

# Four Steps to Completing a Water Shortage Response Plan

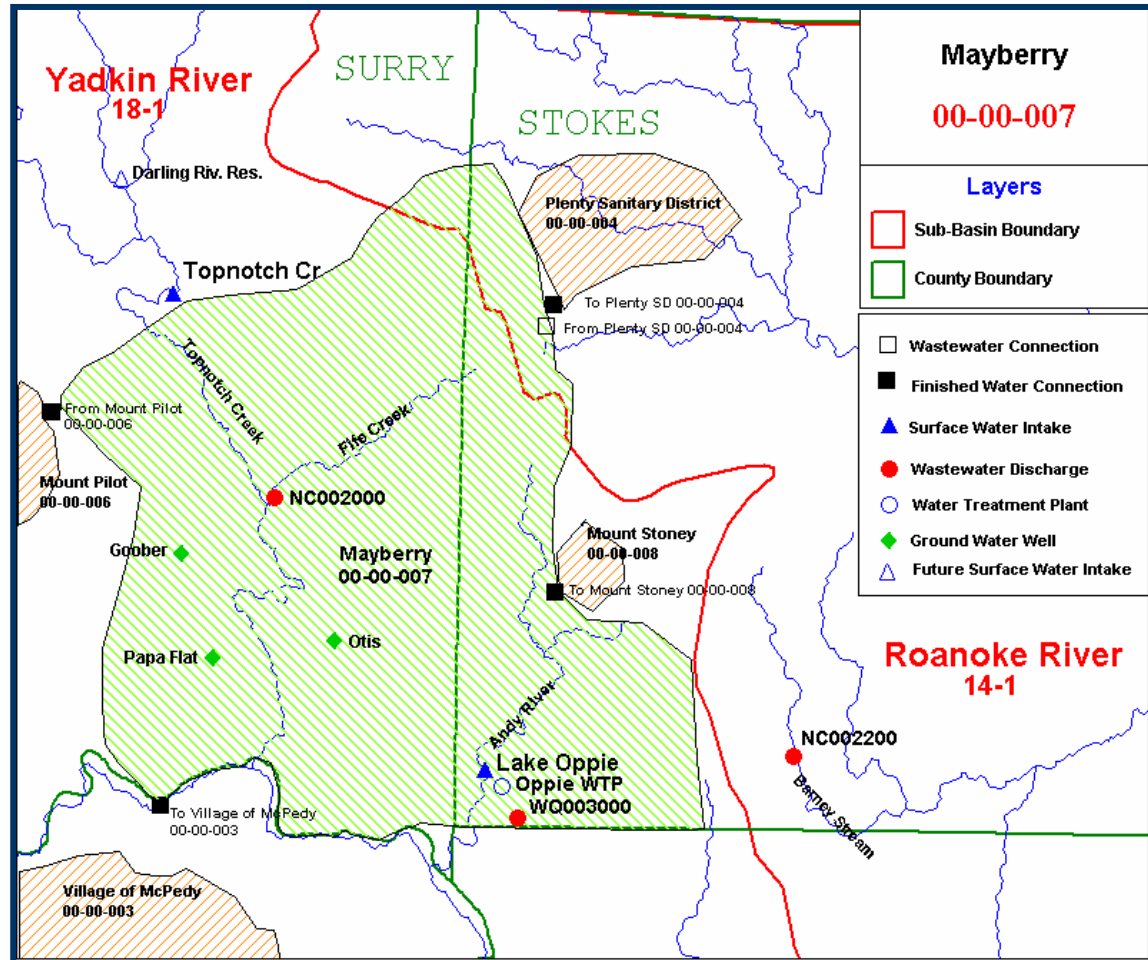
1. Complete the water shortage response summary form to organize essential information
2. Develop a WSRP document explaining in detail all information provided in the summary form
3. Submit WSRP for review to Division of Water Resources
4. Local governing board adopts approved plan

