EPRI | ELECTRIC POWER RESEARCH INSTITUTE

"Together...shaping the future of Electricity"

MGP Site Management Program

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MGP Site Management Staff
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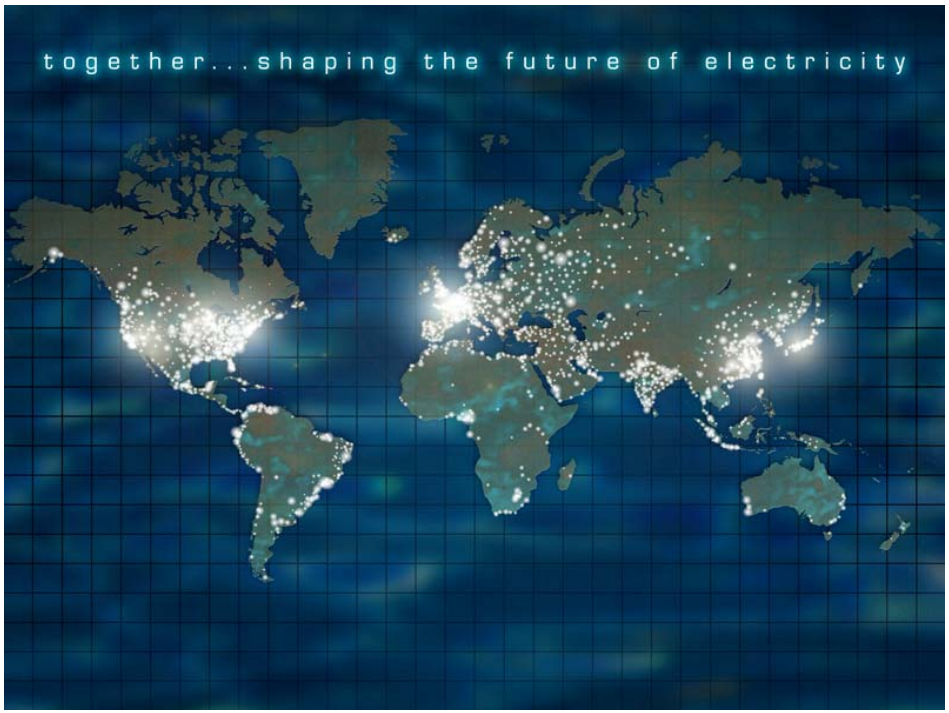
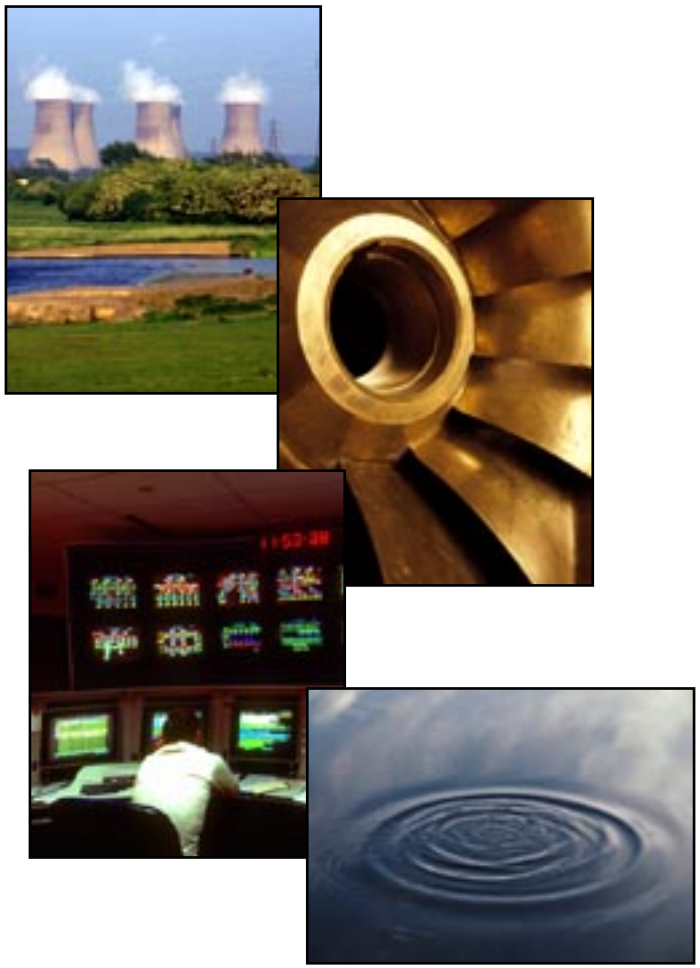
Together…shaping the future of electricity



