Remediation Proposal Update

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South River Science Team

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Remediation Proposal Schedule

Draft Timeline

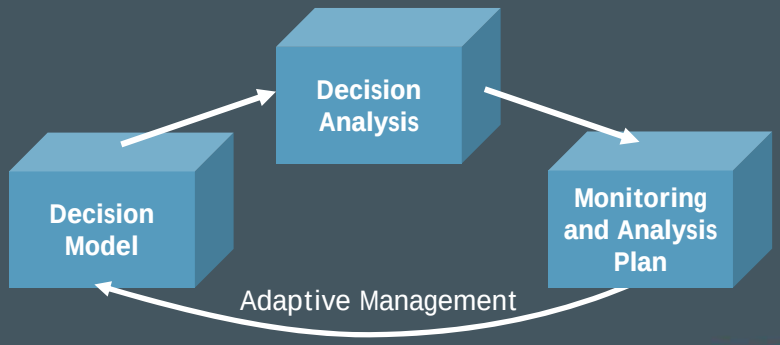
Date	Milestone
April 9	Discussion and input from SRST ROPs Work Group, USEPA, and VA DEQ on objectives and important elements of the Remediation Proposal
May 21	NRDC briefing
June 28	Draft for review by SRST ROPs Work Group, USEPA, and VA DEQ
July 16	Discussion of SRST ROPs Work Group, USEPA, and VA DEQ verbal comments
August 2	Written comments due from reviewers
September 11	NRDC consultation
September 27	Final Remediation Proposal submitted to NRDC, USEPA, and VA DEQ

Features of the Draft Remediation Proposal

- The Remediation Proposal will
  - Incorporate activities/products of SRST ROPs Team
  - Focus on ongoing sources to the aquatic environment
  - Develop recommendations for targeted bank management actions using proven technologies
  - Provide a mechanism for stakeholder input including SRST, regulatory agencies, and the public
  - Form the basis for future work plans for detailed design, construction, monitoring, and adaptive management under regulatory oversight
  - Follow EPA risk management principles

Features of the Draft Remediation Proposal

- Build on ROPs Work Group remedial technology screening and pilot studies (2009 to 2012)
  - Focus on higher ranking remedial technologies
  - Incorporate lessons learned from ongoing bank stabilization and in situ treatment pilot studies
  - Incorporate lessons learned from other ROPs research
- Common elements
  - Up-front source control at former DuPont facility
  - Enhanced adaptive management (EAM)



Remediation Proposal Draft Outline

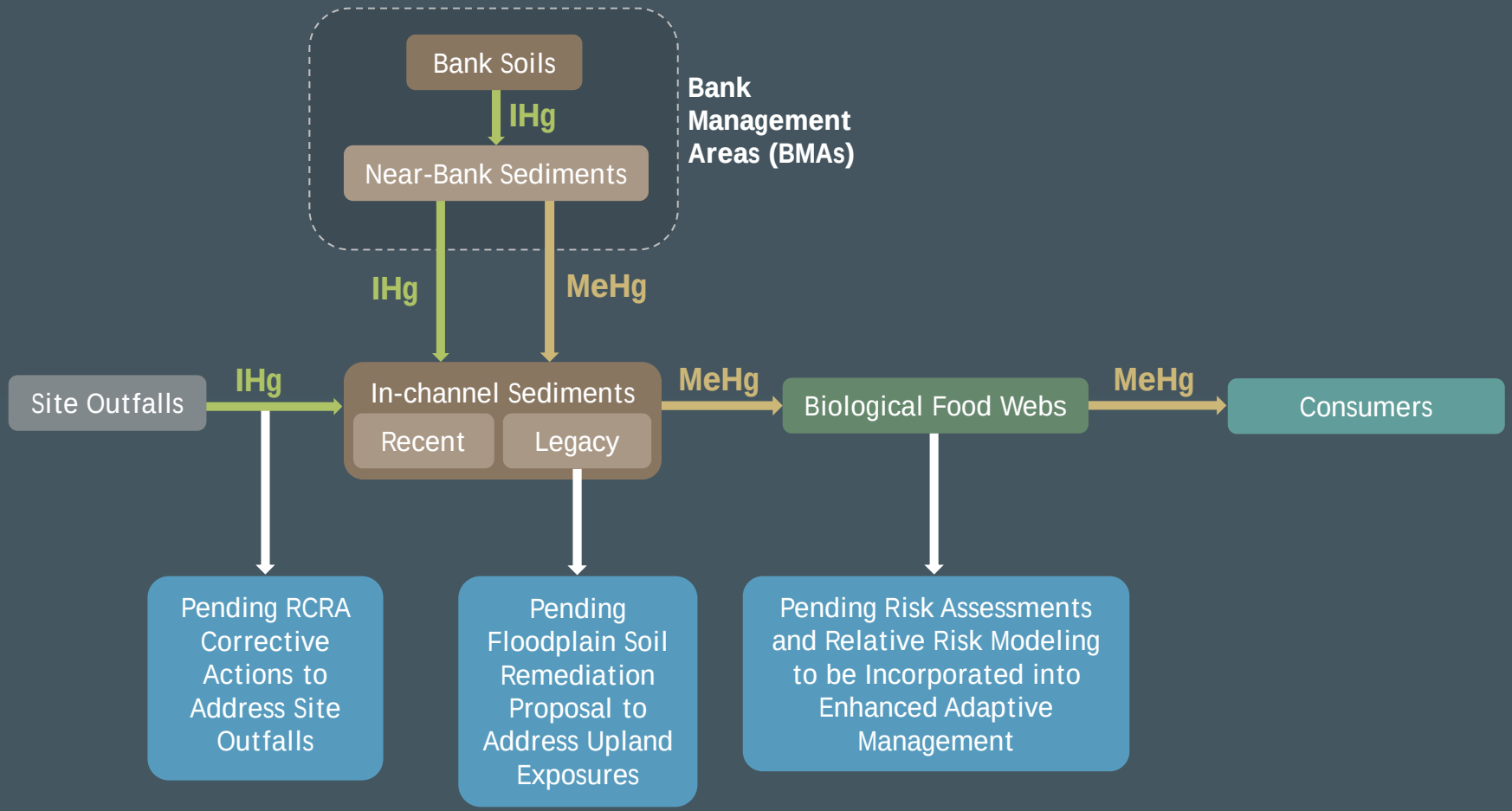
1. Introduction
2. South River Characteristics
3. Basis for Remediation
4. Remediation Alternatives
5. Remediation Alternative Evaluation Criteria
6. South River Remediation Proposal
7. Implementation and Management
8. References

