

Contamination Monitoring

*Standard Operating Procedure, 29 November 2016*¹

1. References

- a. US Nuclear Regulatory Commission (NRC) source material license (SML) number SUB-1435
- b. Radiation Safety Plan for Jefferson Proving Ground Depleted Uranium Impact Area
- c. "Instrument Use, Maintenance, and Calibration," SOP

2. Purpose

To meet NRC SML conditions and RSP requirements for monitoring for depleted uranium (DU) contamination of personnel, vehicles, and equipment as necessary

3. Introduction

- a. a. The NRC has issued SML number SUB-1435 to the Army. This license authorizes the Army to possess depleted uranium (DU) for decommissioning. The License RSO is responsible to both the Army licensee and to the NRC for monitoring, maintaining, and enforcing compliance with NRC regulations and license conditions.
- b. The US Fish and Wildlife Service (FWS) operates the refuge through a 25-year real-estate permit. FWS personnel will perform contamination monitoring whenever they suspect radioactive (DU) contamination.
- c. The health physics standard of practice for personnel, vehicles, and equipment that have a reasonable possibility of radioactive contamination is to check them with instruments. This SOP describes the procedures for this monitoring.

4. Instruments and Equipment at the Exit Hotline

- a. The required instrument for exit monitoring is a Geiger-Mueller pancake probe with associated meter. At least one operable, calibrated pancake probe will be available to monitor personnel, equipment, and tools as necessary. See the "Instrument Use, Maintenance, and Calibration" SOP for the proper use of this instrument, including daily quality control checks.

¹ This SOP supersedes the SOP dated 16 June 2014.

- b. In addition to the proper instruments, the following will be available for contamination monitoring.
 - 1) Soap, water, and paper towels available for decontamination, if needed
 - 2) Blank swipes (for example, NuCon® smears) to document removable contamination, if needed
 - 3) Baggies for transporting individual used swipes, if needed
 - 4) Forms for documentation of all results of monitoring personnel, equipment, and vehicles (blank form attached at end of this SOP)
 - 5) Values for the scanning and static minimum detectable concentrations for the monitoring instrument in units of disintegrations per minute per 100 square centimeters (dpm/100 cm²) (these values may be on the forms)
 - 6) Action levels for detection of contamination in units of counts per minute (cpm) (these values may be on the forms)

5. Procedures

- a. Scanning and, if necessary, decontamination
 - 1) The monitor will record ALL (positive and negative) results of scanning and swiping and will record ALL decontamination efforts on the forms
 - 2) The exit monitor will scan at about ½ inch above surfaces at a rate no faster than 2 inches per second
 - 3) Should count rate exceed the action level, either by a noticeable increase in the audible clicks or by the measured count rate showing on the meter, the monitor will:
 - a) Immediately take a wipe test (swipe) as described below before attempting decontamination
 - b) Attempt decontamination using soap and water and then drying and wiping with paper towels. Normal washing efforts will suffice; do not use excessive force or abrasives that might break the skin.
 - c) Re-scan and re-swipe until no contamination is detected or no more contamination can be removed
 - d) Immediately inform the License RSO (desk 210-466-0368 or cell 210-313-0952) for additional guidance. Maintain a copy of the completed form on-site.
- b. Wipe test (swiping or smearing) and decontamination

- 1) Swipe a prepared, blank wipe, using normal pressure, across 100 square centimeters (cm²). This is roughly equivalent to the area of the palm of your hand. If the available surface area is less than 100 cm², swipe the entire surface.
 - 2) Count the swipe, face up, on a flat clean surface, centered on the pancake probe face, with probe in contact with the swipe (the probe will be cleaned later, if necessary) for **ten minutes**.
 - 3) For personnel if the measured count rate exceeds the background reference count rate by more than 20 percent or for vehicles and equipment if the measure count rate exceeds the action level, repeat decontamination and swipe tests until it does. If contamination is still detected after at least three decontamination attempts, contact the License RSO immediately.
 - 4) Label all swipes with adequate identifying information that correlate with information on the forms, so that they can be identified later. This could be as simple as a number as long as the number is unique and correlated with the form.
 - 5) Save each swipe in a separate baggie to avoid cross-contamination between swipes. The License RSO may want to recount these swipes later on more sophisticated equipment.
 - 6) The instrument will be carefully cleaned before each subsequent measurement if any contamination is detected.
- c. Records and notifications

The form will include the name of everyone who is monitored for contamination, a list of all equipment and vehicles monitored for contamination, all results of monitoring to include where on the person, vehicle, or equipment were contamination was found, and a description of all decontamination efforts.

The form will include the names, signatures, and contact information (telephone number or email address) of those who performed the monitoring. The form will include the date of the monitoring and geographic location where the contamination occurred.

All monitoring and decontamination records become the property of the License RSO, who will retain them for NRC inspection.

Attachment:

Exit Monitoring Record blank form

Exit Monitoring Record

Administrative Information

Today's Date	Probe SN	Meter SN	Cal Date	Cal Due	Surveyor Name

Quality Control Information (from spreadsheet)

Background QC (cpm)			Check Source QC (cpm)		
Average - 20 %	Average	Average + 20 %	Average - 20 %	Average	Average + 20 %
Today's Result		OK?	Today's Result		OK?

Minimum Detectable Concentrations and Action Levels (from spreadsheet)

MDC (dpm/100 cm ²)		Action Level (counts)		
Scanning	Wipes	Personnel (in one minute)	Vehicles and Equipment	
			Scanning (per minute)	Wipes (in 10 minutes)

Survey Results

Time		Identification Person (must have DU training): name Vehicle: type and license number Equipment: type	Scan result ¹ (cpm)	OK? ²	Swipe Result ³ (or NA) (counts in 10 minutes)	OK? ⁴	Surveyor Initials
IN	OUT						

¹ Scan (< 2 inches/second) areas that contacted soil, such as soles of shoes, vehicle tires and floorboards, and bottoms of equipment.

² Take swipe if not OK (that is, result is above applicable action level).

³ Show locations of swipes on cross-referenced figure on separate pages. Notify RSO ASAP.

⁴ Decontaminate and swipe again if not OK. Show new result on new line. Repeat until OK. Notify RSO ASAP.

