

STANDARD OPERATING PROCEDURE EQUIPMENT DECONTAMINATION PROCEDURES

1.0 INTRODUCTION

This Standard Operating Procedure (SOP) was prepared to direct field personnel in the methods for decontamination of field equipment used in the investigation of sites with hazardous and potentially radiological waste.

1.1 Objective

The objective of equipment decontamination is to remove potential contaminants from a sampling device or item of field equipment prior to and between collection of samples for laboratory analysis and limit personnel exposure to residual contamination that may be present on used field equipment.

1.2 Equipment

The following equipment may be utilized when decontaminating equipment. Site-specific conditions may warrant the use or deletion of items from this list.

- Alconox, liquinox or other non-phosphate concentrated laboratory grade soap;
- Deionized water;
- Pump sprayer;
- 1-pint squeeze bottle filled with pesticide-grade hexane;
- 1-pint squeeze bottle filled with pesticide-grade methanol;
- 1-pint squeeze bottle filled with ten (10) percent nitric acid;
- 1-pint squeeze bottle filled with one (1) percent nitric acid;
- Five large plastic wash basins (24 inches by 30 inches by 6 inches deep);
- Two coarse scrub brushes;
- Small wire brush;
- Aluminum foil;
- Polyethylene sheeting;
- Two large capacity barrels;
- All necessary personal protective equipment (gloves, eyewear, tyveks);
- Extra quantities of above listed liquids;
- 4 inch Schedule 40 PVC pipe 4 feet in length with an end cap for decontaminating groundwater pumps and associated tubing (if needed); and
- High pressure sprayer with water supply.

2.0 PROCEDURES

2.1 General

The following procedures should be used for decontaminating field equipment. Procedures will vary with equipment used and potential contaminants present at the site.

2.2 Procedure for Soil Sampling Equipment

Soil sampling equipment, such as split spoon samplers, shovels, augers, trowels, spoons, and spatulas will be cleaned using the following procedure.

1. All tools being removed from the Exclusion Zone shall be checked by the HPT. If the HPT determines that a tool is radiologically contaminated, it shall be decontaminated by the users under the direction of the HPT. The procedures described below may be sufficient to remove radiological contamination. However, use of abrasive materials, ultrasonic cleaners, or other methods approved by the HPT may also be required.
2. Place five wash basins in an established decontamination area that has a low permeability liner (e.g., polyethylene) and secondary containment. The decontamination area must be of sufficient size to allow placement of the five plastic wash basins in a line, and provide an air drying area for equipment.
3. Fill the first wash basin with potable tap water. Add sufficient soap powder or solution to cause suds to form in the basin. Do not use an excessive amount of the soap or rinsing the soap residue off the equipment will be difficult.
4. Using a clean coarse scrub brush, wash the sampling equipment in the soap solution in the first basin, removing all dirt. Be sure to wash inside surfaces of equipment as well as the exterior surfaces. Allow excess soap to drain off the equipment when finished.
5. Rinse the equipment with tap water in the second basin, using a coarse scrub brush or pressure sprayer to aid in the rinse, if necessary.
6. If the equipment is being used to sample for metals, rinse the equipment with nitric acid in the third basin. A 10 percent solution is used on stainless steel equipment. A one percent solution is used on all other equipment. If no metals sampling is being performed, this step may be omitted.
7. Spray down the equipment in the third basin, using deionized water.
8. Spray down the equipment in the fourth basin, using pesticide-grade methanol, if sampling for organic compounds is to be performed. If oily, a two-step process using

methanol, followed by hexane should be used to remove both water soluble and nonsoluble compounds. If no samples for organic compounds are being collected, this step may be omitted.

9. Allow the equipment to completely air dry on clean polyethylene sheeting.
10. Rinse the equipment in the fifth basin, using deionized water.
11. Allow the equipment to completely air dry on clean polyethylene sheeting.
12. Reassemble equipment, if necessary, and wrap completely in clean, unused aluminum foil, shiny side out for transport. Re-use of equipment on the same day without wrapping in foil is acceptable.
13. Allow spent cleaning solutions in the trays to evaporate into the air. If evaporation is not possible, all spent cleaning solutions shall be drummed for disposal along with any other contaminated fluids generated during the field investigation.
14. Record the decontamination procedure in the field logbook or on appropriate field form.
15. If step 8, rinsing with organic solvents, was performed, check the equipment for the presence of residual solvents with a photoionization or flame ionization detector prior to use. If a detection occurs, disassemble the equipment and allow to air dry until no readings are observed, then re-rinse with deionized water.
16. If a tool that was found to have radiological contamination upon leaving the Exclusion Zone is decontaminated and released by the HPT, the survey results shall be documented on a Radiological Survey Data Sheet.
17. If the tool cannot be decontaminated after several tries, then the tool shall be painted or sprayed with yellow paint to indicate that the item is radioactive material. The tool shall be kept in the Exclusion Zone or containerized for subsequent disposal with other radiological wastes. Note that if temperature or humidity conditions preclude air drying equipment, sufficient spares should be available so that no item of sampling equipment need be used more than once. Alternatively, the inability to air dry equipment completely prior to reuse should be noted in the field logbook. In this case, additional rinses with deionized water should be used and recorded.

2.3 Procedure for Ground Water Sampling Equipment

Ground water sampling equipment, such as bailers and stainless steel cord, will be cleaned using the following procedure.

