

MUNICIPAL AND COMMERCIAL EQUIPMENT FOR RADIOLOGICAL RESPONSE AND RECOVERY

Compressing the recovery timeline: Would you like to participate?

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BACKGROUND

This poster describes a collaborative effort between the U.S. Department of Homeland Security, U.S. Environmental Protection Agency, and Argonne National Laboratory on the topic of compressing the recovery timeline through the use of municipal and commercial equipment to support specific goals associated with radiological response and remediation. In order to facilitate the development of ideas and methods for the use of such equipment, we developed example scenarios for five "Support Goals," shown below. These examples are not exhaustive, but are intended to address specific scenarios that might be considered probable and to promote out-of-the-box thinking of potential uses of equipment (see handout). The common initial state for all scenarios is that contamination has been spread over a wide area of the city. First responders have identified the presence of radioactive contamination and have completed their response protocols to provide a preliminary assessment of the radioactivity levels. Life-saving operations have been completed. At this stage, we expect the following activities in the impacted area:

1. People, vehicles, and objects have moved and are moving in and out of the contaminated areas,
2. Precipitation has occurred, increasing the spread of contaminants beyond the original release points,
3. Urgent remediation for critical infrastructure (e.g. water utility, energy utility, transportation, medical, fire stations, government facilities, etc.),
4. Regular activities (e.g. business, school, etc.) in the non-evacuated but contaminated area,
5. Identification and remediation of hotspots, and
6. Development of remediation strategies for the evacuated area.

We are seeking participants from emergency and infrastructure management to brainstorm methods that can be used to recover the urban environment with the goal of producing a guidance document to help plan a detailed recovery effort.

METHODS

- Reviewed citywide all-hazards and radiologically-specific response documents from across the country.
- Solicited responses through a workbook from local and regional emergency management and response personnel from around U.S.
- Holding workshops to brainstorm and discuss potential options and identify gaps in our approach.



EQUIPMENT RECEIVING MOST INTEREST BY SUBJECT MATTER EXPERTS

- Small vehicle with commercial gamma detector.
- Smart phones as radiation detectors.
- Drones equipped with gamma cameras.
- USB-type dosimeters.
- Air filters from home and vehicles for monitoring resuspended contamination.
- Radiation monitors on taxis, buses, ambulances, delivery vehicles, etc. with GPS tracking.
- Speedbump detectors to monitor vehicles.
- Portal or other stationary monitors for vehicles.
- Street sweeper (retrofitted) with on board detectors and GPS tracking.
- Portable water trailer to wash street.
- Soil stabilizer spray systems to control airborne dust.
- Chip sealer (emulsion) distributor to cover roads and reduce resuspension hazard.
- Intermediate bulk container (IBC) with polymer (paint) sprayer to cover streets.
- Mobile spray unit to cover surfaces with films.

SURVEY AND MONITORING

- Monitor the contamination levels in affected areas for an extended period to understand the dose to workers and residents.
- What types of municipal and commercial equipment can be used to enhance the survey and monitoring of contamination?
- We assume traditional survey monitoring equipment such as film badges, portable survey monitors, gamma-ray spectrometers already in place.
- Examples: air filters from garbage trucks and delivery trucks, personal cell phones.



MITIGATION OF RECEIVED DOSE TO FIRST RESPONDERS

- Reduce the radiation dose burden to response personnel.
- What types of municipal and commercial equipment can be used to carry out gross decontamination and to contain and prevent the resuspension and tracking of contamination?
- Examples: Fireboats to knock down radioactivity levels near the shore, dump trucks and bobcats to spread mulch and gravel across roadways.



DECONTAMINATION (GROSS AND FINAL)

- Decontamination methods can be more effective if implemented within days of a release rather than waiting months or years for the contamination to evolve chemically and physically, rendering it more difficult to remove.
- What types of municipal and commercial equipment can be used to carry out gross or final decontamination of contaminated surfaces?
- Examples: Street sweepers to remove particles, asphalt-milling machines to remove the top layer of road surfaces, bobcats to remove top layer of vegetation.



WASTE MANAGEMENT

- Contaminated, solid waste will be generated over a wide area from businesses and residences.
- Solid, radioactive waste should be collected for staging and disposal.
- What types of municipal and commercial equipment can be used to stabilize, contain, store, and transport the radioactive solid waste generated during mitigation and decontamination operations?
- Examples: Municipal waste garbage trucks to pick up garbage and collect in interim locations.



CONTAINMENT OF WATER AND WASTEWATER

- Water will likely be used by first responders to extinguish fires that may be generated during a radioactive release.
- Water may also be used to reduce radiation levels to early responders and subsequent response teams.
- How do we collect or divert water for proper treatment and disposal?
- What types of municipal and commercial equipment can be used to collect, contain, and transport liquid wastes?
- Examples: portable tanks and storage bladders, barges, storm sewer and reservoirs.



STATUS

- Emergency Management personnel from more than eight major cities/counties completed the Support Goal workbook.
- Met with partners from the United Kingdom Government Decontamination Services and their private contractors (suppliers) to brainstorm ideas from the private sector.
- Held workshops in Chicago and New York City and numerous meetings with SMEs and critical infrastructure personnel.

NEXT STEPS

- Summary document from the Workshops and consolidated with surveys received from city/county responders and emergency managers.
- Best Practices documents for use of municipal equipment favored by responders.

TO PARTICIPATE OR FOR MORE INFORMATION

- Take a copy of Support Goals Workbook or contact:
- Michael Kaminski, 630-252-4777, kaminski@anl.gov
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- Sang Don Lee, 919-541-4531, Lee.Sangdon@epa.gov