

Revised Total Coliform Rule: Sample Siting Plan For Small Systems

The Revised Total Coliform Rule (RTCR) requires all public water systems (PWS) to monitor for total coliform bacteria on a regular basis (Administrative Rules of Montana, ARM, 17.38.215). To track where and when these total coliform samples are collected, all PWSs are required to maintain a written sample siting plan (SSP) that identifies sample collection locations and a sample collection schedule. This document must be representative of the water throughout the distribution system. The sample collection for routine and repeat samples may occur at customer residences, dedicated sampling stations, or other designated compliance sampling locations.

This SSP is subject to DEQ review and approval and must be kept up to date so that it reflects current practices. DEQ recommends reviewing the SSP at least annually. When creating a new SSP or revising an existing SSP, the form must be submitted to DEQ, and a copy must be kept in your records. This form is as important to DEQ as it is to the PWS. Please keep a copy of the latest SSP in a convenient location so you can reference this form as needed.

How many routine samples are required?

Under the RTCR, every PWS must collect one or more total coliform samples on a regular basis. All PWS's default to monthly sample collection, however certain groundwater systems can apply for reduced/quarterly monitoring. The number of total coliform samples that are required each month is based on the population of people served by the PWS. The population is calculated as the average daily population served by the PWS during the month of peak use (ARM 17.38.215).

Under ARM 17.38.215, DEQ can increase the monitoring frequency of a PWS based on sample results or other conditions that indicate there is a risk to public health. The PWS will be notified in writing of any changes to sample frequency and the reasoning for the change.

How do I determine how many routine samples are required?

The easiest way to determine how many routine samples you are required to collect each monitoring period is to view your Monitoring Schedule. This tool summarizes all your monitoring and compliance requirements and is linked to DEQ's database so it will update from month to month as you collect samples. The Monitoring Schedule tool is located at <https://deq.mt.gov/water/Programs/dw>. On the right side of the webpage, select "PWS Monitoring Schedule."

How many sample sites are required?

Table 1: The minimum number of routine sample sites is based on how many service connections you have.

Minimum Number of Service Connection	Number of Sample Sites
1	1
2 to 10	2
11 to 100	3
101 to 500	4
More than 500	5

The number of sample sites is based on the size of the distribution system and the number of locations at which people have access to the drinking water. PWSs with larger distribution systems need more sample sites to effectively represent the whole system. For example, a restaurant with 3 sinks will need fewer sample sites to effectively represent the water throughout the distribution system compared to a gas station with 20 sinks, or a city with several thousand service connections. The minimum number of sample sites is therefore based on the number of service connections. DEQ requires a minimum number of sample sites based on the number of service connections, however you may need more than the minimum to effectively represent your distribution system. The physical layout of your system may require you to add more sample sites.

How do I determine how many service connections I have?

The best tool to determine the number of service connections, as well as other information about your drinking water system is Drinking Water Watch (DWW). DWW is the public side to DEQ's database and includes contact information, sample results, and information about the components and size of your system.

1. Navigate to <http://sdwisdww.mt.gov:8080/DWW/>
2. Enter your Water System No. (e.g., MT00#####) or Water System Name.
3. Select the “Search for Water Systems” at the bottom-left of the search fields.
4. In the search results that appear, select your PWS by clicking on the Water System No.
5. The main page for your system shows number of service connections on the right side of the screen.

Example 1: A school serves a daily population of 100 people with only one service connection (a single building). This PWS would be required to collect 1 total coliform sample each month. The one service connection means the system only needs to select one sample site.

Example 2: A neighborhood serves 57 people through 30 service connections (homes). This PWS would be required to collect 1 total coliform sample each month (based on population). This one sample would be collected from 1 of 3 sample sites each month (3 sample sites based on number of service connections). The goal then is to rotate through the sample sites each month so that the whole distribution system is monitored throughout the year.

January	February	March	April	May	June
Site 1	Site 2	Site 3	Site 1	Site 2	Site 3
July	August	September	October	November	December
Site 1	Site 2	Site 3	Site 1	Site 2	Site 3

Figure 1: Example total coliform sampling schedule. One sample would be collected from 1 of 3 sites throughout the year. By rotating between the three sites, we get a better understanding of the overall water quality.

