

Radioactive Waste

*University of Florida
Environmental Health and Safety
Department of Radiation Control*

Welcome to the radioactive waste section of the University of Florida's Radiation Safety Short Course!

By now you have covered fundamental radiation concepts, biological effects of radiation, radiation protection, detection instruments and various techniques for the use of radioactive materials in the laboratory. In this section, we will introduce requirements and techniques for managing radioactive waste in the laboratory. The information in this training will help you manage radioactive waste in a safe, effective manner while maintaining compliance with state and federal regulations.

RADIOACTIVE WASTE

Radioactive Waste is anything that **contains** or is **contaminated** with radioactive material.

All radioactive waste must be collected by EH&S personnel.

Written instructions for radioactive waste management are provided in **Radiation Control Technique #2**.



Successful waste management requires proper identification of waste. Radioactive waste is defined as any waste item that contains or is contaminated with radioactive isotopes. This includes solids, liquids, vials or other contaminated items. All waste considered radioactive waste must be collected and disposed of by Environmental Health & Safety personnel.

RADIOACTIVE WASTE

- **Program is designed to:**
- Provide a method for Safe/Effective management of radioactive waste
- Ensure compliance with State & Federal requirements
- Minimize cost of disposal



The Radioactive Waste Management Program goals are to enhance radiation safety, to ensure regulatory compliance and to minimize disposal costs. This is accomplished by establishing requirements and providing detailed techniques for managing radioactive wastes in an organized, effective manner. The requirements are specific to isotope and to waste media and must be followed to ensure safe effective waste preparation by research laboratory staff and safe handling and disposal by EH&S waste management staff. Well-prepared, properly segregated waste takes less time to process and is therefore less costly to manage. Mixing the wrong isotopes and/or the wrong chemicals or media can lead to unsafe work conditions and unbelievably high disposal costs. The success of the program depends on the participation and support of both EH&S and the research faculty and staff.

RADIOACTIVE WASTE

- **Generator Requirements:**

- Proper Segregation
- Packaging
- Labeling
- Accumulation
- Minimize Waste Generation



EH&S personnel provide support in the form of training, guidance and waste collection and disposal. Faculty and staff are required to manage radioactive waste in the lab through proper segregation, packaging, labeling and accumulation. Segregation and proper accumulation enhance safety and reduce cost. Proper packaging helps facilitate efficient processing. Labeling conveys critical information and is required under state and federal regulations. These requirements streamline waste management, minimize waste generation as well as protect laboratory and EH&S staff. We will cover each of the requirements as we move forward.

Segregation of WASTE

- Segregation based on available treatment options:
- Short $1/2$ life (< 90 days)
 - Hold for Decay
- Long $1/2$ life (> 90 days)
 - Compaction
 - Incineration
- **Segregation enhances safety & reduces cost of disposal**



Segregation enhances safety by identifying wastes by their isotopes and activities. Segregation also keeps waste disposal options open which can reduce cost. Short and long half-life isotopes, defined as having a half-life shorter than or longer than 90 days respectively, must be segregated. Short half-life isotope wastes such as P-32, I-125, and S-35 are held for radioactive decay in drums at the Waste Management Facility. After sufficient decay, they can be disposed of as non-regulated solid waste. Long half-life isotope wastes like H3, C14, and Zn-65 must be shipped for burial after either incineration or super-compaction. Incinerable media such as paper and gloves are less expensive to dispose of because they can be reduced to ash. Non-incinerable media such as glass or metal can only be compacted. Mixing short and long half-life isotopes and or different waste media limits management options and therefore raises cost for disposal.

Segregation of WASTE

- Generators must also segregate:
- by Specific Isotope
 - Most isotope waste must be kept separate.
 - Exception: H-3/C-14 waste may be combined.
- by Physical Form/ Type
 - Solids
 - Liquids
 - Scintillation vials
 - Source vials/pigs
 - Animal carcasses/bedding
- **Mixed Waste**



All radioactive waste must be managed according to isotope. After segregating the radioactive waste by specific isotope, radioactive wastes must be further separated into physical form and type. The one exception to the isotope segregation requirement is waste generated using H3 and C14. Since these both have very long $\frac{1}{2}$ -lives and their disposal methods are similar, there is no benefit to separating these wastes by isotope.

