



**TO:** Chairman Thompson, House Committee on Homeland Security  
**FROM:** Mike Keegan, Analyst, National Rural Water Association  
Kirby Mayfield, Executive Director, Mississippi Rural Water Association  
**DATE:** January 28, 2008  
**RE:** Small Community Regulation Under Chemical Safety Legislation

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We are very grateful for your continued support for providing economically disadvantaged rural and small communities in Mississippi (and the other states) with U.S. Department of Agriculture water grants and low-interest loans, to build and improve drinking water and sanitation to rural America. This grand enterprise of providing safe drinking water and sanitation to rural areas, through USDA funding, has resulted in dramatic improvements in rural public health, a clean environment, and economic development. We want to thank you and acknowledge your unique and unparalleled leadership in Congress to sustain this funding. We also thank you for personally visiting hundreds of small towns in your District to make grants announcements, ensure communities are assisted, and even bringing other Members of Congress to disadvantaged communities in Mississippi, to make them aware of the need.

According to USDA, many rural communities still cannot afford to provide water to all residents and maintain sanitation systems - leaving thousands of families to haul water, rely on shallow wells, or use unsafe supplies. Unlike other environmental funding programs, USDA targets its funds to the smallest, most economically disadvantaged communities. As a result, the program has become the backbone of compliance with environmental mandates and increased public health/economic development in rural areas.

We are writing on behalf of over 27,000 small and rural communities in the National Rural Water Association. Regarding the chemical safety legislation being considered by the Committee, rural America needs your help. We urge you not to treat small local communities like chemical companies. We would be grateful for your support in exempting small local governments (drinking water and wastewater utilities) from this legislation or modifying the legislation to assist small and rural communities with security enhancements versus authorizing new, overly complex regulations that are backed up with fines on small, financially struggling local communities.

Enclosed is a list of all the small and rural water communities in your District that will be regulated under the legislation being considered by the Committee. Also enclosed, are a few profiles of the water and wastewater supplies in some of these communities published by Mississippi Rural Water Association's Circuit Riders. Many of these communities rely on gaseous chlorine to make their drinking water safe. This very effective, safe, and economical type of drinking water disinfection could be mandated to be changed under the proposal legislation, which could result in a step backward for public health protection in these communities that we have worked so hard to get to where they are today. As you know, Mr. Chairman, many of these communities are economically disadvantaged and can least afford and deal with new complex regulations and any potential fines for non-compliance.

Providing the Department of Homeland Security with the authority to fine small town officials (often local volunteers, teachers, mayors, doctors, retired citizens, farmers, etc.) thousands of dollars a day for not complying with regulations designed for chemical companies, fails to recognize the fundamental differences between the chemical companies and small local governments. Local governments (water and wastewater systems) are owned and operated by local consumers – the people who we are trying to protect. We have no profit incentives like businesses. By our very nature, they strive to take every possible action to protect consumers -- themselves.

Progress in drinking and wastewater security in small communities is more of a RESOURCE problem than a REGULATORY problem. Ensuring the best possible security protection in small communities means; (1) ensuring that limited resources are allocated in the most effective manner and (2) locally-elected leaders support security plans. The right approach for long-term progress relies on promoting local support, local education, and available resources. The problem that occurs under a regulatory approach is that it forces the adoption of uniform standards. This results in unintended consequences forcing many communities to spend limited resources on actions they don't see as improving their security at the expense of more important security actions that are unique to their communities. This is occurring under the DHS National Incident Management System (NIMS) where small communities are required to comply with NIMS training, protocols, and procedures that are not helpful, nor necessary, to protect their particular community. This costs communities time, money, and resources – and promotes the impression that federal security mandates are more unnecessary bureaucracy that channels local resources away from local priorities.

A federal framework for enhancing security should not start by putting everyone under a regulatory scope and making them prove (comply) their way out of the scope. It should provide resources and identify on an ad-hoc basis specific cases of local officials not living up to their public responsibilities. After such identification, the local political process would work faster and more economically at correcting deficiencies than a federal civil enforcement action. Plus, the local process promotes local responsibility for protecting their resources.

We have recently started to develop a best practices chemical supply society model, to be implemented in every community in the country. Industry, government, and security experts designed the initial model. We are now in the process of sharing the model with the Department of Homeland Security (DHS), the Environmental Protection Agency, and interested stakeholders, and we are actively looking for comments on ways to improve the model to be more protective. We would be eager to provide your Committee with a briefing on the content of the model at your convenience. Communities may begin to implement the model as soon as February 2008.

This effort is the most protective method to be identified for safeguarding local water supplies' chemical facilities – it will be more protective than extending the DHS current Chemical Facility Anti-Terrorism Standards, or a new Inherently Safer Technology program over water supplies for the following reasons:

- The model plan includes assessment and recommended security measures for all sized communities regardless of how small the quantity of materials they may have on site. Smaller facilities may pose less risk, however, they should be taking precautions to secure limited chemical supplies.

- In addition to walking communities through key security measures including tracking of chlorine tanks – communities must review their disinfection choice to ensure that it is the safest possible method of disinfection that can provide the necessary public health protection. These decisions could be reviewed by local citizens, state agencies, and federal agencies. No federal agency has identified a principal on how they could make these decisions. It is likely that local experts would have more knowledge and expertise to make these decisions, which will be unique in each community.
- The model is specifically tailored to focus on measures that are necessary and relevant in community water supplies, versus a commercial chemical facility making it more detailed, and more targeted for protection water supplies.
- Because the model is locally tailored to address each community's particular vulnerabilities, it promotes local community responsibility, which is essential to ensure protection. Responsible and vigilant local experts (water managers, police, mayors, councils, city managers, long-term community leaders, etc.) can best identify the most pressing vulnerabilities in any community and the most effective security plans. Some vulnerabilities can be as specific as where an extra set of keys is hanging in the office - and the possibilities are infinite. Any national chemical security initiative should result in communities enthusiastically focusing on enhancing local security based on local risk, and not result in communities striving for compliance and sacrificing the larger objective of innovative security plans. Local government should have the primary role and responsibility of ensuring security in their communities and the federal government should promote and assist with security measures.
- Upon completion of the model, each community will have a documented security plan that can be verified and open to public review as appropriate. Federal authorities can easily track which communities have taken the initiative to secure their chemical supplies. The contents of each plan can be held locally and be combined with each communities' vulnerability assessment and emergency response plans.

