


Texas State University - San Marcos Risk Management & Safety	No. RMS-03.01	Rev. B
	Title Decay In Storage	
	Date September 24, 2007	Page 1 of 5
Reviewed By Lisa Arceneaux		Approved By 

1. PURPOSE

The purpose of this procedure is to provide a viable method of waste management of radioactive waste when the half-life of a radionuclide is less than 88 days. The waste may be stored and allowed to decay for a minimum of ten (10) half-lives prior to disposal as non-radioactive waste. Use of this waste management method has been approved by the Bureau of Radiation Control and will be the most cost effective method for disposal.

2. SCOPE

Any authorized laboratory on Radioactive Material License (RAML) # L03321 will be permitted for Decay-In-Storage (DIS) once approved by the Radiation Safety Officer (RSO).

All waste on campus will be separated by half-life and reasonable estimates will be made on the activity present after the material is declared waste. Guidelines have shown that dry waste will constitute ~5% or less of the amount of activity used in each experiment.

These surveys and procedures will be documented for the life of the RAML

3. PRECAUTIONS & LIMITATIONS

- Only radioactive materials with half-lives **less than 88 days** may be disposed of using this procedure.
- This procedure is not applicable to alpha emitting radioisotopes.
- Shielding may be required for those areas storing P-32.
- The laboratory/ storage area shall be locked when authorized personnel are not present.
- The laboratory/storage area shall be posted with "Caution Radioactive Material (CRM)".
- Radioactive waste is segregated by half-life.
- Reasonable estimates shall be made on the activity present after the material is declared waste.
- All waste will be labeled with CRM tape, dated and held for a minimum of ten half-lives prior to being discarded as non-radioactive waste.
- Prior to disposal, the waste shall be surveyed in a low background area.
- Surveys and procedures will be documented for the life of the RAML.
- Transport of waste container out of authorized laboratory complex is not permitted without RSO approval.

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4. TERMS

- CRM – Caution Radioactive Material
- DIS – Decay In Storage
- Mixed Waste – laboratory waste that contains both radioactive material and hazardous chemical waste.
- P-32 – Phosphorous 32 radioisotope; Half-life 14.3 days; Decay by 1.709 MeV Beta no gamma
- Radiation Area – any area, accessible to individuals, in which the radiation levels could result in an individual receiving a dose equivalent in excess of 5 millirem in one hour at 30 cm from the source of radiation or from any surface that the radiation penetrates.
- RAML – Radioactive Material License
- RSO – Radiation Safety Officer
- Unrestricted Area – an area, or access to, which is neither limited nor controlled for radiation or contamination control purposes.

5. PROCEDURE

NOTE:
Section 5.1 is performed by the laboratory generating the waste.

5.1 Preparation

- a. When laboratory radioactive waste container is full notify Laboratory Supervisor.
- b. Seal waste container.
- c. Perform contamination survey on exterior of waste container. Verify container exterior surface contamination levels are:
 - < 1000 dpm/100 cm² beta-gamma.
- d. Perform radiation survey on of waste container. Note highest contact reading.
- e. Estimate of the quantity of radioactive material present in the waste container.
- f. Verify that waste container is properly labeled with the Radiation symbol and the words “CAUTION, RADIOACTIVE MATERIAL” or “DANGER, RADIOACTIVE MATERIAL”

NOTE
Waste disposal tags are available through the Environmental Health, Safety & Risk Management Office.

- g. Record the following on the waste disposal tag and attach tag to the container (see Attachment A):
 - Radioisotope(s) present
 - Activity (indicate either mCi or μCi)
 - Waste type (i.e. liquid – organic, liquid – aqueous, solid, LSC vials)

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- Quantity (i.e. liters, grams, number of LSC vials, etc.)
 - Accumulation start date
 - Location of origin (Department, Building, Room)
 - Name and phone number of lab contact
 - Date container sealed
 - Highest contact radiation survey reading
 - If Mixed Waste, then the middle section of the Waste Disposal Tag is required to be completed.
- h. Contact Environmental Health, Safety & Risk Management Office and request radioactive material waste pickup.
- i. Document the following in laboratory log notebook:
- Waste container unique identifier,
 - Radionuclide(s)
 - Date container sealed
 - Radiation survey results
 - Contamination survey results

NOTE:
Sections 5.2 through 5.5 are completed by the Environmental Health, Safety & Risk Management Office.

5.2 Waste Pickup

- a. Verify Waste Disposal Tag is accurate, complete, signed and attached to waste container.
- b. Perform radiation survey on of waste container. Verify container radiation level readings.
- c. Transfer waste container to authorized storage location.
- d. Perform radiation survey of authorized storage location.
- e. If any radiation level in the storage location is ≥ 5 mrem/hr at 30 cm from any container, perform the following:
 - Post the storage location as a “Radiation Area”.
 - Notify RSO.
 - Verify radiation level readings in unrestricted areas immediately adjacent the storage location are < 2 mrem/hr.
- f. Document the following in storage area log notebook:
 - Waste container unique identifier
 - Radionuclides
 - Date container sealed
 - Radiation survey of waste storage area

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- Storage location

NOTE:

The following is performed after a minimum of 10 half-lives for the radionuclide has elapsed (i.e. 143 days for P-32) for the designate container.