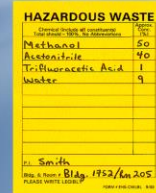
Within each isotope, physical forms such as solids and liquids and specific waste types such as scintillation vials, source vials, animal carcasses and animal bedding must be managed separately. These must be kept in separate containers or packaging.

Mixed Waste, defined as waste that is both Hazardous Waste and Radioactive must be minimized and always kept separate. We will discuss Mixed Waste and Hazardous Waste next.

MIXED WASTE

- EPA definition: **Mixed Waste** contains both Hazardous Waste and Radioactive Waste.
- Must manage Mixed Waste according to both **NRC** and **EPA** regulations
- Disposal is **VERY EXPENSIVE**

If you are generating Mixed Waste you must complete Hazardous Waste Management Training available through myTraining (course #EHS809).



Mixed wastes are both hazardous wastes and radioactive wastes. These wastes are subject to both NRC rules and EPA rules and due to their heavy regulation have a very high disposal cost. Understanding the definition of EPA Hazardous Waste is critical to preventing or minimizing Mixed waste generation. The next slide provides a brief discussion of the EPA definition of hazardous waste. If you generate hazardous waste or mixed waste you must attend a separate course for Hazardous Waste Management Training. This training can be found at the myTraining site within the myUFL portal. The course number is EHS809.

Hazardous Waste

- **Listed by the EPA**
 - Contains spent listed solvents (Methanol, Acetone, Xylene, Toluene, etc.)
- Or has an **EPA defined Characteristic**
 - **Flammable** - Flash Point < 140 °F (60.5°C)
 - **Corrosive** – pH ≤ 2.0 and ≥ 12.5 Strong Acids/Bases
 - **Reactive** – Air/Water Reactive, Cyanides, Sulfides
 - **Toxic** – Contaminated with Specifically Identified Heavy Metals, Pesticides and/or Organic Solvents
- If unsure, contact EH&S to confirm.



The EPA defines Hazardous Waste as waste that is Listed or Characteristic. EPA Listed waste is identified within lists of specific commercial chemicals and/or lists of chemical process wastes. Some of the more common listed wastes involve spent organic solvent and spent solvent mixtures. If your radioactive waste contains a spent organic solvent, it is most likely a Listed hazardous waste.

Radioactive waste is considered hazardous waste if it exhibits any of the hazardous waste characteristics. If a waste has a flashpoint below 140 degrees Fahrenheit it is considered to be a Hazardous Waste. Even low concentration flammable solvent mixtures are likely to have a flashpoint below 140 F. If the pH of a liquid is less than or equal to 2.0 or greater than or equal to 12.5, the liquid is hazardous waste.

Reactive materials include air and water reactive chemicals as well as cyanides and sulfides. Reactive materials require special consideration when it comes to disposal. Contact EH&S for specific guidance on reactive waste. The last characteristic, Toxicity, can be found in wastes that contain heavy metals such as Lead, Arsenic or Mercury and common organic solvents such as cresol or chloroform.

MIXED WASTE

Example- Scintillation Fluid

- **Flammable cocktail:**
 - Scintiverse II, Cytoscint, Biofluor
- **Non-flammable cocktail:**
 - Scintisafe 30%, Ecoscint A, Scintiverse BD, Cytoscint ES, Ready Gel
- **Label flammable cocktail vials with Hazardous Waste label**



Mixed Waste is most commonly generated in waste liquids and scintillation vials. Many older scintillation cocktails have a flammable solvent base such as 1,2,4-Trimethylbenzene also known as “pseudocumene”. Be sure to indicate a hazardous scintillation cocktail by using a Hazardous Waste label.