We appreciate your understanding that advancing security in local communities is fundamentally different from businesses. Local communities' security and planning decisions are already accountable to the local public. Also the mission of every community water supply is protection of public health and ensuring local resources are most effectively allocated. By design, every community strives to take all necessary protection, however, they are often in need of financial, administrative, and technical resources – addressing security concerns for local governments is more of a resource problem than a regulatory problem. The model (and the outreach provided by our professional associations) will promote local assistance, education and technical assistance, which is more appropriate than fines and penalties for communities whose only mission is the protection and safety of their citizens.

We would be grateful for your support in exempting local governments from new regulatory legislation to regulate the chemical security or modifying the legislation to assist small and rural communities with security enhancements. Thank you for considering the exceptional circumstances of small communities. Please contact us with any questions.

From: Mike Keegan [mailto:keegan@ruralwater.org]  
Sent: Tuesday, October 13, 2009 7:55 PM  
To: Freedhoff, Michal  
Cc: Cassady, Alison; Leviss, David; Cohen, Jacqueline  
Subject: Drinking Water Systems Security Act

Thank you for your assistance and interest in the perspective of small and rural communities regarding HR 3258. We appreciate the Committee's consideration and inclusion - and look forward to working with you on the legislation.

Below are our comments to the Committee on June 30, 2009, which reflect our position on the bill. In addition to the comments below, we would like to note that HR 3258 does not exempt small communities under 3,300 persons [section 2 (a)(2)(B)] - and many of these smallest communities rely on volunteers to operate their water supplies, have limited budgets to pay consultants for compliance, and have high concentrations of economically disadvantaged populations. If enacted, HR 3258 would open up all "covered" communities to \$25,000 a day in civil penalties for non-compliance [section 2(0)(1)]. It appears the complexity of the regulatory regime in the bill will likely overburden most small communities capacity and resources - even when they are taking all reasonable security precautions.

As noted in our June 30, 2009 comments and our letter to the DHS Committee, we urge the Committee to consider an alternative security approach in small communities that is more consistent with the widely successful approach from the 2002 Bio-terrorism Act. That approach recognized that small communities are self-governing, non-profit organizations; have no incentive not to take all security actions possible; want to provide safe water and conduct all security measures to protect their water supplies and communities - but are constrained by limited public financial resources. Ensuring the best possible security protection in small communities means, ensuring that limited resources are allocated in the most effective manner, locally-elected leaders support security plans which is critical for long-term success of security efforts, and tailoring a federal program that allows small communities to address the most pressing local security concerns in a manageable compliance program (like the Bio-terrorism Act) that doesn't waste local resources.

Thank you again for your outreach, --Mike Keegan

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Subject: RE: New E&C Water Security Draft  
Date: Tue, 30 Jun 2009 10:26:22 -0400  
From: "Cassady, Alison"  
To: "Mike Keegan" <keegan@bookcase.com>  
Thanks, Mike.  
Alison Cassady  
Professional Staff, House Committee on Energy & Commerce  
Rep. Henry A. Waxman, Chairman, (202) 226-4659

-----Original Message-----

From: Mike Keegan [mailto:keegan@bookcase.com]  
Sent: Monday, June 29, 2009 1:47 PM  
To: Cassady, Alison  
Cc: Couri, Jerry; Leviss, David; Freedhoff, Michal  
Subject: RE: New E&C Water Security Draft

Alison, thank you for the opportunity to comment on the Chairmen's draft chemical security legislation for drinking water supplies.

We appreciate your openness in this process and the consideration of the comments of small and rural communities with public water supplies. As you know, small communities make up over 90% of the

country's approximately 50,000 community water supplies and have the least ability to pay for additional federal initiatives.

After our initial review of the legislation, we are still advocating for an assistance-based approach to enhancing small communities' security - as explained in the attached January, 2008, memorandum to the Chairman of the House Department of Homeland Security Committee ([www.ruralwater.org/thompsonchemsec.pdf](http://www.ruralwater.org/thompsonchemsec.pdf)).

And we are concerned that a uniform/regulatory approach to security in small communities may result in unnecessary expense on low-income communities and mis-prioritizing of local security actions.

We have been working with the Department of Homeland Security (DHS) to develop a chemical security model that all public water systems can implement for no charge with the assistance of their state rural water association. This model was developed with small communities, industry experts, security experts, chemical supply experts, etc. We met with, and formally asked for DHS and U.S. Environmental Protection Agency (EPA) comments on the model - for any needed modifications to ensure it would be adequate. DHS has responded and is currently funding the development of the model, however, EPA has not responded. We are grateful for DHS' support and collaboration on this initiative. This type of approach will result in more security protection of water supplies because it allows communities to prioritize protection on their greatest local risks and ensures local support of security initiatives - versus complying with uniform standards to avoid enforcement actions.

Next week we plan to release the first adopted chemical security drinking water and wastewater plan for the city of Milford, Delaware (press release and Milford's completed chemical security plan are attached). After the release of the funding from DHS in the coming days, we will be able to allow all public water supplies in the country to have access to this free chemical security protection model - and we will begin distribution and implementation of the model.

We would urge the Committee to evaluate this model. We are eager to make any changes that the Committee believes would improve the model to increase protection. We estimate that many communities will begin adopting plans in the coming months. Without such a cost-effective and simple compliance method for small communities, we estimate that the charge for compliance in many small communities could exceed \$10,000 for consulting assistance (as was the case under the Bio-Terrorism Act which had more simple and less burdensome mandates).

In addition we are attaching our testimony before the Subcommittee on small community water supplies' experience with disaster recovery from hurricanes Katrina and Rita that explains what type of resources are needed by water and wastewater supplies during emergencies (<http://archives.energycommerce.house.gov/reparchives/108/Hearings/09292005hearing1646/Rutledge.pdf>).

We appreciate your continued help and support in assisting small and rural communities and we would be eager to further discuss any of the policies we have identified.

Mike Keegan, Analyst  
National Rural Water Association  
Washington, DC  
[t] 202-294-4785  
[f] 866-385-3160  
[keegan@ruralwater.org](mailto:keegan@ruralwater.org)

**TO:** Jerry Couri, Subcommittee on Environment and Hazardous Materials  
Michele Nellenbach, Environment and Public Work Committee  
**FROM:** John Montgomery, Mike Keegan, and Ed Thomas  
**DATE:** October 16, 2006  
**SUBJECT:** Federal Security Issues Regarding Water/Wastewater Supplies

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What we have been discussing within the rural water membership is which federal agency (EPA or DHS) would be the better agency to work with (from our perspective), for advancing water security in our constituency – small and rural water and wastewater supplies.

We have not considered the question; whether or not DHS can become the lead federal agency for water security or wastewater security, legislatively or administratively.

