Disaster-Specific Preparedness/Response Plan

For Public Drinking Water Systems
Per Chapter 62-555.350 (15) F.A.C.

Guide for Public Drinking Water Systems

February 2005

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This template and guide has been developed by the Florida Rural Water Association (FRWA) in collaboration with the Washington State Department of Health, Office of Drinking Water, Olympia, Washington; and reviewed by Florida Department of Environmental Protection.

Acknowledgment of federal government support of this project:

This project and the preparation of this booklet was funded in part by a Water Protection Coordination grant from the Environmental Protection Agency through an agreement/contract with the Drinking Water Program of the Department of Environmental Protection. Total cost of the project was $3,000 of which $3,000 or 100 percent, was provided by the U.S. Environmental Protection Agency.

Introduction
Guidance and Instructions for Template

This guidance document has been developed to help you prepare your Emergency Response Plan.

Preparing an emergency response plan is an essential part of managing a drinking water system, and is required by Chapter 62-555 FAC for systems serving 350 or more people. The Florida Rural Water Association has made this template and guide available to assist public water systems in the development of Emergency Response Plans. The template and guide is made possible through a grant and has been reviewed by the Florida Department of Environmental Protection (FDEP).

How to Use the ERP Template and Guide

Developing an ERP can take a lot of time and effort. The purpose of this document is to make the job easier and help create a plan that works for your water system.

This ERP Guide and Template is intended for use by any water system and may be modified to fit the specific needs of each system. This ERP guide follows the outline in the template -- section by section. The template complies with FDEP minimum requirements and is just a sample; you may modify it in any way that works for you – add sections, or rearrange them if you wish. Larger water systems should use it only as a starting point, because the complexity of larger systems requires more detail.

Upon completion, **DO NOT** submit your ERP to the Florida Department of Environmental Protection (FDEP) **OR** the Environmental Protection Agency (EPA). If you serve more than 3,300 people, you are only required to CERTIFY to EPA that you have completed the ERP before December 31, 2004. FDEP will verify ERP completion during their Sanitary Survey of your system (routine water system inspection), and does not want copies sent to them.

It is recommended that you provide two copies to each supervisor, with instructions for them to store one copy on-site and one off-site to ensure that the document is available to them at all times.

Protecting Public Health

Safe and reliable drinking water is vital to every community. Emergency response planning is an essential part of managing a drinking water system.

Most public water systems have had routine operating emergencies such as pipe breaks, pump malfunctions, coliform contamination, and power outages. These are manageable if the water system has an emergency response plan that can be put into action quickly.

More serious non-routine emergencies may result from intentional acts of sabotage, chemical spills, floods, hurricanes, windstorms, or droughts. These can drastically affect the system and the community that depends on it.

Each emergency has unique effects on different parts of a water system. Floods can cause widespread bacterial contamination, hurricanes can damage sources and distribution systems, and storms can disrupt power supplies. The common element is that each emergency may threaten the system's ability to deliver safe and reliable drinking water.

Events that Cause Emergencies

Why do emergencies happen? There are a variety of reasons including:

- Natural disasters.
- Accidents.
- Deliberate acts of vandalism or terrorism.
- System neglect or deferred maintenance.

An emergency may affect the entire water system or only isolated sections. You should evaluate a variety of events regarding their potential effects on the water system and its infrastructure. Each type of event can cause different types of damage to system components or contamination resulting in a disruption in service. These evaluations should be reflected in the water system's vulnerability assessment and procedures for responding to specific events that are discussed later in this document.

Waterborne Illness in Walkerton, Ontario (2000)

What happened: Storm washes bacteria-laden cow manure into poorly planned and maintained well. Water pumped to taps throughout the town of Walkerton. Operational problems included inconsistent treatment of the water, falsification of water quality tests, mislabeling samples, and failure to notify public health officials in order to avoid regulators.

Results: Seven deaths, 2,300 illnesses from *E.coli* and c*ampylobacter* poisoning.

The fix: More than $11 million spent in reconstructing town's water system and installing temporary filtration.

Judicial inquiry: To find out what went wrong and to examine overall water safety. Found that water system operators were not trained to adequately operate a water system, and they falsified records and water quality tests.

Fallout: Class action suit for as much as $70 million. Government implements new water regulations. Careers ruined.

Cost: Study estimates financial cost of the tragedy at $155 million. Seven lives lost and many ongoing illnesses.

Natural Disasters

Florida water systems have a long history of reacting to and recovering from floods, hurricanes and wild fires. Furthermore, effective December 31, 2005, all water systems serving over 350 people are required to have an emergency response plans (ERP) for responding to such natural disasters.

An ERP should evaluate what facilities are at risk during a natural disaster, what can be done to mitigate impacts, and what actions can be taken to respond to such an event. It is also important to have backup communication plans, because radios and cell phones may not work after an emergency event.

Hurricanes: Hurricanes are an annual threat throughout Florida, and can cause a wide range of emergency situations over large areas of the state. Each water system should evaluate its ability to withstand the potential effects of a hurricane.

Floods: Floods also are a common event in Florida, particularly in conjunction with a hurricane. They can cause widespread contamination as turbid waters carry bacteria that can overflow sources, transmission lines, treatment facilities, and pumping facilities. Floods can also ruin electrical components and telemetry systems.

It is important for a water system to assess its vulnerability to flooding. Consider damage to roads and bridges where distribution or transmission lines are located. Washout of roads or bridges not only damage pipes but also can interfere with repair. If the risk for a flood is high, the water system should plan for and consider mitigating actions to protect facilities and equipment. Another consideration is identification of alternative transportation routes to get in and out of the area.

High winds: Thunderstorms often generate winds in excess of 50 miles an hour and have exceeded hurricane-force sustained winds of 74 miles an hour or greater from time-to-time. These storms often disrupt power and damage water system facilities.

Drought: Droughts are an issue and can have devastating effects on water supplies. During normal years, peak summer demands can double and even triple water use. These same demands during low water years can lead to water shortages. Drought severity is affected by a combination of environmental factors, all of which change over time, including rainfall, temperature, and length of drought. Compared to other natural disasters, drought has a relatively slow onset and is easier to anticipate.

Waterborne diseases: Organisms such as *Giardia* and *Cryptosporidium* can contaminate water supplies and cause waterborne diseases. The 1993 Milwaukee, Wisconsin *Cryptosporidium* outbreak killed more than 100 people and sickened more than 400,000. Another incident occurred in Walkerton, Ontario where an E. coil outbreak killed seven people and sickened over 2,300 (see sidebar on previous page). Both of these cases illustrate that proper operations, management, and planning are truly a matter of life-or-death.

Security Breach in Glen Rose, Texas (2002)

The incident: One night, someone cut a fence around one of the town's reservoir sites, climbed a 25-foot 200,000-gallon tank, and opened a locked hatch. City unable to quickly determine if a public health threat exists.

Actions taken: EPA alerted, along with FBI, Texas Department of Health, Natural Resource Commission, and Department of Homeland Security. EPA assembles a response team of drinking water experts to evaluate the water supply. Water in the tanks isolated, and analysis conducted to determine if water is safe to drink. Investigation begun to determine if this is terrorist activity.

Questions: What kinds of sampling should be conducted? Who has the expertise to do the analysis? How long does it take to get test results?

Analysis conducted: Traditional drinking water parameters, hazard characterization (HAZCAT), radiation, warfare agents. Forensics include light/polarized microscopy, infrared analysis, electron microscopy, and x-ray diffraction.

Difficult issues: Fire fighting vulnerability from low volume, identifying sensitive customers, maintaining acceptable water pressure, customers unhappy with the length of the incident.

Results: All lab tests negative. City, state agencies, and EPA discuss findings and conclude the water is not a threat to health.

Tank drained, cleaned, disinfected, and placed back on-line after ten days.

Human-Caused Events

Human-caused events that can result in a water system emergency include chemical spills, vandalism, terrorism, cyber-attack, fires, construction accidents, and basic neglect of maintaining the system.

Vandalism: Vandalism is generally a spur-of-the-moment act using materials at hand rather than pre-planned or pre-meditated activities. Vandals often break into systems, damage facilities, and paint graffiti. These acts are relatively easy to prevent by enhancing security, increasing lighting, installing locks on doors and hatches, improving signage, and putting up security fencing.

Terrorism: Acts of terrorism are conducted by someone whose intent is to instill fear or induce harm to people and facilities. Acts of terrorism are a very real threat in America. Even though it may seem unlikely, it would only take one well-staged event to undermine confidence in drinking water safety. Being prepared and knowing what to look for are crucial elements of preventing an attack on the system.

