



TOWN OF SPRINGERVILLE WATER

EMERGENCY OPERATIONS PLAN **MANUAL**

NOVEMBER 2014

TABLE OF CONTENTS

<u>Sect.</u>	<u>Page</u>
1.	INTRODUCTION
1.1	Description of the TOS Water Emergency Operations Manual
1.2	Description of the TOS Water System
1.3	Water Production and Well Storage Statistics
1.4	Maintenance of System Demand with Largest Well Out of Service
2.	General “QUICK REFERENCE” INFORMATION
2.1	TOS Public Works Organization Chart
2.2	TOS Staff Phone Numbers
2.3	Local, State and Federal Emergency Phone Numbers
2.4	BLUE STAKE and Local Utility Phone Numbers
2.5	Important Business Phone Numbers
2.6	Regulatory Agency Phone Numbers
3.	GENERAL “QUICK RESPONSE” INFORMATION
3.1	Water <u>Supply</u> Emergencies
3.2	Water <u>Quality</u> Emergencies

APPENDIXES

- A. **WATER SUPPLY EMERGENCIES – “GENERAL INFORMATION”**
- B. **WATER QUALITY EMERGENCIES – “GENERAL INFORMATION”**
- C. **NOTIFICATION FORMS – FOR PUBLIC WATER SYSTEM EMERGENCIES**
- D. **PARTS INVENTORY – FOR EMERGENCY REPAIRS**
- E. **MICROBIOLOGICAL SAMPLING PLAN – SAMPLING SITES/PROCEDURES**
- F. **DIAGRAM OF THE TOS DOMESTIC WATER SYSTEM – Water Lines, Wells, Tanks**

1. INTRODUCTION

The primary purpose for preparing the Town of Springerville Water Emergency Operations Manual (hereinafter referred to as “Manual”) is to assist the Town of Springerville (TOS) representatives and employee(s) in responding (1) safely, (2) quickly, and (3) effectively to a range of potential operational emergencies in the field.

As with most manuals, various Sections or Sub-Sections within this Manual will require updating, expansion, or revision from time to time.

It is important that all TOS Public Works employees have access to this Manual at all times. Furthermore, it is important that all TOS Public Works employees familiarize themselves with the contents of the Manual and point out any errors or omissions for correction or addition.

1.1 Description of the TOS Water Emergency Operations Manual

The Manual contains GENERAL “**QUICK**” REFERENCE and RESPONSE INFORMATION, and additional operations and technical information specific to water **SUPPLY** emergencies and water **QUALITY** emergencies found in the appendix in the back of the Manual.

Please Note! A copy of the base map showing the TOS Existing Water System Facilities is provided in a pocket attached to the inside back cover of the Manual. The Manual is to be used in conjunction with this map.

TOS Public Works employees are to have a set of TOS water supply system maps and a copy of this Manual available at all times.

Funds have been set aside in the TOS budget for emergency repairs and abatement of operational breakdowns so as to restore minimum water service to TOS customers as quickly as possible. The TOS receives Purchase Orders from the Town Clerk immediately when emergencies occur. In the event the emergency is after hours, and parts suppliers are still available, the parts are obtained and the Purchase Order is processed the next day. Expenses in excess of \$1,000.00 per occurrence should be approved by the Public Works Director, or their designated representative.

1.2 Description of the Town of Springerville’s Water System

The TOS potable water system is currently operated with two pressure zones. The West Zone consists of three (3) domestic underground wells, one (1) storage reservoir site and a distribution network. The East Zone consists of five (5) domestic underground wells, a storage reservoir site, a booster station and a distribution network. The West Zone consists of approximately 266 residential and 55 commercial water service connections. The East Zone consists of approximately 375 residential and 32 commercial water service connections.

The seven domestic wells are shown on the enclosed Water System Map, which is located in the back of the manual in the appendix. The two reservoir storage sites are also shown on the map. The map includes locations of water mains and the location of blow-offs in the distribution system. The system consists of 2", 4", 6", 8" and 10" lines.

1.3 Water Production and Well Storage Statistics

The production of each well site is as follows:

<u>Name of Well</u>	<u>Capacity</u>	<u>Zone</u>
1. TANK WELL	50 GPM	EAST
2. WWTP WELL	35 GPM	EAST
3. WILKIN WELL	62 GPM	EAST
4. HAYSTACK WELL	30 GPM	EAST
5. MEADOW WELL	24 GPM	EAST
6. RIVER WELL	109 GPM	WEST
7. VOIGT WELL	90 GPM	WEST
8. FOREST SERVICE WELL	90 GPM	WEST

The domestic water storage available at each well storage site is as follows:

<u>Name of Storage Tank</u>	<u>Capacity</u>	<u>Zone</u>
1. CEMETARY HILL	1,000,000 GAL.	WEST
2. PUMPING STATION	500,000 GAL.	EAST

The water that is utilized in the West Zone is pumped primarily from the River Well and stored in the 1,000,000 gallon Cemetery Hill Reservoir. During the summer, when the water demands are higher, the Voigt Well is used and if necessary, the Forest Service Well will also be put into operation. The River Well is usually operated 24 hours a day, with the other wells operating as necessary. All three wells in the West Zone are in good condition, but the Forest Service Well is used more often as a matter of convenience.

From September 2012 to August 2013, the yearly total for the West Zone was 29,728,825 gallons. The peak system demand for the West Zone occurred in June 2013 and was 5,436,750 gallons. The peak system demand for the West Zone is approximately 181,225 gallons per day. Calculating it back into numbers of users provides the following:

Residential Water Service Connections:	266
Average Daily Use per Connection:	425 gallons (per 24-hour period)
Commercial Water Service Connections:	55
Average Daily Use per Connection:	816 gallons (per 24-hour period)
Approximate peak demand in a 24-hour day:	181,225 gallons (per 24-hour period)

The water that is utilized in the East Zone is pumped primarily from the Tank Well and stored in the 500,000 gallon Pumping Station Reservoir. During the summer, when the water demands are higher, the WWTP Well, Tank Well and the Wilkins Well are utilized. This zone is also aided by a booster pump. The Tank Well is usually run 24 hours a day, with the other wells operating as necessary. All four wells in the East zone are in good condition, but the Haystack Well is used more often as a matter of convenience.

From September 2012 to August 2013, the yearly total for the East Zone was 44,223,475 gallons. The peak system demand for the East Zone occurred in June 2013 and was 4,850,290 gallons. The peak system demand for the East Zone is approximately 161,676 gallons per day. Calculating it back into numbers of users provides the following:

Residential Water Service Connections:	375
Average Daily Use per Connection:	484 gallons (per 24-hour period)
Commercial Water Service Connections:	32
Average Daily Use per Connection:	780 gallons (per 24-hour period)
Approximate peak demand in a 24-hour day:	161,676 gallons (per 24-hour period)

Usage estimates based on average water use in the area. In all situations, reservoirs should be kept as full as possible at all times.

1.4 Maintenance of System Demand with Largest Production Well Out of Service for West Zone, East Zone and Both Zones

In the West Zone, the peak demand in the summer months is approximately 181,225 gallons in a twenty-four hour period. If the largest production well is subtracted (the River Well) in a twenty-four hour period, the two remaining wells (the Forest Service Well and Voigt Well) will be able to produce 259,200 gallons per day. This will be enough to take care of the domestic needs, and still be able to fill the tank for fire protection. If several fires occurred, water from another source would be needed.

Currently, the two pressure zones are separated by valves on Maricopa and Main Street. If those two valves were opened, the system would be turned into one zone, and the four wells from the East Zone could be used to provide water to the system. In the event of problems in the East Zone, the valves could also be opened and water from the West Zone could enter the East Zone.

In the East Zone, the peak demand in the summer months is approximately 161,676 gallons in a twenty-four hour period. If the largest production well is subtracted (the Wilkin Well) in a twenty-four hour period, the three remaining wells (the WWTP Well, Tank Well, Haystack Well, and Meadow Well) will be able to produce 289,440 gallons per day. This will be enough to take care of the domestic needs and still be able to fill the tank for fire protection. As described above, if needed, the water from the West Zone can also be added to the East Zone.

In all instances, resuming maximum water production capability as quickly as possible combined with conservation measures and avoidance or abatement of main breaks can insure continued water service to TOS customers.

2. GENERAL “QUICK REFERENCE” INFORMATION

This Section of the Manual contains general “Quick Reference” information for employees to use, in the event an emergency arises in the field. The general “Quick Reference” information includes the names, addresses and phone numbers of people or organizations that may become involved or should be contacted in an emergency situation. This section includes a TOS Public Works Chart; including the names, addresses and phone numbers of Staff TOS offices, field and mobile phone numbers; local, state and federal emergency phone numbers; BLUE STAKE and local utility phone numbers; important local business phone numbers and regulatory agency phone numbers.

