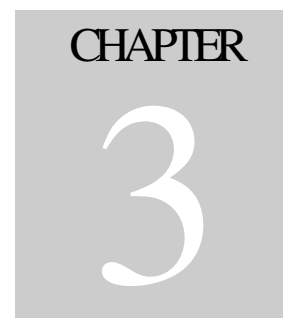


Revised Total Coliform Rule – Chapter 3 Question Index



If your question does not appear in this index or you need more information, please contact the Compliance Assurance Section (CAS) at 217-785-0561 or the appropriate [Regional Office](#) as listed in the Handbook Introduction. All blue text is linked.

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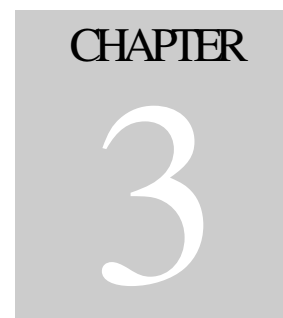
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Revised Total Coliform Rule – Chapter 3



This Chapter has been written in a Question / Answer format. If this Chapter does not answer your question, please contact the Revised Total Coliform Rule (RTCR) Compliance Coordinator at 217-785-0561 or your Illinois EPA [Regional Office](#) as listed in the Handbook Introduction. All blue text is linked.

[Section 1 – General Questions about Coliform](#)

► [What is the Revised Total Coliform Rule \(TCR\)?](#)

The Revised Total Coliform Rule (RTCR) became effective April 1, 2016. It requires all water supplies to monitor for the presence of total coliforms in the distribution system. For drinking water, total coliforms are used to monitor the sanitary quality of the water, adequacy of water treatment, and the integrity of the distribution system. The absence of total coliforms in the distribution system minimizes the likelihood that fecal pathogens are present. Thus, total coliforms are used to determine the vulnerability of a system to fecal contamination.

► [What is total coliform bacteria?](#)

Total coliforms are a group of closely related bacteria that (with few exceptions) are not harmful to humans. They are an indicator that other pathogens may be present in water. Coliform bacteria are present in the intestinal tract of warm-blooded animals. They are shed from the body in the feces. Because these organisms are shed from the body in large numbers and are relatively easy to detect in the laboratory, they have been accepted as an indicator of contamination. All bacteriological samples are analyzed for the coliform group; however, a positive reaction to these coliform analyses may be from sources other than fecal. In order to differentiate between these sources, all samples that are total coliform positive must be analyzed again to determine if *E. coli* is present.

► [What is *E. coli*?](#)

E. coli is a more specific indicator of fecal contamination and potential harmful pathogens. *E. coli* is a more restricted group of bacteria that almost always originates in a human or animal gut. 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. The presence of *E. coli* in a drinking water sample indicates recent contamination and signals a greater possibility that pathogenic organisms may be in the water.

► Why must a water system monitor for total coliform and *E. coli*?

Total coliforms serve as indicators of the efficiency of water treatment, of the integrity of the pipes in the distribution system, and as a screen for the presence of fecal contamination. Usually, coliforms are a sign that there could be a problem with the system's treatment or distribution system.

E. coli indicates that pathogenic organisms may be present that can cause short-term health effects, such as diarrhea, cramps, nausea, headaches, fatigue and jaundice. They may pose a special health risk for infants, young children, and people with severely compromised immune systems.

Section 2 – Monitoring Requirements

► How many coliform samples must a water system collect?

Every Water System (WS) must collect a given number of “routine” coliform samples from the distribution system per month generally based on the population served. See [Appendix A](#). Additional raw, finished, and distribution water samples may be required depending on your source of water, water treatment facilities, service area of the distribution system, and any related sanitary survey deficiencies. After a WS sanitary survey is conducted by the Illinois EPA Regional Office inspector, the total number of coliform samples required each month is listed on the follow-up inspection report that is mailed to the WS. If you are not sure how many samples you are required to collect, please contact your [Regional Office](#) as listed in the Handbook Introduction.

If a WS has a positive coliform sample, confirmation (repeat) samples must be collected immediately. See [Section 5](#) for additional information on repeat samples.

