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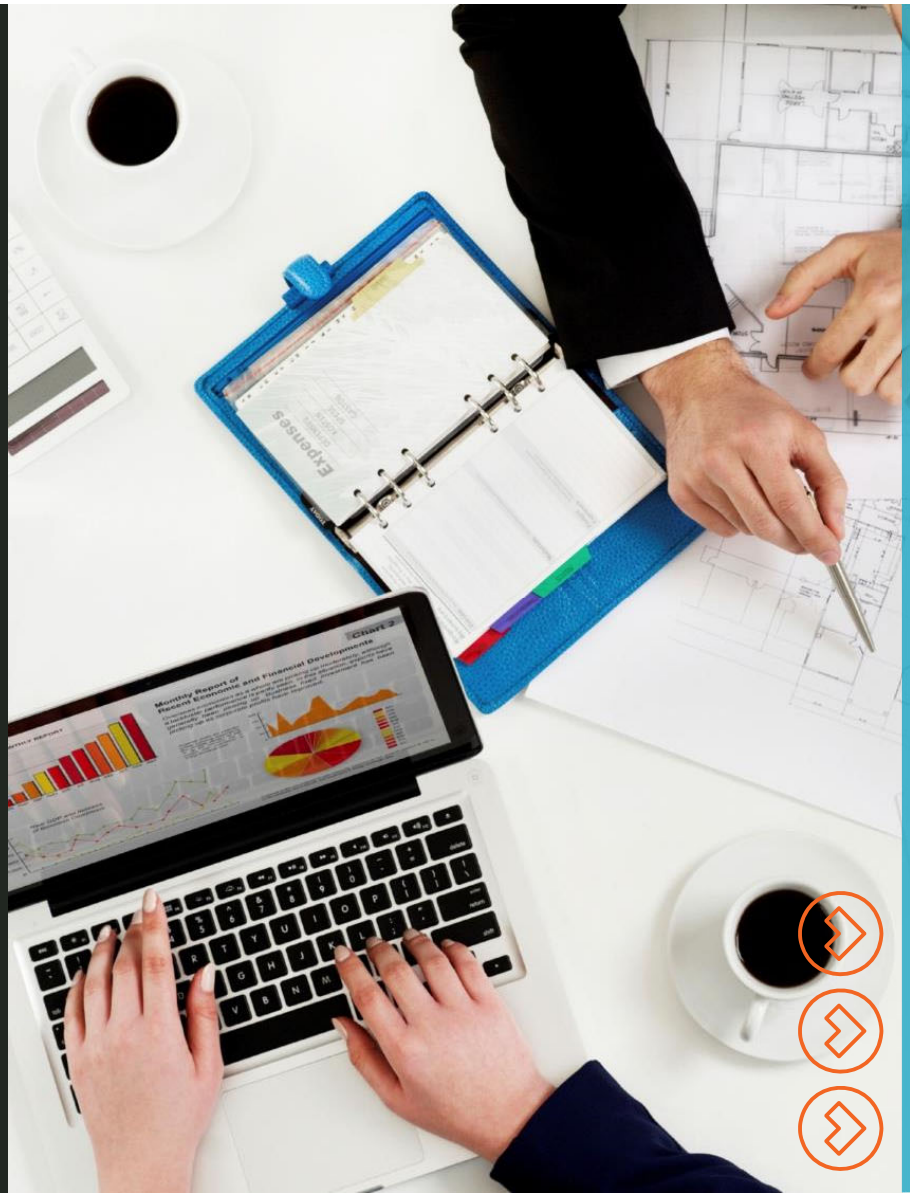
PRESENTS:

Navigating Record of Decision vs Early Action Cleanup Approaches and Adaptive Management



AGENDA

Background

Options

Advantages and Disadvantages

Adaptive Management

Comparisons

Case Studies

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BACKGROUND

Twenty former manufactured gas plant (MGP) sites in Superfund Alternatives Site (SAS) Program

Implemented sediment remedies under three approaches:

- Remedial Investigation / Feasibility Study (RI/FS) Record of Decision (ROD)
- Time Critical Removal Action (TCRA)
- Non-Time Critical Removal Action (NTCRA)

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RI/FS ROD Remedy Approach

Requires RI/FS documents to be approved prior to ROD

Risk assessments or generic screening levels are used to establish preliminary remedial action goals

FS evaluates a range of remedial alternatives, including monitoring and institutional controls, against nine criteria and USEPA selects preferred remedy

USEPA prepares and seeks public comments on the Proposed Remedial Action Plan (PRAP)

Following ROD, negotiate agreements for Remedial Design and Remedial Action

Remedial Design Scope of Work includes Remedial Design Work Plan, 30-60-90-100% designs