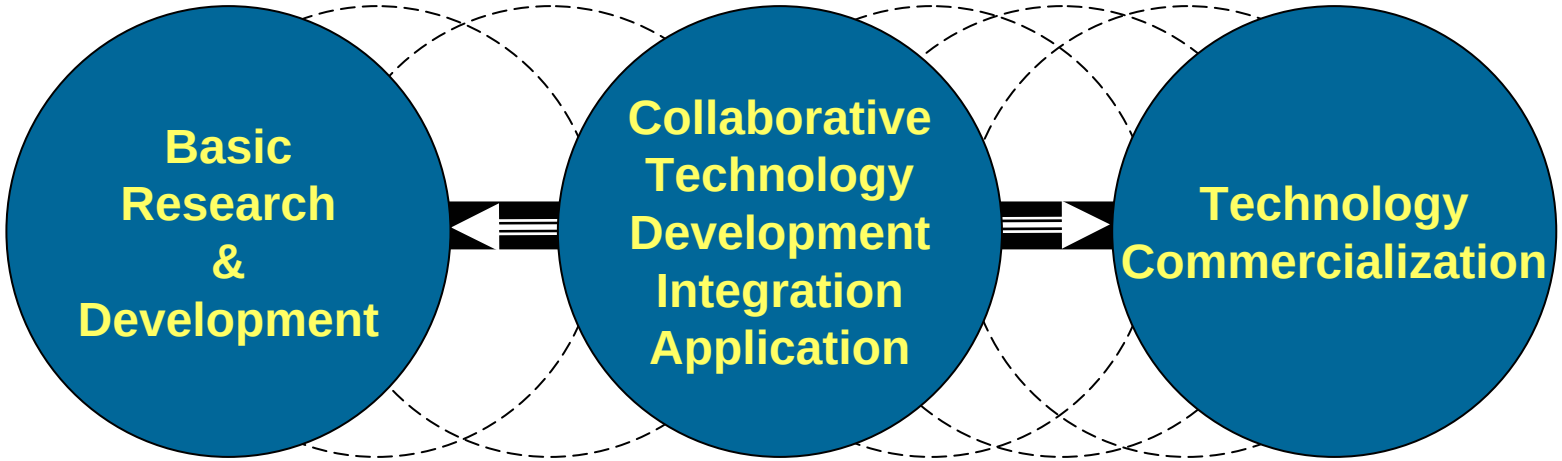
- Founded in 1973
- Objective, non-profit electricity collaborative research organization
- Technology development, integration, demonstration and application
- Broad technology portfolio ranging from near-term solutions to long-term strategic research (Technology Innovation Program)

One of the World's Largest & Most Successful R&D Collaborations



- Over 700 North American members alone
- Over 130 international participants
- Independent electricity research
  - Major issue focus
  - Major opportunity focus

EPRI's Role in the Technology Development to Commercialization Cycle



Research Institutes, Universities

EPRI

Suppliers

Vendors

Depends On The Specific Technology

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Extensive Energy Research Program

Generation

Distributed Resources
Fossil Steam Plants
Combustion Turbines
Market Analysis
Renewables
Hydroelectric

Nuclear Power

Equipment Reliability
Nuclear Operations & Asset Management
High Performance Fuel
Nondestructive Evaluation
High Performance Workforce
Risk/Safety Mgt

Environment & Energy Analysis

Air Quality
Global Climate Change
Land & Groundwater
Water & Ecosystems
Electromagnetic Fields (EMF)
Occupational Health & Safety

Power Delivery & Markets

Transmission
Substations
Grid Reliability
Power Markets
Distribution
Power Quality
Energy Utilization

