



1205 W. Barkley Avenue
Orange, CA 92868
Ph: (714) 997-8090
Fax: (714) 997-3561

PACKAGING ANIMAL CARCASSES (DURATEK / NSSI)

1. Containers must be DOT approved incinerable containers. The outer container must be a 1.5 times the size of the inner container, (for example, a 30 gallon drum inside a 55 gallon drum).
2. Line the inner drum with a plastic liner (at least 4mil thickness).
3. Prepare mixture of approved absorbent and lime. Ratio: 1 part lime to 2 parts absorbent to 3 parts biological material.
4. Add 2-3" of absorbent/lime mixture to the bottom of the outer drum. Place 2-3" of absorbent/lime mixture inside the liner of the inner drum.
5. Place the carcasses on the surface of the lime/absorbent mixture so that the mixture comes in intimate contact with the carcasses. Add lime/absorbent mix to cover the layer of carcasses and repeat to fill drum.
6. Seal plastic liner and close inner drum with lid and bolt ring. Make certain the lid has properly installed gasket.
7. Carefully place inner drum inside the outer drum.
8. Seal outer drum lid and ring with supplied bolt, ensuring the lid has properly installed gasket.

Approved absorbents are:

Speedy-Dry	Safe-T-Sorb	Opalex
Floor Dry - Superfine	Ultra-sorb 248	Hi Dri
Florco & Florcox	Celatom (M-P 78)	Instant-Dri
Moltan Plus		

Note:

- Animal carcasses destined for disposal at Barnwell, with half-life > 5 years must be less than 1 $\mu\text{Ci/cc}$ of the inner container.
- It is critical that intimate contact be made between the lime/absorbent and the animal carcasses. If the carcasses are in plastic bags, the carcass must be removed from the bag or the bag sufficiently torn as to ensure intimate contact with lime/absorbent. The preceding procedure here depends on the biological or radiological hazard presented by disturbing the plastic bag containment, and must be evaluated by the packaging personnel. If it is felt that the plastic bag should be intact, continue with the layer technique as described.
- Use of the technique described results in a containment that will be good for two months or longer. Failure to use the technique may result in putrefaction which could conceivably require over packing. The burial site operator has the option of refusing drums that indicate putrefaction if they arrive at the site in that condition. A properly packaged drum will not have a noticeable external odor once the animals have thawed.

*** WASTE STREAMS ARE NOT TO BE COMINGLED ***

Always wear appropriate personal protection equipment when handling waste.



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PACKAGING ANIMAL CARCASSES (US ECOLOGY)

1. Containers must be DOT 7A approved steel drums.
2. Line the drum with a plastic liner (at least 4mil thickness).
3. Prepare mixture of approved absorbent and lime. Ratio: 1 part lime to 2 parts absorbent to 3 parts biological material.
4. Add 2-3" of absorbent/lime mixture to the bottom of the drum.
5. Place the carcasses on the surface of the lime/absorbent mixture so that the mixture comes in intimate contact with the carcasses. Add lime/absorbent mix to cover the layer of carcasses and repeat to fill drum.
6. Seal plastic liner and close inner drum with lid and bolt ring. Make certain the lid has properly installed gasket.
7. Seal outer drum lid and ring with supplied bolt, ensuring the lid has properly installed gasket.

Approved absorbents are:

Speedy-Dry	Celatom (M-P 78)
Floor Dry - Superfine	Hi Dri
Florco & Florcox	Instant-Dri
Safe-T-Sorb	Moltan Plus
Ultra-sorb 248	Opalex
Other approved absorbents	

Note:

- Animal carcasses destined for disposal at Barnwell, with half-life > 5 years must be less than 1 $\mu\text{Ci/cc}$ of the inner container.
- It is critical that intimate contact be made between the lime/absorbent and the animal carcasses. If the carcasses are in plastic bags, the carcass must be removed from the bag or the bag sufficiently torn as to ensure intimate contact with lime/absorbent. The preceding procedure here depends on the biological or radiological hazard presented by disturbing the plastic bag containment, and must be evaluated by the packaging personnel. If it is felt that the plastic bag should be intact, continue with the layer technique as described.
- Use of the technique described results in a containment that will be good for two months or longer. Failure to use the technique may result in putrefaction which could conceivably require over packing. The burial site operator has the option of refusing drums that indicate putrefaction if they arrive at the site in that condition. A properly packaged drum will not have a noticeable external odor once the animals have thawed.