Our internal discussion is predicated on two main themes (1) positive initiatives within DHS for water security (local government initiatives) and (2) an ad-hoc evaluation of the efficacy of EPA's security polices and initiatives.

Small and rural communities have been encouraged by recent DHS security initiatives to work collaboratively with industry sectors in "partnerships" to enhance security – and utilize the established rural water outreach network to implement federal priorities (i.e. the NIMS project that the DHS has voluntarily initiated in Texas using the rural water outreach network and SEMS vulnerability assessment model utilized by most all small communities).

On the other hand, we have not seen a similar effort by EPA to work in partnerships with small communities or target their resources to the most effective security initiatives in small communities. We recognize that the EPA has used its resources and policy discretion as they see fit. This is perfectly legal and acceptable, however, small and rural communities believe that EPA should adopt a less uniform centralized approach to water security – and focus more of their resources on initiatives that are most successful in small and rural communities.

We do not think the uniform and/or regulatory model (EPA's institutional mission and history under the Safe Drinking Water Act & Clean Water Act) is the most effective for water security. The most protective security plans rely on local responsibility. Without the support of local people, no amount of outside oversight will secure each community's greatest vulnerabilities. Only local experts (water managers, police, mayors, councils, city managers, long-term community leaders, etc.) can identify the most pressing vulnerabilities in any community, and the most effective security and surveillance plans. Some vulnerabilities can be as specific as "where an extra set of keys are hanging in the office." The possibilities are infinite.

The Committees' Bio-Terrorism Act of 2002, acknowledged that the traditional EPA federal regulatory model was not appropriate for water security. We are grateful to the Committee for this – which has been very positive for advancing water security.

However, we think that in some of the key implementation efforts under the Bio-Terrorism Act (and other federal water security policies including Katrina and Rita relief efforts) EPA has not adequately established successful partnerships, targeted its security resources, recognized the most successful security initiatives at the local level, provided disaster relief "assistance," and understood the Congressional intent of the Bio-Terrorism Act. As a result, the main source of

compliance help, security and emergency response planning assistance, and communication in small water supplies – now operates outside of the federal governments’ efforts.

We have included a few examples of these conclusions:

- **Providing disaster relief assistance:** as explained in our testimony before the Subcommittee on Environment and Hazardous Materials, EPA’s efforts in disaster relief were focused on a uniform in-depth assessment of every water supply (including areas that were not significantly impacted) and monitoring for disinfection compliance. According to impacted communities this showed a lack of understanding of what is needed by a small water supply in an emergency – and was not helping meet their immediate water needs which were a rapid triage assessment, on-site technical expertise, emergency energy & operations assistance, parts & technical repair, labor, etc. See, the McGuyver quote from Florida Rural Water’s Gary Williams. [Source: <http://www.ruralwater.org/katrina/>]
- **Recognizing the most successful security initiatives are at the local level (and Congressional intent of the Bio-Terrorism Act):** EPA is sponsoring a federal advisory panel that includes EPA staff as sitting participants (Finding of the Measures Testing Group of National Aggregate Measures of Water Security, [www.epa.gov/safewater/ndwac/securityworkgroup.html](http://www.epa.gov/safewater/ndwac/securityworkgroup.html)). This panel is moving forward on endorsing a program that seems contrary to the limited federal oversight authorities in the Bio-Terrorism Act. The panel is moving forward with a federal program for communities to report on the content of their security plans (including vulnerability assessments) and procedures for a method of measuring the success or progress of local security plans. As participants on this “advisory” committee, EPA staff (along with other panelists) are advocating for a possible new federal security reporting structure and possible review of contents of local reports – a plan that was purposefully not authorized by Congress under the Bio-Terrorism Act. All of this potential reporting and review remains a voluntary federal program. However, the problem is, if this type of scheme is adopted by EPA, it would imply that reporting is endorsed and supported by EPA as necessary to promote security – and the inverse implication would be that non-reporting communities are not acting accordance with these federal directives. Not only does this seem contrary to Congress’ delegated authority, it is contrary to what small communities see as the most effective method of promoting security. As opposed to a uniform measuring of security progress, small communities support initiated a massive peer-review effort to show local communities how they can better protect their communities with a focus on each community’s specific needs and unique vulnerabilities. Such a concept has been initiated in Kentucky to overwhelming success and has resulted in communities changing their security practices since they have been convinced it is necessary.
- **Targeting of federal security resources and adequately establishing successful partnerships:** The most successful and widely supported EPA requirement to date was the vulnerability assessment (VA) mandate under the Bio-Terrorism Act of 2002. The reason we witnessed such massive compliance in such a short time – with minimum local resentment – was that Congress agreed to have EPA review the contents of each VA (but agreed to approve certain models and/or criteria to be contained in each VA in advance of

implementation). This flexibly allowed each rural water association (utilizing the SEMS-VA model) to walk all their state's communities through the SEMS model VA and comply almost immediately. If the federal government had to review the content of each of these VA plans, this initiative would have never started, still not be completed, have cost communities far more, have resulted in widespread backlash, and we would have had a variety of interpretations on which VAs were in compliance. With praise to Congress – the opposite happened. Most all communities completed VAs, protected their communities, and are still today improving and advancing ways to protect their communities. Most all small communities utilized the SEMS assistance approach to complete their vulnerability assessment for no charge. For example, in Minnesota 85% of the state's systems used SEMS to complete their vulnerability assessment. Most other states are finding similar rates of reliance on the rural water SEMS model. At the same time, many consultants were charging 2-10 thousand dollars to complete a vulnerability assessment for small communities. EPA did not query the database of communities competing vulnerability assessments in order to discover which models and outreach initiatives were most effective. We asked EPA to conduct such a query, however, the request was denied. EPA has sponsored and funded the development of other assistance software models that were more costly to complete, less utilized, and more costly to develop. The SEMS software developers (who are not water experts) have fielded over 1,500 phone calls from communities who needed technical help to complete the vulnerability assessment. This ad-hoc assistance is operating independent and outside of EPA and the federal governments security efforts – and has become the main authority on how to comply with the EPA requirements. This success of the rural water SEMS approach could be repeated in new and future rules/initiatives (wastewater security, chemical storage security, GWR, Stage II's IDSE, watershed trading, peer-review assessments, etc.) if EPA endorsed and supported this type of partnership. However, EPA has not adopted a supportive policy for this approach. In 2002, EPA did not support a proposal from NRWA to develop (and fund) the SEMS approach. In 2003, EPA did not support a proposal to expand the SEMS approach to wastewater security protection – and opposed USDA's effort to expand the SEMS approach for wastewater security protection (which is now moving forward over EPA's opposition). In 2006, EPA did not support a proposal from NRWA to expand the SEMS approach for the ground water rule. In 2006, EPA did not endorse the SEMS approach for helping small communities comply with monitoring requirements under the Stage II disinfection by-products rule (IDSE). One small community in South Carolina has been charged over a thousand dollars, by a consultant, to complete their IDSE plan – when the SEMS approach would have allowed them to complete the plan for no charge.