Appendix A: Bank and In-Situ Treatment Pilot Summaries

Appendix B: Green Remediation Evaluation

Appendix C: Cost Estimates of Alternatives

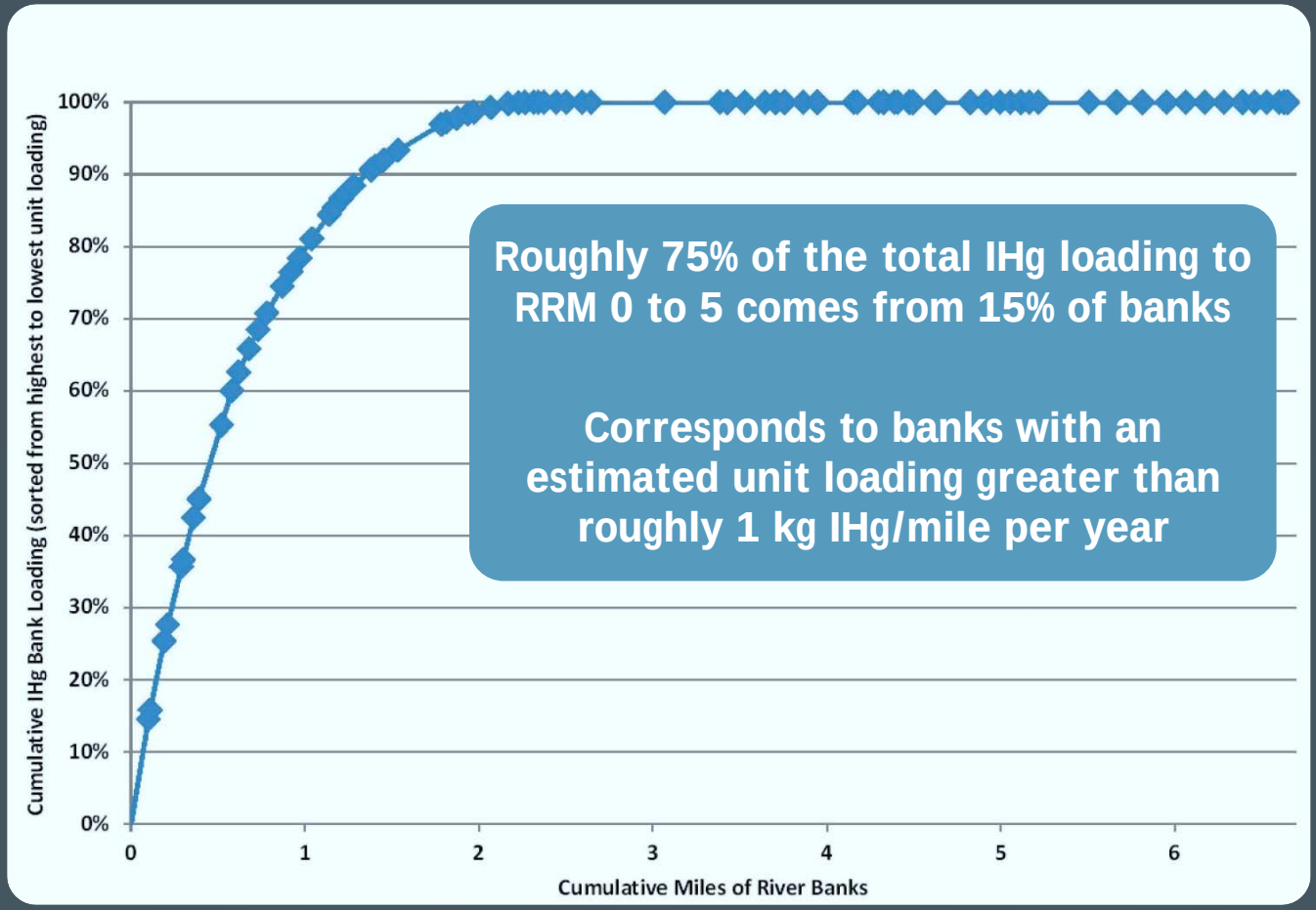
Basis for Remediation
Conceptual Site Model