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PACKAGING SCINTILLATION VIALS

1. Container must be DOT approved 30 or 55 gallon drum (steel or poly).
2. Place a 4 mil liner inside the drum. Add approximately 4" of absorbent inside the liner. Then place another 4 mil liner in the drum.
3. Fill the inner liner with vials and seal the top after the liner is filled.
4. The vials **MUST** be closed, and caps tight.
5. Seal drum lid and ring with supplied bolt, ensuring the lid has a properly installed gasket.

Approved absorbents are:

Speedy-Dry	Celatom (M-P 78)
Floor Dry - Superfine	Hi Dri
Florco & Florcox	Instant-Dri
Safe-T-Sorb	Moltan Plus
Ultra-sorb 248	Opalex
Other approved absorbents	

* Note: Exempt scintillation vials are limited to < .05 μCi of C14 and H3 per milliliter of liquid (approximately 2 mCi per 100lbs). Regulated scintillation vials may contain > .05 μCi per milliliter, and other isotopes per prior approval.

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PACKAGING DRY WASTE

1. Containers must be at a minimum a strong tight container, for domestic shipment of LSA/excepted package waste. Other containers may be used, contact TGA personnel for assistance in selecting the proper packaging.
2. It is advisable to utilize a drum liner or box liner prior to placing waste into the container.
3. When the container is full, close the liner if used, and secure the lid and ring with the supplied 5/8 inch bolt for 30 gallon or larger drums. Drums must have a gasket properly installed in the lid prior to closing.
4. If fiberboard boxes are used, boxes should be in such a condition that handling and transit will not compromise the integrity of the container. All seams and punctures should be well taped or covered. Any noncompliant material requiring repackaging will be done at generator's expense.
5. Dry waste material may consist of any radioactive waste material in a completely dry form. No liquids or RCRA wastes of any type are permitted.
6. Sealed sources or Special Nuclear Material **not** meeting the DOT definition of LSA should **not** be packaged in this manner. Contact TGA personnel for assistance in selecting the proper packaging.
7. Items of questionable origin or questionable nature should first be approved by TGA prior to packaging.
8. Should the radiation level on the surface of the container exceed 200 mR/hr, TGA should be notified prior to pickup.

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PACKAGING BULK SCINTILLATION FLUIDS AND BULK AQUEOUS LIQUIDS

1. Outer container must be 55 gallon or 30 gallon 17H drum or equivalent.
2. Inner container(s) should be unbreakable with a positive screw type closure or equivalent. Recommended: metal or poly inner container.
3. The pH must be between 4 and 11
3. Line outer container with a minimum 4 mil plastic liner.
4. Place a layer of absorbent in bottom of outer container (approximately 3" or sufficient amount to absorb the entire liquid contents)
5. Place filled inner container(s) into outer drum and fill voids between inner and outer containers with absorbent.
6. Seal plastic liner.
7. Seal outer drum lid and ring with supplied bolt, ensuring the lid has properly installed gasket.

