SESSION 2

Addressing Data Gaps That Remain Before the Remedy Can Be Selected

DETERMINING IF DATA ARE ADEQUATE TO SUPPORT DECISIONS

Agenda:
Determining if Data are Sufficient to Support Decision Making

- Objectives
- Purpose of Data
- Type of Data
- Quantity of Data
- Data Quality
- Resources

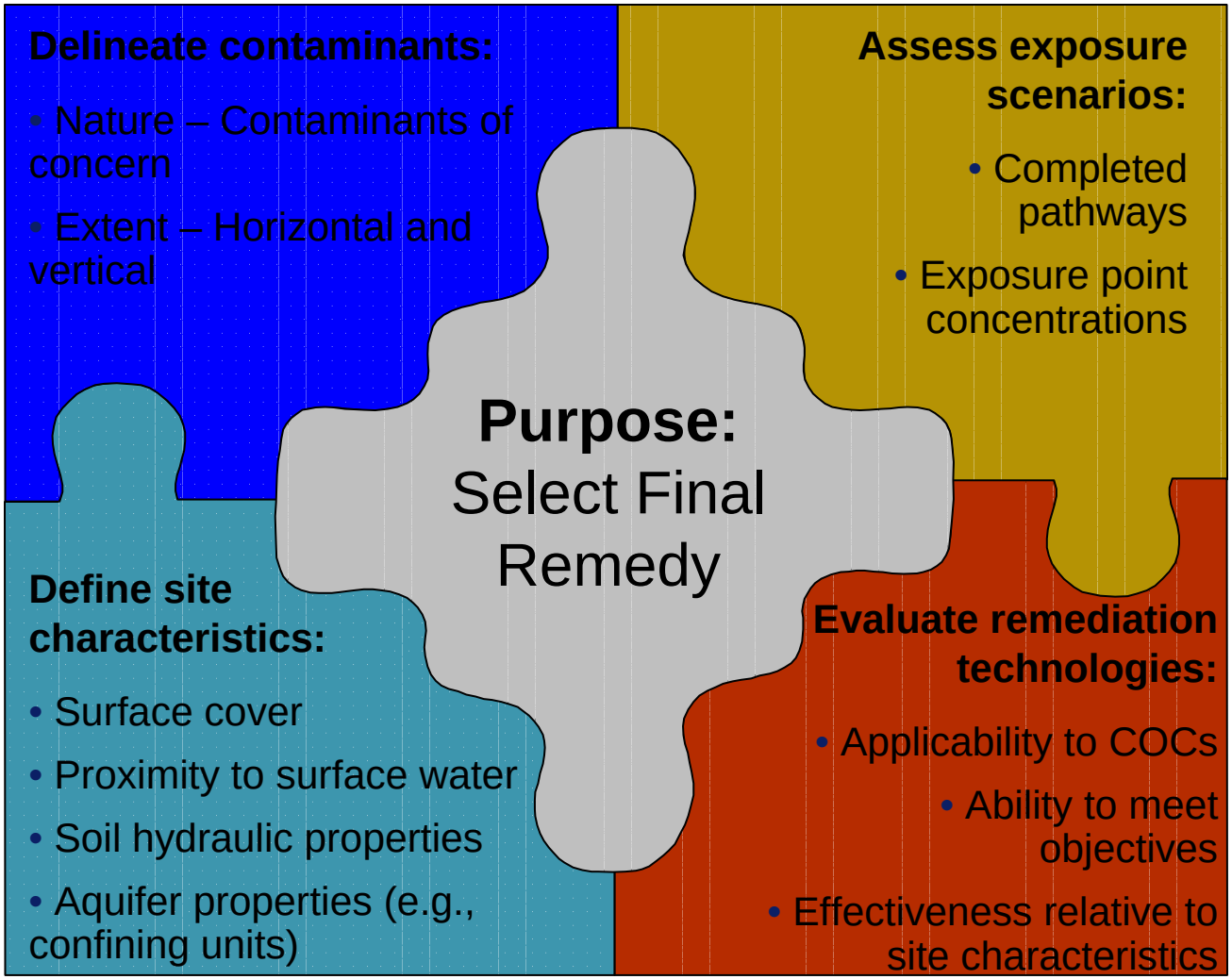
Objectives Must be Re-evaluated Prior to Evaluating the Adequacy of Existing Data and Remaining Data Needs

