

# Homeland Security Research Program

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# Ongoing Threat

"Unless the world community acts decisively and with great urgency, it is more likely than not that a weapon of mass destruction will be used in a terrorist attack somewhere in the world by the end of 2013."

*World at Risk : The Report of the Commission on the Prevention of WMD Proliferation and Terrorism (2008)*

"We assess that many of the countries pursuing WMD programs will continue to try to improve their capabilities and level of self-sufficiency over the next decade."

*Statement for the Record on the Worldwide Threat Assessment of the U.S. Intelligence Community for the Senate Select Committee on Intelligence*, James R. Clapper, Director of National Intelligence, February 16, 2011

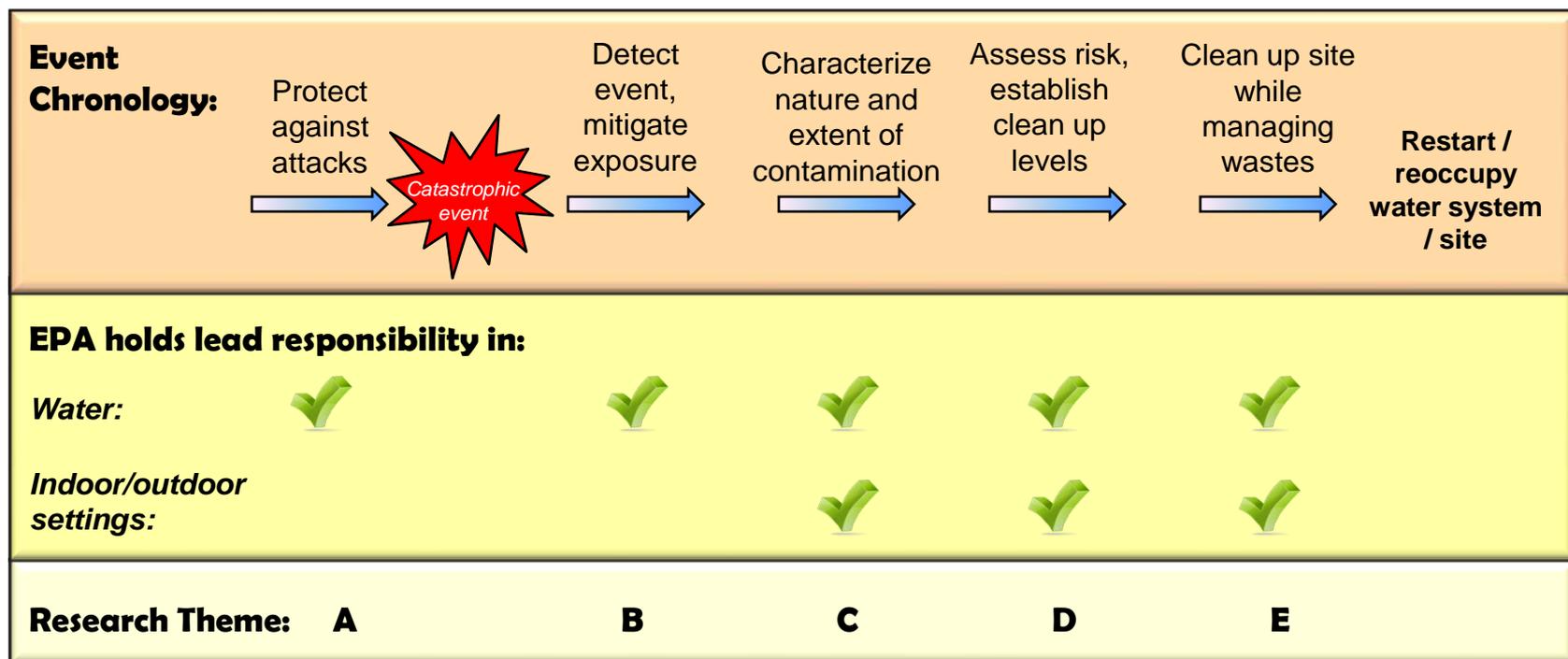
# Problem Statement

- Terrorist attacks are considered to be inevitable
- Sustainability of our communities requires resiliency to disasters
- Resiliency is increased with EPA guidance, tools and support
- Scientific gaps exist in our ability to prepare for and recover from CBR attacks
- HSRP's mission is to fill science gaps to improve EPA's capability
- HSRP work can be applied to other environmental problems



