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Striking a Balance Between Remedial Goals and Habitat Function: An Exercise in Consensus Building

J. Collins (AECOM, Conshohocken, PA) | R.G. Stahl Jr. (E. I. DuPont de Nemours & Company, Wilmington, DE) | R. Davis and C. Patmont (Anchor QEA, Seattle, WA) | C. Mancini (AECOM, Conshohocken, PA)

INTRODUCTION

Mercury (Hg) was used in the manufacturing process at a facility in Waynesboro, Virginia between 1929 and 1950. Aspects of the process resulted in releases of Hg to the site, and to the South River (SR), where it accumulated on river banks. Natural erosion of river bank soils with elevated Hg concentrations is a primary mechanism for legacy Hg loading to the South River aquatic ecosystem. As part of Phase 1 Interim Remedial Measures (IRMs) under the Resource Conservation and Recovery Act (RCRA) Corrective Action, river banks in the first two river miles of the impacted area [relative river mile (RRM) 0 to 2] are being targeted for bank management / erosion control. An initial review of conceptual designs for Phase I Bank Management Areas (BMAs) by stakeholders, including state wildlife agencies and local municipalities, identified a need to factor in the potential loss of riparian habitat functions associated with mature trees. A series of reconnaissance surveys was organized to identify specific patches of valued habitats and resources within the Phase I BMAs. Discussions were held to reach a consensus for the remedial designs based on a balance between remedial goals and habitat function. Aspects of this collaborative approach are presented, including the issues, challenges, actions, and discussions that underpin a final consensus to proceed with the conceptual design for Phase 1 BMAs that meets remedial objectives in balance with habitat function.

CHALLENGES

The remedial strategy is focused on reducing or eliminating erosion of the banks that contribute the greatest Hg loading, including:

- Institutional Controls and Monitoring
- Enhanced Vegetative Stabilization
- Structural Stabilization
- Removal and Disposal

Balancing Objectives

Three objectives needed to be balanced in the design and implementation of the remedy:

1. Working safely and in a manner that reduces or eliminates Hg loading
2. Preserving, as practicable, existing valuable habitats
3. Minimizing, as much as possible, disruptions to the local community

Stakeholders

- City of Waynesboro
- South River Science Team
- E.I. du Pont de Nemours and Company
- US Environmental Protection Agency
- Virginia Department of Environmental Quality
- Virginia Department of Game and Inland Fisheries

REMEDIAL AND ANCILLARY OBJECTIVES

Habitat Concerns

Preliminary designs included removal of large trees at or close to the water's edge (Figure 1), which currently provide significant shade and other ecological benefits to the South River ecosystem (Figure 2)

Figure 1. Riparian Trees Adjacent to SR BMAs

APPROACH

Tree Delineation

- Location (GPS)
- Genus / species
- Height
- Diameter at breast height (dbh)
- Critical root zone (CRZ)

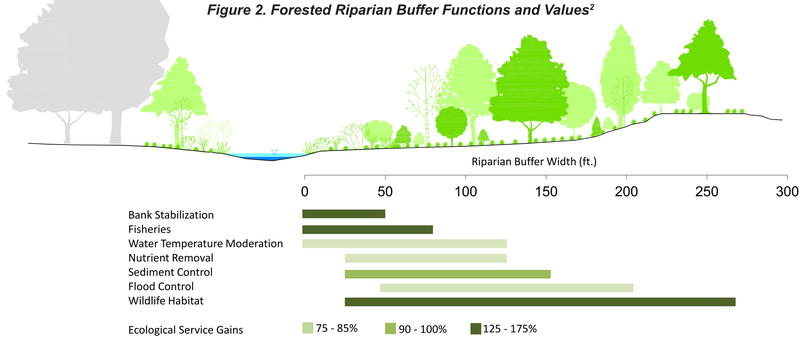
Function and Values Assessment

- Channel condition
- Riparian buffer
- In-stream habitat
- Channel alteration
- Reach condition

Stakeholder Input

- Series of meetings and site visits
- Cooperative discussion and assessments
- BMA-specific

Figure 2. Forested Riparian Buffer Functions and Values[2]



RESULTS

- Development of a logical and transparent approach to evaluate criteria (Figure 3)
- Further modification of remedial plans to account for ecological functions and values

Figure 3. Evaluation of Remedial Alternatives for BMAs

PHASE I

Existing Conditions/ Remedy Selection Criteria → Stakeholder Objectives → Credits → Remedial Alternatives

- BMA Location
- Bank Slope
- Eroding Zone
- Bank Material / Cohesion
- Tree Stability
- Bank Mercury Conc.
- Channel Morphology
- Flood Zone Impact
- Rare, Threatened, or Endangered Species

- Stream Shading (Temperature Regulation / Leaf Litter Inputs, Fish Habitat)
- Canopy Aesthetics
- Aquatic and Riparian Habitat
- Ecological Benefits
- Stormwater Management / MS4
- Greenway Connectivity
- Aesthetics

- TMDL
- Unified Stream Methodology for Use in Virginia[1]
- Chesapeake Bay Stormwater Network
- Restoration

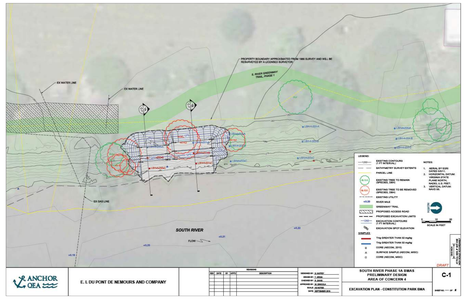
- Remedial Alternatives

PHASE II

Design → Permitting → Construction → Monitoring

DISCUSSION

Figure 4. Constitution Park, Waynesboro, Virginia



- Stakeholder consensus on strategy for each BMA
- Balance between preservation of ecological functions and values and remedial objectives (Figure 4)
- Next steps / path forward: (1) finalize design, (2) permitting

REFERENCES

[1] U.S. Army Corps of Engineers, Norfolk District and Virginia Department of Environmental Quality. 2007. Unified stream methodology for use in Virginia. 37 pp.

[2] Salas, D. 2010. Riparian buffer and upland restoration with woody species. Delaware River Keeper. 26 pp.

The work described in this poster has been performed in conjunction with the South River Science Team (SRST), a multi-stakeholder group including representatives from local, state and federal governments, academia, environmental groups and DuPont. The SRST is a collaborative team created to provide input into the watershed-level, risk-based assessment framework to address mercury in the system. www.southriverscienceteam.org