► Does the number of monthly routine distribution coliform samples ever change?

Yes. A change in population may cause a change in the number of samples. If a change occurs, the Illinois EPA Regional Office will notify the WS.

► Do I have to collect my monthly routine coliform samples from specific locations?

Yes. Failure to do so may result in a monitoring violation. Every WS must have on file an approved coliform sample site plan at the appropriate [Illinois EPA Regional Office](#).

► What is a coliform sample site plan?

A coliform sample site plan is a list of sites by street address, lot number, or other permanent description, that identifies all the approved locations where your routine (monthly) distribution coliform samples may be collected. The list of sites must be plotted on a map of your service area. Larger water systems will divide their distribution system into specific sampling areas.

► Does the site plan have to be approved by the Illinois EPA?

Yes. The list of sites and the map is reviewed by the Illinois EPA Regional Office serving your facility to insure representative sites have been selected. A site number is then assigned to each sample location. All reporting forms must be completed using the sample site number rather than the street address. Your approved site plan **MUST** be followed each time you collect routine samples.

► Where can I get instructions on how to create a coliform sample site plan or make changes to an existing site plan?

Contact the appropriate **Regional Office** as listed in the Handbook Introduction.

► How can I find out the water system's sampling locations?

A copy of the WS's coliform site plan (and sample site numbers) is on file at your Illinois EPA **Regional Office**.

► How can I contact my Illinois EPA Regional Office?

You can determine which Illinois EPA **Regional Office** serves your county by going to the beginning of this Handbook or on-line at <http://www.epa.illinois.gov/topics/compliance-enforcement/drinking-water/sample-collectors-handbook/index>.

► How often and when must I collect my routine samples?

Routine compliance samples must be collected every month. Each month is a sampling period.

A WS with only a **groundwater source** (not under the direct influence of surface water) that **serves 4,900 persons or fewer**, may collect all required samples on a single day if they are taken from each area of the approved sample site plan.

Surface water supplies, supplies using groundwater under the direct influence of surface water and groundwater supplies that serve more than 4,900 people must collect samples throughout the month. WSs that collect weekly or more frequently should continue this practice.

Samples should be collected as early each month as possible, but not before the first day of each month. Prompt collection allows sufficient time for replacement sampling if samples are

discarded. Reasons for discarding samples include: failure to record date or time of collection, sample(s) more than 30 hours old upon arrival at the certified laboratory, and sample(s) broken or frozen in transit. If the sample(s) and/or any necessary replacement samples are not collected within the monthly monitoring period, the WS will be in violation of their monitoring requirements and must make public notice.

Section 3 – Collecting Samples

► How do I choose a proper sample faucet?

Since coliform samples must be representative of the water quality in the distribution system, it is important to select proper sampling locations. Visit the site before selecting it for your coliform sample site plan. See if a smooth-nosed cold-water faucet is available that will allow the collector to run the faucet at a constant flushing rate for 30 to 60 seconds without flooding the sink. You may choose to install a smooth nosed faucet at your designated sample locations.

The sampling faucet should be conveniently located and readily accessible to the collector. Avoid faucets that are connected to private water treatment equipment such as water softeners or filters. Faucets that are subject to exterior contamination because they are too close to a sink bottom or to the ground must be avoided. It is difficult to place a bottle beneath a low faucet without touching the interior of the bottle's neck against the outside of the faucet. Threaded faucets that might harbor bacteria around the threads should not be used. Leaking faucets that allow water to flow around the stem and over the outside of the faucet should be avoided. If an even stream of water cannot be sustained, a more suitable tap should be found. Failure to follow these precautions could result in a contaminated sample.

You may wish to install dedicated sampling faucets or sampling stations to assure access and satisfactory sampling conditions at all times.

► How should a coliform sample be collected?

