

## GENERAL INFORMATION

Country /State - Region - Province	Person(s) completing the questionnaire	Organisation	Email	Remarks
United States	Bruce Means	Office of Remediation and Technology Innovation		

Please fill in the questionnaire by giving short answers to the questions presented in the three spreadsheets (A, B and C). Please write your answers on the empty rows below the questions.

Please note that the questions are related only to EXCAVATED contaminated soil (except Question 1.), including treated contaminated soil.

We are only expecting one filled questionnaire per country or region/province, so please agree on completing the questionnaire with you colleagues, if more than one person from your country will be attending the meeting.

We have introduced some alternative answers and explanations to help you with your answers and to hopefully shorten the time of completing this questionnaire, so do not hesitate to use them, if they are appropriate.

When the questions are not relevant to your country or you don't have any answers, you can use the following abbreviations: NR - not relevant, NI - no idea.

Please feel also free to provide links to any websites or documents for further information.

## A- General situation

### Management of excavated contaminated soil

#### 1. What are the approx. proportions of *in situ*, on site and off site techniques in site remediation?

We estimate that about 27% of Superfund decisions include an *in situ* component for soil remediation, 61% of decisions include an on-site component for soil remediation, and 41% have an off-site component for soil remediation. Many sites use a combination of technologies for soil remediation. Estimates are based on a sample of 188 decision documents, of which 50 have *in-situ* treatment, 115 have on-site *ex-situ* treatment, disposal, or containment; 77 have off-site treatment or disposal. No hierarchy is applied so sites using *in-situ* in combination with some other soil technology on site or off site are counted twice. These documents addressed actions taken at 148 different sites. It is worth noting that soils from Superfund sites (National Priorities List) are often contaminated with PCBs or metals (or other things that are not easily treated). Other kinds of contaminated site programs (e.g., Underground Storage Tanks) might find more soils that are more easily addressed though treatment or natural attenuation and thus may be more likely to be re-used.

#### 2. What is the typical amount of annually excavated contaminated soil (tons per year)?

Please indicate, if the figure is based on estimate or compilation of statistics.

We are not able to provide this estimate. Our databases do not include the information necessary to generate good estimates of annually excavated quantities considering all site cleanup activity in our program.

#### 3. What are the most common treatment methods for excavated contaminated soil?

The most common treatment methods for excavated soil are solidification/stabilization, physical separation/recycling, thermal treatment (low temperature thermal desorption and incineration), and bioremediation. Estimates are based on the published results of EPA's "Treatment Technologies for Site Cleanup Annual Status Report" (12th edition) [<http://www.cluin.org/asr/>] and the preliminary results from the 13th edition (FY05 - FY08) of the Annual Status Report.

#### 4. How much of all the excavated contaminated soil is typically reused as such and/or as treated?

Alternative answers: < 10%, 10-30%, 30-50%, 50-70%, 70-90%, >90%, etc. Please indicate, if the figure is based on estimate or compilation of statistics.

15 - 30% of soil is reused based on an estimate from one year of data. This estimate is based on analysis of 15 of 18 site documents (Preliminary Close-Out Reports) for Construction Complete sites from FY08 that addressed contaminated soil. These data also indicate that roughly 68% of all excavated soils discussed in the 15 site documents was excavated and managed in offsite landfills. Roughly 29% is treated in some form (on-site or off-site) and disposed (either on-site or off-site).

#### 5. What are the main applications for reuse of excavated contaminated/treated soil?

Alternative answers: road construction, other soil construction, noise barriers, land fill covers, etc.

The main applications for reuse of excavated contaminated/treated soil are backfill on the site to restore grade and drainage, stockpiling for future use at the site, and capping or daily cover. This estimate is based on the analysis of 15 of 18 site documents (Preliminary Close-Out Reports) for Construction Complete sites from FY08 that addressed contaminated soil.

