Revised Total Coliform Rule



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Presenters

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RTCR

Background

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RTCR Handout Materials

1) This powerpoint
2) Level 1 Assessment Form-LDHH Final version
3) Level 1 Assessment Assistance Contact Info
4) Workshop Questions/Answers
5) RTCR Repeat Sample Identification Plan
6) RTCR Cheat Sheet

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Why a Revision of the Original Total Coliform Rule?

- Congress requires EPA to evaluate existing drinking water rules every 6 years
- EPA determined the original rule could be revised to make monitoring more efficient and to provide greater public health protection

How did EPA identify the changes to the 1989 TCR?

- EPA established an advisory committee called the Total Coliform Rule Distribution System Advisory Committee in 2007
- The advisory committee was comprised of a panel of 15 key stakeholder organizations, including EPA, states and tribal representatives, utility associations, and advocacy groups for environment, public health, epidemiology, and consumers.
- The advisory committee signed an Agreement in Principle (AIP) outlining its recommendations in 2008.
- In July 2010, EPA proposed a rule that was consistent with the AIP and gave the public an opportunity to review and comment on the proposed rule.

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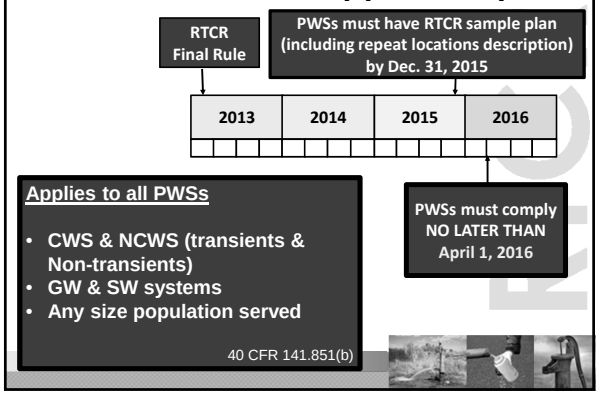
RTCR Timeline and Applicability



Applies to all PWSs

- CWS & NCWS (transients & Non-transients)
- GW & SW systems
- Any size population served

40 CFR 141.851(b)

RTCR Purpose

- Improve public health protection by reducing the pathways through which fecal contamination and pathogens can enter the distribution system
- TCR & RTCR objectives:
  - Evaluate effectiveness of treatment
  - Determine integrity of distribution system
  - Signal possible presence of microbial contamination

Acronyms

CWS	Community Water System
EC+	*E. coli*-Positive
GWR	Ground Water Rule
MCL	Maximum Contaminant Level
NCWS	Non-Community Water System
PN	Public Notification
PWS	Public Water System
RTCR	Revised Total Coliform Rule
TC	Total Coliform
TC+	Total Coliform-Positive
TCR	Total Coliform Rule
TT	Treatment Technique

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Definitions

Public Water System (PWS)	Any entity that provides water for human consumption through pipes or other constructed conveyances to at least 15 service connections or serves an average of at least 25 people for at least 60 days a year.
Community Water System (CWS)	A PWS which serves at least 15 service connections used by year-round residents or regularly serves at least 25 year-round residents.
Consecutive System	A PWS that buys or otherwise receives some or all of its finished water from one or more wholesale systems.

40 CFR 141.2

Definitions (cont.)

Non-community water system (NCWS)	A PWS that is not a CWS. A NCWS is either a "transient non-community water system (TNCWS)" or a "non-transient non-community water system (NTNCWS)."
Non-transient non-community water system (NTNCWS)	A PWS that is not a CWS and that regularly serves at least 25 of the same persons over 6 months per year.
Transient non-community water system (TNCWS)	A NCWS that does not regularly serve at least 25 of the same persons over 6 months per year.

40 CFR 141.2

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Definitions

Routine Monitoring	Normal total coliform (TC) sampling that must be conducted each month for the RTCR.
Repeat Monitoring	The <u>three</u> follow-up samples required for <u>every</u> routine compliance sample that is TC+ . Must be used to determine if PWS triggered an RTCR Level 1 or Level 2 assessment.

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New Definitions

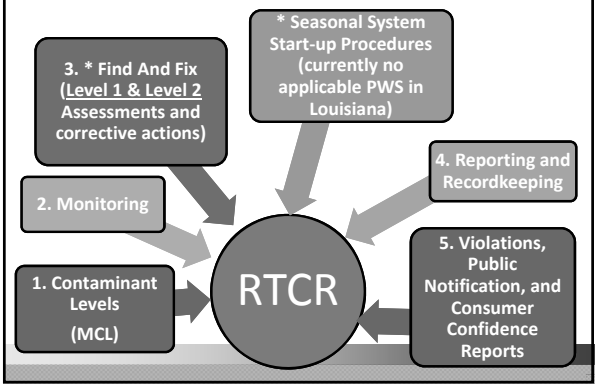
Clean Compliance History	A record of no TCR or RTCR MCL violations, no TCR or RTCR monitoring violations, & no coliform TT trigger exceedances or TT violations.
Level 1 Assessment	An evaluation conducted by the system (can be either operator or owner) to identify the possible presence of sanitary defects, defects in distribution system coliform monitoring practices, & (when possible) the likely reason that the system triggered the assessment.
Level 2 Assessment	A more detailed evaluation of a system conducted by an individual approved by the state. This assessment is conducted to find sanitary defects when there is a higher indicator of microbiological contamination.

More New Definitions

Sanitary Defect	A defect that could provide a pathway of entry for microbial contamination into the distribution system or that is indicative of a failure or imminent failure in a barrier that is already in place.
Seasonal System	A NCWS that is not operated as a PWS on a year-round basis and starts up and shuts down at the beginning and end of each operating season.

40 CFR 141.2

In Brief: What are the RTCR Requirements PWSs Need to Comply with?



What's the main difference between the original TCR and the Revised TCR?

