DEFENSE NUCLEAR FACILITIES SAFETY BOARD

June 6, 1994

MEMORANDUM FOR: G. W. Cunningham, Technical Director

COPIES: Board Members

FROM: Richard E. Tontodonato, Technical Staff

SUBJECT: Trip Report - Review of Implementation of DNFSB Recommendation 93-5 at the Hanford Site, May 17-19, 1994

1. **Purpose:** This trip report documents a visit by DNFSB Staff members (David Lowe, Dominic Napolitano, Richard Tontodonato and Robert Warther) to the Hanford Site on May 17-19, 1994, to review progress toward implementing DNFSB Recommendation 93-5 regarding characterization of high-level tank waste.

2. **Summary:** The Westinghouse Hanford Company (WHC) continues to make progress toward implementing Recommendation 93-5, but the technical basis for the characterization program remains ill-defined, and efforts to resume core sampling of the high-level waste tanks have met with little success.

   The Department of Energy (DOE) has articulated plans to improve its technical management of the tank characterization program and to provide facility representatives for waste tank sampling. However, none of the deliverables identified in the Recommendation 93-5 Implementation Plan have been reviewed and approved by the DOE Richland Operations Office (DOE-RL), and DOE has not taken action on WHC's recommendation to use only one off-site laboratory.

3. **Background:** Characterizing the tank wastes is key to resolving high-level waste tank safety issues at the Hanford Site. On July 19, 1993, the Board issued Recommendation 93-5, which addresses the need for DOE to undertake a comprehensive reexamination and restructuring of the characterization effort. The recommendation sets goals of two years for completing safety-related sampling and analysis for watch list tanks and three years for other tanks. The Board accepted DOE's Implementation Plan on March 25, 1994.

   DNFSB technical staff members visited the Hanford Site in November 1993 and March 1994, to review implementation of Recommendation 93-5. The principal issues identified during the first visit were that WHC did not have an adequate basis for the number of tank samples needed to meet Recommendation 93-5 objectives and was not developing adequate contingency plans for increasing sampling and analysis capacity. The principal issues from the second visit, summarized in a May 11, 1994, letter from the Board to the DOE Office of Environmental Management (DOE-EM), were (1) the technical basis for the sampling program remained ill-defined, (2) Data

Quality Objectives (DQOs) were not being developed with the goal of meeting established tank farms safety limits with high statistical confidence, (3) the sampling schedule was not coordinated with other tank farms programs needing access to risers, (4) WHC's plan to use only one off-site laboratory did not comply with the implementation plan, and (5) DOE-RL was not providing adequate technical direction to WHC. This review was conducted as a follow-up to the March 1994, review.

4. **Discussion:** Discussions among the DNFSB technical staff, DOE-RL, WHC, and Pacific Northwest Laboratory personnel on May 17-19, 1994, are summarized below:

   a. DOE-RL Involvement: In response to the concerns raised in the Board's May 11, 1994, letter, DOE-RL has articulated a plan to more effectively manage the characterization program. DOE-RL has begun to review deliverables previously provided to it by WHC, and intends to work with WHC to ensure future deliverables satisfy the commitments in the implementation plan and are delivered to the Board on time. However, no deliverables have been approved and transmitted to the Board, and the first quarterly report is overdue.

   DOE-RL has also identified a plan to provide facility representatives (FRs) for tank sampling activities. Currently, two FRs are covering the 242-A evaporator, and a third FR is covering the 200 West Area tank farms, but has not been qualified. DOE-RL plans to qualify the third FR and to hire three more FRs for the tank farms this summer. FRs supporting sampling operations will need additional training, not yet identified. In the interim, DOE-RL has assigned two contractor personnel to act as FRs for the tank farms and three to act as FRs for the evaporator.