# Program Design

Design is based on a systems approach to EPA role in a catastrophic event



# Homeland Security Research Themes

Research to:

- A. Help **Protect** Water Infrastructure against Attacks
- B. Improve **Detection** of Contamination and **Mitigation** of Exposure in Water Systems
- C. Improve **Characterization** of the Nature and Extent of Contamination
- D. Improve **Risk** Assessments and Communication
- E. Improve **Cleanup** of Contamination

# Research Theme Sample

## **Theme B: Research to Improve Detection of Contamination and Mitigation of Exposure in Water Systems**

### ***Science questions:***

- What monitoring technologies and surveillance information can adequately detect relevant contamination in a distribution system?
- Can tools be developed to help design optimal monitoring networks?
- Can software tools be developed to optimize monitoring efforts, contaminant detection, and sensor placement in water distribution systems?
- Can real-time software tools be developed to aid utilities in making real-time decisions on how to minimize exposure to contaminated water?

### ***Outcomes:*** Science products from this work:

- will assist water utilities improve their response to intentional contamination by providing a system of sensors and software tools. Better response will reduce the impact of the attack on human health.
- may also discourage terrorist from attempting attacks.
- can be used by utilities for routine monitoring of water quality and to respond to inadvertent contamination events (e.g., cross-contamination or main break events).

# Strategic Directions

Based on needs and guidance from the White House Homeland Security Council, our primary partners, SAB, BOSC and NAS, the major strategic directions identified and to be addressed include:

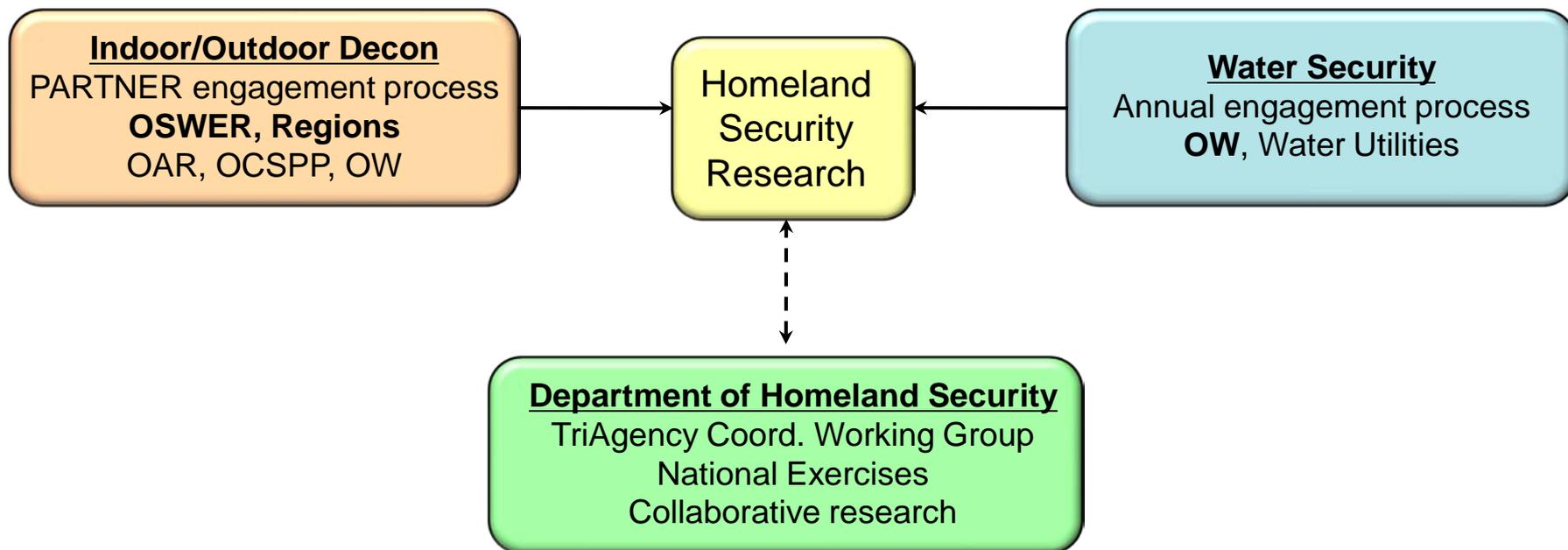
- **Responding to a wide-area anthrax attack** – dose-response, clean up goals, sampling and analytical methods, risk assessment and communication, and clean up strategies
- **Responding to the detonation of a radiological dispersion device (RDD)** – sampling and analytical methods, and clean up strategies
- **Responding to an attack on a water distribution system** – modeling tools to contain the spread of contamination and locate the source, risk assessment and communication, decontamination of infrastructure, and treatment of contaminated water