# Example Water Shortage Response Plan Town of Mayberry

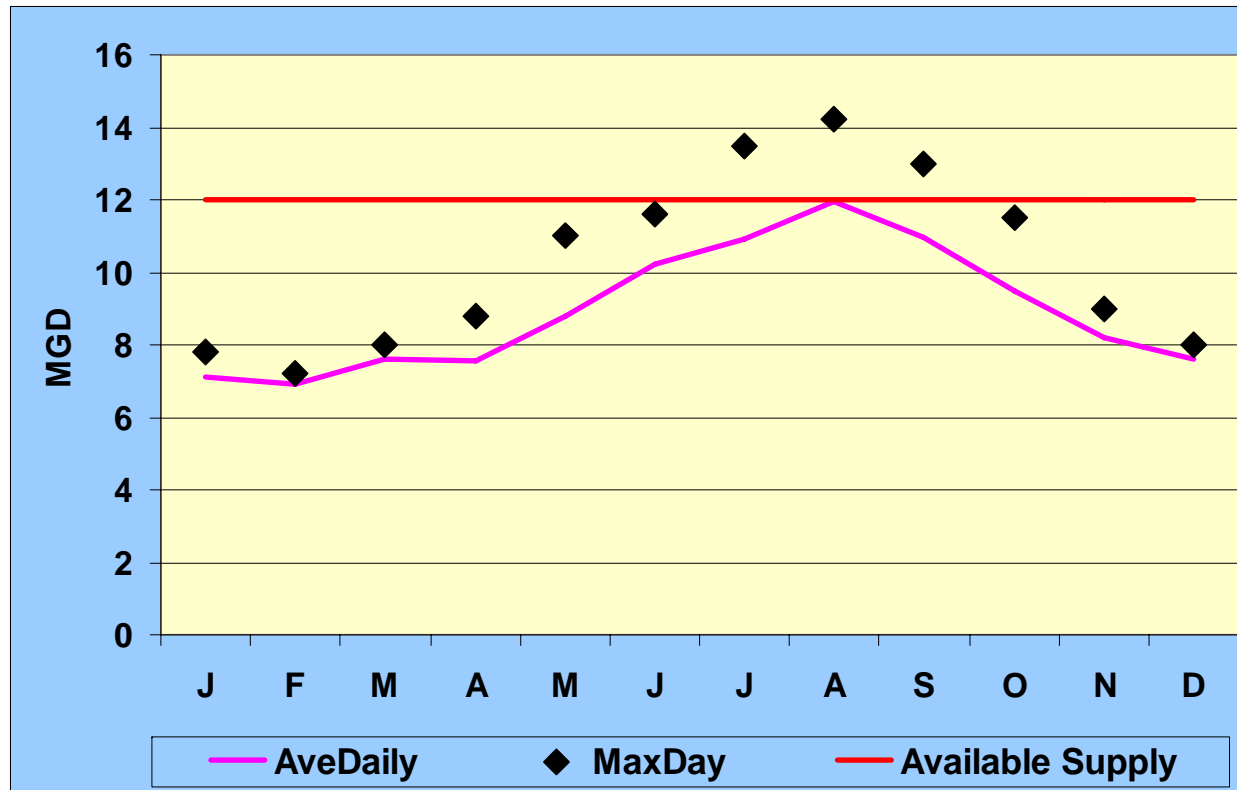
- Mayberry is a fictitious town used to help illustrate example water shortage response planning approaches
- Mayberry's plan clearly outlines authority to limit use of potable water distributed by its water system yet also allows flexibility to adapt to changing conditions

**Every water system should tailor its individual plan to its local conditions**

# Town of Mayberry Service Area



# Town of Mayberry Historical Water Use



# Plan Authority

## A. Who is responsible for implementing the water shortage response protocols?

### 1. Mayberry Town Manager:

- Susan Smith
- Telephone: (555) 321-1000
- E-mail: [manager@townofmayberry.org](mailto:manager@townofmayberry.org)

### 2. Mayberry Utility Director

- James Jones
- Telephone: (555) 321-1234
- E-mail: [utilitydirector@townofmayberry.org](mailto:utilitydirector@townofmayberry.org)

# Plan Notification

B. How will water users and system employees be notified when the water shortage response protocols are activated?

- Mayberry employee e-mail notification
- Notices in all Mayberry municipal buildings
- Town of Mayberry website
- Notice in *The Mayberry Town Crier*
- PSA on local radio and cable stations
- Notice in customer water bills



# Provision Notification

## C. How will water users be informed of required response measures?

- Direct mailing to Mayberry utility customers
- Reverse 911 emergency notification
- Publish provisions of WSRP in *The Mayberry Town Crier*
- Post to Mayberry's town website
- PSA on local radio and cable stations

# Shortage Severity

D. What specific measurements of available supply, demand or system conditions will be used to determine the shortage severity?

