

Next Step: Technological Advances

Problem Summary and Decision Context

Problem: Water treatment systems across the Nation face numerous challenges from unregulated emerging microbial and chemical contaminants. Some areas of the U.S. suffer from drought and currently search for alternative water sources. Other areas need to address excess water in combined sewers to prevent overflows into surface waters, which are often downstream drinking water sources.

Objective: This project will develop the next generation of technological advances to provide guidance in support of water systems.

This project will focus on three areas:

1. Contaminants and their impact on health
2. Adequate removal of contaminants from various water systems
3. Water and resource recovery within treatment systems

Utility to Agency

This project will provide EPA with the following:

- New, innovative options for assessing exposure and risk from emerging contaminants.
- Research results from cutting-edge treatment technologies.
- Human health impact assessments from emerging contaminants and chemical mixtures.

Tasks and Projected Deliverables

Task 6.02A: *Treatment, monitoring and risk assessment for fit for purpose water*

Task 6.02B: *Novel monitoring technologies for occurrence, exposure, and effect for individual and groups of contaminants*

Task 6.02C: *Water treatment technologies for enhanced reduction of chemical and microbial risks*

Task 6.02D: *New methods and tools for measuring human and ecological health risks from chemicals and pathogens*

Task 6.02E: *Advancing public health protection through water infrastructure sustainability (STAR Grants)*

Task 6.02F: *National Center for innovation in small drinking water systems (STAR Grants)*

Task 6.02G: *NetZero Interagency Agreement (STAR)*

Examples of expected deliverables:

- Information on health risks and treatment requirements for targeted reuse (e.g., agricultural, industrial) of treated wastewater.
- Development of analytical and monitoring tools for future UCMR, CCL, and emerging contaminants.
- Guidance for implementation of next generation technologies for drinking water treatment and wastewater treatment and reuse.
- Monitoring tools and assessments for advancing our understanding of risks to human health from water systems.



Future Directions

- Employ new bioassay methods for use in monitoring risks in source and treated water.
- Develop, optimize and demonstrate novel water treatment technologies for drinking water and wastewater reuse.
- Advance predictive models for human health risks from emerging contaminants, groups of contaminants, and pathogens in collaboration with EPA's Chemical Safety and Sustainability Research Program.

Partner Engagement Opportunities

Partners and potential collaborators:

- EPA Program Offices and Regions
- Water Research /Water Environment Research Foundation
- Water Reuse Research Foundation
- Environmental Research Institute of the States
- Association of State DW Administrators
- National Association of Clean Water Administrators