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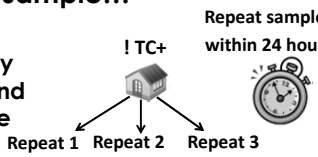
PWS has a Total Coliform bacteria positive sample…

TCR
Mandatory Sample and Re-sample



RTCR
Mandatory Sample and Re-sample
PLUS
Mandatory to Find and Fix Defects

Categories of RTCR Violations

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Main Types of RTCR Violations

- ***E. coli*** **MCL violation**
- **Treatment Technique violations**
- **Monitoring violations**
- **Reporting violations**

- **NOTE: Triggering an assessment (Level 1 or Level 2) is <u>not</u> a "Trigger" violation**

40 CFR 141.860

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MCL Violations

TCR (Acute MCL violation)	RTCR (*E.coli* MCL violation)	
	Routine sample AND	Repeat sample
Fecal coliform-positive repeat sample.	*(1)* TC+	*EC+*
EC+ repeat sample.	(2) *EC+*	TC+
TC+ repeat sample following a fecal coliform-positive or *EC+* routine sample.	(3) *EC+* routine	Fails to take <u>all</u> required repeat samples
	(4) TC+	TC+ (but no *E. coli* analyzed)

40 CFR 141.63 & 141.860(a)

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of MCL Violations

TCR (Acute MCL violation)	RTCR (*E.coli* MCL violation)
One Acute MCL violation occurs for the entire compliance period	More than one E. coli MCL violation can occur during the month. The compliance period is always one month.

40 CFR 141.63 & 141.860(a)

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Treatment Technique (TT) Violations

TCR	RTCR
Does not exists	TT violations: • Failure to conduct a Level 1 or Level 2 assessment within 30 days of the trigger. • Failure to correct all sanitary defects from a Level 1 or Level 2 assessment within 30 days of the trigger or approved timeframe by the state. • Failure of a seasonal system to complete state-approved start-up procedure prior to serving water to public.

40 CFR 141.860(b)

Monitoring Failures

FAILURE TO:	TCR	RTCR
Take routine sample	Monitoring Violation	Same as TCR
Take/analyze for *E. coli* for a TC+ routine sample	Monitoring Violation	Same as TCR
Take repeat samples following a TC+ / EC - routine sample	Monitoring Violation	Triggers a Level 1 Assessment*
Take repeat sample following a EC+ routine sample	Monitoring Violation	*E. coli* MCL Violation
Take/analyze for *E. coli* following a TC+ repeat sample	Monitoring Violation	*E. coli* MCL Violation

**** A Level 2 assessment is triggered after the first Level 1 assessment was triggered within a rolling 12-month period.***

40 CFR 141.859(a)(1)(iii); 141.860(c)

Reporting Violations

TCR	RTCR
Same as RTCR	– Failure to submit a monitoring report after monitoring correctly/timely.
Does not exists	– Failure to notify the state following an *E. coli*+ sample or *E. coli* MCL violation within 24 hours.
Does not exists	– Failure to submit certification after completion of state-approved start-up procedure by a seasonal system.
Does not exists	– Failure to submit completed assessment forms or report completed corrective actions after conducting assessment and corrective actions correctly/timely.

40 CFR 141.204; 141.860(c)-(d)

Treatment Technique Trigger versus Violation

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Treatment Technique Trigger versus Violation

- **Treatment Technique (TTT) Trigger: event(s) indicating impaired water quality and initiating required processes to reduce the level of a contaminant in drinking water**
  - **i.e. E. coli MCL violation, TC+ samples**
- **Treatment Technique Violation: failure to complete the required actions to mitigate potential contamination when there is a treatment technique trigger**
  - **i.e. Failure to complete Level 1 or 2 Assessments and/or corrective actions**

40 CFR 141.2; 141.52(a)(6) & 141.63(c)

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Treatment Technique (TT) Triggers and Level 1 & Level 2 Assessments

TCR	RTCR
Does not exist	**All systems required to <u>conduct Level 1/Level 2 Assessment</u> when monitoring results show that the system may be vulnerable to contamination** — Initiated by Treatment Technique (TT) triggers, it is an evaluation to identify sanitary defects — Conditions that defined a non-acute MCL violation under TCR are now used to trigger an assessment — More proactive approach to public health protection compared to TCR

40 CFR 141.859(a)-(b)

Sample Siting Plans

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Types of RTCR Compliance Samples Required on Sampling Plans

- Routine samples:
  - Required each month
- Repeat samples:
  - Required for when a routine or repeat sample is TC+

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Special Purpose Samples

Special purpose samples are operations-focused investigative samples that are not classified as routine or repeat compliance samples

- Examples:
  - Samples used to determine if: disinfection, flushing, storage tank cleaning, etc. is working properly
  - Boil advisory samples, new water lines, new facilities

40 CFR 141.853(a)(4) & (b)

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Special Purpose vs Compliance Samples

- The following are not special purpose samples & must be used to determine RTCR compliance
  - Extra routine samples taken per the sample siting plan
  - Repeat samples
  - Samples marked on the Lab 8 form as "Drinking Water Program No. 1 – Routine Samples or No. 3, 4, 5 – Repeat Samples"

40 CFR 141.853(a)(4) & (b)

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RTCR

Sample Siting Plan Basics

- Systems must develop and adhere to a sample siting plan and a system-specific schedule
  - Must develop plans and submit to LDHH no later than December 31, 2015
- Sample siting plans are subject to state review & revision
  - LDHH will review plans (Jan 1 – March 31, 2015) and at each sanitary survey

40 CFR 141.853(a)

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RTCR

Surface Water PWS Sampling Plans

- Sampling locations
  - Must be representative of the water in the distribution system
  - Routine & repeat monitoring locations must be shown
  - Monitoring at dedicated sampling stations
- Sample collection schedule
  - Samples must be collected at regular time intervals throughout the entire month
    - i.e. 20 routine samples per month = 5 routine samples taken each week each at a total of 20 different sites

40 CFR 141.853(a)

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RTCR

GW PWS Sampling Plans

- For GW systems, sample siting plan must include locations for:
  - Routine samples
  - Repeat samples
  - GWR triggered source water monitoring sites
- GW systems serving ≤ 4,900 may collect all samples on a single day if taken from different sites

40 CFR 141.853(a)(1) & (5)

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REPEAT Sites on Sampling Plans

Repeat Sampling locations

- List addresses/locations of repeat sites for EACH routine monitoring site, including the Maximum Residence time site
- PWS collect repeat samples using the same procedure as in the TCR
  - 1 at original location
  - 1 within 5 service connections upstream
  - 1 within 5 service connects downstream

40 CFR 141.853(a)(5)

Sample Siting Plans and Special Monitoring Evaluations

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Sample Siting Plans and Special Monitoring Evaluations

What is a special monitoring evaluation?

