

APPENDIX W

Procedures for Waste Disposal

The following methods of waste disposal will be used: release to the environment through the sanitary sewer or by evaporative release; decay-in-storage (DIS); transfer to a burial site or return to the manufacturer; and release to in-house waste. Records will be maintained of the disposal of licensed material, with the exceptions of patient excreta and generally licensed in-vitro kit exemptions.

DISPOSAL OF NON-RADIOACTIVE WASTE

1. All radiation labels are defaced or removed from containers and packages prior to disposal and removal from restricted areas. If waste is compacted, all labels that are visible in the compacted mass are defaced or removed.
2. Non-radioactive waste such as leftover reagents, boxes, and packing material is not mixed with radioactive waste.

DISPOSAL OF RADIOACTIVE LIQUIDS AND GASES

Liquids disposed by release to the sanitary sewer or evaporative release to the atmosphere are in accordance with 64E-5.330, Florida Administrative Code (F.A.C.).

1. Material discharged by release into the sanitary sewer system will be readily soluble or readily dispersible in the water. Radioactive material released into the sewer in 1 month divided by the average monthly volume of water released into the sewer will not exceed the concentration listed in Table III of the ALIs, DACs, and effluent concentrations. (Excreta from patients undergoing medical diagnosis or therapy is exempt from all the above limitations).

Records will be maintained indicating the date, radionuclide, estimated activity of the release (in millicuries or microcuries), and the sink, toilet or drain where the material is released.

2. Dose limits from effluents to unrestricted areas to members of the public will be maintained as required by 64E-5.312, F.A.C., and Table II of the ALIs, DACs, and effluent concentrations. These limits apply at the boundary of the restricted area. Records will be maintained indicating the date, radionuclide, estimated activity released (in millicuries or microcuries), estimated concentration, and the vent site at which the material is released.
3. Liquid scintillation-counting media containing 0.05 microcurie per gram of H-3 or C-14 will be disposed of without regard to its radioactivity. Records will be maintained indicating the date, radionuclide, estimated activity (in millicuries or microcuries), calculated concentration in microcuries per gram, and how the material is disposed.

DISPOSAL BY DECAY-IN-STORAGE (DIS) T_{1/2} < 120 DAYS

1. Radioactive material with a physical half-life less than 120 days will be segregated according to half-life (short, medium, etc.) when disposed by DIS.
2. One container for all waste for DIS - *or* -separate containers for different types of waste for DIS (e.g., one container for needles and syringes, a second container for gauze, etc., and a third container for unused doses) will be used.
3. Waste will be surveyed with all shielding removed, including any shielding provided by the container.

4. When a waste container is full, it will be sealed with string or tape and an identification tag will be attached. The tag will include the date sealed, the longest-lived radioisotope in the container, and the initials of the person sealing the container. The container will be transferred to a DIS area.
5. Radioactive waste will be held for decay for at least 10 half-lives.
6. Each DIS container will be monitored prior to disposal as in-house trash, according to the following procedure.
 - A. Check the radiation detection survey meter for proper operation.
 - B. Remove any shielding from around the container.
 - C. Monitor DIS waste in a low-level (less than 0.05 millirem per hour) area.
 - D. Monitor all surfaces of each individual container.
 - E. Monitor waste such that the container does not provide any radiation shielding.
 - F. Discard as in-house waste only those containers that cannot be distinguished from background. Record the date that the container was sealed, the disposal date, and the type of material (e.g., paraphernalia, unused dosages). Check to be sure no radiation labels are visible.
 - G. Containers that can be distinguished from background radiation levels are returned to the storage area for further decay or transferred for burial at a low level waste disposal facility.
7. Waste (waste elute, generator tubing, waste bottle components, etc.) from strontium/rubidium generators may be disposed of by DIS in accordance with the procedures above. When there is no evidence of breakthrough, the decay time of holding the waste is based on the half-life of rubidium 82. In situations when a breakthrough of the parent strontium 82 is demonstrated, the decay time of holding the waste is based on the half-life of strontium 82.
8. Mo-99/Tc-99m generators will be returned to the nuclear pharmacy or held 60 days for decay in storage before being dismantled. When dismantling generators, a survey meter (preferably with a speaker) will be kept in the work area. The oldest generator will be dismantled first, subsequent generators will be dismantled in chronological order. Each individual column will be held in contact with the survey meter, in a low-background area. The generator date and disposal date will be logged in the waste disposal records. The radiation labels on the generator shield will be removed or defaced.
9. A record of all decay in storage radioactive material will be retained for 3 years. This record will include the date of the disposal, the date on which the radioactive material was placed in storage, the radionuclides disposed, the model and serial number of the radiation survey instrument used, the background dose rate, the radiation dose rate measured at the surface of each waste container, and the name of the individual who performed the disposal.

TRANSFER FOR BURIAL

Except for material suitable for DIS and some animal carcasses, solids will be transferred to a burial site. Follow the packaging instructions received from the transfer agent and the burial site operator. The consignment sheet supplied by the transfer agent will be maintained as the record of disposal. The procedures described in 64E-5.332 F.A.C. will be followed.

GENERALLY LICENSED IN VITRO KITS RELEASED TO IN-HOUSE WASTE

Waste from in-vitro kits that are generally licensed are exempt from waste disposal regulations. Radioactive labels will be defaced or removed. No record of release or radiation measurement will be maintained.

RETURNING RADIOACTIVE SOURCES TO THE MANUFACTURER

Packages will be prepared for shipment following the manufacturer's recommendations or as described in Appendix H.

RETURNING GENERATORS TO THE MANUFACTURER

Used Mo 99/Tc 99m generators not decayed in storage for 60 days and all strontium/rubidium generators will be returned to the nuclear pharmacy, following the specifications in Chapter 64E-5, F.A.C., Part XV and the U.S. Department of Transportation (D.O.T.) regulations.

1. Records demonstrating that the package qualifies as a D.O.T. Specification 7A container will be maintained.
2. Packages will be assembled in accordance with the manufacturer's instructions.
3. Dose rate and removable contamination measurements will be performed as required in 49 CFR Part 173, Subpart I, Class 7 (Radioactive) Materials.
4. Packages will be labeled and the shipping papers are completed in accordance with the manufacturer's instructions.

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