There are many potential threats to drinking water systems, including chemical, biological or radiological contamination as well as damage to infrastructure and computer systems. In most cases, contamination using biological or chemical agents would cause the most concern for a drinking water system. Although it would be difficult to effectively contaminate a large water supply with these agents or cause major damage, the possibility should not be taken lightly. The threat is real, and drinking water systems need to enhance security around facilities and be prepared to respond.

System neglect: System neglect, often referred to as deferred maintenance, is a major cause of emergencies. System components that are aging and need replacement go without attention for so long that they fail, causing an emergency. Drinking water systems need to continuously evaluate facilities and replace them before a massive failure occurs. In one case, a drinking water system continuously put off repairing its major transmission line that traversed a hillside in town. The line finally failed and caused an immense slide, destroying a number of homes and causing significant damage.

Cross Connections: A cross connection is an actual or potential physical connection between a public water system and any source of non-potable liquid, solid, or gas that could potentially contaminate the water supply through a backflow process. Cross connections usually occur unknowingly when someone makes a connection in the system. Backflow is the reverse flow of water or other substances into the public water system. Under backflow conditions, unprotected cross-connections can provide a path for biological, chemical, or physical contaminants to enter the water supply. These contaminants can lead to waterborne disease outbreaks, chemical poisonings, and sometimes death. Backflow usually occurs when there is a loss of pressure somewhere in the system causing water to reverse itself.

Construction accidents: Construction accidents sometime fall into the category of a routine operating emergency. For example, when a contractor damages a water line and the system needs to be shut down for repair. If the response is not timely and effective, this kind of incident can turn into a serious emergency. The system may loose pressure, resulting in serious backflow incidents that contaminate the water. The utility must be aware of construction in and around the system and be prepared to respond quickly to an accident if it happens.

Chemical spills: Many chemicals that are routinely transported can harm humans directly or by contaminating air or water. No drinking water system is safe from a hazardous chemical spill and the resulting contamination. Spills can come from motor vehicles, trains, airplanes, boats, or fixed containers. They can occur at any time without warning, and many solvents are able to leach through PVC pipes. In one 1981 incident, a small crop duster spraying a dangerous herbicide crashed into a central California river upstream from a water intake for a city water supply, resulting in a major emergency. Water systems should evaluate the potential for chemical spills in their wellhead protection programs and use that information for emergency response planning.

A water system may be vulnerable to many natural and man-made disasters. Understanding these vulnerabilities is an important part of emergency planning. In preparing a plan, you may not consider it necessary to do an extensive analysis of a rare event such as a ice storm in Immokalee. However, analyzing the impacts of vandalism or sabotage is important in that they happen quite frequently in Florida. Consider the probability of an event and its likely effect on the water system. Then focus on the actions needed to reduce impacts and respond in a timely and effective manner.

Example: Events That Cause Emergencies

Type of event	Probability or risk (High – Med – Low)	Comments
Hurricane	High	Frequently impact the coastal area
Flood	Medium	System located in an area vulnerable to flooding.
High Winds / Tornados / Thunderstorms	High	System is vulnerable to high wind events. Power is disrupted.
Ice Storm	Low	Rarely occur in Florida
Drought	Medium	Need to plan for decreased well yields during dry summers.
Terrorism	Low	Need to be trained on suspicious activity
Construction Accident	Medium	Construction crews often hit pipes.
Chemical Spill	Low	Complete wellhead protection plan.

Requirements For Emergency Response Plans

Chapter 62-555.350 (15) of the Florida Administration Code (FAC) requires that CWS serving 350 or more persons or 150 or more service connections to develop a written **Disaster-Specific Preparedness / Response Plan** (a.k.a. Emergency Response Plan or ERP) and shall update and implement the plan as necessary.

Plans are to be coordinated with Local Emergency Planning Committee and Florida Department of Law Enforcement Regional Security Task Force when developing emergency plans and shall include.

(a) Communication Charts
(b) Written Agreements with Other Agencies, Utilities, or Response Organizations
(c) A disaster-specific preparedness/response plan shall incorporate the results of a Vulnerability Assessment for each of the following disasters:
- Vandalism or Sabotage
- Drought
- Hurricane
- Structure Fire
- Flood, if applicable
- Forest or Brush Fire
- Hazardous Material Release

(d) Standby Power Requirements
(e) Recommendations regarding the amount of Drinking Water Treatment Chemicals

DEP Deadline for the completion of plans has been extended to December 31, 2005

The **Public Health Security and Bio-terrorism Preparedness and Response Act of 2002,** commonly referred to as the **"Bio-terrorism Act"** amends the **Safe Drinking Water Act** and requires Community Water Systems (CWS) serving greater than 3,300 persons to conduct a vulnerability assessment as well as revise or develop a **Emergency Response Plan (ERP)** to reflect the findings of the vulnerability assessment. This guidance document can be used to help meet the requirement for developing an ERP. Other methods or formats can also be used to meet the emergency response plan requirement.

Purpose of this ERP Guide

The purpose of preparing a ERP focuses on a water system's obligation to protect the health and safety of its customers, staff, and assets – and be able to maintain or restore safe and reliable drinking water.

You cannot do it alone. Developing partnerships with key response agencies should be reflected in the ERP. System personnel should begin by understanding what needs to be accomplished during an emergency. Protecting your customers' health is paramount. If the water has been contaminated, you must notify customers quickly. Then you must resolve the situation at hand and restore safe and reliable water throughout the system. This guide and template should help you:

- Prepare for emergencies and respond appropriately, is to protect the health of customers and community to respond immediately to a variety of events that may result in contamination of the water or disruption of water supply.
    - Be able to quickly identify the emergency, and initiate timely and effective response actions
    - Be able to quickly notify local, state, and federal agencies to assist in the response
    - Protect public health by being able to quickly determine if the water is not safe to drink or use and being able to rapidly notify customers effectively of the situation and advise them of appropriate protective action
    - To be able to quickly respond to and repair damage to minimize or prevent system down time.

Section 1
Communication Charts

When an emergency occurs, there can be confusion, lack of coordination, and poor communication. Timely and effective response can minimize the effects of an emergency. Often, the initial response sets the tone for the entire emergency.

Having a chain of command that defines clear lines of authority and responsibilities for system personnel during an emergency speeds up response time and helps eliminate confusion. System personnel need to know who to report the emergency to, who manages the emergency, who makes decisions, and what their own responsibilities are.

The First Response Step in many emergencies is to notify local law enforcement (call 911) and then the person at the top of the chain of command – the person responsible for managing the emergency and making key decisions. This lead person will assess the situation and initiate a series of response actions based on the type and severity of emergency. Larger systems may have a variety of persons involved in the chain of command. However, small systems may only have one person, usually the water system operator, in their chain of command. These systems will need to make sure each responsibility is clearly defined so the person does not forget any task during an emergency.

In addition to an individual having the lead responsibility, other key responsibilities that should be assigned to system personnel include the following tasks:

- Handle incoming phone calls and administrative support.
- Provide information to the public and media.
- Contact the customers.
- Assess the system's facilities and operations in the field.
- Organize and carry out repairs.

Water System Chain of Command – Lines of Authority

Order	Name & Title	Responsibilities During an Emergency	Contact Information
1	Marsha Ready, Water System Manager (WSM)	Responsible for overall management and decision making. The WSM is the lead for managing the emergency, coordinating with support agencies , and providing information to regulatory agencies, the public and news media. All communications to external parties are to be approved by the WSM.	Phone: 904-232-2323 Cell: 904-790-2323 Pager: 904-799-8999 Email: IMReady@goodwater.com
2	Freddy Filter, Water Treatment Plant Operator (WTPO)	In charge of running water treatment plant, performing inspections, maintenance and sampling and relaying critical information, assessing facilities, and providing recommendations to the WSM.	Phone: Cell: Pager: Email:

Order	Name & Title	Responsibilities During an Emergency	Contact Information
3	Mary Marshall, Office Administrator	Responsible for administrative functions in the office including receiving phone calls and keeping a log of events. This person will provide a standard pre-scripted message to those who call with general questions. Additional information will be released through the WSM.	Phone: Cell: Email:
4	Jerry Mander, Field Staff	Delivers door hangers and assists water system operator.	Phone: Cell: Email:
5			Phone: Cell: Email:
6			Phone: Cell: Email:
7			Phone: Cell: Email:

Emergency Notification

During most emergencies, it will be necessary to quickly notify a variety of parties. Your County Emergency Management Department is probably equipped with a variety of emergency communications equipment and may be in a position to provide valuable assistance with notification of the public. You should establish a partnership with your County Emergency Manager to coordinate this assistance.