## **B- Policy issues**

### **Management of excavated contaminated soil**

**6. List the existing policy instruments for the management of excavated contaminated soil (concerning**  
Please shortly describe the instruments and/or provide links to websites or documents for further information

#### **6a. Regulations**

Management of excavated contaminated soil is subject to solid waste regulations (hazardous and nonhazardous) in accordance with how the soil became contaminated and the level of contamination that remains in the soil (<http://www.epa.gov/osw/index.htm>). US hazardous waste regulations define the level of certain contaminants or characteristics that will make soil a hazardous waste (characteristic waste) or the process that caused the soil to be considered a hazardous waste (listed waste). In general, soil that is a characteristic or listed hazardous waste must be treated to meet Universal Treatment Standards specified in the Resource Conservation and Recovery Act (RCRA) regulations (<http://www.epa.gov/osw/hazard/index.htm>). Special regulations can be used to manage contaminated soil that is also a hazardous waste, including remediation waste rules and the corrective action management unit (CAMU) rule (<http://www.epa.gov/osw/hazard/correctiveaction/resources/guidance/remwaste/camu/>). Soil that is not a hazardous waste is managed and reused based on regulatory criteria, risk-based criteria that are established using conservative generic exposure assumptions, or risk-based criteria calculated on a site-specific basis and considering the proposed reuse (<http://www.epa.gov/osw/nonhaz/index.htm>). Contaminated soil may be addressed under a number of US Federal and State laws and regulatory programs including the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or Superfund); Resource Conservation and Recovery Act (RCRA); Underground Storage Tank (UST) program; Toxic Substances Control Act (TSCA for PCBs); and various State Superfund and State voluntary clean up programs.

#### **6b. Guidelines**

Generally, each regulatory program (Federal and State) develops guidance and policy for interpreting and implementing the Federal or State laws and regulations for their respective programs. These guidances and policy documents are very important for successfully implementing a site clean up. However, there can be important differences between some Federal and/or state guidances.

#### **6c. BAT/BATNEEC criteria**

Reuse criteria are generally determined using conservative generic assumptions or on a site-specific basis designed to reflect the Federal or state program goals.

#### **6d. Registers/inventories/databases (e.g. concerning information on soil streams, locations of reuse sites and treatment technologies)**

If there are any, please indicate if the information is made available to the public

EPA's Technology Innovation Program maintains a Contaminated Site Clean-up Information website that provides resources on technologies, contaminants, issues, strategies and initiatives, vendors and developers, training and events, and additional resources. Guidance documents, databases, and links to other resources can be found on this website. The URL is <http://www.clu-in.org>.

#### **6e. "Soil banks" or other logistic instruments for managing soil streams**

We were not able to identify official Federal or state "soil banks" for managing soil streams. "Banks" and "exchanges" exist for other waste types, especially those amenable to recycling (such as metals and chemicals).

#### **6f. Economic instruments (e.g. taxation and incentives)**

Economic incentives (e.g., favorable or unfavorable tax treatment) to better manage or re-use waste/soil streams or remediated properties are generally considered on a site-specific basis involving current owner, local and state governmental entities, as well as prospective developers.

#### **6g. Other instruments**

Federal legislation referred to as "Brownfields" provides rules and regulations which give exemptions from liability to qualifying parties that seek to clean up and redevelop contaminated properties. The liability exemptions provide incentives for development of contaminated properties.  
<http://www.epa.gov/swerosps/bf/gdc.htm>

**7. Does the management of excavated contaminated/treated soil differ from the management of natural soil or the other waste streams?**

If yes, please shortly describe how they differ (e.g. different legislation, different reuse criteria, different taxation, restrictions on the use)

The management of excavated contaminated/treated soil is similar across the various Federal and state regulations that cover these activities and is similar to the management of other waste streams. There are some differences in terminology and process for the management of excavated/treated soil (such as CAMU and remediation waste rules) that do not apply to other types of waste streams. However, the rules for managing soils that are potentially contaminated from a hazardous waste site generally differ from those that address the soils generated as a by-product of excavation in non-contaminated areas (e.g., from road or building construction).

**8. Do you foresee any changes in the practices of soil reuse due to the new Waste Directive (2008/98/EC)?**

Answers expected only from the EU countries

Not applicable.

