

Preliminary Monitoring and Community Outreach Plan
Briefing Paper
South River Science Team Expert Panel
October 2013

This briefing paper describes the preliminary monitoring and community outreach plan for the planned remediation of the South River and South Fork Shenandoah (SFS) River Remediation Proposal. It is designed to provide information related to the efficacy of the recommended remedial actions described in the South River Remediation Proposal, as well as their ability to reduce exposure of humans and ecological receptors to mercury. The monitoring plan takes into account specific goals, objectives, and concerns outlined in a Consent Decree between DuPont, the Natural Resources Defense Council (NRDC) and the Virginia Chapter of the Sierra Club.

The monitoring plan was designed based on the findings of the Ecological Study (URS 2012) and South River Science Team (SRST) studies with input from SRST members, including state and federal agencies. DuPont has taken into account the valuable comments provided by NRDC and their expert, Dr. Robert Livingston, as well as the long-term monitoring data that have been collected in the South River and SFS River by governmental and non-governmental groups since the 1970s.

DuPont will implement this Remediation Proposal under the RCRA framework; therefore, the final designs for remediation and monitoring will be developed in collaboration with the appropriate regulatory agencies. As this monitoring plan is implemented, there will be frequent and open communication with those involved with the existing monitoring efforts to share data and experience, and where possible, avoid duplication of effort.

The overall goal of the effort is to provide data to assess the efficacy of the remedy in addressing both migration and potential exposure pathways. Specific objectives of the monitoring are to provide data to:

- Monitor human and ecological exposure to mercury
- Monitor system responses to remediation
- Monitor the integrity of the remedial action
- Provide input to the adaptive management framework and relative risk model to determine whether any aspect of the remedial action, monitoring strategy, remedial design, or conceptual model needs to be modified

The monitoring plan is divided into short-term and long-term monitoring plans that have different objectives, monitoring elements and spatial focus.

Short-Term Monitoring Plan

The short-term monitoring plan is designed to measure improvements over relatively rapid timeframes (e.g., 2 to 10 years) and small spatial scales, such as

adjacent to a particular remedial target (e.g., eroding bank). The short-term plan is summarized in Exhibit 1.

First and foremost, the short-term monitoring will assess whether the physical specifications of a remedy are being met, and ensure that the physical integrity of the remedy is repaired should it be affected by flooding or other events.

Secondly, the short-term monitoring will provide chemical and biological information that will feed into the relative risk model and the adaptive management approach. Combined, these data will allow for feedback on the efficacy, integrity, and performance of the remedy, and whether or not the remedial action objectives are being met.

- Reduce Mercury Transport and Exposure
 - Reduce Bank Erosion
 - Topography
 - Bank Pins
 - Vegetation
 - Bank Characteristics
 - Design and Implementation
- Reduce Mercury Loading from Bank
 - Surface Sediment
 - Periphyton
 - Asiatic Clam
- Reduce In-Channel Mercury Exposure
 - Periphyton
 - Asiatic Clam
- Maintain or Improve Riparian and Aquatic Habitat
 - Improve Bank Vegetation
 - Vegetation
 - Improve In-Stream Habitat

Exhibit 1: Preliminary Short-Term Monitoring Elements

Long-Term Monitoring Plan

The long-term monitoring is designed to measure potential mercury exposures to humans and ecological receptors, as well as monitor habitat improvements and responses to remediation. While the short-term monitoring will be focused primarily in the South River at or near those areas where bank management area (BMA) remedies are being implemented, the long-term plan is designed to cover a timeframe of many years to decades, and a much larger area, including watersheds of the South River and SFS River. Sample locations and methodologies are based on the extensive data collected by SRST members. The monitoring elements are listed in Exhibit 2; much of the monitoring detail, including sample locations, sample frequency and sample sizes will be included in the Remediation Proposal. The final plan will be part of the Remediation Work Plan developed as part of the program.

Similar to the short-term monitoring plan, chemical and biological results from the long-term monitoring will also feed into the relative risk modeling and the adaptive management approach. In this way, both the short- and long-term information will be used as input to management decisions regarding the efficacy of remedial actions, the need to alter approaches or evaluate new or improved technologies, or to maintain and/or repair areas as necessary.

Most importantly, the monitoring information will help in estimating changes in the potential exposures and risks to humans and ecological receptors that result from changes in mercury loading to the South River and SFS River. It is expected that once remedial actions have been implemented in the South River, the mercury loading should decline and be accompanied by a concomitant reduction in

potential mercury exposures and potential risks to humans and ecological receptors. Throughout the implementation and monitoring of this Remediation Proposal, there will be open and frequent outreach and communication with local communities, physicians and health clinics, and relevant public-health groups.

Data Use and Evaluation

The monitoring plan is designed to operate within a hypothesis-testing framework. Monitoring data will be collected to understand the effect of remediation on mercury transport pathways or routes of human or ecological exposure. As the monitoring plan proceeds, results will be analyzed and reviewed with the appropriate regulatory agencies to determine if the transport pathways or exposure routes are changing and to what degree.

Data collected that are not changing or are providing ambiguous results may be collected at a reduced frequency, replaced by an alternate medium, modified, or eliminated from the plan in the context of the adaptive management strategy. For example, if THg or MeHg concentrations in earthworm tissue do not change significantly over the first three years, sample frequency may be reduced to once every two years. This latter approach is consistent with the framework specified in the Consent Decree. The decision of whether or not to continue with specific sample locations, tests, or analytes will be focused on their usefulness in the context of the adaptive management approach and any ongoing or planned remedial actions.

Sample Collection Methodologies

Sample collection methodologies will follow those developed for the Ecological Study in collaboration with the regulatory agencies and with the SRST and Monitoring Task Team. The monitoring plan may also be refined further during the remedial design phase.

- Potential Human Exposure
 - Largemouth Bass
 - Smallmouth Bass
 - Snapping turtle
 - Mallard duck
 - Community outreach
- Ecological Exposure
 - Aquatic
 - YOY fish
 - Sediment
 - Benthic invertebrates
 - Periphyton
 - Asiatic clam tissue
 - Terrestrial
 - Adult Carolina Wren
 - Wolf Spiders (family Lycosidae)
 - Earthworms
- Water quality
- Benthic invertebrate Community

Exhibit 2: List of Preliminary Long-Term Monitoring Elements