



Health



Environment



Technology



Sustainability

Adaptive Management: A Practical Approach to Remediation of the Lower Passaic River

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February 12, 2019

What Is Adaptive Management?

“...a formal and **systematic** site or project management **approach** centered on rigorous site planning and a **firm understanding of site conditions and uncertainties**. This technique, rooted in the sound use of science and technology, encourages **continuous re-evaluation** and management prioritization of site activities to **account for new information** and changing site conditions. A structured and continuous planning, implementation and **assessment** process allows EPA, states, other federal agencies or responsible parties to target management and resource decisions with the goal of **incrementally reducing site uncertainties** while supporting **continued site progress**.”

EPA Superfund Task Force, 7/13/18



Recent Focus on Management of Large Sites



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460


JUL 03 2018

OFFICE OF
SOLID WASTE AND
EMERGENCY RESPONSE
NOW THE
OFFICE OF LAND AND
EMERGENCY MANAGEMENT

OLEM 9200.3-120

MEMORANDUM

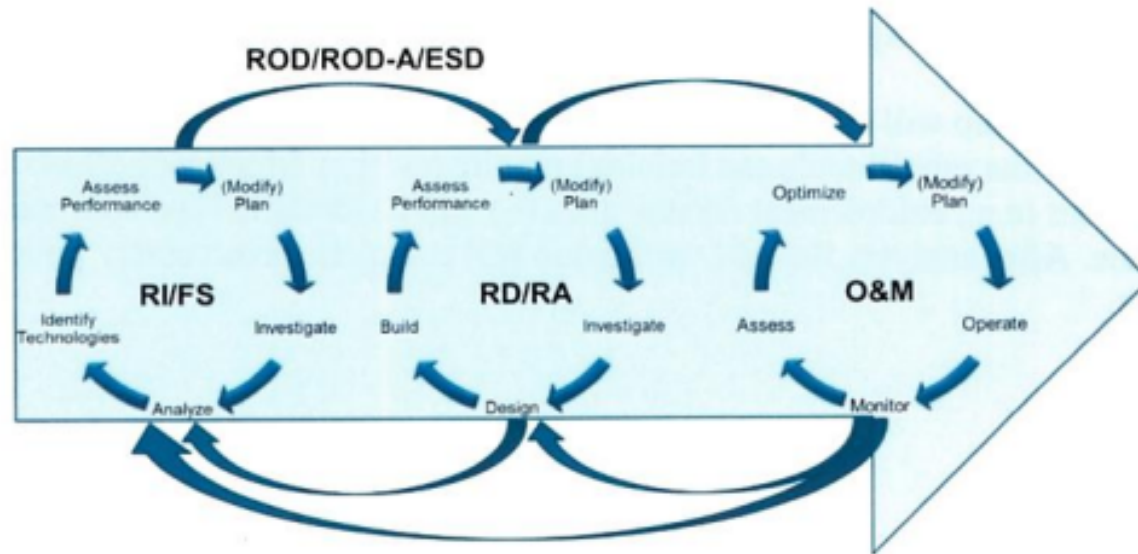
SUBJECT: Superfund Task Force Recommendation #3: Broaden the Use of Adaptive Management

FROM: James E. Woolford, Director 
Office of Superfund Remediation and Technology Innovation

