

## 3<sup>rd</sup> Quarter 2013 Radiation Safety Inspection PBE

### **AU Handling of Liquid Waste**

All waste items are sent to the RRC for disposal. If you know that a sample has a radioactive component, then please request this material be collected and properly disposed of by EH&S. The Radiation Safety Manual, page 54-55 and 110-111, further describes how the process works for segregation and collection radioactive waste using a Pickup Request.

## REQUESTING PICKUP OF RADWASTE

### PREPARATION OF RADWASTE AND RECORDS

#### Segregation

Segregate all radwaste into the following forms: Solids, Liquids, Stock, Scintillation Vials, Gases, Animal Carcasses or Tissue(s), and Animal Waste. These forms then need to be further segregated according to isotope and other hazardous material components. Label all containers that have an EHS "Radioactive Hazardous Material" label with this information.

For liquid radwaste, a sample aliquot measurement of the activity may provide the easiest and most accurate estimate of the overall activity. A composite sample may be used for multiple gallon jugs of the same isotope and hazard class. Be sure to list the activity as of the date of request.

Keep unwanted stock containers separate for pickup. Containers with lead shielding must not be disposed of in normal trash, but must be returned to EHS for disposal or recycling.

See Collection of Radwaste in Your Laboratory for further details.

#### Records

Calculate all activities to the date of the requested pickup. Ensure to date on bottom of form.

Review activity balances for receipts, samples, and different radwaste types to ensure all incoming activity has been accounted for.

### REQUESTING AND OBTAINING RADWASTE PICKUP

#### Request Form

Complete a Radwaste Pickup Request Form (PURF) as follows:

- Date of request,
- AU name,
- AU number,
- Registered user number,
- Person requesting pickup,
- Telephone number,
- Building and room of pickup.

Each container or item must have its own "Radioactive Hazardous Material" label and be listed separately on the PURF.

Different physical forms of radwaste must be packaged and listed separately.

Mark the appropriate physical form box and provide the quantity in the listed units.

List the percent (%) by volume of each chemical component (estimate as necessary) for each pickup item.

Materials listed on the "Radioactive Hazardous Material" label must match the components listed on the form.

Liquids must have a pH greater than 5.5 and less than 9.5. If the pH is not within this range, adjust the pH with an appropriate acid or base. Any addition of acid or base used to adjust the pH must also be listed as a component on the label and on the form.

List the isotope and activity in milliCuries (decayed or measured as of date of request).

Non-contaminated empty lead pigs can be added to the Radwaste Pickup Request Form.

If more bags or jugs are required, you can write your request at the bottom of the form.

Do not write in any other columns of the form.

Contact your assigned HP if you have any questions.

### **Requesting a Pickup**

Fax the completed PURF to the RS Office (882-7940) and note any special instruction.

Alternatively you can complete an online PURF available at:

[https://secureas.missouri.edu/EHS/purf/purf\\_login.cfm](https://secureas.missouri.edu/EHS/purf/purf_login.cfm)

Instructions for the online PURF are also available:

<http://ehs.missouri.edu/haz/forms/webpurf-rad-instructions.pdf>

Routine pick-up routes have been established for some areas of campus. Request forms must be received before 8:00 am on the scheduled pickup day to have your radwaste considered for pickup that day.

EHS will try to complete requested pickups as soon as possible, and will alert the AU if pickup cannot be done within two weeks of the request.

If information is incomplete on the form, or is not clearly printed, or if there is a question about the request, processing of the request may be delayed.

### **Pickup of Radwaste**

At time of pickup, someone in your area must be available to allow access to your radwaste, answer any questions concerning the radwaste, and correct any problems.

If you cannot be in the immediate area, leave a note to alert EHS staff how to locate you. If you cannot be reached within 15 minutes, your radwaste may not be picked up on that day.

If your request form is not complete, is incorrect, or there is a problem with the form or hazard of your radwaste, your pickup may be delayed until the corrections have been made.