ANSWER:

- LDHH does a re-assessment of the adequacy of the sample siting plan
- Conducted by LDHH <u>each</u> sanitary survey
- Applicable to <u>all GWSs</u> serving ≤ 1,000 persons

40 CFR 141.854(c)(2) & 141.855(c)(2)

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RTCR

Sample Siting Plans and Special Monitoring Evaluations

- LDHH determines whether the following are appropriate:
  - # of samples per monitoring period
  - Vulnerable or critical times/sites for sample collection
  - Ensures that the distribution system is evaluated in sufficient detail

40 CFR 141.854(c)(2) & 141.855(c)(2)

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RTCR

How can PWSs Prepare for a Special Monitoring Evaluation

- Keep a copy of your RTCR routine Monitoring Plan and the paper copy of the Repeat Identification plan on file
- Make sure you have routine and repeat sample sites described clearly (list addresses)
- Update both sample plans if major changes happen with PWS:
  - population, distribution system lines, sources, storage tanks

40 CFR 141.854(c)(2) & 141.855(c)(2)

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RTCR

Routine Monitoring

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Minimum Number of Routine Samples

- Systems must collect at least the required number of routine samples
- NO waiver from taking ALL routine samples, even when there is
  - *E. coli* MCL violation
  - Level 1 or Level 2 Treatment Technique trigger occurs

RTCR

40 CFR 141.853(a)(3) & 141.853(a)(4)

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Extra Routine Samples

- Systems may take extra routine samples for public health protection and increased coverage of the distribution system
  - Must be taken in accordance with the sample siting plan
  - Must be representative of the distribution system
  - Must be used in determining whether the TT trigger has occurred

RTCR

40 CFR 141.853(a)(3) & 141.853(a)(4)

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Routine MONTHLY Monitoring Frequency:

- **ALL PWSs must monitor monthly when in operation**
  - **Noncommunity water systems move from quarterly to monthly**
- **Systems must collect samples at regular time intervals throughout the month**
  - **Only GW Systems serving 4,900 or fewer people may collect all samples on a single day if taken from different sites**

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RTCR Routine Sampling is Easier to Remember for Small Water Systems

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of Routine Samples no longer based on previous TC+

- **For PWSs sampling monthly, monitoring requirements for systems serving 4,900 or fewer people:**

TCR	RTCR
Must take at least 5 routine samples in the month after a TC+ sample.	**Systems take their normal number of routine samples the month following a TC+.**

40 CFR 141.21(b)(5); 141.856(b) & 141.857(b)

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Small Systems Taking < 5 Routine Samples per Month

- **For PWSs monitoring monthly, the month following a TC+, systems serving 4,900 or fewer people must sample at their normal routine sample sites:**

# of ROUTINE Samples Required the Month AFTER TC+		
Population served	**New RTCR**	**Original TCR**
Up to 1,000	1	5
1,001 to 2,500	2	5
2,501 to 3,300	3	5
3,301 to 4,100	4	5

40 CFR 141.21(b)(5); 141.856(b) & 141.857(b)

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Monthly Routine Sample Table

TOTAL COLIFORM MONTHLY MONITORING FREQUENCY FOR ALL PWS	
Population served	**Min # of Samples/Mo**
0 to 1,000	1
1,001 to 2,500	2
2,501 to 3,300	3
3,301 to 4,100	4
4,101 to 4,900	5
4,901 to 5,800	6
5,801 to 6,700	7
6,701 to 7,600	8
7,601 to 8,500	9

40 CFR 141.854(c)(1); 141.855(c)(1) & 141.857(b)

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Monthly Routine Sample Table

TOTAL COLIFORM MONTHLY MONITORING FREQUENCY FOR ALL PWS	
Population served	**Min # of Samples/Mo**
8,501 to 12,900	10
12,901 to 17,200	15
17,201 to 21,500	20
21,501 to 25,000	25
25,001 to 33,000	30
33,001 to 41,000	40
41,001 to 50,000	50
50,001 to 59,000	60
59,001 to 70,000	70
70,001 to 83,000	80

40 CFR 141.854(c)(1); 141.855(c)(1) & 141.857(b)

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Monthly Routine Sample Table

TOTAL COLIFORM MONTHLY MONITORING FREQUENCY FOR ALL PWS	
Population served	Min # of Samples/Mo
83,001 to 96,000	90
96,001 to 130,000	100
130,001 to 220,000	120
220,001 to 320,000	150
320,001 to 450,000	180
450,001 to 600,000	210
600,001 to 780,000	240
780,001 to 970,000	270
970,001 to 1,230,000	300

40 CFR 141.854(c)(1); 141.855(c)(1) & 141.857(b)

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Monthly Routine Sample Table

TOTAL COLIFORM MONTHLY MONITORING FREQUENCY FOR ALL PWS	
Population served	Min # of Samples/Mo
1,230,001 to 1,520,000	330
1,520,001 to 1,850,000	360
1,850,001 to 2,270,000	390
2,270,001 to 3,020,000	420
3,020,001 to 3,960,000	450
3,960,001 or more	480

40 CFR 141.856(b) & 141.857(b)

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Routine Samples for PWSs with Varying Population

- **For PWSs with changing population served**
  - **The PWSs population is based on the highest population of the year**
  - **PWS must monitor based on this highest population year round**

40 CFR 141.857(d)

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Repeat Monitoring

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Number of Repeat Samples

- ALL PWSs of any size now take only 3 repeat samples for each TC+
- Small GW systems (serving ≤ 1,000 people) only take 3 repeat samples
  - Under TCR, 4 samples required

TCR - # of Repeats	RTCR - # of Repeats
4 Samples	3 Samples

40 CFR 141.858(a)(1)

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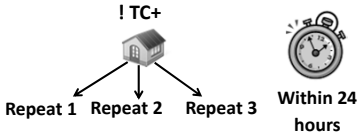
Repeat Monitoring Deadline