Preparation for such notification has three essential components:

1. Assigning responsibility to oversee and carry out the notifications.
2. Assembling comprehensive call-up lists with names and contact numbers.
3. Writing out procedures for quickly disseminating information to appropriate parties.

If you don't have readily available notification information or the means to deliver it, you run the risk of losing valuable response time. This may make the difference between minor and major damage. Having well-formed partnerships will help during these times.

In addition to phone, email, and media for notification, consider forming partnerships with local community groups, scout troops, and school clubs to assist in delivering information when needed.
Water system managers from relatively small systems should poll customers to determine the best method of communicating. It is also a good idea to give customers some general safety information regarding what to do in case of an emergency before one happens.

Notification call-up list
Call-up lists should be comprehensive, including local law enforcement, DEP / DOH, spill response, local mayors and city officials, local health officials, safety officials, local emergency responders ,water testing laboratories, and service/repair providers. A list of priority customers, such as hospitals,

nursing homes, clinics, and schools should also be maintained for immediate notification. The template in Part 2 has comprehensive lists to assist you. You may modify them as necessary.

Notification procedures

Once you have your list completed, it is important to describe the procedures you will use to quickly distribute information to appropriate parties. These procedures describe how to make notifications to specific parties, who is responsible for conducting the notifications, who assists in the notifications, and what methods are used to complete them. In addition, specific procedures on how to issue a health advisory should be defined so that you are prepared to do so in the event that your water supply is unsafe for drinking or use. Issuing a health advisory should be done by the water system when there is reason to believe the water is unsafe. DEP / DOH staff members are available for consultation in making this decision, and your ERP should identify both the name and position title of the person(s) your system should contact for such assistance.

Notification call-up lists - Use these lists to notify important parties of an emergency.

Emergency Notification List				
Organization or Department	**Name & Position**	**Telephone**	**Cell Phone**	**e-mail**
State Warning Point	**Duty Officer**	**800-320-0519**	800-320-0519	N/A
Local Law Enforcement				
Fire Department				
Emergency Medical Services				
Water Operator (if contractor)				
County Health Department				
DEP District Office				
County Emergency Management Dept.				
Local Leader (City Mgr., Mayor, Chair. Co. Comm., etc.)				
Local Hazmat Team (if any)				
Hazmat Hotline				
National Spill Response Center.	Duty Officer	800-424-8802	800-424-8802	N/A

Emergency Notification List				
Interconnected Water System(s)				
Neighboring Water System (not connected)				
FRWA Water Circuit Rider		850-668-2746		

Priority Customers				
Organization Or Department	**Name & Position**	**Telephone**	**Cell Phone**	**email**
Hospital Or Clinic(s)				
Nursing Home(s)				
Public Schools				
Private Schools				
Wastewater Treatment Plant				
Food Processing Or Other Industry				

Service / Repair Notifications				
Organization Or Department	**Name & Position**	**Telephone**	**Cell Phone**	**email**
Electric Utility Co.				
Electrician				
Gas / Propane Supplier				
Water Testing Lab.				

Service / Repair Notifications				
Organization Or Department	**Name & Position**	**Telephone**	**Cell Phone**	**email**
Sewer Utility Co.				
Telephone Co.				
Plumber				
Pump Supplier				
"Dig Safe" or "One Call"				
Rental Equip. Supplier				
Chlorine Supplier				
Other Chemical Suppliers				
Radio/SCADA Repair Co.				
Bottled Water Service				
Bulk Water Supplier				
Well Drilling Co.				
Pipe Supplier				

Effective Communication

Effective communications is a key element of emergency response. Make sure you have a well thought out communications strategy in place as part of your emergency response plan. If you haven't planned ahead by the time a crisis hits, it's too late. How you communicate with your employees, customers, and the media can affect the outcome of the situation.

Developing partnerships with others in your local emergency response network, establishing relationships with your customers and the media, and creating communication tools such as fact sheets and media releases ahead of time will help you communicate efficiently and successfully during a crisis. For example, establish positive media relations before an emergency. Make an effort

to meet with reporters in your local area to share information about your water system and how they could receive information should an emergency occur. Also contact your local emergency response organization and determine what assistance they can provide during an emergency.

During an emergency, the media, your customers, and others will have many questions. Be prepared by organizing basic facts about the crisis and your water system. Assemble a team of players quickly, including a main spokesperson and one or more people to answer customer calls.

Expect your customers to be concerned or upset during a drinking water emergency. How you communicate with people is as important as the content of the information you are delivering. Body language, tone of voice, and expressions of sympathy all play an important role in how the information is received. When an emergency occurs, the news media may be on-scene quickly, requesting information that will inevitably go to the public. Appoint a spokesperson to communicate to the media. Make sure the spokesperson is credible, accessible, in a position of authority, and trained in media interview techniques.

Develop key messages to use with the media that are clear, brief, and accurate. Make sure your messages are carefully planned and have been coordinated with local and state officials. If your messages are different you'll want to know that and be prepared to explain why.

Make sure field and office staff know how to deal with the media and questions from customers and the public. It may be necessary to establish protocols for both field and office staff to respectfully defer questions to the spokesperson.

Small water systems that have limited staff should remember that your County Emergency Management Department, local Fire Department and Local Law Enforcement are available to assist in developing and communicating messages to the media and the public. This can be especially helpful when staff need to focus on resolving the emergency.

Communication Tips

Do:

- Be courteous
- Be prepared
- Designate a spokesperson
- Provide complete, accurate, and timely information
- Tell the truth
- Answer questions honestly (never lie)
- Express empathy.
- Acknowledge uncertainty and offer to get back with more information later.
- Document your communications.

Do NOT:

- Never volunteer any extra information and never estimate anything
- Speculate on the cause or outcome of an incident
- Blame or debate
- Minimize or brush off concerns of customers

- Treat inquiries from interested parties as an annoying distraction from the real business of emergency response

If you don't know the answer to a question, be honest and admit it, then tell the reporter(s) you will find the answer and get back with them --- then do it!

Develop an emergency situation news media plan --- just like preparing for a hurricane, have an media emergency media plan to deal with the news media in times of problems and/or emergencies including, service disruptions, breakdowns, shortages and, of course, in times of hurricanes and other natural disasters --- it always best to be on the offensive rather than the defensive with the news media.

Designated Public Spokesperson and Alternates

Designate a spokesperson (alternates) for delivering messages to the news media & public

Public Spokesperson	Name & Position	Telephone	Cell Phone
Spokesperson	Marsha Ready, Manager		
Alternate 1	Mary Marshall, Office Admin		
Alternate 2	John J. Dunbar, Operator		

Key Messages

Develop possible messages in advance, and update them as the emergency develops:
• We are taking this incident seriously and doing everything we can to resolve it. • Our primary concern is protecting our customers' health. • Another important concern is keeping the system operational and preventing damage. • What we know right now is _____ • The information we have is incomplete. We will keep you informed as soon as we know more. • We have contacted state and local officials to help us respond effectively. • If you think you may be ill or need medical advice, contact a physician. • We are sampling the water and doing tests to determine whether there is contamination.

Health Advisories – Boil Water Notices

During events when water quality and public health are in question, it may be necessary to issue a health advisory. The term *"Health Advisory"* means advice or recommendations to water system customers on how to protect their health when drinking water is considered unsafe. These advisories are issued when the health risks to the consumers are sufficient, in the estimation of the water system or state or local health officials, to warrant such advice.

Health advisories usually take the form of a drinking water warning or boil water advisory. Communication during these times is critical. DEP / DOH staff are committed to working closely with water systems to determine if an advisory is needed. Health advisories should always be well thought out and provide very clear messages.

Use the assistance of your County Health Department and/or District DEP office, and DEP's Mandatory Health Effects Language, located on DEP's website at:

http://www.doh.state.fl.us/environment/water/manual/boil.htm

http://www.DEP.state.fl.us/water/drinkingwater/rules.htm,

and click on "Mandatory Health Effects Language"., PLUS EPA's templates at:

http://epa.gov/safewater/pn.html

Click on "Microsoft Word and Word Perfect files of PN templates" (PN means Public Notifications), then determine which "Tier" of notifications is needed and click on the desired software to receive them in.

