



State of Nevada
Division of Environmental Protection

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Rev: 5.0
Date: 10/16/01

SURFACE SOIL SAMPLING

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1.0 SCOPE AND APPLICATION

The purpose of this Standard Operating Procedure (SOP) is to provide the sampling teams with a step-by-step guide for collecting composite surface soil samples using hand trowels. Samples will be collected in outdoor areas most frequently used by children.

2.0 EQUIPMENT/MATERIAL REQUIRED

Below is a list of the materials needed for surface soil sampling events. Both disposable and reusable sampling equipment are required.

- Personal protective equipment (as specified in the Health and Safety Plan)
- Sampling Plan (SP)
- Property location Map/Fallon Street Map
- 8-oz glass sample containers w/lids
- Sample log sheets
- Sample labels/tags
- Coolers
- Ice
- Aluminum mixing tray
- 1-gallon zip-lock bags
- Paper towels
- Ballpoint pen
- Permanent marker
- Plastic (disposable) trowels
- Steel trowel
- Plastic trash bags
- Potting soil

3.0 SAMPLING PROCEDURES

- 3.1 **Perform a general site reconnaissance** to verify actual site conditions consistent with the HASP. Make entries onto the field data sheet as called for on the sheet.
- 3.2 **Locate surface soil sampling area:** Identify area of the property most used by children, for example; play areas, or walk ways. Describe the area on the Field Data



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Sheet and estimate the distance and direction from a permanent marker, (20 feet NW of the NE corner of the house, utility pole, etc.).

- 3.3 **Select a sample area of approximately 25 square feet** for the collection of a three-part composite sample. Sample parts will be collected from three locations within the sample area. If the child-use area is less than 25 square feet, see Grab Sample instructions in Step 3.10 below.
- 3.4 **Collect Samples:** Put on clean, disposable latex surgical gloves (equivalent) prior to collecting soil samples.

With the plastic and/or steel trowel collect 6 heaping trowel-volumes from each of the three-part sample locations (18 total volumes) from 0-3 inches below ground surface and put the soil into an aluminum mixing pan. Sample collection will focus on soil particles, not other materials intermixed in the soil matrix. Using hands covered with surgical gloves, remove plant material, roots, pebbles greater-than pea size (1/4" diameter), rocks, concrete etc. from the aluminum mixing pan and place them in one of the sample holes.

If the sample area is covered by grass turf or other non-soil material cut away or remove approximately 1 square foot of the non-soil material with a steel trowel and collect soil from 0-3 inches below the cut-away material with the plastic trowel. Replace the removed soil with potting soil, and place non-soil material on top. Tamp it down with your foot and water with home resident's approval and water source.

- 3.5. **Thoroughly mix** the soil volume in the aluminum pan with the plastic trowel or glove-covered hands. Note the qualities (color, texture, etc.) of the homogenized sample on the sample log sheet as called for on the sheet.



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3.6 With the plastic trowel, place the mixed soil into sample containers as follows.

- 1 full 8oz glass jar (Metals analyses)
- 1 full 8oz glass jar (o-chlorine pesticides analyses)
- 1 full 8oz glass jar (o-phosphate pesticides analyses)
- 1 full 8oz glass jar (Aroclor PCBs and SVOCs analyses)
- 1 full 8oz glass jar (Archive)
- 16 oz (approximate) of soil in a double zip-lock bag (rad analyses)

Place remaining soil into one or more of the sample holes. Top off holes with potting soil.

- 3.7 Label each sample container according to the labeling conventions outlined in the SP. Sample labels will be preprinted. Fill out information called for on the label with a permanent marker (*ballpoint pen ink bleeds when wet*).
- 3.8 **Place each glass sample containers into** a separate zip-lock bag and put on ice in a cooler. Place the double zip-lock bag sample container (Rads sample) in cooler without ice.
- 3.9. **Place disposable plastic trowel, aluminum mixing pan and other trash** into a plastic bag for disposal. If a steel trowel is used, place it in a bag for transport back to the field office where it will be decontaminated.
- 3.10 **If the sampling location is less-than 25 square feet**, collect one grab sample from one sample hole from 0-3 inches below ground surface. Follow Steps 3.4 through 3.9.
- 3.11 **Keep samples, clean equipment, and trash separate** to prevent cross-contamination. Transport these items to the field vehicle.



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4.0 QUALITY ASSURANCE/QUALITY CONTROL

To prevent contamination of soil samples from compounds introduced to the site by the sampling teams, personal protection equipment must be worn and used as specified in the Health and Safety Plan (HASP). Health and Safety procedures outlined in the HASP must be followed.

Duplicate samples shall be collected at a ratio of 1 for every 10-sample properties (1:10) for quality control purposes (Blind to Labs).

- 4.1 Collect 12 heaping scoops from each sample hole to be able to fill duplicate sample containers for each analysis (ie: 2 jars for metals, 2 jars for o-chlorine pesticides, etc.).
- 4.2 Follow Steps 3.4 through 3.6 above.
- 4.3 Label the original and duplicate sample containers according to the labeling conventions outlined in the ESP.
- 4.4 Follow steps 3.7 through 3.11 above.

Lab matrix blanks shall be collected at a ratio of 1 for every 20-sample properties (1:20) for quality control purposes (Not blind to Lab).

- 4.5 Collect extra sample volumes from each sample hole to be able to fill 5 extra (lab matrix) sample containers.
- 4.6 Label these samples the same as the original sample and note on the label "lab matrix QC".



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5.0 HEALTH AND SAFETY

Health and Safety procedures as described and defined in the NDEP Health and Safety Plan (HASP) must be observed and implemented prior to dust sample collection. Chemical exposures are not anticipated, and physical or mechanical hazards are only those that would be found in any typical household environment.

6.0 REFERENCES

- 6.1 EPA. 1991. *Compendium of Emergency Response Team (ERT) Soil Sampling and Surface Geophysics Procedures*. Office of Solid Waste and Emergency Response, Washington, DC. EPA/540/P-91/006.
- 6.2 EPA. 1991. *Removal Program Representative Sampling Guidance. Volume 1 - Soil*. Office of Solid Waste and Emergency Response, Washington, DC. 9630.4-10 P892-963408.
- 6.3 WESTON Inc. (Roy F. Weston, Inc.) 1993. *Standard Practices Manual for Soil Sampling With a Spade, Scoop and Stainless Surface Soil Sampler Auger and Tube Sampler*. West Chester, PA.
- 6.4 Health and Safety Plan, *Prepared in Support of: CDC/NCEH Cross-sectional Exposure Assessment Study – Churchill County, Nevada*. September 25, 2001.



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FIELD DATA SHEET

| | |
|--|-----------------|
| House Number: | Date: |
| Arrival Time: | Departure Time: |
| Weather Summary/Estimates: Sunny/PC/Cloudy _____ Est. Wind Speed and Direction _____ Est. Air Temp – Outdoor _____ | |
| Soil Sample Area: Estimate Area Size (square feet): _____ Description of Area (Play area / Walkway) _____ | |
| Sample Description: Composite (3 part) or Grab Sample _____ Approximate distance and direction from fixed point of reference: _____ _____ | |
| Sketch/General Comments: | |