

# Strategies for Small Wastewater Systems for Safeguarding Assets, Emergency Response Planning and Risk Communications

This project is one of a number of tools and protocols focused on wastewater protection funded with a grant from the U.S. Environmental Protection Agency. This array of robust security products and tool kits includes emergency communication protocols, guidance documents, fact sheets, technical libraries and databases, expert software systems, and GIS-based simulation models for contaminant assessments in wastewater collection and treatment systems that provide for a greater culture of security. The projects funded by the grant covered the following broad thematic areas of security research:

- Emergency Response Plan (ERP) and Risk Communications
- Chemical/Biological/Radiological (CBR) Contamination Events and Operator Protocols
- CBR Sensors and Early Warning Systems
- Control System Cyber Security
- Physical Security Technologies

## Security Conditions at Small and Rural Wastewater Treatment Plants

A great deal has been written concerning security practices for large- and medium-sized water and wastewater systems. Some of these practices are relevant and applicable to small, rural, and tribal wastewater systems, but many are not. Small systems tend to have characteristics which preclude them from adopting many of the practices employed by larger wastewater and water utilities. For this project, the research team evaluated existing resources to identify security-related practices and approaches that meet the following conditions:

- **Pertinent to small, rural needs:** Enhancements and/or practices that address security-related issues prevalent among small, rural wastewater systems.
- **Feasible in small, rural context:** Security enhancements and/or practices that are consistent with perceived risk profiles and the technical, managerial, and financial capacity of small, rural, and tribal wastewater systems.
- **Applicable to the needs of the broader municipality:** Wastewater systems are commonly operated under the authority of a county, municipality, parish, special district, or tribal government. Security enhancements and/or practices should be framed to extend, enhance, or cooperate with other municipal and/or regional-scale needs and operations.



**This report outlines a strategy to help small utilities define and implement programs for ongoing sustainable security enhancement.**

## BENEFITS

- Provides a resource for general audiences concerned with risk reduction and security in small municipalities, including system managers, board members, and community leaders.
- Enables small wastewater systems to implement immediate security enhancements consistent with their technical, financial, and managerial capabilities.
- Provides a framework that small systems can use to plan and implement a long-term, sustainable program of security.
- Includes a hypothetical case study to illustrate how a wastewater utility can interact with neighboring localities and other municipal entities to plan a program of long-term security enhancement.

## RELATED PRODUCTS

*Emergency Response Plan Guidance for Wastewater Systems (03CTS4S)*

*Emergency Communications with Your Local Government and Community (03CTS5SCO)*

These projects and others under other security thematic areas were published as separate reports or tools. Some of these products are not available for public distribution because of security concerns, but are available through WaterISAC at <http://www.waterisac.org>.

## AVAILABLE FORMAT

Soft cover and online PDF.

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This study adopts a two-pronged approach with respect to risk reduction and security enhancement for small wastewater systems. First, the report identifies a series of security-related “Practice Areas” that can be implemented in the near term with modest expenditure of financial and/or staff resources. Second, the report outlines a strategy through which small utilities can plan and implement programs for long-term, sustainable security enhancement.

To identify security-related practices consistent with the needs and capabilities of small systems, the research team 1) conducted in-depth interviews with 45 small, rural wastewater systems; 2) reviewed after-action assessment reports developed by the National Rural Water Association (NRWA) describing damage and response actions taken on behalf of systems impacted by Hurricanes Katrina and Rita (NRWA, 2005); 3) conducted a “listening session” with system operators from Florida, Mississippi, Louisiana, and Alabama who had experienced the 2005 Gulf Coast hurricane season; 4) conducted a series of regional workshops involving small system operators, public works directors, and other municipal leaders to assess security-related needs and practices, and to elicit feedback on approaches being considered by the project research team; and 5) conducted broad-based technical literature review addressing small, rural, and tribal wastewater systems, their distinctive characteristics, and typical security-related practices and vulnerabilities.

### Examples of Key Areas of Near-Term Enhancement

- **Perimeter and appurtenance control:** Many small, rural system operators express confidence that they have adequate fencing, alarms, locks, keys, and lighting systems to reduce vulnerabilities to a wide range of threats, including vandalism, terrorism, and “attractive nuisance” liability issues. Most system operators feel that they are able to do a good job of securing doors, gates, hatches, manholes, and other appurtenances that might enable access by malevolent individuals, including terrorists.
- **Oversight of remote components and citizen watch programs:** The widely dispersed nature of system components, low population densities, and relatively small law enforcement forces employed by many rural municipalities and tribal governments combine to make it difficult to patrol and maintain adequate surveillance over utility assets. Some small systems report that citizen watch and similar programs significantly enhance and extend their ability to detect and report suspicious activities or other events that could result in system malfunction.
- **Hazardous material control and personnel training:** Standard training and relatively simple procedures can be instituted to help secure chemicals and assure safe operations.
- **Access to back-up power generators and training in generator operation procedures:** Power loss is perhaps the most common ramification of many types of emergency situations. Back-up generators provide improved reliability of service and reduce the likelihood of sewage overflows.
- **Mutual aid and assistance agreements:** Many small systems operate under some type of mutual aid and assistance arrangement with other utilities and/or municipalities. Mutual aid and assistance provides a way for resource-limited organizations to obtain temporary access to equipment and technical capabilities needed to address disaster situations. In this context, many utilities interviewed for this project report close, effective, and long-term interaction with local volunteer and professional fire departments.

### CONTRACTORS

Charles Herrick, Ph.D.  
*Stratus Consulting*

Joy Barrett, Ph.D.  
*Rural Community Assistance Partnership*

### RESEARCH TEAM

Nicole Kalas  
*Stratus Consulting*

### PROJECT SUBCOMMITTEE

Julia Anastasio  
*American Public Works Association*

Homer Emery  
*San Antonio Water System*

Gail Hackney  
*Arizona Rural Water Association*

Bill Kramer  
*National Rural Water Association*

Mary Messec Smith  
*Colorado Department of Public Health and Environment*

Gene Taylor  
*U.S. Environmental Protection Agency*

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