a 50-foot perimeter surrounding TA-54-1028. This was to ensure no disturbance of the containers and limited the amount of time that workers could be in the vicinity of the containers.

Potential hazards were assessed via a two-phase approach. Phase 1 established the parameters of a safe and stable storage configuration to ensure that (1) the containers are not exposed to work-related energy sources; and (2) all personnel are out of range in the event that a container failed due to natural phenomena or other accident condition hazards. This phase is complete. In Phase 2, potential hazards are being evaluated to derive the controls necessary to reduce the risks associated with any remediation options.

2. Planning for Long-term Safe Storage

Due to the complexity of the mixed-waste FTWCs, a LANL Integrated Project Team (IPT) consisting of subject matter experts across a wide disciplinary range of scientific, operational, safety, and regulatory specialists was assembled in December 2016 to establish a strategy and options for their disposition. The IPT initially identified and rejected several options such as individual venting, segregation, and treatment strategies that were deemed to pose essentially the same or greater hazards as compared to a more comprehensive solution.

- The first option currently being considered does not require direct contact with or handling of the FTWCs. A barrier enclosing TA-54-1028 would be constructed to provide worker protection in the event one or more FTWCs experienced an initiation event. Barrier options being considered include an earth-filled barrier surrounding TA-54-1028 and a welded steel plate enclosure designed to be lowered by crane over TA-54-1028. This approach provides some level of immediate hazard mitigation, but provides no long term solution for disposition. Further, it would not comply with the normal RCRA

permit container inspection requirements, necessitating NMED-HWB approval of a long-term alternate monitoring/inspection method.

- The second option currently being considered involves removing the four 85-gallon drum over-packs containing the FTWCs from TA-54-1028 in a remote operation performed by the LANL Hazardous Device Response Team. A remote-controlled skid steer with a drum grabber attachment would be used to grasp the over-pack drums using minimal manipulation and minimal handling time. They would be lifted slowly without changing their orientation and set on an engineered rack system. The rack system would be inserted into a Dynasafe[1] (or similar) containment system, closed with a gas-tight seal, and returned to RCRA-compliant storage. The containment system would have gas sampling and removal capability. This option would provide greater protection of the containers from external events and assure containment of any unanticipated release should a FTWC container fail inside the system later.

3. Options for Pressure Mitigation and Final Disposition

Concurrently with development of the hazard analyses discussed above, the IPT has worked to identify and begin evaluation of options to mitigate the pressure in the FTWCs. This is necessary in order to enable the containers to be handled, transported and otherwise managed safely (in anticipation of shipment off-site for RCRA-compliant treatment and disposal). In that process, the IPT has reviewed and rejected numerous options in favor of a comprehensive solution that addresses the hazard.

The option presently under review that has survived initial screening reviews by the IPT would involve removing the four 85-gallon over-pack drums containing the FTWCs from TA-54-1028 in a remote operation and placing them into a Dynasafe (or similar) containment system, as discussed in Option 2 above. A remote system will then be used to puncture the inner containers inside the closed containment vessel. Although the purpose of this action is to relieve the inner gas pressure, it may also change the physical/chemical properties of the contained lead, thus meeting the definition of RCRA treatment. Therefore this option, if selected, will be submitted to NMED-HWB for approval.

Once the pressure mitigation operation is completed, the system's integrated equipment will be used to sample remaining gases and relieve any residual pressure through an engineered collection system. Once pressure is relieved, the entire system will be loaded into a DOT-approved shipping container and transported to an approved off-site RCRA treatment facility, where it would be macro-encapsulated to meet the applicable RCRA Land Disposal Restrictions for lead prior to RCRA-compliant disposal.

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[1] See examples of these custom-designed containment systems (used by the DoD, law enforcement agencies, and others) at http://www.dynasafe.com/protection-systems.

4. Current and Planned Future Activities

The current safety basis standing order remains in effect at Area G that establishes an exclusion zone of 50 feet from the FTWCs. This will be maintained until the recovery plan is finalized, approved, and implemented. Additionally, all materials located in the access-controlled area are in long-term storage and there are no active waste-processing activities occurring in the area. No wastes are being added to or removed from the area. Weekly alternative RCRA inspections continue as approved in the March 8, 2017 letter from the NMED-HWB. The Permittees continue to seek viable options for remote gas monitoring, cameras, etc. to enhance the alternative inspections of TA-54-1028.

At the same time, the Permittees have been diligently exploring the treatment and disposal paths that will be available once the pressure hazard has been mitigated. Candidate facilities have been identified and preliminary discussions have been initiated with them. Waste acceptance documents are currently being drafted for preliminary review by the likely candidate facilities.

Actions during the upcoming quarter will focus on detailed development and evaluation of the containment-vessel-based storage and pressure-mitigation options. In particular, Process Hazards Analyses (PHAs) are being developed around the "what-if" scenarios, in order to evaluate the risks of the alternatives for retrieving, moving and loading the FTWC over-pack drums. Mock retrieval sessions are already underway to practice the necessary maneuvers that would be involved.