- System has 24 hours after learning about TC+ routine sample to take repeat samples
- State may extend the 24-hour deadline (new deadline must be specified)

40 CFR 141.858(a)(1)

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Repeat Monitoring Timing

- Must collect all repeats on same day
  - 3 repeat samples are needed for each TC+ routine sample

40 CFR 141.858(a)(1) & (2)

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Follow-up Monitoring for TC+ ROUTINE Sample(s)

Within 24 hours

Site A TC+ <-ROUTINE SAMPLE(S)

Site C TC- | Site A TC- | Site B TC- <- REPEAT SET

- For every routine sample that is TC+:
  - Collect 3 repeat samples
- All TC+ samples must be tested for *E. coli*

Systems must collect a set of repeat samples for EACH routine TC+ sample, even if an MCL or TT exceedance has occurred

40 CFR 141.858(a)(3) & 141.858(b)(1)

Follow-up Monitoring for TC+ REPEAT Sample(s)

Site A TC+

Within 24 hours

Site C TC+	Site A TC-	Site B TC+	<-Repeat Set 1
Site C TC-	Site A TC+	Site B TC+	<-Repeat Set 2
Site C TC-	Site A TC-	Site B TC-	<-Repeat Set 3

In this example, there are a total of 9 repeat samples at 3 sites.

- For each routine TC+ sample, when there are multiple TC+ repeat samples in a set:
  - Collect one set of 3 repeat samples until either:
    - TC are not detected in one complete set of repeats

    OR
    - System determines that a TT trigger has been exceeded and notifies the state

40 CFR 141.858(a)(3)

Frequently Asked Question

Does each TC+ routine sample need 3 repeat samples?

ANSWER: Yes, each TC+ routine sample needs 3 repeat samples regardless of whether there is an E. coli MCL violation or an assessment has been triggered.

Does each TC+ REPEAT sample need 3 repeat samples?

ANSWER: PWSs take repeats until a trigger occurs or all samples are TC - whichever happens first

Disinfectant Residual Samples

- **Under the Disinfection Byproduct Rules:**
  - **Must monitor disinfectant residuals at same time and place as total coliforms are sampled, includes routine and repeat samples**

All routine and repeat RTCR samples must have disinfectant residual results reported on the lab form:
- **PWS will have monitoring and/or reporting violation**

- **Monitoring necessary to demonstrate compliance with chlorine / chloramine Maximum Residual Disinfectant Levels (MRDLs)**

40 CFR 141.132(c)(1)(i)

Demo: LDHH Monitoring Plan Portal

https://www.ldhh-mpp.org/

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RTCR Monitoring and the Ground Water Rule (GWR)

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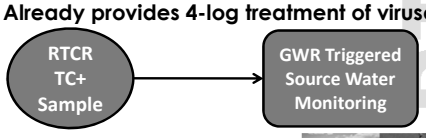
RTCR & GWR

- A GW system must conduct triggered source water monitoring under the GWR if a routine sample collected under the RTCR is TC+, unless:
  - It combines all of its GW with SW/GWUDI water prior to treatment, OR
  - Already provides 4-log treatment of viruses



40 CFR 141.402(a)(1) & (a)(1)(l) & (b)(1)

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GWR Triggered Source Water Monitoring

- GW systems that do not provide 4-log treatment of viruses with a TC+ RTCR routine sample:
  - Must collect at least 1 sample from each source in use at the time the TC+ sample was taken
    - Within 24 hours of being notified of TC+ sample
    - Must be analyzed for the state approved fecal indicator
  - If source sample is FC+, system must collect 5 additional source water samples from that source
    - Within 24 hours of being notified of the FC+ sample
    - Unless state requires immediate corrective action in response to positive source water sample

40 CFR 141.402(a)(2)-(3)

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Notification of EC+ Results

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E. coli Positive Results

- PWSs with their own certified PWS laboratory must notify LDHH by the end of the day when the PWS is notified of an EC+ result
- PWS can also email LDHH after business hours at safe.water@la.gov
  - Include the PWS ID and date of EC+ sample in the email notification
- PWS using LDHH OPH laboratory will be notified by OPH District staff of EC+ samples along with follow-up info on repeat samples

40 CFR 141.858(b)

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Why the 24 hour EC+ notification matters?

- Things to Consider:
  - EC+ results can potentially trigger time sensitive follow-up action
    - Level 1 or Level 2 assessment

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Stay Awake Quiz

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Stay Awake Quiz

What is LDHH's after-hours phone line or alternative notification procedure for systems (with their own PWS lab) to use if they become aware of an *E. coli* MCL violation or EC+ sample after the state office is closed?

A. safe.water@la.gov
B. donotcall@epa.gov

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Stay Awake Quiz #2 ANSWER

What is LDHH's after-hours phone line or alternative notification procedure for systems (with their own PWS lab) to use if they become aware of an *E. coli* MCL violation or EC+ sample after the state office is closed?

A. safe.water@la.gov

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WORKSHOP: Situation A Questions 1-4

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Analyzing Samples

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Analyzing for TC vs. *E. coli*

- All TC+ routine or repeat samples must be tested for *E. coli*
- State can allow a system to forgo *E. coli* testing on a TC+ sample if the system assumes the sample is EC+
  - Case-by-case basis
  - EC+ assumption must still be reported to the state
  - System incurs an *E. coli* MCL violation, is required to conduct a Level 2 assessment, and comply with PN/CCR requirements

40 CFR 141.858(b)

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Certified Laboratories

- Samples must be analyzed by an EPA- or state-certified drinking water lab
- Labs must be certified for each method used for analysis & each contaminant analyzed
- Per bacteriological laboratory certification criteria, PWS with their own certified lab can perform analyses only on their own water system's bacteriological samples

40 CFR 141.852(b)

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Analytical Requirements

- Standard sample volume required for analysis = 100 mL
  - Regardless of analytical method
- Only determining presence or absence of total coliform & *E. coli* is required
- The time from sample collection to initiation of test medium incubation may not exceed 30 hours

40 CFR 141.852(a)(1)-(3)

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Total Coliform Analytical Methods