- Amount of available water
- Demand
- Treatment capacity
- Mechanical failures
- Source water contamination



# Plan Triggers

E. What specific conditions will be used to trigger water reduction measures and movement to more and less restrictive measures?

- Mayberry's primary water source is Lake Oppie
- WSRP triggers focus on Lake Oppie's conditions
- Topnotch Creek can supply Oppie WTP

# Levels of Response

## F. What levels of response will be required?

Stage	Response	Description
1	Voluntary Reductions	All Town of Mayberry customers are encouraged to reduce their water use and improve water use efficiency; however, no penalties apply for noncompliance. Water supply conditions indicate a potential for shortage.
2	Mandatory Reductions	Customers must abide required water use reduction and efficiency measures; penalties apply for noncompliance. Water supply conditions are significantly lower than the seasonal norm and water shortage conditions are expected to persist.
3	Emergency Reductions	Water supply conditions are substantially diminished and pose an imminent threat to human health or environmental integrity.
4	Emergency Reductions	Water supply conditions are substantially diminished and pose an imminent threat to human health or environmental integrity.
5	Water Rationing	Water supply conditions are substantially diminished and remaining supplies must be allocated to preserve human health and environmental integrity.

# Triggers for Lake Oppie

Full Pond 900 ft

## Normal Minimum Elevation

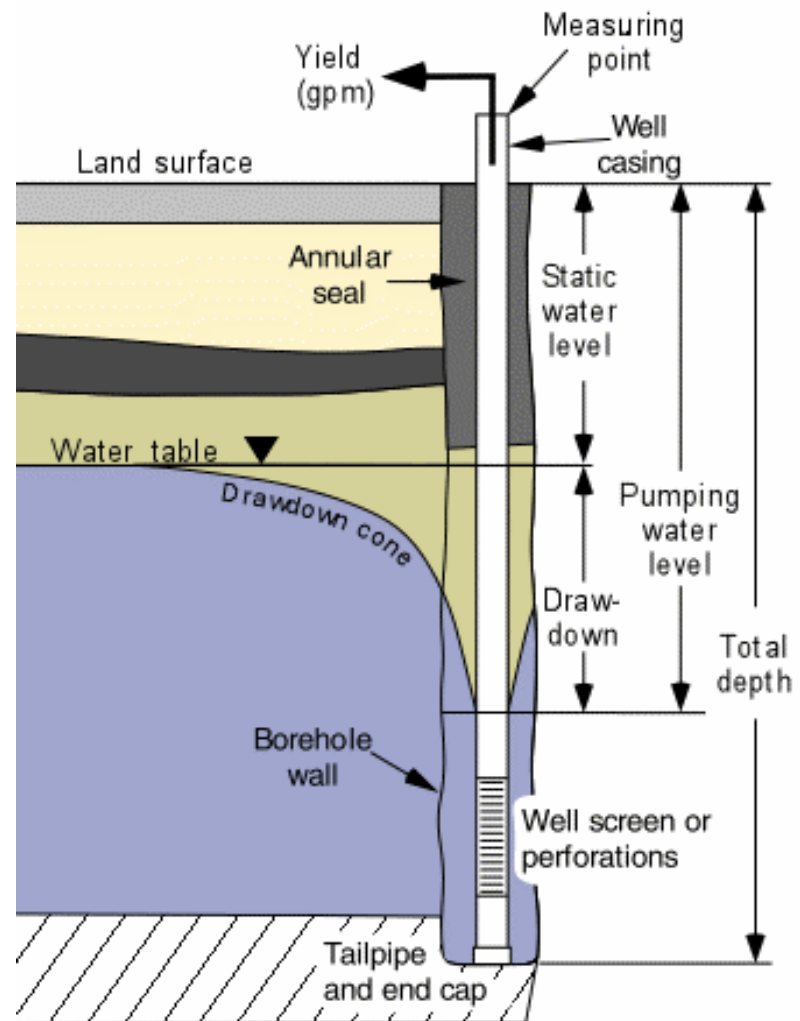
Upper Intake	Stage 1: 893 ft (<75% of Useable Storage)
	Stage 2: 882 ft (<65% of Useable Storage)
Middle Intake	Stage 3: 867 ft (<50% of Useable Storage)
	Stage 4: 860 ft (<30% of Useable Storage)
Lowest Intake	Stage 5: 850 ft (0% of Useable Storage)