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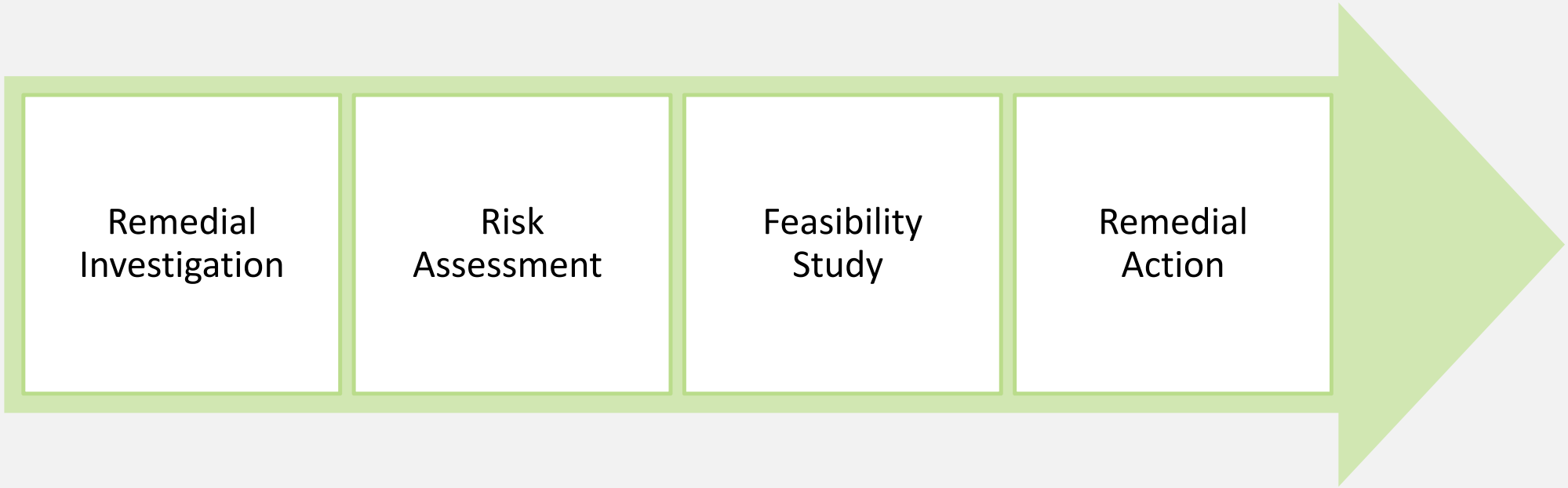
RI/FS ROD REMEDY APPROACH

A Linear Process



The downside of linear thinking …

RI and risk assessments can take years to complete

Uncertainty of risk assessments result in defaulting to background concentrations or negotiated targets

By the time you get to a Remedial Decision – is the data still representative?

Back to the RI

RI/FS ROD Remedy Approach

ADVANTAGES

- Site-wide risk reduction allows “horse trading”
- Ability to include long-term monitoring and institutional controls to address low level contamination risk
- Most likely to be “one and done” remediation event

DISADVANTAGES

- Linear process – potential for outdated data by remedial decision
- Duration to ROD and Remedial Action slow to reduce environmental liability
- Changes in ROD remedy require additional administrative steps (i.e., Explanation of Significant Difference)

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Revitalizing the Superfund Program