TO: Superfund National Program Managers, Regions 1-10

2018 EPA Adaptive Management Framework

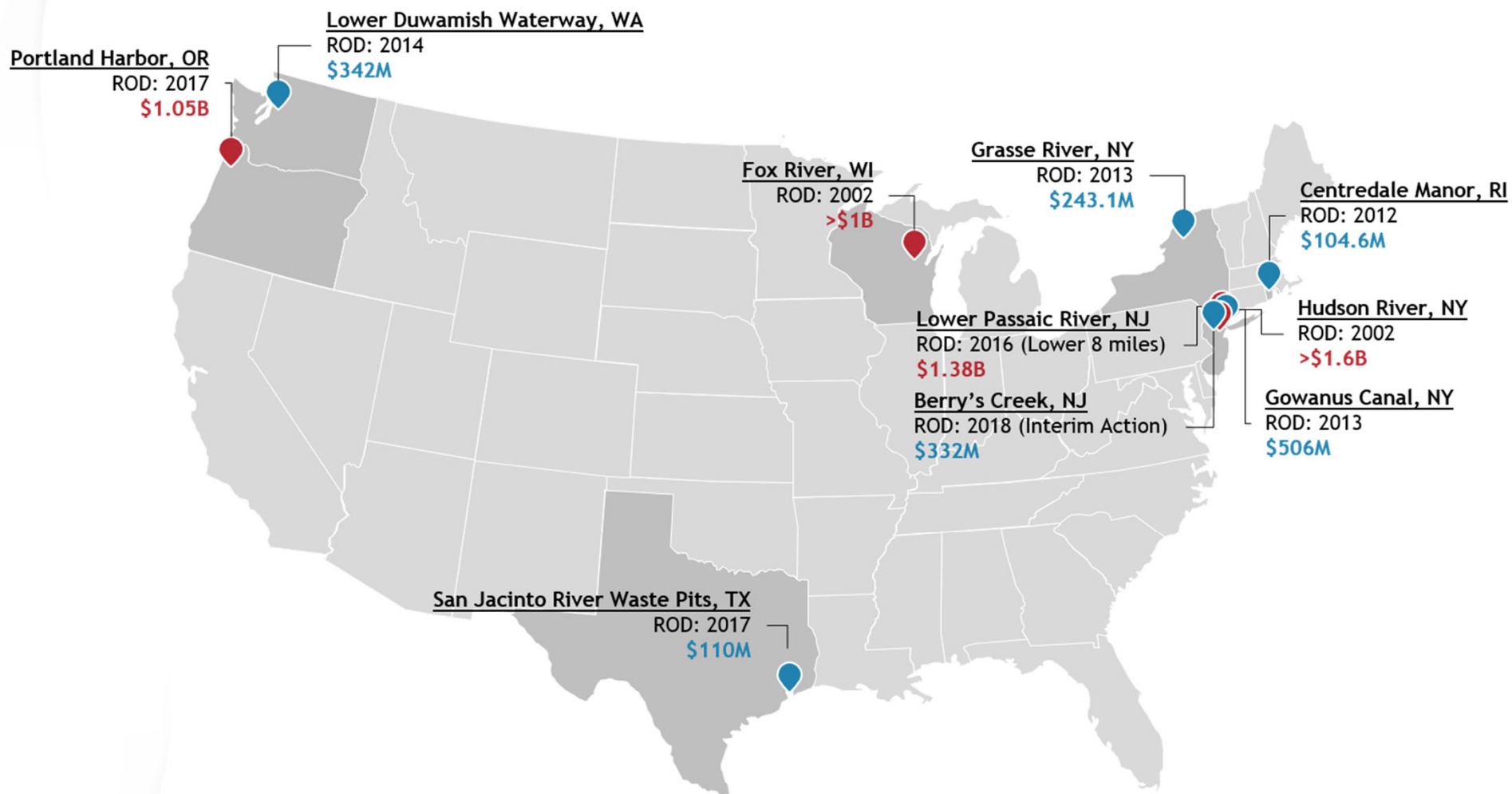
Figure 1 Adaptive Management's Application in the Superfund Remedial Process



ROD: Record of Decision
ROD-A: Record of Decision Amendment
ESD: Explanation of Significant Differences

RD/RA: Remedial Design/Remedial Action
RI/FS: Remedial Investigation/Feasibility Study
O&M: Operation and Maintenance

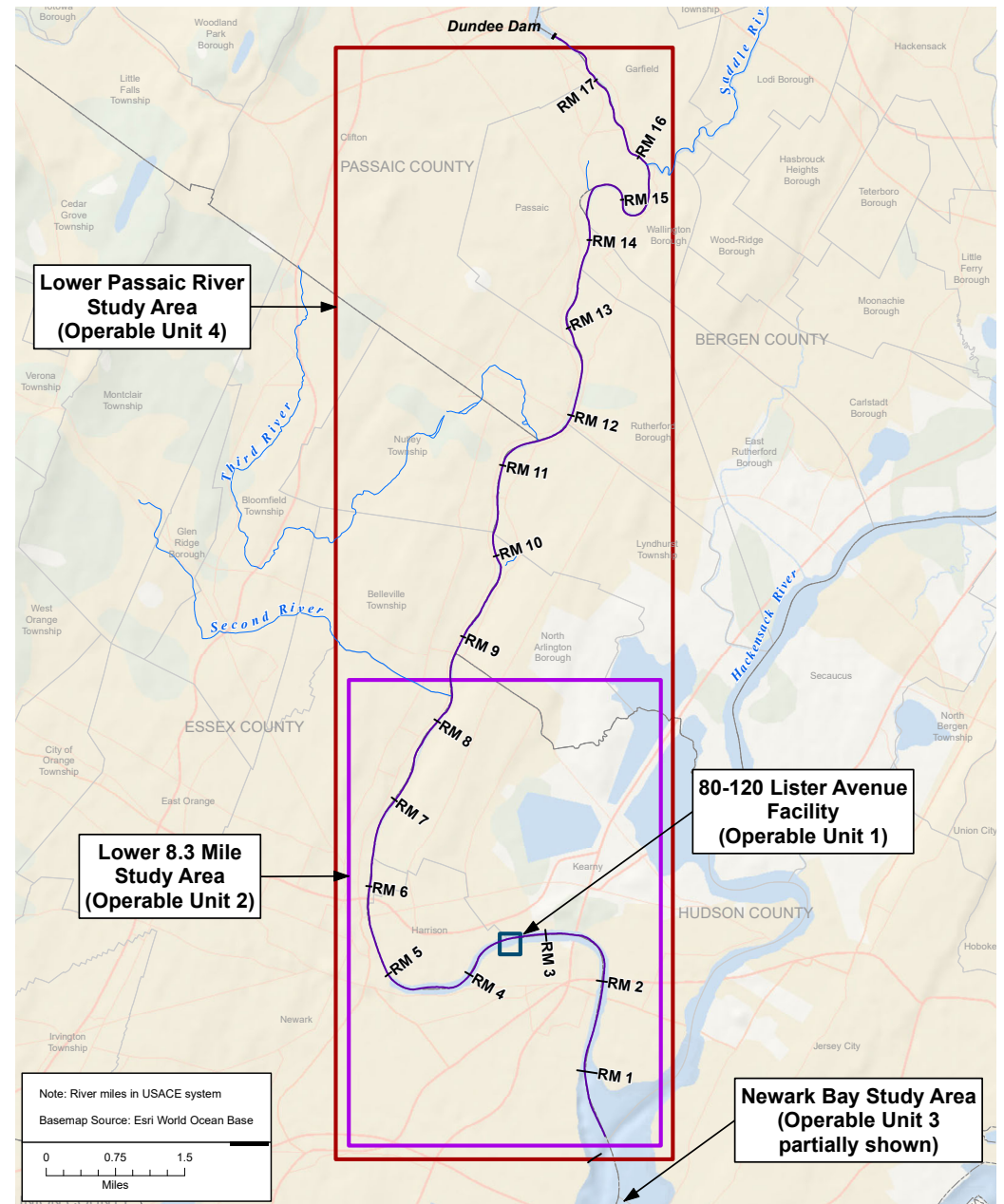
Adaptive Management can be applied
at any time in the CERCLA process