Methodology Category	Methods
Lactose Fermentation Methods	• Standard Methods 9221B - Standard Total Coliform Fermentation Technique • Standard Methods 9221D - Presence-Absence (P–A) Coliform Test
Membrane Filtration Methods	• Standard Methods 9222B – Standard Total Coliform Membrane Filter Procedure • MI medium • m-ColiBlue24® Test • Chromocult
Enzyme Substrate Methods	• Colilert® • Colisure® • E*Colite® Test • Readycult® Test • Modified Colitag® Test

40 CFR 141.852(a)(5)

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E. coli Analytical Methods

Methodology Category	Methods
Escherichia coli Procedure (following Lactose Fermentation Methods)	• Standard Methods 9221 F - EC–MUG medium
Escherichia coli Partition Method	• Standard Methods 9222G - EC broth with MUG (EC–MUG) • Standard Methods 9222G - NA–MUG medium
Membrane Filtration Methods	• MI medium • m-ColiBlue24® Test • Chromocult
Enzyme Substrate Methods	• Colilert® • Colisure® • E*Colite® Test • Readycult® Test • Modified Colitag® Test

40 CFR 141.852(a)(5)

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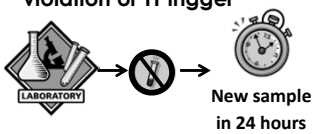
Invalidation of Samples

- Invalidated samples cannot be used to determine if the system had an *E. coli* MCL violation or TT trigger



New sample in 24 hours

- Re-samples must be taken <u>at same locations</u> and used for compliance calculations

Documentation of Sample Invalidation

- ✓ Rationale for invalidation
- ✓ Cause of TC+
- ✓ Action to correct problem

State Signature

40 CFR 141.853(c)

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Invalidation of Samples (cont.)

State may invalidate a sample if:

1. Documentation received from Lab of improper sample analysis
2. Determination of non-distribution plumbing problem and all same site repeat samples are total coliform-positive and all non-same site repeat samples are total coliform-negative

Systems must collect replacement samples for all invalidated samples!

40 CFR 141.853(c)(1)

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Invalidation of Samples (cont.)

State may invalidate a sample if:

3. **Documentation of circumstance or condition that does not reflect water quality in the distribution system and signed by the supervisor of the State official who recommended the decision to invalidate the sample**

Systems must collect replacement samples for all invalidated samples!

40 CFR 141.853(c)(1)

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Sampling Steps

1. **Take your routine samples each month**
2. **Find out your results within 4 days**
3. **If TC+ routine results, take 3 repeat samples for each routine TC+**
4. **Find out your results within 4 days**
5. **If TC+ repeat results, find out if you have triggered an assessment and if you need to take more repeat samples**

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Assessments

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Purpose of Assessments

- All systems required to conduct assessment when monitoring results show that the system may be vulnerable to contamination
- An assessment is an evaluation to identify sanitary defects & TT triggers
- More proactive approach to public health protection compared to TCR
  - Conditions that defined a non-acute MCL violation under TCR are now used to trigger an assessment

40 CFR 141.859(a)-(b)

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RTCR

Sanitary Defects

- Sanitary defect is a defect that could provide a pathway of entry for microbial contamination into the distribution system or that is indicative of a failure or imminent failure in a barrier that is already in place
  - Holes in storage tanks
  - Breaks in pipes
  - Cracks in well seals or casings
- Not linked directly to significant deficiencies under the GWR, but may overlap
- The system should consult with the state regarding how to coordinate actions under the GWR and RTCR, as necessary

40 CFR 141.2

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RTCR

Elements of Assessments

- At a minimum, assessment must include review & identification of the following elements:
  - Atypical events that may affect distributed water quality or indicate that distributed water quality was impaired
  - Changes in distribution system maintenance & operation that may affect distributed water quality, including water storage
  - Source & treatment considerations that bear on distributed water quality
  - Existing water quality monitoring data
  - Inadequacies in sample sites, sampling protocol, & sample processing

40 CFR 141.859(b)(2)

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RTCR

Conducting Assessments

- Assessment, submission of assessment form, and completion of corrective actions:
  - ALL conducted as soon as practical and WITHIN 30 days after the system has triggered an assessment
- Assessment form must include:
  - Assessments conducted
  - All sanitary defects found (if any)
  - Corrective action(s) completed and/or proposed timetable for correction actions not yet completed

40 CFR 141.859(b)(3)-(4); 141.860(b)(1)

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RTCR

No Sanitary Defects?

What if a PWS conducts the required assessment, and does not identify any sanitary defects?

Things to consider:

- Best practices procedures such as flushing and disinfection as part of consultation and corrective actions procedures
- Special purpose samples

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RTCR

Level of Effort – Level 1 vs. Level 2

- Level 1:
  - Conducted by the PWS
  - Primarily completed using existing data
  - May include limited inspections or interviews
- Level 2:
  - Assessment must be conducted by LDHH or state contractor
  - More comprehensive review and may include field investigations, additional sampling, and inspections
  - May involve consultation with additional parties

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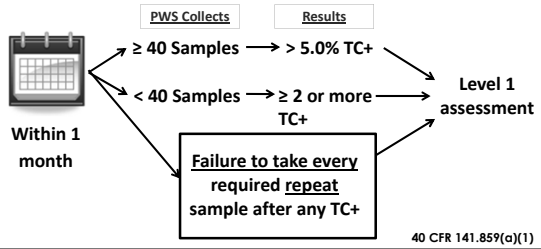
RTCR

Level 1 Assessments

Treatment Technique Trigger: Level 1 Assessment

Must consider all compliance samples (<u>total number of routine & repeat samples</u>) to determine Level 1 assessment trigger



40 CFR 141.859(a)(1)

How can PWSs Prepare for a Level 1 Assessment

- **Know the PWS is responsible for ensuring**
  - **the Level 1 assessment and corrective actions are completed <u>within 30 days of the Level 1 trigger date</u>**
- **Contact LDHH, LRWA, or Louisiana Communities Unlimited if you need help with the assessment**
- **Find and fix as many sanitary defects as soon as possible, even while waiting for help**

