



COPY



GROUND WATER

NOV 19 2018

BUREAU

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Symbol: EPC-DO-18-403
LA-UR: 18-30432
Locates Action No.: U1801172
Date: **NOV 19 2018**

Ms. Michelle Hunter, Chief
Ground Water Quality Bureau
New Mexico Environment Department
Harold Runnels Building, Room N2261
1190 St. Francis Drive
P.O. Box 26110
Santa Fe, NM 87502

Subject: DP-1132, Condition No. 7, Verification of Secondary Containment

Dear Ms. Hunter:

On August 29, 2018, the New Mexico Environment Department (NMED) issued Discharge Permit DP-1132 to the U.S. Department of Energy and Los Alamos National Security, LLC (subsequently transferred to Triad National Security, LLC) for discharges of treated effluent from the TA-50 Radioactive Liquid Waste Treatment Facility (RLWTF). Pursuant to permit Condition No. 7, *Verification of Secondary Containment*, the U.S. Department of Energy and Triad National Security, LLC (DOE/Triad) is required to submit to NMED by November 27, 2018, verification that all units intended to convey, store, treat or dispose of untreated liquid or semi-liquid waste streams meet the requirements of secondary containment as defined in Discharge Permit DP-1132.

Enclosure 1 documents that all treatment, storage, and conveyance units at the RLWTF have secondary containment. The majority of those secondary containments—63 out of 81—are associated with the Radioactive Liquid Waste Collection System (RLWCS). The remaining 18 secondary containments are located within buildings and rooms at Technical Area (TA)-50. Presently, six of these 18 secondary containments do not have functioning leak detection systems, as required by permit Condition No. 7.

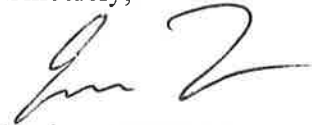
Planning and design are underway for installation of the missing leak detection systems. The design effort will take approximately 90 days. Once the design has been completed, a schedule for installing the additional detection systems will be prepared.

The RLWTF has round-the-clock knowledge of the status of vessels within TA-50 through other facility monitoring systems. For example, tank levels are continuously monitored and an unexpected level drop will generate an alarm that requires a response by the on-call duty operator. In addition, Rooms 60, 60A, and 61 are equipped with continuous radiation monitoring instruments that would sound an alarm if a vessel develops a leak.

In the interim, until the missing leak detection systems are installed, the listed rooms will be inspected at least once each work day. In addition, a revised secondary containment verification report will be submitted with each Discharge Permit DP-1132 quarterly monitoring report until all leak detection systems are installed and operational.

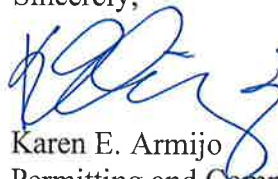
Please contact Karen E. Armijo by telephone at (505) 665-7314 or by email at Karen.Armijo@nnsa.doe.gov, or Robert S. Beers by telephone at (505) 667-7969 or by email at bbeers@lanl.gov if you have questions regarding this submittal.

Sincerely,



Enrique "Kiki" Torres
Division Leader
Environmental Protection & Compliance
Triad National Security, LLC

Sincerely,



Karen E. Armijo
Permitting and Compliance Program Manager
National Nuclear Security Administration
U.S. Department of Energy

TVV/KEA/MTS/RSB:jdm

Enclosure(s): (1) DP-1132, Verification of Secondary Containment

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ENCLOSURE 1

DP-1132, Verification of Secondary Containment

EPC-DO: 18-403

LA-UR-18-30432

Date: NOV 19 2018

Discharge Permit DP-1132
Condition No. 7: Verification of Secondary Containment
Radioactive Liquid Waste Treatment Facility (RLWTF)

November 2018

Purpose

This report verifies secondary containment for all units and systems that convey, store, treat, or dispose of an untreated liquid or semi-liquid waste stream at the Radioactive Liquid Waste Treatment Facility (RLWTF) meet the requirements of secondary containment as defined in Discharge Permit DP-1132.