PACKAGING WASTE

Short $\frac{1}{2}$ life SOLIDS (<90 days):

- **Bag**
- Soft items (paper, soft plastics, gloves)
- Must be clear, 2 mil, and double bagged
- No opaque or colored bags!
- No Aerosols or Liquids



Segregated
by isotope

Once the waste has been separated by specific isotope and physical form it must be packaged appropriately. The following instructions apply to isotopes that have a half-life less than 90 days:

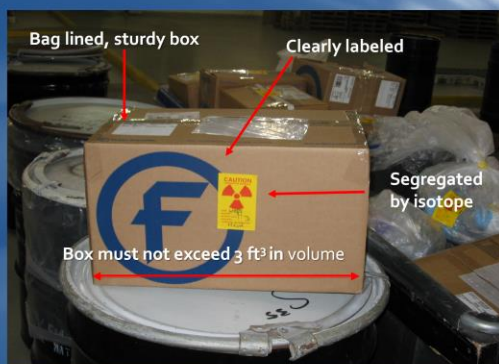
Solid wastes that would not puncture a plastic bag (paper, soft plastics, gloves, etc.) must be packaged in 2 layers of CLEAR plastic bags that are at least 2 mil in thickness. To repeat: Bags must be CLEAR plastic and 2 mil in thickness at a minimum. Waste packaged in red, orange, yellow, white or translucent opaque bags will NOT be accepted! This is required as waste handlers must examine waste for segregation issues prior to removing waste from the lab. Aerosol cans (such as Rad Con) must not be collected in solid waste containers. If aerosol cans cannot be decontaminated, they must be collected in a separate plastic bag for disposal through EH&S.

PACKAGING WASTE

Short $\frac{1}{2}$ life SOLIDS (<90 days):

- **Box**
- Hard or rigid items (glass, hard plastics, pipettes, etc.)
- Lined with clear bag
- 3 cubic feet or less
- No Aerosols or Liquids
- **No Sharps***

Packaged in separate rigid plastic container
Labeled clearly as radioactive
Do Not Use Red Sharps Container



Short half-life solid waste that would puncture a plastic bag such as hard plastic or glass items (i.e. pipettes) and metal items must be packaged in a clear plastic bag lined cardboard box. Solid waste containers should be free of all liquids containerized or otherwise. Limit the size of either the bag or boxed waste to 3 cubic feet or less. “Sharps” such as needles, razor blades, and scalpels must be collected in a rigid plastic container able to withstand puncture. Label the container as radioactive so others in your lab will know that the container is specifically for radioactive waste. Do Not collect radioactive sharps items in a biohazard labeled sharps container as it will not be accepted for disposal.

Next, we will look at some examples of packaged waste in an acceptable bag and cardboard box.

PACKAGING WASTE

Long $\frac{1}{2}$ life solids (>90 days) :

- **Type A (Incinerable)**
 - Paper
 - Plastic
 - Wood
 - Cotton
 - Latex
 - Nylon



Solid wastes with a half-life longer than 90 days must be segregated into Type A, incinerable, and Type B, non-incinerable/burial, solid wastes. These materials are separated due to the different cost for disposal. Incinerable wastes can be burned and reduced to ash whereas burial wastes can only be minimally reduced by compaction. Type A wastes include paper, plastic, wood, cotton, latex, nylon and other incinerable media. Type A wastes from H3 and C14 can be packaged together. Other long half-life isotopes must be kept separate.

PACKAGING WASTE

Long ½ life solids (>90 days) :

- **Type B (non-incinerable):**
 - Metal
 - Glass
 - **Sharps***
 - **Packaged in separate rigid container**
 - **Labeled clearly as radioactive**
 - **Do Not Use Red Sharps Container**
 - Asbestos
 - PVC plastic



Type B wastes include metal, glass, asbestos, Sharps, polyvinyl chloride or other non-incinerable items. Type B wastes must be packaged in a bagged lined box.

