

Emergency Response (ERP) and Operation & Maintenance (OMP) Plans

DWB NMRWA Training
Tuesday 4 April 2017



Presented by the SWIG Technical Services Team

Agenda

- ▶ Why – importance, application
- ▶ Who/When – responsibilities, triggers
- ▶ What – plan components
- ▶ How – review checklist
- ▶ Development Issues/Solutions

Importance

- ▶ Significant deficiencies
- ▶ Minimum technical criteria
 - Linkage to significant deficiency status
- ▶ Indication of system's commitment
 - compliance
 - sustainability
 - appropriate financial investment
- ▶ Development/training opportunity to involve operator(s), staff, board members

Regulatory Authority - NMAC

- ▶ 20.7.10.201.C NMAC requires T/M/F capacity for new systems
- ▶ 20.7.10.201.M(5) NMAC allows Department to deny any application for failure of PWS to demonstrate sufficient T/M/F
 - Appendix A of application lists ERP, OMP

Regulatory Authority - GWR

▶ ERP

- 20.7.10.400.E NMAC, 40 CFR 141.403(a)(4)
- SDWIS Deficiency Codes 001W, 004B

▶ OMP

- 20.7.10.400.E NMAC, 40 CFR 141.23(c)(5)(iii), 63(d)(3), 403(a)(4)
- SDWIS Deficiency Codes 001V, 003L, 006F, 004C

Regulatory Authority - Surface Water

▶ ERP

- 20.7.10.400.E NMAC, 40 CFR 141.723(b), 403(a)(4)
- SDWIS Deficiency Codes 001W, 004B

▶ OMP

- 20.7.10.400.E NMAC, 40 CFR 141.63(e)(3), 23(c)(5)(iii),
- 403(a)(4)
- SDWIS Deficiency Codes 001V, 006F, 003L, 004C

Application

- ▶ One template for each plan
 - tailor to system size & complexity
- ▶ Ensures system addresses each component
 - designed around minimum criteria
- ▶ Some content may not apply but system must make conscious decision why

Water System Emergency Response Plan (ERP)

ERP Objectives & Requirements

- ▶ Reflect current system conditions
- ▶ Help system address unplanned events that can affect public safety and water quality
- ▶ Prove system has capacity to operate, can protect system from vulnerabilities and is a good investment for public funding
- ▶ Include as part of OMP

ERP Events

- ▶ Routine operating emergencies
 - Line breaks
 - Pump/well malfunctions, failures
 - Acute MCL exceedances
 - Power outages
- ▶ Non-routine emergencies
 - Chemical spills (i.e., Gold King Mine)
 - Drought
 - Wind/ice storms
 - Fire/floods
 - Earthquakes, other occurrences
 - Intentional acts of vandalism or sabotage

ERP Uses

- ▶ Identify likely events or threats to system
- ▶ Assign appropriate severity level & response to each type of event
 - Routine & Non-routine
- ▶ Identify appropriate contact personnel within and outside system for each type of event
- ▶ Formalize emergency event communication protocol
 - Example boil water advisory
 - Example Public Notification forms and protocol

ERP Uses

- ▶ Establish emergency plans, actions and procedures for each event
- ▶ Inventory and assess critical equipment
- ▶ Identify critical or vulnerable customers
- ▶ Implement tabletop exercises & other training events
 - Apply lessons learned
 - Evaluate and amend plan so implementation will protect customers and safeguard public health in any emergency

ERP Components

- ▶ System Information
- ▶ Chain-of-Command – Lines of Authority
- ▶ Events that Cause Emergencies
- ▶ Severity of Emergencies
- ▶ Emergency Notification
- ▶ Water Quality Sampling

ERP Components

- ▶ Effective Communication
- ▶ The Vulnerability Assessment
- ▶ Response Actions for Specific Events
- ▶ Alternative Water Sources
- ▶ Curtailing Water Use
- ▶ Returning to Normal Operation
- ▶ Training and Rehearsals

ERP Resources

Emergency response planning and plan development resources can be found on the DWB Tools & Resources page under Emergency Response & Security at:

<https://www.env.nm.gov/dwb/tools/Index.htm>.

- ▶ [Emergency Response Plan Template and Instructions for Drinking Water Systems](#) is a template with instructions for public water systems of any size to help them develop the DWB-required Emergency Response Plan. *Developed by the NMED Drinking Water Bureau.*
 - <https://www.env.nm.gov/dwb/forms/index.htm>
- ▶ [What To Do If Your Water System Has A Boil Water Advisory](#) is a 2-page fact-sheet with instructions for customers of a water system with a Boil Water Advisory. *Created by New Mexico Environment Department and New Mexico Department of Health.*
- ▶ [Security and Emergency Response Planning Toolbox for Small Water and Wastewater Systems](#) is a website that provides guidance modules to public water and wastewater systems serving a population of 3,300 or less to help them develop security and emergency response planning documents. *Created by Rural Community Assistance Partnership.*
- ▶ [Drinking Water Security for Small Systems Serving 3,300 or Fewer Persons](#) is a Simple Tools for Effective Performance (STEP) Guide that helps small systems understand the basics of water system security, including Vulnerability Assessments, Emergency Response Plans, and practical actions to improve system security. *Created by EPA.*

ERP Resources

- ▶ [Emergency Response Guidance for Small and Medium Community Water Systems](#) provides guidance to small and medium-sized community drinking water systems on developing or revising their Emergency Response Plans. *Created by EPA.*
- ▶ [Vulnerability Self-Assessment Tool](#) is a software tool that assists water and wastewater utilities of all sizes with performing security threats and natural hazards risk assessments, as well as updating utility Emergency Response Plans. *Created by EPA.*
- ▶ [Tabletop Exercise Tool for Water Systems: Emergency Preparedness, Response, and Climate Resiliency](#) contains fifteen scenarios that address an all-hazards approach to emergency preparedness and response, including natural hazards and man-made incidents. *Created by EPA.*
- ▶ [Features of an Active and Effective Protective Program for Water and Wastewater Utilities](#) is a brochure that is a starting point for self-assessment and planning for a security program at your water system. *Created by EPA.*

ERP Review Checklist

- ▶ In general self-explanatory due to table form of template
 - Use same info from DSSP & OMP

- ▶ Title page
 - revisions informal – change to formal format like OMP?

