

August 2015



REVISED TOTAL COLIFORM RULE (RTCR)

Implementation Date: April 1, 2016

<http://www.drinkingwater.vt.gov>

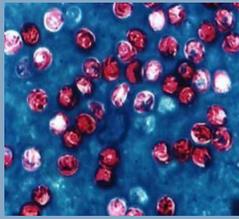
DRINKING WATER AND GROUNDWATER PROTECTION DIVISION

OUTLINE



BACKGROUND: TOTAL COLIFORM RULE

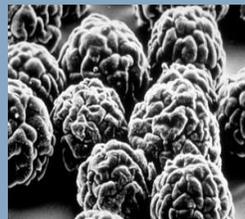
- Published 1989, effective 1990
- There are a variety of waterborne pathogens that can cause health issues:



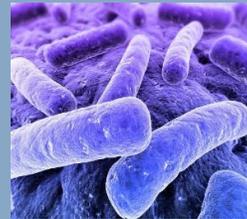
cryptosporidium
oocysts



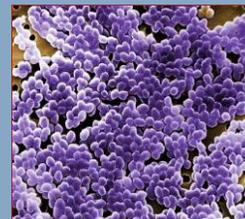
giardia lamblia



poliovirus



legionella



enterococci

- Total coliform is an indicator of the presence of waterborne pathogens
- Regular monitoring of total coliform bacteria to:
 - Verify the integrity of the distribution system
 - Evaluate the effectiveness of treatment
 - Signal possible fecal contamination

BACKGROUND: TOTAL COLIFORM RULE

- Total coliform MCL Goal = 0
- Routine monitoring for TC at a frequency proportional to system population
- Follow-up sampling required for TC+
- MCL Violations (based on sample results)
 - Non-acute (total coliform):
 - Systems under 33,000: 2 or more TC+ samples in a month
 - Systems above 33,000: 5% or more samples are TC+ in a month
 - Acute (E. coli):
 - TC+ RT with EC+ RP
 - EC+ RT with TC+ RP
- Monitoring and Reporting Violations for failure to report sample results
- Public Notice required for MCL and Monitoring and Reporting Violations
- All violations must be reported in the Consumer Confidence Reports

The TCR has been successful in protecting against waterborne disease and outbreaks.

However

- The number of violations have remained steady
- Any improvements likely to occur under the TCR have largely been achieved

Question:

How can we achieve greater public health protection?

Goal

Increase protection of public health by reducing **sanitary defects** that allow fecal contamination and/or waterborne pathogens to enter a distribution system or could indicate a failure or imminent failure in a barrier that is already in place.

TRANSITION TO THE RTCR

What will stay the same?

1. Continue to conduct bacteriological monitoring
2. Continue to use total coliform and E. coli as indicators

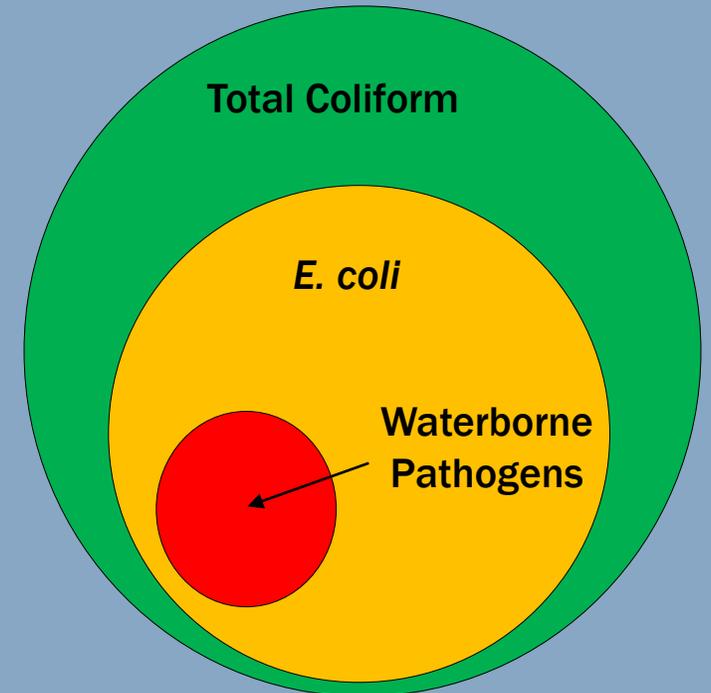
What will change?

1. “Find and Fix”
2. More stringent requirements for maintaining quarterly monitoring for Non-Community systems (where applicable)
3. Increased requirements for “seasonal” systems
 1. Monthly Sampling for groundwater systems
 2. Completion of State-approved start-up procedure
4. Completion of Bacteriological Monitoring Plans

OUTLINE



- Total Coliforms are still used as an indicator of system integrity
- However, total coliforms are not an immediate health concern on their own



NO MORE TOTAL COLIFORM MCL

E. COLI BACTERIA AS AN INDICATOR



- E. coli still an indicator for fecal contamination
- E. coli MCL Goal = 0 maintained from the TCR
- E. coli MCL Violations under the RTCR
 - TC+ RT → EC+ RP
 - EC+ RT → TC+ (or EC+) RP
 - TC+ RT → TC+ RP and E. coli not analyzed
 - EC+ RT → No RP samples collected
- Public Notice within 24 hours required

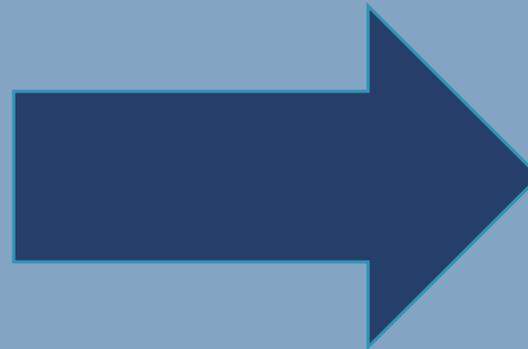
CAUSES OF BOIL WATER IN VERMONT UNDER THE RTCR

Effective April 1, 2016

Yes	No
EC MCL	TC+ Results
<p>Precautionary for:</p> <ul style="list-style-type: none">• Failure to collect RP within 24 hours following EC+• Operational Issues (leaks, fire events, bulk water hauling, depressurization)• Following certain findings in Level 1 and 2 site assessments	

“FIND AND FIX”

- TC as a more suitable indicator of system operation and integrity not public health
- Improved consumer confidence and public perception in water systems



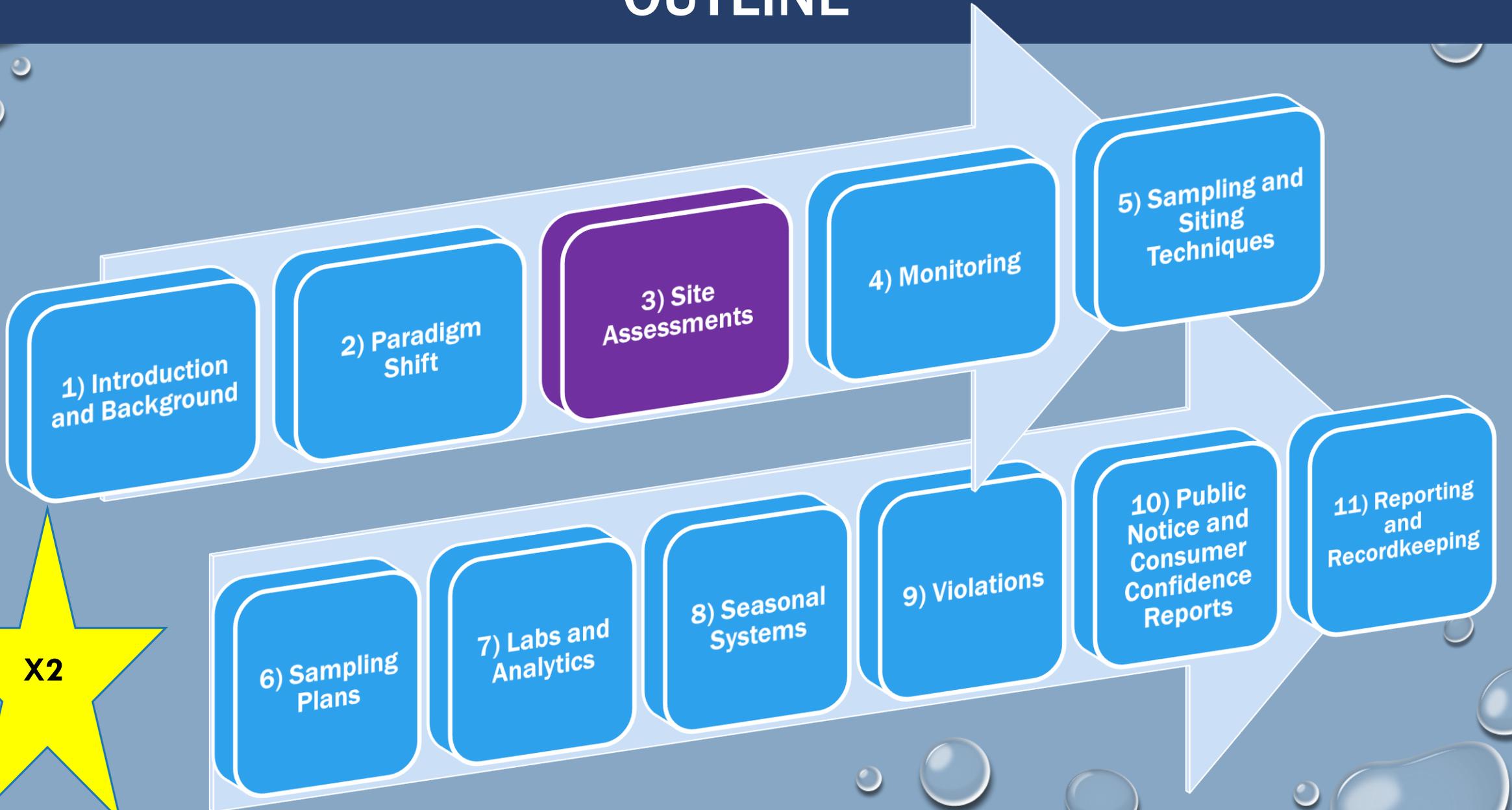
FIND AND FIX



The RTCR will result in:

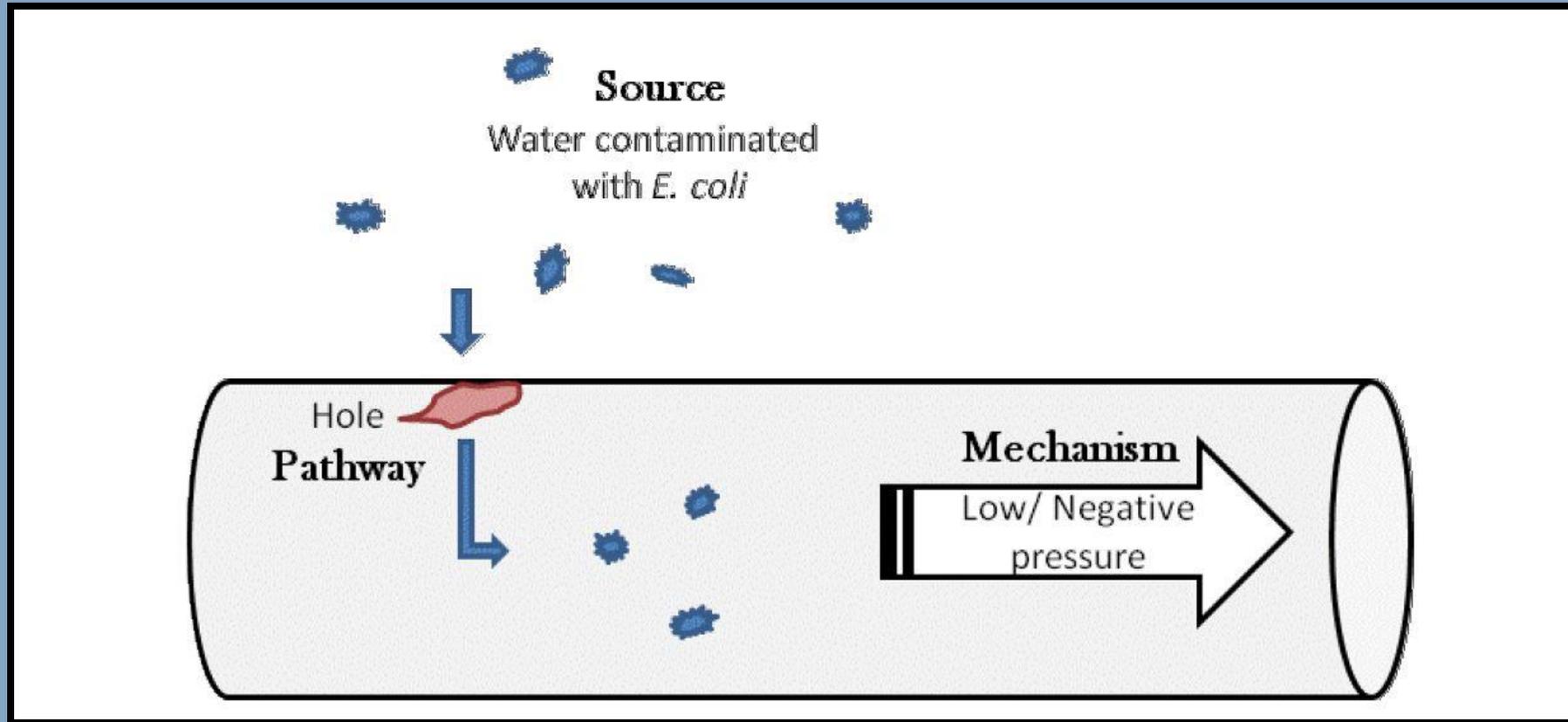
- Increase in site assessments
 - ↳ Decrease in TC/EC +
 - ↳ Decrease in public health risk
 - ↳ Increased operator knowledge of system operation
- Better system performance over time
- Certain “violations” under the current TCR become “triggers” under the RTCR

OUTLINE



- Bacteria may be present in the distribution if the following simultaneously occur:
 1. **Source** of bacteria
 2. **Pathway** into the distribution system or breach in system integrity
 3. **Mechanism** that allows bacteria to be carried on this pathway or that allows bacteria within biofilms, corrosion tubercles, or sediment to break free and enter the water.

CAUSES OF CONTAMINATION





Level 1 Site Assessment

- 2 or more TC+ samples in a month
- Failure to take EVERY repeat sample following TC+ Routine sample

Level 2 Site Assessment

- E. coli MCL
- Second Level 1 trigger in 12 months

1. Level 1 Site Assessment trigger:

- a) Two or more TC + samples in a month; or
- b) System fails to take EVERY required repeat sample following a TC + routine sample.

Resulting in a Level 1 Site Assessment to be performed within 30 days of the trigger

Level 1 Site Assessments can be performed by any validly-certified drinking water system operator with the same class certification as the water system or greater.