Lower Passaic River Study Area



Lower Passaic River Operable Units



RECORD OF DECISION

Lower 8.3 Miles of the Lower Passaic River
Part of the Diamond Alkali Superfund Site
Essex and Hudson Counties, New Jersey



U.S. Environmental Protection Agency
Region II
New York, New York
March 3, 2016

EPA United States Environmental Protection Agency

Cleaning Up the Lower Passaic River

EPA's Plan to Clean Up the Lower Eight Miles | March 2016

The Plan to Clean the Passaic River

A century of industrialization throughout the Passaic River watershed has left behind toxic muck on the bottom and banks of the river. Many chemical products, including the herbicide Agent Orange, were manufactured in facilities located adjacent to the Passaic River. Approximately 90 percent of the volume of contaminated sediments is located in the river's lower eight miles. Concentrations of contaminants have declined minimally in the last 20 years. No one should eat fish or crab caught from the Lower Passaic River.

On April 11, 2014, the EPA proposed a cleanup plan for the lower eight miles of the river. The proposed plan was released for public review and a four-month comment period. EPA received and reviewed more than a thousand comments from a diverse cross section of the public. After carefully considering these comments, EPA has finalized its decision on a cleanup plan. EPA's final plan will protect communities along the Passaic River by reducing the contaminants in fish and crab that pose unacceptable risks to human health and the environment.

What is included in the cleanup plan?

- The entire lower eight miles of the river will be capped bank-to-bank. With the cap in place, the contamination in the sediment will be prevented from entering the food chain, thereby decreasing health risks to people who eat fish and crab from the lower eight miles of the river. The cap will isolate the contaminated sediment, effectively eliminating the movement of a major source of contamination to the rest of the river and Newark Bay.
- Before the cap is placed, 3.5 million cubic yards of contaminated sediment will be removed, bank-to-bank, by dredging the river bottom from Newark Bay to the Belleville/Newark border.
- This will result in the permanent removal from the river of approximately 13 pounds of highly toxic (2,3,7,8- TCDD), 24,000 pounds of mercury, 6,000 pounds of PCBs, and 1,300 pounds of DDT (a pesticide).
- Sediment will be dewatered locally and transported off-site for disposal.
- The estimated cost of the remedy is \$1.38 billion.

3.5 Million Cubic Yards is enough to fill the Red Bull Arena three times.

One cubic yard is roughly the size of a standard dishwasher.

DANGER!

DO NOT CATCH! DO NOT EAT!

BLUE-CLAW CRABS IN NEWARK BAY COMPLEX MAY CAUSE **CANCER** AND MAY HARM BAY DEVELOPMENT OF CHILDREN AND YOUNG CHILDREN

PELIGRO!