What makes a good sample collection location?

Routine total coliform samples must be collected at locations that represent the drinking water being served throughout the distribution system. This commonly means collecting samples inside of residences or businesses so that the final water quality can be monitored. Here are guidelines on selecting sample locations:

- Sample sites should be accessible daily and throughout the year.

- Avoid outside spigots (garden hoses), swivel faucets, and combined hot/cold faucets (single handle for both hot/cold).
- No point of use attachments (aerators, strainers, hoses, filters, etc.). If the faucet has an aerator or attachment, be sure to remove them before sampling.
- No leaks are present.

When do I collect the samples each month?

DEQ recommends collecting total coliform samples as early as possible each month, and early in the week. The laboratory must begin the analysis of total coliform samples within 30 hours of filling the bottle, or the sample is invalid and must be rejected. The sample collection date determines which month the sample is associated to, not the month it is analyzed. By sampling early in the month, you give yourself additional time to re-sample in case something happens to the sample (the sample is received after the 30-hour hold time, sample freezes during shipping, the bottle is dropped and leaks, etc.).

If your ground water system serves 4,900 or fewer people, all the monthly samples may be collected on the same day, if they are collected from different sites. If your system serves more than 4,900 people, the samples must be collected at regular intervals throughout the month.

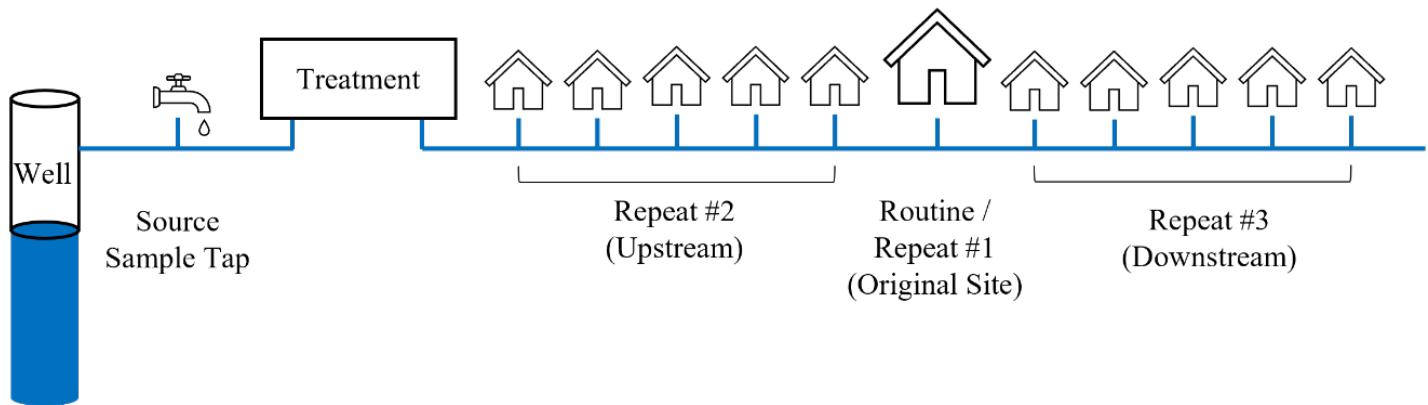


Figure 2: Diagram showing locations of routine sample, repeat samples, and source water samples.

Repeat Samples

Under the RTCR, if a routine sample is reported total coliform-positive, repeat samples must be collected within 24 hours of the PWS being notified of the result. A minimum of three repeat samples must be collected for each total coliform-positive routine sample. One repeat sample must be collected at the original site where the routine sample was collected (Repeat #1), one repeat must be collected within 5 service connections upstream (Repeat #2), and one repeat must be collected within 5 service connections downstream (Repeat #3). Figure 2 shows a diagram of the sample locations. All repeat samples must be properly associated with the routine total coliform-positive sample that caused them. Ask your lab for the best way to document this on the laboratory paperwork.

