

Drinking Water Analysis Laboratory Costs and Sampling Procedures

Be sure to visit WaterLink at <https://waterlink.utah.gov/deq> “Water Monitoring Reports” for your systems current compliance sampling requirements.

It is the responsibility of the public water system and not the analytical laboratory to ensure that a copy of each analysis is submitted to the Division of Drinking Water.

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General

It is the responsibility of each public water supplier to ensure that drinking water samples are collected in accordance with compliance sampling schedules, samples are submitted to a state certified laboratory as required for the appropriate analysis, and results are submitted to the Division of Drinking Water (DDW). This document can be used as a reference guide for drinking water sample collection practices and estimated sample analysis cost.

The following steps should be used at all DDW approved laboratories however, it is necessary to directly contact the laboratory you will be using for specific instructions on the following steps:

1. Sampling schedule – It is important to keep in mind samples have a specific holding time and each laboratory may have certain days they can receive samples.
2. Sample bottles – Each analysis requires a specific sample bottle, specific sampling instructions, and some bottles contain a preservative. Verify the sample bottle is not expired and contains the proper seal or preservative.
3. Sampling documentation – Each laboratory has a sample form or chain-of-custody requirement. The chain-of-custody is an official document representing your sample information. Make sure you complete the necessary information accurately. This document is the record for your sample. Clearly label the sample bottle with the sample collection information used on chain-of-custody.
4. Sample Receiving – Verify the laboratory sample receiving hours and sample handling requirements in transport.
5. Sample reporting – While most laboratories offer to submit results to DDW, ***ultimately it is the responsibility of the public water system and not the analytical laboratory to ensure a copy of each analysis is submitted to the Division of Drinking Water.***

Keep in mind each laboratory will have various hours of operation and analysis they provide. Therefore, it is important to consider sample receiving times and data turn-around time when selecting a laboratory. Be sure to visit WaterLink at <https://waterlink.utah.gov/deq> “Water Monitoring Reports” for your systems current compliance sampling requirements.

The screenshot displays the WaterLink website interface. On the left, there is a search box labeled "SEARCH BY COUNTY/WATER SYSTEM" with a dropdown menu. Below it, three blue arrows point to the search box with the text "Enter System name or number here". In the center, there is a "CREATE A CUSTOM REPORT" section with several checkboxes for report categories: Service Connections, Treatment Plants, Storage, Pumping Stations, Sources, Grouped Source Sampling Stations, Distribution System, and Site Visit History. On the right, there is a "WATER SYSTEM REPORTS" section with three tabs: Bacterial Summary, Inventory, and PS Water Monitoring. The PS Water Monitoring tab is circled in red. A blue arrow points from the text "Select Water Monitoring Tab for monitoring requirements" to this tab. Below the search and report sections, there is a "Public Water System Inventory Report" for "Test2" with details such as PWS ID: UTAH99999, Rating: 04/09/2010, and Status: Inactive. The report is organized into columns: Contacts, Site Information, Site Updates, and Consumptive Use Zone.

Enter System name or number here

Select **Water Monitoring Tab** for monitoring requirements

Compliance Bacteriological Monitoring

Parameter: Routine Total Coliform, E coli

Monitoring Requirements: As part of the **Revised Total Coliform Rule (RTCR)** samples need to be collected from distribution system unless it is a trigger sample that applies to the Ground Water Rule (GWR). These samples are collected from the source before treatment.

Estimated cost: \$15.00 - \$20.00 per sample

Frequency: Every month the water system is in service. Investigative sample(s) is required as part of the seasonal start-up checklist. The number of samples required per month will vary depending on the population served.

Ground Water Rule (GWR): Systems with groundwater source(s) must collect one bacteriological sample from each source in-use following a *positive* sample collected from the distribution system, *except ground water sources that disinfect to 4-log removal of virus.*

Sample Location: As part of the **Revised Total Coliform Rule (RTCR)**, the location from which samples are taken is to be varied throughout the Distribution System. All water systems are required to submit and maintain a current **Bacteriological Sample Site Plan**. This plan identifies the locations of all sample sites from which bacteriological tests are taken. Sample sites are to be representative of all pressure zones and each water source of the distribution system. The sample plan should be revised regularly and following any major construction project impacting the distribution system. **Triggered GWR sample:** needs to be collected from each source in-use, prior to disinfection or treatment. A representative sample of more than one source(s) may be collected at a location approved by the DDW (water systems must identify source sampling as part of the bacteriological sample plan).