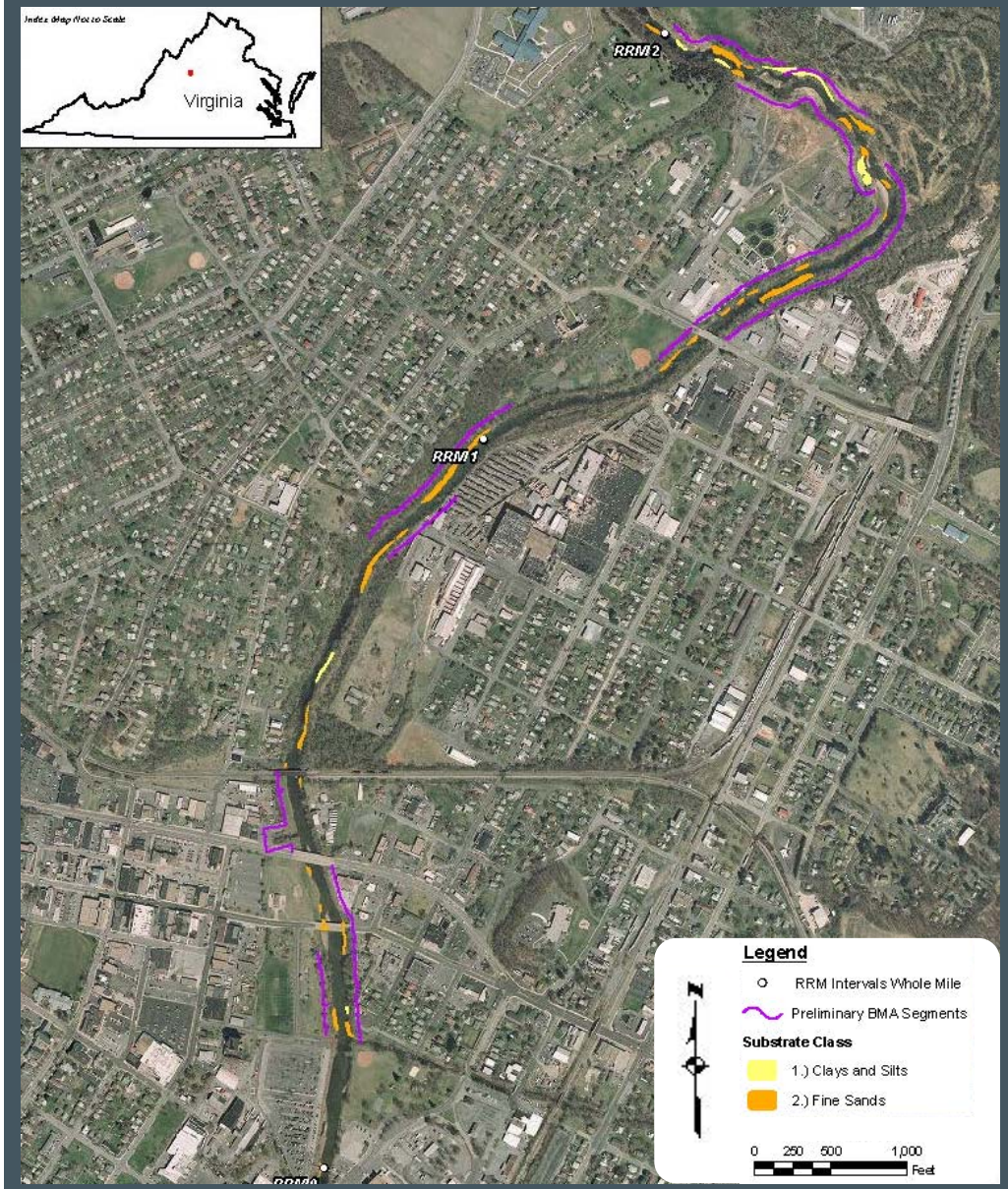
Initial Upstream Actions

- Working hypothesis
  - Reducing loading of legacy IHg to the South River in a stepwise manner beginning with source controls at the former DuPont facility will result in progressive recovery
- Preliminary upstream reach: RRM 0 to 2
  - Reach located immediately adjacent to and downstream of the former DuPont facility
  - Focused on eroding bank deposits that transport legacy IHg into downstream channel and floodplain areas
  - Preliminary reach length based largely on productivity, implementability, and adaptive management considerations
  - Remediation Proposal targets a construction period in the most upstream reach of 1 to 2 years

Cumulative IHg Bank Loading: RRM 0 to 5



Source: From Pizzuto et al. (2011), excluding anthropogenically altered banks



Preliminary Bank Management Areas and Near-Bank Deposits: RRM 0 to 2 (~1.5 miles total)

Bank Management Area Alternatives

- Remediation Proposal is evaluating broad categories of remedial technologies
  - Allows flexibility as agency reviews, stakeholder (e.g., landowner) discussions, remedial designs, and enhanced adaptive management progress
  - Alternative 1: Institutional controls and monitoring
  - Alternative 2: Enhanced vegetative stabilization
  - Alternative 3: Structural stabilization
  - Alternative 4: Removal and disposal

In-Channel Sediments: Remediation Proposal Considerations

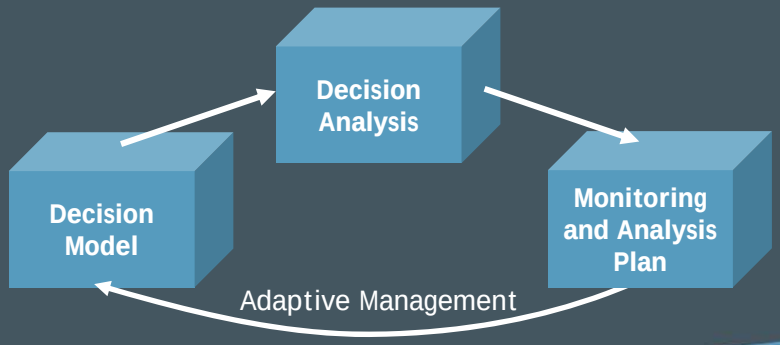
- IHg and MeHg associated with silt particles
  - Localized near-bank deposits
  - Interstices of main channel cobble/gravel/sand matrix