PACKAGING WASTE Summary-Solid Waste

- Short $1/2$ -Life solids by isotope
- Soft items = Bag-doubled /2 mil plastic
- Hard items= Box-bag lined/cardboard

- Long $1/2$ -Life by Isotope (Except H_3 & C_{14})
- Type A (Incinerable) paper/plastic
- Type B (Non-Incinerable) metal /glass

Lets summarize solids: For Short half life solid waste, first separate by isotope and then by form. Soft items are packaged in two bags of 2 mil thickness, rigid items in a bag lined cardboard box. For long half life solids separate by isotope except for H_3 & C_{14} and then into Type A or B. Type A, package in plastic bags, Type B in bag lined box.

Next we move on to liquids.

Packaging WASTE Liquids

- Segregate by isotope.
- No glass bottles
- Use only EH&S provided container (1 gallon HDPE).
- Do not overfill



Liquid wastes must be accumulated in the 1 gallon HDPE jugs provided by EH&S. EH&S cannot accept glass bottles due to the risk and consequence of breakage. The HDPE jugs provided are pre-labeled with the radioactive material and chemical constituents label. Labels must be properly completed before waste will be collected. We will discuss proper labeling shortly

Please note the level of liquid present in the jug pictured. It is approximately $\frac{3}{4}$ full and will provide at least four inches of head space. Jugs that have less than four inches of head space are considered over-filled. Please request additional jugs if necessary.

PACKAGING LIQUID WASTE Vials (Non-scintillation):



- Non-LSC Vials must be emptied into a liquid waste jug
- Liquid must be **completely** emptied out.
- **Do Not** include unused Source Vial content
- Empty vials go to solid waste



Liquid containing vials not used exclusively in an LSC are to be completely emptied into a one-gallon jug. These vials are generally but not limited to 100ml or microcentrifuge tubes. Do not empty unused radioactive material from source vials (pigs) in to your liquid wastes. Adding them to your liquid waste will drastically increase the activity of the waste which could limit disposal options and increase the price of disposal. Any left over source liquid will be collected directly by EH&S. Empty vials should be managed as solid radioactive waste. Separate by isotope and package accordingly.

Packaging WASTE Scintillation Vials:

- **Secure vial caps**
- Package in original flat.
- Place into a bag or bag lined box.
- Note type of scintillation cocktail on label.
 - e.g. Scintiverse , Scintiverse- BD, Scintisafe, etc.



Scintillation vials used in an LSC are typically 10 to 20 milliliters in size and packaged in flats or boxes of 100. These vials can either be collected by placing them in the original flat and then placing the flat into a clear plastic bag or by collecting them loose in a double bagged, lined box. Make sure the caps are secured tightly. The bag should be large enough to accommodate the flat(s) and be closed properly without stretching and risking puncture. Please leave extra room in the bag if you are collecting the vials in flats so that the corners of the flats do not puncture the bag. After the vials have been bagged please note on the bag the type of scintillation fluid used.

PACKAGING WASTE



Here is an example of flats of vials that have been bagged. Please note that there is ample room around each corner to insure that the bag doesn't tear. Please do not put more than 4 flats into any one bag since the weight of the vials may compromise the bag. The bag should be twisted closed, doubled and secured with tape. What's missing here? Yes, you guessed it. The radioactive material label. Left click your mouse for a label.

LABELING WASTE

Radiation Label

- Print Clearly:
 - Date
 - Isotope
 - Activity
 - Location
 - Principal Investigator
- Must be complete and placed on all waste prior to collection.

CAUTION
RADIOACTIVE MATERIAL

DATE 9/22/08
ISOTOPE xp
ACTIVITY (mCi) 1 mCi
LOCATION MSB 226
PRINCIPAL INVESTIGATOR: Smith

So how do we label the radioactive wastes? Each waste bag, box, jug, et cetera must have the “Caution Radioactive Material” label completely filled out in order for the waste to be picked up. Please clearly print the date, the isotope present, the activity, the lab location (including building and room number) and the name of the lab Principal Investigator. An approximation of the remaining activity is acceptable. Radioactive Material labels are provided by EH&S.

