



**Department of Energy**  
Albuquerque Operations Office  
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Los Alamos, New Mexico 87544

APR 14 1997

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Benito Garcia, Bureau Chief  
Hazardous and Radioactive Materials  
Bureau  
New Mexico Environment Department  
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P. O. Box 26110  
Santa Fe, New Mexico 87505

Dear Mr. Garcia:

Subject: Low-Level Radioactive Liquid Waste Treatment Facility (RLWTF) Technical Area (TA) 50-1 Reconfiguration

Thank you for your letter of February 18, 1997, regarding "reconfiguration" of the subject facility. In that letter, you expressed concern about the potential generation of Resource Conservation and Recovery Act (RCRA) waste streams as a result of the proposed installation of the new treatment units at the RLWTF. Specific reference was made to the possible generation of any transuranic mixed waste which might result from the increased treatment efficiencies realized as a result of the upgrades, especially with regard to the generation of a concentrated sludge from new treatment units at the facility.

I would like to take this opportunity to assure you that these concerns are already being considered and addressed by an interdivisional working group composed of staff from various LANL Groups including EM (Environmental Management) RLWTF, ESH-19 (Hazardous and Solid Waste Group), and ESH-18 (Water Quality and Hydrology Group). These issues were also addressed as an integral part of the recommended conceptual design for the RLWTF upgrades.

It is my understanding that Janice Archuleta of your staff has already attended two meetings where members of the aforementioned working group discussed new efforts which were underway to prevent the introduction of RCRA waste streams to the TA-50 RLWTF and the possible generation of a treatment sludge meeting the definition of a "mixed waste" or "transuranic mixed waste." Some of the efforts discussed at those meetings included:

1. Development of a revised Waste Acceptance Criteria (WAC), and waste management document (WMOM), which define the types of wastes that will be accepted by the RLWTF in the future, and documentation (Waste Profile Form) which will be necessary to dispose of these wastes into the facility;
2. The development of influent and sludge monitoring programs to properly characterize the nature of waste streams received and produced by the RLWTF, and demonstrate that



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applicable RCRA exclusions, such as those contained in 40 CFR 261.3 and 261.4, are being met;

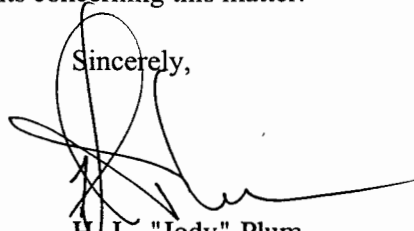
3. Review of RLWTF sampling procedures for influent and sludge to ensure that approved methodologies are being utilized and all applicable EPA Quality Assurance/Quality Control requirements are being met;
4. Review and update of institutional controls so that they are sufficient to ensure that Waste Acceptance Criteria are met in the future; and
5. Definition of the circumstances and criteria which impact LANL's use of RCRA wastewater treatment exclusions and the restrictions on that use.

The RCRA/NPDES Working Group expects to fully complete their efforts by June 30, 1997. At that time, I will provide you with a copy of all relevant program descriptions and documentation resulting from the working group's efforts. Your staff and DOE Oversight Bureau staff will be advised of future working group meetings where input from other interested parties on draft programs and policies will be solicited. A copy of the conceptual design report for the RLWTF will also be provided to your office.

I have enclosed for your information a copy of the revised RLWTF WAC recently reviewed by the working group and currently in use at LANL. If you or your staff have comments or questions regarding this document, please feel free to contact Alex Puglisi of ESH-19 at (505) 667-4882, or Anna Collery of EM-RLWTF at (505) 667-4301. Specific information regarding the RCRA/NPDES Working Group can also be addressed to either Mr. Puglisi, or Paul Schumann of ESH-19 at (505) 667-5840.

Thank you once again for your comments concerning this matter.