# Triggers for Lake Oppie

Stage	Usable Storage	Intake Level
1	<75%	Upper Intake 7ft below full
2	<65%	Upper Intake 18ft below full
3	<50%	Middle Intake 33ft below full
4	<30%	Middle Intake 50ft below full
5	0%	Water Below Lower Intake

# Example Groundwater Triggers

- Pumping time
- Water levels
- Relationship of static water level and pump intake elevation



# Example Groundwater Triggers

## Stage 1

Pumping Time  $>10$  hrs

20% reduction in seasonal normal distance from static water level and pump intake

20% increase pumping time for same output

## Stage 2

Pumping Time  $>12$  hrs

40% reduction in distance from static water level and pump intake

40% increase pumping time for same output

# Example Groundwater Triggers

## Stage 3

Pumping Time >14 hrs

60% reduction in distance from static water level and pump intake

60% increase pumping time for same output

## Stage 4

Pumping Time >20 hrs

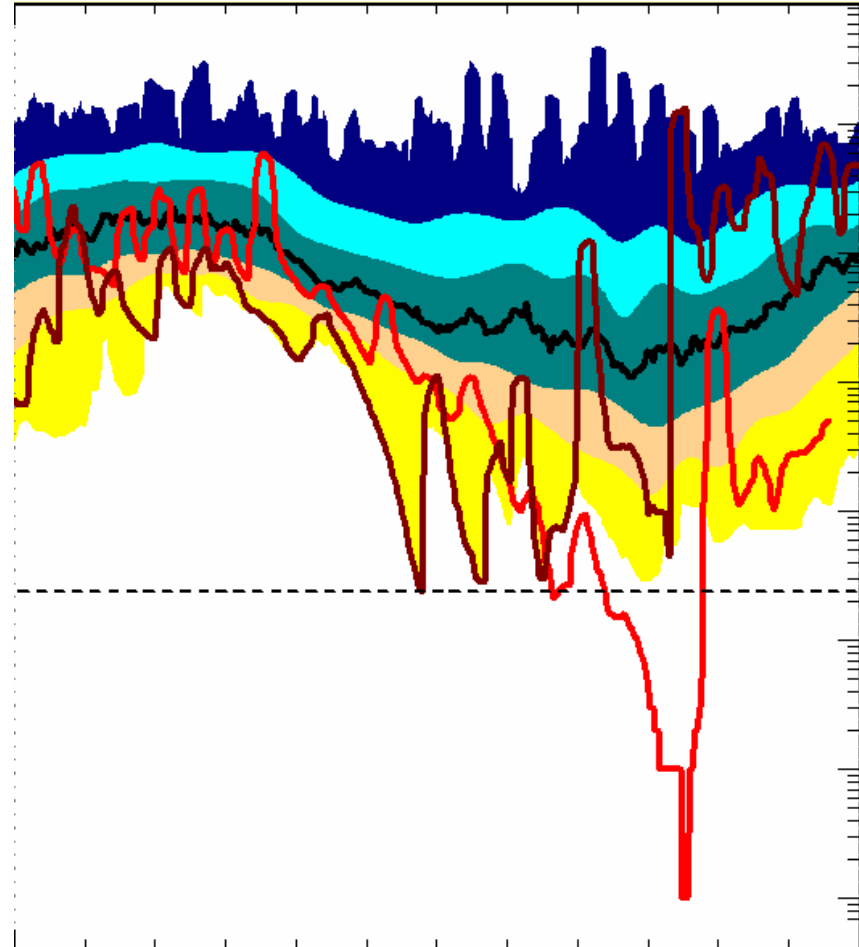
80% reduction in distance from static water level and pump intake

## Stage 5

Water level at pump intake elevation

# Example Run-of-River Triggers

- Flow (cfs)
- River Stage (ft msl)
- Percentile of POR





# Example Run-of-River Triggers

## Stage 1

Water Level at 52ft msl at Intake in River

Discharge at USGS Gage XXX is <300 cfs for >14 days  
>80% of Production Capacity for 3 consecutive days

## Stage 2

Water Level at 50ft msl at Intake in River

Discharge at USGS Gage XXX is <200 cfs for >10 days  
>90% of Production Capacity for 3 consecutive days