- **Being able to effectively communicate with local water supplies:** Local security plans and enhancements need to be adopted with full support of the local community we are trying to protect. The SEMS approach, combined with the rural water outreach is the main source of security assistance (and Bio-Terror Act of 2002 compliance assistance) in small communities. As our in-the-field experience and surveys show, there is not an effective federal government communications effort with small communities regarding water and wastewater security. This was the finding of EPA's own internal report 5 years ago and not much has changed. Our field survey found virtually no small water system has any knowledge of any EPA security personnel (nor have they received any security planning assistance from the U.S. EPA) [source:

[www.ruralwater.org/securitysurvey.pdf](http://www.ruralwater.org/securitysurvey.pdf)]. For example, most of the Threat Assessment documents that EPA was required to deliver to water systems never made it to the small systems through EPA's initial attempt. In 2002, EPA mailed water systems a letter detailing how they could gain access to EPA's Threat Assessment material. Systems were told to reply to the letter by faxing or emailing a request for a password to download the Threat Assessment from the water-ISAC or having it mailed to the system. Our experience shows that many small systems did not receive EPA's letter in October for a number of reasons: many of EPA's addresses were incorrect, the letters never made it to the correct local officials upon delivery, many systems could not get the fax to go through and stopped trying after a number of attempts, after having replied to the letter by fax, many systems did not receive a follow-up password, or received a password that did not function, or could not access the document on the internet, etc. After having heard numerous cases of systems not knowing about the threat assessment (or not having been able to get it through the password process), rural water advised systems to try again to get the Threat Assessment by using a new fax number, a new simpler form, and providing systems technical assistance to complete the transaction. In the course of two weeks, through their daily technical assistance contacts, Illinois Rural Water Association found over 25 small systems that had not been able to procure the Threat Assessment document. In Illinois, the rural water field technician worked with all these small communities to correct the problem. EPA staff told us that, after the rural water field staff addressed the issue, EPA has received a "wave" of requests. During a local rural water security training session at the time, one state association found that the majority of the systems, over 3,300, said they did not receive a letter from EPA. The difficulty in communicating continues. We are working to avoid the belief in small communities where locals often don't see the EPA as a partner with a common security mission, but rather as a bureaucracy that has to be dealt with – and a distraction from solving local priorities. To enhance the federal government interest in better communicating with local small water supplies on security issues, we are interested in discussing a communications partnership between the federal government and rural water associations. Much of this effort has stated in the Gulf States through independent mutual aid networks (source: [www.ruralwater.org/emergencynetworkrelease.pdf](http://www.ruralwater.org/emergencynetworkrelease.pdf)). By relying on state associations to execute the communications in an emergency, the system stays “on” continually because their state association is continually in contact with the local water supplies even when there is no crisis. This ensures that the same people supplying the federal government's information (in a crisis or in an ongoing manner) are the same people that the local water systems naturally turn to for help and advice. Also, water supplies are plugged into the rural training network, which is the main outreach of education in small communities. For example, Wisconsin Rural Water will conduct dozens of regional training session for small communities by the end of the year [<http://www.wrwa.org/workshops.html>].

We appreciate the Committee's consideration of our concerns and continued assistance. We would like to expand this grassroots approach to: implement the DHS NIMS in small and rural water and sewer supplies, to have every facility with significant chemical storage adopt responsible protection measures, implement a wastewater vulnerability assessment effort, review each vulnerability assessment with a peer-reviewed analysis – and make recommendation for additional local security enhancements, and make more of this information (where appropriate) available to the public.

# National Rural Water Association

Washington, DC  
[p] 202-742-4416  
[f] 202-742-4422  
[e] [water@ruralwater.org](mailto:water@ruralwater.org)

**TO: Ranking Member Inhofe, Chairman Thompson, Chairman Price and  
Chairman Dingell**  
**FROM: Mike Keegan and John Montgomery**  
**DATE: March 4, 2008**  
**RE: The Federal Government's Drinking Water Security Programs**

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We are writing to ask for your assistance in directing the federal government's agencies with responsibility for implementing drinking water security programs to adopt initiatives that are most economical, effective, and simple for compliance in small and rural communities. As you know, small communities with limited economies of scale can least afford and deal with new complex federal regulations and any potential fines for non-compliance.

In addition to issues highlighted in the attached memoranda to Congress and the Department of Homeland Security (DHS), we are urging the Environmental Protection Agency and the DHS to implement the Risk Analysis Method for Critical Asset Protection plan (RAMCAP) in a manner workable and cost-effective in small communities. Small communities make up over 90% of the country's approximately 50,000 community water supplies and have the least ability to pay for additional federal initiatives. However, the EPA informed us on February 12, 2008, that the agency would rely on one particular security model (the V-SAT model) to implement RAMCAP in all the country's small and rural communities.

The problem with this agency decision is that most all-small communities utilized a different, less expensive, and simpler security model to complete their Vulnerability Assessment plans under the 2002 Bio-Terrorism Act – and would prefer to build on that model to conduct RAMCAP in their water supplies. Allowing small communities to use their preferred model to implement this new federal directive would save local funds and significantly decrease the complexity of RAMCAP implementation. The small community preferred model (the SEMS model) could be easily modified to allow small communities to move through the RAMCAP plan. However, EPA has decided to only provide funding for modifying the model (V-SAT) that was not widely used by small communities and is more complex (and likely more costly) for small communities. To complete an RAMCAP method that relies on V-SAT, small communities would have to reconstruct their Vulnerabilities Assessments (already completed and filed with EPA) in a far more complex manner that, in many cases, will be beyond small communities' technical capacities.

We appreciate your continued help and support in making federal unfunded mandates as reasonable, economical, and simple as possible. We believe the EPA (and the other federal agencies) should prioritize allocating their funding resources to the portion of the regulated constituency most adversely impacted by their regulations. In this case, the cost of implementing security measures, such as the Vulnerability Assessment and RAMCAP plan, is far more costly per household in small communities versus large community – and this should result in EPA targeting their resources to reduce burden in the small communities.

