U.S. EPA Office of Research and Development

Charge to the Board of Scientific Counselors (BOSC)

Homeland Security Subcommittee Meeting

August 20-21, 2020

EPA's Homeland Security Research Program (HSRP) addresses science gaps related to remediation of environmental contamination that threatens public health and welfare, as well as science gaps related to environmental quality before, during, and after a disaster. HSRP helps EPA carry out its homeland security and emergency response mission by working closely with its partners to understand the potential threats and consequences of hazardous substance release. HSRP works in coordination with partners and stakeholders to conduct the research necessary to provide decision makers the information they need for their communities and environments to rapidly recover after a disaster.

The HSRP is focused on addressing two primary research objectives:

- Advance EPA capabilities to respond to wide-area contamination incidents; and
- Improve the ability of water utilities to prevent, prepare for, and respond to water contamination that threatens public health.

The research to address HSRP partner needs is organized into seven research areas. The research areas are descriptive of the program and align with EPA's response decisions supporting recovery under the National Response Framework (NRF), specifically with respect to EPA's lead role under Emergency Support Function #10 - Oil and Hazardous Materials Response Annex (ESF-10). These response decisions are highly interdependent, with one decision impacting other decisions. The research areas are designed to reflect and support this interdependent system of activities through coordination across the program in support of the HSRP's two primary objectives.

The HSRP research areas are: (1) Contaminant Fate, Transport, and Exposure, (2) Contaminant Detection/Environmental Sampling and Analysis, (3) Wide-Area Decontamination, (4) Water Treatment and Infrastructure Decontamination, (5) Oil Spill Response, (6) Waste Management, and (7) Tools to Support Systems-based Decision-Making.

The BOSC Homeland Security Subcommittee reviewed the entire program in 2019, through a review of the program's Strategic Research Action Plan. Over the course of the next year (2020-2021), the program intends more in-depth reviews with the BOSC HS Subcommittee focused on research under the research areas.

The focus of this current BOSC HS Subcommittee review is on two research areas: Research Area #4 - Water Treatment Infrastructure Decontamination and Research Area #5 - Oil Spill Response.

Research Area: Water Treatment Infrastructure Decontamination Research

HSRP's water research portfolio addresses the needs of water utilities, in line with EPA Program Offices, through bench, pilot, and field-scale research. The portfolio includes studies to address needs related to:

- Decontamination methodologies (including automatic flushing) for various contaminants in distribution systems and premise plumbing;
- Consequences of a cyberattack on water distribution systems/effectiveness of in-line contaminant detectors;

- Wash-water treatment methodologies/source water and storm water; and
- Water system modeling tools.

Charge Question 1a: How well does the water research portfolio of proposed Products and Outputs respond to the partner-identified needs?

Charge Question 1b: The Water Security Test Bed (WSTB) is a critical capability for the water research portfolio to assess full-scale decontamination approaches for contaminated infrastructure, including premise plumbing, and emergency on-site treatment of contaminated water. Are there suggested improvements to the test bed, to the planned research, and/or partner/stakeholder involvement for StRAP implementation?

Charge Question 1c: The HSRP wastewater research is informed by Water Research Foundation (WRF) and National Science Foundation (NSF) workgroups to examine the fate of priority pathogens in wastewater collection system infrastructure and in wastewater treatment plants. To what extent is the planned research and capabilities adequate to address the acceptance and safe/effective treatment of wastewater?

Research Area: Oil Spill Response Research

The Oil Spill Response Research Area provides products that inform emergency response operations for the Agency and Federal partners in charge of spills. Efforts range from effectiveness and toxicity testing for spill-treating agents on the National Contingency Plan (NCP) Product Schedule, detecting and monitoring of released oil with cutting edge technologies, to understanding the fate of oil in the environment.

Charge Question 2a: The U.S. EPA has the regulatory responsibility for maintaining the National Oil and Hazardous Substances Pollution Contingency Plan Product Schedule (NCPPS), which lists commercially-available spill-treating agents for oil spill response operations. Please provide recommendation on how protocol development can be improved or advanced to support the EPA OLEM Program Office which maintains the NCPPS. How can our research program improve partner and/or stakeholder engagement beyond the EPA Program Offices?

Charge Question 2b: Spilled oil that cannot be mechanically removed from the environment undergoes physical, chemical, and biological changes that affect the behavior and ultimate fate of the oil. To better assess oil behavior and the impact of oil on ecosystems, HSRP conducts research on biodegradation, toxicity, dispersion, and detection of oil in water. Please provide recommendations on how to expand or improve experiments conducted within this Research Area and to improve the delivery or dissemination of products to our partners and stakeholders.