

SOP-3 CONTAMINATION SURVEYS

Contamination surveys are to be performed in all Active Locations approved for radionuclide research that involve the handling or use of unsealed radioactive material and the generation of radioactive waste. The Radiation Protection Specialist (RPS) will conduct monthly surveys in all Active Locations. Records will be maintained by Laboratory Services in accordance with the regulations of the Mississippi State Department of Health, Division of Radiological Health.

Survey Frequency:

When using unsealed radioactive materials, contamination surveys will be conducted by the Principal Investigator (PI), or an appointed designee, according to the frequencies listed below:

Radiation Type	Isotopes	Survey Frequency
Beta (<200 keV)	H-3, C-14, S-35	Weekly (Wipes)
Beta (>200 keV)	P-32, P-33	Daily (Area), Weekly (Wipes)
Gamma	I-125, I-131	Daily (Area), Weekly (Wipes)

Contamination surveys do not need to be performed during periods when no radioactive materials are used.

Action Levels:

Radiation Type	Action Level
Beta, x-ray (<200 keV)	2200 dpm
Beta (>200 keV)	220 dpm
Alpha	22 dpm

In accordance with the ALARA concept, an item or location exceeding twice background must be cleaned until background levels are obtained for both fixed and removable contamination. The contaminated location must be resurveyed and the results must be documented.

Survey Methods:

Contamination surveys can be performed using a variety of methods. The two most common methods are "area" and "wipe" surveys.

Area (meter) survey:

- Measures both fixed and removable contamination, and,
- Performed with an appropriate portable radiation survey meter.

Wipe survey:

- Measures only removable contamination, and,
- Is performed using “wipes” counted on a liquid scintillation counter or a gamma counter.
 - Wipe tests are the most versatile and most sensitive method of detecting low-level contamination in the laboratory.

The area supervisor or a designee must complete contamination surveys of the active work area at the end of each week during which operations involving the use or handling of loose radioactive material occurs.

Recording Survey Results:

The PI must maintain permanent records of all contamination surveys, including negative results. The records must include:

- Date of survey,
- Type of instrument used,
- Name of person conducting the survey,
- Survey results - must be keyed to locations on the area drawing, and,
- If contamination is found, the results of retesting after decontamination.

Procedures for Wipe Testing:

1. Obtain the survey list and/or map from the RPS. A survey diagram is posted in every Active Laboratory for reference.
2. Test each location specified on the survey map at least once. The smear test is performed by using wet or dry filter paper or swab, and then gently rubbing the filter paper or swab over an area of approximately 100 sq.cm. with sufficient force to remove loose material from the surface without destroying the filter paper or swab.
3. Place each completed smear inside the scintillation vial labeled for the position tested. Scintillation fluid must be added to each vial prior to counting (typically 50- 100% of the vial volume for optimum efficiency).
4. When ready to obtain counting data for the completed survey, place the vials containing the smears in appropriate racks inside the liquid scintillation counter, with a background scintillation vial as the first vial. The background vial should contain liquid scintillation fluid with a clean sample.
5. Obtain counting data by selecting the appropriate counting protocol, or by selecting the Direct **Disintegrations Per Minute (DPM)** option and selecting the appropriate lower and upper regions for the isotopes to be counted. If the appropriate selections are made in the counting protocol, the data will give the **Counts Per Minute (CPM)**, DPM, activity per unit area or volume and the efficiency of each sample counted.
6. After the counting interval is complete, check the dates printed on the data sheet and identify the positions of all locations surveyed.



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7. Record the results.

- Check each location for removable activity in excess of the established Action Level listed for the laboratory.
- If any location exceeds the Action Level, immediately notify the RPS. If the Action Level is exceeded by a factor of 10 or greater, all lab activity should safely be terminated as soon as possible.
- Activity in the area may continue only after written approval from the RPS.