2.1 TOS Public Works Organization Chart

Steve West – Town Manager

Tim Rasmussen – Public Works Director

Robert Pena – Foreman

2.2 TOS Staff Telephone Numbers

On call phone Twenty-Four Hours a day - (928) 245-0136

Steve West – Town Manager - (928-245-0911)

Tim Rasmussen – Public Works Director - (928) 551-2026
33 N Udall St, Eagar, AZ 85925

Robert Pena – Foreman - (928) 245-9471
418 Butler Dr., Springerville, AZ 85938

Paul Cabbage – (928) 245-1633
706 S Cherry, Eagar, AZ 85925

Richie Davis - (928) 245-0230
125 N Zuni, Springerville, AZ 85938

Fred Otero – (928) 551-3794
168 W. 5th Street, Eagar, AZ 85925

Ray Barraza – (928) 245-9090
1627 E. 1st Street, Springerville, AZ 85938

Town of Springerville Offices

Town Hall - (928) 333-2656

Town Hall Fax # – (928) 333-5598

Public Works – (928) 333-5016

2.3 Local, State and Federal Emergency Telephone Numbers

Medical Emergency

White Mountain Regional Medical Center
118 S. Mountain Ave
Springerville
(928) 333-4368

Fire Emergency

Town of Springerville
Fire Department
23 S Papago St
Springerville
(928) 333-2422

Law Enforcement

Town of Springerville
Police Department
418 E Main St
Springerville
(928) 333-4000

Apache County
Sheriff's Office
St. Johns
(928) 337-4321 or
1-800-352-1850

Poison Control

1-800-362-0101 Emergency

2.3 Local, State and Federal Emergency Telephone Numbers (Continued)

Disaster Assistance

State of Arizona
Department of Emergency and Military Affairs
Division of Emergency Management
5636 E McDowell Road, Phoenix, AZ 85008
1-800-411-2336

Federal Emergency Management Agency (FEMA)
5636 E McDowell Road, Phoenix, AZ 85008
1-800-411-2336

2.4 BLUE STAKE and Local Utility Phone Numbers

Blue Stake

1-800-STAKE IT (1-800-782-5348)

Note: Number only good during normal working hours (i.e. 8AM – 5 PM, Monday through Friday).

Local Utilities

NAVOPACHE ELECTRIC CO-OP INC.
General Office
1878 W White Mountain Blvd
Lakeside
(928) 368-5118

FRONTIER COMMUNICATIONS
931 E Hall St
Show Low
1-800-921-8100

Owens Propane
1657 E Central Ave
Eagar
928-333-9900

Sierra Propane
33 N Zuni
Springerville
928-333-5550

2.5 Important Business Phone Numbers

TETRA TECH INC.
Contact – Doug Brimhall
1801 W Deuce of Clubs, Suite 230
Show Low, AZ 85901
(928) 537-7218

MOHAVE ENVIRONMENTAL LABORATORY
200 N Second St, Suite B
Holbrook, AZ 86025
(928) 524-4635

QUEST ENTERPRISES
Well Drilling and Electrical
Contact - Larry Coffelt
1651 E Hwy 60
Springerville, AZ 85938
(928) 333 4478

HUGHES SUPPLY INC.
5069 Hwy 260
Lakeside, AZ 85929
(928) 537-5788

BLUE HILLS ENVIRONMENTAL
74 N Main St
Eagar, AZ 85925
(928) 333-1628

TOWN OF SPRINGVILLE

Public Works
285 N Papago
(928) 333-5016

TOWN OF SPRINGVILLE

Town Hall – General Information
418 E Main Street
Springerville, AZ 85938
(928) 333-2656

2.5 Important Business Phone Numbers (Continued)

DANA KEPNER
928-537-4076

HD SUPPLY WATERWORKS
928-864-5000

TRUE VALUE
928-333-4433

WOODLAND
928-333-4852

USA BLUE BOOK
1-800-548-1234

GRANGER
1-800-472-4643

For Community Services Announcements:

White Mountain Radio

(928) 368-8100

KRFM
KSNX
KVWM
KDJI
KZUA
KZUZ

Country Mountain Airwaves LLC
(928) 532-1010

KTHQ
KQAZ
KNKI
KRVZ

KWKM Radio
(928) 532-2949

2.6 Regulatory Agency Phone Numbers

Arizona Corporation Commission (ACC)
Utilities Division
1200 W Washington
Phoenix, AZ
(602) 542-4251

Fax: (602) 54-2129

Arizona Department of Environmental Quality (ADEQ)
Northern Regional Office of Water Quality
St. Johns, AZ
Contact – Byron James
(928) 337-3565

Emergency Response – Duty Officer – (602) 390-7894

ADEQ
Office of Water Quality
Drinking Water Compliance Unit
1110 W Washington St
Phoenix, AZ 85007
1-800-234-5677

ADEQ “HOTLINE”
1-800-234-5677

2.6 Regulatory Agency Phone Numbers (Continued)

Arizona Department of Water Resources (ADWR)

3550 N Central Ave
Phoenix, AZ 85012
602-771-8500

Arizona Department of Transportation (ADOT)

200 W McNeil (Maintenance Facility)
Show Low, AZ 85901 Springerville, AZ
(928) 537-2317 (928) 333-4495

Apache County Attorney's Office

County Courthouse
Contact – Michael B Whiting
P O Box 428
St. Johns, AZ 85936
(928) 337-7560

Apache County Board of Supervisors

Contact – Barry Weller, District 3
P O Box 428
St. Johns, AZ 85936
(928) 337-7608

Apache County Communications

P O Box 428
St. Johns, AZ 85936
(928) 337-4149

Apache County Emergency & Risk Management

P O Box 428
St. Johns, AZ 85936
(928) 337-7630

Apache County Department of Public Health Services

P O Box 428
St. Johns, AZ 85936
(928) 337-7525

2.6 Regulatory Agency Phone Numbers (Continued)

Apache – Sitgreaves National Forest

Supervisors Office
30 S Chiricahua Dr
Springerville, AZ 85938
(928) 333-4301

U.S Environmental Protection Agency (EPA)

Region 9
San Francisco, CA
1-866-EPA-WEST
1-866-378-9312

3. GENERAL “QUICK RESPONSE” INFORMATION

This section of the Manual contains a general “Quick Response” Guide for employees to follow in the event of a **water supply or a water quality emergency arises in the field.** Information for determining the potential magnitude of the emergency, and the level of response action that may be necessary, is reviewed thoroughly in Section 3.1 and Section 3.2 of this Manual. Operational and technical information specific to **Water SUPPLY** emergencies and **Water QUALITY** emergencies can be found in the **appendix sections.**

In general, employees that are first to arrive at the scene of the emergency should make an effort to determine the potential magnitude of “level of the emergency” (i.e., minor, moderate, serious) and what steps can be taken immediately to keep the effects of the emergency from spreading (i.e. containment). This Manual recognized three (3) levels of emergencies including:

LEVEL 1. Requires the **lowest** level of emergency response action (i.e., minor emergency).

LEVEL 2. Requires an **intermediate** level of emergency response action (i.e., moderate emergency).

LEVEL 3. Requires the **highest** level of emergency response action (i.e., serious emergency or “disaster”).

Sub-Section 3.1 provides a general “Quick Response” Guide for **Water Supply** emergencies.
ADDITIONAL INFORMATION IS AVAILABLE IN APPENDIX A.

Sub-Section 3.2 provides a general “Quick Response” Guide for **Water Quality** emergencies.
ADDITIONAL INFORMATION IS AVAILABLE IN APENDIX B.

3.1 General “Quick Response” Guide – Water Supply Emergencies

Level 1: Lowest Level of Emergency Response Action

1. Line leak or break on customer’s side of meter or “minor” TOS system line leak,
2. Customer complaint of low or high water pressure.
3. Frozen water meter or leaking water meter.
4. Brief but area-wide power interruption (i.e., light flicker).
5. Minor and easily adjustable/repairable water supply equipment malfunction (i.e., sticking pressure-regulating valve).

STEP Remarks – Response Action

1. Responding TOS employee will be able to make necessary repairs or adjustments, without assistance from other TOS employees. A “Blue-Stake” request may or may not be required.
2. Employee will write a brief description of emergency (or problem) and corrective action taken in their log book and note date, time, location, repair or adjustment action taken, customer name (if appropriate) and if applicable, who is responsible for repair cost(i.e., TOS, customer, contractor, etc.). Employee will bring incident to the attention of the Public Works Director by the next scheduled workday.
3. TOS employees may be asked by a customer or a contractor what work is necessary to conduct a line repair. TOS employees should be as helpful as possible; **HOWEVER**, they are not to conduct any kind of work on customer’s side of service unless problem is at the service valves. Employee’s disregarding this rule are not acting within the scope of their authority as an employee of TOS and assume all liability for doing so.
4. Check all electrical panels, controls, timers and switchgear at each well site and booster station. For instruction on “checking the system” after a brief power outage, turn to appendix “A” for additional information. If problems are found, contact a licensed electrical contractor for assistance in repairs or diagnosis of equipment.

TURN TO APPENDIX “A” FOR RESPONSE ACTION AND INFORMATION REGARDING LEVEL 1 WATER SUPPLY EMERGENCIES.