USEPA TASK FORCE – July 2017

- Early Actions
- Adaptive Management

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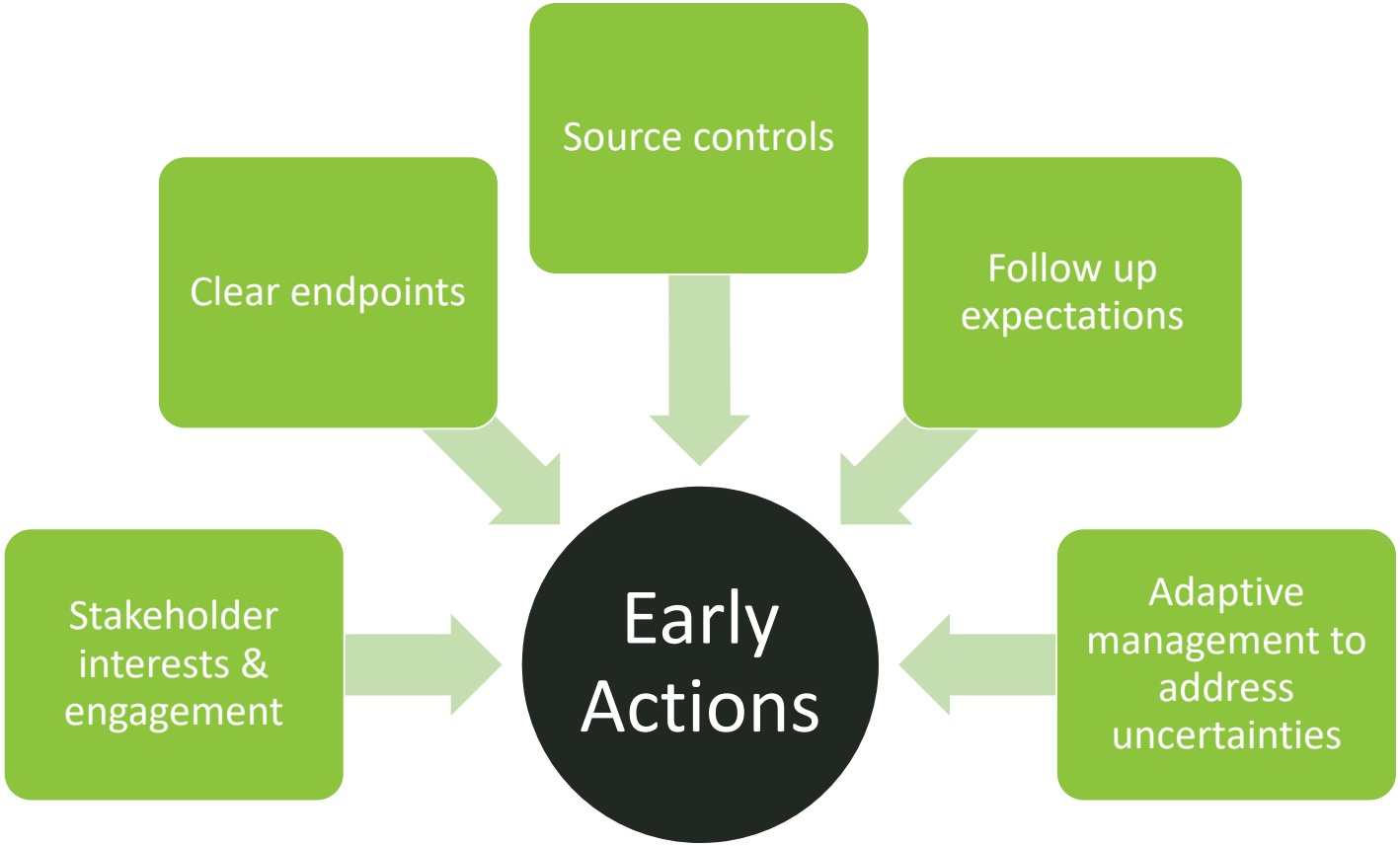
What are the keys to an agreeable Early Action?



TCRA Remedy Approach

Requires imminent and substantial threat, release or threatened release into the environment of a hazardous substance, or pollutant or contaminant

Risk assessments, generic screening levels or focused on source material - flexible

Negotiate an agreement for TCRA

Selected removal action is a presumptive remedy – generally dredging – submit complete design and implement without intermediate design submittals

USEPA prepares Enforcement Action Memorandum – no public comment process

Following TCRA, the site continues with RI/FS Process

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NTCRA Remedy Approach

Requires imminent and substantial threat, release or threatened release into the environment of a hazardous substance, or pollutant or contaminant

Risk assessments, generic screening levels or focused on source material - flexible

Engineering Evaluation and Cost Analysis (EE/CA) Report evaluates a range of remedial alternatives, against three criteria and USEPA selects preferred remedy

USEPA prepares Preferred Remedy for public comment

Agreements and Enforcement Action Memorandums for EE/CA, for Removal Action or Combined

Submit complete design and implement without intermediate design submittals

Following NTCRA, the site continues with RI/FS Process

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TCRA and NTCRA Remedy Approach

ADVANTAGES

- Less iterative design steps – allows for shorter design phase and expedites construction mobilization
- Relatively quick incremental risk and environmental liability reduction
- Incorporates adaptive management into future RI/FS ROD
- Ability to focus on source material, monitor effectiveness, and higher potential for MNR or institutional control in low concentration areas in future ROD

DISADVANTAGES

- Go back through RI/FS process – although likely significantly streamlined
- Potential to remobilize as part of ROD

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Adaptive Management

Relative comparison at a glance

IMPLEMENTATION

CRITERIA	RI/FS ROD	TCRA	NTCRA
Time to Initiate Remediation	Longer	Shorter	Moderate
Data Needs	Greater	Lower	Moderate
Stakeholder Involvement	Greater	Lower	Moderate
Reliance on Risk Assessment	Greater	Moderate	Moderate
Target Cleanup Levels / Objectives	Conservative	Varies	Varies
Administrative Costs to Implement	Greater	Lower	Moderate