In determining whether to issue a health advisory, there are many things to consider and questions to answer, usually in a short time period. This is another important reason that water systems should form partnerships in advance of these events. If there are well-formed partnerships, it will be much easier to obtain information, make decisions, and get the information out to the public.

Section 2
Written Agreements With Other Agencies, Utilities, or Response Organizations

Include any written agreements with other agencies, utilities, or response organizations, such as emergency interconnects, mutual aid or FlaWARN.

Some of your best resources in an emergency are other organizations. Neighboring utilities and cities may have equipment and/or staff that you can use temporarily. The best way to take advantage of such possibilities is through a Mutual Aid Agreement or an Interlocal Agreement.
Mutual Aid Agreements and Interlocal Agreements exist to provide local jurisdictions with the opportunity to exchange services during an emergency or disaster.

A Mutual Aid Agreement is general in nature and is basically an understanding that support will be provided, *if possible*. The type of service to be provided is frequently open ended. A Mutual Aid Agreement is an understanding that, "…my jurisdiction will assist your jurisdiction during an emergency. Give me a call, let me know what you need, and I'll see what we can do." In most circumstances Mutual Aid Agreements are required to be implemented before assistance is requested from the state.

An Interlocal Agreement is specific in perspective and it is more contractual in design. With an Interlocal Agreement, specific services are agreed upon to be provided under defined conditions. An Interlocal Agreement provides a much clearer understanding of what support may be received during an emergency or disaster, but is less flexible.

It is important to understand that both Mutual Aid and Interlocal Agreements are contracts and can say and do what the parties want and agree should be done. In preparing agreements, legal authorities of the jurisdictions, prosecuting attorneys, city attorneys, or hired counsel should play an important part in drafting the document. What is prepared and signed is a matter of coordination and agreement between the local jurisdictions and must comply with legal requirements for that jurisdiction. Once signed, it is a contractual obligation.

Water contamination or disruption of supply may require that the water system get water from an alternative source to meet basic community needs. All public water systems should plan ahead to provide alternate safe water during an emergency, if feasible. It is important to evaluate potential alternative water supplies ahead of time to ensure that the water is safe and the supply is reliable, even during the potential emergencies.

Sources that the water system may use when the primary sources cannot meet demands are defined as "emergency sources." They are used only when required by extreme, and mostly unpredictable, circumstances. Alternative sources might include emergency or back-up wells, surface water sources, or springs. A water system that anticipates use of an emergency source should plan and take action well in advance of any need. As part of the emergency response planning, the water system should test these sources and work with FDEP / DOH to obtain approval of the emergency source. However, Ch. 62-555 FAC does not require the identification of alternative sources.

Another important consideration is whether the water system can establish an inter-tie with an approved water supply that might benefit both systems in an emergency. Discuss this possibility with adjacent water systems.

Emergency Interconnect(s)

Information on the location of interconnection(s) (if any), type and size of interconnecting pipe, pumps and accessory equipment, meters at interconnection(s), normal pressures at both ends of interconnection, volume of water from interconnection(s), type of agreement and approvals needed for use, procedures necessary to use interconnection, etc.

Location (Street)	Intersection of Hwy 60 and SR 244
Location (GPS)	
Description	The XYZ water system has an 8-inch connection with the ABC water system. It is in the southeast corner of the intersection in a vault below grade. All pipes are PVC, gate valves and double check valves are installed enabling flow in either direction. The connection is not metered, in accordance with the interlocal agreement. ABC can supply XYZ with up to 900 gpm indefinitely, about equal to XYZ's average daily usage.

Memoranda of Understanding

Organization	County Emergency Management (CEM)
Summary of Understanding	CEM to provide bottled water when the water system cannot provide any water. CEM to provide public notification when requested by the City Manager/Water System Manager.

Mutual Aid Agreements

Organization	City of Telluride
Summary of Agreement	Both cities agree to assist each other by sharing staff and/or equipment as requested by the City Managers. Neither is obligated to assist the other if resources are being used by the assisting system.

FlaWARN **WEBSITE FOR AGREEMENT: www.flawarn.org**

Organization	Numerous utilities statewide
Summary of Agreement	Utilities agree to assist each other by sharing staff and/or equipment. No utility is obligated to assist another if resources are being used by the assisting system.

Section 3
Disaster-Specific Preparedness/Response Plan

Your disaster-specific preparedness/response plan must include a Vulnerability Assessment and preparedness / response plans for: vandalism or sabotage; a drought; a hurricane; a structure fire; and if applicable, a flood, a forest or brush fire, and a hazardous material release.

Each disaster-specific preparedness/response plan shall incorporate the results of a vulnerability assessment; shall include actions and procedures, and identify equipment, that can obviate or lessen the impact of such a disaster; and shall include plans and procedures that can be implemented, and identify equipment that can be utilized, in the event of such a disaster.

In any event there are a series of general steps to take:

1. Analyze and confirm the type and severity of the emergency.
2. Take immediate actions to save lives.
3. Take action to reduce injuries and system damage.
4. Make repairs based on priority demand.
5. Return the system to normal operation.

Emergencies usually have a wide range of severity. Level of severity can significantly determine appropriate response actions. You must quickly analyze the apparent emergency and confirm what action is appropriate; otherwise you can make the situation worse. Knowing the severity of the emergency and being able to communicate it clearly to others will help system personnel keep their response balanced and effective.

Act first to safeguard personnel and save lives -- then take action to reduce injuries and system damage. Be observant of what is going on around you, and if you suspect vandalism, sabotage or terrorism, contact local law enforcement and make every effort to preserve evidence.

Before you become overwhelmed with the scope and breadth of the emergency or disaster take a moment to review system priorities. Actions/repairs should be based on established priorities (e.g. hospitals, emergency shelters, nursing homes, emergency operation centers, etc. to maintain pressure, flow and disinfection.)

Many factors might need to be considered before you decide to return to normal operation. For example:

- Has the system been repaired to the point that it can meet demand?
- Has the system operator made a safety and operational inspection of all system components?
- Has the system been properly flushed, disinfected and pressure tested?
- Has the water been adequately tested in accordance with sampling regulations?
- Does the water meet standards?
- Is there adequate staff to operate and manage the system?
- Do federal, state, and local agencies support returning to normal operation?
- Have you developed the proper public messages?

Each disaster-specific emergency response plan should include all steps required to return the system to normal operation.

Vulnerability Assessment

It is essential that water systems identify and assess the vulnerability of each system component for both natural and human-caused emergencies, before preparing their disaster-specific preparedness/response plans.

Assessing water system vulnerability for hurricanes, floods, other natural events, and vandalism is common. Community water systems serving populations greater than 3,300 persons were required by the Environmental Protection Agency to identify vulnerabilities to intentional acts of terrorism. Recent changes to Ch. 62-555 FAC incorporate the vulnerability assessment into Emergency Response Planning. This document uses the term vulnerability assessment to mean the process by which the water system evaluates each water system component for weaknesses or deficiencies that may make the system susceptible to damage or failure during a natural or manmade emergency.

In conducting the vulnerability assessment, the water system must estimate how the system and its facilities may be affected in emergency situations. Another integral part of the vulnerability analysis is to assess facilities for security enhancements that may guard against unauthorized entry, vandalism, or terrorism. This overall effort forms the basis for determining what preventive actions or improvements are needed and identifying response actions to take in the event of an emergency.

A vulnerability assessment is essentially a four-part process:

1. Identify and map the water system's components, including sources, treatment facilities, pump-houses, storage reservoirs, transmission lines, distribution lines, key valves, electrical power connections, communication systems, telemetry control, and computer systems.

2. Evaluate the potential and possible effects of various types of emergencies (hurricanes, vandalism, etc.) on the components. You may also want to assess the impact on the system's operations personnel from both a safety standpoint and the added stress of working in these conditions.

3. Define the system's expectations or set performance goals for system components in each event.

4. Identify improvements that have already been made, and any additional ones planned or proposed. Describe mitigating actions the system can take to lessen the impact of the events. **Note:** Ch. 62-555.315(1); 62-555.320(5), (7), (8) and (14) FAC require all systems serving 350 or more people to provide certain security measures.

Assessing system facilities

When conducting an assessment, it is important to involve all appropriate personnel because they are the best source of information on the system's history, operating conditions, and vulnerable components. Partners, including public health agencies, can also provide valuable insight. Many questions can be asked, for example:

- What components are susceptible to vandalism?
- Do the security measures in place comply with Ch. 62-555 FAC's requirements?
- Are the sources and storage reservoirs fenced and locked?
- Are entry gates and doors locked when unattended?