COMPLETED LEVEL 1 ASSESSMENT FORM

VERMONT ENVIRONMENTAL CONSERVATION		Level 1 Site Assessment Form	
Completion and submittal of this form is required following two or more positive total coliform samples within one month <u>or</u> when an inadequate number of repeat samples are collected following a total coliform positive routine sample.			
Drinking Water and Groundwater Protection Division			
System Information			
System Name: Sample System	WSID #: 12345	Class of System: 1A 1E 2 3 4 4A1 4A 4B 4C D (circle class of system)	
Date of Assessment: 6/22/2016	Type of Water System (circle one): TNC / Community / NTNC		
Instructions			
This form must be completed and submitted <u>within 30 days</u> of learning of the requirement to perform the Level 1 Site Assessment. Review sections 1 through 6 below. Answer <u>every</u> question that applies to the water system by circling "Y" for yes or "N" for no. If a specific question is not applicable to the system, circle "NA" for that question. If an <u>entire section</u> does not apply to the water system (if the system does not have treatment and/or storage) circle "NA" in the gray bar for that section. Then fill out sections 7, 8, and 9 completely. In order for this form to be complete it must be signed and dated. Submission of forms beyond the 30 day compliance date will result in a violation.			
Section 1: Changes or Events			
a) NA Y / N changes in operational activity	g) NA Y / N low (below 20 psi) or loss of distribution system pressure		
b) NA Y / N disinfectant residual lower than expected	h) NA Y / N water quality parameters out of range after treatment		
c) NA Y / N firefighting event or hydrant flushing	i) NA Y / N new source added or emergency supply used		
d) NA Y / N signs of vandalism or forced entry	j) NA Y / N flooding; of/around source(s) or distribution system		
e) NA Y / N rapid snowmelt	k) NA Y / N visible indicators of unsanitary conditions		
f) NA Y / N heavy rainfall	l) NA Y / N other		
Section 2: Sampling Site(s)/Protocol			
a) NA Y / N unclean or unsuitable sample tap	f) NA Y / N potential or actual hot water intrusion		
b) NA Y / N aerator was not removed prior to sampling	g) NA Y / N other sampler error (be sure to identify the error in section 7 below)		
c) NA Y / N inadequate tap flushing prior to sampling	h) NA Y / N change in conditions at sample site		
d) NA Y / N auto sensing faucet/swivel-type faucet	i) NA Y / N other		
e) NA Y / N sample bottle or lid contacted something unsanitary prior to or while taking sample (describe what happened in Section 7)			
Section 3: Source(s)			
Drilled/Bedrock Well(s)			
a) NA Y / N recent maintenance to well and/or well pump	f) NA Y / N potential source of contamination (including surface water)		
b) NA Y / N well/pump failure (quantity issue/water outage)	g) NA Y / N electrical conduit damaged or connection to well is loose		
c) NA Y / N well cap missing bolts or gasket	h) NA Y / N damaged or compromised well casing		
d) NA Y / N defective, damaged, or loose well cap/well seal	i) NA Y / N unprotected opening in pump assembly		
e) NA Y / N damaged or unscreened cap vent	j) NA Y / N unsanitary source overflow construction		
f) NA Y / N damaged pitless adapter	k) NA Y / N other		
Spring(s) or Dug Well(s)		Surface Water	
a) NA Y / N potential source of contamination	a) NA Y / N potential source of contamination		
b) NA Y / N infiltration of surface water/run-off	b) NA Y / N recent storm event		
c) NA Y / N unsanitary spring box or well construction	c) NA Y / N infiltration gallery/wet well conditions unsanitary		
d) NA Y / N unsanitary source overflow construction	d) NA Y / N atypical source water quality		
e) NA Y / N other	e) NA Y / N other		
Consecutive Connection(s)			
a) NA Y / N flooded valve/meter vault	d) NA Y / N atypical pressure/flow from wholesaler		
b) NA Y / N damaged interconnection	e) NA Y / N incoming disinfectant residual lower than expected		
c) NA Y / N inadequate backflow protection	f) NA Y / N other		
Section 4: Treatment Process(es) NA			
a) NA Y / N malfunctioning treatment equipment	e) NA Y / N recent installation or repair of treatment equipment		
b) NA Y / N interruption in treatment or power loss	f) NA Y / N treatment method(s) added, changed, or bypassed		
c) NA Y / N change in flow rates (expected or not expected)	g) NA Y / N inadequate treatment equipment or chemicals		
d) NA Y / N improper maintenance and operating procedures	h) NA Y / N turbidity measurements out of range		
e) NA Y / N chlorine residual testing reagents expired	i) NA Y / N other		

Section 5: Storage Tank(s)		NA
a) NA Y / N signs of vandalism or forced entry to tank(s)	g) NA Y / N cover/access hatch not watertight	
b) NA Y / N disinfectant residual lower than expected in tank(s)	h) NA Y / N vent/overflow construction inadequate/compromised	
c) NA Y / N Excessive water age in tank/low turnover	i) NA Y / N deterioration, rust, holes, or other breaches in tank	
d) NA Y / N torn or missing vent and/or overflow screens	j) NA Y / N improper operation or maintenance practices	
e) NA Y / N presence of dead animals or insects in tank(s)	k) NA Y / N other	
f) NA Y / N Overdue for cleaning/inspection (within 10 years for new tanks and every 5 years thereafter)		
Section 6: Distribution		
a) NA Y / N disinfectant residual lower than expected	j) NA Y / N actual or potential backflow/cross-connection event	
b) NA Y / N main breaks or leaks	k) NA Y / N standing water/debris in valve vault	
c) NA Y / N unprotected cross connection(s)	l) NA Y / N pump or valve failure	
d) NA Y / N plumbing/piping modifications/improvements	m) NA Y / N improper operation of valves	
e) NA Y / N inadequate distribution system pressure	n) NA Y / N operation of valves resulting in equipment breakage	
f) NA Y / N operation of air-relief/vacuum valves	o) NA Y / N waterlogged pressure/bladder tanks	
g) NA Y / N power loss (pump station)	p) NA Y / N improper surge control	
h) NA Y / N illegal or unauthorized use of hydrants	q) NA Y / N other	
i) NA Y / N improper operation of pumps		
Section 7: Written Description of Sanitary Defect(s) that were Circled Above		
Use this space to provide additional information that supports the findings identified in Sections 1 through 6 above.		
Explain those defects that are circled "Yes" above. If no sanitary defects were identified, you must state so below.		
<p>Prior to taking sample, facility staff replaced bladder tanks and did not perform any disinfection. Chlorine residual in distribution lower than expected.</p>		
Section 8: Corrective Action(s) and Proposed Timetable		
Use the space below to describe the corrective action(s) taken and the date(s) completed.		
If the water system requires additional time to complete the corrective action(s), provide the proposed timetable below. Water system management and/or owner must be made aware of the proposed timetable for improvement(s).		
Date(s) Corrected	6/24/2016	
Description of Corrective Action(s):	<p>Shocked and flushed entire system. Increased chlorine feed rate, will continue to monitor residual and will step down over the next several days.</p>	
Proposed Timetable for completion (if more time is needed):		
Section 9: Certification		
Print Name	Enter Name	Title Operator
Signature	Signature	Date 6/17/2016
<input checked="" type="checkbox"/> Certified Water System Operator <input type="checkbox"/> Drinking Water and Groundwater Protection Division Staff <small>(circle class) Class 1A 1E 2 3 4A1 4A 4B 4C D</small>		
I certify that I am the person authorized to fill out this form and that the information contained herein is true, accurate, and complete to the best of my knowledge and ability at the time the assessment was performed.		
RETURN COMPLETED FORMS TO:		For Division Use Only:
RTCR Rule Coordinator Drinking Water and Groundwater Protection Division One National Life Drive - Main 2 Montpelier, VT 05620-3521 Fax: 802-828-1541		Reviewed By: _____ Reviewed Date: _____ Approved: Yes / No Approved Date: _____
Complete this form and submit it to the Division within 30 days of learning of the requirement to perform the Level 1 Site Assessment		

LEVEL 1 ASSESSMENT FORM COMPLETION

Section 3: Source(s)									
Drilled/Bedrock Well(s)									
a)	NA	Y	<input checked="" type="radio"/> N	recent maintenance to well and/or well pump	f)	NA	Y	<input checked="" type="radio"/> N	potential source of contamination (including surface water)
b)	NA	Y	<input checked="" type="radio"/> N	well/pump failure (quantity issue/water outage)	g)	NA	Y	<input checked="" type="radio"/> N	electrical conduit damaged or connection to well is loose
c)	NA	<input checked="" type="radio"/> Y	<input type="radio"/> N	well cap missing bolts or gasket	h)	NA	Y	<input checked="" type="radio"/> N	damaged or compromised well casing
d)	NA	<input checked="" type="radio"/> Y	<input type="radio"/> N	defective, damaged, or loose well cap/well seal	i)	NA	Y	<input checked="" type="radio"/> N	unprotected opening in pump assembly
d)	NA	Y	<input checked="" type="radio"/> N	damaged or unscreened cap vent	j)	NA	Y	<input checked="" type="radio"/> N	unsanitary source overflow construction
e)	NA	Y	<input checked="" type="radio"/> N	damaged pitless adapter	k)	NA	Y	<input checked="" type="radio"/> N	other _____
Spring(s) or Dug Well(s)			Surface Water						
a)	<input checked="" type="radio"/> NA	Y	<input type="radio"/> N	potential source of contamination	a)	<input checked="" type="radio"/> NA	Y	<input type="radio"/> N	potential source of contamination
b)	<input checked="" type="radio"/> NA	Y	<input type="radio"/> N	infiltration of surface water/run-off	b)	<input checked="" type="radio"/> NA	Y	<input type="radio"/> N	recent storm event
c)	<input checked="" type="radio"/> NA	Y	<input type="radio"/> N	unsanitary spring box or well construction	c)	<input checked="" type="radio"/> NA	Y	<input type="radio"/> N	infiltration gallery/wet well conditions unsanitary
d)	<input checked="" type="radio"/> NA	Y	<input type="radio"/> N	unsanitary source overflow construction	d)	<input checked="" type="radio"/> NA	Y	<input type="radio"/> N	atypical source water quality
e)	<input checked="" type="radio"/> NA	Y	<input type="radio"/> N	other _____	e)	<input checked="" type="radio"/> NA	Y	<input type="radio"/> N	other _____
Consecutive Connection(s)									
a)	<input checked="" type="radio"/> NA	Y	<input type="radio"/> N	flooded valve/meter vault	d)	<input checked="" type="radio"/> NA	Y	<input type="radio"/> N	atypical pressure/flow from wholesaler
b)	<input checked="" type="radio"/> NA	Y	<input type="radio"/> N	damaged interconnection	e)	<input checked="" type="radio"/> NA	Y	<input type="radio"/> N	incoming disinfectant residual lower than expected
c)	<input checked="" type="radio"/> NA	Y	<input type="radio"/> N	inadequate backflow protection	f)	<input checked="" type="radio"/> NA	Y	<input type="radio"/> N	other _____

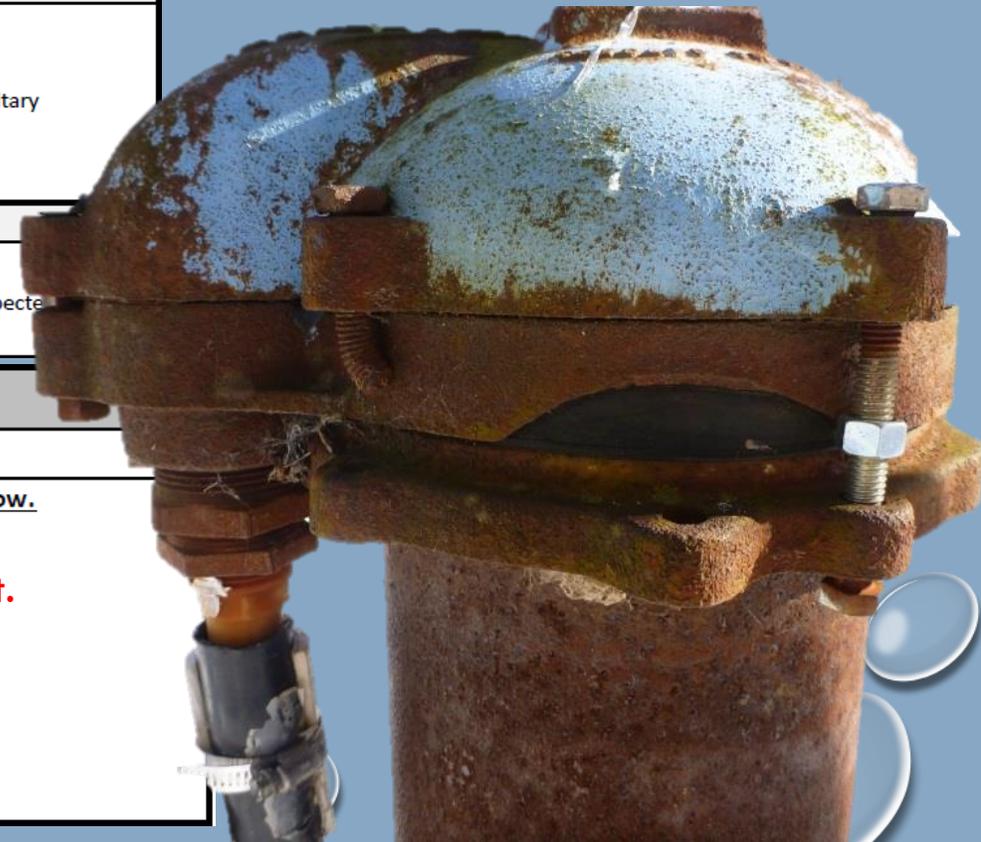
Section 7: Written Description of Sanitary Defect(s) that were Circled Above

Use this space to provide additional information that supports the findings identified in Sections 1 through 6 above.

Explain those defects that are circled "Yes" above. If no sanitary defects were identified, you must state so below.

Well cap is cracked, missing bolts, loose bolts. Cracked electrical conduit.

REQUIRED



LEVEL 1 ASSESSMENT COMPLETION

22



Section 8: Corrective Action(s) and Proposed Timetable

Use the space below to describe the corrective action(s) taken and the date(s) completed.

If the water system requires additional time to complete the corrective action(s), provide the proposed timetable below.

Water system management and/or owner must be made aware of the proposed timetable for improvement(s).

Date(s) Corrected 4/15/2016

Description of Corrective Action(s):

Replaced cap with modern sanitary cap. Replaced conduit with new parts and installed a frost sleeve.

Proposed Timetable for completion (if more time is needed):

LEVEL 1 ASSESSMENT FORM COMPLETION

Section 5: Storage Tank(s)				NA			
a)	NA	Y / <input checked="" type="radio"/> N	signs of vandalism or forced entry to tank(s)	g)	NA	Y / <input checked="" type="radio"/> N	cover/access hatch not watertight
b)	NA	Y / <input checked="" type="radio"/> N	disinfectant residual lower than expected in tank(s)	h)	NA	Y / <input checked="" type="radio"/> N	vent/overflow construction inadequate/compromised
c)	NA	Y / <input checked="" type="radio"/> N	Excessive water age in tank/low turnover	i)	NA	<input checked="" type="radio"/> Y / N	deterioration, rust, holes, or other breaches in tank
d)	NA	Y / <input checked="" type="radio"/> N	torn or missing vent and/or overflow screens	j)	NA	Y / <input checked="" type="radio"/> N	improper operation or maintenance practices
e)	NA	Y / <input checked="" type="radio"/> N	presence of dead animals or insects in tank(s)	k)	NA	Y / <input checked="" type="radio"/> N	other _____
f)	NA	Y / <input checked="" type="radio"/> N	Overdue for cleaning/inspection (within 10 years for new tanks and every 5 years thereafter)				



Section 7: Written Description of Sanitary Defect(s) that were Circled Above
Use this space to provide additional information that supports the findings identified in Sections 1 through 6 above.
Explain those defects that are circled "Yes" above. <u>If no sanitary defects were identified, you must state so below.</u>
<p>Storage tank level control probe penetrations not sealed. Evidence of rodent and insect activity in vault.</p>

REQUIRED

LEVEL 1 ASSESSMENT FORM COMPLETION

Section 8: Corrective Action(s) and Proposed Timetable

Use the space below to describe the corrective action(s) taken and the date(s) completed.

If the water system requires additional time to complete the corrective action(s), provide the proposed timetable below.

Water system management and/or owner must be made aware of the proposed timetable for improvement(s).

Date(s) Corrected June 17, 2016

Description of Corrective Action(s):

Install watertight and sanitary conduit and fittings. Sealed extra penetration. Performed shock disinfection of storage tank and flushed via distribution system.