Level 2: Intermediate Level of Emergency Response Action

Examples of Level 2 “moderate” water supply emergencies include:

1. Line leak or break, TOS’s side of service connection that results in low pressure (less than 20 – psi) or water outage affecting more than one customer:
2. Fire fighting activity, requiring extensive TOS system adjustment and/or monitoring:
3. Short term but area-wide power failure, surge, or interruption (i.e., black-out, brown-out, single phasing); common in summer months during “monsoon” events.
4. Significant adjustable/repairable water supply equipment malfunction (i.e., down-hole well pump assembly or booster pump will not restart automatically, storage tank(s) alarmingly low or dry).
5. TOS property is vandalized.
6. A major component of the water system has become inoperative but can be safely bypassed or removed from service while maintaining minimum water service to TOS customers. Major components include: well pumps, booster pumps, automatic controls, pressure switches, section of water mains that can be bypassed or removed from service without adversely affecting the system’s operational capabilities.

Step **Remarks – Response Action**

1. Responding TOS employee will not be able (or should not attempt) to make necessary adjustments/repairs without asking for assistance from other TOS representatives. In addition, the Public Works Director should be notified as soon as possible so that he can help coordinate repair work, if necessary.
2. If a line break occurs, call in for an emergency “Blue-Stake” as soon as possible and before initiating any digging activity. If the line break occurs on weekends, holidays, or after-hours on weekdays, the “on-call” employee should contact “Blue Stake” directly and provide the necessary information.
3. If a line break occurs, (with the exception of a single customer service line), notify the Arizona Department of Environmental Quality (ADEQ) as soon as possible, preferably on the day of the occurrence. ADEQ must be notified by telephone.
4. Technically, water storage tanks should never go dry but if one or more does become alarmingly low or dry, notify the Public Works Director as soon as possible so that he can take or describe the corrective action necessary. All water storage tanks should be filled to their total capacity prior to weekends, especially during the high demand summer months.

5. If a water supply equipment malfunction occurs as a result of a suspected power supply problem and the equipment will not restart automatically, **DO NOT ATTEMPT TO RESTART EQUIPMENT**, until one or more of the following steps have been taken:

A. The Public Works Director has been notified and conducts a satisfactory inspection:

B. Navopache Electric Co-Op emergency field personnel have been notified and conduct a satisfactory inspection:

C. A local licensed electrical contractor has been notified and conducts a satisfactory inspection.

Failure to follow one or more of the preceding steps by TOS employees could result in (1) accidents causing injury, or (2) a repair/replacement bill for the costs of any TOS owned equipment that is damaged.

6. If TOS property is vandalized, contact the TOS Police Department and request an investigation and preparation of a formal report. If possible, **DO NOT DISTURB ANY OF THE EVIDENCE OR DAMAGED EQUIPMENT UNTIL A DEPUTY HAS CONDUCTED AN INVESTIGATION.**

7. There are currently no major components of the water system that are at risk. With the exception of down hole pump equipment, most major components of the TOS Water System have redundant production equipment installed to avoid water service interruption, (i.e., loped water mains that can have sections bypassed, multiple storage tanks and seven (7) separate underground domestic wells).

TURN TO APPENDIX “A” FOR RESPONSE ACTION AND INFORMATION REGARDING LEVEL 2 WATER SUPPLY EMERGENCIES.

Level 3: Highest Level of Emergency Response Action:

Examples of Level 3 “Serious/Disastrous” water supply emergencies could include:

1. “Down-Hole” Pump Assembly Failure;
2. Long-term and area-wide power failure;
3. Severe damage to one or more well sites and/or booster station facilities or other components of the system including as a result of lightning, fire, collision, earthquake, etc. Major components of the water system have become inoperative and cannot be safely bypassed or removed from service -and- minimum water service to TOS customers cannot be maintained. Major critical components include: well pumps, booster pumps, automatic controls, pressure switches and sections of water mains that cannot be bypassed or removed from service without **adversely** affecting the system’s operational capabilities.
4. Structural collapse of one or more water storage reservoirs/tanks.

Step **Remarks – Response Action**

1. The Public Works Director should be notified as soon as possible so that he can assess magnitude of the Level 3 emergency. The Public Works Director will be responsible for reporting the emergency to the:
 - A.) Arizona Department of Environmental Quality (ADEQ)
 - B.) TOS Town Manager and County Board of Supervisors.
 - C.) Local news media (i.e., T.V., radio, newspaper) for public announcement.
2. In the event, a “down-hole” pump assembly failure occurs, the incident should be initially treated as a **Level 3** emergency; however, this condition may not require all the notification procedures as outlined in **Step 1** above. See **Appendix A** for additional information on how to determine what “**Level of Emergency**” response action is necessary.
3. A long-term and area-wide power failure generally can be expected to cause severe, long-term, and area-wide water supply shortages. If a long-term and area-wide power failure is suspected of occurring, the Public Works Director should contact Navopache Electric Co-Op and obtain their best “realistic” estimate of when service will be reinstated. If an area-wide power outage is expected to last more than 24-hours, then all **Step 1** notification procedures should be implemented.

4. If Navopache Electric Co-Op estimates that a long-term and area-wide power outage is expected to last more than 24-hours, the Town Staff should promptly consider initiating one or more of the following options.

OPTION 1: Lease portable electric generators for one or more of the following well and booster pump facilities.

OPTION 2: Lease a water hauling truck and transport domestic water from another ADEQ approved public water system nearby to fill reservoir sites with domestic water until TOS water production well(s) are restored to use. Required contact information is listed in sub-sections 5 and 6 below. It is recommended to keep usable water storage reservoirs as full as possible during an outage.

TURN TO APPENDIX “A” FOR RESPONSE ACTION AND INFORMATION REGARDING LEVEL 3 WATER SUPPLY EMERGENCIES.

3.2 General “Quick Response” Guide – Water Quality Emergencies

Level 1 : Lowest Level of Emergency Response Action

Examples of Level 1 “minor” water quality emergencies include:

1. Cloudy or milky water due to air in the distribution lines.
2. Slight cloud or dirty water being delivered to the water customer due to particles or dirt in the distribution lines.
3. Chlorine smell in the water that would be considered moderate.
4. Moderate musty taste or odor in the water being delivered to the water customer.

Step Remarks – Response Action

1. Responding TOS employee will be able to take necessary corrective action, **without assistance from other TOS employees.**
2. Employee will write up a brief description of emergency (or problem) and corrective action taken in their log book and note date, time, location, corrective action, customer name (if appropriate), and, if applicable, what is responsible for the water quality being affected. Employee will bring incident to the attention of the Public Works Director on the next regular workday.
3. A sample of the contaminated water if possible should be drawn by the TOS certified operator in a sterile one liter bottle so that the sample may be analyzed for harmful contamination should health concerns be raised in a particular situation. All sample reports and chain of custody forms should be filled out and the sample stored in a refrigerator. **Analysis of this sample may not be required unless an immediate health concern is raised at the time.** A “special” bacteriological sample should always be drawn using an approved bacti-sample container should a customer complain of symptoms’ such as diarrhea, stomach cramps, or flu type symptoms. Bacteriological sampling should be done according to EPA approved guidelines and methods. Samples drawn by the customer **prior** to an TOS employee responding to a water quality complaint should be documented in the employee field notes, but should not be considered for analysis unless the sample was drawn using an approved container and sampling protocol has been followed with chain of custody forms filled out.

4. After possible sampling is completed as outlined in item 3 listed above, flushing procedures should commence as follows:
 - A.) Flush customer's service line for at least 15 minutes to see if Water becomes clear of taste, color or odor problems.
 - B.) Survey the customer's property for cross-connection(s) that could contribute to the problem. Document any information given by the customer regarding plumbing problems on-site.
 - C.) Survey for any construction activity on the property OR in the immediate area affected by the complaint. Should any be found, (repairs to customer's service line, new tap in the water mains for new services or a water main break) then document what was found and the possible relationship to the complaint in water quality.

5. Should the water quality complaint not be resolved on the property of the customer, then the response situation should proceed to a Level II complaint and response action.

TURN TO APPENDIX "B" FOR RESPONSE ACTION AND INFORMATION REGARDING LEVEL 1 WATER QUALITY EMERGENCIES.

Level 2 : Intermediate Level of Emergency Response Action

Examples of Level 2 **“moderate” water quality** emergencies include:

1. Excessive cloudy or milky water due to air in the distribution lines.
2. Moderate cloudy or dirty water being delivered to one or more water customers due to particles or dirt in the distribution lines.
3. Chlorine smell in the water that would be considered strong.
4. Considerable musty taste or odor in the water being delivered to the water customer.
5. A **trace** of odor that is suspect to being of a chemical nature, providing a customer has not complained of any ill affects from water that is suspect to a chemical contamination.

