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## Assessments & Corrective Action



Winter 2015/2016  
Bureau of Water System Engineering  
Water System Operations

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## Assessments

RTCR

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## Purpose of Assessments

- Monitoring results show that the system may be vulnerable to contamination
- Used to identify sanitary defects & TT triggers
- More proactive approach to public health protection compared to TCR
  - Conditions that defined a MCL violation under TCR are now used to trigger an assessment

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## “Find and Fix Approach”


- After a detection of coliform/*E. coli* find your sanitary defect(s) by conducting RTCR Assessments
  - Level 1 assessment
  - Level 2 assessment
- Based on the severity and frequency of potential contamination



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## Sanitary Defects

- “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”



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## Sanitary Defects

- Examples:
  - 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

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### Level 1 vs. Level 2

- Level 1:
  - Conducted by the PWS
  - Primarily completed using existing data
  - May include limited inspections or interviews
- Level 2:
  - More comprehensive review of existing data
  - Must include field investigations or site visits
  - May include additional sampling
  - May involve consultation with additional parties
  - Must be conducted by a party approved by the state. In some situations the state may elect to conduct a Level 2

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### Level 1 vs. Level 2

- Level 1:
  - Conclusion: "No defects found" acceptable
- Level 2:
  - Conclusion: "No defects found" NOT acceptable
  - Shock chlorination is NOT the answer
- Exceptions on case-by-case basis

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### Elements of Assessments

- 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

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### Level 1 Assessments

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### Level 1 Assessment Triggers

Must consider all compliance samples (total number of routine and repeat samples) to determine Level 1 assessment trigger  
40 CFR 141.85(a)(1)

```

    graph TD
      A[Within 1 month] --> B{ }
      B -- "≥ 40 Samples" --> C["> 5.0% TC+"]
      B -- "< 40 Samples" --> D["≥ 2 more TC+"]
      C --> E[Level 1 assessment]
      D --> E
      B -- "Failure to take every required repeat samples after any TC+" --> E
    
```

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### Level 1 Assessment

- Treatment Technique Requirement
- Replaces non acute TCR violations
  - Systems collecting 40 or more samples per month, more than 5.0% are TC+
  - Systems collecting less than 40 samples per month, 2 or more TC+
- Failure to collect all or some repeat samples after TC+ routine
- Can be conducted by the water system

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## Remind Public Water Systems:

- Failure to conduct repeat monitoring automatically triggers a Level 1 or Level 2 assessment.
- Workload: Three repeat samples for each routine TC+ versus an assessment with corrective actions

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## Level 1 Assessment

- Basic examination of:
  - source water
  - treatment
  - distribution system
  - relevant operational practices



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## Completed Level 1 Assessment 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

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## Who Conducts Level 1 Assessments?

- Intended to be self-assessments
- Systems may receive assistance from states
  - PWS may conduct assessment while consulting with state via phone
  - Either the PWS or state can at any time consult with the other party to discuss the assessment or corrective action(s)
  - States may set up alternative methods for form submission

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## Level 2 Assessments

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## Level 2 Assessment Triggers

- Considering all compliance samples (routine and repeat) a system:
  - Has a second Level 1 trigger within a rolling 12-month period
    - Unless the state has determined a likely reason that the samples that caused the first Level 1 TT trigger were TC+ and has established that the system has corrected the problem
  - An *E. coli* violation

**Level 2 Assessment Triggers**


- EC+ repeat sample, following a TC+ routine
- TC+ repeat samples, following EC+ routine
- Failure to collect repeat samples after EC+ routine
- Failure to test for E. coli when any routine or repeat tests TC+
- Two Level 1 triggers in a 12 month period

**E. coli MCL Violation Occurs with Any of These Sampling Result Combinations**

ROUTINE	REPEAT
<b>EC+</b>	<b>TC+</b>
<b>EC+</b>	<b>Any missing repeat sample</b>
<b>TC+</b>	<b>EC+</b>
<b>TC+</b>	<b>TC+ (but no E. coli analyzed)</b>


**Level 2 Assessment**

- A more in-depth examination
- Direct health threat
- Overall system monitoring and operational practices
- Conducted by the State or a party approved by the State



**Completed Level 2 Assessment Components**


- Level 2 assessment contains 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



**Who Conducts Level 2 Assessments?**

- Must be conducted by an approved party
  - A third party approved by the state, including PWS staff, if qualified
  - The state
- Must follow state directives related to:
  - Size & type of system
  - Size, type, & characteristics of distribution system


PWS Type	Level 1 Assessment	Level 2 Assessment*	Level 2 (Driven by E. coli MCL) Conducted by:
<b>Transient</b>	Owner or designee	Certified operator - minimum very small system  Can NOT be operator that performed Level 1. Team OK	State staff (or designee)
<b>Non-transient, non-community</b>	Owner or designee OR Operator (same grades or higher)	Operator(s) (same grades or higher)  Can NOT be operator that performed Level 1. Team OK	State staff (or designee)
<b>Community (any size)</b>	Operator (same grades or higher)	Operator(s) (same grades or higher)  Can NOT be operator that performed Level 1. Team OK	State staff (or designee)
<b>Seasonal</b>	Owner or designee	Operator (same grades or higher) - State seasonal inspector when available Can NOT be operator that performed Level 1. Team OK	State staff (or designee)



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## Development of Level 1 and Level 2 Assessment Forms


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## Pre-rulemaking Activities

- Analysis of past violations to get a handle on anticipated number of assessments and system type
- Pilot of EPA Assessment Forms (past 2 years)
- Stakeholder meetings and conference calls to discuss assessment form development




