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Los Alamos

Los Alamos National Laboratory
Los Alamos, New Mexico 87545

WATER QUALITY & HYDROLOGY GROUP, ESH-18
FAX TRANSMITTAL SHEET

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DATE: 2/22/01 ~~2-20-01~~ LOG NO: WQ&H-FAX-01-

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10592

ALO-LA-LANL-WASTEMGT-2001-0001 Update/Final Report

Occurrence Report

Waste Management

(Name of Facility)

Nuclear Waste Operations/Disposal

(Facility Function)

Los Alamos National Laboratory Los Alamos National Laboratory

(Laboratory, Site, or Organization)

Name: Dennis McLain
Title: Facility Manager **Telephone No.:** (505) 665-5099

(Facility Manager/Designee)

Name: FROSTENSON, CANDACE K
Title: **Telephone No.:** (505) 667-0572

(Originator/Transmitter)

Name: Candace K. Frostenson **Date:** 01/25/2001

(Authorized Classifier (AC))

1. Occurrence Report Number: ALO-LA-LANL-WASTEMGT-2001-0001

Inadvertent Release of Partially Treated Radioactive Wastewater to an Inactive Outfall and Solid Waste Management Unit

2. Report Type and Date: Update/Final

	Date	Time
Notification:	01/11/2001	10:10 (MTZ)
Initial Update:	01/29/2001	16:22 (MTZ)
Latest Update:	01/29/2001	16:22 (MTZ)
Final:		

3. Occurrence Category: Off-Normal

4. Number of Occurrences: 1 **Original OR:**

5. Division or Project: FWO-WFM

6. Secretarial Office: DP - Defense Programs

7. System, Bldg., or Equipment: TA-21, Building 257, Holding Tank 113

8. UCNI?: No

9. Plant Area: TA-21

10. Date and Time Discovered: 01/04/2001 13:30 (MTZ)

11. Date and Time Categorized: 01/08/2001 10:00 (MTZ)

12. DOE Notification:

13. Other Notifications:

Date	Time	Person Notified	Organization
01/04/2001	16:00 (MTZ)	Art Trujillo	DOE/LAAO

14. Subject or Title of Occurrence:

Inadvertent Release of Partially Treated Radioactive Wastewater to an Inactive Outfall and Solid Waste Management Unit

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15. Nature of Occurrence:

02) Environmental
E. Environmental Agreement/Compliance Activities

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16. Description of Occurrence:

Management Synopsis: On January 4, 2001, at approximately 1330 hours, at Technical Area 21, Building 257, the Radioactive Liquid Waste Facility (RLWTF), less than 50 gallons of low-level partially treated radioactive wastewater was released from a holding tank to an inactive outfall (Outfall 050). The Environmental Protection Agency (EPA), National Pollutant Discharge Elimination System (NPDES) outfall is also a designated Solid Waste Management Unit (SWMU) [21-011 (k)]. Once the discharge was discovered, the flow to the tank was immediately halted, and excess flow was pumped back into influent holding tanks.

Background: Wastewater from RLWTF is partially treated and then pumped into two effluent holding tanks, tanks 112 and 113. Gauges monitor the holding tanks until the effluent is transferred from TA-21-257 to the Laboratory's Liquid Waste Treatment Facility at TA-50, Building 2, for further processing and treatment.

At approximately 1330 hours, a waste treatment operator noticed that the level gauge for Holding Tank 113 appeared to be incorrect and immediately inspected the tank. Upon inspection, the operator observed the wastewater entering the tank overflow. The operator immediately stopped flow to the tank and placed a portable pump into the tank to pump the wastewater back to influent tanks, which stopped the inadvertent overflow.

Upon further investigation, facility management personnel determined that the overflow of Holding Tank 113 was piped to the inactive outfall and SWMU, releasing less than 50 gallons of partially treated radioactive wastewater to the outfall and SWMU. Preliminary tests indicated the water pH was 11.5 and it was slightly radioactive (412 pci/l gross alpha, 2.4 nci/l gross beta, and 660 nci/l tritium). Initial test levels were below radiation levels already present in the outfall and SWMU. Results from longer tests

run on the following day showed readings of 140 pci/l alpha, 2.2 nci/l beta, and 620 nci/l tritium.

Water from the release remained within the outfall and SWMU, a fenced area that is not publicly accessible. The area contains known contamination from Laboratory operations dating back to the 1950s. The SWMU had been selected for legacy waste cleanup operations by the Laboratory's Environmental Restoration Project, scheduled for cleanup in the spring/summer 2001. Signs on the fence surrounding the area warn of the radioactive contamination inside.

The LANL ESH-18 Water Quality Group reported the inadvertent release of partially treated radioactive wastewater to an inactive outfall and SWMU to the New Mexico Environment Department (NMED) and the EPA. ESH 18 verbally reported to NMED/EPA on 1/2/01. Written reports were submitted to NMED/EPA on 1/10/01. This reporting requirement is in the State of New Mexico Water Quality Commission Control requirements and EPA's requirements under the NPDES permit.

17. Operating Conditions of Facility at Time of Occurrence:

Normal

18. Activity Category:

03 - Normal Operations

19. Immediate Actions Taken and Results:

The discharge was halted within 15 minutes of discovery.

The Laboratory's Water Quality and Hydrology Group immediately notified the New Mexico EPA by telephone and formally notified them in a Release/Discharge Notification report on January 10, 2001.

Wastewater operations at TA-21-257 RLWTF will remain halted until level gauges are recalibrated, alarms are functional, and administrative procedures are established to visually inspect the tanks above 70 percent during filling operations.

