AFCEE Performance Monitoring Technologies (PMT) Matrix

Farrukh Ahmad, Ph.D.
Groundwater Services, Inc.
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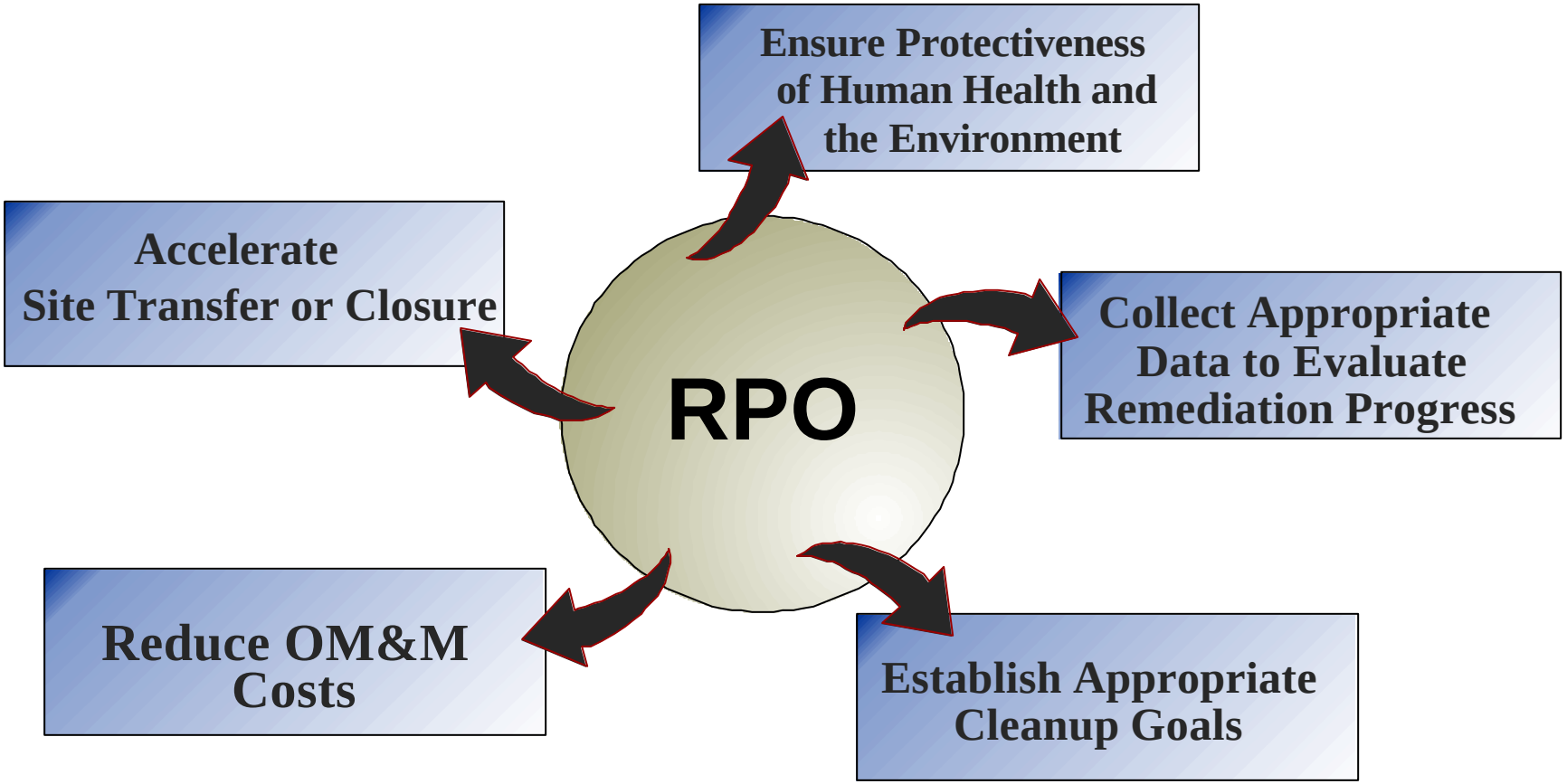
Outline

- Basis
- Evaluating a Remediation Technology
- Available Products
- Performance Monitoring Technologies Matrix
  - Function/Focus
  - Organization
  - Form

Impetus for Remed. Technol. Eval.