Step **Remarks – Response Action**

1. Responding TOS employee will be able to take necessary corrective actions **without assistance from other TOS employees.** A “Blue Stake” request should not be required.
2. Employee will write up a brief description of emergency (or problem) and corrective action taken in their log book and note date, time, location, corrective action taken, customer names (if appropriate), and, if applicable, what is responsible for the water quality being affected. Employee will bring incident to the attention of the Public Works Director at the next regular workday.
3. A sample of the contaminated water if possible should be drawn by the TOS certified operator in a sterile one liter bottle so that the sample may be analyzed for harmful contaminates should health concerns be raised in a particular situation. All sample reports and chain of custody forms should be filled out and the sample stored in a refrigerator. **Analysis of this sample may not be required unless an immediate health concern is raised at the time.** A “special” bacteriological sample should always be drawn using an approved bacti-sample container should a customer complain of symptoms such as diarrhea, stomach cramps, or flu type symptoms.

Bacteriological sampling should be done according to EPA approved guidelines and methods. Samples drawn by the customer **prior** to an TOS employee responding to a water quality complaint should be documented in the employee field notes, but should not be considered for analysis unless the sample was drawn using an approved container and sampling protocol has been followed and the chain of custody forms filled out.

4. After possible sampling is completed as outlined in item 3 listed above, flushing procedures should commence as follows:
 - A.) Flush all customer service lines that report a water quality problem for at least 5 minutes to see if water becomes clear of taste, color or odor problems. If more than three or four services are affected, then water main flushing is recommended instead of flushing several customer services.
 - B.) Survey the area for any customer's properties for cross-connection(s) that could contribute to the problem. Document any information given by any of the customers regarding plumbing problems on-site.
 - C.) Survey for any construction activity on the property OR in the immediate area affected by the complaint. Should any be found, (new tap in the water mains for new services or main break, water main shut down or use of a nearby fire hydrant,) then document what was found and the possible relationship to the complaint in water quality.
5. Flush the closest water main(s) to the area affected by use of a blow-off, fire hydrant or other acceptable means of flushing the water mains that is available. Shut down main line valves for mains that are connected to the water main affected so as to limit the flushing of water to the area affected by a water quality complaint. Flushing should be at a rate of 100 to 2000 gallons per minute. Distribution system pressures should be maintained at a level of at least 20 psi at all times. Flushing should take from 15 to 45 minutes, depending on how dirty the water is being flushed. Excessive velocity during flushing can aggravate the problem instead of helping it. Bac-T samples will be pulled for testing.

**TURN TO APPENDIX "B" FOR RESPONSE ACTION AND INFORMATION
REGARDING LEVEL 2 WATER QUALITY EMERGENCIES**

Level 3: Highest Level of Emergency Response Action

Examples of Level 3 “serious/disastrous” water quality emergencies could include:

1. Excessive cloudy or excessive dirty water being delivered to more than one water customer due to a large amount of particles or dirt in the distribution lines.
2. Chlorine smell in the water that could be considered excessive.
3. Excessive musty taste or odor in the water being delivered to the water customer.
4. A **significant** amount of odor that is suspect to being of a chemical nature, and the customer(s) **has complained of affects** from water that suspect to a chemical contamination.

Step **Remarks – Response Action**

1. The Public Works Director should be notified soon as possible so that he can assess magnitude of the Level 3 emergency. Thereafter, the Town Manager should be notified by the Public Works Director. The Public Works Director shall notify, if magnitude of emergency warrants:
 - A.) Arizona Corporation Commission (ACC);
 - B.) Arizona Department of Environmental Quality (ADEQ);
 - C.) Local news media (i.e., T.V., radio, newspaper) for public announcement.
2. In the event of a “major contamination situation” the incident should be treated as a Level 3 emergency; this condition will require all notification procedures as outlined in Step 1 above. **IF ANY CROSS-CONNECTION RESULTS IN A CONTAMINATION PROBLEM, ADEQ MUST BE NOTIFIED WITHIN 24 HOURS.**

3. A long-term and area-wide contamination incident generally can be expected to cause severe, long-term, and area-wide water supply use abandonment. If a long-term and area-wide contamination incident is suspected of occurring, the Public Works Director shall implement a notification process in the immediate area and have all lead water mains to the affected area shut down and valved off from the remainder water distribution system. Bottled drinking water should be ordered and provisions should be made to distribute one gallon per person a day until ADEQ approved redistribution of TOS water, after thorough sampling, ensures that no contamination exists in the domestic water being distributed.

4. Flushing of the water mains through blow-offs in the area affected is required, providing care is given to the flushing process so that the remaining areas of the distribution system are not affected. It is important not to exceed the water system's production capacity so as to avoid over drafting the storage tanks or creating pressure problems in the remainder of system that is still operating. Additional information regarding flushing procedures is included in Appendix "B".

**TURN TO APPENDIX "B" FOR RESPONSE ACTION AND INFORMATION
REGARDING LEVEL 3 WATER QUALITY EMEERNCIES.**

APPENDIX A

WATER SUPPLY EMERGENCIES – GENERAL INFORMATION

APPENDIX A

WATER SUPPLY EMERGENCIES – GENERAL INFORMATION

A. Determining “Level of Water Supply Emergency” Response Action Necessary

As a TOS representative trying to assess the “level of water supply emergency and the appropriate action necessary for a given situation, the following information should be considered in the decision making process:

1. What measures are needed to ensure the safety of employees, customers, limit property damage and minimize the impact of the situation on the TOS system?

It is extremely important the TOS representatives implement what is needed immediately to ensure that no individuals are exposed to the threat of injury or death and that damage to property and the TOS water system is minimized. Proper agencies should be notified such as Navopache Electric Co-Op, Blue Stake, the TOS Police Department and TOS to avoid shock or injury by having utilities located and turned off, if necessary. The area should be secured with barricades and boundary warning tape so the area is clear for responding emergency vehicles and road traffic is rerouted to prevent injury to individuals entering the damaged area.

2. Who has the responsibility to resolve the situation at hand?

If the emergency is located on the customer’s property such as a broken service line, it is the responsibility of the property owner to repair and restore water service to his building or residence. TOS representatives are not allowed to conduct repairs on plumbing systems not owned by TOS except where a customer’s service line connects to the FLAWED service connection. If other utilities are damaged, those agencies should be contacted to do their own repairs. Documentation of the situation should be included in a damage report so that liability and financial issues can be resolved after the response and repairs are made.

3. What agencies and/or individuals need to coordinate activities together in order to resolve the emergency situation?

After an affected area or situation is secured to prevent injury to individuals, contact should be made to the individual agencies that need to be involved in the repairs and provide assistance in maintaining water service as much as possible.

4. To what degree is the emergency situation?

A.) Affecting the water SUPPLY service to individual(s)?

If the situation involves more than water service, more than one TOS customer (except for a report of sickness or contamination), the situation is probably a moderate water supply situation. If more than a few water services are affected then the situation probably can be considered serious. A “Disaster or catastrophic” situation should involve a notification process where many of the regulatory agencies are contacted.

B.) Affecting the water SUPPLY of the remainder of the TOS water system?

If the situation has a serious or dramatic effect on storage tank reserves, the operation of the remainder of the TOS system or puts critical components of the water system at risk, then the event probably requires a Level 2 or Level 3 response situation.

C.) Causing property damage to TOS property or private property?

If property is being damaged by an uncontrolled main or service line break, control valves should be located immediately and turned off. **This should happen only when safety consideration for TOS representatives and other individuals located in the area have been evaluated. The level of emergency response should be Level 2 or Level 3, should significant property damage be present or possible.**

D.) Going to involve in time or resources to resolve a SUPPLY situation?

Time constraints and resources such as equipment rental, parts on hand and parts availability, weather and portable light equipment must be considered. **It is important to limit the response to the immediate situation at hand. Work which can be done during regular work hours will save on the expenses and limit potential injury to individuals involved with repairs. If a critical component can be bypassed safely, then access to the area should be restricted and the proper person(s) notified of the situation.**

Consideration of the overall items mentioned above should help determine the “Level of Response” required in any emergency situation that arises.

APPENDIX A

WATER SUPPLY EMERGENCIES – GENERAL INFORMATION CONTINUED

A.1 LEVEL 1 WATER SUPPLY EMERGENCY SITUATIONS:

1. **Situation:** Service line leak or break on customer's side of meter;
Response:
 - A. Shut curb stop off at the service connection to stop water flow.
 - B. Notify the customer of their responsibility to make repairs.
 - C. When service is turned back on, check that leak(s) are stopped.

2. **Situation:** Service line leak or break on TOS side of the meter;
Response:
 - A. Locate leak and call for Blue Stake if digging is required.
 - B. Shut down main when ready to repair leak and notify customers.
 - C. Perform repairs per ADEQ standards with proper parts/tools.
 - D. Flush lines when completed and check for leaks.
 - E. Disinfect affected repair and collect Bac-T samples for testing.
 - F. Backfill affected area and secure till solid ground.
 - G. Document event with responsible party, parts, labor, time, etc.

3. **Situation:** Customer complaint of low or high water pressure;
Response:
 - A. Check pressure with no water flowing through meter.
 - B. Check pressure with one faucet open in the yard/house.
 - C. Pressure should be between 30 to 60 psi with no water flow.
 - D. Pressure should not drop more than 10-15 psi with water use.
 - E. High pressure reading should be compared to system pressure.
 - F. Low pressure with use = obstruction, break in service line.
 - G. High pressure readings usually mean system pressure high. Check.