- ▶ Section 2 – system info
 - Directions
 - Facilities locations

- ▶ Section 3 – chain of command, lines of authority
 - Differences based on expertise, responsibilities

ERP Review Checklist

- ▶ Section 4 – events
 - realistic type, probability

- ▶ Section 5 – severity
 - Realistic

- ▶ Section 6 – emergency notifications
 - Water hauler
 - Driller
 - NM Water/Wastewater Agency Response Network (NM WARN)

ERP Review Checklist

- ▶ Section 7 – water quality sampling
 - Link with Appendix K of SW/WHPP (section 12 of OMP)

- ▶ Section 8 – communication
 - Multi-lingual
 - Templates

- ▶ Section 9 – vulnerability assessment
 - Link with sections 5, 6 & 8 of OMP

- ▶ Section 10 – response actions for events
 - Link with sections 4 & 5 of ERP

ERP Review Checklist

- ▶ Section 11 – alternative water sources
 - Water hauler

- ▶ Section 12 – curtailing water use
 - Conservation levels
 - Independent or tied to events

- ▶ Section 13 – returning to normal operation
 - Documentation of damages & costs for BoF emergency application

- ▶ Section 14 – training & rehearsals
 - Link to revisions

Common Development Issues & Solutions

General Information

Section 1: Emergency Response Mission & Goals

Section 2: System Information

Section 3: Chain of Command – Lines of Authority

Section 4: Events that Cause Emergencies

Section 5: Severity of Emergencies

Section 6: Emergency Notification

Section 8: Effective Communication

Section 11: Alternative Water Sources

Section 12: Curtailing Water Use

Technical Sections

Section 7: Water Quality Sampling

Section 9: The Vulnerability Assessment

Section 10: Response Actions for Specific Events

Section 13: Returning to Normal Operations

Section 14: Training and Rehearsals

Common Development Issues & Solutions

- ▶ The Developer sometimes attempts to populate everything with content without logically processing how template items relate to their Utility, or just leaves the template sections blank.

Common Development Issues & Solutions

Section 7: Water Quality Sampling

Sampling parameter	Do we have procedures?	Basic steps to conduct sampling
Heterotrophic Plate Count (HPC)	Yes	Procedures in accordance with the Sampling and Reporting for Sampler 1 and 2 Certification (a 167 page document).
Chlorine Demand	Yes	Verified by NMED
Nitrate/Nitrite	Yes	Tested by NMED – Results are not reported to ABC Water Association
Total Organic Carbon (TOC)	Yes	Procedures in accordance with the Sampling and Reporting for Sampler 1 and 2 Certification (a 167 page document).
Total Halogenated Organic Carbon (TOX)	Yes	Procedures in accordance with the Sampling and Reporting for Sampler 1 and 2 Certification (a 167 page document).
Cyanide	Yes	Procedures in accordance with the Sampling and Reporting for Sampler 1 and 2 Certification (a 167 page document).
All Others	No	Wait for no warning Violation letter

Common Development Issues & Solutions

Section 9: The Vulnerability Assessment

System component	Description and condition	Vulnerability	Improvements or mitigating actions	Security improvements
Source	Well	Declining Water Table	Emergency Well	Physical Barriers, Inspect Daily
Storage	Storage Tank	Thermal Stratification, Short Circuiting	Mixer	Physical Barriers, Inspect Daily
Treatment	Peristaltic Pump	Line & Injector Clogs, Power Outages	Regular PM	Physical Barriers, Inspect Daily
Pump house	Building	Harborage for Vermin	Housekeeping	Physical Barriers, Inspect Daily
Computer and telemetry system	RTU	Wet Connections	Regular PM	Physical Barriers, Inspect Daily

Common Development Issues & Solutions

Section 11: Alternate Water Sources

<u>Alternative sources</u>	<u>Names</u>	<u>Phone</u>	<u>Availability</u>	<u>Is the water Safe for drinking?</u>
Walmart 7555 N Mesa St, El Paso, TX 79912	Bottled Water (various brands)	(915) 833-1335	<ul style="list-style-type: none"> • Up to 1,000-gal (1-gal jugs) • Available within 24-hrs, every 2-4 days 	Yes
Tanker trucks in the area available to deliver bulk water	City of Sunland Park Fire Department 1030 McNutt Rd Sunland Park, NM 88063	(575) 589-2302	<ul style="list-style-type: none"> • 5,000 gal • Available in > 6-hrs, indefinitely 	No, Fire Trucks are not approved water haulers

Common Development Issues & Solutions

Section 12: Curtailing Water Usage

- Consider advising residents to ensure all spigots and faucets are closed.
- If the interim water supply is small, consider advising residents not to fill their bathtubs.
- Consider advising residents water is only for hygienic needs.
- Consider advising residents to only flush for bowel movements.
- Consider advising residents to wet themselves during showering, shut off the water while lathering, and utilize the water to rinse.
- Consider advising residents to wash garments only as necessary.
- Ask the system to consider shutting off water to vacant homes.
- Use disposable cutlery.
- Use waterless hand sanitizing liquid.
- Save any gray water you use for toilet flushing of solids

