

Contact Person	Sarah Morris-Benavides	Revision	3.0
Document	Plan 10200.033	Effective Date	05/15/2015
		Review Date	05/15/2018

Radioactive Waste Management Basis

The Ames Laboratory Radioactive Waste Management Basis is documented in accordance with DOE Order 435.1, *Radioactive Waste Management*, and DOE Manual 435.1-1, *Radioactive Waste Management Manual*, which establish requirements for the management of radioactive waste at facilities operated by the Department of Energy (DOE) and its contractors. The Environment, Safety, Health and Assurance (ESH&A) Office is responsible for all radioactive waste operations at the Ames Laboratory.

1.0 APPROVAL RECORD

- Reviewed by: Program Assistant, Document Control (Molly Daub)
- Reviewed by: Radiation Safety Officer (Mike McGuigan)
- Approved by: Manger, ESH&A (Sean Whalen)
- Approved by: Chief Operations Officer (Mark Murphy)
- Approved by: Associate Director for Sponsored Research (Deb Covey)
- Approved by: Assistant Director for Scientific Planning (Cynthia Jenks)
- Approved by: Chief Research Officer (Duane Johnson)
- Approved by: Deputy Director (Tom Lograsso)
- Approved by: Laboratory Director (Adam Schwartz)
- Approved by: DOE Contracting Officer, Ames Site Office (Jennifer Stricker)

The official approval record for this document is maintained in the Training & Documents Office, 105 TASF.

2.0 INTRODUCTION

- 2.1 Low-level Radioactive Waste (LLW):** Currently there is minimal research involving radioactive materials at the Laboratory. Infrequently, small amounts (50 grams or less) of radioactive materials are used that may result in small amounts of contaminated debris. The majority of radioactive waste comes from renovation activities and remediation of legacy radioactive contamination due to the activities of the post-WWII era research involving thorium. Typically, renovation, remediation, and research activities generate 50 to 200 cubic feet of LLW per year. Little mixed low-level waste (MLLW) generation is expected. ESH&A is responsible for collecting, consolidating, characterizing, treating, packaging and transporting LLW.
- 2.2 High-level and Transuranic Radioactive Waste:** Chapters II and III of DOE Manual 435.1-1 address high-level and transuranic waste. Requirements in these chapters do not apply as the Laboratory does not generate these types of waste. The Laboratory does not have any high-level or transuranic waste in storage and does not foresee generating any of these types of waste in the future through either remediation or renovation. This document and related documents will be updated accordingly in the case that this changes.
- 2.3 Disposal:** Onsite disposal is not an option at the Laboratory. Whenever possible, the Laboratory will ship its LLW to another DOE facility for disposal. Commercially approved disposal facilities will be utilized when DOE facilities are not available or cost effective.

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3.0 OPERATIONS

3.1 Collection

Collection of radioactive low-level waste (LLW) and mixed low-level waste (MLLW) is addressed in the Laboratory's [Waste Management Program Manual \(10200.003\)](#).

3.2 Storage for Shipment

LLW and MLLW is stored in two locations: 1) Room B56A Spedding Hall and, 2) Room 105 Mechanical Maintenance Building (Radioactive Waste Area (RWA)). B56A is a small temporary storage room where LLW and MLLW is temporarily stored until analysis is completed. There is no potential for a radiological release to the outside environment from contents in B56A because all materials are contained. After analysis, LLW and MLLW is transferred to the RWA. LLW is segregated, solidified (if necessary), compacted and packaged in the RWA. The RWA is equipped with a continuous air monitor (CAM) to monitor the room's air during activities with significant release potential. The CAM is also used to monitor the exhaust air from the room's compactor when compacting radioactive debris. The Laboratory maintains an exemption from obtaining an Iowa DNR air construction permit per IAC-567-22.2(2)"w"(1) for the compactor. The compactor is equipped with a HEPA filtration system that is tested and certified annually.