4. **Situation:** Minor leak or break in the TOS water mains;
Response:
 - A. Locate main leak and call for Blue Stake if digging is required.
 - B. Shut down main when ready to repair leak and notify customer.
 - C. Perform repairs per ADEQ standard with proper parts/tools.
 - D. Flush main lines when completed and check for leaks.
 - E. Disinfect affected repair and collect Bac-T samples for testing.
 - F. Backfill affected area and secure till solid ground.
 - G. Document event with responsible party, parts, labor, time, etc.

5. **Situation:** Frozen water meter or leaking water meter;
- Response:** A. Notify customer of problem and change out meter.
B. Thawing with a torch **slowly** may be possible.
C. Check meter for leaks after heated and ensure it is working.
6. **Situation:** Brief but area-wide power interruption (e.g., light flicker);
- Response:** A. Check all electrical panels, controls, timers and switchgear at each well site and at booster station.
B. If problems are found; contact a licensed electrical contractor for assistance in repairs or diagnosis of equipment.
C. **Do not make electrical repairs alone. Never do “hot” repairs.**
7. **Situation:** Broken shutoff valve on the customer’s side of the meter;
- Response:** A. Notify customer to remove valve and repair/replace as needed.
B. Check for leaks when service is turned back on.
8. **Situation:** Broken curb stop on TOS side of the water meter;
- Response:** A. Shut down main when ready to replace stop and notify customer
B. Perform repairs per ADEQ standards with proper parts/tools.
C. Flush lines when completed and check for leaks.
D. Disinfect affected repair and collect Bac-T samples for testing.
9. **Situation:** Pressure Reducing Valve sticking or inoperative;
- Response:** A. Shut curb stop off at the service connection to stop water flow.
B. Notify the customer of their responsibility to make repairs.
C. When service is turned back on, check that leak(s) are stopped.
10. **Situation:** Backflow Prevention Assembly inoperative or leaking;
- Response:** A. Shut curb stop off at the service connection to stop water flow.
B. Notify the customer of their responsibility to make repairs.
C. Service should not be turned on unless BPA is tested & certified.

APPENDIX A

WATER SUPPLY EMERGENCIES – GENERAL INFORMATION CONTINUED

A.2 LEVEL 2 WATER SUPPLY EMERGENCY SITUATIONS:

1. **Situation:** Line leak or main break, TOS’s side of meter, that results in low pressure (less than 20 psi) or water outage affecting more than one customer.

Response: A. Locate leak and call for Blue Stake if digging is required.
 B. Shut down main when ready to repair leak and notify customers.
 C. Perform repairs per ADEQ standards with proper parts/tools.
 D. Swab parts/inside main with 5% Bleach undiluted.
 E. Flush lines when completed and check for leaks.
 F. Disinfect affected repair and collect Bac-T samples for testing.
 G. Backfill affected area and secure until solid ground.
 H. Document event with responsibility party, parts, labor, time, etc.
 Provisions should be made to repair a main break in 24 hours.
2. **Situation:** Fire fighting activity, requiring extensive TOS system adjustment and/or monitoring;

Response: A. All storage tanks should be checked hourly to ensure no over drafting of the storage tanks occurs.
 B. TOS system pressure should not fall below 20 psi during a fire protection event.
 C. System demand should be verified and tanks kept half full.
3. **Situation:** Short term but area-wide power failure, surge, or interruption (e.g., black-out, brown-out, single phasing); common in summer months during “monsoon” events.

Response: A. Standby generators should be tested after surge/brown-out.
 B. Check all electrical panels, controls, timers, and switchgear at each well site and booster station.
 C. If problems are found, contact a licensed electrical contractor for assistance in repairs or diagnosis of equipment.
 D. **Do not make electrical repairs alone. NEVER do “HOT” repairs.**
 E. Provisions needed for panel/part replacement within 24 hours.

4. **Situation:** Significant adjustable/repairable water supply equipment malfunction (i.e., down-hole well pump assembly or booster pump will not restart automatically, storage tank(s) alarmingly low or dry).
- Response:**
- A. Assess if component can be safely bypassed or redundant component can provide minimum water service to customers.
 - B. Check all electrical panels, controls, timers and switchgear at each well site and booster station.
 - C. If problems are found, contact a licensed electrical contractor for assistance in repairs or diagnosis of equipment.
 - D. **Do NOT make repairs alone. NEVER do “hot” repairs.**
 - E. Provisions needs for panel/part replacement within 24 hours.
5. **Situation:** TOS property is vandalized.
- Response:** A. If TOS property is vandalized contact the TOS Police Department and request an investigation and report.

APPENDIX A

WATER SUPPLY EMERGENCIES – GENERAL INFORMATION CONTINUED

A.3 LEVEL 3 WATER SUPPLY EMERGENCY SITUATIONS:

1. **Situation:** “Down-Hole” Pump Assembly Failure

Response: At present (2014) there are eight (8) groundwater production wells supplying all of the water used by TOS customers. A “well failure” incident may require TOS personnel to take the highest level of emergency response depending on which well is down and what system demands is at a given time. (See beginning of manual under well production rates and system demand figures.)

2. **Situation:** Long-term and area-wide power failure

Response: With a standby generator available.

3. **Situation:** Severe damage to one or more well sites and/or booster station facility or other components of the system including as a result of lightening, fire, collision, earthquake, etc.

Response:

- A. An overall assessment of which components are damaged.
- B. Prioritize what components can be restored to use quickly.
- C. Prioritize what components offer the greatest productive use.
- D. Make provisions for standby power and haul water if needed.
- E. Restore each component based on this value and effectiveness.

4. **Situation:** Structural collapse of one or more water storage reservoirs/tanks.

Response:

- A. Valve off tank and bypass the component with a direct feed.
- B. Secure the area to avoid injury or property damage.
- C. Drain the remainder of the tank and call in for emergency repairs.
- D. Enact water conservation procedures with TOS customers.

APPENDIX B

WATER QUALITY EMERGENCIES – GENERAL INFORMATION

APPENDIX B

WATER QUALITY EMERGENCIES – GENERAL INFORMATION

B. Determining “Level of Water Quality Emergency” Response Action Necessary

As a TOS representative trying to assess the “level of water quality emergency and the appropriate action necessary” for a given situation, the following information should be considered in the decision making process.

1. What measures are needed to ensure the safety of employees, customers, limit property damage and minimize the impact of the situation on the TOS system?

It is extremely important that TOS representatives implement what is needed immediately to ensure that no individuals are exposed to the threat of injury or death and that damage to property and the TOS water system is minimized. Proper agencies should be notified such as Navopache Electric Co-Op, Blue Stake, TOS Police Department and TOS to avoid shock or injury by having utilities located and turned off if necessary. The area should be secured with barricades and boundary warning tape so the area is clear for responding emergency vehicles and road traffic is rerouted to prevent injury to individuals entering the damaged area. Individuals complaining of sickness or contamination of domestic water should be referred to medical help.

2. Who has the responsibility to resolve the situation at hand?

If the contamination is limited to a customer’s property, **turn service off and leave it off until all clean-up measures are completed.** TOS representatives are **not** allowed to conduct clean-up on plumbing systems not owned by TOS except where a customer’s service line connects to the TOS service connection. If other utilities are damaged those agencies should be contacted to do their own repairs. Documentation of the situation should be included in a damage report so that liability and financial issues can be resolved after response and repairs are made.

3. What agencies and or individuals need to coordinate activities together in order to resolve the emergency situation?

After an area or situation is secured to prevent injury to individuals, contact should be made to the individual agencies that need to be involved in the repairs and provide assistance in resolving any contamination problems as much as possible.

4. To what degree is the emergency situation?

A. Affecting water QUALITY service to individual(s)?

If the situation involves more than water service, more than one TOS customer (except for a report of sickness or contamination), the situation is probably a moderate water quality situation. If more than a few water services are affected then the situation probably can be considered serious. **Any contamination of the water system must be reported to ADEQ as soon as possible.**

B. Affecting the water QUALITY of the remainder of the TOS water system?

If the situation has a serious or dramatic effect on storage tank reserves, the operation of the remainder of the TOS system or puts critical components of the water system at risk, then the event requires a Level 3 response situation.

C. Causing property damage to TOS property or private property?

If property is being damaged by a contamination situation, the control valves should be located immediately and turned off. **This should happen only when safety considerations for TOS representatives and other individuals located in the area have been evacuated. The level of emergency response should be a Level 3 response should significant property damage be present or wide spread sickness is reported from drinking water.**

D. Going to involve in time or resources to QUALITY situation?

Time constraints and resources such as equipment rental, parts on hand and parts availability, weather and portable light equipment must be considered. **It is important to limit the response to the immediate situation at hand. That work which can be done during regular work hours will save on the expenses and limit potential injury to individuals involved with repairs. If a critical component can be bypassed safely, then access to the area should be restricted and the proper person(s) notified of the situation.**

UNDER NO CONDITIONS SHOULD WATER SERVICE BE RESTORED UNTIL ADEQ HAS MADE AN ASSESSMENT OF THE CONTAMINATION SITUATION AND SAMPLING RESULTS DEMONSTRATE THAT THE WATER IS SAFE TO DRINK.