Thank you and please contact us with any questions.

# National Rural Water Association

101 Constitution Ave., NW Suite 900

Washington, DC 20001

[p] 202-742-4416

[f] 202-742-4422

[e] [water@ruralwater.org](mailto:water@ruralwater.org)

**TO:** Jan Mares, U.S. Department of Homeland Security  
**FROM:** John Montgomery and Mike Keegan  
**DATE:** August 3, 2007  
**SUBJECT:** Securing Local Water Supplies

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As you know, local water supplies are critical to public health protection, sanitation, fire fighting, and emergencies facilities like hospitals, etc. They have been identified by DHS as one of the country's 17 critical infrastructure sectors and in need of federal protection. The National Rural Water Association (NRWA), over 25,000 small and rural community members, is actively advancing security in the country's small and rural drinking water and wastewater supplies. Small and rural communities have been encouraged by recent DHS security initiatives to work collaboratively with industry sectors in "partnerships" to enhance security - and utilize the established rural water outreach network to implement federal priorities. We are interested in further partnering with the Department of Homeland Security to enhance security within our constituency. The following summaries characterize our efforts and thoughts on:

- Implementing the Bio-Terrorism Act of 2002 (EPA Vulnerability Assessments)
- Securing Gaseous Chlorine in Small Water and Wastewater Supplies
- Implementing the National Incident Management System in Small Water and Wastewater Supplies
- Measuring Security Progress in Small Water and Wastewater Supplies
- Implementing Vulnerability Assessments and Emergency Response Plans in Small Water and Wastewater Supplies not covered in the Bio-terrorism Act
- Implementing a Security Communications Network and Effectively Targeting Federal Resources in Small Water and Wastewater Supplies

## **Implementing the Bio-Terrorism Act of 2002 (EPA Vulnerability Assessments)**

NRWA developed a specially designed vulnerability assessment model and implemented an outreach program to ensure compliance and assist water supplies in completing their vulnerability assessments (as required under the Bio-Terrorism Act of 2002). This EPA approved - rural water model (programmed into the simple SEMS software application that was distributed to small water supplies, [www.semstechnologies.com](http://www.semstechnologies.com)) allowed for immediate and simple compliance including electronic compliance filing. This software application has been modified/expanded to incorporate additional security modules including: wastewater SEMS, emergency response plans, DHS NIMS compliance, etc. EPA claims that upwards of 90% of the small systems used the rural water model to complete their vulnerability assessment. The success of this security and compliance effort was largely a result of the federal-local partnership that relied on the existing rural water network of local assistance, local government support, and useable/economical software application to complete the federal mandate. State rural water associations assisted communities in the

completion of the vulnerability assessments through regional training workshops and direct on-site assistance (i.e. [www.ruralwater.org/reporttocongress/chapter3.pdf](http://www.ruralwater.org/reporttocongress/chapter3.pdf) - p. 11). This resulted in massive compliance and support for the assessments. NRWA received a one-time \$2.0 million congressionally directed appropriation to carryout this initiative. We have been urging EPA and DHS to build on the success of the vulnerability assessment effort and use it as the model for all federal security efforts in securing small drinking water and sewer supplies.

### **Securing Gaseous Chlorine in Small Water and Wastewater Supplies**

Thousands of small communities rely on gaseous chlorine for public health and environmental protection - in treating drinking water and wastewater. Gaseous chlorine is often the key ingredient in ensuring the safety (disinfection) of local drinking water supplies - preventing waterborne disease outbreak. Additionally, this chemical is often the most effective disinfectant in eliminating microbiological pathogens from municipal wastewater effluent flowing into U.S. waters. NRWA is aware of the security risks associated with gaseous chlorine storage and transportation and we are assisting communities limit these risks through our expert field technicians in each state. However, there is no comprehensive national approach to address risks of gaseous chlorine at the local level. NRWA would be eager to implement such an initiative in partnership with the Department of Homeland Security. Such an initiative would be relatively simple to implement in the country's small water supplies through an expansion of the already adopted vulnerability assessments. We believe a simple planning and educational model could be adopted (in consultation with federal agencies, state agencies, and local governments). This program would be implemented similar to the vulnerability assessments in a matter of months using the rural water network and existing software that already contains the data for EPA's initial vulnerability assessments. Such a model would likely consist of: a local evaluation of the risk tradeoffs of gaseous chlorine storage versus the reliability of disinfection of alternatives, assistance and review of local security measures for storage and use of gaseous chlorine, assistance in changing to alternative treatments where appropriate, a mechanism for cataloguing the users of gaseous chlorine, and a metric to measure national progress in implementing the gaseous chlorine security plans in those communities.

### **Implementing the NIMS in Small Water and Wastewater Supplies**

DHS and one of our state associations (Texas Rural Water Association - TRWA) have agreed to a partnership and initial contract to implement the DHS' new emergency response systems (the National Incident Management System - NIMS) in small community drinking water supplies. This project has allowed implementation of NIMS to be practical and economical by expanding the SEMS vulnerability assessment application to include a new NIMS planning component, which upon completion, allows small communities to become NIMS compliant in Texas. The NIMS plan allows local water supplies to respond to natural disasters and any threats to security including terrorism (water contamination and disruption). It also establishes the local, state, and national coordination of first responders and other relief services. According to DHS, implementing the NIMS security plans in the country's critical infrastructure is a priority for national security. This is the first plan and partnership to move forward on a method for protecting one of the country's 18 specific critical infrastructure identified in the Homeland Security Presidential Directive (HSPD)-7 and the National Infrastructure Protection Plan (NIPP). The initial agreement between DHS/TRWA (February 16, 2007) was piloted in Texas. It was met with wide support in Texas drinking water supplies because the partnership agreed a tailored guidance for water supplies to adopt the NIMS plan by expanding the water supplies current Vulnerability Assessments to be NIMS compliant. We are eager to expand this effort to all communities and provide the necessary on-site assistance to ensure local adoption of NIMS.

### **Measuring Security Progress in Small Water and Wastewater Supplies**

The 2007 Water Sector Specific Plan of the National Infrastructure Protection Plan (NIPP), coordinated by the Department of Homeland Security (DHS) provides the framework for integrating Water Sector critical infrastructure and key resource protection efforts into a unified program. This effort includes the objective of measuring advancements in protecting the national water suppliers.

