

# SP1

## SAMPLE RECEIPT

### 1.0 PURPOSE

To provide sample identification and radiological screening.

### 2.0 RESPONSIBILITIES

#### 2.1 Project Leaders/Laboratory Manager

- Evaluate projects to identify those with the potential for having samples containing activity levels that may require special laboratory handling in accordance with the procedure, "Radiochemical Contamination Control", QCP6.
- Provide direction to sample collectors and those performing log-in as to screening and records requirements.

#### 2.2 Field Survey Personnel (sample collectors)

- Determine at collection time, those samples in categories requiring special handling and note on sample container and collection record form.
- Deliver samples to designated log-in/sample holding area.
- Assure chain-of-custody documentation is completed to transfer custody of samples to laboratory. (See QA Manual)

#### 2.3 Laboratory Personnel

- Receive and screen samples collected by organizations other than ESSAP sent directly to the laboratory.

### 3.0 SAMPLE SCREENING

3.1 The following three categories of samples have been established for the purpose of controlling contamination in the laboratory during sample analysis. Within each category, the upper limit for certain isotopes are defined. These definitions are based on the frequency of analyses and the potential to cause contamination problems in the laboratory. Non-routine isotopes will be evaluated on a case by case basis.

- Low Activity (LA) -
  - (1) U-234/238, natural or processed - 150 pCi/g (soil/sediment) or 150 pCi/L (liquid)
  - (2) Th-228/232, natural or process - 150 pCi/g (soil/sediment) or 150 pCi/L (liquid)
  - (3) Th-230, natural or processed - 25 pCi/g (soil/sediment) or 25 pCi/L (liquid)
  - (4) Transuranics - 25 pCi/g (soil/sediment) or 25 pCi/L (liquid)
  - (5) Strontium - 25 pCi/g (soil/sediment) or 25 pCi/L (liquid)
  - (6) Tritium - 1000 pCi/g (soil/sediment) or 1000 pCi/L (liquid)
  - (7) Tc-99 - 200 pCi/g (soil/sediment) or 200 pCi/L (liquid)
  - (8) Gamma Emitters - 100 pCi/g (soil/sediment) or 100 pCi/L (liquid)
  - (9) Samples of small size, e.g., smears, are limited to 1000 pCi total activity, when the activity is dispersible (i.e., in other than a solid matrix) or the analysis entails other than strictly physical operations (weighing or direct counting).
- Moderate Activity (MA) - Samples with activity levels between 1 and 100 times the upper limits for the Low Activity category.
- High Activity (HA) - Samples containing greater than the Moderate Activity category limits.

Certain contaminants (for example, very low energy, pure beta emitters, and pure alpha emitters in soil and water) will not be detectable at the MA and/or HA levels using direct monitoring methods. Site history and other analytical data (if available) may be used as a basis for initially identifying samples as potentially containing contaminant levels requiring special laboratory handling. The conservatively estimated activity level should be assumed. Any such samples would, in addition to the activity category, be further identified as "Suspect".

- 3.2 Prior to collection of samples (or receipt of samples that are submitted directly to the laboratory by other organizations), the cognizant project supervisor will evaluate the potential that samples may contain activity levels in excess of the Low Activity category limits. If it is determined that such a potential does not exist, that evaluation is documented by a note to the project file, a notation in the project logbook, a statement in the project Health and Safety Plan, or other documentation in the permanent record.

If it is determined that there is a potential for receiving samples containing MA and/or HA levels, a plan for screening will be developed by the project supervisor. The plan will identify:

- potential radionuclide contaminants which may exceed LA Levels;
- areas of the survey site from which samples may contain such levels;
- screening techniques (instruments, site history) to be used; and
- instrument response action levels (if appropriate) to be used for designating categories.

This information becomes part of the project file; project personnel will receive instruction in screening plan implementation.

- 3.3 At the time of collection by ESSAP personnel, those samples containing other than LA levels (by virtue of field measurements, site history, or sample characteristics) will be identified. Warning labels, containing the designation MA or HA, will be affixed to the containers and a notation will be added to the sampling record form. Samples for which screening by direct monitoring is not applicable, but which are suspect for other reasons, will also include the wording "Suspect".
- 3.4 When samples are to be received from other collecting organizations, the ESSAP project supervisor will request that the providing organization include information about anticipated activity levels and identify those specific samples suspected of containing MA and HA.
- 3.5 During log-in, samples received from other organizations will be monitored by direct measurement to confirm (where possible) the activity category. Again, the information in 3.1 will provide guidance as to the category levels. Those samples which have not previously been identified as requiring special handling, will be labeled. Categories and screening level data will be noted on the containers and in the Relational Database (RDB).
- 3.6 Guidance for performing sample screening
- Select the instrument which will provide the greatest sensitivity for the potential contaminant. The instrument must have a response and background check performed each day before use to ensure the instrument is in proper operating condition. The response check will also ensure that the instrument battery is in the prescribed operating range.

- Scan the sample to locate the point of maximum direct radiation. Determine the maximum direct contact radiation level and compare with the appropriate action levels for the sample category. Note the screening category on the sample label and in the sampling record form or sample logbook, as appropriate. The scan and measurement should be performed in a manner that provides an optimum condition for identifying activity, but prevents the possibility of contaminating instruments, personnel, and other samples. For example, soil samples may be monitored directly, while avoiding contact between the probe face and the sample. Record pertinent data in the ESSAP Lab Area Survey Record.
- Where direct screening methods are not sufficiently sensitive to identify MA and HA categories, but the sample is suspected for other reasons of containing such levels, enter the notation "Suspect" on the sample label and in the RDB.
- In certain cases, other routine measurements may be sufficient to categorize a sample, without additional screening. Examples are: (1) where field surface activity measurements indicate a total activity level below the upper limit for LA Samples, screening of smears will not be necessary, and (2) When an *in-situ* soil contact gamma measurement indicates that a sampling location does not potentially contain elevated concentrations of gamma emitters, gamma screening of the sample will not be required.