

Field Equipment Decontamination

SSFL SOP 12

Revision: 1

Date: November 2012

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Issued:  11/26/2012
Signature/Date**1.0 Objective**

The objective of this technical standard operating procedure (SOP) is to describe the general procedures required for decontamination of non-disposable field equipment for the Santa Susana Field laboratory (SSFL) site. Given the history of radioactive material usage at SSFL, screening for radioactive materials will occur with all field operations. Decontamination of field equipment is necessary to ensure acceptable quality of samples by preventing cross-contamination. Further, decontamination reduces health hazards and prevents the spread of contaminants off site.

2.0 Background

Decontamination of equipment will occur before sampling begins and between each sample collection (for sampling equipment). All decontamination water will be collected for future disposal.

2.1 Definitions

ASTM Type II Water – Reagent grade water defined by American Society for Testing and Materials (ASTM) that is used in the final rinse of surfaces of contaminated equipment.

Clean – Free of contamination and when decontamination has been completed in accordance with this SOP.

Cross-Contamination – The transfer of contaminants through equipment or personnel from the contamination source to less contaminated or non-contaminated samples or areas.

Decontamination – The process of rinsing or otherwise cleaning the surfaces of equipment to rid them of contaminants and to minimize the potential for cross-contamination of samples or exposure of personnel.

Material Safety Data Sheets – These documents discuss the proper storage and physical and toxicological characteristics of a particular substance used during decontamination. These documents, generally included in site health and safety plans, shall be kept on site at all times during field operations.

Potable Water – Potable water is provided by local city sources and is safe for consumption. Chemical analysis of the water source will not be required before it is used.

Site Health and Safety Technician – The person who will use field screening instruments to monitor all field activities for VOCs and radiological contaminants and pre-shipment sample coolers. This person is a trained radiological technician who works under the guidance of Science Application International Corporation's (SAIC's) Certified Health Physicist (CHP).

Sampling Equipment – Equipment that comes into direct contact with the sample media.

Soap – Low-sudsing, non-phosphate detergent such as Liquinox™.

2.2 Associated Procedures

- SSFL SOP 2, *Surface Soil Sampling*
- SSFL SOP 3, *Subsurface Soil Sampling with Hand Auger*
- SSFL SOP 4, *Direct Push Technology Sampling*
- SSFL SOP 5, *Backhoe Trenching/Test Pits for Sample Collection*

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- SSFL SOP 6, *Field Measurement of Total Organic Vapors*
- SSFL SOP 7, *Field Measurement of Residual Radiation*
- SSFL SOP 13, *Guide to Handling Investigation-Derived Waste*

3.0 Responsibilities

Field Team Leader (FTL)-ensures that field personnel are trained in the performance of this procedure and that decontamination is conducted in accordance with this SOP. The FTL may also be required to collect and document rinsate samples (also known as equipment blanks) to provide quantitative verification that these procedures have been correctly implemented.

Field Team Member-performs decontamination of field sampling equipment and/or or oversees subcontractors performing decontamination activities. Ensures the procedures are followed, equipment is clean, and collects field equipment rinseate blanks.

4.0 Required Equipment

- Stiff-bristle scrub brushes
- Plastic buckets and troughs
- Portable hot-water/steam, high pressure spray cleaners
- Soap
- Nalgene or Teflon sprayers or wash bottles or 2- to 5-gallon, manual-pump sprayer (pump sprayer material must be compatible with the solution used)
- Plastic sheeting, plastic bags, and/or aluminum foil to keep decontaminated equipment clean between uses
- Disposable wipes, rags, or paper towels
- Potable water
- ASTM Type II water
- Trough or collection pool to contain wash waters during decontamination
- Sheet plastic to place beneath trough to contain any splash water
- Gloves, safety glasses, and other protective clothing as specified in the health and safety plan
- Tools for equipment assembly and disassembly (as required)
- 55-gallon drums for temporary storage of decontamination water
- Drum labels
- Pallets for drums holding decontamination water
- Pump to transfer water to drums (as needed)

5.0 Procedures

Decontaminate all reusable equipment (non-dedicated) used to collect and/or handle samples before coming into contact with any sampled media or personnel using the equipment. Screen all used equipment for radioactivity before transport to the decontamination area (SSFL SOP 7). Decontaminate equipment at portable decontamination stations set up at the sampling location. Transport equipment to and from the decontamination station in a manner to prevent cross-contamination of equipment and/or area. Take precautions such as enclosing large equipment (rods) in plastic wrap while being transported .

Construct the decontamination area so that contaminated water is either collected directly into appropriate containers (5-gallon buckets or steel wash tubs) suitable for collecting the decontamination water. If needed construct small soil berm or depression lined with plastic to collect any overspray or splash. Transfer water from the collection pool and containment area into 55-gallon drums for temporary storage. Stage decontamination water until sampling results or waste characterization results are obtained and evaluated and the proper disposition of the waste is determined (SSFL SOP 13).

Decontaminate all items that come into contact with potentially contaminated media before use and between sampling and/or drilling locations. If decontaminated items are not immediately used, cover them with either clean plastic or aluminum foil depending on the size of the item. Decontamination procedures for equipment are as follows:

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General Guidelines

- Potable and ASTM Type II water will be free of all contaminants of concern.
- Decontaminated equipment will be allowed to air dry before being used.
- Equipment type, date, time, and method of decontamination along with associated field quality assurance sampling shall be recorded in the appropriate logbook.
- Gloves, boots, safety vest, safety glasses, and any other personnel protective clothing and equipment shall be used as specified in the health and safety plan.