Emerging Issues that may influence the strategic directions:

- ***The Food Safety Modernization Act (2010)***
- **Nontraditional agents**
- Increased attention to managing **nuclear contamination** in light of the Fukushima nuclear power plant disaster.



# Working with Partners and Stakeholders



## Coordination with Other Federal Agencies



- DoD
  - DTIC
  - DTRA
  - Army
  - ECBC
  - TSWG
  - ACE/ERDC
- USDA
- USGS
- CIA
- DOE
  - ORNL
  - SNL
  - LLNL
  - ANL
- CDC
  - NIOSH
- DHS
  - S&T
  - University Programs



## Multiple Uses of HSRP Products

### *Examples*

HS Research Products	Other Uses
Water contamination detection tools	Routine distribution system monitoring
Analytical methods	Broad use
Microbial risk assessment methods	Other pathogen issues
Decontamination of buildings	Mold, chem cleanup
Waste management tools	Most disasters
Provisional advisory levels	Industrial releases, spills

# Challenges

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- What coordination with other ORD programs should be undertaken?
  - How should other disasters be addressed?
  - In what areas should behavioral sciences research be targeted?
  - How should the program better address issues of sustainability?

# Appendix

**Additional slides for reference**

# EPA Homeland Security Drivers and Responsibilities

## Drivers

Bioterrorism Act (2002)

Homeland Security Presidential Directives (2003-2008)

National Response Framework (revised 2008)

Elements of:

- Comprehensive Environmental Response, Compensation and Liability Act
- Emergency Planning and Community Right-to-Know Act
- Clean Water Act
- Safe Drinking Water Act
- Oil Pollution Act
- Clean Air Act



## Responsibilities

- **Protect water systems from attacks and for detecting and recovering from successful attacks** affecting water systems by leading efforts to provide States and water utilities guidance, tools and strategies. *EPA is the federal government Sector Specific Agency (SSA) lead for water infrastructure.*
- **Decontaminate buildings and outdoor areas** impacted by a terrorist attack by leading efforts to establish clearance goals and clean up.
- **Develop a nationwide laboratory network** with the capability and capacity to analyze for chemical, biological and radiological agents for routine monitoring and in response to a terrorist attacks.

**Food Safety Modernization Act of 2010**



**“provide support for, and technical assistance to, State, local, and tribal governments in preparing for, assessing, decontaminating, and recovering from an agriculture or food emergency”**

# Major Accomplishments



- **Water contamination detection tools** developed and integrated into OW's Water Security Initiative, in use in several large cities
- **Liberty RadEx (national exercise, 2010)** – rad research used in planning and down-selection of technologies
- **EPA Biostrategy Guide (draft)** – incorporates research results on sampling/analytical methods, resuspension, clean up goals, remediation approaches, waste management.
- **Selected Analytical Methods** – adopted by EPA's lab network, many State labs
- **Provisional Advisory Levels** (over 100 for air/water matrices)
- **R&D 100 Awards:**
  - 2009: Mobile water sample concentrator
  - 2010: CANARY event detection software tool
- **Technical assistance to Regions**
  - Natural anthrax contamination – responders used our advice and research results to help choose clean up approach
    - 2007-8: Danbury, CT
    - 2009-10: Durham, NH
  - Mustard gas canisters, New Bedford, MA – consulted on analytical methods, cleanup options





# FY 2011 Capstone Field Study Results in FY2012

## Bio-Response Operational Testing and Evaluation (BOTE) Project

Full-scale building decon at Idaho National Laboratory

Objectives:

- To conduct and evaluate field-level facility remediation studies
- To evaluate the effectiveness of waste/washwater collection, decontamination, and disposal procedures
- To determine the total cost of applying the selected decontamination technology (i.e., including sampling, waste handling and treatment)