Use great care when collecting coliform samples. Only bottles received from a certified laboratory should be used to collect samples. It is extremely important that the sample collector uses only the approved sampling locations and follows proper sampling techniques. Contamination from the sampling faucet can occur if caution is not used. Should an incident occur during sample collection that may result in contamination, the sample should be discarded and a new bottle requested. **It is assumed that all samples submitted for testing are properly collected. Sample error will not be accepted as an excuse to avoid repeat sampling.** Generally, the following protocol should be followed:

1. Sample bottles should be examined when received. If for any reason (loose caps, caps off, etc.) the sterility of the bottle is in question, the bottles should not be used.
2. Open an approved sampling faucet so that a smooth flow of water at moderate pressure is obtained. Be sure that there is no splashing. Allow the water to flow for sufficient time

to clear the service line. Depending on time of year and water source you may notice a water temperature change when the line has been cleared.

3. **If your WS is chlorinated**, check for residual chlorine. These results **MUST** be included on the reporting form. Indicate whether the residual measured is free (F) or total (T) chlorine.
4. The bottle cap should not be removed until you are ready to collect the sample. Do not lay the bottle cap down or put it in a pocket. Hold the bottle in one hand and the cap in the other, keeping the bottle cap right side up (threads down) and taking care not to touch the inside of the cap. Avoid touching the inside of the sterile bottle(s) with your fingers or the faucet nose.
5. Once you start filling the bottles do not adjust the stream flow. Do not allow splashing drops of water from the ground or sink to enter the bottle. Fill the bottle to the 100 ml mark on the side of the bottle. Cap the bottle immediately. Then turn off the faucet.

► Can I use any container to collect the sample?

No. You must use sterile 100 ml plastic (or glass) bottles obtained from a certified laboratory. These bottles contain a small amount of sodium thiosulfate to neutralize the residual chlorine in the sample. The sodium thiosulfate may appear as a tablet or as a white residue in the bottle. Do NOT rinse this material out of the bottle.

► Do we need to use any special reporting forms when submitting samples to the laboratory?

Yes. These forms can be obtained by calling your **certified laboratory**. The reporting forms should be included with the bottles.

► How do I complete the reporting/collection form?

For the most part, the form is self-explanatory. A few reminders:

1. Always use your Illinois EPA assigned sample site numbers (not sample address). If a site number does not exist for a location, please add it to your site plan by calling your **Illinois EPA Regional Office**. Simply record the address if it's a "one-time" sample location.
2. Be-sure you include all "Contact Person" information including telephone number and cellular number. This information is very important in the event of a positive sample.
3. Clearly mark sample purpose.
4. If your WS is chlorinated, you must include the chlorine residual on the form. Failure to do so will result in a violation.

► After I collect the sample, how long does it have to reach the laboratory?

30 HOURS. In order for the laboratory to analyze the sample(s), it must be received within 30 hours of collection. If not, a replacement must be collected. It is strongly recommended that the monthly routine samples be collected within the first few days of each month. This will allow ample time for the collection of replacement sample(s) if they are required.

► What days of the week should I collect my samples?

It is preferred that routine samples be collected and shipped to the laboratory on Mondays or Tuesdays. If routine samples are hand delivered to the laboratory, they should be delivered no later than Thursday. However, emergency or repeat samples may be submitted at any time. If you anticipate the samples will arrive on a weekend or holiday, you should contact your certified laboratory and make the necessary arrangements. It is recommended that you call your certified laboratory for a contact person, business hours, and any special delivery instructions.

► Do all coliform samples collected during the month count towards meeting our compliance monitoring requirements?

No. Special purpose samples, such as those taken to lift a boil order, or new construction samples to determine whether disinfection practices are sufficient following pipe placement, replacement or repair, will not be used to determine compliance with the Maximum Contaminant Level (MCL) or towards the routine number of samples required each month. Routine raw and/or finished water entry point samples do not count towards meeting the total number of distribution samples required each month.

► Our water system is chlorine exempt. Are there any special monitoring requirements?

Yes. In past years, some very small systems have been granted an exemption from chlorination by the Illinois EPA. New exemptions are no longer granted. The Illinois EPA still honors past chlorine exemptions, but recognizes that the water lacks the protection of the residual chlorine. Consequently, it is especially important that the bacterial quality of the water be monitored at frequent intervals. One of the conditions of the exemption is that samples be collected and analyzed at twice the frequency required of a chlorinated WS (two times a month).

Section 4 – Interpretation of Results

► How do I know if the sample is satisfactory?