"The vulnerabilities, event consequences, and capabilities of typical small utilities are substantially different than larger utilities. Provided a small utility is not serving a critical facility, the tools and metrics it uses will of necessity be simpler, less resource intensive, and consistent with the lower likelihood that it will be a target of terrorist attack. However, small facilities that have higher exposures to natural disasters (e.g. coastal utilities or those in hurricane zones) may need somewhat more elaborate response and recovery plans. The most effective measures for small systems will be evaluated through the CIPAC process and will rely heavily on the vulnerability assessment and ERP tool used by the majority of small systems." [Water Sector Specific Plan]

Currently, NRWA is developing a set of straight-forward and understandable metrics that will give federal agencies and policymakers usable data/results on measuring such progress. Similar efforts have already been conducted, ad hoc, through our state rural water associations' peer-reviews and follow-up vulnerability assessment implementation reviews. In the coming weeks, our analysts will develop uniform metrics to measure security progress in small water suppliers and conduct a sampling of actual water suppliers to measure progress and test the metrics. We would encourage federal input on the content of the metrics and partnerships with NRWA in completing such a measure in small water suppliers in the country. Again, such an initiative would be relatively simple to implement in all the country's small water suppliers through an expansion of the already adopted vulnerability assessments and additional in-the-field resources.

### **Implementing Vulnerability Assessments and Emergency Response Plans in Small Water and Wastewater Supplies not covered in the Bio-terrorism Act**

The Department of Agriculture is prioritizing security advances and the adoption of vulnerability assessments in water suppliers, within their funding programs, in communities less than 3,300 populations (a total of 8,986 water supplies). This USDA initiative that is operating in partnership with state rural water associations - and relying on the SEMS vulnerability assessment application for water, wastewater, and emergency response plans - has resulted in the completion of vulnerability assessment in 58% of the applicable water supplies. This is one of the most successful approaches in implementing security plans in small communities and reflects that a non-regulatory approach can be more successful than a regulatory approach. Also, non-regulatory approaches ensure local support of participating communities in adopting security plans, which is the most critical element in security plans.

### **Implementing a Security Communications Network and Effectively Targeting Federal Resources in Small Water and Wastewater Supplies**

Rural water association networks have been the main source of assistance in emergency response in small and rural communities. In the most recent and severe case this summer, rural water technicians are the lead assistance in Greensburg, Kansas in restoring the drinking water and sanitary sewer service to that tornado stricken small community (providing water to the temporary hospital, housing units, and the community in time). This was also the case in the response to the hurricanes in the Gulf Coast where the hundreds of small and rural communities relied on

assistance from the local and surrounding state rural water associations for immediate assistance in restoring drinking water and sanitation service. However, there is not an effective federal government communications effort with small communities regarding water and wastewater security and disaster relief. This was the finding of an EPA internal report 5 years ago. Our field survey found virtually no small water system has any knowledge of any federal security initiatives [[www.ruralwater.org/securitysurvey.pdf](http://www.ruralwater.org/securitysurvey.pdf)]. To enhance the federal government interest in better communicating with local small water supplies on security issues, we are interested in discussing a communications partnership between the federal government and rural water associations. Much of this effort has been initiated through independent mutual aide networks ([www.ruralwater.org/emergencynetworkrelease.pdf](http://www.ruralwater.org/emergencynetworkrelease.pdf)). By relying on state associations to execute the communications in an emergency, the system stays "on" continually because their state association is continually in contact with the local water supplies even when there is no crisis. This ensures that the same people supplying the federal government's information (in a crisis or in an ongoing manner) are the same people that the local water systems naturally turn to for help and advice.

**TESTIMONY OF  
MAYOR BILL RUTLEDGE AND MAYOR EDDIE FAVRE  
ON BEHALF OF THE  
NATIONAL RURAL WATER ASSOCIATION  
BEFORE THE  
SUBCOMMITTEE ON ENVIRONMENT AND HAZARDOUS MATERIALS  
SEPTEMBER 29, 2005**

*Testimony available at [www.ruralwater.org/katrina](http://www.ruralwater.org/katrina)*

Mayor Eddie Favre  
City of Bay St. Louis  
<[higalley@aol.com](mailto:higalley@aol.com)>  
111 Court St., Bay St. Louis, MS 39520  
228-467-9092

Mayor Bill Rutledge  
City of Pontotoc  
<[mayorbill@pontotoc.net](mailto:mayorbill@pontotoc.net)>  
116 N. Main St., Pontotoc, MS  
662-489-4321

*[Note: This testimony was completed in one day, while we concurrently operated a full-time relief operation, and we ask the Committee for all deference in our ability to document and assess the situation and make our points. We believe we can appear before the Committee without compromising our relief operations and appreciate the opportunity to testify.]*

Background of Mayor Rutledge

Mr. Chairman, my name is Bill Rutledge; I have been the mayor of the City of Pontotoc, Mississippi, since 1997 (currently in my third term). Pontotoc is the northern part of the state and has a population of 5,200. I am vice president of the Mississippi Municipal League, one the board of directors of the Mississippi Rural Water Association, and a member of the Northern Mississippi Mayors Association. My background includes 27 years of military service, including the National Guard. Before becoming mayor, I was a Circuit Rider, a job that required me to travel to over 500 drinking water supplies in the state and assist those communities with operation, maintenance, and compliance with their drinking water systems. My city has had firsthand experience with disasters. In 2001, a tornado hit my community (and county) and devastated us; it wiped out 10% of our downtown area, killed six citizens, cut a swath a mile wide for 23 miles across the county, and destroyed 350 homes (not counting businesses).

Objective of My Comments

I hope to provide the Committee with the following key points in my comments:

- Illustration of what many communities experienced that were hit by hurricane Katrina.
- Explanation of what communities face in recovering from Katrina's impact.
- An attempt to provide a status of recovery of the communities in the region.
- Explanation of what the local communities see as the public health and environmental conditions of the region, and the progress that is being made on that front.

- Our (from the local perspective) initial thoughts on what has worked for recovery and why, and what we think federal policy makers should know in order to be better able to enhance federal emergency policy (both preparedness and response).

For much of my testimony, I will use the example of the City of Bay St. Louis, Mississippi, to illustrate my points and give a clear example of the situation. Bay St. Louis was one of the harder hit communities on the Gulf Coast. My community has been working with Bay St. Louis on response and recovery from the initial hours after the hurricane hit. Through our state municipal association, our cities have been paired up to provide this assistance in our “Adopt a City” initiative which has been a key effort to aide Bay St. Louis and which I will expand upon later. I am joined here today by my friend and colleague, Eddie Favre, who is the mayor of Bay St. Louis. I will read a joint statement to the Committee and both of us are happy to answer any questions.

