Toxic Contaminants Policy and Prevention

Principles to Manage Toxic Contaminants through Water Quality Improvement Best Management Practices

Managing Toxic Contaminants to Protect Fish, Wildlife, and People:

Toxic Contaminants are a Threat to Human Health and Harm Fish and Wildlife. Toxic contaminants, primarily high levels of polychlorinated biphenyls (PCBs) and mercury, have led to advisories on the amount of fish people should eat from the Chesapeake and its rivers. Some contaminants can increase cancer risk (PCBs, PAHs) and cause developmental and neurological damage (mercury) in humans, thus posing a public health risk. Toxic contaminants have shown to cause health and reproductive problems in fish and wildlife. Because of these concerns the Chesapeake Bay Program developed a goal to reduce the impacts of toxic contaminants.

Urban Toxic Contaminants (UTCs) and Human Health: UTCs such as PCBs, mercury, and PAHs that degrade living resources also affect human health through consumption of contaminated fish and seafood and exposure to airborne contaminants. These UTCs are the often related to industrial, commercial and transportation-related sources. The contaminants impact aquatic ecosystems through association with urban runoff and previously contaminated sediment.

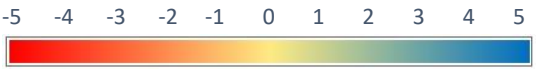
Agriculture-associated Contaminants and Ecological Health: Chemical contaminants associated with agricultural lands and production, include biogenic hormones (from animal manure), veterinary pharmaceuticals and antibiotics, pesticides, and herbicides, Mixtures of these chemicals have been shown to harm stream conditions, fish health, and local biodiversity.

Stormwater Management and Sediment Control: Many toxic contaminants, especially urban toxic contaminants (PCBs, PAHs, mercury) tend to associate with sediment and originate in urban and industrial areas where they are transported into the ecosystem through contaminated sediment in stormwater. Thus, any best management practice (BMP) that controls or traps sediment and prevents stormwater runoff can aid in preventing release of urban toxic contaminants into waterways and aquatic ecosystems.

Agriculture Practices: BMPs on agricultural land for managing release of nutrients and sediment from crop and animal practices can concurrently trap herbicides and pesticides from crops and biogenic hormones and pharmaceuticals from animal operations, thus preventing their release to the Bay and tributaries.

Best Management Practices with *Toxic Contaminants Management* in Mind

Best Management Practice	Urban Pollutants	Agricultural Pollutants	Stream Health	Forage Fish	Citizen Stewardship
Bioretention	1.5		3	2.5	4.5
Filtering Practices	2		2	3	1.5
Infiltration Practices	2		2.5	3	2
Runoff Reduction	2.5		3	2.5	0.5
Dry Ponds	2		1	1	1.5
Wet Ponds	2.5		1.5	2.5	1
Urban Forest Buffers	2.5		4	3	2
Streamside Forest Buffers	3		2	2	0
Narrow Forest Buffer	3		2	2	0
Agricultural Forest Buffer		4	2	2	0



*Values were taken from a Tetra Tech study evaluating BMP effects on outcomes on a scale of +5 (very beneficial) to -5 (very harmful). However, the Toxic Contaminants Workgroup did not recommend scores higher than +3 or -1, due to a need for further research to accurately quantify co-benefits for toxic contaminants.

* Recent research indicates that upgrades to enhance nutrient removal in municipal wastewater treatment plants (WWTPs) can significantly reduce PCB loads in wastewater effluent. In addition to the nonpoint source BMPs above, enhanced nutrient removal upgrades to WWTPs may have significant co-benefits for toxic contaminants management.

Guiding Principles for Incorporating Contaminants Management into Phase III WIPs

WIP Development

- **Target areas with known legacy contaminants,** often historically urban and industrial sites. One primary focus is PCBs, which were banned from production in the 1970s. However, PCBs are very environmentally stable and persist in sediments associated with contaminated land.
- **Emphasize BMPs that trap sediments** and associated contaminants, particularly in areas that flood or erode.
- **Consider practices to reduce agriculture-associated contaminants:** Contaminants, associated with pesticides and manure can enter waterways through agricultural runoff and contaminate drinking water.
- **Consider toxic contaminants management in a local area planning goal**: To reduce the impacts of toxic contaminants, consider inclusion of activities to mitigate that risk in your jurisdiction's phase III WIP.
- **Target Waste Water Treatment Plant upgrades** for both significant and nonsignificant municipal treatment plants. PCBs, pharmaceuticals and contaminants related to personal care products are loaded to local waters from treatment plant effluent.

WIP Implementation

- **Environmental justice** is an important consideration for toxic contaminants management. It has been established that many UTCs are concentrated in historically diverse and underserved communities. **Members of these communities should be engaged in the planning and implementation of practices to manage toxic contamination.**
- When implementing cover crop BMPs and other agricultural practices that use herbicides, **use practices that minimize the risk of runoff and groundwater contamination**, such as buffers and proper application rates and procedures.
- **Combine BMP implementation efforts with traditional contaminant regulatory measures** where there are local TMDLs and permits for toxic contaminant reduction.
- **Partner with Local Governments, NGOs and local stakeholders on approaches that provide co-benefits for reduction of contaminants, nutrients and sediment.**
- **Plan for effects of climate change:** Consider impacts of climate change-related phenomena such as sea level rise and increased storm frequency and severity when siting, designing, and maintaining BMPs.

Tools and Resources

- Toxic Contaminants Workgroup Chesapeake Bay Program Page
- Link to co-benefits scoring and report
- Resources from the Delaware River Basin Commission
- Link to CAST
- Resources for PCB TMDLs:
  - Maryland
  - Virginia
  - Washington, DC
- Resources that will be available in spring 2018:
  - *BMP Quick Reference Guide: urban and agricultural practices (currently draft)*
  - *Draft PCB resource center, on Toxic Contaminants Workgroup Projects and Resources Page*
  - *Endocrine Disrupting Chemicals Synthesis Project*

- *Chesapeake Bay Program Environmental Justice Screening Tool*

Contacts for More Information

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