Requirements

Discharge Permit DP-1132 requires Los Alamos National Laboratory (LANL) to verify secondary containment by November 27, 2018. Permit requirements are listed below:

- Condition 7 of DP-1132 requires that LANL submit to the New Mexico Environment Department (NMED) verification demonstrating that all units intended to convey, store, treat, or dispose of an untreated liquid or semi-liquid waste stream meet the requirements of secondary containment as defined in DP-1132.
- Definition Y of DP-1132 defines secondary containment as a constructed unit or system designed to prevent any migration of waste streams or accumulated liquid out of the unit or system to the soil, ground water, or surface water at any time.
- Definition Y of DP-1132 adds that secondary containment can include, but is not limited to: double-walled pipes, concrete and floors equipped with sumps and alarm systems to detect potential leaks.
- Definition Y of DP-1132 states that secondary containment must be:
 - Designed, constructed and maintained to surround the unit on sides and bottom;
 - Free of cracks, gaps, or fissures;
 - Constructed of, or lined with, materials that are compatible with the waste streams to be in contact with the unit or system;
 - Placed on a foundation or base capable of withstanding pressure gradients, settling or uplift which may cause failure of the unit or system; and
 - Equipped with a leak detection system that is designed and operated so that it will detect the failure of the primary containment structure.

Scope of the Secondary Containment Survey

The secondary containment verification included all facilities and systems regulated by Discharge Permit DP-1132:

- Underground collection systems (piping and access vaults) at six LANL Technical Areas: TA-03, TA-35, TA-48, TA-50, TA-55, TA-59;
- Treatment units and systems in five buildings at TA-50 (Buildings 1, 2, 66, 248, and 250);
- The three treatment processes as described in Discharge Permit DP-1132: the main treatment process, the transuranic radioactive liquid waste (RLW) treatment process, and the secondary treatment process;
- The seventeen treatment units within the three treatment processes.

Treatment Processes

The RLWTF receives and treats RLW from generators at LANL. The RLWTF has a main treatment process for low-level RLW, a process for treating transuranic RLW, and a secondary treatment process for waste streams from both the low-level and transuranic processes.

The main treatment process consists of influent collection and storage, the treatment of low-level RLW, and the discharge of treated water to the environment. Process steps include treatment with chemicals in a reaction tank, filtration, ion exchange, reverse osmosis, and the sampling and analysis of treated water prior to discharge. Two secondary streams are generated by primary treatment, solids precipitated in the reaction tanks, and reverse osmosis concentrate. Both are sent to the secondary treatment process.

Transuranic RLW treatment consists of influent collection and storage, treatment of the transuranic RLW, and sludge treatment. Treated transuranic RLW cannot be discharged to the environment because it exceeds DOE, EPA, and NMED effluent limits (e.g., Radioactivity levels in treated transuranic RLW can exceed levels found in low-level RLW influent). Instead, treated transuranic RLW must be re-treated in the main or secondary treatment processes. Solids from the treatment process are concentrated, solidified with cement, and shipped to the Waste Isolation Pilot Plant (WIPP) for disposal as a transuranic waste.

The secondary process treats wastes from the primary and transuranic treatment lines. It consists of a vacuum filter to treat solids from main process, secondary reverse osmosis to treat RO concentrate from the main process and/or treated transuranic RLW, and a bottoms disposal step. Wastes from the secondary treatment process are disposed as low-level radioactive solid waste.

Treatment Units

Units within each of these process lines are summarized in Table 1, and discussed in the following pages.