Common Development Issues & Solutions

- ▶ Sections 4, 5 and 10 are interrelated but the Developer does not realize they need to complement each other to create a functional plan
 - Section 4: Probability of an Event
 - Section 5: Severity Scale
 - Section 10: Response Actions

Common Development Issues & Solutions, Section 4

Type of event	Probability or risk (High-Med-Low)	Comments
Transmission or Line Breaks	Medium (4-10/ yr)	<ul style="list-style-type: none"> The aspects that <u>are</u> considered a factor are as follows: age of lines, the materials used, local geology, freeze/ thaw interaction. The aspects that <u>are not</u> considered a factor are as follows: water hammer, altitude, burial depth
Power Outages	Low (1-2/ yr)	<ul style="list-style-type: none"> The aspects that <u>are</u> considered a factor are as follows: accidents and operator neglect with the power provider, tree falls.
Disinfection Equipment Failure	Low (clogs ~6/ yr)	<ul style="list-style-type: none"> The aspects that <u>are</u> considered a factor are as follows: Line and injector clogs, pump failure, hose may come loose on the chlorinator.
Pump Failure	Low (1/ 2-3 yrs)	<ul style="list-style-type: none"> The aspects that <u>are</u> considered a factor are as follows: pumps have generally lasted 4 to 8 years. Water hardness may be a factor.

Common Development Issues & Solutions

Section 5: Severity of Emergencies

Severity Level	Service & Public Health Risk	Percent of System Affected	Time Lapse of Interruption	Example
1	Minor	≤ 10	≤ 24 -hrs	Valve Damage
2	Moderate	≤ 50	≤ 72 -hrs	Chemical Pump Failure
3	Major	≥ 50	≥ 72 -hrs	Well Outage
4	Severe	≥ 50	≥ 1 -wk	Drought
5	Catastrophic	Catastrophic	Catastrophic	Flood

Common Development Issues & Solutions

Section 10: Response Actions for Specific Events

- ▶ Transmission or Line Breaks
- ▶ Power Outages
- ▶ Disinfection Equipment Failure
- ▶ Pump Failure
- ▶ **Wildfire**
- ▶ Drought
- ▶ High Winds
- ▶ Reduction or Loss of Water in a Well
- ▶ Customer Complaints
- ▶ Earthquake
- ▶ Flood
- ▶ Chemical Spills
- ▶ Construction Accidents
- ▶ Cross-Connections
- ▶ Vandalism/ Terrorism
- ▶ System Facilities on Private Land
- ▶ Freeze
- ▶ Bacteriological Contamination

Common Development Issues & Solutions, Section 10

G. Microbial (coliform, E. coli) Contamination

Assessment	Low
Immediate actions	<ul style="list-style-type: none">• Turn off all connections to houses, and notify customers while turning off service<ul style="list-style-type: none">○ Ensure customers have not turn service back in• super chlorinate (10 ppm)• flush (2.5 fps)<ul style="list-style-type: none">○ Take residuals to ensure the affected portion of distribution water quality is back in compliance.• Preferably that a BacT sample (labeled accordingly as a special sample) to be tested at CERTIFIED LAB in CITY (refer to OMP, Appendix J).<ul style="list-style-type: none">○ Wait for result negative microbial results before returning to service.• Restore service to all customers<ul style="list-style-type: none">○ Ensure service connection meter is not running indicating an open valve within the property<ul style="list-style-type: none">▪ Preferably return service when the customer is present in this situation.• Perform Level I/II Assessment.<ul style="list-style-type: none">○ https://www.env.nm.gov/dwb/RTCR.htm
Notifications	<ul style="list-style-type: none">• Notify customers while shutting off service connections• Notify system compliance officer• Notify customer when service is returned
Follow-up actions	<ul style="list-style-type: none">• Monitor water quality assess issue what caused problem.

Common Development Issues & Solutions, Section 10

Section 10: Follow-up Actions

- What about maintenance work orders and changing on-hand inventory tracking for asset management?
- Is there notification or follow-on actions for other agencies and/ or companies?
- Should you evaluate the frequency of this occurrence to determine if the O&M plan is being followed and/or if changes are needed in the system's O&M process?
- Does this indicate another vulnerability that should be included Section 9?
- Do employee's need remedial training?
- Are Senior Water Rights in jeopardy?
- Optimize blending of lower quality water?
- Evaluate the rate structure?
- Long-term infrastructure plan, PER, etc.?
- Water conservation program?
- Evaluating the structural integrity of surface structures before subsurface structures?
- Damage to distribution lines due to shifting ground and soil liquefaction, resulting in potential water loss, water service interruptions, low pressure, contamination and sink holes and/or large pools of water throughout the service area?
- Incur liability.
- Evaluate security programs.
- Evaluate user access.
- Is the event a symptom of a greater problem?