- Are all security measures practiced consistently by staff?
- Does overgrown vegetation compromise the effectiveness of fencing?
- Are there unsecured objects (such as building materials) around the facility that may be used for breaking and entering?
- Are warning signs posted around all critical components of the water system?

There are many ways to organize the assessments. One method is to identify the types of emergencies that are preventable and unpreventable as you assess each component. Preventable causes such as aging equipment, poor maintenance, poor system design, lack of security measures such as fencing and lighting, spare parts, high risk or ill advised land usage near a water sources are all factors that can be managed to prevent water system emergencies. Make sure to consider the land usage near your water sources when you describe your vulnerable areas. Contaminant sources such as septic tanks near your water sources may be managed through source protection measures. For example, relocating a septic system out of a sanitary radius or relocating livestock away from the source are important activities to consider.

Unpreventable causes are those that are beyond the control of the water system. Hurricanes, droughts, floods, vandalism, terrorism, and power outages are a few examples. These events can be anticipated, and some mitigating actions can be taken to lessen the impact. However, every emergency is unique and you can never anticipate everything that may happen. As you complete your assessment, pay particular attention to understanding how to respond to the event by developing a series of quick response actions that will help protect public health and lessen the overall impact.

Integrating water system security considerations

Historically, water system security and emergency response planning have focused on vandalism, contamination, and natural disasters. However, after recent terrorist attacks, the idea of what constitutes a threat to drinking water supplies has changed. There is new emphasis on enhancing water system security to guard against vandalism and intentional acts of sabotage. A critical step in enhancing water system security is integrating security considerations into the vulnerability assessment. This exercise helps to expand the identification of threats and define specific safeguards that can be taken to guard against attack.

There are many things to consider when evaluating the security of a water system. What are the most probable threats to the system? Is it a hostile employee, vandal, terrorist, or random cyber attack? These potential threats have different effects and consequences and require different mitigating actions.

In addition to using a variety of water system personnel to assist in conducting the overall vulnerability assessment, you may want to include a representative from local law enforcement. A fresh view from the law enforcement perspective may help identify something you have overlooked. Also, look into larger community emergency response planning efforts to assist you.

Another important security consideration is protecting sensitive information about the water system. The last thing you want to do is give potential vandals or terrorists access to information on your system's vulnerabilities and emergency response procedures. Identify sensitive information and protect it.

Identifying vulnerabilities, improvements, and mitigating actions

The table below shows a simple way for your system to identify the vulnerability of each component, and define what improvements or mitigating actions can lessen the impact of an event.

Once a vulnerability assessment has been completed, use the information for financial planning or budgeting processes. Prioritize the system improvements and security enhancements identified in the vulnerability assessment and determine how and when they can be funded. Are there some that justify a rate increase? Can they be funded from reserves? Consider these important questions as you finalize the vulnerability assessment and emergency response plan.

Example: Facility Vulnerability Assessment

System component	Description and condition	Vulnerability	Security improvements
Raw Water Source	Two 150' deep groundwater wells supply the system. They are located within a few hundred feet of developed areas. The wells are in excellent condition.	The wells are most vulnerable to contamination from above ground activities because they are only 150' deep.	1. Implement wellhead protection program. 2. Secure well houses to foundation and install lighting around well houses. 3. Upgrade well house doors with deadbolts. 4. Purchase additional land surrounding wells.
Pump-house and pumping facilities	The pump-house and pumping facilities are in good condition.	Pump-house does not have security fencing or lighting and is prone to vandalism.	1. Install fencing, lighting, and signage to protect against unauthorized entry. 2. Install tamper-proof padlocks and harden entry points.
Treatment Facilities	There is a chlorination system in each well/pump-house. Both are in sound operating condition.	Chlorination systems are subject to power outages.	1. Install fencing, lighting, and signage to protect against unauthorized entry. 2. Install a back-up generator in compliance with Ch. 62-555.320(14) FAC.
Storage Facilities	Storage reservoirs are in sound condition, but are not fenced.	Vandals could access reservoir hatches.	1. Install fencing, lighting, and signage to protect against unauthorized entry. 2. Coordinate with local law enforcement for increased patrols. 3. Install tamper-proof padlocks on hatches.
Distribution System	Approx. 10,000 lin. Ft. of mains, with diameters varying from 10 in. to 2 in. Plus approx. 300 fire hydrants, and approx. 50 city owned backflow preventers.	Any customer could back-pump chemicals into the system. Fire hydrants could be used to back-pump chemicals into the system.	1. Backflow preventers are required on all new service connections. 2. Backflow preventers are being installed on existing connections as described in backflow prevention program. 3. Fire hydrants have tamper-resistant locks, fire dept. and water staff have keys.
Computer and telemetry systems	Computer and telemetry systems are located in the water system's main office. All systems are in good operating condition.	Main office does not have adequate security measures. Also, computers should be better protected against cyber attack or hacking.	1. Secure computers and telemetry with firewalls, virus protection, passwords, and back-up protection. 2. Install security system in main office to guard against theft and vandalism.

The following tables–outline possible actions and procedures to be taken in response to specific events.

A. Vandalism or Sabotage Response Procedures

EXAMPLE

1. Utility staff first aware of incident:
   a) Calls 9-1-1/Local Law Enforcement.
   b) Calls Water System Manager (WSM).
2. WSM determines severity of incident, and calls:
   a) Mayor, who also informs city commissioners, and if necessary, calls for emergency meeting of City Commission.
   b) State Warning Point.
3. City Commission determines need to contact others:
   a) County Emergency Management Director.
   b) County Health Department.
   c) others as needed.
4. WSM assesses damage and directs repairs as needed:
   a) Isolate components (if necessary)
   b) Minimize damage
   c) Repair facilities
5. Upon completion of repairs, WSM returns system to normal:
   a) Reports findings to Mayor and others as needed.
   b) Updates ERP as needed.

B. Drought Response Procedures

Include water use restrictions per Consumptive Use Permit An emergency may require reducing water usage, so you should identify curtailment measures in advance. Possible measures include restrictions on landscape watering, car washing, filling of swimming pools and hot tubs, and other nonessential activities such as cleaning driveways and sidewalks. There can be various combinations of voluntary and mandatory measures. **The water system should develop and formally adopt measures through ordinance, resolution, or by-laws.**

As part of this effort, consider ways to inform customers about the need to curtail water use. Examples include door-to-door postings, phone contact, posting of signs in visible community areas, and contacting the news media. Curtailment messages should be pre-scripted to ensure proper messages are delivered.

EXAMPLE

1. WSM coordinates with Mayor and Water Management District (WMD) regarding drought conditions.
2. If necessary, Mayor meets with City Commission regarding additional (more stringent than required by WMD) water restrictions.
3. Mayor directs WSM to implement additional water use restrictions, if necessary.
4. WSM activates Customer Notification Plan.
5. City Commission determines there is no further need for additional restrictions.
6. WSM returns system to normal by activating Customer Notification Plan.

7. WSM reports system status as needed.
8. WSM updates ERP as needed.

C. Hurricane Preparedness & Response Procedures

Pre- Hurricane **(36 to 48 hrs prior to arrival)**	1. WSM coordinates with Mayor and County Emergency Management regarding response to hurricane. 2. WSM checks operation of auxiliary and standby equipment. 3. WSM orders/ensures available fuel and treatment chemicals to provide for a fourteen (14) day period. 4. WSM checks and replenishes inventory of spare parts and supplies; rain suits, flashlights, batteries, portable radios, hard hats, rubber boots, gloves, etc.. 5. WSM ensures fourteen (14) day supply of treatment chemicals is available.
Hurricane Watch **(24 to 36 hrs prior to arrival)**	1. City Commission declares Emergency; 2. Mayor instructs WSM to coordinate with Emergency Operations Center where Incident Command System is established. 3. Mayor cancels personal leave. 4. WSM issues work assignments and reporting protocol. 5. WSM authorizes employees to secure their personal property and arrange for safety of family members. 6. Employee(s) top-off fuel in vehicles, stand-by and portable equipment. 7. WSM stops all construction in utility service area and advises contractors to secure their equipment/material.
Hurricane Warning **(24 hrs or less prior to arrival)**	1. Personnel report to duty at designated location with protective gear, work clothing and personal gear for a four (4) day period. 2. WTPO fills all water storage facilities to capacity. 3. Employee(s) load trucks with supplies and equipment. 4. Employee(s) follow evacuation protocol (directed by Emergency Management) a. Disconnect electrical power supply to treatment plant(s) and wells. b. Store vehicles and equipment in designated area. c. Enact system shutdown and evacuate to location as directed by Incident Commander.