20. Direct Cause:

4) Design Problem
B. Inadequate or Defective Design

21. Contributing Cause(s):

1) Equipment/Material Problem
A. Defective or Failed Part

7) External Phenomena
A. Weather or Ambient Condition

22. Root Cause:

6) Management Problem
A. Inadequate Administrative Control

23. Description of Cause:

Direct Cause: 4B Design Problem, Inadequate or Defective Design

The overflow of Holding Tank 1B was piped to the inactive outfall where it was then released to a SWMU. The liquid waste tank operators incorrectly assumed that the discharge line for Holding Tank 1B had either been removed or filled with concrete as an action in an unmonitored discharge occurrence in 1991. Corrective actions taken to plug the discharge pipeline at that time were believed to have been effective in preventing leaks due to faulty valves in the discharge pipes from reaching the outfall. However, this release to the outfall revealed that action taken in 1991 was not adequate. A temporary plug was placed in the overflow pipe from the tank as Corrective Action #1 for this incident. Corrective Action #2 will be placement of a permanent cap of the discharge pipeline at the tank source and evaluation of options to either remove the line or to fill it in with concrete.

Contributing Cause #1: 1A Equipment/Material Problem, Defective or Failed Part

The tank level gauge for Holding Tank 1B was unreliable. Operators normally performed visual inspection of the level in the tank because the reading on the level gauge monitored an imprecise span from zero to 100%. The tank level gauge reading has occasionally exceeded 100% and the tank has not overflowed in the past. At the time of this incident, the gauge indicated that the tank was at 88% of capacity. Although the older model air pressure gauge is the operators' preferred control indicator, it is subject to freezing in the winter. The recalibration of holding tank gauges is Corrective Action #3. In addition, there was failure of the electronic conductive detection alarm that should have worked under any weather conditions. The G-2 system, a computerized control system, was established in the early 1990's and was programmed with an option to monitor inhibited or unacknowledged alarms. The tank filling alarm function has been unreliable and has not been used for the past few years because operators have relied on visual inspection of the tanks and also because management did not assign priority to correction of the control system electronics malfunction. Corrective Action #4 is repair of the holding tank fill electronic control system alarm function.

Contributing Cause #2: 7A External Phenomena, Weather or Ambient Condition

Snow on the walkway prevented the operator from timely access to the holding tank inspection port to perform a visual inspection of the level inside the tank after he noticed the 88% gauge reading in the control room. The fifteen minute delay in his response time allowed the tank to fill beyond capacity.

Root Cause: 6A Management Problem, Inadequate Administrative Control

FWO-WFM has not implemented a preventive maintenance calibration program for holding tank gauges. Although operators routinely conduct visual inspection of the fill level in holding tanks, administrative procedures do not establish criteria or requirements for quality assurance of the inspection. Corrective action #5 is establishment of administrative controls to assure calibration of holding tank gauges and to assure standard operation of visual inspection to verify holding tank fill levels.

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24. Evaluation (by Facility Manager/Designee):

The process for decommissioning systems, such as permitted outfalls, needs to ensure all possible sources of flows are isolated. Plans in place for decommissioning systems and facilities over an extended period of time should include routine maintenance of monitoring capabilities until the system or facility is fully decommissioned.

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25. Is Further Evaluation Required?: No

26. Corrective Actions
(* = Date added/revised since final report was approved.)

1. A temporary plug was placed in the overflow pipe from the tanks.

   Responsible Group: FWO-WFM

Target Completion Date: 01/19/2001	**Completion Date:** 01/19/2001

2. This tank is in process of being abandoned in place. The holding tank used to replace this tank will have the overflow line configured to drain into the main influent tank.

   Responsible Group: FWO-WFM

Target Completion Date: 06/01/2001	**Completion Date:**

3. Holding tank gauges will be recalibrated and placed on a facility calibration program. Instrumentation review of gauges for similar tanks used by FWO-WFM will be conducted and captured in the calibration program.

   Responsible Group: FWO-WFM

Target Completion Date: 01/26/2001	**Completion Date:** 01/09/2001

4. The holding tank fill electronic control system alarm function will be repaired.

   Responsible Group: FWO-WFM

Target Completion Date: 01/31/2001	**Completion Date:** 01/09/2001

5. Administrative controls will be established to assure calibration of holding tank gauges and to assure standard operation of visual inspection to verify holding tank fill levels.

   Responsible Group: FWO-WFM

Target Completion Date: 02/28/2001	**Completion Date:** 01/22/2001

27. Impact on Environment, Safety and Health:

An NPDES operational spill Release/Discharge Notification to state and federal environmental offices was filed by the LANL ESH-18 Water Quality Group for Permit Number NM0028355. There was no impact on the safety or health of workers or the public as a result of this occurrence.

28. Programmatic Impact:

None

29. Impact on Codes and Standards:

None

30. Lessons Learned:

Holding tanks for contaminated waste water must be monitored to be certain that the gauges measuring the rate of fill and the tank capacity level are accurate to prevent discharge and release to the environment. Gauges should be calibrated, alarms should be functional, and operating procedures should provide guidance for visual inspection of tank levels. Decommissioning of waste water systems should ensure all sources of potential environmental impact are identified and isolated.

31. Similar Occurrence Report Numbers:

1. ALO-LA-LANL-WASTEMGT-1991-1004
2. ALO-LA-LANL-FIRNGHELAB-2000-0002

32. User-defined Field #1:

33. User-defined Field #2: