USDA GAP PROGRAM WATER FAQS

This document is intended to provide information for frequently asked questions on how to meet the water requirements in the USDA GAP audit, USDA Harmonized GAP audit and USDA Harmonized GAP Plus+ audit.

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Why is water important to the safety of produce?

Water is used throughout fresh produce production. Water can be both a place for pathogens to live, and a manner for pathogens to move throughout a produce farm or packinghouse. Once contaminated water is introduced into an operation it has the potential to move that contamination throughout the entire system – onto the hands, clothing, and footwear of employees, onto food contact equipment or surfaces, or from product to product.

What types of water are used in produce production?

Water is used throughout the fresh produce production. For food safety purposes the USDA GAP audit program categorizes water into three types:

Pre-harvest Water – any water used in the growing process prior to the time that a crop is harvested/cut/picked. Pre-harvest water uses include irrigation, fertigation, chemigation, frost protection, and cooling during growing.

Post-harvest Water – any water that contacts the crop during the harvest process or at any time after harvest, and any water that is used on food contact surfaces.
Post-harvest water includes – fluming, washing produce, cooling (after harvest), ice, cleaning food contact equipment, cleaning bins and/or packaging, and handwashing water.

Drinking water – Water available for employees to drink.

What requirements exist for pre-harvest water?

An auditee who uses pre-harvest water needs to assess the risks associated with their water source to determine whether or not and how the water should be used.

A risk assessment identifies the risks associated with water used in produce production. This assessment should include the type of water source, the geography of the surrounding environment, the method of application, the characteristics of the crop, the stage of the crop (timing of application), the historical testing results of the water sources, and any additional known risk factors for the water source.

Based on the outcome of the risk assessment, auditees will determine how they will monitor for risk, and mitigate any risks associated with the use of this water. An auditee must create a plan to mitigate water risks that outlines:

Preventive controls – What the auditee will do to prevent the water from becoming contaminated (e.g., install fence to water to prevent livestock or wild animal access, perform routine checks of well casings to ensure they are sealed) or what they will do to reduce risks associated with the use of the water (e.g., using plastic over drip tape to reduce the chance of water contacting the edible portion of the crop).

Monitoring and verification procedures – How the auditee will monitor the risk associated with their water source. For GAP audits, this should include microbial water testing, unless water comes from a municipal source. While the USDA GAP audits do not set a quantitative (numerical) threshold that water tests should meet, it is expected that an auditee sets an expectation for their water source. The threshold identifies the point at which the water is not suitable for use without taking a corrective action. This threshold should be based on industry standards, prevailing regulations, historical testing, and relevant science. In simplified terms, an auditee needs to outline what water testing standard they intend to meet based on their risk assessment.

Corrective Actions – Actions an auditee will take when their water source monitoring indicates that there is elevated risk associated with the use of the source. For example, what will be done if the water test comes back above the set threshold or if a significant and/or prolonged animal intrusion is observed into the water source? Corrective actions could include using an alternate water source or application method, treating the water source, employing a waiting/die off period between water use and harvest, or disposing of contaminated produce.

Documentation – What documentation will be kept by the auditee to demonstrate that they are adhering to their water management plan. Examples of documentation may include water test results, corrective action reports, and treatment records/logs.

For more guidance on assessing risks associated with water, and for a sample water risk assessment, please visit the International Fresh Produce Association website.

International Fresh Produce Association has also compiled a list of industry guidance documents for produce, which may be helpful in performing risk assessments for the listed crops.

How often does pre-harvest water need to be tested?

It is a requirement for all USDA GAP audits that water testing be performed (or water authority documentation, such as municipal water tests, be provided) on all water used in the operation. The frequency of water testing should be directed by the risk assessment that an auditee has developed for their water source, which considers industry guidance and/or regulations. If no specific guidelines exist, the USDA GAP program outlines the following best practices for how many water tests to perform for each water source:

Municipal water – Acquire test results or most recently available water report from the local water authority annually.

Well water – Test at a minimum annually. If test results indicate potential contamination, reperform water source risk assessment to identify the source of contamination and take appropriate corrective actions, (such as treating the well).

Surface water – Test quarterly in warm climates such as California, Florida, Texas, and other southern states when water is used year-round. Test three times during the growing season in northern climates such as New York, Pennsylvania, and Michigan - first at planting, second at peak use, third at or near harvest.

What microbial requirements need to be met for pre-harvest water testing?

It is a requirement for all USDA GAP audits that water testing be performed (or water authority documentation, such as municipal water tests, be provided) on all water used on the operation. The USDA GAP programs do not set specific microbial requirements for water testing for pre-harvest water, but instead rely on each auditee to set their own science-based microbial threshold(s) based on industry best practices, regulations, relevant science, and their own risk assessment of when their water source(s) is at regular versus elevated microbial risk.

I grow leafy greens, are there specific water testing requirements that I need to meet?

The California and Arizona Leafy Green Marketing Agreements (LGMA) have set strict requirements around the testing, use, and treatment of pre-harvest water. More information about these requirements is available on the CA LGMA webpage and AZ LGMA webpage respectively. If you grow leafy greens but are not a part of one of these marketing agreements you may choose to use this industry guidance in your risk assessment, but it is not mandatory to meet these requirements.