TABLE 1: RLWTF TREATMENT PROCESSES AND UNITS

Treatment Unit	Location
Main Treatment:	
M1 Collection system	TA-03, 35, 48, 50, 55, 59
M2 Influent storage	50-250
M3 Emergency influent storage	50-250
M4 Reaction tanks	50-01
M5 Microfilter	50-01
M6 Pressure filters	50-01
M7 Perchlorate ion exchange	50-01
M8 Primary reverse osmosis	50-01
M10 Effluent storage	50-01
Transuranic:	
T1 TRU Collection system	TA50, 55
T2 TRU Influent storage	50-66
T3 TRU Treatment	50-01
T4 TRU Sludge	50-01
T5 TRU Effluent	50-01
Secondary Treatment:	
S1 Secondary reverse osmosis	50-01
S2 Rotary vacuum filter	50-01
S3 Bottoms storage	50-248

Location: Technical Area – Building (e.g., 50-248)

Table 1 does not list treatment unit M9, copper-zinc ion exchange, because this treatment step is no longer used. Nor does Table 1 include units that convey or store treated water to be discharged to the environment, in accordance with DP-1132 Condition 7. Specifically, it does not list the NPDES Outfall 051, the mechanical evaporator system (MES), or the solar evaporation tank (SET).

Vessels and Secondary Containment

Table 2 expands upon the treatment unit summary provided in Table 1. Table 2 lists vessels associated with each treatment unit, vessel location, and information about each vessel and its secondary containment.

Vessels include water treatment equipment (e.g., the microfilter) and tanks associated with the unit (e.g., the sludge tank and cleaning tanks). Each vessel is described by capacity, material of construction, and whether the vessel is above ground, on the ground (or floor), or in-ground. Definition CC of Discharge Permit DP-1132 defines these three terms, as they apply to tanks.

Table 2 also describes the secondary containment provided for each vessel, by identifying the type of secondary containment, its material of construction, and the leak detection alarm that notifies RLWTF personnel of the presence of water in the secondary containment.

Survey Summary

The survey confirmed that secondary containment is in place for all units and systems that convey, store, treat, or dispose of an untreated liquid or semi-liquid waste stream. However, the following rooms in Building 50-01 do not have the required leak detection systems:

- Room 24, location of the secondary reverse osmosis treatment unit
- Room 36, location of the double-pass M8 reverse osmosis unit
- Room 61, used for storage of low-level solids (TK08)
- Rooms 60 and 60A, location of equipment for the treatment of transuranic RLW
- Room 62, used for storage of RLW that has been chemically treated and filtered (TK09)

Planning and design is underway for the installation of the required leak detection system in these rooms. The design effort will take approximately 90 days. Once the design has been completed, a schedule for installing the additional detection systems will be prepared.

The RLWTF has round-the-clock knowledge of the status of vessels within these rooms through the other facility monitoring systems. For example, tank levels are continuously monitored, and unexpected level drops generate an alarm that requires a response by an on-call duty operator. In addition, Rooms 60, 60A, and 61 are equipped with continuous radiation monitoring instruments that would sound an alarm if a vessel develops a leak.

In the interim, until the leak detection alarms are installed, the listed rooms will be inspected at least once each work day. In addition, a revised secondary verification report will be submitted with each DP-1132 quarterly monitoring report, until leak detection systems are installed.