A key objective of both of us, here today, is not to gratuitously criticize relief operations and/or federal agencies. We don’t think that would be of any service to our communities. We are interested detailing what did work and providing the Committee with a local perspective of public health and environmental conditions.

#### Background of Mayor Favre

Eddie Favre is in his fifth term as mayor. Before he became mayor, Eddie worked in the city administration and is a certified public accountant. Bay St. Louis is a community of 8,200 (currently 5,000) population on the Bay of St. Louis (on the Gulf Coast). The community’s water supply is provided by two wells and the wastewater service is maintained by 40 lift stations (sewer pumps) of varying sizes, located around the communities, with the effluent pumped to a regional wastewater system for treatment.

#### Summary of Katrina Impacts in Bay St. Louis

The night before the hurricane, the city staff was preparing for the water and wastewater system for the hurricane by checking the generators at the well sites and moving equipment and sensitive electrical facilities to secure areas. However, the hurricane flooded the community more than any imaginable level (significantly more than hurricane Camille, which had been the previous standard for flooding maps). Almost all of the city was under water of varying depths, some areas as much as 25 feet. Mayor Favre’s own home was in the one of the hardest hit portions of the city and all that is left now are a few pilings. He has been living in the fire station since the Sunday before the hurricane, where city officials and police stayed through the storm, and where they are staging relief operations. The extreme flooding lasted approximately five hours and, combined with the approximately 150-mile-an-hour winds, devastated the city: ripping up roads, piling houses on top of each other, toppling the largest trees, destroying a few thousands homes, destroying approximately 75% of the tax base, making approximately 60% of the homes in the community uninhabitable, etc.

The hurricane knocked out electrical service and flooded all 40 sewer lift stations, making them inoperable and destroying almost all the electrical components in the lift stations. One lift station was thought to be safe and emergency response equipment was stored there. However, even this station was flooded, destroying approximately \$500,000 of equipment (generators and backup electrical systems which the city desperately needed in the aftermath.

Immediately after the worst of the impacts (approximately midday on Monday), the condition of the water and wastewater system was dire. There were numerous breaks in lines; thousands of houses had been destroyed which tore lines from the ground; downed trees brought up lines; washed out roads left main lines exposed and damaged; both wells were down without power; etc. City officials started assessing damage and repairing the water supply by Monday afternoon. By Tuesday morning they were valving off lines and restoring the wells from generated power. Valving off lines is the first measure taken in restoring the water supply (restoring water pressure to portions of the system). This simply prevents the water from flowing out of the system through the breaks (which there were too many to count). Contamination can flow into the system through line breaks, and lack of pressure makes it very difficult or impossible to maintain the necessary disinfectant in the system. Of course, through this process, the entire system was under a boil water order. By Wednesday (day 2), some portion of the water supply was being restored to houses that were inhabited. The process of valving off sections of the communities in order to maintain pressure and find/fix leaks continued round the clock for the next 3–4 days. This process was very labor intensive. Any particular valve which needed to be shut off to return water service could be buried under a series of houses (many feet deep), buried by very large trees, or ripped from the earth from collapsed buildings. Much of this work required heavy machinery (backhoes, tree removal cranes, numerous chain saws, etc.) and it could sometimes take a crew the better part of a day to remove all the stacked houses and dig for the valve.

After initially stabilizing the water system, the city public works staff began assessing the needs of the wastewater systems. Each lift station had to be rebuilt, as the electrical control panels had been destroyed by water. New parts had to be ordered and installed in each station to begin wastewater service. Waste service was partially restored in a week (at approximately 2:00 AM the following Monday, the primary lift station was in service). Another 25 stations were operational by the following Friday. Every control panel had to be changed in the lift stations.

Wastewater has to go somewhere in a disrupted system—it was impossible to control all untreated effluent from the wastewater system at all times. The wastewater system was inundated with flood water. This, combined with restored water service and torn up sewer lines (opening them to be filled by sand, wood, kitchen sinks, tires, bricks, debris, etc), caused some isolated overflows or untreated wastewater. This overflow was highly diluted with rainwater, and the city initiated some ad hoc emergency treatment of the overflows by placing chlorine tablets directly into the overflow streams as they ran off from the wastewater system. Much of the runoff was being absorbed by receiving waters contaminated by the hurricane with dead animals, vehicles, and other debris washed into them. The city posted notices to stay out of the bay waters that had been contaminated from the general runoff and dead animals in the bay. Some people in distress had been washing items and bathing in the bay water.

Electrical power was restored 10 days after Katrina hit—for those 9 days the systems were operated on emergency generated power.

#### Current Status of Water and Sanitation

Currently, the water system is up and pressurized; however, we are finding new leaks every day and, as we restore new portions of the system and increase pressure, new breaks occur. The stress that is being placed on the water distribution system makes it fragile and prone to breaks. Loss of pressure means safety of the drinking water could be compromised. The water quality tests for coliform contamination have been met—the water has passed those tests, and the pressure is adequate, however fragile. And we are maintaining the necessary residual amount of

chlorine disinfectant in the system. All this means the boil water order could be lifted. However, it is the decision of the local city officials not to lift the boil order at this time because the distribution system is (in the mayor and public works staff's opinion) still too fragile and vulnerable. The order could be lifted in the coming days. As recently as Monday of this week, a main pump had electrical failure, which caused loss of pressure. Almost all the people in the area (upwards of 5,000) are drinking bottled water and only using the city water for washing, toilets, and household needs.

Currently, the wastewater system is operating, pumping all sewage possible to our regional treatment works. The wastewater system has experienced limited, isolated overflows from broken or backed-up service lines; however, this is minimal and decreasing each day. There is a backup system for all the centrally collected sewage, in the event that the regional treatment plant can't accept our wastewater stream. As a backup, the old lagoon is available to store and treat practically any wastewater overflow from the central collection systems. This backup could handle a number of days of the sewage without any discharge to the environment.

#### Immediate Technical Assistance and Equipment Is Needed (Environmental Regulation is Not Needed, Nor Appropriate)

Bay St. Louis has been helped through the recovery from the initial moments following the hurricane. Numerous technical response crews have been working in the community to restore water and sanitary service. The city has had Mississippi Rural Water Circuit Riders working every day for two weeks without break. Rural Water organized most of the personnel logistics in Bay St. Louis and in the other coastal counties. Rural Water Director Pete Boone and his staff were responsible for coordinating much of the recovery and providing technical personnel. Numerous utility crews have been working in Bay St. Louis from the City of Pontotoc; Clearwater, Florida; Fort Myers, Florida; Davenport, Iowa; Navy electricians (Seabees); Air Force Red Horse Squadron; American Gas Association; Yankee Gas; the Town of Cornett, Mississippi; and others that should be mentioned.