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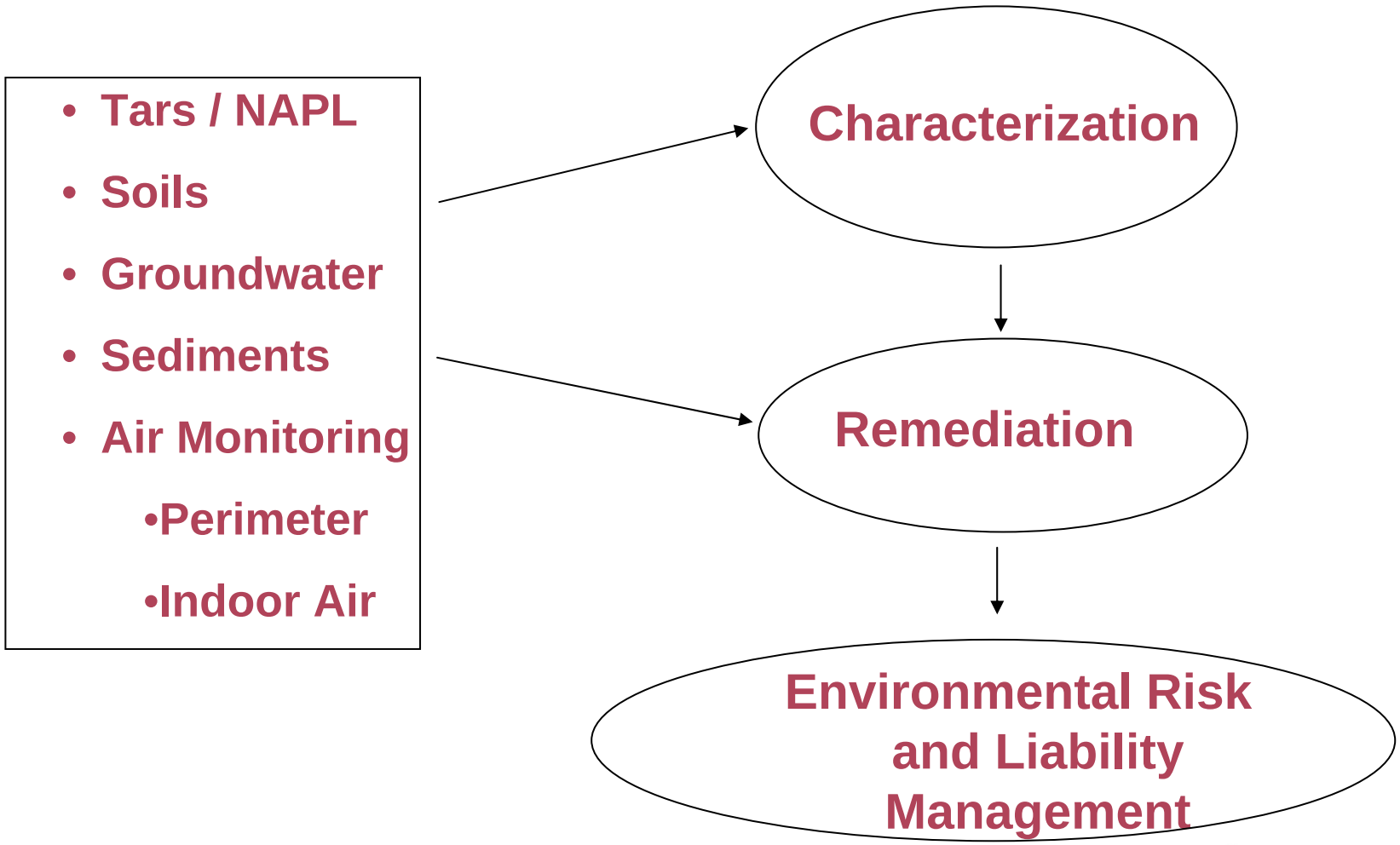
EPRI Fundamentals

- R&D generally performed by subcontractors (over 1600 ongoing projects)
- R&D not intended to develop alternatives for available suitable products
- Generalized research results accessible to public, commercialized (400 patents and 1000+ current products)
- EPRI owns results of research