LABELING WASTE

Chemical Constituents Label:

- List all constituents by percentage
- " $\leq 1\%$ " or "trace" are acceptable estimates for constituents at very low concentrations.
- Percentages should add up to 100%
- Pre-printed labels are a convenient way to label frequently generated waste

The first example shows a pre-filled form with handwritten entries: Sodium Chloride (2%), Tris Buffer (2%), Ethanol (6%), and Water (90%). The second example shows a similar form with printed entries: Dimethylsulfoxide (8%), Water (8%), Bromophenol blue (Trace), and Tris buffer (Trace).

- List all constituents by percentage
- "<1%" or "trace" are acceptable estimates for constituents at very low concentrations.
- Percentages should add up to 100%
- Pre-printed labels are a convenient way to label frequently generated waste

[illegible][illegible]

Picture label can be found on the 1 gallon poly jugs provided by EH&S. You must list each chemical constituent present in the liquid waste as a percentage. The amounts of some compounds can change the requirements for waste disposal. The sum of all constituents should equal 100. This ensures that you have identified 100% of the waste content. Pre-printed labels are an easy way to keep up labels on repeat waste streams.

LABELING

Radioimmunoassay (RIA) kits:

- Many I-125 RIA kits contain Thimerosal (Mercury)
- Identify as "Kit Waste" on label.
- Segregate from other liquid waste.

Chemical (Include all constituents)	Approx. Conc. (%)
Sodium Chloride	2 %
Tris Buffer	2 %
Ethanol	6 %
Water	90 %
**Contains RIA Kit Waste	<1%
Please write legibly.	

If you work with I-125 from a Radioimmunoassay kit please note this fact on the chemical constituent label. Many RIA kits have less than 1% of the preservative thimerosal which contains mercury. The waste generated using the kit is considered Characteristic Hazardous Waste and therefore Mixed Waste. RIA kit waste must be collected separately from other I125 liquid wastes. By segregating the two waste streams, the amount of mixed waste is controlled and disposal costs are kept to a minimum.

OTHER RADIOACTIVE WASTE

Bio-hazardous + Radioactive Waste:

- Not acceptable
- Must be deactivated
- Avoid bleach if possible
 - see EH&S Biological Waste Management for alternatives
- **NO RED BAGS**



Bio-hazardous wastes that are also contaminated with radioactive material must be deactivated prior to being collected by EH&S personnel. Avoid chlorine based disinfectants as they will contribute to the formation of chloroform in waste mixtures. Waste that contains chloroform is considered Characteristic Hazardous Waste and therefore Mixed Waste. If further guidance is needed on how to decontaminate biohazardous materials please contact the Biological Safety Department at 392-1591. Do not use red biohazard bags to package radioactive materials that have been deactivated.

OTHER RADIOACTIVE WASTE

Source Vials (pigs):

- Package in separate container
(Ziploc bags work best)
- Segregate by isotope



Pigs include the source vials and their outer shell that the radioactive material is packaged in. Pigs are collected separately from other solid waste because they can contain significantly higher activity than lightly contaminated solid wastes. These must be collected separately from your other solid wastes in a ziploc bag with a completed radioactive waste label. If you have several pigs to be collected then it is acceptable to place them into a larger clear bag.

Please note that some pigs contain lead as a shielding. This shielding must be collected by EH&S as well and not discarded.

OTHER RADIOACTIVE WASTE

Animals

- Must be deceased
- Must be frozen before pickup
- Double bagged
- Segregate by isotope
- Bags must not contain other material.
(i.e. Gloves, Pipets, Paper)
- Must have proper label.
- Include # and type of animal.



Animal carcasses contaminated with radioactive material must be picked up by EH&S. The animals must be deceased, frozen, double bagged and properly labeled with the number of animals indicated before they can be picked up. No gloves, pipets, paper or other waste materials may be collected in the bag containing the animals. If you do not have adequate space to store the quantity of animals generated then contact the Waste Management Facility PRIOR to generating the animal waste so that we may accommodate a timely transfer.