Table 2: RLWTF Vessels and Secondary Containment

Treatment Unit	Vessel	Location	Vessel			Secondary Containment			
			Capacity (gals.)	Category	Material	Structure	Material	Leak Detection	
Main Treatment: M1 Collection system M2 Influent storage M3 Emergency influent storage M4 Reaction Tanks M5 Microfilter M6 Pressure filters M7 Perchlorate ion exchange M8 Primary reverse osmosis M1 Effluent storage	Piping (~ 4 miles) Vaults (63) WWRM tanks (2) Xfer piping Xfer pump room WWRM tanks (4)	Six TAs Six TAs 50-250-003 50-250-004 50-250-001 50-250-003	---	In-ground In-ground Aboveground In-ground Aboveground Aboveground	Polyethylene Concrete Fiberglass Polyethylene Steel Fiberglass	Pipe Floor Floor Pipe Floor Floor	Polyethylene Concrete Concrete Polyethylene Concrete Concrete	63 alarms 63 alarms PLC250_SMP3 250_Inf_250_Eff PLC250_SMP1 PLC250_SMP3	
	TK71, TK72 Filter Sludge tank Cleaning tanks (2) Filters (3)	50-01-70 50-01-70 50-01-70 50-01-70 50-01-63	10,000 40 500 200 100	Aboveground Aboveground On-ground On-ground Aboveground	Steel Steel Polyethylene Polyethylene Lined Steel	Floor Floor Floor Floor Floor	Concrete Concrete Concrete Concrete Concrete	RUF_71A_A1 RUF_71A_A1 RUF_71A_A1 RUF_71A_A1 SMP_16_A2	
	IX vessels (8) TK09 R72 RO unit R72 CIP tank M8 RO unit M8 CIP tank N.Frac, S.Frac	50-01-16 50-01-62 50-01-72 50-01-72 50-01-36 50-01-36 50-01-34B	50 10,000 40 500 60 300 20,000	Aboveground Aboveground Aboveground Aboveground Aboveground Aboveground	Fiberglass Steel Steel Polyethylene Fiberglass Polyethylene Steel	Floor Floor Floor Floor Floor Floor Floor	Concrete Concrete Concrete Concrete Concrete Concrete Concrete	SMP_16_A2 F RUF_71A_A1 RUF_71A_A1 F F SMP_34B_A1	
	Transuranic: T1 TRU Collection system T2 TRU Influent storage T3 TRU Treatment T4 TRU Sludge T5 TRU Effluent	Piping (~1 mile) Vaults (1) Acid tank Caustic tank TK1 TK2 TK-7A TK3	TA50, TA55 50-201 50-66 50-66 50-01-60 50-01-60 50-01-60A 50-01-60	---	In-ground In-ground Aboveground Aboveground Aboveground Aboveground Aboveground	PVDF, PP Concrete Steel Steel Steel Fiberglass Fiberglass	Pipe Floor Floor Floor Floor Floor Floor Floor	PVDF, PP Concrete Concrete Concrete Concrete Concrete Concrete Concrete	CTL_WM57_A1 CTL_WM57_A1 CTL_WM66_A4 CTL_WM66_A4 F F F F

Notes: See Page 6

Table 2: RLWTF Vessels and Secondary Containment (concluded)

Treatment Unit	Vessel	Location	Vessel			Secondary Containment		
			Capacity (gals.)	Category	Material	Structure	Material	Leak Detection
Secondary Treatment: S1 Secondary reverse osmosis	RO vessel	50-01-24	10	Aboveground	Fiberglass	Floor	Concrete	F
	TK25	50-01-24	300	Aboveground	Polyethylene	Floor	Concrete	F
	TK73	50-01-70	3,700	Aboveground	Steel	Floor	Concrete	RUF_71A_A1
S2 Rotary vacuum filter	Vacuum filter	50-01-116	900	Aboveground	S.Steel	Floor	Concrete	SMP_16_A2
S3 Bottoms storage	TK08	50-01-61	8,000	Aboveground	Steel	Floor	Concrete	F
	TK-NE, SE, SW, NW	50-248	20,000	Aboveground	Steel	Floor	Concrete	SMP_TKF_A2
	3K tank	50-248	3,000	Aboveground	Steel	Floor	Concrete	SMP_TKF_A2
	17K tank	50-02	17,000	Aboveground	Steel	Floor	Concrete	SMP_WM2_A2

Notes:

1. Vessel Descriptions, per definition CC of DP-1132: Aboveground, On-ground, In-ground.
2. When multiple tanks or vessels are identified, capacity is for each vessel.
3. Collection systems: Each access vault is equipped with a sump and leak detection probe-alarm
4. Collection system:
 - Piping: leaks in primary pipe would drain into the next downstream access vault.
 - Access vaults: each is equipped with a sump and leak detection probe-alarm.
5. Location: Technical Area-Bldg-Room
6. F means a leak detection system for the listed containment needs to be installed.