Collaboratively Funded Manufactured Gas Plant (MGP) Site Management Issues

- Developing in-situ technologies that reduce or eliminate the need for “dig and haul”
- Forensics and Fingerprinting
  - MGP residuals
  - Non-Aqueous Phase Liquids (NAPLs)
- Off-site emissions/odor issues
- Methods and techniques for remediating sediments
- Human and ecological risks

EPRI's MGP Research Portfolio



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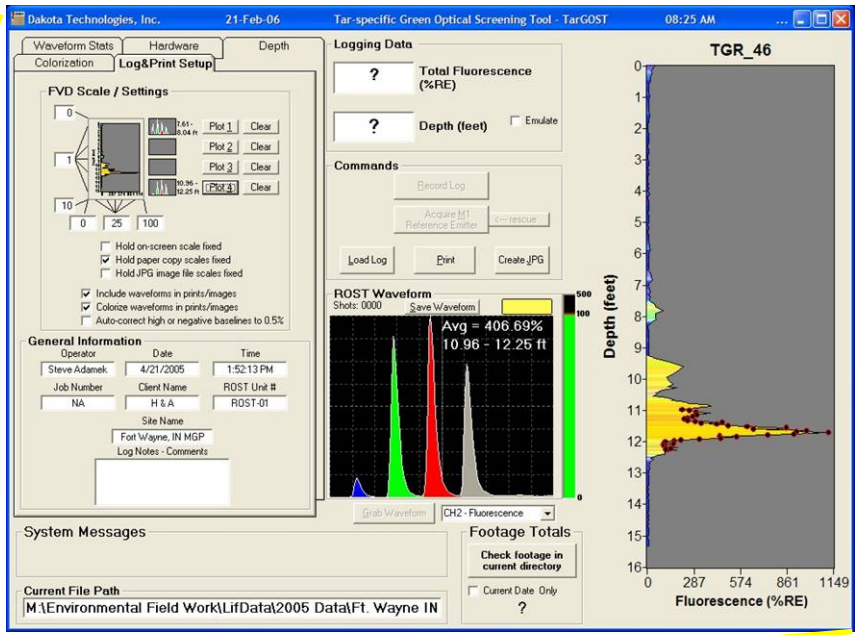
MGP Characterization in Soil

- EPRI is credited for validating some down-hole *Screening Tools* such as Tar Specific Green Optical Screening Tool (TarGOST®)
  - Rapid
  - Inexpensive
  - Reliable



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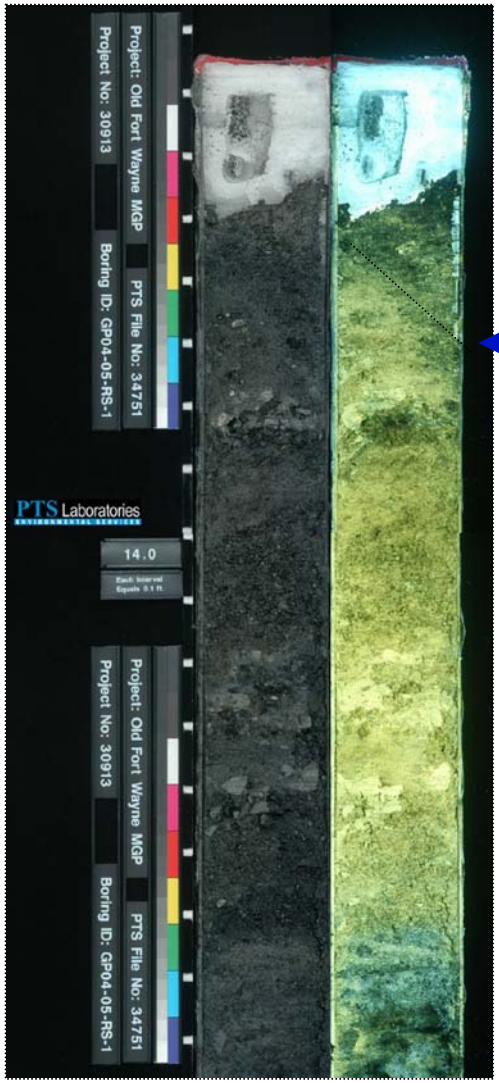
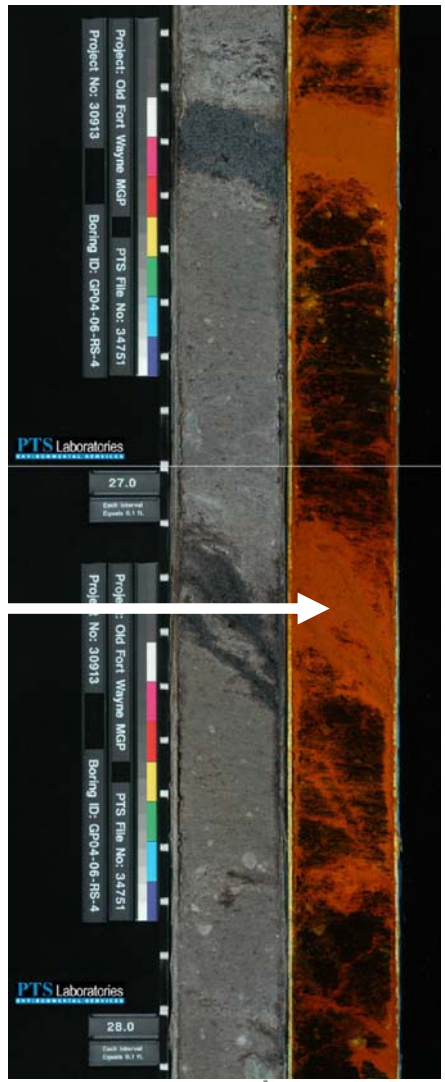
Fluorescent Core Photography verifies TarGOST Results