Completed Level 1 Assessment Form Components

- **Must include:**
  - **Sanitary defect(s) identified**
    - **Assessment form may note that no sanitary defects were identified, if applicable**
  - **Corrective actions taken**
  - **Proposed timetable for corrective actions not yet completed**
- **Completed assessment, submitted form, and completed corrective actions ALL due within 30 days of the trigger**

40 CFR 141.859(b)

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RTCR

Level 1 Assessor Criteria

Operator License Level	Population Served	Level 1 Assessor Qualifications
Class 1	<1,000	An operator or group of operators who hold, in total, certifications in production, treatment*, and distribution
Class 2	1,001 – 5,000	
Class 3	5,001-25,000	
Class 4	Over 25,000	

***PWSs without Treatment certification must work with a neighboring PWS or contract operator to do a Level 1 assessment.**

Assistance for Level 1 Assessment Forms

- **Get help as soon as possible and no later than 14 days after the Level 1 trigger date**
  - **See Level 1 Assessment Assistance Contacts**

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RTCR

Submission & Review

Within 30 days of learning that trigger has been exceeded → Submit completed Level 1 assessment form to state

- LDHH will review assessment to determine if:
  - System identified likely cause of Level 1 trigger
  - System corrected the problem or has an acceptable schedule for correction

40 CFR 141.859(b)(3)(iii)

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Stay Awake Quiz

95

Stay Awake Quiz

What are the MINIMUM five elements of a Level 1 assessment?

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Level 2 Assessments

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Treatment Technique Trigger: Level 2 Assessments

12 rolling months

When more than Level 1 Trigger occurs

E. coli MCL violation

Level 2 Assessment

PWS has:

- Previous Level 1 trigger within a rolling 12-month period
- *E. coli MCL* violation

40 CFR 141.859(a)(2)

E. coli MCL Violation: Level 2 Assessment Trigger

A PWS is in violation of the *E. coli* MCL when any of these conditions occur:

E. coli MCL Violation Occurs with Any of These Sampling Result Combinations	
ROUTINE	REPEAT
EC+	TC+
EC+	Any missing repeat sample
TC+	EC+
TC+	TC+ (but no *E. coli* analyzed)

40 CFR 141.860(a)

99

How can PWSs Prepare for a Level 2 Assessment

- Know the PWS is responsible for ensuring
  - the Level 2 assessment and corrective actions are completed within 30 days of the Level 2 trigger date
- Be available for the date/time of the LDHH scheduled Level 2 assessment
- Follow-up with LDHH if you have not received your scheduled date/time for assessment
- Find and fix as many sanitary defects as soon as possible, even before LDHH arrives

100

Level 2 Assessor Criteria

- Must be conducted by the LDHH staff:
  - District Engineer, District Sanitarian, Engineer Manager, or Central Office Management as approved by the Chief Engineer

40 CFR 141.859(b)(2); 141.859(b)(4)(i)-(ii)

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Completed Level 2 Assessment Form Components

- Level 2 assessment elements contain the same elements as the Level 1, but each element is investigated in greater detail
- Must include:
  - Sanitary defect(s) identified
    - Assessment form may note that no sanitary defects were identified, if applicable
  - Corrective actions taken
  - Proposed timetable for corrective actions not yet completed

40 CFR 141.859(b)(4)(i)

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Submission & Review

Within 30 days of learning that trigger has been exceeded

Submit complete Level 2 assessment form to the state

- State will review assessment to determine if:
  - System identified likely cause of Level 2 trigger
  - System corrected the problem or has an acceptable schedule for correction

40 CFR 141.859(b)(4)(iv)

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RTCR

What's your PWS probability of having to do a Level 1 or Level 2 Assessment?

104

RTCR

Do you remember to take all repeat samples within 24 hours after a TC+?

Yes – memory of an elephant and I always remember

No – I forget a lot or sometimes

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RTCR

My PWS has at the most no TC+ or only 1 TC+ per month and I remember to take all repeat samples.

True

False

106

My PWS occasionally has Acute MCL violations under the TCR.

True

False

107

WORKSHOP: Situation A Questions 5-6

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Defects that may result in pathways for Biological Contamination

Sources

Wells & Apurtenances

Pitless adapter without a seal

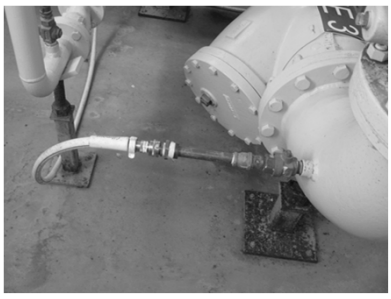
Compression seal that does not seal properly

Pitless adapter with low casing, cracked pad

Not a potable water cap (no seal, no vent)

Air relief valve with no screen, & too low to floor

Portable cross connection



Improper seal for electrical

Hole in casing seal

Vent casing is low, not facing down, not 18” off deck

Spring Box - seal missing

Cap to casing fill tube cracked

Bolts for well head seal not tight, Vent too low, screen too large

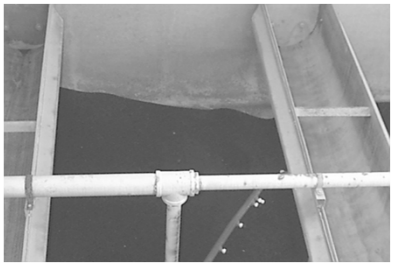
Treatment

Day tank with (large) opening

Chlorine pump is unsecured, portable cross connection

Improper Chlorine day tank

Surface wash creates mounding media



Mud balls (decrease filtration area)

Storage Tanks

Hatch has no gasket to create seal

Flat hatch (not knife edge) without seal

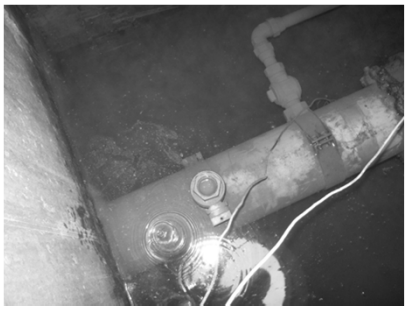
Screen is too large & defeated by pipe

Hatch on side of tank no seal

Bad seal on water level indicator, No overflow

Distribution Issues

Water in Vault / Air Relief Valve not Vented



HOW A LACK OF PREVENTIVE MAINTAINANCE CAN CAUSE PATHWAYS FOR CONTAMINATION

GWR E. coli Positive Initial Triggered Source Water Sample(s)

and

RTCR Level 1 and Level 2 Assessments

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Two Separate Requirements

- A GWR *E. coli* + initial triggered source water sample(s)
  - Followed by 5 additional follow-up GWR source water samples
- RTCR Level 1 and Level 2 Assessment still required
  - When triggered based on RTCR routine/repeat results
  - May wish to pay more attention to well area and source issues during assessment

