

MITIGATION - SCIENCE AND TECHNOLOGY ADVANCES FOR CHEMICAL AND BIOLOGICAL HAZARD MITIGATION

Urban Area Remediation Following A Biological Agent Release - Analysis For Coastal Operational Resiliency (ancor) Wide Area Demonstration

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Bacillus anthracis, the causative agent of inhalation anthrax, is one of the most highly studied biological threat agents. Significant gaps remain related to the remediation of outdoor urban areas following a biological agent release. This presentation describes the planning, execution, data interpretation and outcomes from the Analysis for Coastal Operational Resiliency (AnCOR)'s Wide Area Demonstration (WAD) which was held in May 2022. The AnCOR program is an interagency effort involving the U.S. Environmental Protection Agency (EPA), Department of Homeland Security (DHS) Science and Technology Directorate (S&T), and the United States Coast Guard (USCG). The primary WAD objective was to expand the understanding of the operational effectiveness of decontamination methods and sampling strategies developed in a laboratory by testing them in an outdoor urban environment. A non-pathogenic organism, Bacillus atrophaeus var. globigii (Bg), was used as a surrogate.

Samples were collected pre- and post-decontamination for comparison of recovery and assessment of decontamination efficacy of those areas common in an urban environment, also providing sampling personnel real-world experience in collecting samples in full personal protective equipment (PPE). Sampling was also conducted on added materials that are commonly found on a USCG base.

The WAD decontamination assessment utilized high test hypochlorite (HTH) on hard surfaces and peroxyacetic acid (PAA) on vegetation (i.e., grass and trees). The application of decontaminants HTH and PAA was utilized to show the effectiveness against Bg using commercial off-the-shelf (COTS) spray technologies under field conditions. Additionally, designated waste materials were placed inside semipermeable bags made from innovative materials, then fumigated in a roll-off container using chlorine dioxide (ClO₂) gas. Novel techniques and strategies for data management were used during the WAD including detailing the roles, processes, and technologies for data acquisition, data management for sample collection, and visualization of results from field-collection through analysis and reporting.

The WAD provided opportunities to improve response readiness for mitigating the effects of a release of a biological organism in an outdoor urban environment and to gain real-world experience with decontamination of a biological organism using commercially available equipment. Information from this study could be applied to US military assets impacted by a biological agent.