“Light-end” LNAPL

Heavier DNAPL oil



Note: Fluorescent photography performed by PTS Laboratories, Santa Fe Springs, CA

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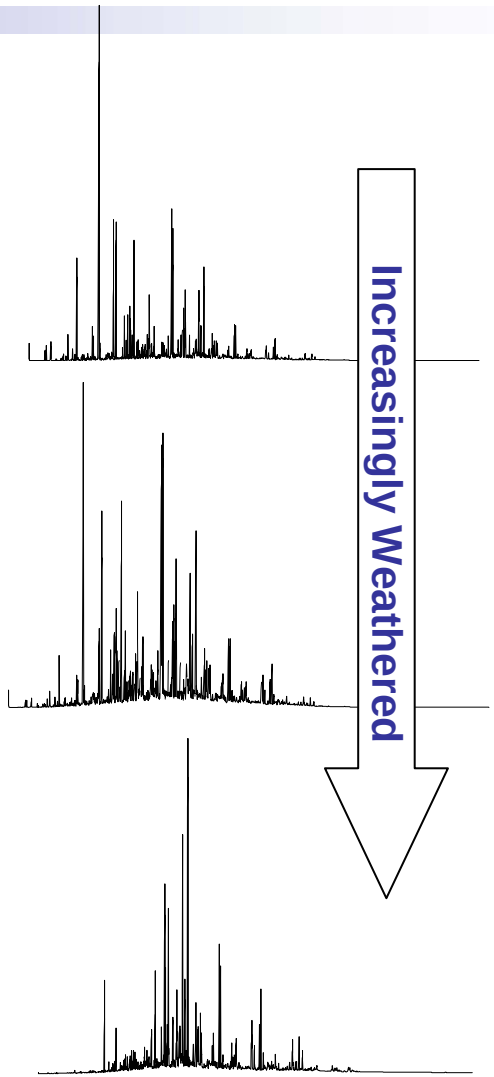
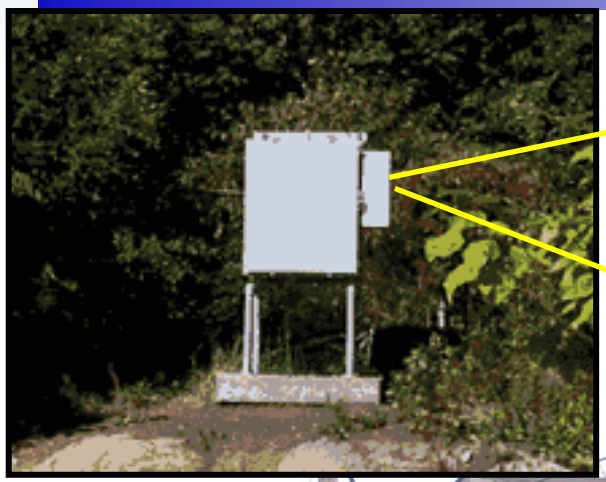
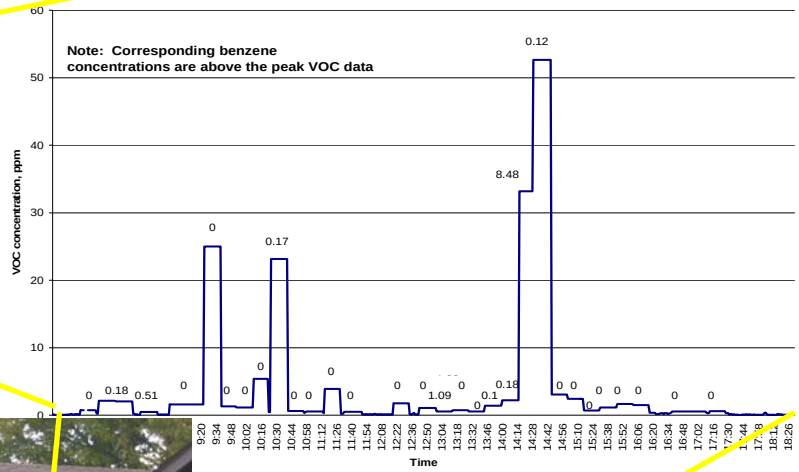
Source Identification