Corrective Actions Associated with Level 1 and Level 2 Assessments

141

Timing of Corrective Action

- PWS must complete corrective action:
  - By the time assessment form is submitted, which is within 30 days of the trigger

  OR
  - Within state-approved timeframe
- PWS must notify the state when each scheduled corrective action is completed
- Either PWS or state can at any time request a consultation with the other party to discuss the corrective action

40 CFR 141.859(c) & (d)

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RTCR

Stay Awake Quiz

What violations does the PWS have if it has more than 5% TC + results (*E. coli* absent), completes the required assessment and all corrective actions within 30 days of the trigger?

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RTCR

Corrective Actions; Best Practices and Best Available Technology

- Best practices – actions that PWSs should consider following an assessment trigger regardless of whether or not they have identified a sanitary defect or likely cause of the TC or *E. coli* occurrence.
- Best available technologies (BATs) – list of "best technologies, treatment techniques, or other means" that EPA identifies to help PWSs comply with rules.

Common Corrective Actions

- Well maintenance/repair
- Revisions/development/implementation of operations plan
- Disinfection
- Flushing
- Replacement/repair of distribution system components
- Storage facility maintenance
- Maintenance of adequate pressure
- Sample siting plan review and training on proper sampling technique
- Collection of additional follow-up samples
- Instituting boil water orders

Common Causes of Contamination & Corrective Actions

Common Cause	Common Corrective Action(s)
Failure to disinfect (or improper disinfection) after maintenance work in the distribution system	• Disinfection
Main breaks	• Disinfection • Replacement/repair of distribution system components
Holes in storage tank, inadequate screening, etc.	• Maintenance of storage facility • Addition of security measures • Development & implementation of an operations plan
Cracks in well seal, casing, etc.	• Replacement/repair of well components

Common Causes of Contamination & Corrective Actions (cont.)

Common Cause	Common Corrective Action(s)
Loss of system pressure	• Maintenance of adequate pressure • Valve maintenance • Addition or upgrade of on-line monitoring & control
Biofilm accumulation in the distribution system	• Flushing • Maintenance of adequate pressure
Cross connections	• Maintenance of adequate pressure • Installation of backflow prevention assembly/device • Implementation/upgrade of cross connection control program

Common Causes of Contamination & Corrective Actions (cont.)

Common Cause	Common Corrective Action(s)
Inadequate disinfectant residual	• Disinfection • Flushing • Maintaining appropriate hydraulic residence time • Addition or upgrade of on-line monitoring & control
Contaminated sampling taps	• Replacement/repair of distribution system components • Sampler training
Sampling protocol errors	• Sampler training • Development & implementation of an operations plan

Corrective Actions and Simultaneous Compliance Issues

- PWSs should be aware that actions implemented to comply with the RTCR (e.g., disinfection as a corrective action) may affect their compliance with other rules.
  - Temporary disinfection and compliance with the DBP rules.
  - Effect of alkalinity and pH adjustments (to comply with the LCR) on disinfection efficacy
  - Effect of changes in the disinfectant residual on the corrosivity of water

RTCR

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Reporting and Recordkeeping Requirements

RTCR

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Reporting Requirements – RTCR

Systems must report to the state:	
REQUIREMENT	**TIMING**
E. coli **MCL violation, or** ***E. coli*** **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**

40 CFR 141.861(a)(1)-(3)

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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**

40 CFR 141.861(a)(3)-(5)

152

Reporting Violations

- **A PWS is in violation of reporting requirements when any of the following occurs:**
  - **Failure to submit disinfectant residual results on lab form**
  - **Failure to submit a completed Level 1 or Level 2 assessment form within 30 days of learning of the trigger**
  - **Failure to notify the state by the end of the next business day following an *E. coli*-positive sample or *E. coli* MCL violation**
  - **Failure to report completion of corrective action**

40 CFR 141.860(d)

153

PWS Recordkeeping

PWSs must maintain records:	
REQUIREMENT	**TIMING**
Records of action taken by the system to correct violations of primary drinking water regulations	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

40 CFR 141.33(a)-(c) & (f)

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PWS Recordkeeping (cont.)

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

40 CFR 141.861(b)

155

Public Notification & Consumer Confidence Report Requirements

156

Tier 1 & 2 PN Requirements

Tier	Violation
Tier 1	Has an *E. coli*-positive repeat sample following TC+ routine sample
	Has TC+ repeat sample following an *E. coli*-positive routine sample
	Fails to take all required repeat samples following an *E. coli*-positive routine sample
	Fails to test for *E. coli* when any repeat sample is TC+
Tier 2	TT violation resulting from failure to perform Level 2 assessment or corrective action
	TT violation resulting from failure to perform Level 1 assessment or corrective action

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Tier 3 PN Requirements

Tier	Violation
Tier 3	**Monitoring Violations:**
	Failure to take every required routine or additional routine sample.
	Failure to analyze for *E. coli* following a total coliform-positive routine sample.
	RTCR Reporting Violations:
	Failure to submit disinfectant residual sample results, monitoring plan, or completed assessment form after a system properly conducts monitoring or assessment in a timely manner.
	Failure to notify the state following an *E. coli*-positive sample in a timely manner.