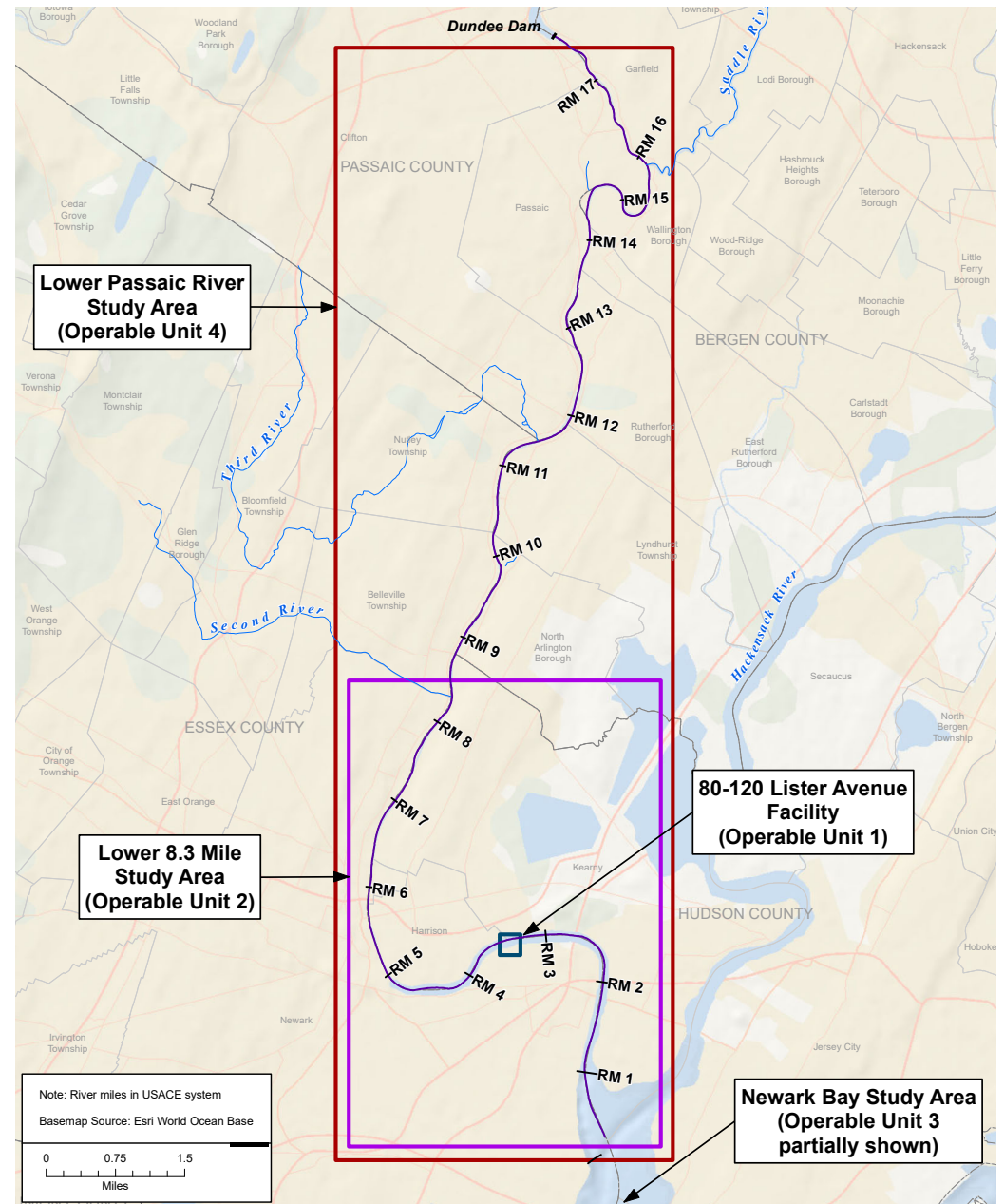
NO LOS PESQUE! NO LOS COMA!

LOS CAMAROS DE TAPAS AZULES COMERIAL EN ESTOS Y OTROS PEQUEÑOS Y PUESTOS ATROFIAN EL DESARROLLO GENERAL DE NIÑOS Y MUJERES PEQUEÑAS

THE COMPLETE RECORD OF DECISION INCLUDING ALL OF EPA'S RESPONSES TO COMMENTS IS AVAILABLE AT WWW.OURPASSAIC.ORG

[www.ourpassaic.org](http://WWW.OURPASSAIC.ORG)