5.1 Heavy Equipment Decontamination

The following steps will be used when decontaminating heavy equipment (i.e., backhoes):

1. Establish a decontamination area (e.g., large troughs or plastic sheeting with temporary wood bermed sides) that is large enough to fully contain the equipment to be cleaned. All decontamination areas must be upwind of the area under investigation.
2. Screen the backhoe bucket and arm for radioactivity. If measured above background, take measures to contain decontamination water separately from non-radioactive-impacted water.
3. With the heavy equipment in place, spray areas (e.g., bucket of the backhoe) exposed to contaminated media using a hand-handle sprayer. Be sure to spray down all surfaces that contact soil.
4. Use brushes, soap, and potable water to remove dirt whenever necessary.
5. Remove equipment from the decontamination pool and allow it to air dry before returning it to the work site.
6. After decontamination activities are completed, collect all contaminated wastewater, plastic sheeting, and disposable gloves, boots, and clothing in separate containers or receptacles (i.e., solids and liquids). A decontamination area may be used for multiple day/weeks provided the containment integrity is maintained. All receptacles containing contaminated items must be properly labeled for disposal. Liquids must be separated from solids and drummed.

5.2 Downhole Equipment Decontamination

Downhole equipment includes rods, stems, etc. Follow these steps when decontaminating this equipment:

1. Set up a centralized decontamination area (e.g., large trough or plastic bermed area), if possible. This area shall be set up to collect contaminated rinse waters and to minimize the spread of airborne spray.
2. Set up a "clean" area upwind of the decontamination area to receive cleaned equipment for air-drying. At a minimum, clean plastic sheeting must be used to cover tables or other surfaces on which decontaminated equipment is to be placed. All decontamination areas shall be upwind of any areas under investigation.
3. Screen all equipment for radioactivity before decontamination. If measured above background, take measures to contain decontamination water separately from non-radioactive-impacted water.
4. Place the object in a 5-gallon bucket or tub for detergent wash. If needed, longer equipment may be placed on aluminum foil or plastic-covered wooden sawhorses or other supports. The objects to be cleaned shall be at least 2 feet above the ground to avoid splash back when decontaminating.
5. Using soap and potable water wash the contaminated equipment. When using hand-held sprayers aim nozzle downward to avoid spraying outside the decontamination area. Be sure to spray inside corners and gaps especially well. Use a brush, if necessary, to dislodge dirt.
6. Move the equipment to a second bucket and rinse the equipment using clean, potable water.

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7. Using a suitable sprayer, conduct a final rinse of the equipment thoroughly with ASTM Type II water.
8. Remove the equipment from the decontamination area and place in a clean area upwind to air dry.
9. After decontamination activities are completed, collect all contaminated wastewaters, plastic sheeting, and disposable gloves, boots, and clothing in separate containers or receptacles. All receptacles containing contaminated items must be properly labeled for disposal. Liquids must be separated from solids and drummed. Any radioactive decontamination water must be contained in separate drums.

5.3 Sampling Equipment Decontamination

Follow these steps when decontaminating sampling equipment:

1. Set up a decontamination line (e.g., buckets or trough). The decontamination line shall progress from "dirty" to "clean." A clean area shall be established upwind of the decontamination wash/rinse activities to dry the equipment. At a minimum, clean plastic sheeting must be used to cover the tables or other surfaces that the decontaminated equipment is placed for drying.
2. Disassemble any items that may trap contaminants internally. Do not reassemble the items until decontamination and air drying are complete.
3. Wash the items with potable water and soap using a stiff brush as necessary to remove particulate matter and surface films.
4. Thoroughly rinse the items with potable water.
5. Rinse the items thoroughly using ASTM Type II water.
6. Allow the items to air dry completely.
7. After drying, reassemble the parts as necessary and wrap the items in clean plastic wrap, place in plastic baggies or in aluminum foil if not used immediately.
8. After decontamination activities are completed, collect all contaminated waters, plastic sheeting, and disposable personal protective equipment. Separate solid waste from liquid investigation-derived waste. Place solid items in trash bags for municipal disposal. Liquids must be separated from solids and drummed. Any radioactive decontamination water must be contained in separate drums. Refer to site-specific plans for labeling and waste management requirements.

5.4 Waste Disposal

Refer to site-specific plans and SSFL SOP 13 for waste disposal requirements. The following are guidelines for disposing of wastes:

- All wash water, rinse water, and decontamination solutions that have come in contact with contaminated equipment are to be handled, packaged (55-gallon drums), labeled, marked, stored, and disposed of as investigation-derived waste.
- Small quantities of decontamination solutions may be allowed to evaporate to dryness.
- Unless otherwise required, plastic sheeting and disposable protective clothing may be treated as solid, nonhazardous waste and placed in trash bags for disposal.
- Waste liquids shall be sampled, analyzed for contaminants of concern in accordance with disposal regulations, and disposed of accordingly.

6.0 Restrictions/Limitations

If the field equipment is not thoroughly rinsed and allowed to completely air dry before use, volatile organic residue, which

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interferes with the analysis, may be detected in the samples. The occurrence of residual organic solvents is often dependent on the time of year sampling is conducted. In the summer, volatilization is rapid, and in the winter, volatilization is slow.

7.0 References

American Society for Testing and Materials (ASTM). 2002. *Standard Practice for Decontamination of Field Equipment at Nonradioactive Waste Sites*, ASTM D5088-02. January 10.

U. S. Environmental Protection Agency. 1987. *A Compendium of Superfund Field Operations Methods*, EPA/540/P-87/001.1.