- **During current decade DOD will spend >$1billion/year on OM&M of environmental remediation systems (RPO Handbook, 1999)**
- **Remedial Process Optimization (RPO) Program**
  - **Tiered (Phase I and II)**
  - **Phase I monitors progress toward site cleanup goals**
  - **Phase II involves more detailed technology evaluation, including Remedial System Optimization (RSO)**
  - **Works with other regulatory requirements**

Benefits of RPO



(Source: AFCEE RPO Handbook, 1999)

Phase II RPO

- Review Existing Remediation Goals
- Design Review:
  - Validate Conceptual Site Model
  - Define Technology Evaluation Criteria
  - Evaluate Presence of Limiting Conditions
- Collect Additional Performance Data
- Evaluate System Effectiveness

Technology Evaluation Criteria

- **Cost**
- **Performance**
- **Duration of Operation**

Performance Evaluation Goals

- **RPO**
  - **Ability to Attain Cleanup Goals (Effectiveness)**
  - **Optimized Operation (Efficiency)**
  - **Protective of Human Health and the Environment (Remedy Protectiveness)**
- **OPS Demonstration at BRAC Sites (CERFA)**
  - **Operating as Designed (“Properly”)**
  - **Ability to Attain Cleanup Goals (“Successfully”)**

Performance Evaluation Goals

- **RCRA**
  - **Protective of Human Health at Point of Compliance of SWMU (Remedy Protectiveness)**
- **5-Year ROD Review (CERCLA)**
  - **Ability to Attain ARARs (Reduction of Risk to Human Health and the Environment)**

Available Tools for Technology Eval.

- **Technology Information/Profiles**
  - **Federal Remediation Technologies Roundtable (FRTR): Screening Matrix and Reference Guide (www.frtr.gov)**
  - **AFCEE Remediation Matrix - Hierarchy of Preferred Alternatives**
  - **USEPA Technology Innovation Office (www.clu-in.org)**
- **Sampling & Analysis Method Selection**
  - **FRTR: Field Sampling and Analysis Matrix**
  - **USEPA: Field Analytical Technol. Encyclopedia (www.fate.clu-in.org)**
  - **AFCEE: Draft Analytical Protocol for 13 High-Priority Treatment Technologies**

PMT Matrix: Function

- **Information Tool**
- **Identifies required measurements specific to each technology in the FRTR/AFCEE Matrix**
- **Provides concise reference for minimum remedial action system monitoring to support:**
  - **5-Year ROD reviews**
  - **Operating Properly & Successfully (OPS) demonstrations**
  - **Remedial System Optimization (RSO) initiatives**