Relative comparison at a glance

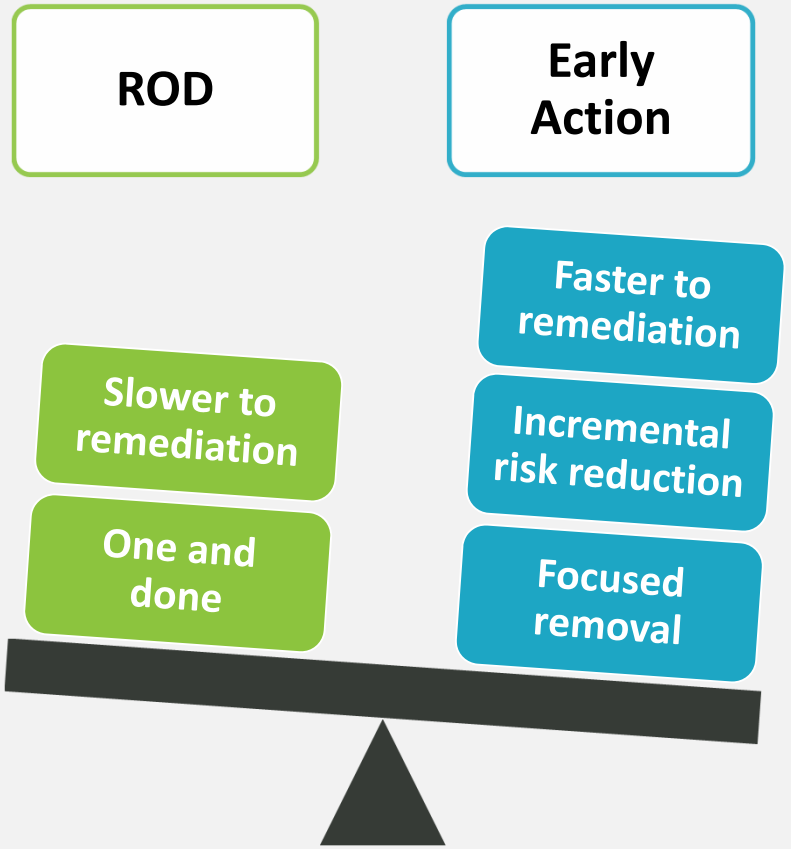
POST-IMPLEMENTATION

CRITERIA	RI/FS ROD	TCRA	NTCRA
Certainty of Final Remedy	Greater	Lower	Moderate
Post Remedy Monitoring Requirements	Varies	Not applicable	Not applicable

WEIGHING THE OPTIONS IN APPROACHES

What is more important for your management?

Both approaches will work depending on your objectives.



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ROD Approach Case Study

AOC for RI/FS: **May 2006**
RI Report (Revision 3): **April 2012**
FS Report (Revision 2): **April 2012**
ROD: **September 2012**

AOC for Remedial Design: **May 2013**
Consent Decree: **October 2014**
Remedial Action: **October-December 2015**

Remedial Action Level: **generic screening level**
Status: **Five-Year Review**

Years to ROD: **6**
Years from ROD to Remedial Action: **3**

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TCRA Approach Case Study

AOC for RI/FS: **Jan 2007**
River OU RI Report (Revision 1): **July 2009**
River OU FS Report (Revision 2): **May 2011**
River OU ROD: **September 2012**

AOC for River OU TCRA: **June 2011**
River OU Removal Action: **June - December 2011**

Remedial Action Level: **NAPL / site-specific risk value from dose-response risk assessment**
Status: **Sediment monitoring to support No-Further Action / Five-Year Review**

Years to ROD: **5**
Years from AOC for River OU TCRA to Removal Action: **0**

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NTCRA Approach Case Study

AOC for RI/FS: **May 2006**
RI Report (Revision 2): **February 2015**
FS Report (Revision 3): **June 2017**
ROD: **September 2017**

Enforcement Action Memorandum: **April 2012**
AOC for EE/CA: **July 2012**
EE/CA Report: **July 2012**
Enforcement Action Memorandum/AOC for NTCRA: **October 2012**

Removal Action: **October 2012 - March 2013**

Remedial Action Level: **NAPL/generic screening level**
Status: **Site-wide ROD includes institutional controls, semi-annual sand cover monitoring, and bathymetry to support Five-Year Review**

Years to ROD: **11**
Years from AOC for EE/CA to removal action: **0.75**

WHICH WAY WILL YOU GO?

Questions?

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