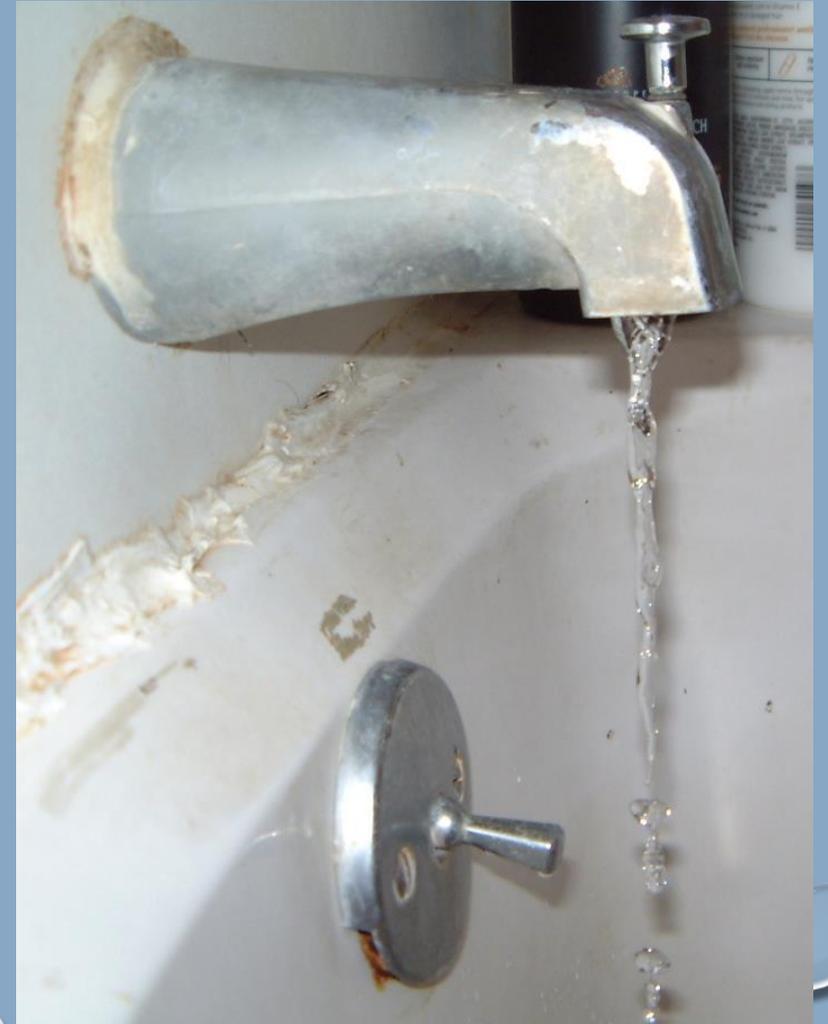
Proposed Timetable for completion (if more time is needed):



LEVEL 1 ASSESSMENT FORM COMPLETION

Section 2: Sampling Site(s)/Protocol

- | | | | |
|--|---|--|--|
| a) NA <input checked="" type="radio"/> Y / <input type="radio"/> N | unclean or unsuitable sample tap | f) NA <input checked="" type="radio"/> Y / <input type="radio"/> N | potential or actual hot water intrusion |
| b) NA <input type="radio"/> Y / <input checked="" type="radio"/> N | aerator was not removed prior to sampling | g) NA <input type="radio"/> Y / <input checked="" type="radio"/> N | other sampler error (be sure to identify the error in section 7 below) |
| c) NA <input type="radio"/> Y / <input checked="" type="radio"/> N | inadequate tap flushing prior to sampling | h) NA <input type="radio"/> Y / <input checked="" type="radio"/> N | change in conditions at sample site |
| d) NA <input type="radio"/> Y / <input checked="" type="radio"/> N | auto sensing faucet/swivel-type faucet | i) NA <input type="radio"/> Y / <input checked="" type="radio"/> N | other _____ |
| e) NA <input type="radio"/> Y / <input checked="" type="radio"/> N | sample bottle or lid contacted something unsanitary prior to or while taking sample (describe what happened in Section 7) | | |



Section 7: Written Description of Sanitary Defect(s) that were Circled Above

Use this space to provide additional information that supports the findings identified in Sections 1 through 6 above.

Explain those defects that are circled "Yes" above. If no sanitary defects were identified, you must state so below.

Used unsuitable sample tap – tub faucet with mixing valve and internal shower valve.

REQUIRED

LEVEL 1 ASSESSMENT FORM COMPLETION

Section 8: Corrective Action(s) and Proposed Timetable

Use the space below to describe the corrective action(s) taken and the date(s) completed.

If the water system requires additional time to complete the corrective action(s), provide the proposed timetable below.

Water system management and/or owner must be made aware of the proposed timetable for improvement(s).

Date(s) Corrected 4/22/2016

Description of Corrective Action(s):

Reviewed online resources for taking samples. Will no longer sample from a bathtub faucet. Will use only clean, non-mixing, non-swivel faucets with external threads for future sampling.

Proposed Timetable for completion (if more time is needed):



LEVEL 1 ASSESSMENT FORM COMPLETION

Section 6: Distribution

- | | | | | | | | |
|----|----|--|--|----|----|--|---|
| a) | NA | <input checked="" type="radio"/> Y / <input type="radio"/> N | disinfectant residual lower than expected | j) | NA | Y / <input checked="" type="radio"/> N | actual or potential backflow/cross-connection event |
| b) | NA | <input checked="" type="radio"/> Y / <input type="radio"/> N | main breaks or leaks | k) | NA | Y / <input checked="" type="radio"/> N | standing water/debris in valve vault |
| c) | NA | Y / <input checked="" type="radio"/> N | unprotected cross connection(s) | l) | NA | Y / <input checked="" type="radio"/> N | pump or valve failure |
| d) | NA | Y / <input checked="" type="radio"/> N | plumbing/piping modifications/improvements | m) | NA | Y / <input checked="" type="radio"/> N | improper operation of valves |
| e) | NA | Y / <input checked="" type="radio"/> N | inadequate distribution system pressure | n) | NA | Y / <input checked="" type="radio"/> N | operation of valves resulting in equipment breakage |
| f) | NA | Y / <input checked="" type="radio"/> N | operation of air-relief/vacuum valves | o) | NA | Y / <input checked="" type="radio"/> N | waterlogged pressure/bladder tanks |
| g) | NA | Y / <input checked="" type="radio"/> N | power loss (pump station) | p) | NA | Y / <input checked="" type="radio"/> N | improper surge control |
| h) | NA | Y / <input checked="" type="radio"/> N | illegal or unauthorized use of hydrants | q) | NA | Y / <input checked="" type="radio"/> N | other _____ |
| i) | NA | Y / <input checked="" type="radio"/> N | improper operation of pumps | | | | |

Section 8: Corrective Action(s) and Proposed Timetable

Use the space below to describe the corrective action(s) taken and the date(s) completed.

If the water system requires additional time to complete the corrective action(s), provide the proposed timetable below.

Water system management and/or owner must be made aware of the proposed timetable for improvement(s).

Date(s) Corrected _____

Description of Corrective Action(s):

Identified a leak on Market Street near where the positive samples were located. Fixed the leak but have reason to believe there are other leaks on that main, further down due to lower than normal system pressure and increased production.

Proposed Timetable for completion (if more time is needed):



LEVEL 1 ASSESSMENT FORM COMPLETION

- Since this fix is going to take some time to complete fully, the system needs to request more time and propose a completion date.
- This proposed date will need to be approved by the state.

Section 8: Corrective Action(s) and Proposed Timetable

Use the space below to describe the corrective action(s) taken and the date(s) completed.

If the water system requires additional time to complete the corrective action(s), provide the proposed timetable below.

Water system management and/or owner must be made aware of the proposed timetable for improvement(s).

Date(s) Corrected May 1, 2016

Description of Corrective Action(s):

Fixed the initial leak then shocked and flushed the main. We need to trace this line and assess if another leak may be present. Pressure on the south side of town is lower than usual and system production is higher than normal for this time of year.

We need additional time to find and fix the leak. We propose a completion date of September 1, 2015 for the repair.

Proposed Timetable for completion (if more time is needed):

- Correct all sanitary defects found during the assessment.
- Within 30 days of triggering the assessment:
 - Complete Assessment
 - Correct Defects
 - Complete and submit form
- If the system needs more time, propose a schedule to State.



The State determines if the assessments and schedules are sufficient

- **Must be permanent or be able to be made permanent under a schedule.**
- **Must follow industry best management practices.**
- **Must meet the construction and operation standards of the Water Supply Rule.**



- **Incomplete:**
 - **Unsigned, no WSID, no system name, no date, system type or operator classification**
- **Sanitary defects circled but not explained in section 7**
- **No completion date or proposed timeline for corrective action(s)**

2. Level 2 Site Assessment Trigger:

a) E. coli MCL Violation:

b) Second Level 1 assessment Trigger
in **12** rolling months

RT	RP
TC +	EC +
EC +	TC +
EC +	No RP
EC+	TC+ EC not analyzed

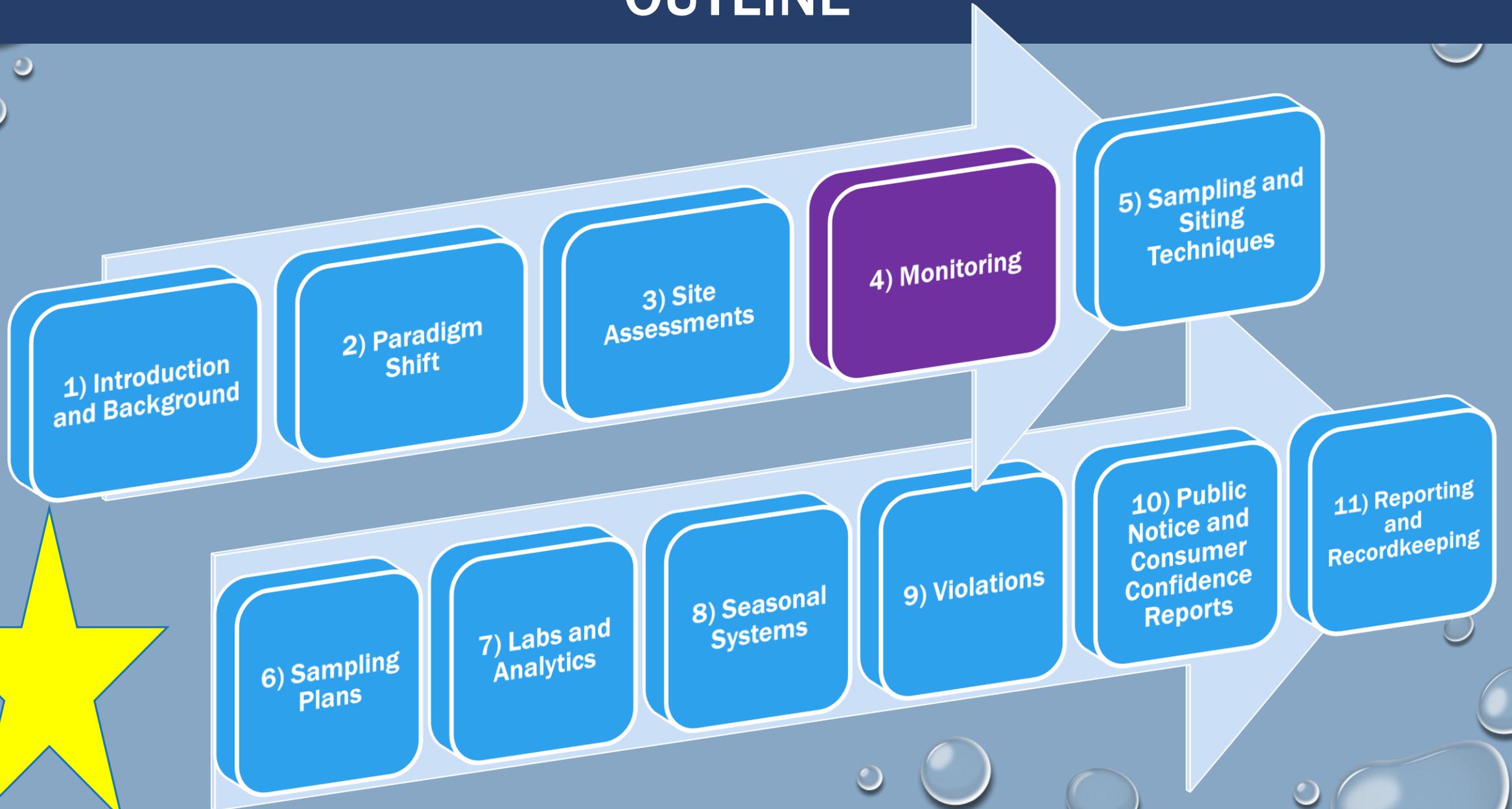
Resulting in a Level 2 Site Assessment to be performed within 30 days of the trigger

Level 2 Site Assessments are more in-depth and must be performed by the state or a party approved by the state.

TRIGGERED SITE ASSESSMENTS SUMMARY

	Level 1 Site Assessment	Triggered Level 2 Site Assessment
Who	Certified operator of the same class or greater	State or party approved by the state
What	A 2 page form that walks through the system and identifies sanitary defects	A more complicated inspection, document review, and sample site analysis.
When	Within 30 days of the second TC+ in a month or after failing to take all repeat samples.	Within 30 days of triggering a second Level 1 assessment in 12 months or an EC MCL.
Why	Protection of Public Health, identify pathways or potential pathways of contamination.	

OUTLINE



NUMBER OF SAMPLES PER MONITORING PERIOD

Population	Number of Samples
25 – 1,000	1
1,001 – 2,500	2
2,501 – 3,300	3
3,301 – 4,100	4
4,101 – 4,900	5
4,901 – 5,800	6
5,801 – 6,700	7
6,701 – 7,600	8

Population	Number of Samples
7,601 – 8,500	9
8,501 – 12,900	10
12,901 – 17,200	15
17,201 – 21,500	20
21,501 – 25,000	25
25,001 – 33,000	30
33,001 – 41,000	40
41,001 – 50,000	50

- **Systems taking more than 1 sample must take the samples at regular intervals throughout the month.**
- **Groundwater Systems under 4,900 may take all samples on the same day if taken from different locations.**

SAMPLING FREQUENCIES UNDER RTCR

- All Surface Water/GWUDI Systems: **Monthly** (Same as TCR)
- Community Water Systems: **Monthly** (Same as TCR)
- Non-Community, GW, over 1,000 in population: **Monthly** (Same as TCR)
- Seasonal, Transient Non-Community Systems: **MONTHLY**
- Year-round Non-Community, served by GW, 1,000 and under in population: **Quarterly** (Same as TCR) **until...**

TRANSITION TO MONTHLY MONITORING

Year-round, Non-Community, on Groundwater, under 1,000 in population:
Sample Quarterly unless and until ONE of the following happens:

1) Level 2 Trigger	<ul style="list-style-type: none">• 2 X Level 1 Site Assessments over 12 month period• E. coli MCL Violation
2) E. Coli MCL Violation	<ul style="list-style-type: none">• TC+ RT → EC+ RP• EC+ RT → TC+ RP (or EC)• TC+ RT → TC+ <u>RP</u> and E. coli not analyzed• EC+ RT → No Repeats Taken
3) Total Coliform TT Violation	<ul style="list-style-type: none">• Fail to conduct Level 1 or Level 2 within 30 days of trigger• Fail to correct sanitary defects in 30 days or by state-approved schedule
4) Two RTCR Monitoring Violations or one RTCR Monitoring violation and one Level 1 site assessment in 12 months	<ul style="list-style-type: none">• Fail to take RT or Additional RT sample(s) (monitoring violation)• Fail to analyze EC following TC+ <u>RT</u> (monitoring violation)

Transition (back) to Quarterly Monitoring

Year-Round, Non-Community on Groundwater, under 1,000 in population.

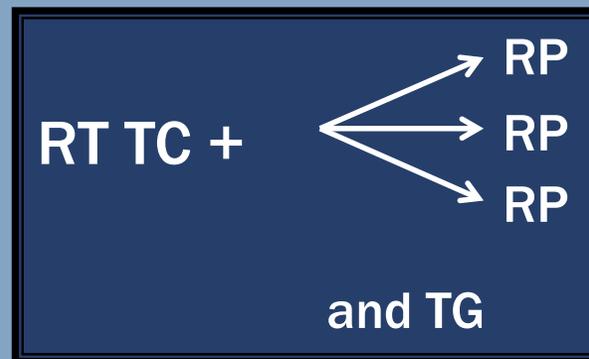
Systems will be required to sample monthly until the issue that caused the increased monitoring is corrected and BOTH:

1) The system has had a sanitary survey or voluntary level 2 site assessment within the last 12 months, be free of sanitary defects, and have a protected source that meets construction standards;

2) Have a clean RTCR compliance history for the last 12 months. A clean compliance history means: No E. coli MCL violations, no monitoring violations, no TT Triggers (level 1 or 2 site assessments), and no TT violations (failure to conduct a level 1 or 2 assessment within 30 days of trigger, failure to correct sanitary defect within 30 days or under the state-approved schedule).

REPEAT SAMPLING UNDER RTCR

- Every Water System must take 3 repeat samples for **EACH** routine TC+ sample.
 1. Same sampling site as RT TC+
 2. Within 5 connections/locations upstream
 3. Within 5 connections/locations downstreamand GW Systems must take 1 triggered source water sample from each source that was active at the time of the TC +.



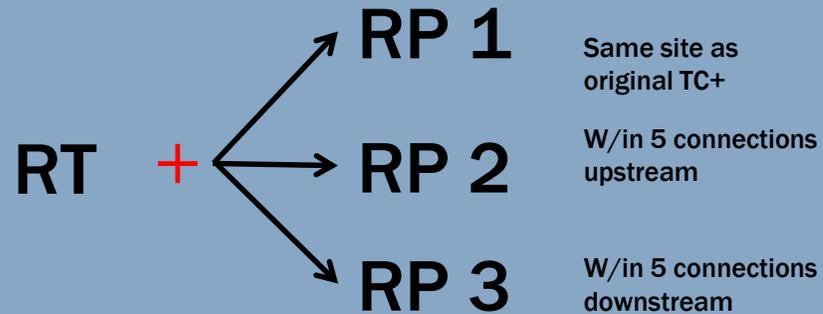
Additional Routine Samples

The Month Following a TC + Routine Sample:

- Monthly Systems: Resume normal monthly sampling according to plan and schedule.
- Quarterly Systems: must take **3** Additional Routine samples the month following the TC + sample.



Month 1



and 1 TG for each active GW source

Month 2

RT

If TC+

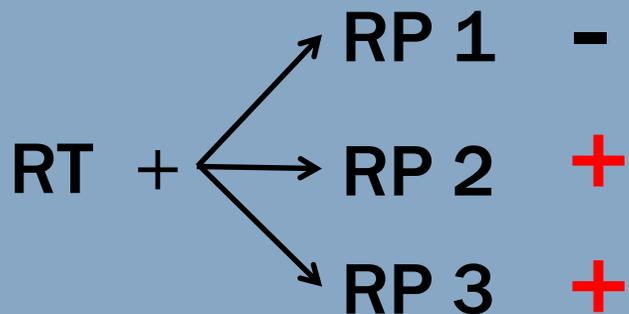


and 1 TG for each active GW source

HYPOTHETICAL – SINGLE MONTHLY SAMPLE

System taking single monthly sample

Month 1



and 1 TG for each active GW source

Site Assessment Triggered

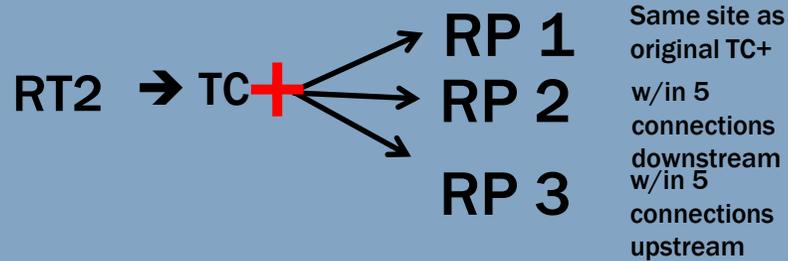
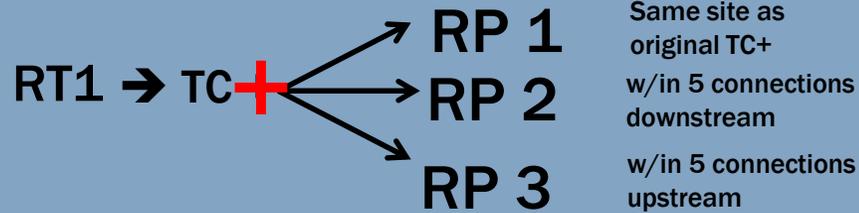
Month 2

RT -

No further action needed
(upon completion of Site Assessment)

SAMPLING EXAMPLE: MULTIPLE MONTHLY ROUTINE SAMPLES

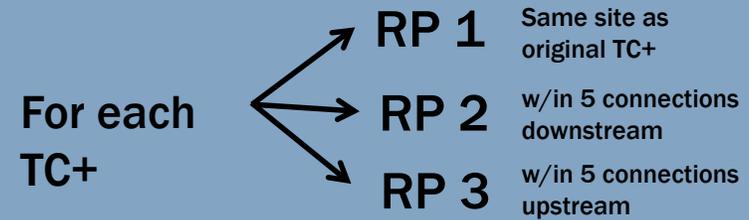
Month 1



RT3 → TC-
and 1 TG for each active GW source

Month 2

RT1



RT2

and 1 TG for each active GW source

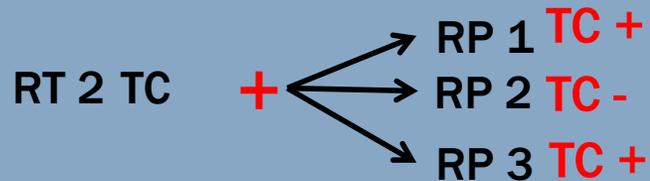
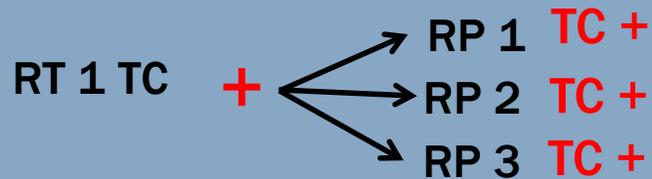
RT3

***Since 2 RT samples are TC+, it triggers an assessment**

HYPOTHETICAL – MULTIPLE MONTHLY SAMPLES

System Taking Multiple Monthly Samples

Month 1

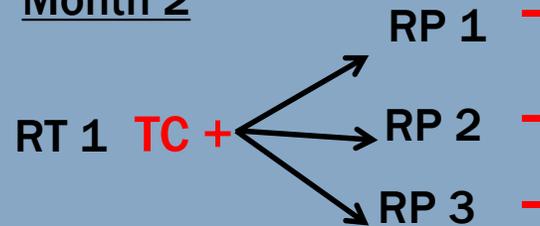


RT 3 TC -

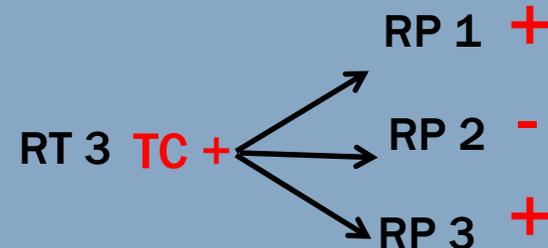
and TG for each active GW source

Assessment triggered, >2 TC+ samples in a month

Month 2



RT 2 TC -



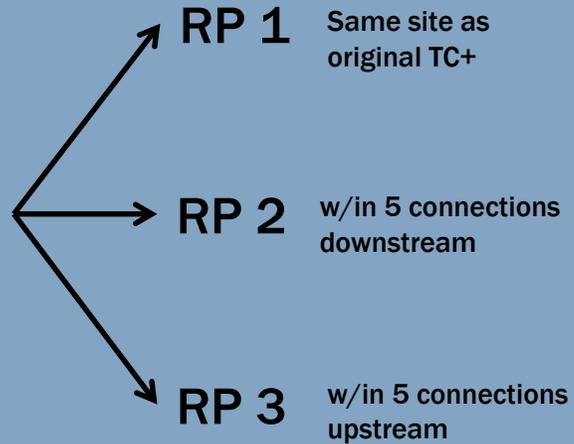
and TG for each active GW source

Second, separate assessment triggered, >2 TC+ samples in a month

SAMPLING EXAMPLE: QUARTERLY ROUTINE SAMPLE

Month 1

RT → TC +

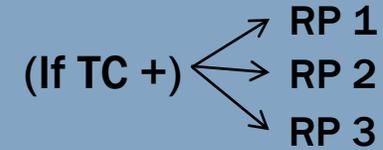


and 1 TG for each active GW source

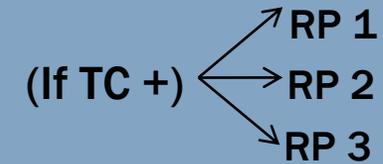
If any of the RP are TC +, an assessment is triggered

Month 2

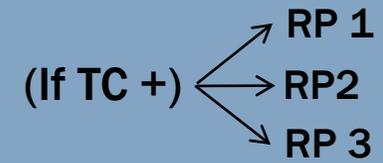
Additional RT 1



Additional RT 2



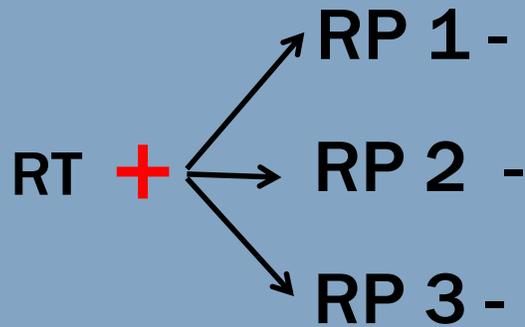
Additional RT 3



and 1 TG for each active GW source

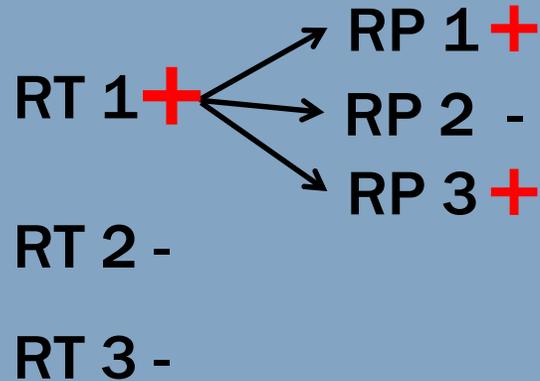
HYPOTHETICAL - QUARTERLY MONITORING

Month 1



and TG for each active GW source

Month 2



and TG for each active GW source

Assessment triggered

Month 3

If assessment from Month 2 is a **Level 1**:

- RT 1 -
- RT 2 -
- RT 3 -

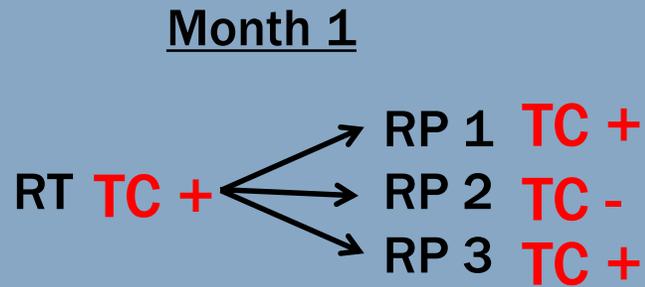
3 Additional Routines the month following a TC+, system on Quarterly Monitoring

If assessment from Month 2 is a **Level 2**:

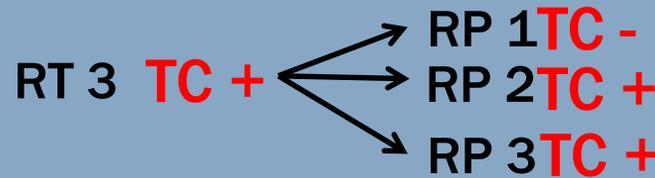
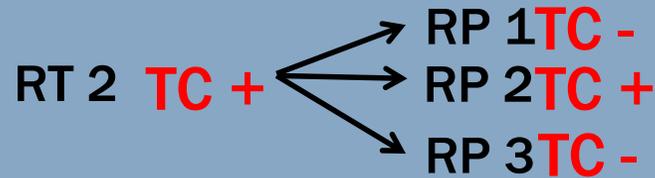
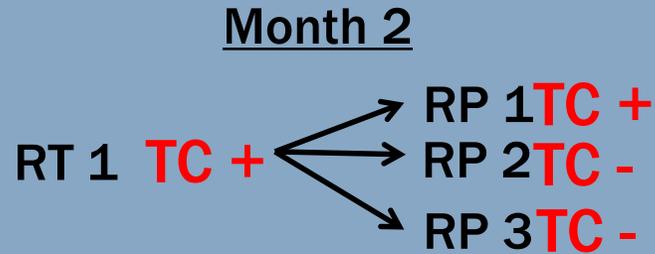
- RT 1 -

Monthly Monitoring is Triggered.

WORST CASE SCENARIO: QUARTERLY SYSTEM WITH PERSISTENT ISSUES



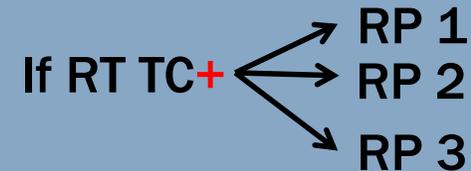
and TG for each active GW source



and TG for each active GW source

Month 3

Monthly Monitoring



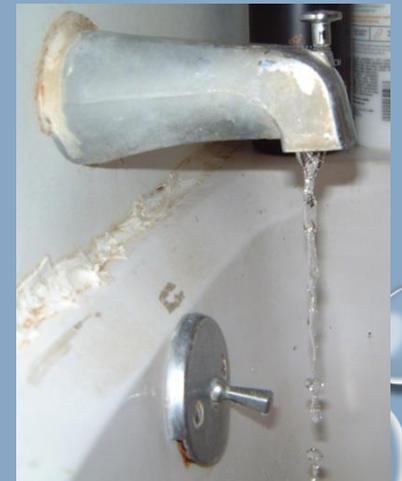
and TG for each active GW source

*It may be possible to take 18 samples over 2 months before triggering monthly monitoring.