- Using forensic techniques to identify and measure degradation products of hydrocarbon-type contaminants
- Additional line-of-evidence for the effectiveness of natural and engineered remediation projects



Air Monitoring: Fixed and Portable Air Monitors produce Total Hydrocarbon Concentration vs. Benzene readouts





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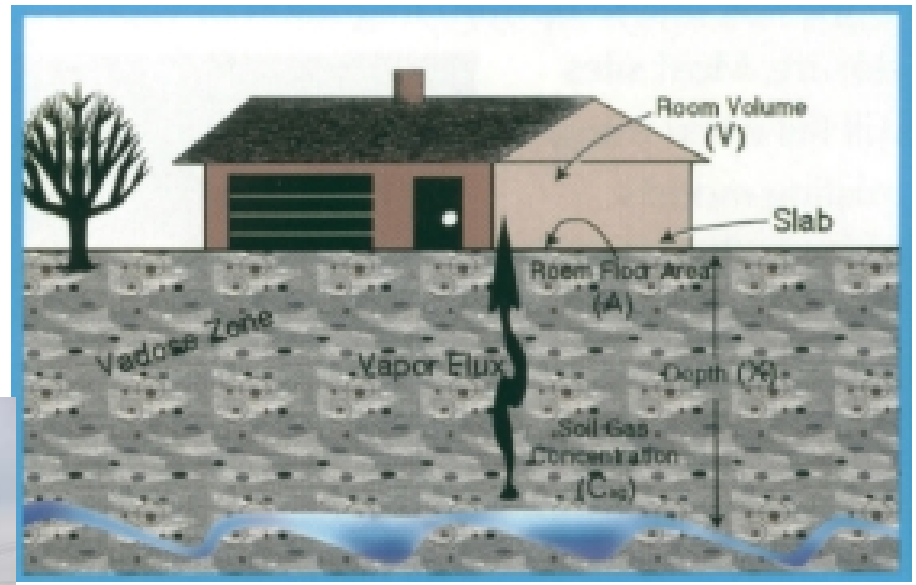
MGP – Air Monitoring

Soil Vapor Intrusion
- Indoor air quality



Finding better ways to monitor for and identify any potential MGP-related airborne contaminants

