
		ESH&Q Section Procedures
Procedure Number/Name ESHQS-RPE-001 – ESH&Q RPE ROUTINE MONITORING PROGRAMS		Original Date: 3/28/2003
Written by: Gary Lauten	Reviewed and Updated By: Joel Fulgham & Maddie Wolter	Date: 5/10/2017

Approvals

Written By:  Date: 5/10/2017
Joel Fulgham, ESH&Q RPE Lead RCT

Written By:  Date: 5/10/2017
Maddie Wolter, ESH&Q RPE RSO Group Leader

Approved By:  Date: 5/10/17
John Anderson, ESH&Q RPE Department Head

Revision History

Author	Description of Change	Revision Date
Maddie Wolter	<ul style="list-style-type: none"> Transferred to ESH&Q procedure Updated personnel titles after ESH&Q reorganization 	3/30/2017
Joel Fulgham	Initial release (BDDP-SH-1003)	3/28/2003

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1.0 PERSON(S) AUTHORIZED TO PERFORM THIS PROCEDURE

Environment, Safety, Health & Quality (ESH&Q) Section Radiation Physics Engineering (RPE) Department Radiation Safety Officer (RSO)/Radiological Control Technician (RCT) group personnel and RCTs assigned to the Hazard Control Technology (HCT) Team. Facility Engineering Support Services trained personnel will continue performing the routine surveys of the railhead.

2.0 PURPOSE OF THIS PROCEDURE

The ESH&Q RPE RSOs and/or designee(s) are responsible for:

- a) Preparing this procedure
- b) Determining which areas of the Lab are subject to routine monitoring
- c) Determining the appropriate frequency of routine monitoring for each area, and making adjustments as necessary
- d) Determining the appropriate monitoring instrumentation and survey techniques for each area
- e) Reviewing survey results and documentation, and to recommend corrective actions as appropriate
- f) Maintaining the appropriate records and related documentation

3.0 REFERENCES

Fermilab Radiological Control Manual (FRCM)

4.0 RPE ROUTING MONITORING PROGRAM DESCRIPTION

The purpose of the RPE routine monitoring programs are to understand the dose rates in an area to help keep personnel doses As Low As Reasonably Achievable (ALARA) and to ensure that: radioactive material is properly labeled and controlled; radioactive waste areas are properly maintained; sumps, Radioactive Water (RAW) systems, and Low Conductivity Water (LCW) systems do not exceed pre-determined radioactivity concentration levels. The program also helps to ensure that radiological signs and postings throughout the Lab are correct and legible, and that radioactive material does not accidentally leave the site without being authorized. The program conducts parameter monitoring of systems with a potential radiological consequence such as airborne radioactivity levels, interlocked detector readings, water and pump flow monitoring systems, fan systems, and other ventilation systems. Surveys, sampling and reviews included in these programs are performed by ESH&Q RCTs, either in the RPE Department or the Environmental Protection (EP) Department HCT Team.

- a) Items identified in shielding assessments that require routine monitoring are included in this program and documented accordingly.

- b) Radiological surveys (“snoop” surveys) are performed at Fermilab areas that are accessed by workers as workers. These surveys are documented and grouped into packets according to their designated survey frequency, with a cover page for each frequency. Instruments used for snoop surveys are documented on the cover page. When completed, the packets are submitted to the ESH&Q RPE RSO Group Leader for review.
- i. Weekly surveys encompass areas that have a higher probability of containing radioactive materials. These are areas where radioactive materials are regularly handled and content and conditions can change frequently.
 - ii. Monthly surveys are areas of lower traffic involving radioactive material, but are deemed to require a monthly survey to ensure radioactive material is properly controlled.
 - iii. Quarterly surveys encompass areas that are deemed to have a lower probability of containing radioactive material than monthly areas; or are areas where the frequency of radioactive material movement is comparatively low.
 - iv. Semi-Annual surveys are areas that are seldomly occupied and rarely have radioactive material.
 - v. Annual surveys are areas typically unoccupied and have a very low potential for radioactive material storage, or are office areas for personnel who normally are not expected to work with or come in contact with radioactive material, such as for some areas in Wilson Hall.
 - vi. Areas that are not entered by radiological workers in the course of their employment duties, such as on-site housing, the Daycare, the Users center, etc., are not part of the routing monitoring program.
- c) Beam enclosure surveys (opening up surveys) are required prior to changing from Controlled Access to Supervised Access after running beam. This survey is not required for experimental halls to go into Open Access. Enclosure surveys may also be conducted outside of opening up surveys as needed.
- d) Radiological signs, postings and fences are also reviewed on a semi-annual basis. Radiological signs and postings are reviewed to verify that they are in the correct location, intact, not faded and are legible. Signs will be removed, repaired and/or replaced if necessary. Radiological fences are reviewed in conjuncture with the outdoor signs and postings. If radiological fences are found to be deficient (i.e., missing, fallen down, or have holes greater than 1 square foot) FESS will be contacted to request repair. Plant growth around radiological fencing and signs is managed to ensure that the signs remain legible.