Consideration of the overall items mentioned above should help determine the “Level of Response” required in any emergency situation that arises.

APPENDIX B

WATER QUALITY EMERGENCIES – GENERAL INFORMATION CONTINUED

B.1 LEVEL 1 WATER QUALITY EMERGENCY SITUATIONS:

1. **Situation:** Cloudy or milky water due to air in the distribution lines.

 Response: A. Flush customer's service line 10 to 15 minute to clear line of excess air from the distribution system. If this type of flushing will not eliminate the problem, then proceed to Level 2 complaint. Collect Bac-T samples before and after flushing for testing.

2. **Situation:** Slight cloudy or dirty water being delivered to the water customer due to particles or dirt in the distribution lines.

 Response: A. Flush customer's service line 10 to 15 minutes to clear the dirt in the customer's service line and/or the TOS distribution system. If this type of flushing will not eliminate the problem, then proceed to Level 2 complaint. Collect Bac-T samples before and after flushing for testing.

3. **Situation:** Chlorine smell in the water that would be considered moderate.

 Response: A. Flush customer's service line 10 to 15 minutes to clear the line of excess chlorine smell originating from the distribution system. If this type of flushing will not eliminate the problem, then proceed to Level 2 complaint. Chlorine smell would only be from shocking the storage tanks as the TOS system is normally not chlorinated.

 B. Check chlorine level at the customer's residence/business. If levels of CL2 exceed 3.0 ppm, then proceed to a Level 2 complaint.

4. **Situation:** Moderate musty taste or odor in the water being delivered to the water customer.

 Response: A. Flush customer's service line 10 to 15 minutes to clear line of musty taste or odor from the customer's service line and/or the TOS distribution system. If this type of flushing will not eliminate the problem, then proceed to Level 2 complaint. Collect Bac-T samples before and after flushing for testing.

APPENDIX B

WATER QUALITY EMERGENCIES – GENERAL INFORMATION CONTINUED

B.2 LEVEL 2 WATER QUALITY EMERGENCY SITUATIONS:

1. **Situation:** Excessive cloudy or milky water due to air in the distribution lines.
Response: A. Flush the TOS water main located closest to the customer's service line 15 to 30 minutes to clear the main line of excess air trapped inside the TOS distribution system. If this type of flushing will not eliminate the problem, then proceed to Level 3 complaint. Collect Bac-T samples before and after flushing for testing.
2. **Situation:** Moderate cloudy or dirty water being delivered to one or more water customers due to particles or dirt in the distribution lines.
Response: A. Flush the TOS water main located closest to the customer's service line 15 to 30 minutes to clear the main line of excess chlorine trapped inside the TOS distribution system. If this type of flushing will not eliminate the problem, then proceed to Level 3 complaint. Collect Bac-T samples before and after flushing for testing.
B. Look for source of dirt such as water service or water main repair, recent flushing or other construction activities.
3. **Situation:** Chlorine smell in the water that would be considered strong.
Response: A. Flush the TOS water main located closest to the customer's service line 15 to 30 minutes to clear the main line of excess chlorine trapped inside the TOS distribution system. If this type of flushing will not eliminate the problem then proceed to level 3 complaint.
B. Check chlorine levels in the storage tanks to see if levels are excessive. If levels of CL2 exceed 3.0 ppm, then sodium thiosulfate should be added to the storage tanks to reduce the CL2 levels.
4. **Situation:** Considerable musty taste or odor in the water being delivered to the water customer.

Response: A. Flush the TOS water main located closest to the customer's service line 15 to 30 minutes to clear the main line of musty taste or odor trapped inside the TOS distribution system. If this type of flushing will not eliminate the problem, then proceed to Level 3 complaint. Collect Bac-T samples before and after flushing for testing.

5. **Situation:** A **trace** of odor that is suspect to being of a chemical nature, providing a customer has **not** complained of any ill affects from water that is suspect to a chemical contamination.

Response: A. Flush the TOS water main located closest to the customer's service line 15 to 30 minutes to clear the main line of a contaminate trapped inside the TOS distribution system. If this type of flushing will not eliminate the problem, then proceed to Level 3 complaint. Collect water samples for testing.

B. Look for a source of a chemical taste or odor such as a cross-connection on-site or a water service or water main repair, recent flushing, or other construction activities. Document finding. Consider notification and sampling included in "Quick Response".

APPENDIX B

WATER QUALITY EMERGENCIES – GENERAL INFORMATION CONTINUED

B.3 LEVEL 3 WATER QUALITY EMERGENCY SITUATIONS:

1. **Situation:** Excessive cloudy or excessive dirty water being delivered to more than one water customer due to a large amount of particles or dirt in the distribution line.

Response: A. Flush the TOS water main located closest to the customer’s service line, 30 to 45 minutes to clear the main line of excess dirt trapped inside the TOS distribution system.
 Collect Bac-T samples before and after flushing for testing.

 B. Check for sources of excessive dirt such as: well casing problems, main breaks, other construction activities. Consider notification of customers to discontinue use until source is found.
2. **Situation:** Chlorine smell in the water that would be considered excessive.

Response: A. Flush the TOS water main located closest to the customer’s service line 10 to 15 minutes to clear the main line of excess air trapped inside the TOS distribution system.

 B. Check chlorine levels in the storage tanks to see if levels are excessive. If levels of CL₂ exceed 3.0 ppm, then sodium thiosulfate should be added to the storage tanks to reduce the CL₂ levels.
 Consider notification of customers to discontinue use until source of excess chlorine is found.
3. **Situation:** Excessive musty taste or odor in the water being delivered to the water customer.

Response: A. Flush the TOS water main located closest to the customer’s service line 15 to 30 minutes to clear the main line of musty taste or odor trapped inside the TOS distribution system. If this type of flushing will not eliminate the problem, then proceed to Level 3 complaint. Collect Bac-T samples before and after flushing for testing.

B. Look for a source of musty taste or odor such as a cross-connection on-site or a water service or water main repair, recent flushing, or other construction activities.

4. **Situation:** C. Consider addition of chlorine to system at a rate of 1.0 ppm. A **significant** amount of odor that is suspect to being of a chemical nature, and the customer(s) **has complained of effects** from water that is suspect to a chemical contamination.

Response: A. A long-term and area-wide contamination incident generally can be expected to cause severe, long-term, and area-wide water use abandonment. If a long-term area-wide contamination incident is suspected of occurring, the Public Works Director should implement a notification process in the immediate area and have all lead in water mains to the affected area shut down and valved off from the remainder of the water distribution system. Bottled drinking water should be ordered and provisions should be made to distribute supplies of one gallon person per day until ADEQ approved redistribution of TOS water, after thorough sampling ensures that no contamination exists in the domestic water being distributed.

B. Flushing of the water mains through blow-offs in the area affected is required, providing care is given to the flushing process so that the remaining areas of the distribution system are not affected. It is important not to exceed the water system's production capacity so as to avoid over drafting the storage tanks or creating pressure problems in the remainder of the system that is still operating.

C. In the event of a "major contamination situation" the incident should be treated as a Level 3 emergency; this condition will require all the notification procedures as outlined in the "Quick Response" section. IF ANY CROSS-CONNECTION RESULTS IN A CONTAMINATION PROBLEM, ADEQ MUST BE NOTIFIED WITHIN 24 HOURS.

APPENDIX C

NOTIFICATION FORMS FOR WATER SYSTEM EMERGENCIES

Water Supply Emergency – Incident Report

This Report format was developed to obtain available information about the water supply emergency. Water system representatives are encouraged to be familiar with the Report content so that as applicable, information is expeditiously and accurately reported to the TOS

Water Supply Emergency – Incident Report

Water System Name

Water System PWSID No:

System Point of Contact: (name, title, work/cell numbers)

1) **Incident Description:** A water supply emergency has caused the system (or portion(s) of the system service area – identify zone) to be without water and/or experience a loss of positive pressure or has caused the delivery of potable water that is not in compliance treatment requirements and/or water quality standards established in the Federal and State Safe Drinking Water Act regulations.

2) **Time of Incident:** (day, date, time)

3) **Details of Incident:**

4) **County/Municipality Impacted:**

5) **Area Impacted:** (provide northern, southern, western, and eastern street boundaries impacted by the water main break)

6) **Number of service connections/population impacted:**

7) **Critical facilities/sensitive populations affected:** (hospitals, nursing homes, assisted living facilities, dialysis centers, surgical centers, endoscopy suites, schools,

daycare facilities, etc., indicate “none” if not applicable.

8) **Notifications made:** (includes local police, fire, public works, health departments, school districts and mayor(s) of any affected municipalities, county health department(s) and offices of emergency management, and critical/sensitive populations, as appropriate).

9) **Cause of water supply Incident:** (physical damage, treatment malfunction, unknown, etc.)