Sincerely,



H. L. "Jody" Plum  
Office of Environment and Projects

LAAMEP:9BK-016

Enclosure

cc:  
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cc w/enclosure:

J. Archuleta

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### 3. LIQUID RADIOACTIVE WASTE

The Radioactive Liquid Waste Treatment Facility (RLWTF) treats and disposes of aqueous low-level radioactive waste. This waste is usually discharged to the RLWTF through a network of buried pipelines, generally referred to as the radioactive liquid waste collection system (RLWCS). The RLWTF consists of three treatment plants: the TA-50-1 Main Radioactive Liquid Waste Treatment Plant (Main Plant), the TA-50-1, Room 60 Pretreatment Plant (Pretreatment Plant), and the pretreatment plant at TA-21-257 (DP-257). Waste acceptance criteria for the RLWTF are based on the following:

- DOE Order 5820.2A
- DOE Order 5400.5
- U.S. Department of Transportation (DOT) regulations
- New Mexico Hazardous Waste Management regulations (20 NMAC 4.1) which implement RCRA regulations
- New Mexico Water Quality Control Commission regulations/standards
- National Pollutant Discharge Elimination System (NPDES) permit
- Groundwater Discharge Plan
- As-low-as-reasonably-achievable (ALARA) considerations

Liquid waste meeting the requirements of this Chapter may be poured down drains connected to the RLWCS, which is connected to the RLWTF; however, generators not connected to the RLWTF by the RLWCS may have waste transported to a treatment plant for treatment.

#### 3.1 Transportation Requirements

Occasionally liquid waste may be transported to a treatment plant in containers, such as Tuff Tanks™, 55-gallon drums, or tanker trucks. If RLWTF personnel transport a waste in its tanker truck, the waste must contain less than 2 $\mu$ Ci/L of radioactivity and/or qualify as a "limited quantity" of radioactive materials.

Unless arrangements are made with the RLWTF, generating groups are responsible for transporting liquid waste to a treatment plant in full compliance with applicable packaging and transportation standards. RLWTF personnel may assist in transporting larger volumes of liquid waste, such as waste in Tuff Tanks™ and volumes large enough to be transported by tanker truck. Generating groups may incur the cost of transporting liquid waste transported by RLWTF personnel.

All transported waste must be properly documented with a Waste Profile Form (WPF) and a Chemical Waste Disposal Request (CWDR). The generating group must provide at least 48 hours notice before the waste is transported to a treatment plant. If the waste is transported by RLWTF personnel, the generator will be contacted to

coordinate the time and place of the pickup. The exact location must be specified for the pickup. Either the waste generator or the WMC must be present at the time and place of pickup to ensure that the correct items are transported. Failure to have a waste generator or WMC at the designated site and time may result in a delay of the waste pickup. In addition, if RLWTF personnel assist in transporting waste, the generating organization must provide the necessary equipment, such as forklifts, required for safely transferring the waste.

### 3.2 Container Requirements

Containers must be approved by DOT for transportation of the given waste type and must meet the following criteria:

- Be made of a material that will not react with the transported liquid waste
- Have surfaces that are clean and free of any oils and chemicals or surface contamination
- Be of sufficient thickness that any deformation is within design parameters
- Have no bottom outlets that are unprotected
- Be in good condition, with no leaks, rusting, dents, bulges, or other structural defects that could impair the integrity or safe handling of the container

If integrity of the container is questionable, the waste generator must test the container or repackage the waste to ensure safe transportation of the liquid waste in the container. Waste packaged in unacceptable containers will not be accepted.

Waste generator organizations are ultimately responsible for their waste containers. After waste is disposed of at the treatment plant, containers provided by the waste generating group will be triple-rinsed by RLWTF personnel, scanned for surface contamination, and returned to the generator.

Transport of highly radioactive aqueous waste requiring shielding is not anticipated; however, if shielding is required, the waste generator must provide an adequate amount to comply with the Laboratory's ALARA policy. After the waste is disposed, the shielding material is returned to the waste generator.

### 3.3 Package Weight

Package weight must not exceed the rated capacity of the container based on DOT-specified package certification tests for the contained material. No other requirements or restrictions are specified for package weight.

### 3.4 Waste Content

The RLWTF accepts each waste stream on a case-by-case basis, dependent on the chemical constituents, concentration, volume generated, and frequency of generation. The RLWTF may require the generator to provide additional information, such as analytical data, if more information is required to determine if the waste is acceptable for treatment.