- e) Sump systems, LCW systems, and Radioactive Water systems (RAW) are identified and surveyed at a routine frequency as determined by the area RSO. The monitoring frequency is determined by consideration of the potential for radioactivation and the production rate of radionuclides, need to perform trending analyses, obtaining baseline data for future comparisons and trending, and to ensure that the Fermilab Radiological Control Manual requirements are met.
- f) All dumpsters are surveyed with a long-reach Bicon Analyst immediately before being picked up by the conventional waste management service's dump truck to ensure that there are no radioactive materials leaving site in the dump truck.
- g) Airborne radioactivity monitoring is conducted for areas with a potential for airborne radioactivity. Continuous airborne monitoring (CAM) is conducted at a few locations where the potential for airborne radioactivity is considered significant, to maintain vigilance over the airborne radioactivity where higher airborne concentrations could indicate failed or compromised ventilation systems, or to collect data to monitor existing conditions.
- h) TLD badges and other dosimetry are routinely used as area monitors in several locations throughout the Lab. Badges are collected at the discretion of the area RSO(s). Records and reports of the results are maintained.

These lists are subject to change without notice, but are kept updated in a timely fashion.

Listings of the current content and scope of the routing monitoring program is maintained by the ESH&Q RPE Department RSO Group leader.

5.0 PROGRAM DOCUMENTATION

Documentation and Radiological Records

- a) Radiological records are maintained for all monitoring in accordance with the Fermilab Radiological Control Manual.
- b) Monthly and Quarterly Routine Monitoring Summaries are generated for information and tracking purposes.
- c) Contamination wipes taken during radiological surveys, both snoop surveys and opening up surveys, shall adhere to the following standards:
 - i. Wipes are documented on radiological survey maps with a circled number, followed by an F if the wipe was taken on the floor, and followed by an R if taken on radioactive material. If the wipe was taken on an object, such as a magnet or a work bench, it is just the wipe number inside the circle.

- ii. Wipes taken during normally scheduled radiological (“snoop”) surveys are not individually counted with a frisker and therefore there will be no reading recorded on individual area map legends, however they will be bulk-frisked to ensure that they are not contaminated before being taken to the Radionuclide Analysis Facility (RAF) to avoid contaminating the RAF equipment. The wipes will be officially counted at RAF, and these results will be considered the official record and attached to the packet of survey maps. This allows for a lower level of detection than a field analysis using a frisker, giving more confidence of protecting the public.
 - iii. Wipes taken during beam enclosure surveys are counted with a frisker for instant identification of work conditions. The results seen on the frisker will be documented on the survey map legend. These wipes are only submitted to RAF if there is a need to identify any unexpected contamination.
 - iv. When submitting wipes to RAF, the ESH&Q RPE RSO Group Leader will be added to the list of results recipients. The results will be combined with the appropriate map when scanned and archived.
- d) Any deficiencies found during radiological surveys, either snoop surveys or opening up surveys, will be noted on the map during the survey. Any deficiencies found during fence/posting audits will be noted on the inspection checklist.
- e) Routine monitoring survey maps and/or packets will be submitted to the ESH&Q RPE RSO Group Leader or designee(s) for review and retention. Once the maps and/or packets are reviewed and signed by the RSO Group Leader or designee, the packet will be scanned and saved to the Radiation Physics SharePoint site, [Snoop Survey Program Page](#). *(NOTE: Dumpster surveys performed by HCTT will be maintained by HCTT.)*
- i. For surveys performed by RCTs: original copies of the schedules and maps will be submitted to the “Routine Monitoring Surveys” mail slot in the Linac.
 - ii. For surveys performed by HCTT: scanned copies of the schedules and maps will be emailed, and originals will be sent via Fermilab mail, to the ESH&Q RPE RSO Group Leader. This will ensure that the schedules and maps are documented in case the originals get lost in the mail.
 - iii. For surveys performed by FESS: scanned copies of the schedules and maps will be emailed to the FESS RSO, and originals will be sent via Fermilab mail to the ESH&Q RPE RSO Group Leader. This will ensure that the schedules and maps are documented in case the originals get lost in the mail.