### **Inventory Records**

Update your records to reflect that the activity of the radwaste, which was removed from your lab, is no longer possessed under your authorization.

### **Special Needs**

Contact your assigned HP for any special radwaste handling needs or questions.

## WHAT HAPPENS AT EHS AFTER YOU SUBMIT YOUR REQUEST FOR A RADWASTE PICKUP

### GENERAL

Upon arrival at our office your request for a radioactive waste pickup is sent to our waste handling personnel, so that we can schedule it into our pickup schedule.

### EHS PICKUP

Once we have verified the appropriate information has been submitted, your request will then be scheduled for pickup at the next available time.

Should you need a special pickup, please notify your assigned HP so that one can be arranged.

Once the waste has been picked up and sent to its intermediate destination at EHS it is entered into the database. If you are subtracting out too much inventory, i.e., more that you have in stock, use, etc., an error will occur and you will be notified by your assigned HP. This is why we need you to decay and estimate as accurately as possible the radwaste amount that you wish to be picked up.

You will have a chance to correct any information submitted during the quarterly report review period. This will allow you to correct, add, or delete any information which was erroneously entered into your activity account.

Upon segregation at EHS into mixed, liquid or solid wastes, the radwaste is stored until a sufficient quantity can be accumulated for further processing (i.e., decayed in storage, shipped as radioactive waste, or mixed waste.)

### EHS MANAGEMENT AND DISPOSAL OF RADWASTE

#### Solid Radwaste (Dry)

Depending on the isotope, the solid waste will be shipped to a licensed burial site, held at EHS facilities for decay to background levels or incinerated.

Solids that contain a hazardous component are considered mixed waste. They are placed in the EHS

hazardous waste facility, and ultimately shipped to a permitted facility for disposal.

#### Liquid Radwaste

Liquid radwaste that does not contain a hazardous component (as defined by EPA RCRA regulations) will be disposed of in accordance with NRC regulations to the sanitary sewer. Isotopes that have half lives shorter than 120 days are held to decay for a period of time prior to final survey and disposal.

Liquids that contain a hazardous component, and cannot be decayed to background levels, are considered mixed waste. They are placed in the EHS hazardous waste facility, and ultimately shipped to a permitted facility for disposal.

#### Scintillation Vials and Animal Carcasses

Scintillation vials containing H-3 and C-14 are incinerated in the EHS incinerator. Isotopes with half lives less than 120 days are incinerated after a decay period of at least 10 half lives.

Animal carcasses or tissue are held for decay, if possible, and then incinerated.

Scintillation cocktail and animal tissues containing H-3 or C-14 in concentrations of equal to or less than 0.05 microCuries/g of material can be disposed of as if they did not contain radioactive materials. Only EHS staff can make this type of disposal. Availability of this disposal option is why it is very important to have a reasonable estimate of activities for H-3 and C-14 in these forms.

Scintillation vials, animal carcasses and tissues that contain a hazardous component, and cannot be decayed to background levels, are considered mixed waste, and they are placed in the EHS hazardous waste facility, and ultimately shipped to a permitted facility for disposal.

Scintillation vials, and animal carcasses and tissue with isotopes greater than 120 day half life are shipped off-site to a radwaste facility for further processing and disposal.

### **Stock Items, Stock Containers, and Shielding**

Stock vials are kept separate for decay in storage and final survey.

The stock containers are inspected to determine if they have lead shielding. Containers not containing lead are surveyed and, if clean, may be disposed of as normal trash or reused. Containers containing lead are surveyed and, if clean, they may be reused or recycled.

### **Sealed Sources, Foils, and Seeds**

Unwanted sealed sources, foils, and seeds with half lives less than 120 days are held for decay of at least 10 half lives and then disposed as normal trash.

Every effort is made to return unwanted sealed sources, foils, and seeds with half lives greater than 120 days to their manufacturer. Otherwise, they are shipped off-site to a radwaste facility for further processing and disposal.