



## 5.6 SEDIMENT SAMPLING

Sediment and soil should be regarded as fundamentally differing media with specific sampling considerations for each. While many dictionaries identify sediment as material deposited under the influence of any fluid and include air as a potential depositing fluid, the HEER office adopts an operational definition of sediment as material that is currently under water (e.g., harbor bottom sediment) or primarily underwater (e.g., tidal flats, ephemeral stream beds). The concentration and distribution of contaminants differ for sediments from those of a soil system through factors such as stream flow, resuspension rate, and seasonal fluctuations. Stratification may affect the exchange of contaminants at the water-sediment interface, necessitating seasonal sampling. Sediment samples are typically collected at sites where migration pathways to sediments and discharge points have been identified.

The following sections summarize sediment sampling equipment and procedures. Additional procedural information on sediment sampling is available from many sources including Superfund Program, Representative Sampling Guidance, Volume 5: Water and Sediment (USEPA, 1995b), USGS National Field Manual for the Collection of Water-Quality Data (USGS, 2005), and Field Sampling Procedures Manual (NJDEP, 2005).

### 5.6.1 Sediment Sampling Equipment

Various types of sampling equipment are available for collecting sediment samples. Consider the type and characteristics of the water body associated with the sediment to be sampled when selecting sampling equipment. Factors such as the width, depth, flow, and bed characteristics of the water body are important.

If the sediment collection point is located beneath a water column of less than 4 inches with little flow, a scoop may be sufficient for collecting a sample. If the sediment collection point is located in an area with greater than a 4-inch water column or in an area with fast water flow, select a sampling device that will minimize washing of the sample as it is retrieved through the water column, such as benthic grab samplers or sediment core samplers. Benthic grab samplers include center pivot grabs, clamshell pivot grabs and drags, sleds, and scoops. Sediment core samplers are capable of collecting sediment samples from greater depths than benthic grab



samplers. In addition, sediment core samplers have the ability to retain the integrity of sediment horizons with minimal disturbance.

Several types of benthic grab samplers and sediment core samplers are described in the following documents, among other sources.

- New Jersey Department of Environmental Protection (NJDEP) Field Sampling Procedures Manual. August 2005.
- United States Geological Survey (USGS), National Field Manual for the Collection of Water-Quality Data, Book 9, Handbooks for Water-Resources Investigations, Chapter A8, Bottom-Material Samples. Version 1.1. June 2005.

### 5.6.2 Collection of Sediment Samples

Collect sediment samples from the biotic zone (i.e., the 0 to 6-inch interval) of the bottom of the water body. Deeper samples may also be necessary to delineate contamination. If a contamination release is not recent, it is possible that later events could have resulted in deposition of a new, possibly uncontaminated sediment layer above the sediment of concern. Thus, dredges that collect only near-surface sediments could result in an incomplete characterization of that location. Depending on the thickness of clean sediment overlying contaminated layers and the depositional situation over time, the underlying contaminant sediment may pose a threat of being uncovered by future erosional events. Conversely, clean sediment of sufficient thickness in an overall constant depositional environment may act as a cap over underlying contamination and indicate that the exposure pathway is incomplete.

A *Multi-increment* sampling approach for sediment samples is recommended. See Sections 4 for details on *Multi-increment* sampling. Decision units for sediment samples need careful consideration to include factors such as specific areas of sediment deposition, and differences in sediment particle sizes as affected by water transport.

When collecting sediment samples, take care to minimize disturbance of the sample and washing of the sample as it travels through the liquid above. If sediment fines are lost during sample collection, the sample will not be representative. Do not decant excess liquid collected with the sediment sample because fines, water-soluble compounds, and volatile organics may be lost. If



**Section 5**  
**Soil and Sediment Sampling Guidance**  
*Sediment Sampling*

both sediment and surface water samples are collected in the same location, collect the surface water sample first. If several sediment samples are collected from a streambed, collect the most downstream sample first with subsequent samples collected while proceeding upstream. Follow appropriate sample handling procedures, which are described in Section 11.