OUTLINE

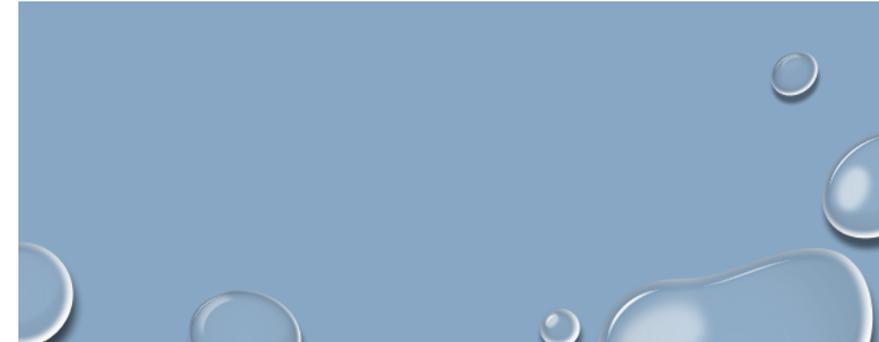
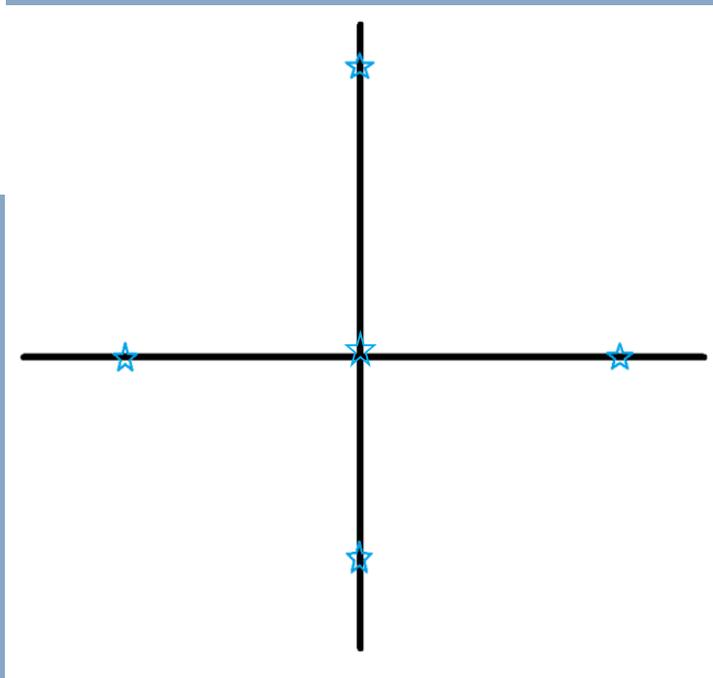
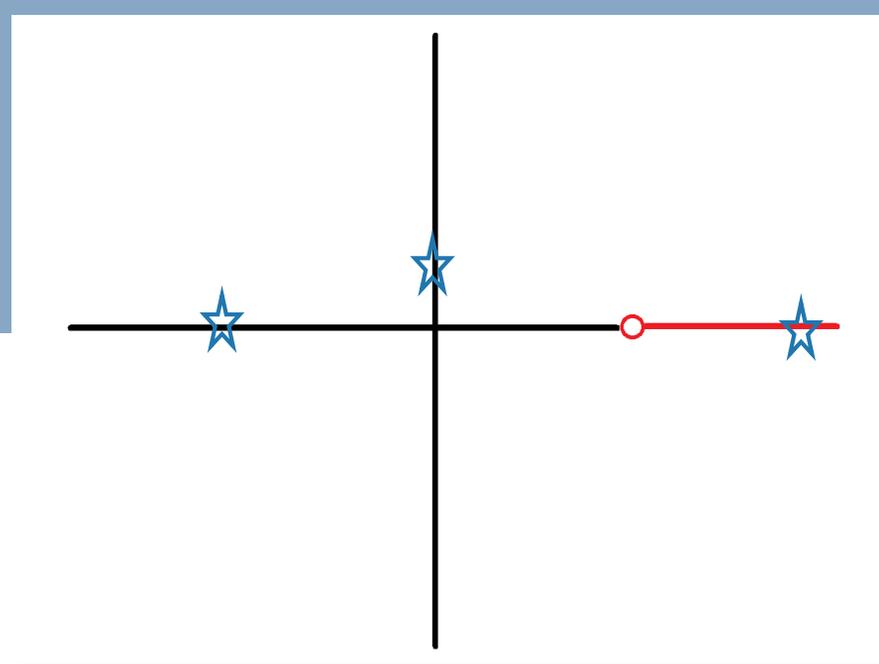
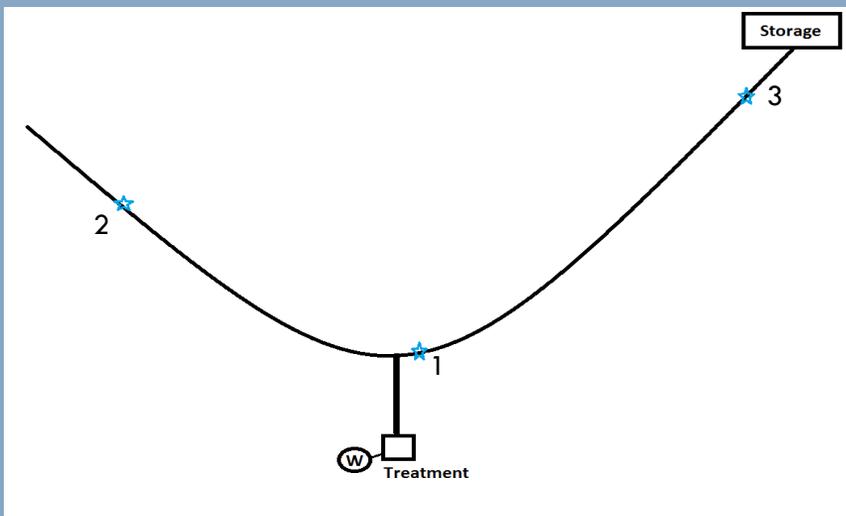


SAMPLE TAP SELECTION – DOS AND DON'TS



SAMPLE SITING

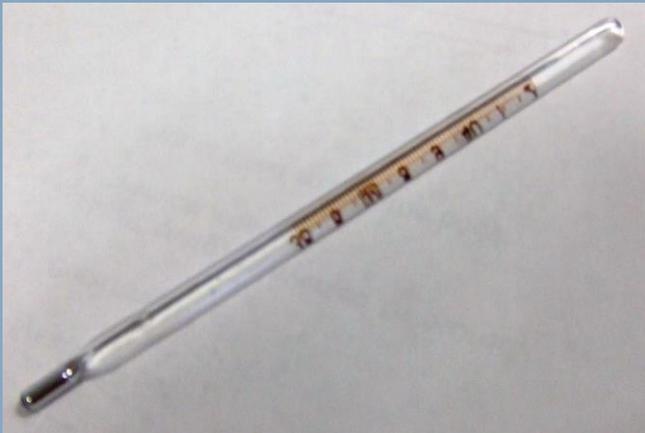
Sample sites must be representative of water in the entire distribution system.



- RCAP Guidance: <https://vimeo.com/136001193>
- Select sites representative of water in the entire distribution system.
- Assemble supplies, including good, clean, sample bottles
- If the system chlorinates, make sure to have a chlorine residual test kit.

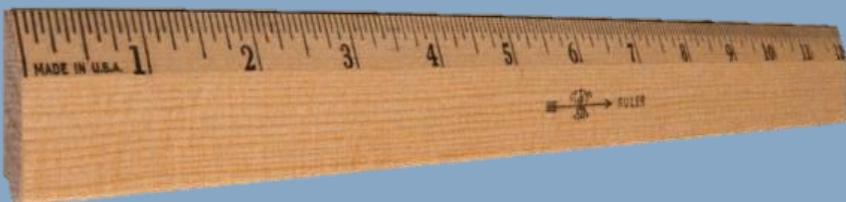


- Make sure the sample tap is in good working order, no attachments, no outdoor hose bibs.
- Disinfect faucet/tap.
- Run the **COLD** water 5-10 minutes to clear the internal plumbing and service lines – consider using a thermometer to identify when the temperature stabilizes.



SAMPLING TECHNIQUE

- While the water is running, complete the lab forms and associated paperwork.
- Adjust the flow down to $1/8$ -inch, about the width of a pencil.



- Remove the sample bottle cap, keep it away from the running water and pointed down.

- Do not rinse the bottle, do not remove preservative/dechlorinating agent in the bottle.
- Fill the bottle to the neck. Need to leave some space, but make sure to have enough (at least 100 mL) volume to be analyzed.
- Once full, replace the cap.
- Put the bottle into a cooler, refrigerator, or on ice.
- Should be kept between 0 and 10° C





- If chlorinating, take a chlorine residual from the tap, write it on the lab paperwork.
- Turn off the tap and re-connect any aerators or accessories.
- Make sure laboratory form is filled out completely and correctly.
- Coolers used to transport samples should be cleaned daily.
- **Get sample(s) to the lab within 24 hours of collection.**
- **Sample early in the week and early in the monitoring period.**

OUTLINE



STEP 1: FINDING THE FORM

GO TO: WWW.DRINKINGWATER.VT.GOV

59

drinkingwater.vermont.gov

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VT DEC

dwgwpd home | loans | public notices | contacts

dec home > dwgwpd home

Welcome to the Drinking Water and Groundwater Protection Division

In the fall of 2011, the Water Supply Division and parts of the Wastewater Management Division merged to become the Drinking Water & Groundwater Protection Division (DWGWPD). The Division's central office is located in the National Life Building in Montpelier, and there is also staff located in five regional offices.

Regulatory programs managed by the Division include, but are not limited to:

- [Public Drinking Water Supply](#)
- [Groundwater Withdrawal \(water\)](#)
- [Wastewater System and Potable Water Supply \(Regional Offices – drinking water and wastewater\)](#)
- [Indirect Discharge \(wastewater\)](#)
- [Underground Injection Control \(wastewater\)](#)

The Division also certifies/licenses:

- [Public Drinking Water System Operators](#)
- [Wastewater & Potable Water Supply Designers](#)
- [Well Drillers](#)

The above programs all have compliance and enforcement components as well as permit issuance responsibilities. The Division, along with State-approved regional and national organizations, provides technical assistance and educational opportunities to water system operators and site designers. The Division supports and/or co-sponsors training opportunities that enhance the technical abilities of our regulated communities, as well as, our own staff.

Within these pages you will find the rules and regulations under which each program regulates activities, applicable applications, forms, guidance, practices, procedures, information about the training opportunities for the individuals we license, lists of those individuals, and other related links.

Contacting the DWGWPD

Please go to the [Staff and Location](#) page to find a map for our regional offices. The map will link to information about the Barre, Essex Junction, Rutland, Springfield, and St. Johnsbury offices. Our [main office](#) is in Montpelier.

If you wish to [contact Drinking Water and Groundwater Protection Division staff](#) please call the numbers as listed or send an email to staff. You may also contact us by leaving a message on our main line at: 1-800-823-6500 in-state or 802-828-1535. Voice messages left on the main line are checked daily. The fax number for the Montpelier office is: 802-828-1541.

If you wish to meet with staff at the [National Life building](#) please call ahead to arrange a time, so staff can greet you in the lobby. All visitors are required to sign in and obtain a visitor's badge.

U.S Mail:
Drinking Water and Groundwater Protection Division
Vermont Department of Environmental Conservation
Agency of Natural Resources
1 National Life Drive (Main Building- Floor 2)
Montpelier, VT 05620-3521

IN THE EVENT OF A SYSTEM EMERGENCY:
For After-Hours Water System Emergencies: Dial 741-5311 - then enter your phone number (a local call within Vermont for a 24-hour pager for Drinking Water and Groundwater Protection Division emergency response).

drinkingwater.vermont.gov • groundwater.vermont.gov • septic.vermont.gov • wastewater.vermont.gov
VT DEC • Drinking Water and Groundwater Protection Division • 1 National Life Drive, Main Building, 2nd Floor • Montpelier, VT 05620-3521
Telephone toll-free in VT: 800-823-6500 or call 802-241-3400 • Fax: 802-828-1541

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about dec • assistance • divisions & programs • dec permits • dec regulations • dec publications
dec grants & loans • dec maps & GIS • hotline numbers • related links • privacy policy • ANR home

FINDING THE FORM

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60

FORMS

[Water System Officials Contact Form](#)
[Public Water Supply Survey Form](#)
[Public Notice Certification Form](#)
[Lead and Copper Sampling Plan](#)
[Lead and Copper Sampling Plan Guidance](#)
[Bulk Water Hauling as an Emergency Form and Guidance](#)
[Extended Period- Bulk Water Hauling as an Emergency Source \(to submit weekly\)](#)
[Monthly Operations Report for Filtered Surface Water Systems](#)
[Monthly Operations Report Instructions for Filtered Surface Water Reporting](#)
[Monthly Operations Report for Groundwater and Systems Purchasing Groundwater](#)

RTCR Forms & Examples

[Revised Total Coliform Rule \(RTCR\) Introductory Fact Sheet](#) **NEW**
[RTCR Coliform Sampling Plan & Guidance 1,000 or Under Population](#) **UPDATED** (formerly called bacteriological sampling plan)
[RCTR Coliform Sampling Plan & Guidance Greater than 1,000 Population](#) **UPDATED** (formerly called bacteriological sampling plan)

[INSTRUCTIONAL VIDEO: RTCR Sampling Plan Form Training](#) **NEW**

Completed Examples:

[PCWS - Greater than 1,000 Population](#)
[PCWS - 1,000 or Less Population](#)
[NTNC - School](#)
[TNC - Campground](#)
[TNC - Motel](#)
[TNC - Restaurant](#)

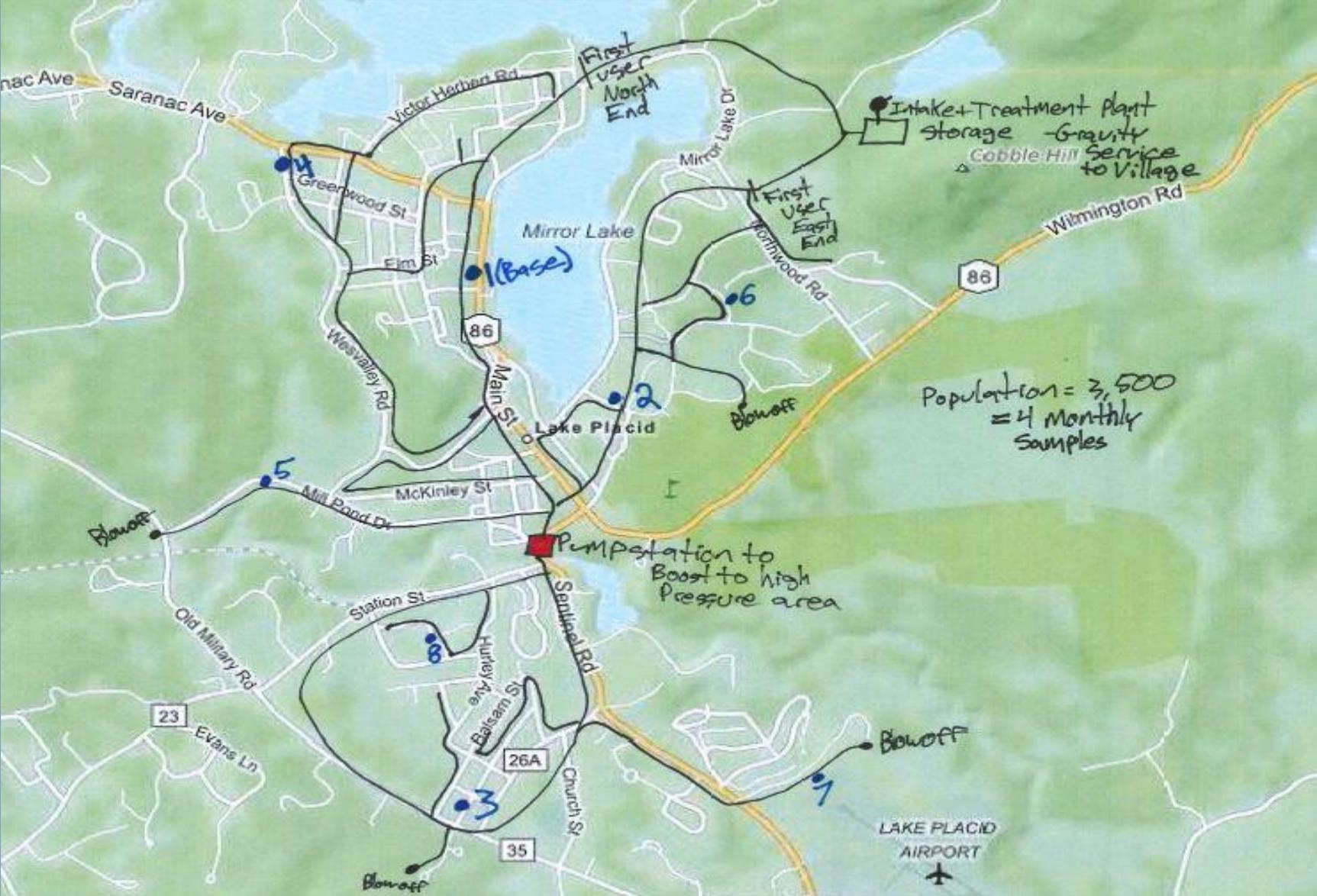
[Groundwater Seasonal Start-Up Form](#) **NEW**
[Surface Water Seasonal Start-Up Form](#) **NEW**

