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# DEFENSE NUCLEAR FACILITIES SAFETY BOARD

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94-0003534



July 5, 1994

The Honorable Thomas P. Grumbly  
Assistant Secretary for Environmental Management  
Department of Energy  
Washington, D.C. 20585

Dear Mr. Grumbly:

Enclosed is a report prepared by the Defense Nuclear Facilities Safety Board's staff on the environmental monitoring program for Technical Area 54 at the Los Alamos National Laboratory. The report clearly indicates that the current radiological environmental monitoring program needs to be improved. Such programs provide added assurance that safety practices on site to minimize and limit off-site releases of radioactivity are effective. As such, they represent an important component of a "defense in-depth" approach to assuring public health and safety. It would appear that a comprehensive reappraisal of the program is in order.

The report is provided for your information and appropriate follow-up action. The Defense Nuclear Facilities Safety Board wishes to be advised of actions taken to address the matters reported.

If you need any further information in this connection, please let me know.

Sincerely,

A handwritten signature in cursive script, appearing to read "John T. Conway".

John T. Conway  
Chairman

c: The Honorable Tara O'Toole, EH-1  
Dr. Everet H. Beckner, DP-2  
Mr. Mark Whitaker, Acting EH-6

Enclosure

## DEFENSE NUCLEAR FACILITIES SAFETY BOARD

July 6, 1994

**MEMORANDUM FOR:** G. W. Cunningham, Technical Director

**COPIES:** Board Members

**FROM:** Mark T. Sautman

**SUBJECT:** Los Alamos National Laboratory - Environmental Monitoring Program Review Trip Report (April 13-14, 1994)

1. **Purpose:** This report documents the Defense Nuclear Facilities Safety Board (DNFSB) staff's observations regarding the Los Alamos National Laboratory's (LANL) Environmental Monitoring Program for Technical Area-54 (TA-54). This review was conducted by Monique Helfrich, Albert G. Jordan, James McConnell, Mark Sautman and Steven Stokes.
2. **Summary:** The Environmental Monitoring Program (EMP) is intended to provide defense in-depth for health and safety. The EMP does not report representative data in a timely manner as required by DOE Order 5400.1, *General Environmental Protection Program*. The 1992 Environmental Surveillance Report, due June 1, 1993, has not yet been issued. These monitoring data can be instrumental in detecting environmental problems from low level radioactive waste (LLRW) disposal and other activities to prevent off-site contamination, yet some data have often gone unanalyzed for years. In addition, LANL could not provide any technical bases for many of the environmental monitoring locations. Furthermore, the significance of the results does not appear to have been evaluated systematically to estimate the extent of contamination or the integrity of the waste containers.
3. **Background:** LANL disposes of its LLRW in TA-54, Area G, which is adjacent to the lands of the San Ildefonso Pueblo. Environmental monitoring is performed to support several projects including the Waste Site Study, the Transuranic Waste Remediation project, Environmental Remediation, and routine site-wide monitoring. Media examined include air, surface and ground water, soil, sediments, vegetation, foodstuffs as well as external radiation.
4. **Discussion:** Meetings on the EMP were held with both LANL and DOE Los Alamos Area Office personnel. The following text highlights the significant observations made by the DNFSB staff.
  - a. Timeliness of Reporting: DOE Order 5400.1 states that annual site environmental surveillance reports (ESR) shall be released by June 1 of the following year; a requirement LANL has not met since 1990. Recent reports have been a year late because of the low priority placed on laboratory analysis of samples required for DOE Order compliance. LANL stated that on-site laboratories have been strained by the great number of samples

required for environmental restoration. LANL also stated that it expects recent contracts with off-site laboratories will reduce the turnaround time from the current 12 months. However, current estimates for completion of their 1993 ESR still reflect over a one year delay in reporting the data.

- b. Sampling Program: Within TA-54, there is little integration of the various environmental monitoring projects. This has impacted the quality and usefulness of the results. Soil sampling locations and depths have been inconsistent and sediment samples are missing for some years. These problems make long-term trending difficult. Furthermore, many of the air, sediments, and soil sampling locations' identifications have had multiple names or duplicated those for a different medium. A unique identification system which identifies the location, medium, and program would avoid confusion and make trending easier. In addition, technicians use unapproved draft procedures for the air monitoring system because all of the approved procedures are for monitors which were replaced in 1992.

LANL could not provide any formal design bases for many of the sampling locations, nor was it known by personnel interviewed by DNFSB staff who was responsible for deciding on sampling locations. In some projects, samples were deliberately taken to determine the upper limit of waste migration and their locations were based on waste site proximity, meteorological conditions, visual inspections, radiation surveys, and surface topography. For other projects, it is apparently not known if the sampling locations were chosen to be representative, worst case, or just close to power connections. This makes it difficult to draw conclusions from these results because the sample location significance is unknown.

- c. Quality of Environmental Monitoring Reports: In addition to the environmental surveillance data reported annually in the ESR, more extensive monitoring and data analysis is performed as part of the Waste Site Study (WSS) program. However, little of the WSS data collected between 1988 and 1991 were analyzed until 1992 and detailed data analysis and trending was not completed until September 1993 because of lack of funding. The formal reports for samples collected in 1988 and later years are still in the draft stage. However, LANL started to report WSS data in the most recent ESR.

The San Ildefonso Pueblo have expressed the concern that LANL's ESR is misrepresenting the amount of contamination. This is because the unreported WSS data, acquired by the Pueblo and provided to the DNFSB staff, were often higher than the concentrations reported for TA-54 in the ESRs. LANL reported as recently as last February that the lower reported concentrations could not be compared to the higher unreported ones although the air sampler used to determine representative TA-54 concentrations is located just outside the fence and the WSS air samplers are located just inside the fence. LANL has not provided a satisfactory technical justification for this position. In addition, the DNFSB staff have noted numerous minor discrepancies between the concentrations

reported in the ESR and those in internal LANL memorandums. LANL stated that these were due to recent recalculations of the concentrations, which appeared in the memos.

The problems discussed above have hindered the timely identification and remediation of contamination incidents. For example, the Pu-238 concentrations measured by an air sampler began to increase in 1986 by up to a factor of a thousand. (This was still below permissible concentrations though.) The actual source of contamination was never determined, but a potentially contaminated glovebox 40 meters from the air sampler was the suspected source. This glovebox was stored in a plywood box on top of the ground and was exposed to wind and rain with other discarded equipment. The Pu-238 air concentrations did not return to normal levels until late 1990. This corresponds to the time period when the scrap equipment was removed and the site was flattened and compacted to prepare it for another project. The crate was not opened and examined until late 1993, seven years after the incident began, by which time any possible loose contamination may have been washed or blown off. In addition, there never was a formal investigation to determine the root cause or any corrective actions.

5. **Future Staff Actions:** The staff plan to review additional environmental monitoring reports to be provided by LANL.