ACCUMULATION

Accumulation Requirements for Radioactive Waste :

- Waste must always be **properly labeled**.
- Waste must always be **properly packaged** by isotope and type.
- Waste **must not be stored near sinks or drains**.
- Liquids must be kept in **secondary containment**.
- Waste containers must be **closed at all times**.
- Post Satellite Accumulation Sheet if you have Mixed Waste.

Now we will discuss the proper ways to store your radioactive waste. All waste containers should be labeled when accumulation begins. Every liquid, solid waste, et cetera should have a properly filled out radioactive waste label displayed on the container. Properly labeling the waste container communicates the radioactive hazard and indicates what isotopes may be collected in it.

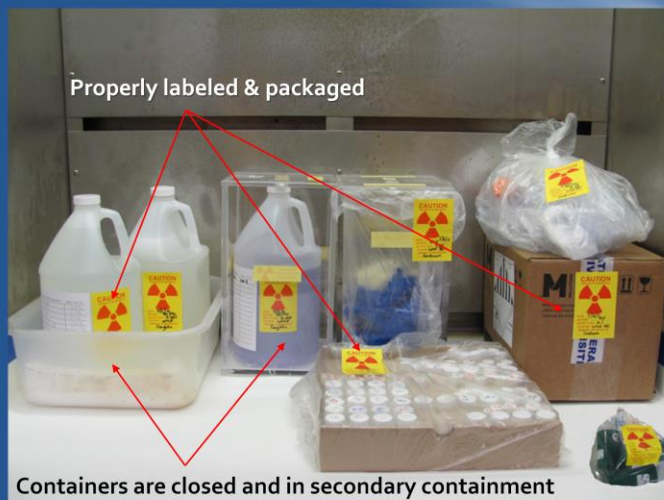
All waste should be stored in a suitable container in order to prevent a spill or to prevent accidental release. Storing liquid wastes in the 1 gallon poly jugs vs a glass container prevents the possibility of a spill due to breakage. By accumulating metal or sharp items in a bag lined box, we can prevent the release of contents due to a tear.

Do not store radioactive wastes next to a sink or drain. This prevents a release from moving beyond our control. If waste must be stored in a fume hood or near a sink or drain, secondary containment must be provided. This can be something as simple as a Rubbermaid container to a hard plastic box used for shielding.

All containers must be closed unless currently adding radioactive waste to that container.

If Mixed Waste is being generated a Satellite Accumulation Area sheet must be posted with your lab's lab waste manager clearly printed where the person is denoted. The SAA sheet must be posted where the mixed waste is being generated.

ACCUMULATION



Here is an example of how to properly accumulate your radioactive waste. Note that the liquid wastes have secondary containment, that all containers are closed and properly labeled.

RADIOACTIVE WASTE PICKUP

- Prepare waste using these guidelines
- Submit pickup request form via campus mail
- EH&S will come to your lab to collect
 - Waste not properly prepared cannot be picked up
- No phone-in request
- No-E-mailed requests

After segregating, packaging, labeling and accumulating your waste using these guidelines, your goal should be to now have the waste removed for disposal. Submit a pick up request form via campus mail to P.O. Box 112725. Campus mail generally takes two days for it to reach our facility so please plan accordingly. Requests for your radioactive waste pick up will not be accepted by phone or e-mail. We will complete the Radioactive Waste pick-up form next.