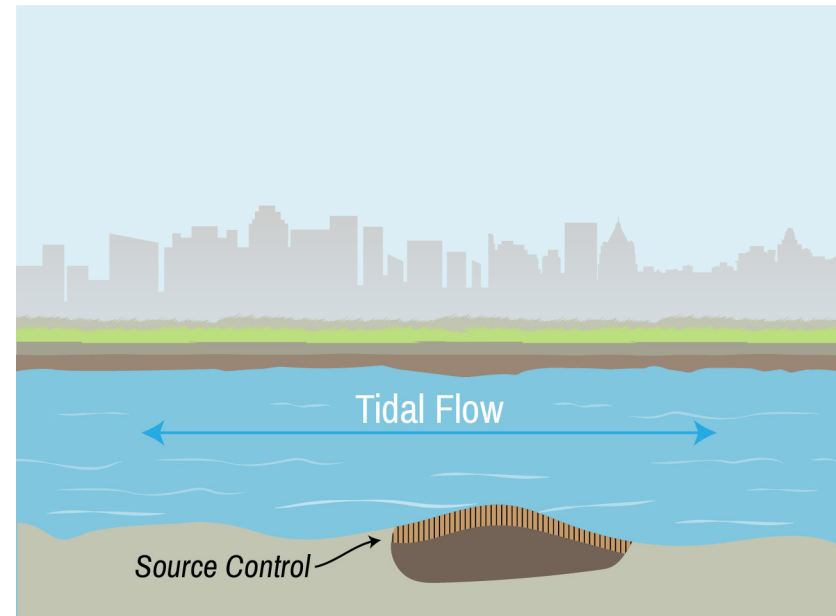
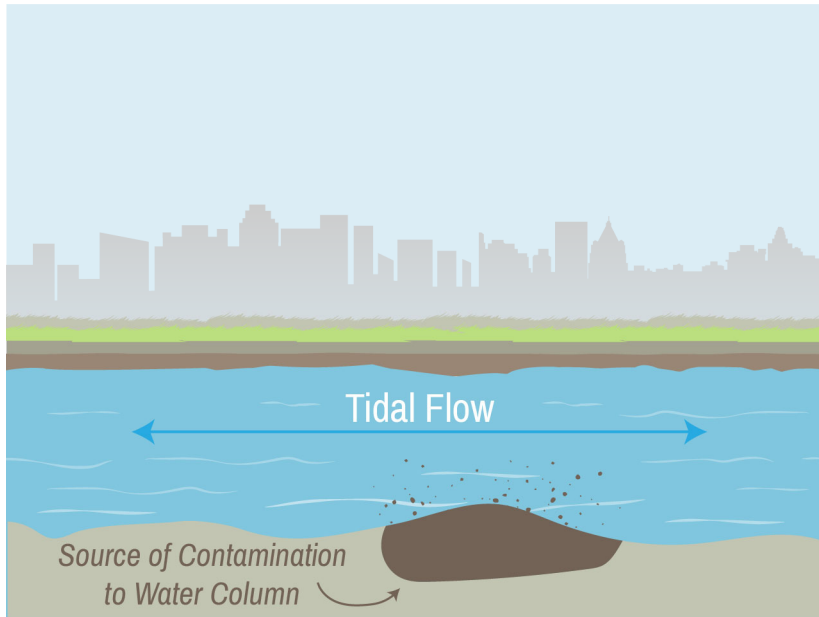
OU4 17-mile Study Area



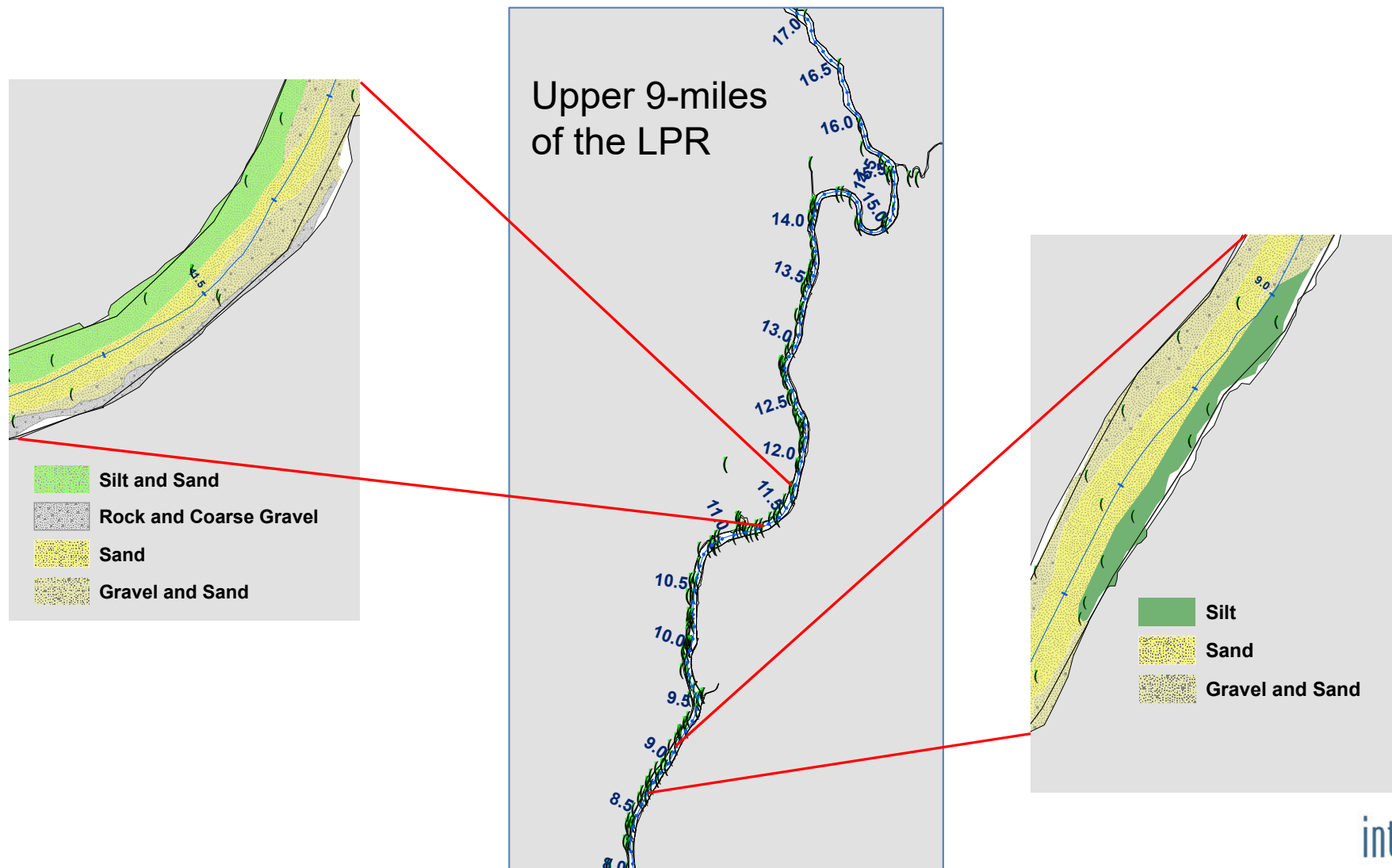
What is Adaptive Management on the Upper 9-Miles of the LPR?