Some liquid waste streams, although treatable at certain concentrations and volumes, if entering a treatment plant at high enough volumes and concentrations may shock load treatment systems causing severe operational problems. Other liquid waste streams, although treatable, may be difficult to efficiently treat or may exceed allowable regulatory limits set by the Clean Water Act or RCRA, so can only be accepted at very low concentrations and/or volumes, depending on the type of waste, chemical constituents, volume generated, frequency of generation, and concentration. If wastes in the above two categories enter the RLWTF at high enough concentrations and/or volumes, the RLWTF may violate its NPDES permit. Examples of wastes that fit into these categories are

- nitrogen and other nitrogen compounds
- boiler/chiller waters
- detergents/surfactants
- scintillation cocktails not regulated by RCRA

**WARNING:** Generators cannot intentionally dilute a waste to meet the criteria of this WAC or to meet regulatory exclusions.

The content of liquid waste sent to the RLWTF must meet certain criteria, identified below:

- **Radionuclides:** The maximum allowable radioactivity concentration for waste discharged to the Main Plant and DP-257 is 0.5  $\mu\text{Ci/l}$  and for waste discharged to the Pretreatment Plant through the acid and caustic lines is 60  $\mu\text{Ci/l}$  for acid waste and 4500  $\mu\text{Ci/l}$  for caustic waste. The concentration limits for radionuclides acceptable for discharge to the RLWTF are listed in Table 3-1. Waste-generating groups must make special arrangements with the Radioactive and Industrial Wastewater Science Group for the treatment of liquid waste having an activity greater than 0.5  $\mu\text{Ci/l}$  and not destined for treatment at the Pretreatment Plant. Generators of radioactive liquid waste having an activity greater than 0.5  $\mu\text{Ci/l}$  may be required to provide the RLWTF with biweekly summaries of volumes and activity levels of each of the waste discharged to the RLWCS.
- **Tritium:** Accelerator-produced tritium is not allowed for treatment at the RLWTF. The concentration of reactor-produced tritium allowed is 20,000 pCi/l.
- **Radium:** The concentration of  $^{226}\text{Ra}$  and  $^{228}\text{Ra}$  in the waste must not exceed 30 pCi/l.
- **Chemical Waste:** Inorganic acids and bases with a pH between 2 and 12 may be accepted for treatment at the RLWTF. Inorganic acids and bases, which may be regulated by RCRA because of

corrosivity (D002), may be accepted on a case-by-case basis. DP-257 and the Main Plant do not have a hazardous waste facility permit. In general, waste regulated by RCRA (see Table 3-3), such as acetone, methyl-ethyl-ketone (MEK), 1,1,1-trichloroethane (TCA) and electroplating waste, are not acceptable for treatment at the Main Plant or DP-257, because such treatment may constitute a violation of RCRA. For additional information concerning RCRA, contact the Hazardous and Solid Waste Group. Organic waste not regulated by RCRA may be accepted for treatment on a case-by-case basis, dependent on the chemical constituents, concentration, and volume generated.

- *Metals:* Waste streams containing metals regulated by RCRA (see Appendix B) are generally not acceptable for treatment at the Main Plant and DP-257; therefore, the metal concentrations must not exceed the limits provided in Table 3-2. Waste streams containing RCRA-regulated metals may be approved for discharge to the Pretreatment Plant on a case-by-case basis. Limits for other metals regulated by the NPDES permit are also listed in Table 3-2.
- *Temperature:* The temperature of liquid waste discharged to the RLWCS should not exceed 60°C (140°F).
- *Unacceptable Waste:* Waste streams containing any of the following components are unacceptable for treatment or disposal at the RLWTF:
  - PCBs
  - RCRA-regulated wastes in Table 3-3<sup>1</sup>
  - Electroplating operations waste
  - Sanitary waste
  - Infectious microorganisms or microorganisms capable of generating hydrogen sulfide

### 3.5 External Package Contamination/Dose Rate

To keep radiation exposures to personnel and the environment ALARA, qualified personnel, such as Health Physics Operations radiological control technicians (RCTs) must survey containerized waste for surface contamination and dose rates. Removable surface contamination may not exceed the limits established in Table 2-2 of the *LANL Radiological Control Manual*. The external surface dose rate of a package of liquid waste may not exceed 200 mrem/hr.