Recovery Procedures	Initiate upon receiving ***"All Clear"*** from Incident Commander: 1. WSM surveys damage and submits Damage Assessment Report to Mayor. 2. WSM coordinates with County Emergency Management Dept and activates Customer Notification Plan, if necessary. 3. WSM notifies FDEP of any limitations in ability to supply potable water. 4. WSM and staff make all necessary repairs and take water samples as needed. 5. WSM keeps detailed records of labor, material, rental and repair costs for FEMA reimbursement. 6. WSM obtains FDEP approval to return to normal operation, if necessary. 7. WSM returns system to normal operation. 8. WSM activates Customer Re-notification Plan, if necessary. 9. WSM reports water system information as needed. 10. WSM updates ERP as needed.

D. Structure Fire Response Procedures

EXAMPLE

1. Utility staff discovering fire:
    a) Orders evacuation of the building.
    b) calls 9-1-1 to notify Fire Department and local Law Enforcement.
    c) calls WSM.
2. WSM determines severity of incident, and calls:
    a) Mayor, who also informs city commissioners, and if necessary, calls for emergency meeting of City Commission.
    b) State Warning Point.
3. City Commission determines need to contact others:
    a) County Emergency Management Director.
    b) County Health Department.
    c) Others as needed.
4. WSM directs staff to support Fire Department and other emergency staff, if needed.
5. WSM and staff assess damage when fire extinguished.
6. WSM and staff repair facilities as needed.
7. WSM reports water system status, as required.
8. WSM updates ERP, as needed.

E. Flood Preparedness & Response Procedures

Is any critical part of your system in a flood prone area? If so, this procedure is required.

EXAMPLE

1. WSM informed of flood conditions at Well No. 1
2. WSM directs staff to operate water system without Well No. 1 for the duration of the flood event.
3. Once flood has receded, WSM and staff assess flood damage.
4. WSM and staff repair facilities as needed.
5. WSM directs staff to pump Well No. 1 until it is clear, and then take samples for quality and bacteriological analysis.
6. Staff repeats step 3 until the well meets water quality standards.
7. WSM directs staff to return Well No. 1 to normal service protocol.
8. WSM reports water system status, as required.
9. WSM updates ERP, as needed.

F. Forest or Brush Fire Response Procedures

Is any critical part of your system subject to forest or brush fire? If so, this procedure is required.

EXAMPLE

1. Utility staff discovering fire:
    a. Orders evacuation of any threatened buildings.
    b. calls 9-1-1 to notify Fire Department and local Law Enforcement.
    c. calls WSM.
2. WSM determines severity of fire, and calls:
    a. Mayor, who also informs city commissioners, and if necessary, calls for emergency meeting of City Commission.
    b. State Warning Point.
3. City Commission determines need to contact others:
    a. County Emergency Management Director.
    b. County Health Department.
    c. Others as needed.
4. WSM directs staff to support Fire Department and other emergency staff, if needed.
5. WSM and staff assess damage when fire extinguished.
6. WSM and staff repair facilities as needed.
7. WSM reports water system status, as required.
8. WSM updates ERP, as needed.

G. Hazardous Material Release Response Procedures

Do you have any hazardous material (chlorine gas) at your water system? If so, this procedure is required.

EXAMPLE

1. Utility staff discovering chlorine leak/release orders evacuation of facility, and calls 9-1-1 as well as WSM.

2. WSM calls:
    a. State Warning Point
    b. Mayor, who also informs city commissioners, and if necessary, calls for emergency meeting of City Commission.

3. WSM ensures that all staff are safe and aware of the situation.

4. Fire Department Hazardous Materials Team (FDHMT) determines severity of the leak and the need to contact others:
    a. County Emergency Management Director.
    b. County Health Department.
    c. Others as needed.

5. FDHMT establishes "hot zone" perimeter and ensures that all unprotected people are kept outside of it.
6. WSM ensures that any injured staff member is receiving proper care.
7. WSM directs staff to support FDHMT and other emergency staff, if needed.
8. FDHMT locates source of Chlorine leak and stops it.
9. FDHMT measures Chlorine concentrations until all areas are safe for unprotected people.
10. FDHMT informs all parties of safe conditions.
11. WSM and staff assess damage.
12. WSM and staff repair facilities as needed.
13. WSM reports water system status, as required.
14. WSM updates ERP as needed.

H. Other Disaster Response Procedures

NONE OF THIS EXAMPLE IS REQUIRED by DEP in Chapter 62-555.350(15). Use it only if there are other disasters that you want to prepare for, such as a Contamination Event, SCADA Attack, or Structural Damage from an Intentional Act?

EXAMPLE

Contamination

1. Utility staff first aware of apparent contamination:
    a) Calls local law enforcement
    b) Calls Water System Manager (WSM).

2. WSM determines if contamination is indicated, and if so calls:

a) Mayor, who also informs city commissioners, and if necessary, calls for emergency meeting of City Commission.
b) State Warning Point and requests immediate assistance from a Florida Environmental Response Team (FERT).
c) County Health Department.
d) 9-1-1/Local Law Enforcement, IF a criminal act is indicated.

3. WSM, Mayor and City Commission, in consultation with FDEP and County HD, determine need to contact others:
   a) County Emergency Management Director.
   b) Local media and others as needed.
   c) Water utility customers.

4. WSM and County HD prepare notice to customers, if needed.
5. WSM distributes approved notice to customers and media.
6. FERT determines sampling protocol, takes samples, and determines what the contaminant is.
7. FERT advises County HD, WSM and Mayor of the contaminant and assists with determination of action required.
8. WSM takes action required to eliminate contaminant from water system and protect public health.
9. Upon obtaining FDEP/Co. HD approval, WSM informs Mayor of water system's return to normal.
10. Mayor informs media that the water is free of the contaminant and the water is safe.
11. WSM prepares an "all clear" notice for customers.
12. WSM has "all clear" notice distributed to customers.
13. WSM prepares report of incident, and:
    a) Reports findings to Mayor and others as needed.
    b) Updates ERP as needed.

SCADA Attack

1. Utility staff first aware of attack:
   a) Calls Water System Manager (WSM).

2. WSM determines severity of attack, and if appropriate, calls:
   a) Mayor, who also informs city commissioners, and if necessary, calls for emergency meeting of City Commission.
   b) State Warning Point.
   c) 9-1-1/Local Law Enforcement.

3. City Commission determines need to contact others:
   a) County Emergency Management Director.
   b) County Health Department.
   c) others as needed.

4. WSM assesses damage and directs computer system repairs as needed:
   a) Repair hardware components (if necessary)
   b) Replace software, as necessary
   c) Install improved electronic security, as necessary.

5. Upon completion of repairs, WSM prepares report of attack, and:
   a) Reports findings to Mayor and others as needed.
   b) Updates ERP as needed.

Structural Damage from an Intentional Act

1. Utility staff first aware of damage:
   a) Calls 9-1-1/Local Law Enforcement.
   b) Calls Water System Manager (WSM).

2. WSM determines severity of incident, and calls:
   a) Mayor, who also informs city commissioners, and if necessary, calls for emergency meeting of City Commission.
   b) State Warning Point.

3. City Commission determines need to contact others:
   a) County Emergency Management Director.
   b) County Health Department.
   c) others as needed.

4. WSM assesses damage and directs repairs as needed:
   a) Isolate components (if necessary)
   b) Minimize damage
   c) Repair facilities

5. Upon completion of repairs, WSM returns system to normal:
   a) Reports findings to Mayor and others as needed.
   b) Updates ERP as needed.

Section 4
Standby Power Requirements

Include details about how the water system meets the standby power requirements as described in Ch. 62-555.320(14), and 62-555.350(15)(d) FAC. Each community water system (CWS) serving, or designed to serve, 350 or more persons or 150 or more service connections shall provide standby power for water source, treatment, and pumping facilities necessary to deliver drinking water meeting all applicable primary or secondary standards at a rate at least equal to the Average Daily Water Demand.