Sample collection supplies

- ✓ Sample bottles. Only use 100 ml plastic sterile-sealed bottle with a dechlorinating agent (thiosulfate). Note: bottles contain an expiration date and a lab may not accept bottles from a different lab. Do not store bottles in vehicle for extreme temperatures may affect the integrity of the bottle.
- ✓ Sample log/chain of custody
- ✓ Sample transport container/Ice chest
- ✓ Coolant. Blue ice is best

Sample Collection: Follow sample collecting instruction provided by laboratory. Samples should be collected from consumer's cold water taps (without water treatment devices such as softeners or filters). Points selected in the distribution system should be representative of the water served. Avoid freeze-less yard hydrants and taps with aerators, screens or hose-bib type threads. Bathtub taps are acceptable in homes. Disinfection of sample tap - Flaming the faucet is not necessary. The faucet should be opened and allowed to run for 3 to 4 minutes before sampling. Fill sample bottle above 100 ml line. Immediately place the sample on ice (not in ice water) or in the fridge until transport. DO NOT let the sample freeze. The laboratory must analyze samples within 30 hours of



collection or within 6 hours for compliance surface water samples. Triggered GWR samples should be collected from a sampling tap without threads and prior to disinfection.

Results: Results need to be submitted to DDW as soon as possible but no later than the 10th of the following month.

Lead and Copper Monitoring

Estimated cost: \$15.00 - \$20.00 per Lead sample
\$15.00 - \$20.00 per Copper sample
\$25.00 - \$40.00 per Combined Lead & Copper

Monitoring Requirements: The required frequency and number of samples is based on the population served by the water system and historical lead and copper sample results. Check WaterLink to see when your water system is scheduled to conduct sampling. If you are on reduced monitoring (sampling yearly or once every 3 years), lead and copper **samples are required to be collected in the June 1 through September 30th** time frame. The population monitoring frequency table below can be found on the DEQ website here <https://deq.utah.gov/Compliance/compliance/drinkingwater/lead-copper-rule/index.htm>

Population	Initial Monitoring	Reduced Monitoring
>100,000	100 samples	50 samples
10,001-100,000	60 samples	30 samples
3,301-10,000	40 samples	20 samples
501-3,300	20 samples	10 samples
101-500	10 samples	5 samples
100 or less	5 samples	5 samples

Sample location: Public water systems are required to have a **Lead and Copper Sample Site Plan**. A template to complete this plan can be found on the DEQ website here <https://documents.deq.utah.gov/drinking-water/rules-implementation/lead-and-copper-rule/DDW-2017-003263.pdf>

Sample collection is categorized on a Tier 1-3 classification (see below). All samples must be collected from either kitchen or bathroom taps at "Tier 1" sites. If this is not possible, then collect as many as possible from the "Tier 1" sites and collect the remaining required samples from "Tier 2" sites. If this is not possible, collect as many as possible from "Tier 1" sites first, then as many as possible from "Tier 2" sites and then the remaining required samples can be collected from "Tier 3" sites. If "Tier 2" or "Tier 3" sites are used, the water utility shall explain in a letter, when submitting the data to the state, why "Tier 2" and/or "Tier 3" sites were selected. The Tier classification list below can be found on the DEQ website here <https://deq.utah.gov/Compliance/compliance/drinkingwater/lead-copper-rule/index.htm>

Tier	Community Water System	Non-Transient Water System
Tier 1	Single family residence with: Lead pipes Lead service lines Copper pipes with lead solder installed after 1982	Any building with: Lead pipes Lead service lines Copper pipes with lead solder installed after 1982
Tier 2	Buildings or multi-family residences with: Lead pipes Lead service lines Copper pipes with lead solder installed after 1982	Any building with: Copper pipes with lead solder installed after 1982
Tier 3	Single family residence with: Copper pipes with lead solder installed after 1982	Not Applicable

Sample collection supplies

- ✓ 1 liter sample bottles supplied by laboratory
- ✓ Copy of sample instruction to provide to home owner
- ✓ Sample log/chain of custody
- ✓ Sample transport container

Sample Collection: Follow sample collecting instruction provided by laboratory or a copy of Lead and copper sampling procedures can be found on Utah’s DEQ website found here, <https://documents.deq.utah.gov/drinking-water/rules-implementation/lead-and-copper-rule/DDW-2017-003264.pdf>. **Note: 1 liter sample bottles are required for compliance sampling.** Make sure the sample collector understands the 6 hour no water use requirement and completely fills the sample bottle.