   DOE-RL clarified its involvement in regulatory issues associated with using off-site laboratories, to resolve concerns raised in the Board's May 11, 1994, letter. DOE-RL has coordinated review of National Environmental Policy Act (NEPA) issues with Los Alamos National Laboratory (LANL) and Idaho National Engineering Laboratory (INEL). No new NEPA documentation is needed to allow analysis of Hanford tank wastes at LANL, and DOE-RL believes that INEL will soon reach the same conclusion. During the DNFSB Staff visit, DOE-RL confirmed that Nuclear Regulatory Commission personnel consider the WHC schedule for obtaining a certificate of compliance for the shipping cask to be achievable.

   b. Sampling Strategy: In response to the Board's May 11, 1994 letter, WHC is now planning to obtain core samples from each available riser for the remaining tanks to be sampled during FY 94, in accordance with the implementation plan. This is a positive step, but it is still not clear how WHC will develop and validate tank waste distribution models based on data from samples. WHC has made progress toward an integrated approach to sampling, having begun programs to coordinate riser use among the various tank farm programs and to survey tank

risers before sampling. However, WHC has not formulated a strategy to execute the riser survey program in time to provide input for developing sampling plans and schedules.

To address a concern raised in the April 22, 1994, DNFSB Staff trip report accompanying the Board's May 11, 1994, letter, WHC tasked Oak Ridge National Laboratory (ORNL) to independently calculate the relative standard deviation (RSD) for the ferrocyanide concentration in samples from tanks 241-C-109 and -112. ORNL determined that the RSD is 18%, which appears to validate the 22% RSD that WHC used to show that only two samples are needed from each ferrocyanide tank. Since it is still not clear how the RSD calculations were performed, the DNFSB Staff plans to independently validate the RSD.

c. Sampling activities: WHC has not met the implementation plan's milestones for increasing core sampling capacity or for sampling the tanks. The first rotary mode core sampler was required to be ready for use in March 1994, but will not be available until the end of June, largely due to the need for equipment upgrades identified during operational testing. The next two rotary mode samplers are required to be ready for use in September 1994, but will probably be delayed until December or January, primarily because the design uses parts and equipment no longer manufactured. The rotary mode samplers are needed for tanks with a hard crust on the waste, and these delays could prevent meeting the goals committed to in the implementation plan. Although WHC has discussed the possibility of using additional shifts to minimize the effect of equipment delays, no firm plans have been developed.

Three tanks were scheduled to be sampled by mid-May using the push mode sampler, but only one has been sampled thus far. This sampling attempt encountered numerous difficulties and recovered less than two inches of material from each riser sampled. This led to a WHC decision to photograph or videotape the waste surface before future sampling events, to help determine which sampler is appropriate and to identify unusual features or obstacles in the tank.

Grab sampling, which recovers bottles of liquid and sludge, and vapor sampling are progressing well. WHC is developing a portable "in-situ" vapor sampling technique as an alternative to Hanford's only tank vapor sampling truck. This sampling method could resolve vapor sampling capacity issues, but plans for completing development and validation were not well defined.

These early sampling events have revealed several operational constraints on sampling. First, the sampling program is not receiving sufficient crane and industrial hygiene monitor support. WHC stated that only two sampling crews can be supported simultaneously, and often even this limited effort is delayed. Unless positive action is taken, the planned ramp-up in sampling activities will be disrupted by this problem. Second, sampling has been delayed several times due to high winds. WHC is evaluating using glove bags on the risers to allow

sampling to continue during windy periods. However, sampling personnel working on this project did not know why health physics technicians halt work when winds exceed 15 miles per hour (mph), even though site instructions allow work up to 25 mph, so it is unclear whether a significant improvement in the ability to sample tanks on windy days will result.

d. Off-Site Laboratories: The concern raised in the Board's May 11, 1994, letter regarding the number of off-site laboratories remains unresolved. DOE-RL has decided not to act on WHC's recommendation to change the implementation plan to use one off-site laboratory instead of two until it is shown that a single off-site lab will provide sufficient capacity. However, only INEL is currently preparing to analyze tank waste samples. Prolonged inaction may preclude using LANL as scheduled in the implementation plan.

5. **Future Staff Actions:** The DNFSB technical staff is planning to visit the Hanford Site in July 1994, to follow up on the findings of the March 1994, and May 1994, trips, to review the results of the next core sampling events, and to discuss deliverables for the Recommendation 93-5 Implementation Plan, including the FY 95-96 sampling schedule.