The details about standby power should include the following:

1. Description of each standby power source and location; or connection to at least two independent power feeds from separate substations;
2. Description of exactly what facilities each standby power source is connected to and designed to operate;
3. Description of how electrical loads will be transferred from one power source to another (automatically/manually) such that minimum water distribution system pressure is maintained,
4. Description of audio-visual alarm system activated and operator(s) are notified in the event any power source fails.
5. Recommendations regarding the amount of fuel to maintain on site, and the amount of fuel to hold in reserve under contracts with fuel suppliers, for operation of auxiliary power sources.

Standby Power for Wells or Surface Water Intakes

Standby Power (or by alternate means) to OPERATE WELLS at Average Daily Demand

Average Daily Demand (ADD) in gpd or gpm	800,000 gpd or 556 gpm
Wells Needed to Supply Average Daily Demand	Well No. 2 -- 850 gpm
Standby Generator (kW) Needed for ADD &	100 kW, 480 Volt, 3-Phase, John Deere, Trailer Mounted
Power Failure Transfer, Alarms & Notifications	Automatic Transfer Switch, Audio-Visual Alarm System Activates at Power Failure and Transfer and Operators are Automatically Paged
Generator Fuel Consumption	4.2 gallons per hour
Recommended On-Site Fuel Storage (gallons)	300 gal – 3 days
Reserve Fuel by Supplier Contract	1,100 gal – 11 days

Standby Power for Treatment Facilities

Standby Power (or by alternate means) to TREAT WATER at Average Daily Demand

Treatment Facilities Needed to Supply ADD	**Sodium Hypochlorite Injector Pump**
Standby Generator (kW) Needed to Operate ADD Treatment Facilities	5 kW, 120 Volt, Single-Phase, Honda
Power Failure Transfer, Alarms & Notifications	Automatic Transfer Switch, Audio-Visual Alarm System Activates at Power Failure and Transfer and Operators are Automatically Paged
Generator Fuel Consumption	0.85 gallons per hour
Recommended On-Site Fuel Storage (gallons)	100 gal – 4 days
Reserve Fuel by Supplier Contract	250 gal – 10 days

Standby Power for Pumps

Standby Power (or by alternate means) to PUMP WATER at Average Daily Demand

Pumps Needed to Supply ADD	High Service Pump No. 2 or 3 - 600 gpm
Standby Generator (kW) Needed to Pump ADD	100 kW, 240 Volt, 3-Phase, Kohler, Trailer Mounted
Power Failure Transfer, Alarms & Notifications	Automatic Transfer Switch, Audio-Visual Alarm System Activates at Power Failure and Transfer and Operators are Automatically Paged
Generator Fuel Consumption	2.8 gallons per hour
Recommended On-Site Fuel Storage (gallons)	225 gal – 3 days
Reserve Fuel by Supplier Contract	825 gal – 11 days

Section 5
Drinking Water Treatment Chemicals & Disinfectants

If applicable, recommendations regarding the amount of drinking water treatment chemicals, including chemicals used for regeneration of ion-exchange resins or for onsite generation of disinfectants, to maintain in inventory at treatment plants. Do not just list chemical storage capacity, but instead recommend the minimum amount of chemicals to maintain in inventory, which depends upon the location and reliability of chemical suppliers, the status of impending disasters, etc.

Disinfection Treatment Information

Disinfection Chemical(s)	Chemical / Location No. 1	Chemical / Location No. 2
Name of Chemical	Sodium Hypochlorite for Pre and Post Chlorination	Anhydrous Ammonia for Chloramination
Type of Chemical Feed	Positive Displacement Injector Pump	Positive Displacement Injector Pump
Chemical Storage Location	In Well House	In Well House
Recommended Minimum Amount to be Maintained in Storage (gal) (2 week supply)	200 gallons	50 gallons

Other Chemical Information

Chemical(s) Used	Chemical #1	Chemical #2	Chemical #3	Chemical #4
Name of Chemical	Lime Softening	Poly-Phosphate		
Type of Chemical Feed	Slurry Pump	Injector Pump		
System Location	At Well 1 Only	Water Plant High Service Pumps		
Chemical Storage Location	At Well 1 Only	Water Plant High Service Pumps		
Recommended Minimum Amount to be Maintained in Storage (gal) (2 week supply)	Lime, 250 lbs. Slaked Lime, 100 gal	55 gallons		

Appendix A
Basic System Information

This information is useful and recommended for inclusion in your ERP, it is not required by DEP in Chapter 62-555.350(15).

Keep this basic information readily available for when you need it for emergency responders, repair people, the news media and potentially, an emergency operator.

Basic System Information

System identification number (PWS ID)	**5555555**	
System name and address	**XYZ Water System** **123 Main Street, PO Box 123** **Sample, FL 33333**	
Basic description and location of system facilities	**The XYZ water system has two groundwater wells. The wells pump through chlorination injection facilities into the ground storage tank. High Service pumps deliver water to the elevated storage tank.**	
GPS Coordinates	**Latitude: 29° 43' 45" Longitude: 81° 54' 15"** *GPS coordinates will help emergency crews find your system following a major catastrophe.*	
Population served and service connections.	Population = **650**	Connections = **225**
System Owner	**Sample City**	
Management Authority	**Mayor and 4 Commissioners**	
Name, title, and phone numbers of person responsible for maintaining and implementing the ERP.	**Marsha Ready** **Water System Manager (WSM)**	**904-232-2323 - Phone** **904-790-2323 - Cell** **904-799-8999 - Pager**

System Demand

Demand based on Monthly Operational Records and system capacity based on Sanitary Survey.

Average Daily Demand (gpd)	800,000 gpd
Maximum Daily Demand (gpd)	1,480,000 gpd
System Capacity (gpd)	1,800,000 gpd
Peak Hour Demand (gpm)	1,540 gpm

Location of Pertinent Information

Item	Location
Distribution System Map	Hanging file in operator's office, labeled "Distribution System"
O&M Manual(s)	Bookshelf in operator's office, 3rd shelf from top.
Start-Up / Shut-Down Procedures	Operator's top left file drawer, labeled "Start-up / Shut Down"

Well Information

GPS coordinates will help emergency crews find wells following a major catastrophe.

Well Information	Well No. 1	Well No. 2	Well No. 3	Well No. 4
GPS well tag #	AAA1234	AAA1235	AAA4321	AAA3214
Location (street)	Jones Rd & 3rd St.	SR 60 & Main St.	CR 62 & Farmers Market PL	
GPS Coordinates	Lat: 29° 43' 45" Long: 81° 54' 15"	Lat: 29° 44' 00" Long: 81° 55' 00"	Lat: 29° 42' 45" Long: 81° 54' 30"	
Well Depth (ft)	300 ft	400 ft	400 ft	
Well Yield (gpd)	900,000 gpd	1,300,000 gpd	1,300,000 gpd	
Pump Type	Vertical Turbine	Submersible	Submersible	
Manufacturer	Gould	Gould	Gould	
Capacity (gpm)	600 gpm	850 gpm	900 gpm	
Motor Manufactured	Lincoln	Lincoln	Lincoln	
Horsepower	20	50	50	
Phase	3-Phase	3-Phase	3-Phase	
Volts/Amps	480 Volts / 20 Amps	480 Volts / 50 Amps	480 Volts / 50 Amps	

Surface Water Sources

GPS coordinates will help emergency crews find surface water intakes following a major catastrophe.

Surface Water Information	Intake No. 1	Intake No. 2
Location (Street / Description)	N / A	N / A
GPS Coordinates		
Critical Water Level		

Finished Water Storage

GPS coordinates will help emergency crews find tanks following a major catastrophe.

Name of Storage Unit	Tank No. 1	Tank No. 2	Tank No. 3	Tank No. 4
Location (Street)	Water Plant	45 Oak Street	1504 Hwy 19	
Location (GPS)	Lat: 29° 43' 45" Long: 81° 54' 15"	Lat: 29° 44' 00" Long: 81° 55' 00"	Lat: 29° 42' 45" Long: 81° 54' 30"	
Type (ground, elevated, etc.)	Bolted Steel Ground	Steel Elevated	Concrete Ground	
Capacity (gal)	50,000 gal	150,000 gal	75,000 gal	
Empty Elevation	N / A	145-ft	N / A	
Overflow Elevation	55-ft	175-ft	85-ft	

High Service Pumps

HSP	HSP No. 1	HSP No. 2	HSP No. 3	HSP No. 4
Location (street)	Water Plant	Water Plant	Water Plant	
Pump Type	Split Case Centrifugal	Split Case Centrifugal	Split Case Centrifugal	
Manufacturer	Ingersoll-Rand	Ingersoll-Rand	Ingersoll-Rand	
Capacity (gpm)	300 gpm	600 gpm	600 gpm	
Motor Manufacturer	Delta	Delta	Delta	
Horsepower	20	40	40	
Phase	3-Phase	3-Phase	3-Phase	
Volts/Amps	480 Volts / 20 Amps	480 Volts / 50 Amps	480 Volts / 50 Amps	

Appendix B
Training and Rehearsals

This information is useful and recommended for inclusion in your ERP, it is not required by DEP in Chapter 62-555.350(15).