The laboratory will determine if any bacteria are present in your sample(s). If no bacteria are present the sample is considered satisfactory with a (S) recorded on the reporting form.

If bacteria are detected in the sample, the laboratory will record the number of colonies (if using the membrane filter technique) and analyze the sample to see if the bacteria are coliform. If the bacteria are determined to be coliform the laboratory will use the designation of “P” (positive). If no coliform is detected, the designation will be given as “N” (negative).

Any sample with a non-coliform bacteria count of 200 colonies or less is considered a satisfactory (S) sample.

If any coliform bacteria are found, the sample is positive and requires collection of repeat samples as described in **Section 5 – Repeat Samples / Follow-up to Coliform Positive Samples**. Additional tests are performed on the original total coliform positive sample to determine if *E. coli* is present. This result is also recorded on the reporting form with a P or N.

A sample analyzed by the membrane filter technique is deemed invalid (I) in the following scenarios:

1. Samples are negative for coliform but exhibit confluent growth. Confluent growth is continuous bacterial growth covering all or part of a membrane filter.
2. Samples are negative for coliform but bacteria colonies are too numerous to count (reported as G- or TNTC by the laboratory).

Submission of replacement sample(s) is required. When using the multiple fermentation tube procedure or the presence-absence procedure, if the media is turbid with no production of gas or acid, the sample also is invalidated with replacement sample(s) required.

► How long must I keep coliform results and other related paperwork?

5 years. Records of total coliform analyses must be kept for no less than five (5) years. The actual laboratory reports may be kept or the data may be transferred to tabular summaries.

Local procedures may contain requirements concerning the retention of records. The most stringent requirement should be followed.

Section 5 – Repeat Samples / Follow-up to Coliform Positive Samples

► How am I notified of positive coliform samples?

If a routine or replacement sample is total coliform positive, the certified laboratory and Illinois EPA Regional Office will try to contact the WS by telephone using the contact name and number provided on the reporting form. All WSs should keep a small number of extra coliform bottles/reporting forms in case of required repeat sampling. If for some unforeseen reason, the WS does not have extra coliform bottles on hand, the laboratory will overnight coliform bottles to the facility. However, this is not a preferred situation. Remember, responsibility for timely sampling ultimately falls on the WS. Therefore, waiting for bottles to arrive in the mail incurs

risk on the WS. Obviously, to receive “repeat” sample bottles in the mail is an indication that there is a positive sample and immediate action is needed.

► What is a repeat sample?

Any sample that is analyzed as a follow-up to an initial positive result is referred to as “repeat” sample. After a routine coliform sample is found to be total coliform positive, repeat samples are required to confirm the initial positive result(s), to determine if the contamination is ongoing, and to evaluate the extent of the contamination within the distribution system.

► How many repeat samples must I collect?

Three repeat samples are required for each distribution sample that is coliform positive;

► Where must repeat samples be collected?

One repeat sample must be collected from a tap within five (5) service connections upstream from the original sample, another repeat sample must be collected within five (5) service connections downstream from the original sampling site, and the last must be collected at the original site.

A water system may have identified locations that are better representative for repeat samples than sample locations within 5 service connections of the original routine locations. If this is the case, the water system should contact their Regional office to add the repeat locations to the coliform sample site plan. If a water system determines that the locations within 5 service connections upstream and/or downstream are not appropriate they have the option to have a written Standard Operating Procedure (SOP) for selecting repeat sites in the event a routine sample goes positive.

All repeat samples (or sample set) must be collected on the same day. Exceptions to this rule are WS with a single service connection. In this case the Illinois EPA may allow the WS to collect the repeat samples over a four-day period or to collect a single sample of at least 300 ml.

► Where should the repeat samples be collected if the positive sample was collected at the end of the distribution system?

The WS is still required to collect three repeat samples. If the original sampling site is at the end of the distribution system (or one tap away from the end) an additional sample will be required upstream or from the same building.