10) **Estimated time to repair/restore normal service:**

11) **Provisions for alternate water supply:** (includes interconnection with another community water system, bottled water, water tanker, temporary overland (hydrant to hydrant) connections, or Not Required

12) **Corrective Actions Status:**

(Establish corrective actions implemented which may include the following (subsequent status reports may expand on the corrective actions implemented):

- a. A Boil Water Advisory (BWA) was issued by the system.
- b. Establish BWA delivery methods (includes telephone notification system ie. Reverse 911, TV/Radio Broadcasts, Hand Delivery (door-to-door), sound truck, etc.)
- c. Status of repairs/replacement, etc.
- d. Disinfection and flushing of the repaired infrastructure in accordance with Industry Standard: AWWA C651.
- e. Samples collected to verify restoration of water quality.

Town of Springerville
418 E Main St
Springerville, AZ 85938
Phone: (928) 333-2656

UNSAFE WATER NOTICE

Date _____

Dear _____;

This is to notify you that your drinking water has been determined unsafe to drink due to a suspected contamination incident that has affected the Town of Springerville's distribution and supply system. Body contact with the contaminated water is not recommended. It is also not recommended to use the contaminated water to wash either your clothes or your dishes.

The Town is in the process of distributing bottled water to our customers for their protection. Distribution of bottled water will be based on 1 one-gallon plastic container, per person, per day.

Every effort is being made to resolve this issue as quickly as possible. If you have questions or require further discussion, please contact our office.

Sincerely,

Public Works Director

Town of Springerville
418 E Main St
Springerville, AZ 85938
Phone: (928) 333-2656

NOTICE TO CONSERVE WATER

Date _____

Dear _____;

The Town of Springerville is experiencing a breakdown in a major component of the water system. You are hereby requested to limit your water consumption as much as possible until repairs are made, at which time you will be notified. The Town of Springerville Public Works Department should have the water service returned to normal within 48 hours.

If you have any questions or require further discussion, please contact our office.

Sincerely,

Public Works Director

APPENDIX D

PARTS INVENTORY FOR EMERGENCY REPAIRS

<u>QUANTITY</u>	<u>DESCRIPTION</u>
2	2" GATE VALVE
3	4" GATE VALVE
3	6" GATE VALVE
6	2" REPAIR CLAMP
6	4" REPAIR CLAMP
6	6" REPAIR CLAMP
6	8" REPAIR CLAMP
100 feet	4" SDR 35 PVC PIPE
100 feet	6" SDR 35 PVC PIPE
100 feet	8" SDR 35 PVC PIPE
100 feet	4" C900 PVC PIPE
100 feet	6" C900 PVC PIPE

These are the main repair parts included in inventory.

Additional parts are being added to the list as funds are available.

Smaller parts such as curb stops, meters, service line pipe, couplings and bushings are available and stocked in the service vehicles.

APPENDIX E

MICROBIOLOGICAL SAMPLING SITING PLAN AND SAMPLING PROCEDURE MANUAL FOR THE TOWN OF SPRINGVILLE WATER

MICROBIOLOGICAL SAMPLE SITING PLAN AND SAMPLING
PROCEDURE MANUAL

FOR THE

TOWN OF SPRINGERVILLE
DRINKING WATER SYSTEM

NOVEMBER, 2014

**MICROBIOLOGICAL SAMPLE SITING PLAN AND
SAMPLING PROCEDURE MANUAL FOR THE TOWN
OF SPRINGERVILLE DRINKING WATER SYSTEM**

**TOWN OF SPRINGERVILLE
SPRINGERVILLE, ARIZONA**

November, 2014

TABLE OF CONTENTS

- 1.0 INTRODUCTION**
- 2.0 CRITERIA FOR SELECTING BACTERIOLOGICAL SAMPLE SITES**
 - 2.1 Introduction**
 - 2.2 Summary of TCR Requirements**
 - 2.3 Criteria for Bacteriological Sample Station Site Selection**
- 3.0 DESCRIPTION BACTERIOLOGICAL SAMPLING PROGRAM**
 - 3.1 Introduction**
 - 3.2 Sources of Water and Entry into the Distribution System**
 - 3.3 Description of Distribution System Layout and Design**
 - 3.4 Bacteriological Sampling Station Sites**
 - 3.5 Routing and Schedule for Bacteriological Sample Collection**
 - 3.6 Bacteriological Sampling Procedures**
- 4.0 CONCLUSION**

LIST OF TABLES & FIGURES

Table or Figure

- A List of Domestic Wells and Storage Reservoirs**
- B Table of Bacteriological Sampling Site Locations**
- C Map of Bacteriological Sampling Site Locations, Zones for Bacteriological Sample Collection, and Flushing Blow-offs at Dead End Mains.**

1.0 INTRODUCTION

The Town of Springerville (TOS) drinking water system consists of eight (8) domestic underground wells, two storage reservoir sites with two storage tanks and a distribution network. The TOS serves a total of 728 meters with approximately 641 residential and 87 commercial water service connections. To ensure microbiological safety of the water supply, the TOS collects distribution system water samples monthly and submits the samples to a State approved laboratory that analyzes the samples for the presence of coliform bacteria. The samples are collected by the TOS's certified operators. At the present time, bacteriological samples are collected from a faucet located at Town Hall.

2.0 CRITERIA FOR SELECTING BACTERIA SAMPLING SITES

2.1 INTRODUCTION

This section presents a summary of the existing regulations with regards to the bacteriological quality of distributed domestic water that TOS provides to the community. A summary of the relevant regulations and the criteria for sample site selection for the Town of Springerville are presented below.

2.2 SUMMARY OF TCR REQUIREMENTS FOR TOS

The Total Coliform Rule (TCR) was promulgated by the United States Environmental Protection Agency (USEPA) on June 29, 1989 and became effective on December 31, 1990. This rule was adopted by the State of Arizona as R18-4-241 on July 21, 1991. The total number of samples to be collected from a water distribution system

is a function of the population served. The minimum number of samples that are required to be drawn and analyzed for bacteriological water quality by the Town of Springerville under the existing ADEQ regulation is (2) TWO samples a month, since the Springerville resident population is in the range of 1,001 to 2,500 individuals.

Compliance with the TCR is determined by the presence or absence of bacteria in the samples rather than the density of coliforms in the positive samples. The total number of coliform positive samples must not exceed 5 percent of the samples collected each month. In the event of a positive sample during routine sampling, resampling is required. Resampling for coliform bacteria constitutes additional sample collection at the original location and at service connections up and downstream from the original location, until no positive samples are detected at these sites. Since the number of samples required to be drawn to satisfy the TCR requirement for the Town of Springerville is only (2) two samples a month, no positive samples can be detected in order to achieve compliance with the rule.

The following actions were identified in the TCR as the best available technologies (BAT) for total coliform. Those that apply to the Town of Springerville are:

- Protection of wells from contamination by coliform appropriate placement and construction;
- Occasional introduction of a chlorine disinfectant residual throughout the distribution system, especially during the beginning and duration of the summer tourist season;
- Proper maintenance of the distribution system including appropriate pipe replacement and repair procedures, main flushing programs, proper operation and maintenance of storage tanks and reservoirs;
- A comprehensive backflow and cross-connection control program as specified in ARS R18-4-232;

- **Continual maintenance of positive water pressure in all parts of the distribution system.**

2.3 CRITERIA FOR SITE SELECTIONS

According to the State regulations, “A public water system shall collect total coliform samples at sites which are representative of water throughout the distribution system according to a written sample siting plan which shall be subject to Department review and approval. A public water system shall collect samples at regular time intervals throughout the month....” **The criteria by which the State will determine the acceptability of the sample sites as representative of the system is not clearly defined. However, based on information obtained from guidance documents and other information made available and published by the Arizona Department of Environmental Quality (ADEQ) the Town of Springerville sampling site plan is based on the following:**

- **Total number of samples as per the requirement of the rule;**
- **Uniformity of the distribution of samples with respect to the various locations throughout the water system;**
- **Uniformity of the distribution of samples with respect to the various location of storage reservoirs and dead end water mains;**
- **Regularity of sample collection frequency at the designated sample sites;**
- **Identification of alternative sample sites for Resampling purposes in the event positive coliform samples are drawn at the regular sampling sites.**

The sample siting plan of the Town of Springerville therefore, includes the following:

- **System information such as the name, address, phone numbers, description of system, population served and laboratory information;**
- **System map identifying reservoir locations, wells booster pumps and point of entry into the distribution system;**
- **Proposed sampling sites and map which include check sampling stations in the same zones as the regular sampling stations;**

- Source water, type and points of entry to the distribution system and blow-off locations at the dead ends of the distribution system for flushing purposes.

Based upon the above considerations, the sample siting plan/maps of TOS;

- Identifies groundwater sources, storage reservoirs and prominent system dead ends on a distribution system map.
- Based upon the current Town of Springerville population, determines the number of samples required to be collected for compliance with TCR.
- Determines number of sample sites depending on the dead ends and other unique features in the water system.
- Locates the regular sample sites that reflect the population that resides within the Town's service area. Consideration was given to the proposed sampling site's access and consideration of additional sampling locations for check sampling at service connections on each side of the regular routine sample sites.
- Develops the sampling frequency at the selected sites. This is a designation of sample zones utilized throughout the different months of the year. There are four regular sampling stations with two stations in two different pressure zones. Each month a sample will be taken from each zone. The sampling stations will also be alternated throughout the year.