Common Development Issues & Solutions

- ▶ Developer frequently dismisses emergency events as never being likely
- ▶ Developer does not consider all the aspects associated with an emergency

Common Development Issues & Solutions



CPWA INSPECTION
TEAM 2

Common Development Issues & Solutions



2016. 7.26 12:14



2016. 7.26 12:15

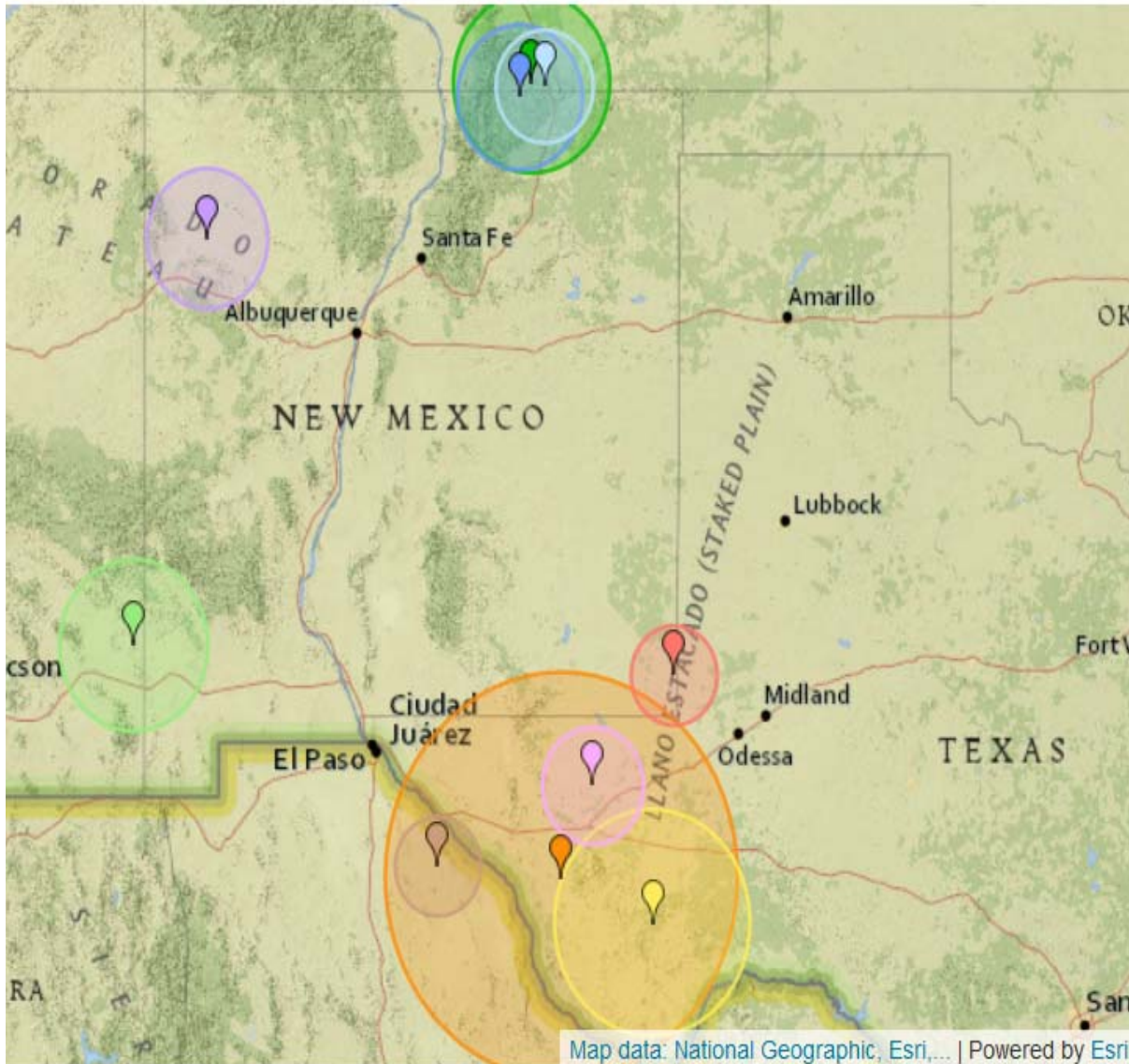


2016. 7.26 12:11



2016. 7.26 12:16

Common Development Issues & Solutions



86 years ago 6.5 magnitude, 10 km depth
Fort Davis, Texas, United States

22 years ago 5.7 magnitude, 17 km depth
Alpine, Texas, United States

3 years ago 5.3 magnitude, 6 km depth
Lordsburg, New Mexico, United States

5 years ago 5.3 magnitude, 4 km depth
Trinidad, Colorado, United States

12 years ago 5.0 magnitude, 5 km depth
Raton, New Mexico, United States

41 years ago 5.0 magnitude, 25 km depth
Crownpoint, New Mexico, United States

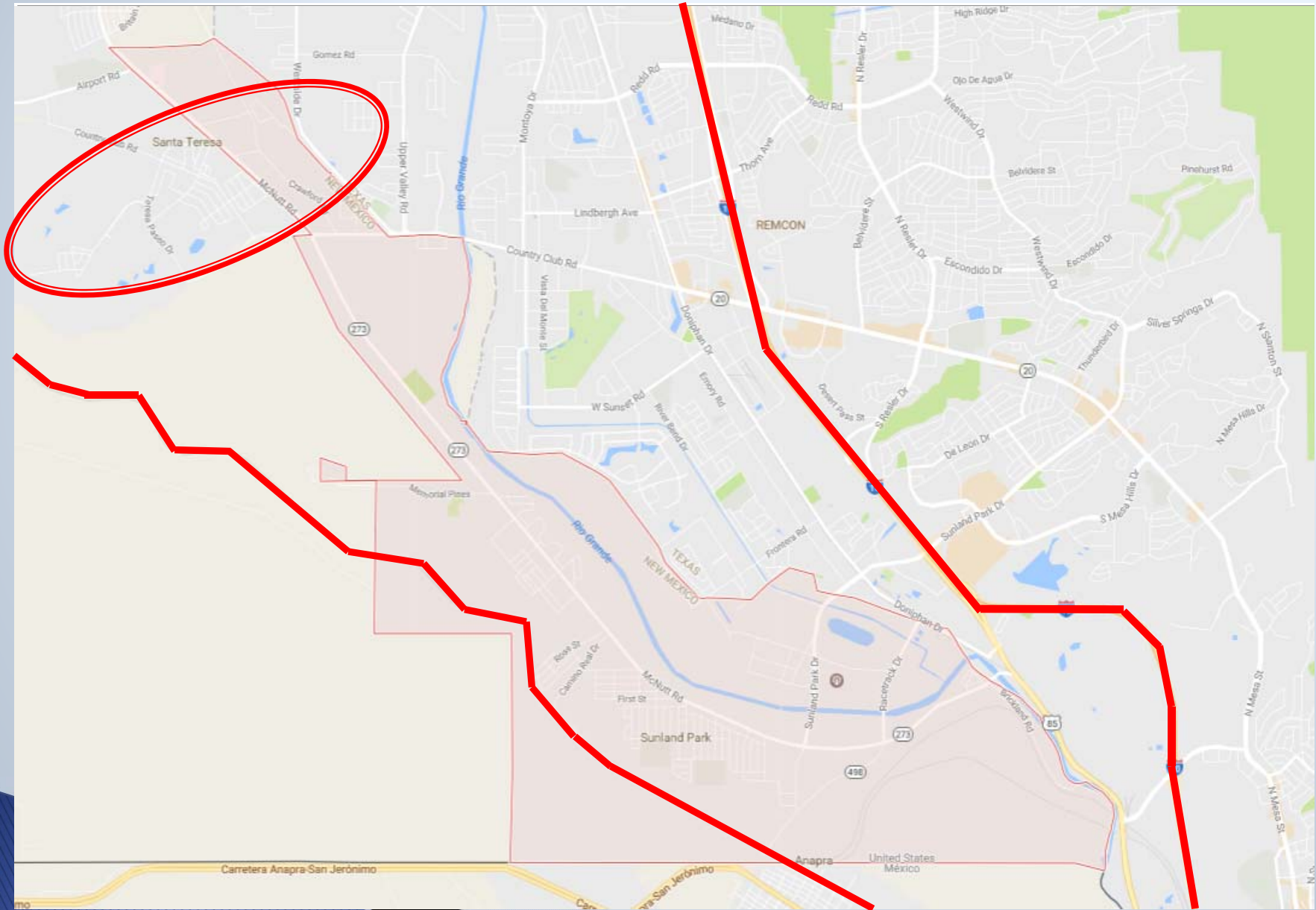
42 years ago 4.8 magnitude, 5 km depth
Pecos, Texas, United States

5 years ago 4.7 magnitude, 5 km depth
Trinidad, Colorado, United States

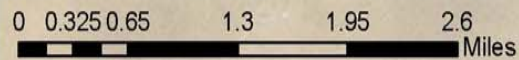
6 years ago 4.6 magnitude, 10 km depth
Sierra Blanca, Texas, United States

25 years ago 4.6 magnitude, 5 km depth
Eunice, New Mexico, United States

Common Development Issues & Solutions



Common Development Issues & Solutions



Common Development Issues & Solutions



Common Development Issues & Solutions

- ▶ General Factors Not Realized by Utility When Responding to an Emergency
 - Record Keeping
 - Financial and Legal Accountability
 - Priority Customers
 - Schools, Hospitals, Nursing Homes, Daycares
 - MOU's, MOA's, NM WARN, Regionalization of Resources

Water System Operation & Maintenance Plan (OMP)

OMP Objectives & Requirements

- ▶ Reflect current system conditions
- ▶ Address operation & maintenance (& management) of system for the purpose of protecting public health