What is needed in this crisis and future crises is immediate access to technical personnel and equipment. Communities know the water is not safe long before it is declared not in compliance, and no one wants to restore safe water more than the local officials. We don't need someone to tell us we must comply, but rather, we need the help and know-how to fix the problem. The problem to solve is purely a RESOURCE problem not a REGULATORY problem. This is why regulators are of little help in these situations. The type of people that are needed are: experienced operators, electricians, machinery crews, machine repair crews, expert pipe repair personnel, contractors, etc. Mandating progress is easy; it is the "how-to" that is hard and essential to limiting harm to public health and the environment. For the "how-to," the city relied on the help from the previously mentioned volunteers.

From the mayor's perspective, water is about the most important service for public welfare. Sanitation is critical, however, a community can get by for some time with loss of sanitation. Electricity is perhaps equally as critical as water, and the return of electrical power is typically the sign that things are being pulled together, but drinking water is an immediate and essential public health and welfare service.

I was the second person Mayor Favre called after Katrina's impact in Bay St. Louis. Using resources from the City of Pontotoc, our crews loaded cargo trucks and city vehicles with backhoe tires and parts, washers, refrigerators, buster pumps, chlorinator parts, baby food, baby

clothes, blankets, plastic tarp coverings, diesel fuel, oil, gas cans, grills, cooking trailers, etc., along with four-man crews, and immediately headed for Bay St. Louis. Pontotoc has been shifting in three-man crews to Bay St. Louis and the neighboring hard hit city of Waveland every four days.

These crews and the technical crews from the mentioned organizations can operate heavy machinery, repair the machinery, isolate and fix leaks, install and repair pumps, dig up mains, etc. These crews have the experience to bring the water pressure up without damaging other parts of systems. The process of valving off sections of the system, repairing the lines, bleeding out the air, and returning pressure takes skilled technical personnel. Repairing of backhoe tires proved to be a desperately needed service and critical to recovering water and sewer.

One technical field person from Florida reported the following when asked what common technical assistance is needed in damaged communities:

*“Much more complicated [than just generators]. Electrical components cleaned and replaced; control panels rebuilt; electric motors and pumps replaced or rebuilt; bypass pumps installed; generators wired direct; lift stations cleaned with vacuums or jet cleaned; leaks located and repaired with backhoes brought out from Florida; valves located and closed/opened or valves inserted to isolate areas of system; lift stations rebuilt; wastewater plants made to work with baling wire, rubber bands, bubble gum, or anything laying around. For example, wire is needed to bypass missing electrical controls so crews can go into rubble of destroyed houses and pull out wire to rewire water and wastewater plants. Think in terms of 50 McGuyvers doing whatever it takes to get water to folks and stop wastewater in the streets, in the Gulf, etc. At one plant, Florida crews walked around the destroyed warehouse/supply building to find circuit boards, fuses, whatever they needed and could find to get plant online. They even took circuit boards found and cleaned up best they could, so they could be used. These are master electricians, instrument techs, and top professionals in there areas.”*

Other crews from Pervis, Lamar County, and Monticello have responded to other Gulf Coast communities. In all of their cases of critical response, there was no approval process, forms, or red tape—just neighboring communities (already familiar with each other through participation in common associations, including municipal leagues and rural water associations) responding with the know-how and immediacy regardless of potential reimbursement.

What we have witnessed in this relief operation is the necessity of familiarity among the needy and contributing communities. It has been apparent that strangers can't have the relationship, familiarity, and trust needed to be helpful in an emergency situation. Our two cities have been working cooperatively for years, eliminating any learning curve which could cause delayed response and the trust deep.

Working with partners in professional associations resulted in access to a network of experts. The Rural Water Circuit Riders were able to use their contacts across the state to acquire parts, plumbers, gas technicians, pipe, etc., that only comes from networking in the association of water and wastewater utilities. By networking within the association of mayors, Bay St. Louis and other cities were able to find immediate expert contractors and volunteer crews.

This familiarity and peer assessment/review also acts as a check against any fraud. Because we have all of the leadership of the communities in the state cooperative looking at the actions of all the other communities, it acts as an effective self-policing filter (a system of checks and balances).

Structural reasons that these volunteer and professional associations were so critical and effective in responding to the crises include:

- The fact that the associations' functions are directly accountable to their members (the communities), ensuring that they act in a manner most favored and beneficial to the membership.
- An understanding that time is a function of success (i.e., delayed response can significantly harm the public). In Louisiana, the EPA is conducting an in-depth assessment of every water supply (even communities with no reported problems). This type of inquiry has delayed what the communities believed was their immediate pressing need for equipment and technical assistance—to maximize public health protection. For example, while the EPA was just starting their intensive reporting assessment, communities were seeking out help where they could get it, and couldn't wait for EPA to complete its assessment. In Livingston Parish, a Circuit Rider found much of the parish's utilities without energy immediately following the hurricane. After coordinating with local officials, including fire officials and parish emergency offices, to target the most severely impacted utilities, the Circuit Rider was able to communicate with those operators via Nex-Tel (all phone communications were lost). Unable to procure water bladders from FEMA or emergency organizations, he was able to find approximately 20 water storage tanks and a colleague with a flatbed tow truck and started delivering the filled, large potable water storage containers to at least seven communities (Port Vincent, Paradise Ponte Island, Springfield, Head of Island, Killian, Bayview, and Vincent Acres). Working around the clock to keep the containers filled (10-hour supply), the pressure in the water systems was maintained. The tow truck operator was able to lift the main container on the truck high enough to create a siphon to fill the container left on-site.
- All authority is localized. There is no need to seek approval from a centralized hierarchy that is not in the middle of the situation—and real-time changes to plans and policies can be made to react to local conditions and variables.

What I have just described is the relief operations for communities' environmental services. However, there has been an allegorical response to our citizens' immediate individual human needs. The local churches have been the main response on this level. We have seen churches providing widespread operations to assist families and individuals. I personally witnessed a caravan of 71 church vehicles bringing relief to the Gulf Coast communities on one drive down highway 49 to Biloxi. In these communities, churches have been preparing meals for citizens and law enforcement officials tired of eating MREs, cooking on-site, carrying meals to people who won't leave their houses, taking in refugees, and all other acts of human kindness. There is not a church in my county that hasn't contributed to the relief.

Overall Assessment of Region's Environmental Impacts From Loss of Water and Sewer Service  
The assessments from Alabama, Mississippi, and Louisiana are detailed in the following appendix.