### 3.6 Package Marking and Labeling

All labels and markings required by the DOT for the waste must be on the containers prior to transport. Containers must also have completed *Health Physics Radioactive Materials Survey Tag*.

<sup>1</sup> Limited exceptions may be approved by RLWTF personnel on a case-by-case basis.

TABLE 3-1

Limits on Radionuclides Acceptable for Discharge to the RLWTF

	Maximum Allowable Concentration (Ci/l)
<b>Treatment Location</b>	
Main Plant (includes industrial waste from TA-55)	5.0E-7 total
DP Plant	5.0E-7 total
Pretreatment Plant (waste from TA-55-PF4)	
Process Caustic Waste	4.5E-3 alpha
Process Acid Waste	6.0E-5 alpha
<b>Radionuclide</b>	
<sup>74</sup> As	4.0E-8
<sup>7</sup> Be	1.0E-6
<sup>141</sup> Ce	5.0E-8
<sup>134</sup> Cs	2.0E-9
<sup>137</sup> Cs	3.0E-9
<sup>56</sup> Co	1.0E-8
<sup>57</sup> Co	1.0E-7
<sup>58</sup> Co	4.0E-8
<sup>60</sup> Co	5.0E-9
<sup>152</sup> Eu	2.0E-8
<sup>3</sup> H (accelerator- produced)	0 (none allowed)
<sup>3</sup> H (reactor-produced)	2.0E-8
<sup>133</sup> I	1.0E-8
<sup>52</sup> Mn	2.0E-8
<sup>54</sup> Mn	5.0E-8
<sup>226</sup> Ra + <sup>228</sup> Ra	3.0E-11
<sup>83</sup> Rb	2.0E-8
<sup>84</sup> Rb	1.0E-8
<sup>46</sup> Sc	2.0E-8
<sup>48</sup> Sc	2.0E-8
<sup>75</sup> Se	2.0E-8
<sup>22</sup> Na	1.0E-8
<sup>85</sup> Sr	7.0E-8
<sup>89</sup> Sr	2.0E-8
<sup>90</sup> Sr	1.0E-9
<sup>113</sup> Sn	5.0E-8
<sup>48</sup> V	2.0E-8
<sup>88</sup> Y	3.0E-8
<sup>65</sup> Zn	9.0E-9



TABLE 3-2

Limits on Metals Acceptable for Discharge to the RLWTF

Metal	Allowable Concentration (mg/L)
Aluminum	$\leq 5.0$
Arsenic	$< 5.0$
Barium	$< 100$
Boron	$\leq 5.0$
Cadmium	$< 1.0$
Chromium	$< 5.0$
Cobalt	$\leq 1.0$
Copper	$\leq 1.0$
Lead	$< 5.0$
Mercury	$< 0.2$
Silver	$< 5.0$
Selenium	$< 1.0$
Vanadium	$\leq 0.10$
Zinc	$\leq 95.40$

TABLE 3-3

Unacceptable Waste at the RLWTF

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The following RCRA regulated waste<sup>1</sup>

waste exhibiting the characteristic of ignitability as defined in 40 CFR § 261.21

waste exhibiting the characteristic of reactivity as defined in 40 CFR § 261.23

waste exhibiting the characteristic of toxicity as defined in 40 CFR § 261.24

F-listed waste as defined in 40 CFR § 261.31

K-listed waste as defined in 40 CFR § 261.32

P-listed waste as defined in 40 CFR § 261.33

U-listed waste as defined in 40 CFR § 261.33

PCBs

Waste at temperatures greater than 140° F

Nonaqueous waste

Infectious microorganisms

Sanitary waste, except from specific showers and sinks in change rooms where radioactivity may be present

Microorganisms that could generate hydrogen sulfide (H<sub>2</sub>S)

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### 3.7 Additional Requirements/Restrictions

#### 3.7.1 Volume

On the WPF, the generator must specify the maximum projected volume of liquid that he/she will dispose down a drain connected to the RLWCS within any single day. Generators anticipating a volume increase must inform the RLWTF of the increase before disposing of the waste down a drain and complete a new WPF, if the increase will become a part of routine operations. If RLWTF personnel determine the volume may shock load treatment systems, personnel will work with the generator to determine an acceptable method of disposing of the waste. This will help ensure that the RLWTF does not incur violations of its NPDES Permit.