- ▶ Help system maintain compliance with applicable State and Federal regulations such as SDWA, CWA, OSHA
- ▶ Prove system has capacity to operate, is project-ready and is a good investment for public funding

OMP Uses

- ▶ Define system O&M, management organizational structure
- ▶ Training tool
- ▶ Schedule standard operating, maintenance and sampling activities & procedures
- ▶ Define specifications for new installations & repairs

OMP Uses

- ▶ Identify chemical, appurtenance and equipment suppliers & contractors
- ▶ Schedule routine activities and reporting
 - Sampling
 - Equipment calibration & maintenance
 - Meter reading and water loss analysis
 - SWL, PWL measurements
 - Voltage, amperage readings
 - Conservation fee payments
 - Annual Consumer Confidence Report

OMP Minimum Contents

- ▶ System Ownership and Designations
- ▶ Introduction and Overview
- ▶ System Organizational Structure and Contacts
- ▶ Regulatory Agency(s) and Regulations
- ▶ General System Description
- ▶ System Operation and Control

OMP Components

- ▶ Testing, Recordkeeping and Reporting
- ▶ Maintenance
- ▶ Spare Parts, Supplies and Chemicals
- ▶ Safety
- ▶ Emergency Preparedness and Response
- ▶ Source Water/Wellhead Protection Plan

OMP Resources

- ▶ EPA best practices guide for distribution system O&M
 - http://www.epa.gov/ogwdw000/smallsystems/pdfs/guide_smallsystems_dist_system_08-25-06.pdf

- ▶ EPA PM Card File for Small Public Water Systems Using Ground Water, EPA 816-B-04-002 December 2004 (EPA Log Cards)
 - http://www.epa.gov/safewater/smallsystems/pdfs/logcards_smallsystems_preventivemaintenance.pdf

- ▶ EPA guide booklet for card file
 - http://www.epa.gov/safewater/smallsystems/pdfs/booket_smallsystems_preventmaint.pdf

- ▶ DWB O&M Plan template
 - <https://www.env.nm.gov/dwb/forms/index.htm>

OMP Review Checklist

- ▶ Title, revisions pages

- ▶ Section 1 – system info
 - Ownership, ownership type, contact info, federal designation & source