# Example Run-of-River Triggers

## Stage 3

Water Level at 48.5ft msl at Intake in River

Discharge at USGS Gage XXX is  $< 150$  cfs for  $> 7$  days

100% of Production Capacity on any day

## Stage 4

Water Level at 47ft msl at Intake in River

Discharge at USGS Gage XXX is  $< 100$  cfs for  $> 5$  days

## Stage 5

Water Level at 45ft msl at Intake in River

Discharge at USGS Gage XXX is  $< 50$  cfs

# Levels of Response

Town of Mayberry has five response levels:

Stage 1: Voluntary Reductions

Stage 2: Mandatory Reductions

Stage 3: Emergency Reductions

Stage 4: Emergency Reductions

Stage 5: Water Rationing

# Stage 1: Voluntary Reductions

- Ask all water users to reduce use 5%
- Educate customers about water conservation and efficiency
  - Irrigate landscapes only one inch per week
  - Prevent runoff and watering impervious surfaces
  - Water deep to encourage root growth
  - Wash only full loads in clothes and dishwashers
  - Use spring-loaded nozzles on garden hoses
  - Repair known leaks

# Stage 2: Mandatory Reductions

- Goal reduce water use by 10% from previous month level
- Continue Voluntary Reduction actions
- Irrigation limited to a half inch per week between 8PM and 8AM
- Ban use of drinking water for washing impervious surfaces
- Limit testing and training that uses drinking water

# Stage 3: Emergency Reductions

- Continue actions from previous stages
- Goal reduce use an additional 20%
- Ban non-essential uses of drinking water
- Limit garden and landscape irrigation to minimum amount necessary for survival
- Drought surcharge on rates

# Stage 4: Emergency Reductions

- Continue actions from previous stages
- Goal reduce use an additional 25%
- Ban use of drinking water except to protect public health and safety
- Increase drought surcharges

# Stage 5: Water Rationing

Goal = provide drinking water to protect public health (residences and residential health care facilities and correctional facilities)

- Who should get potable water?
- Can hospitals and other residential facilities be isolated to receive potable water?
- How can you limit unauthorized use and excess use?



# Stage 5: Water Rationing

- All customers allowed a minimum needed for public health protection
- Firefighting is the only allowable outdoor water use
- Provide pickup locations to distribute potable water

# Plan Enforcement

## G. How will the provisions of the water shortage response protocols be enforced?

- Dedicated hotline to report violations
- E-mail contact to report violation on town website [waterwaste@townofmayberry.org](mailto:waterwaste@townofmayberry.org)
- Utility personnel and Town police will issue citations according to the following schedule:

1 <sup>st</sup> Violation	Warning
2 <sup>nd</sup> Violation	\$100 fine
3 <sup>rd</sup> Violation	\$250 fine
4 <sup>th</sup> Violation	\$500 fine
5 <sup>th</sup> Violation	\$500 fine and discontinuation of service

# Public Comment

H. How will customers review and comment on the plan before it is finalized?

- WSRP Task force
- Draft plan published in *The Mayberry Town Crier* and on town website
- Public meeting for comments on draft
- Revised Draft published at least 30 days before adoption vote by Town Council
- Notice in water bills

# Variance Protocols

## I. How will variance requests be processed?

- Applications for variance requests are available from:
  - Town Utility Office
  - Town of Mayberry website
- Submit application to Utility Office for review
- Decision by Utility Director within two weeks

# Variance Protocols

## J. What criteria will be used for granting variances?

- Impact on water demand
- Necessary use of drinking water
- Expected duration
- Alternative source options
- Social and economic importance
- Prevention of structural damage

# Measuring Effectiveness

K. How will the effectiveness of the protocols be measured?

- Frequency of activation
- Problem periods without activation
- Number of violation citations
- Desired reductions attained
- Evaluation of demand reductions
  - Were achieved reductions due to plan measures or because of seasonal variations?

# Plan Revision

## L. How will the protocols be revised when needed?

- The Town of Mayberry Utility Director will review the WSRP:
  - After each activation
  - To adapt to new water supplies or demands
  - Every five years at a minimum
- A work group will review procedures after each emergency reduction stage to recommend necessary improvements to Mayberry's Town Council

# Response Consistency

Does your system depend on water from somebody else's reservoir?

Yes  No

If yes, are your water shortage response protocols consistent with those of the owner of the reservoir?

Yes  No