1. All equipment being removed from the Exclusion Zone shall be checked by the HPT. If the HPT determines that a piece of equipment is radiologically contaminated, it shall be decontaminated by the users under the direction of the HPT. The procedures described below may be sufficient to remove radiological contamination. However, use of abrasive materials, ultrasonic cleaners, or other methods approved by the HPT may also be required.
2. Place five wash basins in an established decontamination area that has a low permeability liner (e.g., polyethylene) and secondary containment. The decontamination area must be of sufficient size to allow placement of the five plastic wash basins in a line, and provide an air drying area for equipment.
3. Fill the first wash basin with potable tap water. Add sufficient soap powder or solution to cause suds to form in the basin. Do not use an excessive amount of soap or rinsing the soap residue off the equipment will be difficult.
4. Wash the sampling equipment in the soap solution in the first basin, removing all residues. Be sure to wash inside surfaces of equipment as well as exterior surfaces. Allow excess soap to drain off the equipment when finished.
5. Rinse the equipment with tap water in the second basin.
6. If the equipment is being used to sample for metals, rinse the equipment with nitric acid in the third basin. A 10 percent solution is used on stainless steel equipment. A one percent solution is used on all other equipment. If no metals sampling is being performed, this step may be omitted.
7. Spray down the equipment in the third basin, using deionized water.
8. Spray down the equipment in the fourth basin, using pesticide-grade methanol, if sampling for organic compounds is to be performed. If oily, a two-step process using methanol, followed by hexane should be used to remove both water soluble and nonsoluble compounds. If no organic compounds sampling is being performed, this step may be omitted.
9. Allow the equipment to completely air dry on clean polyethylene sheeting.
10. Rinse the equipment in the fifth basin, using deionized water.
11. Allow the equipment to completely air dry on clean polyethylene sheeting.
12. Reassemble equipment, if necessary, and wrap completely in clean, unused aluminum foil, shiny side out for transport. Re-use of equipment on the same day without wrapping in foil is acceptable.

13. Allow spent cleaning solutions in the trays to evaporate into the air. If evaporation is not possible, all spent cleaning solutions shall be drummed for disposal along with any other contaminated fluids generated during the field investigation.

14. Record the decontamination procedure in the field logbook or appropriate field form.

15. If step 8, rinsing with organic solvents, was performed, check the equipment for the presence of residual solvents with a photoionization or flame ionization detector prior to use. If a detection occurs, disassemble the equipment and allow to air dry until no readings are observed. Re-rinse with deionized water.

16. If equipment that was found to have radiological contamination upon leaving the Exclusion Zone is decontaminated and released by the HPT, the survey results shall be documented on a Radiological Survey Data Sheet.

17. If the equipment cannot be decontaminated after several tries, then the tool shall be painted or sprayed with yellow paint to indicate that the item is radioactive material. The equipment shall be kept in the Exclusion Zone or containerized for subsequent disposal with other radiological wastes. Note that if temperature or humidity conditions preclude air drying equipment, sufficient spares should be available so that no item of sampling equipment need be used more than once. Alternatively, the inability to air dry equipment completely prior to reuse should be noted in the field log. In this case, additional rinses with deionized water should be used and recorded.

2.4 Procedure for Oversized Equipment

Oversized equipment, such as submersible pumps, will be cleaned using the following procedure.

1. All equipment being removed from the Exclusion Zone shall be checked by the HPT. If the HPT determines that a piece of equipment is radiologically contaminated, it shall be decontaminated by the users under the direction of the HPT. The procedures described below may be sufficient to remove radiological contamination. However, use of abrasive materials, ultrasonic cleaners, or other methods approved by the HPT may also be required.

2. Fill two clean barrels with tap water.

3. Add sufficient concentrated soap to one barrel to form a thin layer of soap suds.

4. Immerse the pump in the soap containing barrel and start pump. Circulate the soap solution through the pump and feed discharge into a waste disposal drum.

5. Immerse the pump in the barrel filled with clean tap water and start pump. Circulate the water through the pump and feed discharge into a waste disposal drum. Run the pump until no soap residue is visible in the discharge.

6. Deionized water should then be run through the pump and used to rinse all submersible parts and hoses.
7. Record the decontamination procedure in the field logbook or appropriate field form.
8. If equipment that was found to have radiological contamination upon leaving the Exclusion Zone is decontaminated and released by the HPT, the survey results shall be documented on a Radiological Survey Data Sheet.
9. If the equipment cannot be decontaminated after several tries, then the tool shall be painted or sprayed with yellow paint to indicate that the item is radioactive material. The equipment shall be kept in the Exclusion Zone or containerized for subsequent disposal with other radiological wastes.

2.5 Procedure for Measuring Equipment

Measuring equipment, such as pressure transducers or water level indicators, will be cleaned using the following procedure.

1. All equipment being removed from the Exclusion Zone shall be checked by the HPT. If the HPT determines that a piece of equipment is radiologically contaminated, it shall be decontaminated by the users under the direction of the HPT. The procedures described below may be sufficient to remove radiological contamination. However, use of abrasive materials, ultrasonic cleaners, or other methods approved by the HPT may also be required.
2. Fill two clean basins with tap water.
3. Add sufficient concentrated soap to one basin to form a thin layer of soap suds.
4. Immerse the device in the soap containing basin and gently agitate. Scrub device if it is soiled. Do not submerge any electrical connectors or take up reels, only that portion of the device in contact with potentially contaminated water.
5. Immerse the device in the basin containing the rinse water and gently agitate. Do not submerge any electrical connectors or take up reels, only that portion of the device in contact with contaminated water.
6. Spray rinse equipment with deionized water.
7. Allow the equipment to air dry.
8. Record the decontamination procedure in the field logbook or appropriate field form.
9. If equipment that was found to have radiological contamination upon leaving the

Exclusion Zone is decontaminated and released by the HPT, the survey results shall be documented on a Radiological Survey Data Sheet.

10. If the equipment cannot be decontaminated after several tries, then the tool shall be painted or sprayed with yellow paint to indicate that the item is radioactive material. The equipment shall be kept in the Exclusion Zone or containerized for subsequent disposal with other radiological wastes.