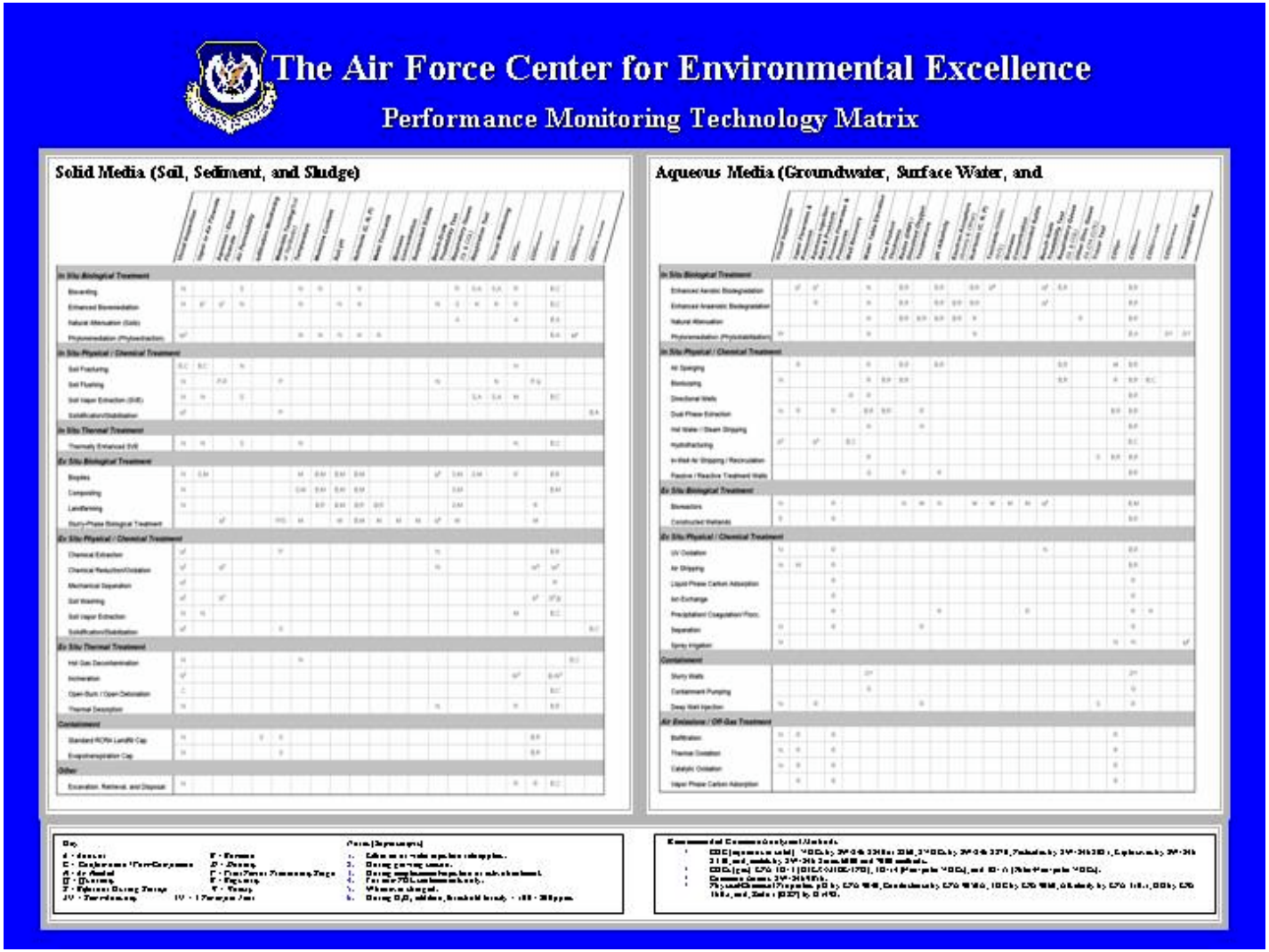
PMT Matrix: Organization

- **Contaminated Solid Media (26)**
  - **Soil**
  - **Sediment**
  - **Sludge**
- **Contaminated Aqueous Media (28)**
  - **Groundwater**
  - **Surface Water**
  - **Leachate**

PMT Matrix: (Org.) Technol. Types

- In Situ Biological
- In Situ Physical/Chemical
- In Situ Thermal (solid media only)
- Ex Situ Biological
- Ex Situ Physical/Chemical
- Ex Situ Thermal (solid media only)
- Containment
- Air Emission / Off-Gas (aqueous media only)

PMT Matrix: Form (2'x3' Poster)



PMT Matrix: Form (Web Profiles)

- **Definition of Effective Performance**
- **List of Measurements of Effective Performance**
- **Details on Required Measurements of Performance**
  - **Parameters and their Locations**
  - **Effectiveness Indicators**
  - **Monitoring Frequency**
- **Recommended Analytical Methods**
- **Summary Table**

QUESTIONS?

Limitations

- Amount of available information
  - Conventional technology
  - Innovative technology
- Time variant behavior and the reduction in performance monitoring over time
- Not a cost estimating tool
  - Site-specific inputs required for determining cost