Sample Results: The lab may not analyze the samples before the September 30th sampling deadline. That is ok, as long as the sample is collected before the deadline. **Note: It is the responsibility of the system to submit the Consumer Notice Certification Form to DDW by December 15th.** The water system must provide the consumer notice as a soon as possible, but no later than **30 days after learning the results**. Consumer notice form and 90th percentile calculator can be found on the DDW’s website here, <https://deq.utah.gov/Compliance/compliance/drinkingwater/lead-copper-rule/index.htm>

Disinfection by Products (DBPs)

Monitoring Requirements: Water systems that use Stage 1 disinfectants such as: ozone, chlorine dioxide, or chlorination for disinfection, or purchased water that uses disinfectant is required to sample for DBPs. Check WaterLink to see when your water system is scheduled to conduct sampling. Samples are collected at Entry Point to Distribution System and in the Distribution system depending on disinfectant used.

Parameter: HAAs Haloacetic Acids and Total Trihalomethane

Estimated cost: HAA \$150-\$175
TTHM \$75-\$100

Sample collection supplies

- ✓ Sample bottles supplied by lab. Three 40 ml vials with teflon cap liner that contain a preservative.
- ✓ Sample log/chain of custody
- ✓ Sample transport container/Ice chest
- ✓ Coolant. Blue ice is best

Sample Collection: Follow sample collection instructions provided by laboratory. It is recommended to collect HAA and TTHM samples at the same time. Flush cold water tap for 3 minutes or longer to reach constant temperature, then reduce flow to approximately the size of a pencil. Hold vial at angle and let steam flow into bottle. When close to filling, hold vertical and fill bottle completely to form a curved surface (meniscus). **DO NOT OVERFILL** and spill reagent. If that happens, you will have to re-collect the sample with a new vial. Place cap back on without spilling, then gently invert to mix, making sure reagent is well mixed with sample. Repeat step for all three bottles required for the analysis. Keep samples cool and return to lab within the holding time.

Meniscus
bubble →



Parameter: Bromate

Estimated cost: \$75-\$90

Sample collection supplies

- ✓ Sample bottles supplied by lab. Plastic 200 ml or quart bottle, no preservative.
- ✓ Sample log/chain of custody
- ✓ Sample transport container/Ice chest
- ✓ Coolant. Blue ice is best

Sample Collection: Follow sample collecting instruction provided by laboratory. Collect sample at entry point to the distribution system. Lab may need to add preservative soon after collection. Keep samples cool (blue ice) and return to lab within the holding time.



Parameter: Bromide

Estimated cost: \$30-\$45

Sample collection supplies

- ✓ Sample bottles supplied by lab. Plastic quart bottle, no preservative.
- ✓ Sample log/chain of custody
- ✓ Sample transport container/Ice chest
- ✓ Coolant. Blue ice is best



Sample Collection: Follow sample collection instruction provided by laboratory. Collect sample at entry point to the water treatment facility. Keep samples cool (blue ice) and return to lab within the holding time.

Asbestos

Monitoring Requirements: Water systems with a source developed in asbestos containing geological formations or contain asbestos cement pipe in the distribution, without a waiver must sample every 9 years. Check WaterLink to see when your water system is scheduled to conduct sampling. Samples are collected at the entry point to distribution system or in the distribution system depending on your systems requirements.

Estimated cost: \$250-\$330

Sample collection supplies

- ✓ 1 liter plastic bottle
- ✓ Sample log/chain of custody
- ✓ Sample transport container/Ice chest
- ✓ Coolant. Blue ice is best



Or

Plastic or glass bottles may be used but plastic is preferred.

Sample Collection: Follow sample collecting instruction provided by laboratory. Wear gloves and eye protection. Flush tap for 3 minutes. Rinse the bottle and cap 3 times with sample water then fill container leaving 2 inches of air at top. Keep samples cool and return to lab within the holding time.

Inorganics & Metals

Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Cyanide, Fluoride, Mercury, Nickel, Selenium, Thallium

Monitoring Requirements: Sampling frequency will depend if systems is using ground or surface water and historical results. Check WaterLink to see when your water system is scheduled to conduct sampling. Samples are collected at the source or entry point to distribution system depending on your systems requirements.

