

The following is a summary of a recent incident at Columbia University. The information presented is intended to provide awareness and help readers plan against the occurrence of a similar situation in their laboratory or work area.

Hot Stocks

Environmental Health & Safety (EH&S) encountered three incidents in as many weeks where routine surveys discovered external contamination on three radioactive material (RAM) stock vials. In two incidents the vials were already contaminated upon receipt from the manufacturer, and in the third stock vials were contaminated during routine laboratory handling.

The RAM receiving process EH&S follows prevented contaminated product from reaching the destined laboratory and possibly causing a more significant contamination incident. Radioactive materials are delivered directly to EH&S prior to distribution to labs not only for inventory purposes but also to ensure any problems are discovered before the delivery reaches the laboratory. The contamination incidents have since been reported to and are being addressed by the manufacturer.

In the third incident, a routine EH&S [quarterly radiation safety audit](#) uncovered two stock vials that were contaminated during handling in the laboratory. The stocks were partially used, an indicator that contamination was spread from contact with contaminated gloves or during withdrawal of material from the vial. The laboratory, with EH&S support, safely transferred the stocks into clean vials.

Lessons Learned

- Stock vials contain highly concentrated radioactive material and are susceptible to exterior contamination during laboratory handling. EH&S RAM receipt procedures ensure stock vials will arrive in the laboratory with no external contamination, and good radiochemical hygiene will ensure they remain contamination free. Standard precautions include treating the outer container (pig) and stock vial as if they are assumed to be externally contaminated. Changing gloves immediately after handling the pig and stock vial, especially for difficult to detect isotopes (e.g. H-3, C-14, and S-35), will significantly reduce the risk for spreading contamination to another work surface.
- Wipe testing is the only reliable method to determine if contamination has spread to a stock vial. Both pig and stock vial should be surveyed for contamination after each use and as part of the [monthly survey](#). Wipes for low-energy isotopes (e.g. H-3, C-14, S-35) must be counted by liquid scintillation, while wipes for higher-energy isotopes (e.g. P-32) can be scanned on the spot with a handheld Geiger Meter. Remember that zero contamination is desired, but the acceptable threshold is 200 disintegrations per minute (dpm) per 100 square centimeters of area. If contamination is discovered, it should be removed as soon as practical.

For further information on this or any other safety related matter, please contact the [EH&S office](#).