A water system may have identified locations that are better representative for repeat samples than sample locations within 5 service connections of the original routine locations. If this is the case, the water system should contact their Regional office to add the repeat locations to the coliform sample site plan. If a water system determines that the locations within 5 service connections upstream and/or downstream are not appropriate they have the option to have a

written Standard Operating Procedure (SOP) for selecting repeat sites in the event a routine sample goes positive.

► How many repeats are required if a finished water entry point sample or raw well sample is positive?

One. Only one repeat sample should be collected from the positive finished water entry point location or raw positive location. Raw or finished entry point samples (or raw/entry point repeat samples) are not used when determining compliance.

Prior to August 2007, a routine coliform positive finished water (entry point) sample required three or four repeats. This has changed. Only one repeat is now required and it is to be collected from the same entry point location as the positive (downstream repeat samples are no longer required).

► How much time do I have to collect repeat sample(s)?

24 Hours. If a routine or replacement sample is total coliform positive, the WS must collect a set of repeat samples within 24 hours of being notified of the positive result. Again, **all WS should keep a small number of extra coliform bottles/reporting forms in case of required repeat sampling.** If the WS is waiting for bottles to be shipped from the laboratory, repeat samples must be collected on the day of bottle receipt.

All repeat samples (or sample set) must be collected on the same day. Exceptions to this rule are WS with a single service connection. In this case the Illinois EPA may allow the WS to collect the repeat samples over a four-day period or to collect a single sample of at least 300 ml.

► When does the repeat sample collection “start clock” begin?

The 24-hour clock starts when the laboratory (or IEPA) notifies the water system of the initial positive coliform result. You have 24 hours from the time of notification to collect your repeat samples and return them to a laboratory for analysis. If you fail to meet this window, a violation will be issued, provided that no extension had been granted.

If the WS cannot be reached via phone, the Illinois EPA has defined “notified” as the date that the laboratory initiates shipment of repeat sample bottles. The laboratory records this date on the coliform reporting form. The repeat samples must be collected on the on the day that the bottles are received at the WS.

► What if I cannot meet the 24-hour repeat collection requirement?

Illinois EPA acknowledges that some circumstances may arise, totally beyond the control of the WS, which prevent repeat samples from being collected within the 24-hour period. Therefore, extensions may be granted by calling the Drinking Water Compliance Assurance Section at 217-785-0561 or your **Regional Office**. A valid reason for the extension must be provided.

Extensions cannot be granted after the fact. Therefore, requests for extensions MUST be made prior to or at the same time the repeat samples are being collected. Extensions will always specify exactly how much time the WS has to collect and return the repeat samples. Failure to obtain the extension or failure to meet the terms of the extension will result in a monitoring violation. Please remember that an extension on the 24-hour repeat collection requirement is NOT a waiver for actually collecting the repeat samples.

► What happens if I am notified on a Friday of positive routine results (or receive repeat bottles on a Friday or Holiday)?

The 24-hour collection requirement must still be met. You should contact your **certified laboratory** to arrange a time on Saturday to collect the repeat samples and drive them to the laboratory. If this is not possible, the WS must request an extension the first business day following the weekend or holiday. Please call the Illinois EPA at 217-785-0561 at the earliest possible time to request an extension on the 24-hour requirement.

It is strongly recommended that all routine coliform samples be collected and mailed on a Monday or Tuesday to avoid this situation.

► What happens if any of the repeats are positive or invalid?

If one or more repeat samples in the set are total coliform positive or invalid, the whole repeat monitoring process must start over. A new “set” of three repeats must be collected within 24 hours of being notified of the positive or invalid repeat.

If a repeat sample location is positive and is not from the same location as the original positive sample (and/or the original site is negative), the next repeat collection should be based on the original positive site location and NOT the positive repeat location. Every consecutive set of repeat samples must be collected at the same locations as the 1st set of repeat samples.

The WS must repeat this process until either total coliform are not detected in one complete “set” of repeat samples or the WS determines that an Assessment has been triggered and notifies the Illinois EPA. It is highly recommended that sampling be repeated until a “set” is satisfactory.

► Does one (or more) positive routine or repeat sample change the following month’s monitoring requirements?

No. Under the Revised Total Coliform Rule there is no additional sampling requirement as long as the water system is on a monthly sampling schedule.