- ▶ Section 2 – intro
 - Mission, objectives
 - Education/training policy
 - Revision policy

- ▶ Section 3 – organizational structure & contacts

OMP Review Checklist

- ▶ Section 4 – DWB CO designation

- ▶ Section 5 – system description
 - Location, pop served, # of connections
 - Flow demands
 - Types of services, rate structure
 - Water source(s), water rights
 - Typical raw water analysis (reflecting annual/seasonal fluctuations)
 - Transmission, Treatment, Storage, Distribution
 - Reference Appendix D for site map showing facilities and service area
 - Same description can be used for sample siting plan and emergency response plan

OMP Review Checklist

- ▶ Section 6 – operation & control
 - Start-up, Operation and Control, Troubleshooting, Shutdown and Emergency procedures for system feature
 - Reference Appendix E for operator log documents
 - Reference Appendix F for well permit(s)/log(s)/water rights from OSE
 - Standard plans and specifications for new installations, expansions
 - New service connection SOP
 - Flushing, valve exercise, X-conn control programs
 - SCADA
 - Back-up power
 - Reference Appendix G for water purchase/sales contracts
 - Reference Appendix H for equipment technical data, specifications, as-builts, other drawings
 - Reference Appendix I for manufacturer's O&M manuals

OMP Review Checklist

- ▶ Section 7 – testing, recordkeeping, reporting
 - Reference Appendix J for DSSP (stand-alone document)
 - Meter testing and calibration (master, service, others)
 - Calibration of field/lab instrumentation
 - Special samples identification and protocol - new installations or repair, secondary, process control
 - Recordkeeping SOPs for types of records and duration
 - MORs – Subpart H only
 - Monthly OSE water production reporting
 - Water conservation fee payments
 - PN procedures, annual CCRs
 - Reference Appendix K for testing/calibration/maintenance tracking forms, 3rd party equipment testing/calibration/maintenance contracts, disinfectant residual monitoring & reporting forms, MOR templates and monthly OSE report template

OMP Review Checklist

- ▶ Section 8 – maintenance
 - Reference manufacturer's maintenance procedures from O&M manuals in Appendix I
 - Preventive maintenance (PM) task table or outline for each system feature based on manufacturer's recommendations and system's operational experience
 - Table or outline of all contractors approved to service/repair system equipment
 - Repair/service protocol, NSF-60/61 specifications and SOPs – internal, 3rd party call-out
 - Reference Appendix L for PM and breakdown maintenance tracking documents

OMP Review Checklist

- ▶ Section 9 – spare parts, supplies, chemicals
 - Reference manufacturer's maintenance procedures from O&M manuals in Appendix I
 - Preventive maintenance (PM) task table or outline for each system feature based on manufacturer's recommendations and system's operational experience
 - Table or outline of all contractors approved to service/repair system equipment
 - Repair/service protocol, NSF-60/61 specifications and SOPs – internal, 3rd party call-out
 - Reference Appendix L for PM and breakdown maintenance tracking documents

OMP Review Checklist

- ▶ Section 10 - safety
 - Table or outline of personal protective equipment (PPE) required for all operator tasks (reference tasks in Section 6)
 - Safety SOPs, such as
 - accident investigation
 - operating motor vehicles, forklift, backhoe
 - First aid/CPR
 - Fire protection
 - Chemical safety/hazard communication/SDS
 - Trenching/shoring
 - Lock-out/tag-out
 - Confined space
 - Reference Appendix N for all relevant OSHA regulations

OMP Review Checklist

- ▶ Section 11 – emergency response
 - Reference Appendix O for ERP (stand-alone document)
 - NM WARN status
 - Table or outline of all emergency contacts
 - Internal contacts within system - may be different for different events
 - External contacts
 - Emergency notification procedure(s) protocol/SOP

- ▶ Section 12 – SW/WHPP
 - Could also include water conservation and/or drought contingency plans
 - Reference Appendix P for DWB-approved SW/WHP Plan (stand-alone document)

Common Development Issues & Solutions

- ▶ The Developer lacks the technical and managerial knowledge of the water system which the OMP is being developed for to create a functional document

Common Development Issues & Solutions

General Information

Table of contents

Section 1: System Ownership and Designations

Section 2: Introduction and Overview

Section 3: System Organizational Structure and Contacts

Section 4: Regulatory Agency(s) and Regulation

Section 10: Safety

Appendices

Technical Sections

Section 5: General System Description

Section 6: System Operation and Control

Section 7: testing, recordkeeping and reporting

Section 8: Maintenance

Section 9: Spare Parts, Supplies and Chemicals

Common Development Issues & Solutions

- ▶ The Developer does not know how to populate Section 10 – Safety.
 - Developer simply states the Utility follows all OSHA regulations
 - Developer does not reference safety consideration for specific tasks
 - Chlorine – PPE, SDS's, etc
 - Tank Inspection – Confined Area
 - Developer leaves the Section blank

Common Development Issues & Solutions

- ▶ Developer does not realize that the completeness checklist for the OMP is in the instructions
- ▶ Developer misunderstands the section examples and either misrepresents their system by building on them or leaves them in the plan untouched

Common Development Issues & Solutions

Name: OMP Instructions Checklist Template
Effective Date: October 1, 2015
Version: 1

2

Drinking Water System Operation and Maintenance Plan Minimum Essential Criteria Review Checklist

The following checklist is provided by the NMED-DWB as a guide for water systems developing their operation and maintenance plan (OMP). The DWB will also use the checklist when providing technical assistance and when reviewing these plans for compliance. Please note that all items may not apply to all water systems, some items may be included as standard operating procedures (SOPs), as appendices or in multiple chapters (provide once and reference back to original location).

