PROTOCOL

Development of Exposure Groups

Introduction

This protocol has been developed in order to support the Savannah River Site environmental remediation program. Before characterizing a unit, a conceptual site model will be developed. In this model, a concept of the potential human and ecological receptors, the type of contaminated media at the unit, and transport routes will be identified. Each is described briefly below.

Receptors
Human health and ecological receptors are the known and hypothetical humans, animals, fish, etc., which may come into contact with contaminated media at the unit.

Media
Media of potential concern are defined as any medium through which human or ecological receptors may be exposed to constituents or through which constituents may be transported to potential receptors. Typical media include the following:

Surface soil
Subsurface soil
Surface water
Groundwater (by aquifer)
Sediments
Air
Biota

Routes
Transport routes of constituents to receptors include the following:

Ingestion (of soil, water, etc.)
Inhalation (of dust particles, vapors)
Dermal exposure

The purpose of the development of exposure groups is to provide an estimate of the concentration of contaminants in order to support an analysis of the extent of contamination at the unit and the risks associated with the presence of the contaminants.

The first step in the process is to determine the concentrations of contaminants in all of the media of potential concern. The data analysis process begins with two sets of samples, as follows:

- unit-background samples
- unit-source samples

Data from the investigation will be further grouped into sets and subsets for each medium. Exposure group, abbreviated as 'EG', is the term used to refer to the appropriate set of data that will be used to calculate the exposure point concentration for a given media of potential concern. Special EGs may be developed for hot spots, if needed.

The second step in the process is to determine if the contaminants have the potential to migrate from their present locations. Appropriate exposure groups are specified to support this analysis.

The third step in the process is to determine risks for each of these *receptor/media/route* combinations. These risks will be estimated in order to determine the total media risk as presented in the Human Health Constituents of Concern Protocol. Appropriate exposure groups are specified to support this analysis.

Details

Background Exposure Groups

There are three exposure groups for background soils.

Soil from 0 to 1 foot, background for the unit.
Soil from 0 to 4 feet, background for the unit.
Soil from 0 to WT (water table), background for the unit.

For groundwater, all of the background samples will be pooled, as appropriate.

For surface water, all of the background samples will be pooled, as appropriate.
For sediments, all of the background samples will be pooled, as appropriate.

Contaminant Migration Exposure Group

The exposure group for contaminant migration includes all of the unit-source soil analytical results for all of the samples taken anywhere between the surface of the unit soils and the uppermost aquifer. All of these data will be pooled into one exposure group. Other EGs may be developed, as needed, such as those, which represent hot spots.

Risk Assessment Exposure Groups

In the risk assessment, consideration will be given to a variety of *receptor/media/route* combinations. It is important to note that EGs are developed for each unit under investigation and are tailored to the needs of the risk assessment for that unit. Additional EGs may be developed, as needed.

Typical EGs are as follows:

Soil from 0 to 1 foot, over the area of the unit.
Soil from 0 to 4 feet, over the area of the unit.
Groundwater in a designated aquifer system (may be in the highly concentrated area of the plume, if appropriate).
Surface Water in a nearby water system.
Sediments in nearby drainage areas.