Triggered Source (Raw) Water Samples

Under the Ground Water Rule (ARM 17.38.211), PWSs that use ground water are required to conduct source water monitoring when a routine total coliform-positive sample is reported. PWSs that are required to maintain

4-log disinfection systems due to *E. coli*-positive source water samples are not required to conduct source water monitoring. Source water monitoring must be conducted for each well that was providing water to the distribution system when the routine total coliform-positive sample was collected. Source water samples must be collected prior to any treatment. The source water sample is collected from as close to the well as possible to isolate it as a source of bacteria.

What if my sample location is at the common header of two or more wells?

The Ground Water Rule requires each individual source be monitored. If your sample location is at or after the common header, the system must be manually flushed with each well before sampling:

1. Manually turn the first well on and turn off all the other wells.
2. Allow the water from the first well to flush through the common header for 5-10 minutes.
3. Collect a sample and document which well was active for that sample.
4. Repeat this process for the remaining wells that could have been active when the routine sample was collected.

Questions?

If you have any questions or comments regarding the Sample Siting Plan form or anything involving the Revised Total Coliform Rule, please call either (406) 444 – 2691 or (406) 444 – 5314 or email DEQRTCRLEVEL12@mt.gov.

Directions for Completing the Sample Site Plan

Step 1: How many routine samples am I required to collect each month?

Use the Monitoring Schedule tool to determine how many samples are required each month.

Step 2: How many routine sample sites do I need?

Use Drinking Water Watch and Table 1 above to determine the minimum number of sites you need to rotate between throughout the year. Depending on your distribution system, you may need more sample sites to represent your entire distribution system.

Step 3: Locate the appropriate routine and repeat sample sites.

The total coliform samples must be collected from sites that represent the entire distribution system.

Locate appropriate routine and repeat sample sites that represent the entire distribution system, but also consider accessibility and the considerations above that make a good sample site (see section “What makes a good sample collection location?” on Page 2).

Step 4: Document your routine sample sites.

Record each routine sample site in the form, starting on the next page. This form is as much use to you as it is to DEQ. The more detail you can provide on the location of the sample sites, the better. Instead of “13 Oak Street,” use “13 Oak Street, first floor men’s restroom sink.”

Step 5: Document an upstream and downstream repeat site for each routine site.

For each routine site, there are three repeat samples. The first repeat sample is the same location as the routine site. Document the locations for the upstream and downstream repeat sample sites.

Step 6: Document which well(s) feed water to each routine site.

Is your system a groundwater system? If yes, document the sample locations for each raw water sample.

Step 7: Complete the Sample Schedule.

Once you have documented all of the routine, repeat, and triggered source water sample locations, you need to document which sample site(s) will be monitored each month. The schedule on page 9 does not need to specify the exact day you will collect the sample, only which site(s) you will monitor each month. If your system is closed for certain months each year, please document this by using “Closed” in those months.

Step 8: Attach a map.

To illustrate the locations of the routine, repeat, and triggered source sample locations, a map showing the layout of the drinking water system is required. This map must include all pertinent buildings, drinking water facility locations (well, treatment, pumps, etc.), and sample locations. Here are three common sources of maps to which you can mark the locations of the facilities and sample sites:

- Engineering drawings: The best starting point is an engineering drawing of the drinking water system. These will automatically include all of the water facilities, so the only notes to add are the locations of the sample sites.

- Online mapping imagery: Services such as Google Maps/Earth and Apple Maps have satellite imagery that can be printed and have notes added.
- Evacuation maps: Many buildings, such as schools and businesses, have evacuation maps posted. These can provide a good starting point to add other notes.
- Hand-drawn maps: The last option is to hand draw the map. This is sufficient for very small systems that may only include 1-2 buildings and minimal facilities. Larger systems may not be able to accurately depict the whole system with the required details.

Step 9: Submit the Form

Once you have completed this form and created a map of the system, it is time to submit a copy of the form and map to DEQ. If you choose to mail the form to DEQ, please mail a copy of the form and keep the original for your records.

You may submit the form and map by mail, fax, or email:

Mail the form and map to:

ATTN: RTCR Rule Manager
Montana DEQ
Public Water Supply Bureau
PO Box 200901
Helena, MT 59620

Fax the form and map to:

(406) 444-4386
ATTN: RTCR Rule Manager
Montana DEQ
Public Water Supply Bureau

Email the form and map to:

DEQRTCRLEVEL12@mt.gov