► Who is responsible for notifying the Illinois EPA if results are positive?

The WS is responsible for notifying the Illinois EPA when a total coliform positive sample is found and for having the appropriate repeat samples analyzed. In most cases, an agreement has

been made between the certified laboratory and the WS that the laboratory will notify the Illinois EPA; however, even in this case, the WS is held accountable for this notification requirement.

A copy of the laboratory report must be submitted by the certified laboratory or the WS to the Illinois Environmental Protection Agency, Bureau of Water, Compliance Assurance Section #19, 1021 North Grand Avenue East, P.O. Box 19276, Springfield, Illinois 62794-9276. Reports must be submitted within ten days of the sampling period, and should include both routine and repeat sample analyses.

Section 6 – Invalidating Sample Results

► Can a sample result be invalidated?

A coliform positive sample can be invalidated when there is a significant reason to believe the test results are not accurate or not representative of the water quality. These samples are not used in compliance calculations and a replacement must be collected within the same monitoring period (same month).

There are three conditions in which a total coliform positive sample result may be invalidated:

1. The laboratory establishes that an error in its analytical procedure caused the total coliform positive result.
2. The Illinois EPA, on the basis of the results of repeat samples collected determines that the total coliform positive sample resulted from a domestic or other non-distribution system-plumbing problem.
3. The Illinois EPA determines that there are substantial grounds to believe that a total coliform positive result is due to a circumstance or condition that does not reflect water quality in the distribution system.

The laboratory will invalidate the results if they are unable to obtain a true result according to the test method used to analyze the sample. If a laboratory invalidates a routine sample due to interference, the WS must collect another sample from the same location as the original sample within 24 hours of being notified of the interference problem.

► How can I have a positive coliform result invalidated?

The invalidation process involves 3 steps:

1. All repeat samples must have been collected in accordance with the repeat sampling requirements.
2. As soon as you feel a sample should be invalidated, the Illinois EPA **Regional Office** should be contacted by telephone and the situation discussed. If the Regional Office verbally agrees that the sample is not representative of the water quality, they will direct

you as to what certain steps need to be taken (e.g., proof, additional samples, etc.). Ultimately, the Regional Office will recommend to the Illinois EPA Compliance Assurance Section (CAS) whether or not a sample should be invalidated. Failure to get the Regional Office's concurrence will result in your request being rejected by the CAS. If you are unable to speak to Regional Office staff, please contact CAS at 217-785-0561.

3. A formal written requested must be sent to the **Regional Office** and CAS within four weeks of the original routine sample collection date. The written documentation must state the specific cause of the total coliform positive sample and what action the supplier has taken, or will take, to correct this problem.

The Illinois EPA will provide a written notification to the WS as to whether or not the request for invalidation was granted.

The Illinois EPA will not invalidate a total coliform positive sample solely on the grounds that all repeat samples are total coliform negative.

► How soon do I have to initiate the invalidation process?

At the time of receiving notice of positive results, the WS should immediately begin an investigation and collect repeat samples. At that time, any reason to question validity of a result should be acted on promptly while the situation is fresh at hand.

► If a sample is invalidated by the Illinois EPA or the certified laboratory does it still count towards meeting the monthly monitoring requirements?

No. You MUST collect another routine sample to replace any invalidated routine sample. To confirm the sample purpose look at the reporting form. Remember that all routine samples are marked with a sample purpose of "Routine" on the reporting form. The replacement sample(s) MUST be collected within the same monitoring period (same month). Repeat samples cannot be used to meet this requirement.

► My repeat sample is invalid. Now what?

If one or more repeat samples in a set are invalid, the whole repeat monitoring process must begin over starting with the collection of a new "set" of repeat samples within 24 hours. Every consecutive set of repeat samples should be collected at the same locations as the 1st set of repeats.

Section 7 – Laboratory Related Questions

► Can we have our coliform samples analyzed anywhere?

No. A laboratory certified by the Illinois Department of Public Health (IDPH) must analyze samples. A sample analyzed at a laboratory that is not IDPH certified cannot be used for compliance. Use this link to see a listing of **certified laboratories**.

► Do we need to use any special reporting forms when submitting samples to the laboratory?