- What is the problem that needs to be addressed?
- What decision(s) need to be made?
- What data are required to support the decisions?
  - Purpose
  - Type
  - Quantity
  - Quality
- Data Quality Objectives (DQO) Process
  - Systematic planning approach
  - Prompts user to think through critical aspects
  - Ensures appropriate type, quantity, and quality data

The Purpose and Intended End Use of the Data Must Drive the Type, Quantity, and Quality of Data Collected

Data are needed for numerous, different purposes to support remedy selection

Data of varying types, quantity, and quality may be required to support each purpose



It is Critical to Understand the Type of Data that Need to Be Collected to Support Decisions

Increasing Defensibility

Types of Data	Example Uses
▸ Qualitative/Subjective Data – Observation based – Subject to interpretation	– Preliminary decisions – Site physical characteristics – Exposure characteristics
▸ Screening Data – Rapid methodology – Less rigorous QC – Often less accurate/precise	– Field decisions – Time critical delineation – Supporting data – Funding limitations
▸ Definitive Data – Standardized Methodology – Rigorous QC – Identity and quantity confirmed	– Critical data – Final decisions – Enforcement/legal action

Care Must Be Taken to Ensure that Data Are Used for the Purpose and in the Context for Which It Was Intended

- Qualitative methods provide general observational data to assist decision making
- Screening methods provide supporting data for decision-making
  - Examples: field test kits, probes, meters
  - Advantages: fast, timely, economical, efficient
  - Disadvantages: require confirmation by definitive data to support critical decisions
- Definitive methods yield primary data for decision-making
  - Examples: gas chromatography/mass spectrometry
  - Advantages: accurate/precise, highly defensible
  - Disadvantages: cost and time

There Must Be a Sufficient Quantity of Data to Support Decision Making

- Are data adequate to define the type of contamination?
  - Appropriate COPCs
  - Representative mean concentrations
  - Based on site history
- Are data adequate to define the distribution of the contamination?
  - Migration pathways
  - Horizontal and vertical
- Are data adequate to evaluate exposure scenarios?
  - In general
  - Relative to specific receptors
- Are data adequate to assess the applicability of remedial technologies?

Data Quality Must Be Adequate to Support Decision Making

- **Precision –** Reproducibility or mutual agreement of the data
  - Example: Duplicate results for a single location that exhibit significantly different concentrations are imprecise.
- **Accuracy –** Correctness or exactness of the data
  - Example: Data that exhibit a low concentration relative to a known spike are inaccurate.
- **Representativeness –** Degree to which the data represent or illustrate actual conditions
  - Example: Older data may not be representative of current site conditions.
- **Comparability –** Degree to which one data set can be compared to or correlated with another.
  - Example: Data collected using two different methods are less comparable than data collected using the same method.
- **Sensitivity –** Ability of methods to produce acceptable measurements at concentrations of concern.

Resources

- Guidance for the Data Quality Objectives Process (QA/G-4), EPA/600/R96/055, August 2000
- Guidance for the Data Quality Objectives Process for Hazardous Waste Sites (QA/G-4HW), EPA/600/R-00/007, January 2000
- Guidance on Choosing a Sampling Design for Environmental Data Collection (QA/G-5S), EPA/240/R-02/005, December 2002
- Guidance for Data Quality Assessment: Practical Methods for Data Analysis (QA/G-9), EPA/600/R-96/084, July 2000

http://www.epa.gov/quality/qa_docs.html

http://www.hanford.gov/dqo/