3.3 LLW Certification and Characterization

LLW is certified according to the receiving or disposal facility's requirements/guidelines. The Environmental Specialist is responsible for maintaining profiles and certifying that waste materials are within the profiles' specifications. Verification and/or characterization of LLW may be completed by chemical analysis, generator knowledge, surveys, and/or gamma spectroscopy depending on the waste matrix and origin. One or more of these methods may be required depending on the disposal facility's requirements and/or type or origin of waste. The Laboratory's LLW is tracked by the *Radioactive Waste Acceptance* form (Form 10200.107). A form is completed for each LLW item (debris bag, equipment, etc.). Data from the form is entered into the Laboratory's Waste Web Application.

3.4 Packaging & Transportation

Packaging and transportation operations are performed in accordance with the Laboratory's [Transportation Safety Manual \(48303.001\)](#), and ESH&A's Radioactive Waste Packaging and Shipping Procedures (10200.071), federal regulations, state regulations and disposal facility guidelines.

4.0 WASTE GENERATION PLANNING

4.1 Life-Cycle Planning

The majority of the Laboratory's LLW is generated from renovation activities in spaces with legacy contamination. These renovation activities are dependent on funding and short-term and long-term facility needs. Therefore, it is difficult to accurately predict the life-cycle of the Laboratory's LLW. However, based on past activities, it is estimated that the Laboratory could generate sufficient quantities to justify a cost effective shipment (usually one truckload) and disposal every 6-8 years for the next 20 years.

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4.2 Waste with No Identified Path to Disposal

Currently the Laboratory does not have any of this type of waste and does not foresee having any in the future. Any proposed activity that will or could potentially generate a waste with no disposal path would require prior approval from the DOE Field Element Manager.

5.0 EXEMPTIONS

Ames Site Office approval of this Radioactive Waste Management Basis will constitute approval of the following exemptions for the Ames Laboratory.

5.1 Approval of Exemption for Use of Non-DOE Facilities (See DOE Manual 435.1-1 Requirement I.2.F(4))

DOE waste shall be treated, stored, and in the case of low-level waste, disposed of at the site where the waste is generated, if practical; or at another DOE facility. Ames Laboratory will exercise an exemption in accordance with DOE M 435.1-1 I.2.F (4) to ship LLW to off-site commercial facilities. Use of DOE disposal facilities has been evaluated and found not to be cost effective. Currently there is only one DOE disposal site, the Nevada Test Site, available to receive Ames Laboratory LLW. The costs of obtaining and maintaining Nevada Test Site waste generator certification will be weighed against the cost of using a commercially available disposal route during the fiscal year prior to shipping LLW.

5.2 Approval of Exemption for the Storage Limit for Low-level Waste (LLW) and Mixed Low-level Waste (MLLW) (See DOE M 435.1-1 Requirement IV.N. (2))

Low-level waste that has an identified path to disposal shall not be stored longer than one year prior to disposal, except for storage for decay, or as otherwise authorized by the Field Element Manager. Due to the small amounts of low-level waste generated at the Ames Laboratory, it is not economically practical to ship on an annual basis. The Laboratory will evaluate each fiscal year whether it is cost efficient to ship LLW and/or MLLW in the next fiscal year based on the amount accumulated and the expected generation. When enough LLW and/or MLLW has been generated to render a shipment necessary and cost effective, the Laboratory will seek concurrence from the Ames Site Office.

6.0 REFERENCES AND RESOURCES

- Waste Management Program Manual, 10200.003
- Waste Minimization/Pollution Prevention Plan, 10200.024
- Hazard Identification for Excess Property Materials, 10200.054
- Hazardous Waste Generator References and Resources (AL-073), 10200.040
- Radioactive Waste Acceptance Form, 10200.107
- Transportation Safety Manual, 48303.001
- Radioactive Waste Packaging and Shipping Procedures, 10200.071
- Waste Management Contingency Plan, 10200.017
- Waste Management Contingency Procedure, 10200.044