Approved absorbents are:

Speedy-Dry	Celatom (M-P 78)
Floor Dry - Superfine	Hi Dri
Florco & Florcox	Instant-Dri
Safe-T-Sorb	Moltan Plus
Ultra-sorb 248	Opalex
Other approved absorbents	

Note:

- Bulk aqueous liquids destined for disposal at Barnwell with half-life > 5 years must be less than 1 μCi /cc using the volume of liquid in the inner container (approximately 3.4 mCi per gallon).
- Exempt scintillation vials are limited to < .05 μCi of C14 and H3 per milliliter of liquid (approximately 2 mCi per 100lbs). Regulated scintillation vials may contain > .05 μCi per milliliter, and other isotopes per prior approval

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PACKAGING ABSORBED LIQUIDS

1. Outer container must be 55 gallon or 30 gallon 17H drum or equivalent.
2. Outer container must be lined with a 4 mil plastic liner and sealed at the top when container is packed.
3. Inner containers must be non-breakable and capable of a leak tight closure. (Screw cap).
4. Liquid in inner containers must be absorbed with at least a one to one ratio of absorbent to liquid with **NO FREE STANDING LIQUID**.
5. Place inner containers to be packaged into the outer drum filling all voids with absorbent. Total maximum capacity of inner containers cannot exceed 20 gallons.

Approved absorbents are:

Speedy-Dry	Celatom (M-P 78)
Floor Dry - Superfine	Hi Dri
Florco & Florcox	Instant-Dri
Safe-T-Sorb	Moltan Plus
Ultra-sorb 248	Opalex
Other approved absorbents	

Note:

- Absorbed liquids destined for disposal at Barnwell with half-life > 5 years must be less than 1 μCi /cc using the volume of the inner container(s) (approximately 3.5 mCi per gallon).
- US Ecology has restrictions on disposing of absorbed liquids. Contact TGA personnel for details and pricing. EMC solidifies all aqueous liquids for disposal.

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NITRATE SOLIDIFICATION PROCEDURE

Materials:

- Ludlum survey meter with pancake and Nal probe
- Latex or Nitrile 10" cuffed gloves
- Lab coat or Tyvek disposable coat
- Safety glasses
- 10 - 20 gallon UN rated open head steel drum
- Structural grade concrete, e.g. Quickrete
- Hand trowels
- Wide mouth plastic bottle
- Tarp

Procedure:

1. Cover the work area with the tarp.
2. Fill the wide mouth plastic bottle with a quantity of water not exceeding the maximum amount that may be added to the concrete mix per the concrete manufacturer's instructions.
3. Empty the thorium or uranyl nitrate into the bottle and agitate until all crystals have dissolved. Rinse the nitrate bottle with water and add rinse water to the bottle.
4. Open the steel drum and empty one (1) bag of structural grade concrete into the drum.
5. Slowly add nitrate solution while mixing thoroughly using the hand trowels. Care should be taken to thoroughly mix the concrete near the sides of the drum and to avoid splashing to the concrete / nitrate slurry.
6. Additional bags of concrete may be added as the total quantity of nitrate solution warrants. (See note below)
7. Mixing should continue until concrete is thoroughly mixed and has obtained a plastic like consistency.
8. After mixing is complete, place all contaminated materials, e.g. nitrate bottle, plastic bottle, trowel and gloves, in the drum on top of the concrete.
9. Survey for radioactive contamination. Any items found to be radioactive should be decontaminated or deposited within the drum for disposal.
10. Provide a solidification certificate as described by the Washington State Department of Ecology. (see next page)

Note: The quantity concrete mix required is directly related to the quantity of water required to completely dissolve the thorium or uranyl nitrate.

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**NOTICE AND CERTIFICATION FOR URANYL NITRATE
AND/OR THORIUM NITRATE**

A shipment of wastes that formerly exhibited one of the characteristics of a hazardous waste was made from the "Originating Facility" identified below to the US Ecology commercial low-level radioactive waste disposal facility in Richland, WA. At the time of shipment, the wastes no longer exhibited a characteristic of a hazardous waste.

Originating Facility:
Address:

EPA I.D. #:

The characteristic waste as initially generated had the EPA Hazardous Waste code D001 and belonging in the ignitability, non-waste water treatability group.

I certify under penalty of law that the waste has been treated in accordance with the requirements of 40 CFR 268.42. I am aware that there are significant penalties for submitting a false certification, including possibility of fine or imprisonment.

Authorized Signature

Title

Date

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