STEP 2: BASIC SYSTEM INFO

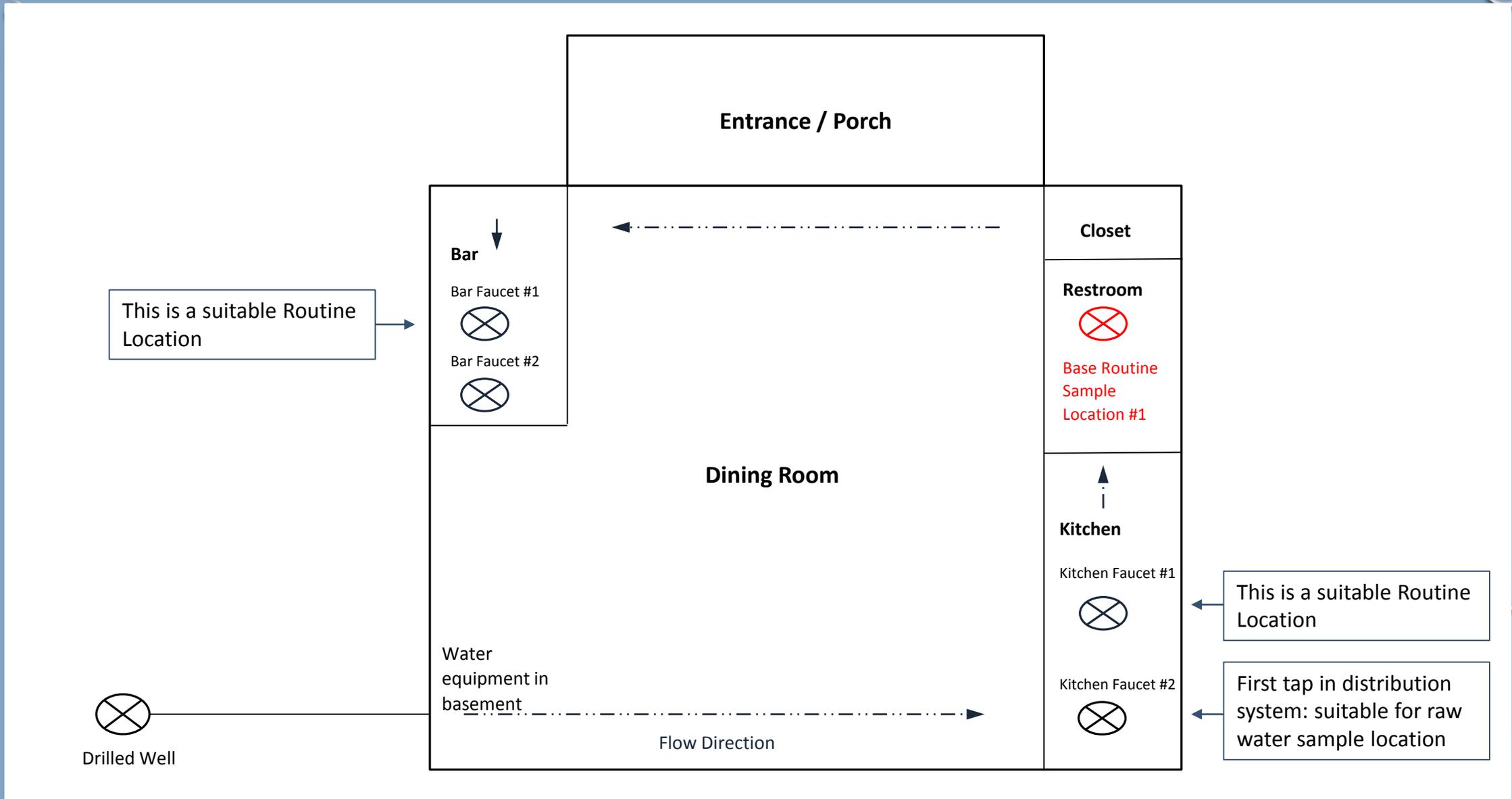
System Information		
System Name:	WSID Number:	System Type (check one): <input type="checkbox"/> TNC <input type="checkbox"/> NTNC <input type="checkbox"/> Community
# of Service Connections (if there are only a few connections, <u>also</u> write in the total number of available sampling taps):	Source Water Type (check one): <input type="checkbox"/> Groundwater <input type="checkbox"/> Surface Water/GWUDI <input type="checkbox"/> Consecutive	
System Population:	# of Pressure Zones (if the system relies on a well pump, gravity storage, or single pump station to deliver water to all users in the distribution system, enter "1"):	
Dates of Operation (SEASONAL SYSTEMS ONLY): Open: _____ Close: _____		
Number of Distribution Systems (check one): <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> more than 3. If the system has more than one distribution system, identify the distribution system to which this form pertains: DS00 _____		

ion of 1,000 or less. For systems with multiple dis is required. **Attach a map to this plan.** The map , clearly labeled coliform sampling locations tha tap locations (if the system uses groundwater), lo

STEP 2 CONTINUED: MAP SUBMISSION (COMMUNITY)



STEP 2 CONTINUED: MAP SUBMISSION (TNC)



STEP 4: COMPLETE SAMPLE LOCATIONS AND JUSTIFICATION

	Routine Location Address	Justification	5 Connections Upstream For repeat locations Numbers 2 – 5 are optional	5 Connections Downstream For repeat locations Numbers 2 – 5 are optional
1	Routine Location 1 (Base): _____		1	1
			2	2
			3	3
			4	4
			5	5
● ● ●				
7	Routine Location 7: _____		1	1
			2	2
			3	3
			4	4
			5	5

Instructions: The locations for all routine samples taken for compliance purposes must be identified in this table. 1) List up to 7 routine monitoring locations. These are the locations where the required routine compliance samples (monthly or quarterly) are collected. If possible, list the 911 addresses for each location. If those addresses are not available, list where the samples are taken. 2) Explain why the system chooses to sample at each location under the “Justification” column. 3) List at least one and up to five repeat samples within 5 connections upstream and 5 connections downstream for each Routine sampling location listed.

STEP 5: SAMPLE SCHEDULE AND SOURCE INFORMATION

Fill out
sample
schedule

Don't
forget to
sign the
form!

Fill out
source
information
(systems
using
groundwater)

Table 2 – Quarterly Monitoring
To be completed only by **year-round NTNC and TNC systems using groundwater**. Systems must alternate between the Routine 1 (Base) location and at least one other Routine location as identified on the previous page, depending on system complexity. Identify in what quarter each Routine sample location will be sampled.

Quarter	Routine Sampling Location
1 st : January 1 through March 31	
2 nd : April 1 through June 30	
3 rd : July 1 through September 30	
4 th : October 1 through December 31	

Table 3 – Monthly Monitoring
To be completed by any **public water system serving 1,000 people or less**. Systems must alternate between the Routine 1 (Base) location and at least one other Routine location as identified on the previous page, depending on system complexity. Identify in what month each Routine sample location will be sampled.

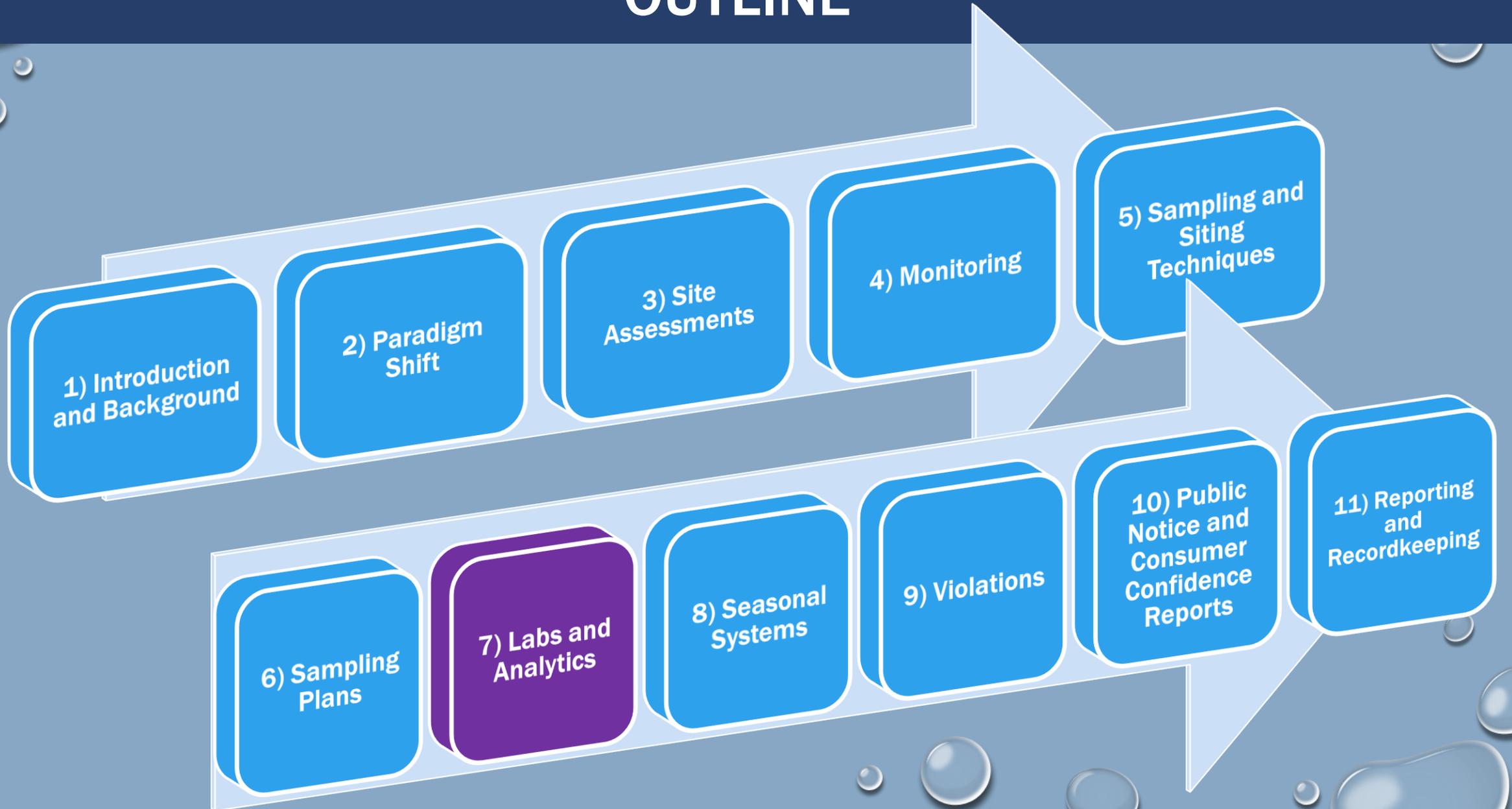
Month	Routine Sampling Location
January	
February	
March	
April	
May	
June	
July	
August	
September	
October	
November	
December	

Table 4 – Source Information
Provide the names/numbers of groundwater sources (wells, springs, etc.) and the source sample tap location at which each source may be sampled **prior to any treatment**. If a raw water sampling tap is not available prior to the first user, identify the first tap/faucet closest to where the water enters the system.
Attach additional sheets if necessary

Source Name/Number	Source Sample Tap Location	Is this a combined source sample location?
Source 1:		
Source 2 (if applicable):		
Source 3 (if applicable):		
Source 4 (if applicable):		

Revised 8/20/2015 3

OUTLINE



- Samples must be analyzed by a VT Department of Health certified drinking water lab
- List of Laboratories certified for drinking water analysis:
http://healthvermont.gov/enviro/ph_lab/water_test.aspx
- Labs must be certified for each method used for analysis & each contaminant analyze
- Colilert® Analytical Method for TC & EC – VT Labs

ANALYTICAL REQUIREMENTS

- **Standard sample volume required for analysis:**
100 mL – Regardless of analytical method
- **Only required to determine the presence or absence of total coliform & *E. coli*.**
- **The time from sample collection to initiation of test medium incubation: **May not exceed 30 hours****
- **Sodium thiosulfate will typically be included by the lab to neutralize the chlorine in the water sample.**

REJECTION OF SAMPLES

BR – Broken

CL – Chlorine Present

EH - Exceeds hold Time

HS – Excessive head space

FZ – Frozen sample

IN – Insufficient Information

VO – Insufficient Volume

LA – Lab accident

LT – Leak in transit

IP – Invalid sampling protocol



When notified by lab: Collect replacement sample within 24 hours

Mark the type of compliance sample on form for lab:

- **Routine (RT):**

- Sample(s) required by monitoring schedule.
- Additional Routine (NTNCs and TNCs on quarterly only) 3 samples the following month after TC+ Routine sample.

- **Repeat (RP):** Samples required immediately after TC+ Routine sample.

- **Trigger Source (TG):** Ground water source sample required immediately after TC+ Routine sample.

***NOTE – If sample is marked “Special” or “Other” it will not be used for compliance purposes (SP)!**

RTCR SAMPLE COLLECTION FORM (CONT.)

- Mark sample collection information on lab form
- Sample location information is on the system's monitoring schedule:

Paper

COLIFORM BACTERIA MONITORING			
Sampling Locations	Facility		Sample Point ID
	ID	Facility Name	Description
	DS001	DIST SYSTEM-BROOKWELL (UNITS 1-	TC001
	DS002	DIST SYSTEM-ROAD WELL (UNITS 32	TC002

Analyte/Group Name	Monitoring Period	Monitoring Frequency
COLIFORM BACTERIA	1/1 - 12/31	2 every Month

Web

COLIFORM BACTERIA			
Facility ID	Facility Name	Sample Point	
DS001	DISTRIBUTION SYSTEM	TC001	
DS002	DISTRIBUTION SYSTEM	TC002	