- An interim remedy that initiates a process that:
 - Is rooted in a **conceptual understanding** of the river
 - Recognizes **uncertainty**
 - Supports **continued site progress**
 - Is followed by **assessment** of progress and **reevaluation** as **new information** becomes available

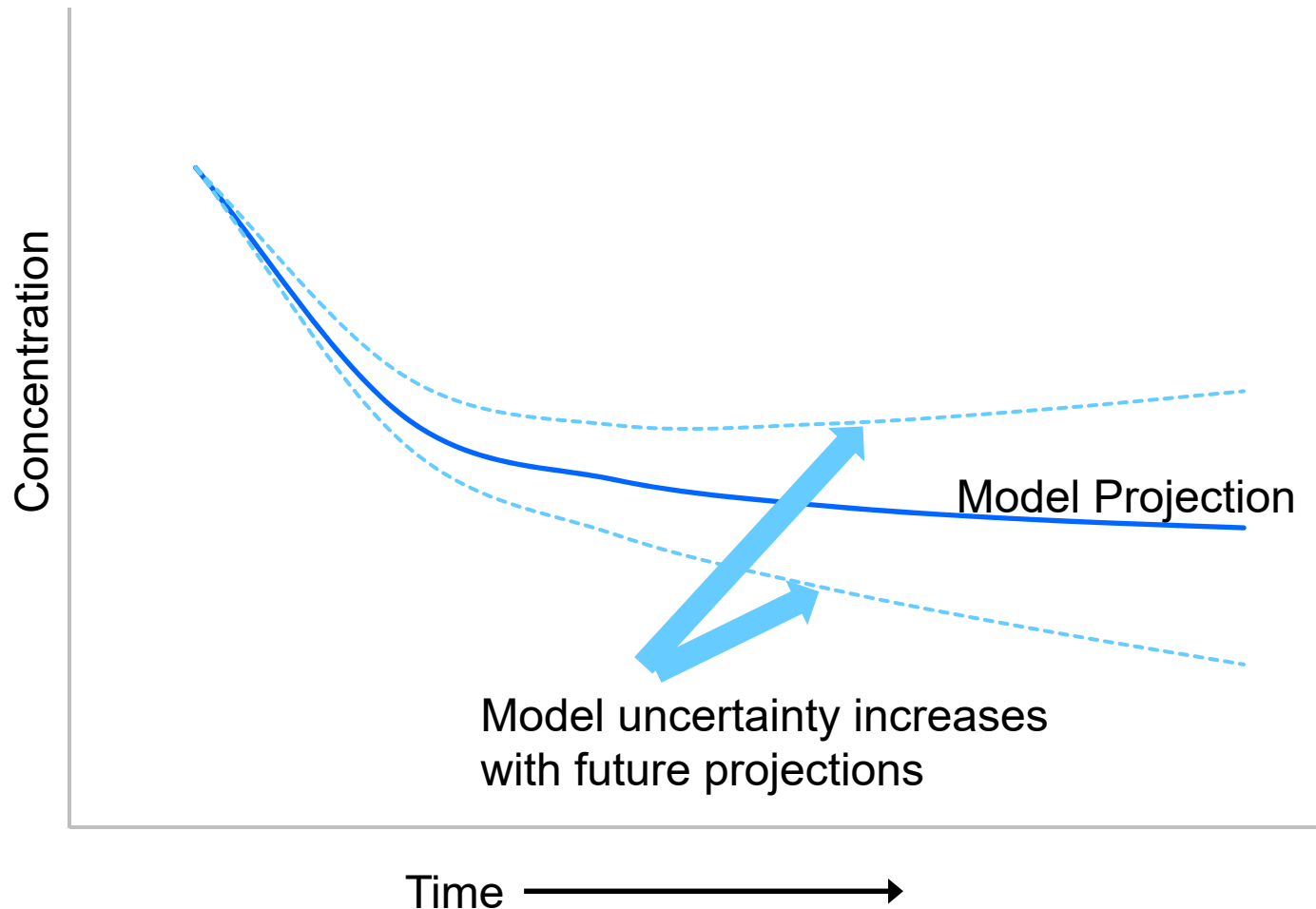
Inhibited Recovery in the Upper 9-miles



Key Uncertainties—Data Do Not Fully Capture Spatial Variability

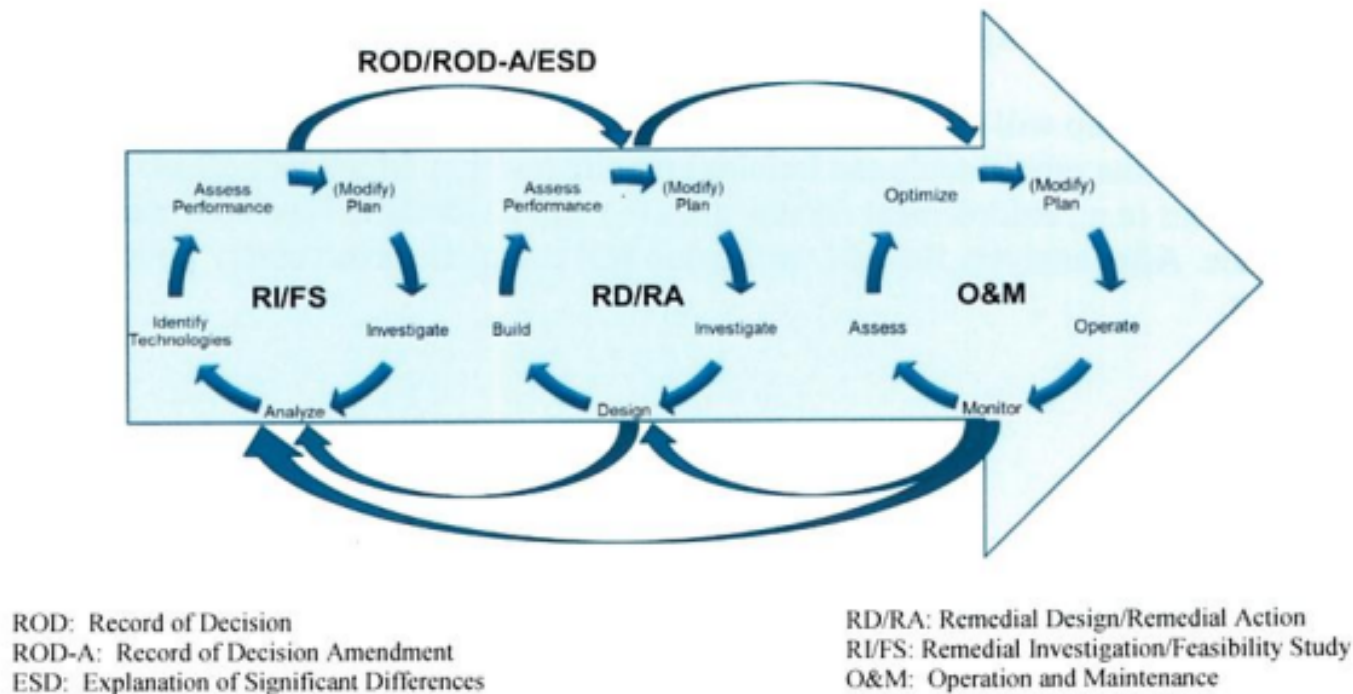


Key Uncertainties—Lack of Time Series Data Limits Use of Model Projections