Emergency response training is essential. Training educates system personnel about emergency situations and resulting effects on water systems and also provides an opportunity to practice responses. Any training should have a purpose, appropriately selected personnel, and qualified instruction and supporting materials.

Training can be conducted in a variety of ways, including attending training classes or bringing in experienced trainers for on-site training and exercises. Training should include information about the Incident Command System; how it works; when it's implemented; who's involved; and how water system staff may fit into it. Personnel can practice emergency communications, isolating parts of the system, inspecting system components, and learning what to look for in case of a security breach. It is also important to train staff on how to communicate with the media and customers during an emergency.

Periodic training reinforces previous efforts, as people often forget things that they don't use very often. It also provides an opportunity to train new staff and learn about new problems, new techniques, and changes in equipment. Be aware of current and upcoming training topics, especially hot topics that tend to come around as a result of a specific event.

Emergency rehearsals, sometimes referred to as "table-top exercises" are valuable tools to make sure employees are always prepared to respond. Ideally, rehearsals are set up by the water system manager and are unannounced to employees. Practicing for an emergency is the only real way to thoroughly evaluate the emergency response plan and the system's ability to implement it. The final step of a rehearsal is to evaluate and discuss the results.

For maximum effectiveness, it is recommended that you coordinate training and rehearsals with your County Emergency Manager.

Schedule for drills, tabletop exercises, and other ways to practice emergency response:

Event	Description	People & Organizations Involved	Date
Training	Emergency response communications, emergency response planning, issuing health advisories. Incident Command System roles and responsibilities	Water System Manager	TBD
Training	Emergency response communications, emergency response planning, suspicious activity training. Incident Command System roles and responsibilities	Water Treatment Plant Operator	TBD
Training	Emergency response communications, suspicious activity training	Field Staff	TBD
Training	Emergency response communications, emergency response planning	Office Administrator	TBD
Rehearsal	Conduct actual emergency drill semi-annually	Water system staff	Unannounced
On-site training drills	Conduct specific drills, i.e, communications, water line breaks, sampling with a professional trainer	Water system staff and professional trainer	May 2005

Appendix C
Plan Approval

This information is useful and recommended for inclusion in your ERP, it is not required by DEP in Chapter 62-555.350(15).

Plan Approval

Representatives of the water system who are ultimately responsible, such as water system manager, owner, board members, commissioners and council members, should review, approve, and sign the emergency response plan. This demonstrates support for the plan, acknowledges the effort put into its preparation, and puts it officially into effect. During an emergency, having their support is essential to implementing the ERP.

Be sure to consider securing and protecting the emergency response plan as it may contain sensitive information about facilities and response activities that you may not want others to know in order to safeguard the water system. However, do not withhold the plan from staff and other personnel involved with its implementation.

Example: Plan approval

This plan is officially in effect when reviewed, approved, and signed by the following people:

Name / Title	Signature	Date
Marsha Ready, Water System Manager	*Marsha Ready*	March 1, 2005
Bob Jones, Mayor	*Bob Jones*	March 1, 2005

Appendix D
Stand-By Generator Sizing For Emergency Situations

This information is useful in preparing your Disaster-Specific Preparedness / Response Plan.

The 2004 hurricanes taught us the wisdom of having stand-by power generation. So how many do you need? It's impractical to set hard rules for the size and number of stand-by generators. Determination of need must be site specific and tailored to each utility. Below is a listing of issues to consider for your system.

- DEP requires that water systems provide enough stand-by power (or by alternate means) to operate your water system *at least equal to the average daily water demand* by no later than December 31, 2005, per 62-555.320 (14). This should include wells, treatment, and pumping.
- Experience showed that connecting to two independent power feeds from separate substations did not ensure against loss of power.
- Generator needs can be reduced if you have reliable emergency interconnects, but may not be sufficient in major storm events if other water systems are also down.
- FRWA strongly recommends that systems join and actively participate in mutual aid agreements, such as FlaWARN.
- Wastewater treatment facilities should have dedicated stand-by generation.
- The ratio of mobile generators to lift stations might be 1:20 or 1:30 or 1:40 – depending on whether a system has SCADA, by-pass pumps, septic pumper trucks, refueling tanks, and available staff to work around the clock.
- Stand-by generators should be mobile trailer mounted units (and equipped with adequate cable and quick disconnect plugs).
- All plant and lift station power panels should be equipped with quick disconnect plugs for greatest flexibility and ease – recommend male plugs on the generator and female on every control panel. Plugs should be standardized throughout the system and match surrounding systems. Staff should be well trained on how to disconnect main power before connecting stand-by generators.
- Experienced electricians should pre-wire panels and plugs -- hot wiring not preferred during emergency situations with lots of rain and wind.
- FRWA STRONGLY recommends instituting a proactive preventative maintenance program for ALL generators—– extended warranty, maintenance service contracts, security locks, stabilize fuel; storage; rotating equipment; checking tires / batteries, and capital replacement program. Without such a program, your generator(s) will most likely be out of service when you need them.
- Expect a generator failure rate of about 10% to 20% during service, even with a preventative maintenance program. Therefore, larger systems will want to consider having SPARE generators.
- Generators should be at least 2.5 to 3 times the total horsepower requirement. Given that one kilowatt is equivalent to 1.34 horsepower, and using a 2.5 safety factor: a 10 Hp motor, needs a 20 kW generator (10 Hp x 0.75 x 2.5 = 18.75 kW, round up to nearest 20 kW & check startup amperage). The safety factor is needed to take into account startup power, power factors, and lost amperage through wires. Generators tend to run longer, use less fuel, and overheat less frequently if they are taking a lower load.
- Do you need a transfer switch and an automatic exerciser? Do you need both 240 & 480 voltages? Is generator operation going to disturb near-by residents?

Should you have any questions or comments feel free to contact Florida Rural Water Association for assistance with sizing generators.

FAX MEMORANDUM

To:	**Sterling L. Carroll, P.E.**
From:	**Florida Rural Water Association**
Date:	
Fax:	
Phone:	
Subject:	**Generator Sizing Assistance**

Return by Fax to 850-893-4581 for assistance in sizing generators for your facility.

Name of Water / Wastewater System _____
E-MAIL Address _____
Address (Street, City, Zip) _____
PWS ID _____ or GMS ID _____

Send information on each piece of major equipment – **Horsepower, Voltage, and Amperage**
(If you cannot put all information on this sheet attach additional sheets)

Well Pump(s) Horsepower _____ Volts _____ Amps _____
Well Pump(s) Horsepower _____ Volts _____ Amps _____
Well Pump(s) Horsepower _____ Volts _____ Amps _____

High Service Pump Horsepower _____ Volts _____ Amps _____
High Service Pump Horsepower _____ Volts _____ Amps _____
High Service Pump Horsepower _____ Volts _____ Amps _____

Transfer Pump(s) Horsepower _____ Volts _____ Amps _____
Metering Pump(s) Horsepower _____ Volts _____ Amps _____

Other Equipment Horsepower _____ Volts _____ Amps _____
Other Equipment Horsepower _____ Volts _____ Amps _____
Other Equipment Horsepower _____ Volts _____ Amps _____

Office Building & AC Horsepower _____ Volts _____ Amps _____
Maint Bldg & AC Horsepower _____ Volts _____ Amps _____
Transfer Pump(s) Horsepower _____ Volts _____ Amps _____

Number of Lift Stations _____
LS #1 Total Horsepower _____ Volts _____ Amps _____
LS #2 Total Horsepower _____ Volts _____ Amps _____
LS #3 Total Horsepower _____ Volts _____ Amps _____
LS #4 Total Horsepower _____ Volts _____ Amps _____
LS #5 Total Horsepower _____ Volts _____ Amps _____

Blower(s) Horsepower _____ Volts _____ Amps _____
Blower(s) Horsepower _____ Volts _____ Amps _____

Comments: _____