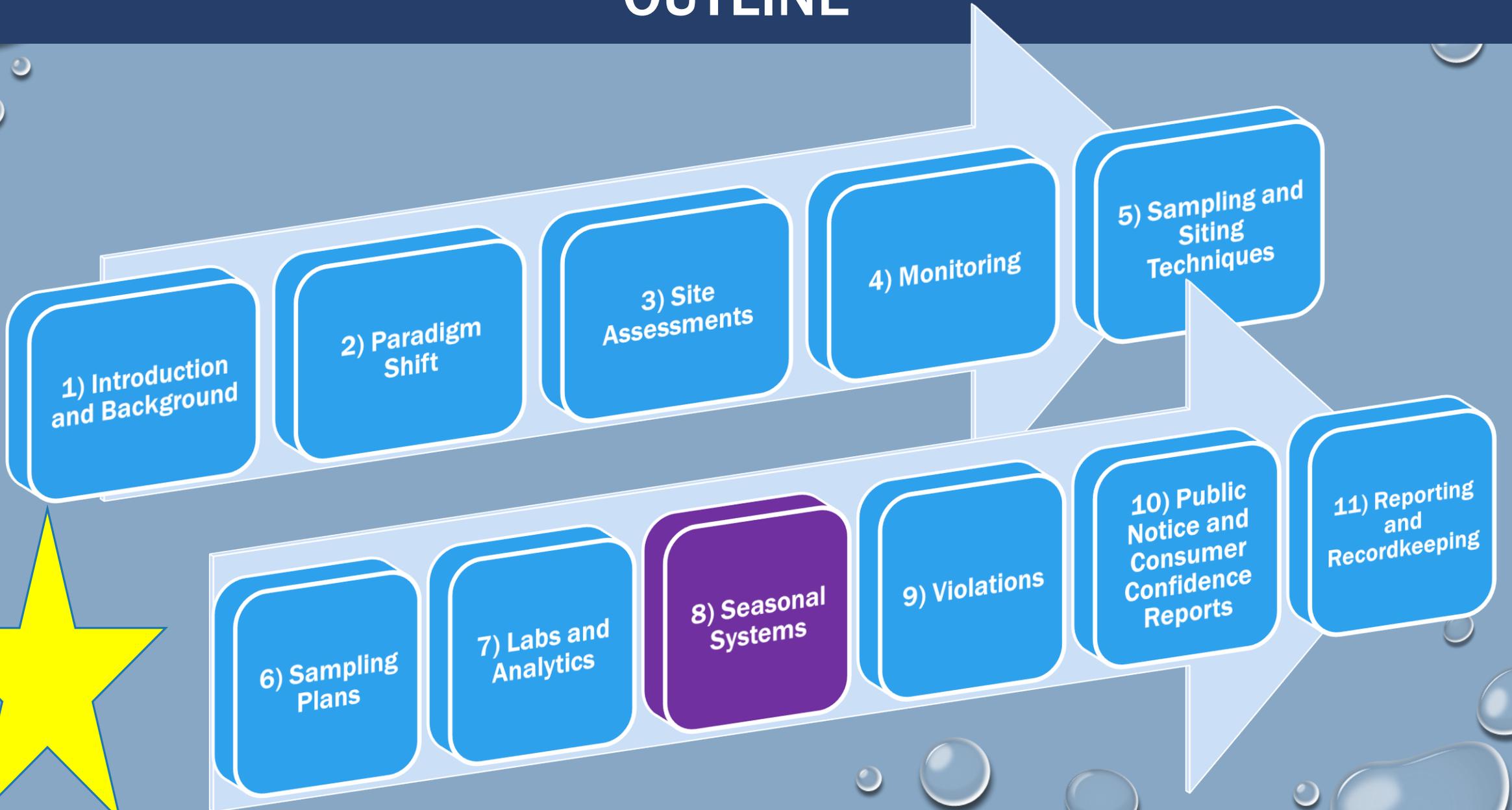
Analyte	Monitoring Period	Start - End Date	Sample #
COLIFORM (TCR)	1/1 - 12/31	7/1/2015 -	2 per QT

QT - Quarter YR - Year
 MN - Month DL - Day
 1T - One Time Only

RTCR & GWR SAMPLE TYPE, FACILITY ID & SAMPLE POINT ID

Sample Type	Facility ID	Sample PT ID	Sample Location Description
Routine, Distribution (RT)*	DS001, DS002..etc.	TC001, TC002..etc.	Specific Address/Name for sample location
Repeat, Distribution (RP)*	DS001, DS002..etc.	TC001, TC002..etc.	
Trigger, Source (TG)** -Groundwater systems	WL001, WL002..etc.	RW001, RW002..etc.	
Replacement Routine, Repeat or Trigger Source	See above, same as original sample.		
Special (SP)	See above for “Special” distribution or source sample		
* TCR = Total Coliform Rule		** GWR = Groundwater Rule	

OUTLINE



Seasonal Systems:

- Do not serve water to a public population (25 or more people) year round.
- Starts-up and Shuts-down at the beginning and end of an operating season.
- Does not necessarily de-pressurize.

Requirements:

1. Monthly Routine Monitoring
2. State-Approved Seasonal Start-Up Procedure and Certification



 **VERMONT**
DRINKING WATER AND GROUNDWATER PROTECTION

MONITORING SCHEDULE

VT000000 SEASONAL SYSTEM
Schedule Year: 2016 System Status: A System Type: NC Primary Source: GW Population: 34

COLIFORM BACTERIA MONITORING

Sampling Locations	Facility		Sample	
	ID	Facility Name	Point ID	Description
	DS001	DISTRIBUTION SYSTEM	TC001	

Analyte/Group Name	Monitoring Period	Monitoring Frequency
COLIFORM BACTERIA	5/1 - 10/31	1 every Month

- Required to collect 1 TC sample in each month the system is in operation.

Seasonal systems are required to complete a State-Approved Seasonal Start-Up Procedure & Certification prior to serving water to the public.

Goal: Identify and eliminate pathways of contamination prior to serving water to the public.

- 1. Comprehensive visual inspection of the water system.**
- 2. Shock-Chlorinate and/or Flush the Water System.**
- 3. Collect Your Monthly Sample.**
- 4. Sign the Certification of Completion.**
- 5. Submit the Form to DWGWP.**

SEASONAL STARTUP PROCEDURE

 <p>VERMONT ENVIRONMENTAL CONSERVATION</p> <p>Drinking Water and Groundwater Protection Division</p>	<h2 style="text-align: center;">Seasonal Start-Up Procedures and Certification</h2> <h3 style="text-align: center;">Public Water Systems Serving Groundwater</h3>			
<p>The use and submission of this form is recommended for all seasonal groundwater public water systems at the beginning of the 2015 operating season before serving water to the public. These procedures are recommended for the 2015 operating season, but will be required for the 2016 operating season according to the Revised Total Coliform Rule.</p>				
<h3>System Information</h3>				
System Name:	WSID #:	Class of System: 1A 1B 2 3 4 4A1 4A 4B 4C D (circle one)		
<p>What months are you open? _____</p>				
<p>What day was this start-up procedure completed? _____</p>				
<p>What day do you plan on opening in 2015? _____</p>				
<h3>Instructions</h3>				
<p style="text-align: center;">The Division recommends that all seasonal systems complete this form at the beginning of the 2015 operating season before serving water to the public.</p> <p>Complete Step 1 below. Certify that each element was evaluated by checking the "Complete" or "NA" box if the element is Not Applicable to the Water System. Shock-chlorinate and flush the water system and collect the routine monthly sample(s) as outlined in Steps 2 and 3 and certify they are complete by checking the "Complete" box. Sign and date the form according to Step 4 and return the form to the Division according to Step 5. <u>Return the signed and dated form to the Division prior to opening, along with any feedback you have on the use of the form itself.</u></p>				
<h3>Step 1: Visual Inspection of the Water System</h3>		<table border="1" style="width: 100%; text-align: center;"> <tr> <td style="width: 50%;">Complete</td> <td style="width: 50%;">NA</td> </tr> </table>	Complete	NA
Complete	NA			
<p>Visually inspect the source, treatment, storage, and distribution system for sanitary deficiencies.</p>				
<p>a) <u>If the system has a well:</u> Check the well. Make sure that the well cap is tight and intact and that no bolts are missing. Make sure that the electrical conduit is not cracked or broken. Confirm that the vent screen is in place and intact. Make sure the area around the well is graded to prevent water from ponding around the casing.</p>	<input type="checkbox"/>	<input type="checkbox"/>		
<p>b) <u>If the system has a spring:</u> Check the spring. Make sure the cover is adequately sealed and no insects, rodents, or debris are able to get into the spring. Make sure any vents or overflows have adequate screening on the ends of the pipes. Make sure the spring box integrity prevents surface water infiltration. Make sure there are no new potential sources of contamination near the spring.</p>	<input type="checkbox"/>	<input type="checkbox"/>		
<p>c) <u>If the system utilizes treatment:</u> Make sure the treatment equipment is operational and maintained. Make sure chemical storage tanks are cleaned and sealed and all solutions are refreshed. Make sure the system has adequate test equipment, such as a chlorine test kit with valid reagent packets. Make sure any backwash or discharge lines have an air gap and are not hard-piped into drains.</p>	<input type="checkbox"/>	<input type="checkbox"/>		
<p>d) <u>If the system utilizes water storage:</u> Make sure the storage tank has been inspected and cleaned (if necessary) within the last 5 years. Make sure the access hatch/cover is gasketed, watertight, and made of the appropriate materials (no wooden covers). Make sure the storage tank is free from insects, rodents, and debris. Make sure any overflows, drains, or vents have screens covering the pipes. Make sure the overflow and drain pipes terminate above ground and prevent contamination from surface water.</p>	<input type="checkbox"/>	<input type="checkbox"/>		
<p>e) <u>Distribution:</u> Make sure the system maintains adequate pressure. Make sure there are no cross-connection hazards. Make sure pumps and valves are operating properly. Make sure valve pits are free of standing water and debris. Confirm that there are no obvious signs of leaks or line breaks.</p>	<input type="checkbox"/>	<input type="checkbox"/>		
<p>f) <u>Routine Sample Locations:</u> Make sure routine sampling locations are identified, that faucets are appropriate for total coliform testing (no swivel faucets, separate hot and cold faucets if possible), and that sample taps and sinks are clean.</p>	<input type="checkbox"/>	<input type="checkbox"/>		

SEASONAL STARTUP PROCEDURE

Step 2: Shock-Chlorinate and/or Flush the Water System After visually inspecting the water system and making any necessary improvements, shock-chlorinate and/or flush portions of the water system that may include, but not be limited to, the source, storage facilities, treatment, and the distribution system. Write a brief summary of the shock-chlorination procedure implemented in the space provided.		Complete
[Empty space for summary]		<input type="checkbox"/>
a) Chlorine residual introduced to distribution system (if measured): _____		
b) Duration of time chlorine maintained in the distribution system (if applicable): _____		
Step 3: Collect a Routine Monthly Sample After shock-chlorinating and/or flushing the system, collect a total coliform bacteria sample any time during the first month of operation and send it to a certified laboratory for analysis.		Complete
a) Collect one sample at any time during the first month of operation. The sample may be collected before or after water is made available to the public.		<input type="checkbox"/>
b) Code the sample as Routine (RT) on the laboratory chain of custody.		
Step 4: Certification of Completion Upon completion of all necessary steps above, fill out the certification below.		
Print Name	Title	
Signature	Date	
I certify that I am the person authorized to fill out this form and that the information contained herein is true, accurate, and complete to the best of my knowledge and ability at the time the procedure was performed.		
Step 5: Return Form to the DWGPD Submit a copy of the completed form to the Drinking Water and Groundwater Protection Division no later than 10 days following the month of service start-up (e.g. The report is due by June 10th for systems returned to service in May). Keep a copy of this form for your records.		
TNC Program Specialist Drinking Water and Groundwater Protection Division One National Life Drive - Main 2 Montpelier, VT 05620-3521 Fax: 802-828-1541		

Step 1: Visual Inspection of the Water System

a) Visually inspect the Source: Well

- Is the cap bolted and tight?
- Is the electrical conduit secured to the cap?
- Is the cap / conduit broken or cracked?
- Is there a screen on the vent?
- Is there adequate drainage?



Step 1: Visual Inspection of the Water System

b) Visually inspect the Source: Spring

- Is the cover sealed and tight?
- Does the source need to be cleaned of debris and sediment?
- Are there indications of insect / rodent activity?
- Are the vents / overflows screened?
- Do the vents / overflow terminate 18" above grade?



Step 1: Visual Inspection of the Water System

c) Visually inspect the Treatment Plant

- Maintained and operational?
- Is your chemical solution fresh?
- Are chemical storage cleaned and sealed?
- Did your chemical reagents expire? Is your equipment calibrated?
- Backwash / discharge line have air gaps?



Step 1: Visual Inspection of the Water System

d) Visually inspect the Storage Tank

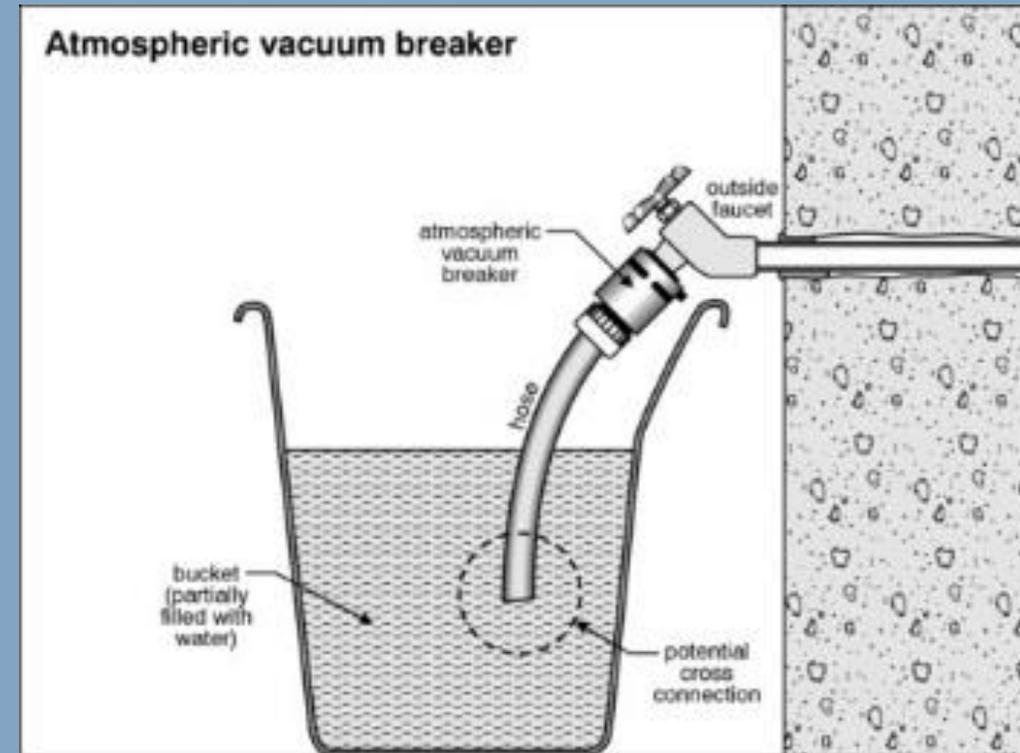
- Has the tank been inspected / cleaned?
- Is the integrity of your storage tank maintained?
- Watertight cover?
- Sealed penetrations?
- Is the vent / overflow / drain screened?
- Does the vent / overflow / drain terminate 18" above grade?



Step 1: Visual Inspection of the Water System

e) Visually inspect the Distribution System

- Does the system maintain adequate pressure?
- Are there any cross-connection hazards?
- Are hoses fitted with vacuum breakers / backflow prevention devices?
- Are pumps and valves operating properly?
- Are valve pits free of standing water?
- Are there signs of leaks / line breaks?



http://www.homesmsprealestateblog.com/images/2008/07/13/1547_2.jpg

Step 1: Visual Inspection of the Water System

e) Visually inspect Sample Locations

- Identify routine sample locations.
- Avoid swivel / mixing faucets.
- Avoid automatic faucets.
- Avoid internal threads.
- Remove aerators.
- Make sure sample tap is clean and accessible.



Steps 3 – 5: Sample, Sign, Submit

Step 3: Take your Sample!

- Collect your monthly routine monitoring bacteria sample.

Step 4: Sign the Certification of Completion

- Upon completion of Steps 1 – 3 sign the certification form.

Step 5: Submit to DWGWP

- Submit signed form to the DWGWP no later than 10 days following the month of startup.

Step 4: Certification of Completion Upon completion of all necessary steps above, fill out the certification below.	
Print Name	Title
Signature	Date
I certify under penalty of law that I am the person authorized to fill out this form, and the information contained herein is true, accurate and complete to the best of my knowledge and belief.	
Step 5: Return Form to the DWGPD Submit a copy of the completed form to the Drinking Water and Groundwater Protection Division no later than 10 days following the month of service start-up (e.g. The report is due by June 10th for systems returned to service in May). Keep a copy of this form for your records.	
TNC Program Specialist Drinking Water and Groundwater Protection Division One National Life Drive - Main 2 Montpelier, VT 05620-3521 Fax: 802-828-1541	

OUTLINE



RTCR Violation Types

- 1. E. Coli MCL Violation (Tier 1)**
- 2. Treatment Technique Violation (Tier 2)**
- 3. Monitoring Violation (Tier 3)**
- 4. Reporting Violation (Tier 3)**

E. COLI MCL VIOLATION

- TC+ routine sample followed by a EC+ repeat sample
- EC+ routine sample followed by TC+ (or EC+) repeat sample
- Fails to test for E. coli when a repeat sample is TC+
- EC+ sample followed by a failure to collect all repeat samples

E. Coli MCL Violation

- TC+ RT → EC+ RP
- EC+ RT → TC+ RP (or EC)
- TC+ RT → TC+ RP and E. coli not analyzed
- EC+ RT → All Repeats not Taken

E. Coli violations are Tier 1 which require public notice within 24 hours.

TREATMENT TECHNIQUE VIOLATION

- Failure to conduct the required assessment within 30 days of the trigger
- Failure to correct all sanitary defect(s) found through an assessment within 30 days of the trigger or in accordance with a State-approved schedule.
- Seasonal system does not complete start-up procedure prior to serving water to the public.