30. DESCRIPTION OF BACTERIOLOGICAL SAMPLING SITES

3.1 INTRODUCTION

This section presents a description of the bacteriological sampling sites identified for use within the Town of Springerville Drinking Water System. These sampling sites were selected in accordance with the criteria presented in section two, which were developed to comply with the State's regulatory requirements. A description of the potable water system is also provided in this section.

3.2 WATER SOURCES AND STORAGE

The Town of Springerville operates eight (8) underground domestic wells. The Voigt and Wilkins wells are usually the two (2) that are in operation and two (2) above ground storage reservoir sites.

3.3 DISTRIBUTION SYSTEM DESIGN

The TOS's Drinking Water System covers an area along the north and south side of State Highway 260 in a water service area about 5 miles wide by about 2.5 miles tall. It consists of 2", 4", 6", 8" and 10" water lines. The lines are constructed of Cement Transite, Steel and PVC. The system is broken up into two (2) pressure zones as shown on the map in the appendix.

"East Side Wells"

Tank Well 55-506640 (On Water Treatment Rd)

40 GPM / 50 GPM (6")/ Installed in 1983

North 34 08.125'

West 109 15.124' (On 24/7)

Water Treatment Well 55-623221 (On Water Treatment Rd)

62 GPM / 35 GPM (6")/ Installed 1983

North 34 08.330'

West 109 15.165' (Used frequent to fill tank)

New motor/ pump installed in 8/2014

Wilkins Well 55-500049 (Kenny McClain Property)

98 GPM/ 62 GPM (6")/ Installed 1983

North 34 08.148'

West 109 15.171' (Used not frequently to fill tank)

Haystack Well 55-507067 (On Trammell property)

40 GPM / 14 GPM (3")/

Installed 1984

North 34 08.131'

West 109 14.870' (Not used frequently)

Meadow Well 55-585060 (On Trammell property)

24 GPM

Installed 1985

North 34 08.254'

West 109 17.273'

"West Side Wells"

River Well 55-623217 (Off of Airport Road by the Bridge)

110 GPM/ 109 GPM (6")/ Installed 1982

North34 07.926'

West 109 17.735' (On 24/7)

New motor/ pump and wire installed in 2013

Voight Well 55-504731 (Off of Maricopa Rd)

125 GPM/ 90GPM (6")/ Installed 1983

North 34 07.451'

West 109 16.690' (Used frequently and On 24/7 in the summer)

Forest Service Well 55-623223 (On Navajo Rd)

120 GPM / 90 GPM (6")/ Installed 1956

North 34 08.122'

West 109 16.866' (Used not frequently to fill tank)

Navopache Well 55-623224 (Off of Main St/ Behind the Speckled Trout)

Off line (3")/ Installed 1956

North 34 07.953'

West 109 17.061'

Airport Well 55-587015 (Up by the Airport)

Off Line (6")/ Low Producer/ Installed 2002

North 34 07.809'

West 109 18.211'

Town Hall Well 55-623219 (By the Fire Department)

Off Line

"East Side Tank" (On Water Treatment Rd)

Pumping Station Storage Tank 500,000 gallons. Installed 1983.

North 34 08.125'

West 109 15.124'

"West Side Tank" (On top of Cemetery Hill)

Cemetery Hill Storage Tank 1,000,000 gallons. Installed 1996.

East Booster Pump Station (On Water Treatment Rd)

100 PSI

Built in 1983/ Computers added in 1995 and updated in 2009

Backup Generator installed in 2014

East Lift Station (Off of Apache Rd)

21 GPM

Built in 1982

West Lift Station (On Hwy US 60)

50 GPM

Built in 1982/ Above ground pumps installed in 2011

Waste Water Treatment Plant (Water Treatment Rd)

Built in 1982

<u>Capacity/ Usage</u>	<u>Present</u>
Avg. Daily	146,000 per day
Peak Daily	211,000 per day
Design Capacity	325,000 per day

<u>Water</u>	<u>Sewer</u>
641 Residential	390 Residential
<u>87 Commercial</u>	<u>126 Commercial</u>
728 TOTAL	516 TOTAL

3.4 BACTERIOLOGICAL SAMPLING SITES

According to the site selection criteria presented in Section 2, the bacteriological sampling sites were chosen to be representative of the water distribution system with regards to the following parameters:

- Population density
- System dead ends
- Distance from groundwater sources, distribution design and layout

The TOS distribution system consists of two (2) pressure zones. Based on the size of the distribution system, it was decided that a total of ten (10) sampling sites, four (4) for routine sampling (rotated on a monthly basis for the two (2) samples required by ADEQ per month) and six (6) additional check sampling stations would sufficiently cover the testing requirements. Should check samples need to be drawn from points other than the regular sampling stations in response to an MCL violation for bacteriological quality, the additional check sampling stations will ensure no false positive check samples are obtained from contaminated sampling sites. All of these sampling stations sites are representative of the population density and system dead ends. These sampling station sites need to be sampled on a rotating basis. Table B lists the selected sample station sites along with alternate locations identified for each of the four (4) routine sampling station sites.

MICROBIOLOGICAL SAMPLE STATION SITES FOR TOWN OF SPRINGVILLE, ARIZONA (TABLE B)					
Bacteriological samples analyzed by: MOHAVE ENVIRONMENTAL LABORATORY 200 N SECOND ST, SUITE B HOLBROOK, AZ 86025 (928) 524-4635					
REGULAR SAMPLE STATION		ALTERNATE SAMPLE STATION		ALTERNATE SAMPLE STATION	
	LOCATION		LOCATION		LOCATION
RTCR-002	Town Hall	RTCR-002UP	Town Park	RTCR - 002DN	Town Yard
RTCR-001UP	Pena Residence	RTCR-001	Barraza Residence	RTCR-001DN	Booster Pump Station

The ten (10) locations will all have individual fixtures installed specifically for sampling.

A list of the sampling sites and the corresponding addresses are provided in Table C.

TABLE C

NAME:

1. Town Hall
2. Town Park
3. Town Yard
4. Pena Residence
5. Barraza Residence
6. Booster Pump Station

ADDRESS:

- 418 E Main
- Mohave & Cochise
- Yavapai & Papago
- 469 Butler Drive
- 1627 East 1st Street
- Water Treatment Rd

3.5 ROUTING AND SCHEDULE FOR BACTERIOLOGICAL SAMPLE SITE COLLECTION WITHIN THE TOS DRINKING WATER SYSTEM

Sample location identified in the previous section can be grouped into two (2) sample collection zones as follows:

- Zone 1: Sites 1, 2, 3, 4 & 5**
- Zone 2: Sites 6, 7, 8, 9, & 10**

The Total number of samples collected from a sample site is a function of the service area population. The current year round population for the service area is under 2,500. The required number of samples to be collected each month for populations of 1,001 to 2,500 is two (2). This can be accomplished by the following monthly sampling schedule:

	<u>ZONE 1</u>	<u>ZONE 2</u>
Month One:	Town Hall	WWTP
Month Two:	Town Hall	Airport
Month Three:	Fire Department	Airport
Month Four:	Fire Department	WWTP
Month Five:	Repeat the sequence again beginning with month One.	

According to the above schedule, two (2) samples each month will be collected which will satisfy the regulatory requirements. S. Voigt Street and the Airport are both the furthest sampling sites from their water sources. City Hall and the State Yard are located in more populated areas. All of the regular or alternative stations will be sampled at faucets or at water meter boxes, with the use of commercially available sampling fixtures.

Repeat check samples need to be collected from the routine sample station locations, as well as the alternate locations identified in Table B should an MCL violation occur.

3.6 SAMPLING PROCEDURE FOR BACTERIOLOGICAL SAMPLING

REMOVE ANY FAUCET ATTACHMENT PRIOR TO DISINFECTION AND SAMPLING

- 1. Disinfect the faucet with chlorine bleach (5% or greater concentration).**
- 2. Turn on the water and allow it to run in a steady stream for 5-6 minutes.**
- 3. Open the container.**
- 4. Grasp the container near the bottom**
- 5. Put the container under the flowing stream.**
- 6. Fill the bottle to the neck or indicated fill line.**
- 7. Seal the container as soon as it is filled and removed from the flow.**
- 8. Turn the water off.**
- 9. Label the container.**
- 10. Complete the required forms.**
- 11. Place the container and completed forms in an approved shipping box.**
- 12. Clean up the sampling site.**
- 13. Transport the samples to a State approved lab within 48 hours.**

4.0 CONCLUSIONS

The Town of Springerville currently samples from one (1) site in the Town. With the implementation of this program, a more representative sampling pattern will be established. Commercially available sampling fixtures will not interfere with the customer's water use or their meter readings. Sample sites presented in Section 3 were carefully selected to reflect the population density and system characteristics such as dead ends.

APPENDIX F

DIAGRAM OF THE TOS DOMESTIC WATER SYSTEM WATER LINES, WELLS, TANKS, ETC.,