RAD WASTE PICKUP

RADIOACTIVE WASTE PICK-UP REQUEST						
P.I.: <u>Smith</u>			Mail to: Waste Management Facility, PO Box 112725			
Building & Room: <u>ARB R5-216</u>			Phone: 392-8400			
Department: <u>Medicine</u>			Date: <u>9/22/08</u>			
Phone: <u>(552) 392-8907</u>						
Isotope	Amount (mCi) Total Activity	Type of waste (circle) (Solid, Liquid, Animal, Vials)	Indicate Quantity of (Gallons = GL, Boxes = Bx, Bags = B) to be Picked up		Hazardous Chemical? Yes* No	
<u>3H</u>	<u>0.2</u>	<u>(S)</u> L A V	<u>2 Bags</u>			<u>X</u>
<u>32P</u>	<u>0.8</u>	S L A <u>(V)</u>	<u>1 box</u>			<u>X</u>
<u>32P</u>	<u>1.5</u>	S <u>(L)</u> A V	<u>3 Gal</u>			<u>X</u>
		S L A V				
		S L A V				
Date Received _____			Total Gallons _____			
Date Collected _____			Total Cubic Feet _____			
Collected By _____			Ifas JHMC Shands Eng Clas Other _____			
Acknowledged By _____			Prepared By _____			
*NOTE: List all chemical constituents and % of constituents on waste containers that are to be picked up. Print full name of chemical.			This information is complete and correct and all chemical components of this waste have been accurately listed on the respective containers.			
Form No. EH&S/RSA-2 11/82			Signed: <u>[Signature]</u> Principal Investigator			

Form # EHS/RSA-2 must be completed and sent to EH&S Waste management before waste can be collected. At the top of the form, please indicate the Principal Investigator, The lab building and room number, the department, and a contact phone number. The phone number is critical as our staff must call ahead to ensure that staff are present to sign the pick-up form and answer any waste related questions. Please include the best number to reach you, which may be a nearby office number or a cell phone number if you are in and out of the lab. Enter the date that the form was mailed in the space on the top right. We will also date the form when we receive it. This helps us keep the requests in proper order. In the next section, you must provide detailed information about the different wastes to be collected. There are 5 columns and 5 rows to input information for each waste stream. The 5 column headings indicate the isotope or isotopes present, total activity in millicuries, the type of waste either solid, liquid, animals or liquid scintillation vials, the quantity of waste whether the waste includes a hazardous chemical. In the example given there are three waste streams listed: solids, vials and liquids. Under the first column and first row, the isotope in this waste stream is Tritium. In the second column first row the total activity is listed as 0.2 millicuries. In the third column the type of waste is indicated as being solid waste. The fourth column indicates that there are two bags in this waste stream. The fifth column indicates that the waste is not a hazardous waste. So the first row example has indicated that the lab has two bags of tritiated solid waste that has a total activity of .2 millicuries and isn't a hazardous waste.

The second row indicates that the lab has one box of P-32 Liquid Scintillation Vials with a total activity of 0.8 millicuries and doesn't contain a hazardous waste. The third row indicates that the lab has 3 gallons of P-32 liquid waste with a total activity of 1.5 millicuries and doesn't contain a hazardous waste. Each waste stream is recorded on a separate row even if it contains the same isotope.

Prior to submitting the form, the person completing the form should enter their name in the "prepared by" space and the form should be signed by the Principal Investigator. Most labs have limited space for radioactive waste storage, so it is in your best interest to request a waste collection well in advance of reaching your practical accumulation limit.

RADIOACTIVE WASTE

Generator Requirements

- Proper Segregation
- Packaging
- Labeling
- Accumulation
- Request Waste Pick-up
- Minimize Waste Generation

You should now be able to properly segregate your Radioactive Waste by isotope and by waste type. You should be able to define and identify Mixed Waste. You should be able to properly package and prepare your waste for collection by EH&S waste management staff. You should be aware of accumulation requirements and the form and information necessary to request a waste pick-up. By using various techniques and strategies described here you should be able to keep radioactive waste generation to a minimum.

RADIOACTIVE WASTE

For questions concerning radioactive waste: contact EH&S Waste Management Facility: 392-8400

This concludes the Radioactive waste management portion of the Radiation Safety Short Course. You must now complete the assessment portion of the course. Please contact the Environmental Health and Safety Waste Management Facility at 392-8400 for questions concerning radioactive waste management.