Yes. These forms can be obtained by calling your **certified laboratory**. The reporting forms should be included with the bottles.

► Is the water system or the laboratory responsible for getting results to the Illinois EPA?

The water system. Regardless of whether a State or private laboratory is used, the WS is ultimately held accountable. It is very important that the WS is in frequent contact with the laboratory to confirm: the samples reach the laboratory, the status of results (positive vs. negative), and the results are sent to the Illinois EPA in a timely manner (within 10 days of the sampling period).

► Where can I find a certified laboratory?

Use this link to find a list of **certified laboratories**. You may also obtain this list by contacting either the Bureau of Water or the Division of Laboratory Services or by searching the Illinois EPA's web page at: <http://www.epa.state.il.us/labs/pdf/accredited-labs-condensed.pdf>

Section 8 – Compliance, Violations, and Follow-up Actions

► What is an MCL?

State and federal regulations set maximum contaminant levels (MCLs) on contaminants that have been determined to cause possible health effects. The RTCR establishes an MCL for *E. coli*.

► What is an ACUTE coliform MCL exceedance and how is it determined?

Acute MCLs are extremely serious and require immediate action. Coliform sample results have indicated an immediate threat to the WS and serious health effects can result. Therefore, water customers must be notified without delay. A tier 1 public notice must be issued within 24 hours of notification of the sample result. The WS must contact their Regional Office.

All samples that are total coliform positive must be examined for *E. coli*. Below describes how Acute MCL violations are determined.

IF ANY	AND	THEN
Routine distribution sample is total coliform positive	One or more repeat sample is <i>E. coli</i> positive	Acute MCL Violation
Routine distribution sample is <i>E. coli</i> positive	Any repeat sample is <i>E. coli</i> and/or total, coliform positive	Acute MCL Violation
Routine distribution sample is <i>E. coli</i> positive	Fail to collect all repeats (even if some were collected and negative)	Acute MCL Violation
Repeat distribution sample is total coliform positive - following an <i>E. coli</i> positive routine sample.	Fail to test for <i>E. coli</i>	Acute MCL violation

► What is an Assessment?

An Assessment is a written evaluation of the water system. The purpose is to aid in identifying any sanitary defects that indicate failure (existing or potential) of protective barriers against microbial contamination. An Assessment is triggered if a WS has an indication of coliform contamination. The purpose is to assess the problem and take corrective action as indicated. There are two types of Assessments: Level 1 and Level 2.

► What triggers an Assessment?

A **LEVEL 1 ASSESSMENT** is triggered when a WS exceeds the number of allowed coliform positive samples. The number allowed depends on the number of routine distribution samples collected during the monthly sample period.

Number of Routine* Distribution Samples per Month	Assessment Triggered
Less than 40 are collected	Two or more positive routine and/or repeat
40 or more are collected	>5% of the routine and/or repeat samples are positive**

* Repeat samples are not included in total count collected for the month; however they are included when determining MCL Violation Trigger. Finished entry point samples and/or raw samples are not included in compliance calculations.

** In calculating the five percent, do NOT round the numbers. As an example, a value of 5.05 percent cannot be rounded to five percent to meet compliance

In addition, if a system fails to collect any of the three repeat samples for a positive routine sample a Level 1 Assessment is triggered.

Once an assessment is triggered a WS has 30 days to submit the Level 1 Assessment Form.

A **LEVEL 2 ASSESSMENT** is triggered if a WS has an *E. coli* MCL or if a WS triggers a second Level 1 Assessment within a rolling 12 month period.

Once an assessment is triggered a WS has 30 days to submit the Level 2 Assessment Form.

► What is a monitoring violation and how can I avoid one?

A monitoring violation occurs when the coliform monitoring requirements for a month are not met. All WS are required to submit samples for bacteriological analysis during each calendar month. Do NOT sample before the beginning of the month.