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Tier 1 PN Requirement

- ***E. coli* MCL violation = Tier 1 PN**

Within 24 hours of violation

→ **Issue Tier 1 PN (with modified standard health effects language)**

→ **Consult LDHH**

- **Systems must comply with any additional PN requirements**

40 CFR 141.202(a)-(b)

159

Tier 2 PN Requirement

- No monthly *E. coli* MCL violation
- TT violations = Tier 2 PN

Within 30 days of violations if by mail/hand delivery and 14 days newspaper

→ Issue Tier 2 PN (with modified standard health effects language)

40 CFR 141.203(a)-(b)

160

Tier 3 PN Requirement

- Monitoring violations and reporting violations

→ Issue Tier 3 PN*

Within 90 days of violation if by mail/hand delivery and 45 days newspaper

40 CFR 141.204

161

STAY AWAKE QUIZ

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STAY AWAKE QUIZ

Tier 3 PN is required for which of the following reporting violations? (Select all that apply)

A. **Failure to submit a monitoring plan or completed assessment form in a timely manner after the PWS has properly conducted monitoring or an assessment.**
B. **Failure to notify the state in a timely manner following an *E. coli*-positive sample, as required by 40 CFR 141.858(b)(1).**

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Health Effects Language

Violation
Failure to monitor for total coliforms or *E. coli* prior to serving water to the public: "We are required to monitor your drinking water for specific contaminants on a regular basis. Results of regular monitoring are an indicator of whether or not your drinking water meets health standards. During [compliance period], we 'did not monitor or test' or 'did not complete all monitoring or testing' for [contaminant(s)], and therefore cannot be sure of the quality of your drinking water during that time."
Failure to complete other actions: Appropriate standard content elements in 40 CFR 141.205(a).

40 CFR 141.205(d)(2); Appendix B to Subpart Q –1h

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Health Effects Language

E. coli MCL Violation	
Tier 1	"***E. coli* are bacteria** whose presence indicates that the water may be contaminated with human or animal wastes. **Human pathogens** in these wastes can cause short-term effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a greater health risk for infants, young children, the elderly, and people with severely compromised immune systems."

40 CFR 141, Appendix B to Subpart Q –1g

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Health Effects Language (cont.)

TT Violations (assessment triggered by presence of *E. coli*)	
Tier 2	"Coliforms are bacteria whose presence indicates that the water may be contaminated with human or animal wastes. Human pathogens in these wastes can cause short-term effects, such as diarrhea, cramps, nausea, headaches, or other symptoms. They may pose a greater health risk for infants, young children, the elderly, and people with severely compromised immune systems. We violated the standard for *E. coli*, indicating the need to look for potential problems in water treatment or distribution. When this occurs, we are required to conduct a detailed assessment to identify problems and to correct any problems that are found."
	System must also include the following applicable sentences:
	"We failed to conduct the required assessment."
	"We failed to correct all identified sanitary defects that were found during the assessment that we conducted."

40 CFR 141, Appendix B to Subpart Q –1f

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Health Effects Language (cont.)

TT Violations (assessment triggered by presence of total coliform)	
Tier 2	"Coliforms are bacteria that are naturally present in the environment and are used as an indicator that other, potentially harmful, waterborne pathogens may be present or that a potential pathway exists through which contamination may enter the drinking water distribution system. We found coliforms indicating the need to look for potential problems in water treatment or distribution. When this occurs, we are required to conduct assessments to identify problems and to correct any problems that are found."
	System must also include the following sentences:
	"We failed to conduct the required assessment."
	"We failed to correct all identified sanitary defects that were found during the assessment that we conducted."

40 CFR 141, Appendix B to Subpart Q –1e

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Consumer Confidence Reports (CCR)

- **CWS must report**
  - **Until March 31, 2016**
    - **Total coliform, fecal coliform & *E. coli*: number or percentage of positive results**
  - **Starting April 1, 2016**
    - ***E. coli*: number of positive results**
    - **Level 1 or Level 2 assessment language**

RTCR

40 CFR 141.153(c)(4); 141.153(d)(4)(vii), (viii), & (x)

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WORKSHOP: Situation B and Situation C

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Best Practices for PWSs

- Prevent assessment triggers by:
  - Take all repeats
  - Be proactive about finding and fixing sanitary defects before samples are TC+
  - Use disinfection and flushing best practices
- Contact lab within 4 days of sample collection for results
- Complete assessments and corrective action within 30 days of EC+ or TC+ assessment trigger

Questions?

LDHH:

- Jennifer Kihlken
  Jennifer.Kihlken@la.gov
  phone: 337-475-3231

Stay Awake Quiz ANSWER

What are the MINIMUM five elements of a Level 1 assessment?

1. Existing water quality monitoring data
2. Atypical events affecting distributed water quality or indicate that distributed water quality was impaired;
3. Source and treatment considerations that affect distributed water quality, where appropriate;
4. Changes in distribution system maintenance and operation that may affect distributed water quality, including water storage; and
5. Inadequacies in sample sites, sampling protocol and sample processing.

Do you remember to take all repeat samples within 24 hours after a TC+?

NO – I forget a lot or sometimes

At a minimum, a Level 1 Assessment is required <u>each</u> time repeat samples are missing. A Level 2 Assessment is required if a previous Level 1 has been triggered within the previous 12 months.

My PWS has at the most no TC+ or only 1 TC+ per month <u>and</u> I remember to take all repeat samples.

FALSE

For PWSs that collect less than 40 total routine and repeat samples, a Level 1 Assessment is triggered with two or more TC+ results in the month. A Level 2 Assessment is required if a previous Level 1 has been triggered within the previous 12 months.

My PWS occasionally has Acute MCL violations under the TCR.

TRUE

An Acute MCL violation (which requires boil water advisory) is equivalent to an E. coli MCL violation under the RTCR and will require a Level 2 Assessment.

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Stay Awake Quiz ANSWER

What violations does the PWS have if it has more than 5% TC + results (*E. coli* absent), completes the required assessment and all corrective actions within 30 days of the trigger?

NONE. There are no violations issued because the PWS met all requirements for the treatment technique trigger. 5% TC + is no longer a violation under RTCR.

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STAY AWAKE QUIZ: Answer

- **Tier 3 PN is required for which of the following reporting violations? (Select all that apply)**
  - **A. Failure to submit a monitoring plan or completed assessment form in a timely manner after the PWS has properly conducted monitoring or an assessment.**
  - **B. Failure to notify the state in a timely manner following an *E. coli*-positive sample, as required by 40 CFR 141.858(b)(1).**

177