## **C- Technical issues**

### **Management of excavated contaminated soil**

#### **9a. Are there guidelines and associated criteria to determine whether soil is suitable for reuse?**

If yes, please shortly describe the contents of the guidelines (e.g. assessment tiers and the type of methods) and the type of criteria (e.g. soil remediation criteria, other risk-based soil concentration values, leaching criteria, toxicity criteria). Please feel also free to provide links to websites or documents for further information

Yes. The guidelines for reuse of soil are similar to the guidelines that apply to soil left in place. Soil that is reused and soil that is left in place must meet cleanup criteria based on the intended reuse of the site or soils. The applicable cleanup criteria depend on the regulatory program (Federal or State) under which the cleanup is conducted. Federal and State promulgated cleanup levels exist for some contaminants and these promulgated levels may be the cleanup criteria used for a particular site under many circumstances. However, for contaminants without promulgated cleanup levels, soil remediation criteria generally are risk-based, using commonly accepted toxicity values and exposure factors determined by the relevant Federal or State entities. The resulting risk-based cleanup criteria are developed considering the exposure routes of concern for the site and may address direct contact, ingestion (soil, water, fish, other media), leaching to groundwater, discharge of contaminated groundwater to surface water, and intrusion of vapors into structures from contaminated soil or groundwater. Cleanup levels for soils are usually established for residential, industrial, agricultural, or other relevant land use and exposure scenarios, as appropriate. These cleanup levels may differ depending on the regulatory program under which the cleanup occurs. For the Federal Superfund program, a site-specific risk assessment is always conducted. Readily available cleanup criteria are generally used to set preliminary remediation goals for sites requiring response action. However, the site-specific risk assessment is used both to determine the baseline risk associated with the un-remediated site and to establish final remediation goals for the site where action is in fact warranted. In some State programs, a two tiered approach may be used. Generally, under these programs, the responsible parties or cleanup agencies are permitted to use one of two different approaches: Under the first approach, established risk-based criteria can be used both to determine the need for action, and to determine cleanup levels (generally used for simple or smaller contaminated properties). Under the second approach, both the need for action and the final cleanup levels are based on a site-specific risk assessment as described in 9b.

#### **9b. Are those mandatory or is it possible to deviate from them based on site-specific risk assessment?**

If yes, please indicate if a risk assessment methodology to be used is defined

Many state programs use a tiered system for establishing cleanup levels for soil. If readily available, generic criteria are not appropriate for site circumstances, then often another option is to develop site-specific cleanup criteria based on a site-specific risk assessment that considers the particular characteristics or exposures at the site. The risk assessment methodologies generally are defined by the relevant regulatory agencies and generally require collection of adequate site-specific data. The process and results are typically subject to regulatory review and approval. Public involvement may be required during the data collection, risk assessment, and remedy selection process.

#### **10. Are there specific procedures for quality control related to reuse and/or treatment of excavated contaminated soil?**

If yes, please list the elements they concern (e.g. sampling, methods, tests and interpretation of the results)

Yes. Generally, the quality control requirements are established in the remedial design and remedial action plans. The plans specify 1) the sampling and analysis requirements with appropriate QA/QC, 2) field methods and geophysical tests with appropriate standard operating procedures and QA/QC, and 3) how the results are to be reported and interpreted

#### **11. Are there any requirements for structures, monitoring or site conditions related to reuse applications?**

If yes, please shortly describe the requirements

Yes. In general, the requirements for structures, monitoring, and site conditions are directly related to reuse applications. Structures to be reused would normally undergo a structural engineering evaluation to confirm their suitability for the intended use. Structures that are decontaminated and then reused would undergo monitoring during decontamination and after decontamination to confirm established decontamination criteria have been achieved. Structures subject to ongoing contamination issues, such as those subject to potential vapor intrusion or with vapor intrusion mitigation systems, would be monitored periodically to assess the effectiveness of the mitigation system or to assess whether or not vapor intrusion is an issue. Cleanup levels or criteria, monitoring requirements, and site condition requirements would be related to how the site is to be reused.