- Address near-bank deposits during remediation
  - Relatively minor extensions of BMAs
- Monitored natural recovery of main channel
  - Primary remedy identified for channel
  - Accelerated recovery after source control/bank action
  - Uncertain recovery time frame (3 to 30 years)
  - Approach lends itself to enhanced adaptive management

In-Channel Sediments: Remediation Proposal Considerations (cont.)

- Limited large-scale in-channel remediation options beyond monitored natural recovery
  - Removal (dredging or excavation)
    - Limited effectiveness due to resuspension and residuals
    - Extensive habitat degradation
  - Capping with or without reactive amendments
    - Permitting (flood elevation) and long-term stability challenges
    - Still exploring reactive caps in ROPs - UT Austin
  - In situ treatment with reactive amendments
    - Deployment, stability, and long-term effectiveness challenges
    - Still exploring sediment treatment in ROPs – U Waterloo
    - Still exploring water column treatment in ROPs - JMU

Status of Monitoring and Enhanced Adaptive Management Plans

- Short-term monitoring plan
  - To be included in draft Remediation Proposal
  - Tied to short-term RAOs and enhanced adaptive management
  - Ongoing SRST Monitoring Subteam review of strawman
- Long-term monitoring plan
  - Under development - builds on work to date; SRST Monitoring Subteam review
- Enhanced adaptive management plan
  - Decision model being refined – Corps ERDC journal publication pending
  - General plan to be included in draft Remediation Proposal
  - Will link to Relative Risk Modeling



Questions?