How to Perform a Contamination & Direct Radiation Survey

"How can I be sure my work area isn't contaminated?"

Surveys are performed to detect contamination from radioactive material. Surveys of laboratory areas are required in frequencies specified on your Radionuclide Use Permit and in the Radiation Safety Procedures Manual. As a minimum, a contamination (wipe) survey is required to be performed and documented in each radionuclide laboratory on a monthly basis. Depending on the radionuclides and activity utilized, a direct survey may also be required. If contamination is detected, decontamination may be required. If decontamination is unsuccessful, the area may need to be covered and/or shielded. These surveys should be performed as follows:

DIRECT RADIATION SURVEYS

Direct radiation surveys are performed using a portable survey instrument (e.g., Geiger counter). If you are trying to detect a beta emitter, you should check the surface with the end window of the probe. It should be noted that covering the end window with a protecting material (e.g., plastic wrap, etc.) may in fact be shielding the probe from the radioactive material it is intended to detect. High-energy gamma emitters may be detected through the side of the probe. In either case, the probe should be held as close to the surface as possible without contaminating it. If contamination is detected, a wipe survey should be performed to determine if the contamination is removable. As a reminder, survey instruments will not detect $^3$H and will not easily detect other low energy beta emitters such as $^{14}$C and $^{35}$S. Areas to survey include those where contamination may be expected (e.g., work areas, equipment, hoods, etc.) and unexpected areas (e.g., desks, doorknobs, telephones, etc.). Even though a direct survey may not be required as a condition of your permit, it is a good idea to perform one after each experiment to check for possible contamination. If a direct survey is required, it must be recorded on the Radiation Safety Data Sheet and filed in the Radionuclide Inventory and Survey Book. Should a contaminated area measure greater than 2 mR/hr at one foot after decontamination, the area should be shielded and the Radiation Safety Office contacted.
CONTAMINATION (WIPE) SURVEYS

Contamination surveys are performed by rubbing a piece of filter paper or swab across a surface. The wipe may be taken dry or slightly moistened (typically with alcohol or scintillation fluid). A moistened wipe may help to remove contamination that has adhered to a surface, but a dry wipe is perfectly acceptable. The area wiped is typically 100 cm$^2$, which has been described as moving the wipe from side-to-side over a distance of about one-foot, using moderate pressure. The wipe should be analyzed with the appropriate detector (i.e., liquid scintillation or gamma counter). If you are using both beta- and gamma-emitting radionuclides, the wipes should be counted by both liquid scintillation and gamma counting techniques. Contamination surveys should again be taken in areas where contamination may be expected (e.g., work areas, equipment, hoods, etc.) and unexpected areas (e.g., desks, doorknobs, telephones, etc.). Decontamination should be performed if greater than 2000 disintegrations per minute (dpm) per 100 cm$^2$ above background are detected. For simplicity, one can utilize 200 counts per minute (cpm) above background as the decontamination action level providing the counting instrument has been tested to assure it has a minimum counting efficiency of 10%. Decontamination may be accomplished by washing the area with a decontaminate (e.g., Radiacwash) or soap and water. You should start from the outer edge of the contaminated area and work your way towards the center. Rewipes should be taken after decontamination efforts to ensure the area meets the acceptable limits. All wipe survey results (including re-surveys) must be recorded on the Radiation Safety Data Sheet and filed in the Radionuclide Inventory and Survey Book.
Verification of Radiation Safety Training

THIS FORM MUST BE RETURNED TO THE RADIATION SAFETY OFFICE

By signing below I acknowledge that all individuals authorized to use radioactive materials on my Radionuclide Use Permit have received and reviewed the Radiation Safety Training sheet for October 2012 –"How to Perform a Contamination & Direct Radiation Survey"

Permit Holder (please print):____________________________________

Permit Holder Signature:_________________________________________

Date:________________

This form must be returned to the Radiation Safety Office, CL 159, Via Email or Faxed to 274-2332 By October 31, 2012