Designing/Approving Sampling Plans

Presented by

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What will we cover in this session?
When is sampling needed?
When a site review has identified a potential environmental concern then sampling / testing are needed to confirm the presence or absence of contaminants, and/or the extent of concentration.
What is the role of a Phase I Investigation in designing a sampling plan?
The Phase I Site Assessment is an important planning document.

- **Who** - responsible party
- **What** - toxic chemicals
- **When** - past usages of a site
- **Where** - sample location / media
- **Why** - recognized environmental concerns
What is the role of sampling in a Phase II Investigation?
Phase II Site Investigation

1. Develop the Scope of Work

2. Assessment Activities
   - Review Existing Information
   - Develop Hypothesis
   - Test Hypothesis – Sampling Plan

3. Evaluation of Data

4. Presentation of Findings and Conclusions
What questions need to be answered for a sampling plan?
Lots of Questions:

- Why are we testing; to buy, sell or redevelop?
- Who is trained to safely sample?
- What personal protection is needed?
- What media needs sampling; air, vapors, soil, water, petroleum, materials?
- What am I testing for – metals, chemicals, asbestos, mold, stability?
- What is the most likely spot for highest concentrations?
More Questions:

- When or how quickly are results needed?
- What standards should I use?
- What is the proposed reuse; housing, industrial, playground, grazing land?
- What equipment do I need?
- Do I have sample containers?
- Do I need pH, permeability, moisture?
- How much money is available?
Exposure Pathways

A Traditional Environmental Knowledge-based Scenario

- Montane Resources
- Riparian Resources
- Wetlands Resources
- Desert Resources

Pathways:
- Air and Dust Inhalation
- Cultural Activities
- Direct Soil Exposure
- Groundwater
- Surface Water Use
- Sediment Exposure
- Aquatic Foods
- Gathered Foods
- Garden Produce
- Irrigation
- Processing
- Game Meat
- Game

9/6/2012
How much and how many samples should be taken?
- **Qualitative confirmation**
  - a field screening
  - “YES or NO” that a contaminant is present.

- **Quantitative confirmation**
  - laboratory analysis
  - “HOW MUCH” or “HOW BAD”.
When are sampling plans approved and who approves them?
As soon as sampling plans are designed then approval begins

Internal Tribal approval 1st

For all USEPA funded projects, talk with your Project Officer
What are some reasons for developing sampling plans?
Mine Scared Lands / Mining Operations

Reclamation Monitoring
Land Reuse Planning
Water / Wastewater Issues
Emergency Response
Air Quality
Industrial Sites

Minerec Mining Chemical
TBA February 2009
Petroleum Sites
Above Ground Storage Tanks (ASTs)
How is a sampling plan designed?
Sampling Plan Design

- Introduction
- Background
- Project Data Quality Objectives
- Sampling Rationale
- Analyses
- Field Methods And Procedures
- Sample Containers, Preservation And Storage
- Disposal Of Residual Materials
- Sample Documentation And Shipment
- Quality Control
- Field Variances
- Field Health And Safety Procedures
What are “project data quality objectives”? 
Scientifically Sound Sampling

Defensible
Adequate
Accurate
What sampling information is specific to different contamination issues?
Every contamination issue requires specific sampling procedures, techniques, equipment, and containers, as well as specific analytical methods.

Consult with your laboratory
Is there a good way of estimating assessment costs?
<table>
<thead>
<tr>
<th>Site Designation</th>
<th>Acres</th>
<th>Notes: description, history</th>
<th>Clean-Up Issues</th>
<th>Phase I &amp; Phase II Assessment Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>ST UST AZ</td>
<td>1</td>
<td>Contamination not found</td>
<td></td>
<td>$1,800</td>
</tr>
<tr>
<td>ST Carismatico AZ</td>
<td>1</td>
<td>Petroleum, Soil, Water, etc.</td>
<td></td>
<td>$5,528</td>
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<tr>
<td>Auto shop MI</td>
<td>1</td>
<td>Prior to the 1940s, a gasoline station was on the property with pump island in concrete. In 1982 UST s removed but no assessment was completed.</td>
<td></td>
<td>$17,497</td>
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<tr>
<td>Dorset VT</td>
<td>2.5</td>
<td>Gas station Abandoned in the 1970s. 2 gasoline USTs and 2 pumps. USTs were removed in 1993</td>
<td></td>
<td>$18,728</td>
</tr>
<tr>
<td>La Junta CO</td>
<td>0.90</td>
<td>Gas station Abandoned in the 1970s. 2 USTs which were filled in-place with sand</td>
<td></td>
<td>$30,001</td>
</tr>
<tr>
<td>mine ID</td>
<td>218</td>
<td>Lead, Metals, Soil</td>
<td></td>
<td>$37,100</td>
</tr>
<tr>
<td>G Rvr school AZ</td>
<td>4</td>
<td>Petroleum, Soil, Water</td>
<td></td>
<td>$47,988</td>
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<tr>
<td>ST PW Yard AZ</td>
<td>1.5</td>
<td>Petroleum, Soil, Water, etc.</td>
<td></td>
<td>$49,715</td>
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<tr>
<td>Salmon ID</td>
<td>0.27</td>
<td>3 USTs; contaminated soils 5-9 ft below surface</td>
<td></td>
<td>$62,519</td>
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<td>Salem OR</td>
<td>0.35</td>
<td>Gas station with UST</td>
<td></td>
<td>$67,770</td>
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<td>mine CA</td>
<td>5</td>
<td>PCB, VOC, Lead, Soil</td>
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<td>$100,000</td>
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<tr>
<td>Yuma mine AZ</td>
<td>40</td>
<td>Lead, Soil</td>
<td></td>
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<td>Peanut mine</td>
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<td>Petroleum, Soil, Water, etc.</td>
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<td>$200,000</td>
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<tr>
<td>Shoe mine</td>
<td>4</td>
<td>Surface water, Metals</td>
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<td>$225,000</td>
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<tr>
<td>S Rvr feedlot AZ</td>
<td>160</td>
<td>Extensive issues</td>
<td></td>
<td>$249,381</td>
</tr>
</tbody>
</table>
What do I need to do if a Licensed Contractor is to be hired?
- Remember the reason for sampling!
- Find local licensed environmental firms!
- Write a good RFP!
- Review Project Sampling Analysis Plan!
- Provide site access!
- Monitor the entire process!
- Keep good records!
References

➢ Search the Internet!
Questions?