#### 3.7.2 Acceptable Knowledge

Upon request, the generator must make acceptable knowledge documentation available to RLWTF personnel evaluating the WPF.

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<sup>1</sup> Limited exceptions may be approved by RLWTF personnel on a case-by-case basis.

### 3.7.3 Storage Tanks

All tanks used to store liquid waste must meet the requirements of the Laboratory's *Spill Prevention Control and Countermeasure Plan* and *Storm Water Pollution Prevention Plan*. Contact the Water Quality and Hydrology Group for additional information.

### 3.7.4 Posting of Sinks Connected to the RLWCS

Each sink connected to the RLWCS must be posted with a sign informing the user of the requirements for disposing of waste down the drains. See Appendix F for a current sign with information that must be posted at each sink. The generating group is responsible for ensuring all sinks are posted and the most current sign is posted. Signs may be obtained from the RLWTF at 667-4301. The operating group may develop and post its own signs; however, at a minimum all information on signs supplied by the RLWTF must be on the signs and the RLWTF must approve the signs.

### 3.7.5 Labeling of Radioactive Waste Lines

Pipelines within buildings and connected to the RLWCS should be labeled "Radioactive Waste Line." Contact the RLWTF at 667-4301 for labels and for assistance in determining which pipelines are connected to the RLWCS.

### 3.7.6 Connections to the RLWCS

A WPF must be submitted to and approved by the RLWTF before any waste can be discharged to the RLWTF through a connection to the RLWCS.

### 3.7.7 New Waste Streams

Each operation creating a new waste stream requiring treatment through the RLWTF, even if the waste stream will be generated only one time, must be characterized on a WPF.

### 3.7.8 Modification of a Waste Stream

When the characteristics of a waste stream change, the waste generator must notify the RLWTF and submit a new WPF before discharge. Examples of modified waste streams are operational changes that cause a significant differences in the chemical, physical, or radionuclide composition of the waste or a significant difference in the volume of waste piped to the RLWCS. The RLWTF must approve the new WPF before transfer to the RLWCS can resume or a containerized waste can be transported.

### 3.7.9 Standard Operating Procedures

Each operation involving the generation, management, handling, or disposal of liquid waste requires a standard operating procedures (SOP), which must be prepared, reviewed, and approved as specified in Administrative Requirement 1-3, *Standard Operating Procedures and Special Work Permits*. Each SOP must specify the methods

for segregating radioactive liquid waste from other nonradioactive hazardous or nonhazardous materials, proper and safe handling of liquid waste, and proper disposal and transportation of liquid waste. RLWTF personnel are available to help liquid waste-generating groups prepare these SOPs; other groups from the Environment, Safety, and Health Division, such as Health Physics Operations, the Health Physics Measurement Group, and Nuclear Criticality Safety may also be consulted.

The RLWTF must review all SOPs involving the generation or disposal of liquid waste before the SOPs are implemented. To ensure compliance with the SOPs and applicable regulations, as well as to determine where program improvements are needed, The RLWTF reserves the right to perform periodic field operational reviews of these SOPs. The frequency of the reviews shall depend on the needs of the particular operations.

### 3.8 Exemptions/Exceptions

Instructions for applying for exemptions/exceptions to this WAC are in Chapter 21.

# ROUTING/TRACKING SLIP

Incoming Document(s)

RE: LANL TA-50-1 RLW RF Reconfiguration  
Date Rec: 4/21/97  
Date Out: 4/22/97

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Lydie,  
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Thanks JK.