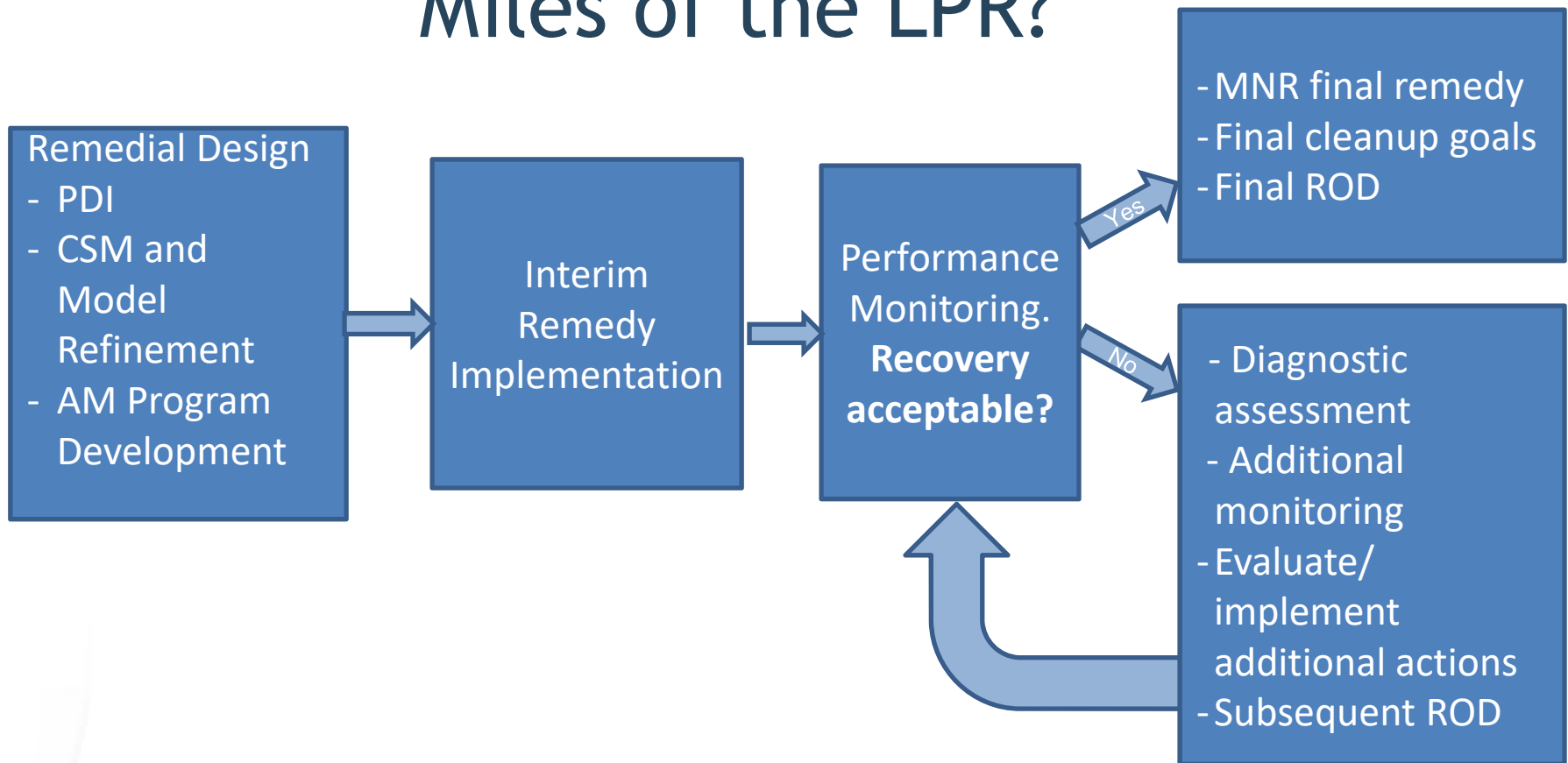


What are the Options Given this Uncertainty?

Figure 1 Adaptive Management's Application in the Superfund Remedial Process

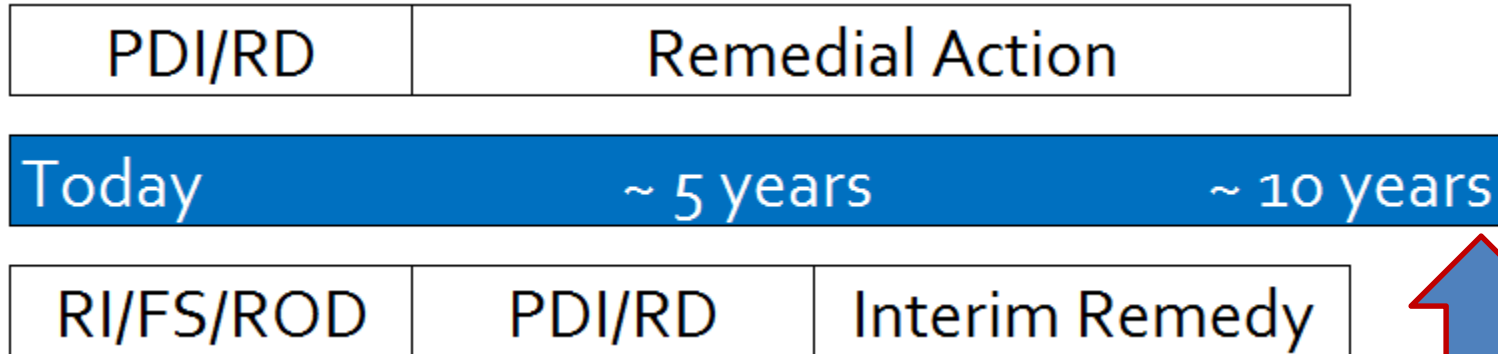


What Could the Adaptive Management Process Look Like for the Upper 9-Miles of the LPR?



Allows LPR Remedial Actions to Align

Lower 8-mile Remedial Action



Upper 9-mile Source Control IR

Adaptive Management is a Good Approach for the Upper 9-miles of the LPR

- Allows for interim remedy implementation to expedite recovery and risk reduction while continuing to increase site understanding and reduce uncertainty
- Potential opportunity to coordinate removal with the lower LPR, to optimize logistics, and to complete river-wide removal actions sooner
- Consistent with recent EPA guidance and recommendations to use Adaptive Management at complex sediment sites



Thank you!



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Thank you to Cooperating Parties Group and AnchorQEA