The WS must meet several criteria to avoid a monitoring violation:

1. At a minimum, collect the required number of distribution samples each month. The number of distribution samples required is based on population served. **Appendix A** specifies the minimum number of water samples that must be collected at representative points throughout the distribution system each month. In some cases, a WS may be required to collect more than the minimum number of distribution samples. It is crucial that every WS operator know the coliform monitoring requirements for the WS.
2. Sampling locations used must be in accordance with the approved written coliform sample site plan. All sampling areas must be represented during each monthly sampling period.
3. All replacement and repeat samples must be returned promptly to the laboratory for analysis. These samples will be included in determining compliance.
4. Repeat samples and replacement samples for invalid (negative coliform growth) samples must be collected within 24 hours of notification. If these samples cannot be collected within 24 hours, you must contact the Illinois EPA for an extension. The time extension will be given on a case-by-case basis and will always specify exactly how much time the WS has to collect and return the repeat samples. Failure to obtain the extension or failure to meet the terms of the extension will result in a monitoring violation.
5. If a private certified laboratory analyzes samples, it is the responsibility of the WS to make sure that copies of the reports are sent to the Illinois EPA within 10 days of the end of the sampling period (month).
6. Collect at least five coliform distribution system samples the month following a coliform positive finished or distribution system sample.

► How are violations determined?

The table below describes how violations are determined.

IF	THEN
E. coli MCL violation	Tier 1
Treatment technique (TT) violations: failure to perform an assessment or failure to correct any sanitary defect found within 30 days or a time	Tier 2

period agreed upon by the State.	
Monitoring violation – failure to collect any of the required routine distribution samples during a monthly period*; failure to test for <i>E. coli</i> following a total coliform positive sample.	Tier 3
Reporting violation – failure to submit a monitoring report by the required deadline; failure to submit a correctly completed assessment form assessment by the required deadline; failure to timely notify the State following an <i>E. coli</i> positive sample	Tier 3

* All samples **MUST** be collected between the first and last day of the month

► How are repeat samples used in determining compliance?

Repeat samples are not counted towards determining monthly distribution monitoring compliance. However, failure to collect repeats within 24-hours (following notification of a positive routine sample) will result in a monitoring violation unless the WS obtained a waiver from the 24-hour collection requirement.

In addition, if a WS fails to collect any of the repeat samples for a positive routine sample, that will trigger a Level 1 or Level 2 Assessment.

► Do I need to notify the water customers of a violation?

Yes. Each violation and situation requiring notice has been assigned to one of three categories, or tiers, based on the risk of adverse health effects. Public notice is required for any of the following:

Tier 1 Violations or other Situations	<p>Tier 1 violations or problems may result in an immediate adverse health problem for some consumers.</p> <p>Violation of the acute MCL for total coliform, when <i>E. coli</i> is present in the water distribution system, or failure to test for fecal coliform or <i>E. coli</i> when any repeat sample tests positive for coliform</p>
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Tier 2 Violations	All violations of the <i>treatment technique</i> and <i>MRDL</i> requirements <i>except</i> where <i>Tier 1 notice</i> is required Violations of the <i>monitoring</i> requirements when required by the Illinois EPA (see Tier 3)
Tier 3 Violations or other Situations	<i>Monitoring and/or Reporting</i> violations, except where Tier 1 or Tier 2 notice is required as determined by Illinois EPA.

For specific information on public notification (such as form, matter, content, and frequency), please review Chapter 1 Public Notification of this handbook

Section 9 – Common Mistakes to Avoid

Below describes some common errors that may result in a violation.

1. WS does not collect the correct number of repeat samples following a routine positive sample.
2. Marking the wrong sample purpose box on the reporting form. Most often, this occurs when collecting a repeat (due to positive sample) sample and marking it as an invalid replacement or replacement (due to invalid, TNTC, or broken) sample and vice versa.
3. Failure to use sample site numbers.
4. Failure to report the chlorine residual (if chlorine/chloramines is added) on the reporting form.
5. Failure to monitor early in the month. Waiting until the end of the month to collect the routine samples does not allow enough time for follow-up actions if required.

Appendix A

Total Coliform Monitoring Frequency for Community Water Systems

Population Served	Minimum Number of Samples Per Month
25 to 1,000 ¹	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

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
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
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

¹ Includes public water supplies that have at least 15 service connections, but serve fewer than 25 persons.