Estimated cost: \$270-\$325

Sample collection supplies

- ✓ 500 ml container preserved with nitric acid (Metals).
- ✓ 2 liter plastic container preserved with sodium hydroxide pellets (Cyanide).
- ✓ 2 liter plastic bottle with no preservative (Inorganics).
- ✓ Sample log/chain of custody
- ✓ Sample transport container/Ice chest
- ✓ Coolant. Blue ice is best



Sample Collection: Follow sample collection instructions provided by laboratory. Flush tap for 3 minutes. Fill bottle 2 inches from top. DO NOT OVERFILL and spill reagent. If that happens, you will have to re-collect the sample. Keep samples cool (blue ice) and return to lab within the holding time.

Nitrate & Fluoride

Monitoring Requirements: Historical results will determine continued sampling frequency. Check WaterLink to see when your water system is scheduled to conduct sampling. Nitrate and Nitrite samples are collected at the source. Fluoride samples may be collected from the distribution or source depending on requirement. Typically, distribution sampling is only required if Fluoride is added to the system.



Estimated cost: \$15-\$20

Sample collection supplies

- ✓ 250 ml plastic container
- ✓ Sample log/chain of custody
- ✓ Sample transport container/Ice chest
- ✓ Coolant. Blue ice is best

Sample Collection: Follow sample collection instructions provided by laboratory. Flush tap for 3 minutes. Fill bottle 2 inches from top. Keep samples cool (blue ice) and return to lab within the holding time.

Radiological - RADS

Gross alpha particle, radium-226, radium-228 & total Uranium

Monitoring Requirements: New sources are required to conduct initial monitoring within the first quarter. Sampling frequency will depend on historical monitoring results. Samples are collected at the entry point to distribution system that is representative of all sources being used. Check WaterLink to see when your water system is scheduled to conduct sampling.

Estimated cost: Gross alpha particles \$60-\$95
Radium-226 \$125-\$150
Radium-228 \$170-\$190
Total Uranium \$75-\$90

Sample collection supplies

- ✓ ½ gallon plastic bottle with nitric acid preservative
- ✓ ½ pint unpreserved plastic bottle
- ✓ metals bottle
- ✓ Sample log/chain of custody
- ✓ Sample transport container/Ice chest
- ✓ Coolant. Blue ice is best



Sample Collection: Follow sample collection instructions provided by laboratory. Flush tap for 3 minutes. Fill bottle 2 inches from top. DO NOT OVERFILL and spill reagent. If that happens, you

will have to re-collect the sample. Keep samples cool (blue ice) and return to lab within the holding time.

Sodium, Sulfate, & TDS (Total Dissolved Solids)

Monitoring Requirements: Monitoring frequency will vary based on system type. Samples are collected at the entry point to distribution system that is representative of all sources being used. Check WaterLink to see when your water system is scheduled to conduct sampling.

Estimated cost: Sodium & Sulfate \$15-\$25
TDS \$20-\$25

Sample collection supplies

- ✓ Sodium & Sulfate 250 ml plastic container
(Both constituents can come from same bottle)
- ✓ TDS ½ gallon plastic bottle
- ✓ Sample log/chain of custody
- ✓ Sample transport container/Ice chest
- ✓ Coolant. Blue ice is best

Sample Collection: Follow sample collection instructions provided by laboratory. Flush tap for 3 minutes. Fill bottle 2 inches from top. Keep samples cool (blue ice) and return to lab within the holding time.



Pesticides

Pesticides, herbicides, semi-volatiles, & carbamates (24 analytes)

Monitoring Requirements: Monitoring frequency will vary based on system type. Samples are collected at the entry point to distribution system that is representative of all sources being used. Check WaterLink to see when your water system is scheduled to conduct sampling.

Estimated cost: \$1000-\$1500

Sample collection supplies

- ✓ 5 amber glass 1 liter bottles with sodium sulfite preservative
- ✓ 3 amber glass 40 ml vials with sodium thiosulfate preservative
- ✓ 2 amber 40 ml vials with MCAA & Sodium Thiosulfate
- ✓ Sample log/chain of custody
- ✓ Sample transport container/Ice chest
- ✓ Coolant. Blue ice is best



Sample Collection: Follow sample collection instructions provided by laboratory. Flush tap for 3 minutes. Fill bottle 2 inches from top. DO NOT OVERFILL and spill reagent. If that happens, you will have to re-collect the sample. Keep samples cool (blue ice) and return to lab within the holding time.

Volatile Organics (VOC)

21 analytes

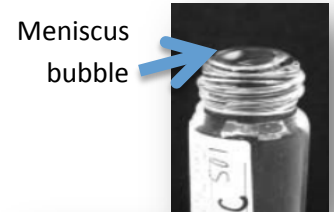
Monitoring Requirements: Monitoring frequency will vary based on system type. Samples are collected at the entry point to distribution system or distribution system. Check WaterLink to see when your water system is scheduled to conduct sampling.