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## Anticipated Level 1 Assessments

YEAR	CWS	NTNC	TNC	TOTAL
2013	35	50	233	318
2012	47	54	223	324
2011	64	59	311	434
2010	51	51	221	323
2009	30	47	153	230

- 5 year average = 325.8 Level 1 assessments per year
- In 2013 there were 318 violations for 245 systems (or 116 multiple system violations)




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## Anticipated Level 2 Assessments

YEAR	CWS		NTNC	TNC	TOTAL
	≤ 250	> 250*			
2013	0	0	8	36	44
2012	1	1	9	45	56
2011	9	1	8	81	99
2010	8	2	11	50	71
2009	2	0	9	50	61

- 5 year average = 66.2 Level 2 assessments per year


\*2012 (Old Bridge, 66200), 2011 (East Orange, 75000), 2010 (Winslow, 39174 & Moorestown 19000)



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## Draft Level 2 Assessment

- See handout – still draft & accepting comments
- Developed by several sources:
  - EPA form, interim guidance
  - Other states
  - Stakeholder group (CEHAs, water systems, labs)
- Format: checkboxes preferable



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## Draft Level 1 Assessment

Still draft & accepting comments

- Will be based on final Level 2
- Format: checkboxes preferable
- Issue: EPA Level 1 and Level 2 questions are the same


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## Corrective Actions Associated with Level 1 and Level 2 Assessments

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## Submission & Review



Submit complete assessment form to the state

Within 30 days of learning that trigger has been exceeded

Site visit date

Shock chlorination is not the answer!

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## Submission & Review

- Identified sanitary defects and subsequent corrective actions must be described in the assessment form
- The State determines if the assessment is sufficient
- 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
  - Site visit date, all sections complete
  - **\*\*Level 2\*\*** detailed inspection – expect consultation

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## Submission & Review

Observations to date

- Y means N, N means Y, confusing w/out instructions
- Illegible writing, missing pages, incomplete sections, missing dates, missing corrective actions, missing signature, missing attachments
- Improper chlorination
- No response, failure to submit proposed actions within 30 day timeframe will result in a violation

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## Violations and Public Notice

- Treatment technique:
  - Assessment not submitted or incomplete
  - Submitted after 30 day deadline or state-approved deadline
  - Corrective actions not completed or not completed w/in specified timeframe
  - Tier 2 PN required (include in CCR for CWS)

Reminder:

- Tier 2 PN only required if you fail to complete or submit assessment
- Tier 1 PN only for *E. coli* MCL violation
- Tier 3 PN for monitoring **and** reporting violations

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## Special Considerations for State Review & Approval

- Confirmation that Corrective Actions are completed and effective
- Things to Consider:
  - Pictures to verify
  - Follow-up sampling after corrective actions have been completed

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### Special Considerations for State Review & Approval

- How can the State and County continue to emphasize the importance of follow-up monitoring to a routine TC+ sample?
- Things to Consider:
  - Require follow-up sampling as part of the assessment consultation and corrective actions procedures
  - Incorporate follow-up sampling as part of the sampling plan

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### Special Considerations for State Review & Approval

- 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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### Timing of Corrective Action

- System must complete corrective action:
  - By the time assessment form is submitted, which is within 30 days of the trigger
  - OR
  - Within state-approved timeframe
- System must notify the state when each scheduled corrective action is completed
- Either system or state can at any time request a consultation with the other party to discuss the corrective action

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### Timing of Corrective Action

What if a system conducts a required assessment, sets a timeline for corrective action years into the future, which is accepted by the primacy agency, but triggers additional assessments before the corrective action can be completed?

ANSWER: The system would incur a Level 1 or Level 2 assessment for each triggered event and must correct any additional sanitary defects. If the system discovers that the contamination continues to be caused by the original triggering event, the system can perform interim measures that ensure the delivery of safe water.

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### Common Causes of Contamination & Corrective Actions

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### Common Corrective Actions

- Well maintenance/repair
- Disinfection
- Flushing
- Replacement/repair of distribution system or storage components
- Storage facility maintenance
- Development/implementation of operations plan
- Maintenance of adequate pressure
- Training on proper sampling technique

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## Shock Chlorination

- Must be performed in accordance with:
  - All state regulations
    - NJAC 7:12-11
  - AWWA Standards
  - Authorized professional: licensed well driller, licensed pump installer, or licensed plumber who is versed with the appropriate procedures
  - Record chlorine residuals in a log

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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

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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

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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

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## Summary/Key Points

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## Level 2 Assessments

NOW (1989 TCR)	≈	APRIL 2016 (RTCR)
Acute MCL Violation		Acute MCL Violation
Tier 1 PN		Tier 1 PN
Remedial Measures Report		Level 2 Assessment

# HEALTH RISK




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## Level 1 Assessments


**NOW (1989 TCR) ≠ APRIL 2016 (RTCR)**

- Monthly (Non-Acute) Violation
- Tier 2 PN


 **NO Non-Acute MCL violations**

- NO Tier 2 PN
- TT to complete Level 1 assessment

**NO HEALTH THREAT**

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- Complete the form in its entirety
- Submit on time (30 days)
- Include signature, site visit date
- Shock chlorination is not the answer!!!
- Check w/County for add'l requirements
- Complete as soon as triggered
- Ask if you questions! Request consultation for extension
- Include a timeline (dates, dates!)
- Attach lab reports, invoices, etc.

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## Questions/Feedback

Bureau of Water System Engineering  
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