This plan is required by the DWB so that systems can convey to the Bureau that they are aware of every component of their system, how each one works individually and together to provide multi-barrier protection against contamination, and that the system has the capacity to operate their system. Missing or inadequate OMPs will be noted as a significant deficiency during a sanitary survey and the DWB Compliance Officer will require the water system to address this deficiency within a prescribed timeframe. Similarly, systems applying for certain public funds for water system improvements will be assessed by their capacity to operate their system; the OMP is one of those technical capacity criteria.

Checklist Items

- Title page with water system name, PWS #, contact info, preparer's name & date prepared, revisions tracking
- Table of Contents
- Section 1 - System Ownership and Designations
 - Ownership name(s) & contact info
 - System type based on federal definitions
 - System source(s) based on federal definitions
 - Contact list; governing board, admin, operations/maintenance
- Section 2 - Introduction and Overview
 - Purpose of O&M Plan
 - System mission
 - Plan contents overview
 - Review frequency and updates
 - Use as training tool for new hires
- Section 3 – System Organizational Structure and Contacts, including ownership, governance & operations
 - Personnel list with job title and summary of duties & responsibilities
 - Training/continuing education requirements
 - Reference Appendix A for job descriptions
 - Reference Appendix B for all operator and other certificates/licenses
 - Include contract operator contract(s) in Appendix B if operator not an employee of system
- Section 4 - Regulatory Agency(s) and Regulations
 - Identify water system NMED-DWB Compliance Officer with contact info
 - Reference Appendix C for NMED SDWA regulations

Common Development Issues & Solutions

- Reference Appendix F for well permit(s)/log(s)/water rights from OSE
- Transmission
- Treatment
- Disinfection
- Storage
 - Water age determination SOP
 - Corrosion control
 - Inspection, cleaning & repair protocols/SOPs
- Pressure tanks
- Pump stations
- Distribution system – pipe, valves, hydrants, meters
 - Standard plans and specifications for new installations, expansions
 - New service connection SOP
 - Specialty valves such as PRV, altitude
 - Flushing
 - Valve exercise program
 - Cross-connection control
 - Customers with private wells
- Fire protection
 - Backflow/back siphonage protection
- SCADA
- Back-up power
- Description of any water purchase or sales agreements
 - Reference Appendix G for contracts
- Reference Appendix H for equipment technical data, specifications, as-builts, other drawings
- Reference Appendix I for manufacturer's O&M manuals

EXAMPLE:

Operation of the <water system> is provided by <name(s)> who is/are currently licensed by the NMED-UOCP as <level>

<operator name(s)> operational responsibilities and procedures are as follows:

Table 1 Distribution System Routine Operational Tasks (Adapted from EPA 816-F-06-038, September 2006)		
Frequency	Task	Benefits
Continuously	Maintain the operating pressure range of distribution system	<ul style="list-style-type: none"> ❖ Reduces the risk of backflow contamination. ❖ Helps your system provide better service to customers. ❖ Reduces damage to infrastructure due to excess pressure. ❖ Provides adequate fire flow.
Daily	Track unaccounted for water	<ul style="list-style-type: none"> ❖ Can reduce pumping and treatment costs. ❖ Helps identify leaks, breaks, stolen water, and inaccurate meters.
Daily	Inspect storage tanks	<ul style="list-style-type: none"> ❖ Detects vandalism. ❖ Ensures that access hatches are locked.
Monthly	Test for presence of excess biofilms	<ul style="list-style-type: none"> ❖ Indicates a presence of inadequate chlorine residual, possible high disinfection byproduct levels, and water stagnation.
Monthly	Monitor water quality (e.g., pH, temperature)	<ul style="list-style-type: none"> ❖ Provides information on potential contamination of raw and finished water. ❖ Helps determine effectiveness of treatment. ❖ Helps assure the compatibility of the water with the materials.
Annually	Inspect valves Exercise valves	<ul style="list-style-type: none"> ❖ Improves reliability. ❖ Familiarizes crews with valve location. ❖ Identifies inoperable valves. ❖ Locates obstructed valve boxes. ❖ Ensures isolation of distribution system sections when necessary.

Common Development Issues & Solutions

- ▶ Developer does not know how to develop Sections 6 & 8 (Operator Sections) due to formatting, technological literacy or lack of water system knowledge

Common Development Issues & Solutions

Frequency	Task	Description
Daily	Check Disinfection Level & Feeder Pump	<ul style="list-style-type: none">• Check the liquid level in the hypochlorite barrel.<ul style="list-style-type: none">○ Clean and refill the barrel if there is sludge build-up.• Ensure feeder lines are not clogged<ul style="list-style-type: none">○ <u>Refer to Section 10, Chlorine Safety</u>○ If the pump is running, disconnect the discharge tubing to assure that the unit is pumping○ If no solution comes out of the discharge tubing, there is most likely a plug in the system or the diaphragm drive mechanism is faulty.• Make sure the pump is running. If it isn't, check the power plug and switch.<ul style="list-style-type: none">○ <u>Refer to Section 10, Electrical Safety</u>○ If it still doesn't run when there is power present, the wiring to the motor should be checked for continuity. A wire may have come loose in the plug.○ The motor may be burnt out → check warranty (if under warranty contact manufacturer)• Chlorine feeder should be dosing to provide average of 0.7-0.8 mg/L, measured with HACH Pocket Chlorometer II (refer to Section 7) sampled from the Entry Point (refer to Appendix J)<ul style="list-style-type: none">○ Note: temperature, pH, and flow rate affects chlorine dosage.○ <u>Refer to Appendix I for pump instructions</u>