Estimated cost: VOC \$200-\$220

Sample collection supplies

- ✓ Sample bottles supplied by lab. Three 40 ml vials with teflon cap liner that contain a preservative.
- ✓ Sample log/chain of custody
- ✓ Sample transport container/Ice chest
- ✓ Coolant. Blue ice is best

Sample Collection: Follow sample collection instructions provided by laboratory. Flush cold water tap for 3 minutes or longer to reach constant temperature. Then reduce flow to approximately the size of a pencil. Hold vial at angle and let steam flow into bottle. When close to filling, hold vertical and fill bottle completely to form a curved surface (meniscus). DO NOT OVERFILL and spill reagent. If that happens, you will have to re-collect the sample with a new vial. Place cap back on without spilling, then invert to mix, making sure reagent is well mixed with sample. Verify no air bubbles in the bottle (see picture). Then re-open cap and add lab provided amount of HCL to the vial. This may require adding drops or pouring specified amount into vial. *Careful HCL may cause burns so use proper gloves and eye protection.* Repeat step for all bottles required for the analysis. If a trip blank vial is included with bottle set do not open. This is use to determine potential contamination. Keep samples cool and return to lab within the holding time.



New Drinking Water Source Analysis

Monitoring requirement will be determined as part of new source plan approval. Sampling requirements may include all water quality monitoring constituents: Primary Inorganic contaminants, Secondary Inorganic contaminants, Pesticides, RADS, VOC's, and additional contaminants (41 analytes). Estimated cost is \$2000

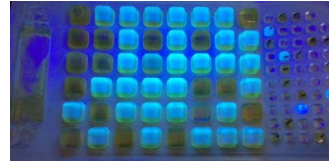
Unregulated Contaminant Monitoring Rule (UCMR)

The 1996 Safe Drinking Water Act (SDWA) amendments require that once every five years EPA issues a new list of no more than 30 unregulated contaminants to be monitored by public water systems (PWSs). UCMR4 started in 2018. Monitoring requirements are based on the population size of a water system. To find out more information on UCMR requirements for your system contact DDW. You can find a list of EPA approved UCMR laboratories here <https://www.epa.gov/dwucmr/list-laboratories-approved-epa-third-unregulated-contaminant-monitoring-rule-ucmr-3>

Investigative Monitoring

Total Coliform & E. coli (MPN)

The total coliform and E. coli MPN analysis is the same analysis as the Total Coliform rule analysis, except a quantitative tray is used to determine HOW MUCH bacteria is present. This test is very useful when trying to determine the extent of the contamination and if disinfection is resolving the issue. Estimated cost is \$15-\$25. Sample collection method is same as Presence/Absence Total coliform test.



Cyanotoxins

Some species of algae/cyanobacteria can produce toxins called Cyanotoxins. Cyanotoxin monitoring is a relatively new technology that is rapidly improving. The limited options for cyanotoxin monitoring include: Toxin strip tests, ELISA total toxin tests, and advanced Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS). The estimated cost of analysis can range from \$30-\$300 depending on how specialized the analysis is. Collect sample in plastic 200 ml to 1 liter bottle. Limited labs offer these analyses.



Legionella

Legionella is a type of bacteria that can grow in water systems and cause Legionnaires disease. People can get Legionnaires disease when they breathe in small droplets of the bacteria. The Utah State health lab is offering the Legionella analysis every Thursday for an estimated cost of \$70. Sample collection: fill half gallon container. Container does not have to be sterile.



Giardia and Cryptosporidium

Giardia and Cryptosporidium analysis are a requirement of the Long Term Enhanced Surface Water Treatment Rule (LT2). This analysis may not be offered in the state of Utah. Only laboratories that meet the certification requirement of the LT2 rule can be used for compliance sampling. Visit the EPA website for a list of labs here <https://www.epa.gov/dwlabcert/cryptosporidium-laboratories-acceptable-monitoring-comply-long-term-2-enhanced-surface>

Sample Collection: Verify with a laboratory if they accept a water sample or filter sample. They will supply the sampling method. Estimated cost: \$300-\$350



Microscopic Particulate Analysis (MPA)

The MPA analysis is used to determine if a ground water source is under the direct influence of surface water (UDI). If a PWS is a potential UDI candidate, DDW will perform/require a MPA test. Typically this test involves filtering 500-1000 gallons of the source and then the filter is sent out for the analysis. Estimated cost is \$300-\$350.