5.3 Liquid Waste Disposal

- a. Remove waste container to a low background area.
- b. Perform radiation survey on of waste container using a portable survey meter with a NaI(Tl) scintillation detector.
- c. If no activity is detected and waste does contain hazardous chemical(s), then perform the following:
 - 1) Remove or obliterate all radioactive material markings on the waste container.
 - 2) Transfer container to Central Accumulation Area for disposal.
- d. If no activity is indicated and waste does **NOT** contain hazardous chemical(s), then dispose of liquid down waste storage area sink drain.
- e. If reusing waste container perform the following:
 - 1) Rinse the container with water (at least two volumes).
 - 2) Store container in appropriate location.
- f. If desired to dispose of waste container perform the following:
 - 1) Rinse the container with water (at least two volumes).
 - 2) Remove or obliterate all CRM labels or tape on the container prior to disposal.
- g. Complete Attachment B, DIS Disposal Record

5.4 Solid Waste Disposal

- a. Remove waste to a low background area.
- b. Perform radiation survey on of waste using a portable survey meter with a NaI(Tl) scintillation detector.
- c. If no activity is indicated, remove or obliterate all CRM labels or tape on the container.
- d. Dispose of waste as non-radioactive as appropriate.
- e. Complete Attachment B, DIS Disposal Record

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6. PERFORMANCE METRICS



Stored short lived radioactive waste is kept to a minimum quantity.
Documentation of disposal is kept for the lifetime of the RAML.

7. ATTACHMENTS/APPENDICES



- Attachment A, Waste Disposal Tags
- Attachment B, DIS Disposal Record

Attachment A Waste Disposal Tags

Texas State University-San Marcos
Hazardous Waste Code
Risk Management and Safety Office - 245-3616

CHEMICAL  BIOLOGICAL 

CHEMICAL/S	%QTY	CLASS
1		<input type="checkbox"/> OXIDIZER
2		<input type="checkbox"/> FLAMMABLE
3		<input type="checkbox"/> COMBUSTIBLE
4		<input type="checkbox"/> ACID pH _____
5		<input type="checkbox"/> BASE pH _____
6		<input type="checkbox"/> EXPLOSIVE
		<input type="checkbox"/> POISON
		<input type="checkbox"/> IRRITANT
		<input type="checkbox"/> ORM
		OTHER: _____

RADIOACTIVE  BIOLOGICAL 

RADIO-ISOTOPE/S	ACTIVITY		STATE			
	uCi	mCi	LIQUID	SOLID	LSC VIALS	QTY
P-32	100	uCi	<input type="checkbox"/> ORGANIC <input checked="" type="checkbox"/> AQUEOUS			4 L
			<input type="checkbox"/> ORGANIC <input type="checkbox"/> AQUEOUS			

Accumulation Start Date: _____
 Lab Contact: _____ Phone: _____
 Bldg.: _____ Room: _____
 Dept./Div.: _____ Auth.#: _____
 Signature: _____ Date: _____

Special Instructions: _____
Pickup: _____ Date: _____



Example of Liquid Waste Disposal

Completed by
EHS.



Completed by
responsible
laboratory.

Completed by
EHS.

Texas State University-San Marcos
Hazardous Waste Code
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CHEMICAL  BIOLOGICAL 

CHEMICAL/S	%QTY	CLASS
1		<input type="checkbox"/> OXIDIZER
2		<input type="checkbox"/> FLAMMABLE
3		<input type="checkbox"/> COMBUSTIBLE
4		<input type="checkbox"/> ACID pH _____
5		<input type="checkbox"/> BASE pH _____
6		<input type="checkbox"/> EXPLOSIVE
		<input type="checkbox"/> POISON
		<input type="checkbox"/> IRRITANT
		<input type="checkbox"/> ORM
		OTHER: _____

RADIOACTIVE  BIOLOGICAL 

RADIO-ISOTOPE/S	ACTIVITY		STATE			
	uCi	mCi	LIQUID	SOLID	LSC VIALS	QTY
P-32	100	uCi	<input checked="" type="checkbox"/> ORGANIC <input type="checkbox"/> AQUEOUS		100	
			<input type="checkbox"/> ORGANIC <input type="checkbox"/> AQUEOUS			

Accumulation Start Date: _____
 Lab Contact: _____ Phone: _____
 Bldg.: _____ Room: _____
 Dept./Div.: _____ Auth.#: _____
 Signature: _____ Date: _____

Special Instructions: _____
Pickup: _____ Date: _____

Example of Scintillation Vial Disposal