Common Development Issues & Solutions

- ▶ Developer has difficulty differentiating between Water System tasks Section 6 and 8 tasks:
 - Operation & Control Tasks (Section 6)
 - Maintenance Tasks (Section 8)

Common Development Issues & Solutions, Section 6

Potential Operations & Control Tasks

Complete Security Checks	Continuously
Check Chemical Supply Levels and Record Usage	Daily
Record Water Levels in Storage Tanks	Daily
Check and Record Water Levels in Pressure Tanks	Daily
Inspect Chemical Feed Pumps for Proper Operation	Daily
Check and Record Chlorine Residuals at Entry Point	Daily
Record Well Run Time and Pump Cycle Starts	Daily
Check Water Meter Readings and Record Water Production.	Daily
<u>Record other daily chemical Solution Usage</u>	Daily
<u>Check and Record Chlorine Residuals in Distribution</u>	Daily to Weekly
<u>Inspect Booster Pump Stations</u>	Daily to Weekly
Check Fluoride Concentration in Distribution	Daily to Weekly
Check Instrumentation for Proper Input/ Output	Daily to Weekly
Check and Record Fluoride Concentration in the Distribution System	Daily to Weekly
Check and Record Static and Pumping Levels of Each Well	Monthly
<u>Begin Safety Equipment Repair Log Card</u>	Monthly
Customer Meter Reading	Bi-Annually
<u>Flushing Program</u>	Annual Rotation
<u>Backflow Prevention Program</u>	Annual Rotation
Water Loss/ Leak Detection Program	Annually to Triennially
<u>Review Emergency Response Plan</u>	Annually to Triennially

Common Development Issues & Solutions, Section 8

Potential Maintenance Tasks

<u>Investigate Customer Complaints</u>	As Needed
Maintain a Log of Water Line Repairs	As needed
<u>Record Pumping Rate for each Well or Source Water Pump</u>	Daily
Inspect Heater Operation	Daily to Weekly
<u>Clean Pump House and Grounds</u>	Weekly to Monthly
Ensure Fire Hydrants Are Accessible	Weekly to Monthly
Inspect Storage Tanks	Weekly to Monthly
Clean Storage Tank Grounds	Weekly to Monthly
Operate all Valves Inside the Treatment Plant and Pump House	Monthly
Inspect, Clean, and Repair Control Panels in Pump House and Treatment Plant	Monthly
<u>Calibrate Chemical Feed Pumps after Overhaul</u>	Every 3-Months
Inspect Testing Equipment	Every 3-Months
Inspect and Clean Chemical Feed Lines and Solution Tanks	Every 3-Months
Valve Exercising Program	Annual Rotation of Distribution
Flush the Distribution System and exercise/ Check Fire Hydrant Valves	Annual Rotation of Distribution
<u>Prepare for Season Operation Differences</u>	Annually
Inspect and Clean the Chemical Solution Tanks	Annually
Have Electrician Check the Running Amps on Well Pumps	Annually
Overhaul Electrical Feed Pumps	Annually to triennially

Common Development Issues & Solutions

- ▶ Developer thinks that it is mandatory to incorporate entire large documents such as:
 - Drinking Water Regulations (Appendix C)
 - Manufacturer's O&M Manuals (Appendix I)
 - NMED-DWB DSSP (Appendix K)
 - Emergency Response Plan (Appendix O)
 - Source Water/ Wellhead Protection Plan (Appendix P)

Common Development Issues & Solutions

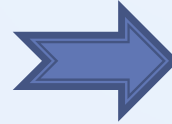
- ▶ There is some redundancy within all of these plans
 - Facilitates each plan's individual functionality
 - Material from one plan may be used in another plan when developing these plans
 - Facilitates each plan's association with the others and helps to demonstrated the interconnectivity of each plan's purpose to real-world operations
 - Intended to bridge the knowing-doing gap

Common Development Issues & Solutions

Interchangeable Material When Developing Plans

OMP

Section 2: Introduction and Overview



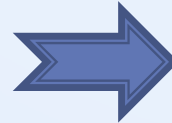
ERP

Section 1: Emergency Response Mission & Goals

OMP

Section 2: System Information

Section 5: General System Description



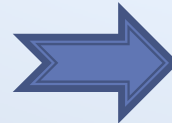
ERP

Section 2: System Information

OMP

Section 7: testing, recordkeeping and reporting

DSSP (OMP, Appendix J)



ERP

Section 7: Water Quality Sampling

OMP

Section 1: System Ownership and Designations

Section 3: System Organizational Structure and Contacts



ERP

Section 3: Chain of Command - Lines of Authority

Common Development Issues & Solutions

Interrelated Material When Developing Plans

OMP

Section 9: Spare Parts, Supplies and Chemicals

Section 10: Safety



ERP

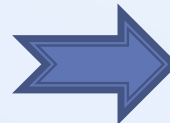
Section 10: Response Actions for Specific Events

OMP

Section 6: System Operation and Control

Section 7: testing, recordkeeping and reporting

DSSP (OMP, Appendix J)



ERP

Section 13: Returning to Normal Operations

Section 14: Training and Rehearsals

OMP

Section 4: Regulatory Agency(s) and Regulation

DSSP (OMP, Appendix J)



ERP

Section 6: Emergency Notification

Section 8: Effective Communication

Section 12: Curtailing Water Use

Section 11: Alternative Water Sources

OMP

Section 8: Maintenance

Section 9: Spare Parts, Supplies and Chemicals



ERP

Section 9: The Vulnerability Assessment

Section 4: Events that Cause Emergencies

Emergency Response (ERP) and Operation & Maintenance (OMP) Plans

Questions, Discussion?



Presented by the SWIG Technical Services Team