Treatment Technique Violations are Tier 2 which require public notice within 30 days.

- Failure to collect every required routine or additional routine sample in a compliance period
- Failure to test for E. coli following a routine sample that is TC+

Monitoring violations are Tier 3 which require public notice within 1 year

- Failure to submit sample results or completed assessment form after a system properly conducts monitoring or an assessment in a timely manner.
- Failure to notify the State of an EC + sample the day the system learns of the EC detection.
- Failure of a seasonal system to submit a certification of completion of the State-approved start-up procedure.

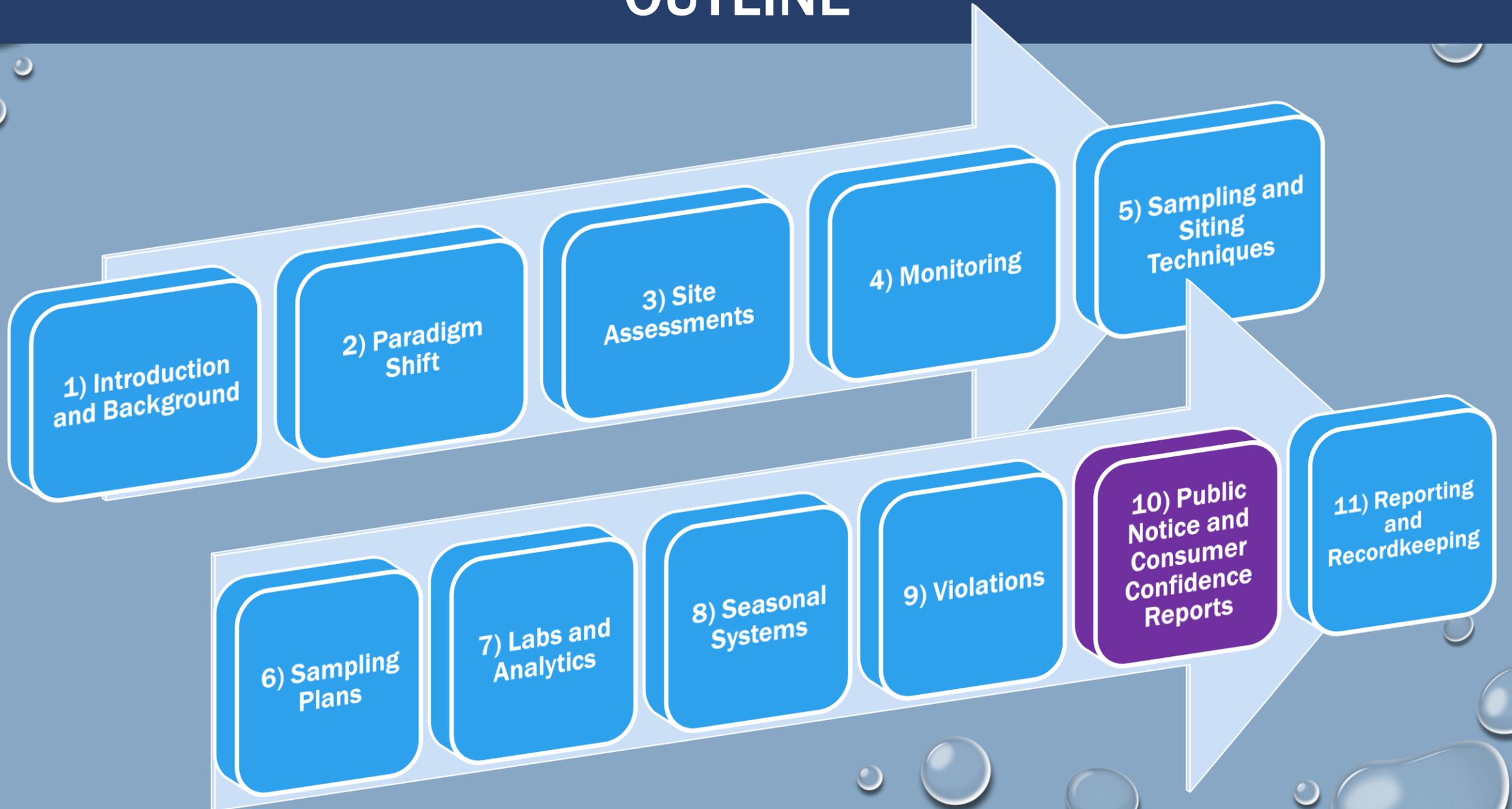
Reporting violations are Tier 3 which require public notice within 1 year

COMPLIANCE GUIDE

Sample Results		E. Coli MCL Violation?	Required Assessment
RT Sample	RP Sample		
EC +	TC +	YES	Level 2
EC +	Any Missed		
TC +	EC +		
TC +	TC+ (E.coli not analyzed)		
TC +	Any Missed	NO	Level 1*
TC +	TC+		
TC +	TC -	NO	NO
EC +	TC -		

*** Level 2 Assessment is required for second Level 1 in a rolling 12-month period**

OUTLINE



PUBLIC NOTICE FOR RTCR VIOLATIONS

Tier	Deadline to provide notice	RTCR Violation	Repeat Notices
1	24 hours	E. Coli MCL Violation	Every 3 months until the situation is resolved
2	30 days	Treatment Technique Violation	Every 3 months until the situation is resolved
3	1 year	Monitoring Violation Reporting Violation	Annually until the situation is resolved

Description of violation

DRINKING WATER WARNING
 ABC Water System (VT0012345)
water is contaminated with fecal coliform (or *E. coli*)

When the violation occurred

BOIL YOUR WATER BEFORE USING

Actions consumers should take

Fecal coliform [or *E. coli*] bacteria were found in the water supply on 8/1/15. These bacteria can make you sick, and are a particular concern for people with weakened immune systems.

Should alternate water supplies be used

What should I do?

DO NOT DRINK THE WATER WITHOUT BOILING IT FIRST! Bring all water to a boil, let it boil for one minute, and let it cool before using, or use bottled water. Boiled or bottled water should be used for drinking, making ice, brushing teeth, washing dishes, and food preparation until further notice. Boiling kills bacteria and other organisms in the water.

Potential health effects

Fecal coliforms and *E. coli* are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Microbes in these wastes can cause diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a special health risk for infants, young children, and people with severely compromised immune systems.

Population at risk

The symptoms above are not only caused by organisms in drinking water. If you experience any of these symptoms and they persist, you may want to seek medical advice. People at increased risk should seek advice about drinking water from their health care providers.

When the system expects to resolve the violation

What happened? What is being done?

Bacterial contamination can occur when increased run-off enters the drinking water source (for example, following heavy rains). It can also happen due to a break in the distribution system (pipes) or a failure in the water treatment process.

What is being done to correct the violation

Two samples tested positive for *E. coli* in the Main Well distribution following a heavy rain event. Inspection of the well found some pitting in the casing and further investigation identified corrosion holes in the casing below the ground surface to a depth of 2 feet. We have contracted with a well drilling company to remove and replace the damaged portion of the well casing. We will inform you when tests show no bacteria and you no longer need to boil your water. We anticipate resolving the problem within 1 week.

Name and phone number for more information

For more information, please contact First Last at 802-123-4567 or
 1 National Life Dr
 Montpelier, VT 05620

Required distribution language

Please share this information with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this notice in a public place or distributing copies by hand or mail.

Certification

Method(s) of Distribution: Hand delivered to each unit and posted in community building. Date Distributed: 8/2/15
 (e.g. hand or direct delivery, posting, television, radio)

I First Last (print name) Certify, as the Responsible Person (or authorized representative) of the water system indicated above, that the public notice has been provided to customers in accordance with the delivery, content, and format requirements and deadlines in the Vermont Water Supply Rule (Chapter 21, Subchapter 21-10).

Signature: _____ Date: 8/2/15
 Within 10 days of issuance of public notice, send a copy of the notice to:
 Drinking Water and Groundwater Protection Division, One National Life Drive - Main 2, Montpelier, VT 05620-3521

1 - Community Water Systems may use posting as a second method, but must also use radio, television, or hand or direct delivery.

Complete/distribute by July 1 of each year to cover the previous year

CCRs summarize information regarding:

- the sources used
- detected contaminants
- compliance issues
- health and educational information

CCRs are also a good opportunity to provide any updates:

- system improvements over the last year
- anticipated improvements (short and long term)
- staff recognition (new staff, education, awards)

- **The number of assessments required and completed**
- **The corrective actions required and completed (derived from the assessments)**
- **What triggered the assessments (E.coli MCL or not)**
- **If an assessment or corrective action was not completed (Treatment Technique violation)**

- **Date and time of water system meetings**
- **Name and contact information for the person who can answer questions about the CCR**
- **Tables are complete and accurate**
- **Explanation of violations including steps taken to address them**
- **Progress made or a schedule to address significant deficiencies and the Permit to Operate compliance schedule activities.**
- **All sections must be complete prior to distributing**

There must be at least one form of DIRECT DELIVERY of the CCR which may include:

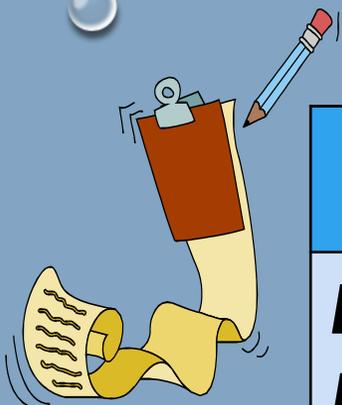
- Mailing a copy to each bill-paying customer
- Hand delivering a copy to each service connection
- Electronic delivery* (must meet certain requirements)
 - Paper or electronic communication (e.g. email, water bill, post card notification) must provide the specific URL providing a direct link to the CCR
 - If a customer is unable to receive a CCR by the chosen electronic method, the CCR must be provided by an alternative method allowed by the Rule
 - If using an electronic delivery, a prominently displayed message and the direct URL must be include in ALL notifications of CCR availability

OUTLINE



REPORTING REQUIREMENTS

Systems Must Report To The State:



REQUIREMENT	TIMING
<i>E. coli</i> MCL violation, or <i>E. coli</i> positive routine sample	By end of current business day (or next business day if state office is closed)
TT violation	By end of next business day
Level 1 or 2 assessment report	Within 30 days of learning that the system has exceeded a TT trigger

REPORTING REQUIREMENTS, (CONT.)

Systems Must Report To The State:

REQUIREMENT	TIMING
Coliform monitoring violation	Within 10 days of learning of violation
Completion of corrective action, if occurring after submittal of an assessment report	When each corrective action is completed
Seasonal system certification of compliance with state-approved start-up procedures	No later than 10 days following the end of the month in which the system opened.

PWS RECORDKEEPING

Systems Must Maintain Records:



REQUIREMENT	TIMING
Records of action taken by the system to correct violations	3 years
Public notices issued & certifications made	3 years
Records of microbiological analysis	5 years
Copies of monitoring plans	As long as analyses are required

Systems Must Maintain Records:

REQUIREMENT	TIMING
Level 1 or 2 assessment forms	5 years
Documentation of corrective actions	
Other available summary documentation of sanitary defects & corrective actions	
Records of any repeat samples taken that meet the state's criteria for an extension of the 24-hour period for collecting repeat samples	

Search for operator certification Information

OR
Search for Water System information

- Bacterial data
- Chemical data
- Current and following year Monitoring Schedules
- Always to date with latest info available to the state

[HTTPS://ANRWEB.VT.GOV/DEC/DWGWP](https://anrweb.vt.gov/dec/dwgwp)

The screenshot shows the Vermont Drinking Water and Groundwater Protection Division's "Drinking Water Database Search" page. It features the Vermont state logo and a circular seal with "VERMONT DEC ANR DWGWP". There are two search buttons: "Search by Operator" and "Search by Water System". Below these are instructions: "Search for Operator Certification Information" and "Search for Bacteria Sample Data, Chemical Sample Data or Monitoring Schedules". A search form contains fields for "Water System ID (WSID)" and "Water System Name" (with "lodge" entered). A "Search" button is next to the name field. Below the search options are radio buttons for "Bacterial Data" (selected), "Chemical Data", "Current Year Monitoring Schedule", and "Future Year Monitoring Schedule". A note says "Choose One Above - Then Select a System". Below the search options, it states "Your search returned 49 records. Click [select] to view the details." A table lists the results with columns for "WSID" and "WSName".

	WSID	WSName
Select	VT0000153	OLYMPIA MOTOR LODGE
Select	VT0000173	CASCADES LODGE
Select	VT0000272	SKYSHIP BASE LODGE
Select	VT0000341	SUMMIT LODGE
Select	VT0000410	SWISS FARM LODGE
Select	VT0000600	KITZHOF LODGE
Select	VT0000673	FLEUR DE LIS LODGE
Select	VT0000701	MID MOUNTAIN LODGE
Select	VT0000722	BIG BEARS LODGE
Select	VT0000750	BASE LODGE

KEY TAKEAWAYS OF THE RTCR

- The RTCR goes into effect **April 1, 2016**
 - There is no more Total Coliform MCL, E. coli MCL remains
 - No more Total Coliform-based Public Notice or Boil Water requirements in Vermont, E. coli-based boil and PN remains
 - Systems must take **3 repeat samples for each positive routine sample**
 - Monthly systems resume normal monthly monitoring the month following a routine positive sample
 - Quarterly systems must perform **3 additional routine samples** the month following a routine positive sample
 - Systems must complete each “set” of samples, regardless of sample results or triggers
 - 2 or more total coliform samples in a month triggers a site assessment
 - E. coli MCL violation requires a boil water notice and a Level 2 Site Assessment.
 - State precautionary boil may apply.

Before April 1st

- Review online resources for sampling plan forms including:
 - <https://www.youtube.com/watch?v=dJ5v6Aw9tXA>
 - <http://www.drinkingwater.vt.gov/pcwsapps.htm>
- Submit new bacteriological sampling plan (templates/forms forthcoming)
- Attend RTCR training – Level 1 Assessments and Sampling Plans
- Check out DWGWP website

After April 1st

- Seasonal systems perform seasonal startup procedures and submit completed startup form to DWGWP

Sample early in monitoring period!

QUESTIONS AND CONTACTS

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For questions regarding TNC systems

Julie Hackbarth
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802-585-4897

David Love
david.love@Vermont.gov
802-585-4902

For questions regarding Community or NTNC systems



ACRONYMS USED DURING THIS PRESENTATION

TC	Total Coliform	} + = Present - = Absent	CWS	Community Water System
EC	<i>E. coli</i>		TT	Treatment Technique
RT	Routine sample		MCL	Maximum Contaminant Level
RP	Repeat sample		GW	Groundwater
TCR	Total Coliform Rule		SW	Surface Water
RTCR	Revised Total Coliform Rule		Groundwater Under the	
MPN	Most Probable Number	GWUDI	Direct Influence of Surface	
TG	Triggered groundwater source water sample		Water	
NC	Non-Community Water	CCR	Consumer Confidence	
TNC	System (either TNC or NTNC) Transient Non-Community water system		Reports	
NTNC	Non-Transient Non-Community water system	DWGWP	Drinking Water and Groundwater Protection Division	
		PN	Public Notice	