MGP Remediation

- Typically relies on '*dig and haul*' technologies

Excavating soils at an MGP site

Remediating sediments at an MGP site

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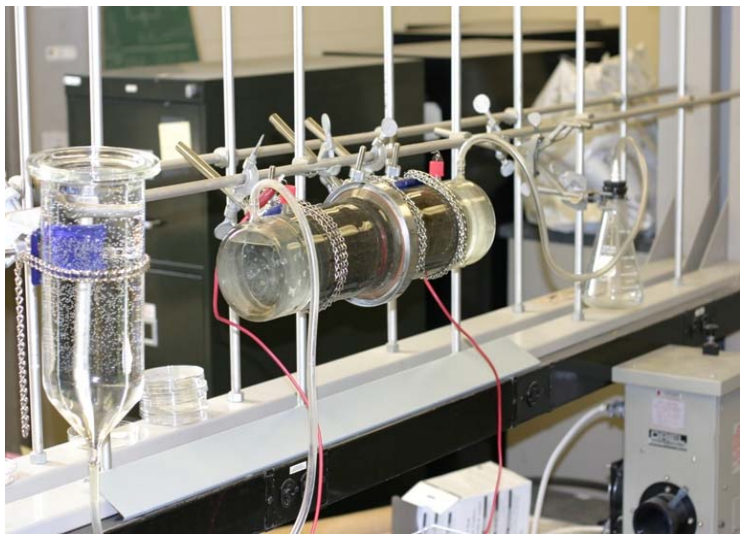
Testing alternative strategies when dig and haul is not an option

- Using In-situ Technologies instead of ‘dig and haul’
  - Advanced Chemical Oxidation



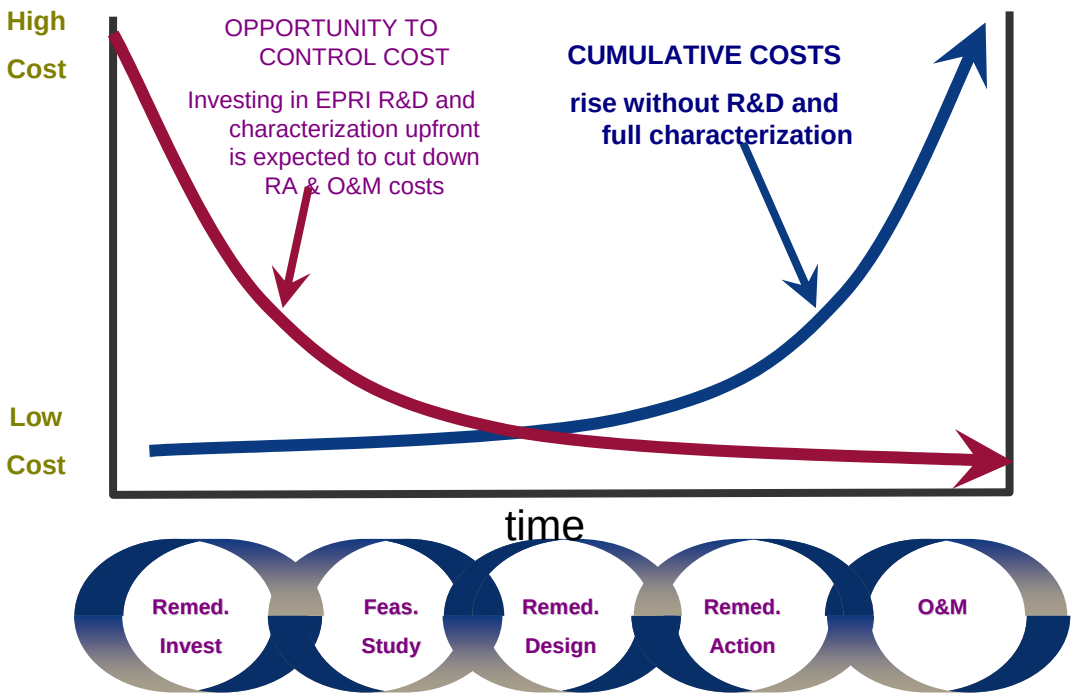
- In-Situ Stabilization/Solidification

  -Barrier walls along rivers

  -Site wide solidification

  -High pressure grouts

EPRI MGP Program focuses on using R&D to assist in Reducing Long-Term Costs to Utility Industry



Long Term Spending Timeline on MGP Sites

An investment in R&D during the RI Phase is anticipated to lower long term O&M costs

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