What counts as surface water? Is water from a spring surface or groundwater?

Surface water is any water which was been exposed to the environment. This includes lakes, ponds, rivers, streams, creeks, brooks, deltas, canals, or any water (including municipal) that has been collected in a containment vessel that is open to the environment. Spring water is considered surface water if it is exposed to the environment or directly influenced by surface water at any point before it is used in the farming operation, for example, if it is collected in a holding pond or open tank.

Untreated surface water cannot be used in post-harvest application. While the use of treated surface water for post-harvest purposes is not considered a best practice, we recognize that in rare cases there may not be another option. International Fresh Produce Association has developed guidance on the risks associated with using treated surface water for post-harvest activities.

Is rainwater collected off a roof considered to be surface water?

While rainwater as it falls may be "clean," once rainwater contacts a surface it can become contaminated by anything on the surface. Rainwater which falls on a roof may encounter any number of contaminants, including bird (or other wild animal) feces which can be found on almost every roof. For this reason, rainwater which is collected and held is considered to be of significant risk and should be evaluated and/or treated to reduce the risk associated with the use of this water.

Do I need to meet the FSMA Produce Safety Rule water testing requirements?

The FDA has currently extended the compliance dates for Subpart E (Agricultural Water) of the FSMA Produce Safety Rule; therefore, we **do not** consider the water testing requirements from the Final Produce Safety Rule, published in 2015 as prevailing regulations and are not requiring that auditees adhere to them. For more information about the compliance extension please see the Federal Register notice.

When the FDA clarifies and finalizes agricultural water testing standards and sets compliance dates, these will be considered prevailing regulations for all covered farms/commodities, and therefore will be required as part of the water management plan for all covered Harmonized and Harmonized GAP Plus+ auditees.

Prior to regulatory implementation of the FSMA Produce Safety Rule Subpart E §112.41-112.50 agricultural water requirements, if an operation uses these parameters for their monitoring and verification procedures in their water management plan, auditors will verify that the testing requirements as specified in the food safety plan are being adhered to.

I am using drip irrigation under plastic. Do I need to test my water?

Yes. The USDA GAP program asserts that it is important to know the quality of water being used on your operation even if it is unlikely to contact the edible portion of the crop. It is a requirement for all USDA GAP audits that water testing be performed (or water authority documentation, such as municipal water tests, be provided) on all water used on the operation.

Where do I take a water sample from?

A water sample should be taken from a location that most accurately represents the water that is used on produce. For example, an auditee who pumps irrigation water out of a river should collect their water sample as close as possible to the intake pipe in the river.

If an auditee uses equipment which may reduce risk (e.g., a filter) or introduce risk (e.g., old pipes, or pipes with dead legs) the auditee may wish to take their water sample from the end of their distribution system to capture the effects that the system has on the water quality. This should be reflected in their risk assessment and water testing procedure.

I use the same water source as my neighboring farm, can we use the same water test(s)?

If a water test can be taken from a location which represents the water used by both operations, then yes, both auditees can use the same water test(s), but both auditees will be expected to have copies of the test results in their own food safety plans. However, if there are significantly different risks in the source where it is pulled by each auditee, then they will each need to take their own water tests so that it is representative of their use.

Example 1 – Two growers pull irrigation water from the same pond which straddles their property line. Each grower has their own pump with intake pipes floated towards the center of the pond. These growers could pull a representative sample from the middle of their pond and share the test results. It is important to note, even if they share a water sample result, they still need to assess how and when the water is applied, the delivery system, and to which crop(s) it is applied. One grower may be able to accept the resulting water quality because they use drip that does not contact the harvestable portion of the crop while the other grower is using overhead, close to harvest, on a crop that is very susceptible to contamination.

Example 2 – Two growers each pull irrigation water from the same stream. There are two farms separating the growers who also have access to the stream including a cattle farm. In this case the growers would each need to collect their own water samples as the risk to the water source may change as it moves through the other farms.

What requirements exist in the USDA GAP audits for post-harvest water?

All post-harvest water must meet the microbial standards for drinking water. For the purposes of USDA GAP audits, this is no detectable generic *E. coli*.

The EPA National Primary Drinking Water Regulations: Revisions to the Total Coliform Rule (RTCR) considers *E. coli* to be an indicator of fecal contamination. If water used for post-harvest purposes shows detectable *E. coli* immediate corrective action will be needed as this exceeds the EPA Maximum Contaminant Level (MCL) for *E. coli*.

The RTCR uses total coliforms as an indicator of system operation and condition rather than an immediate public health concern. Detectable total coliform no longer has a MCL, however, are now used to trigger an assessment of the system. For the purposes of GAP audits, detectable total coliform in a post-harvest water test would indicate potential contamination and therefore require that the water system be reevaluated following a company's corrective action process.

What requirements exist in the USDA GAP audits for drinking water?

Each USDA GAP audit requires that an auditee makes drinking water available for their employees. Drinking water is defined by the EPA with limits set for microbial and chemical contaminants. This is a requirement that is set by the Occupational Safety and Health Administration (OSHA) standards that employers provide free drinking water to all employees.

For more information about drinking water please see the EPA National Drinking Water Regulations webpage.

How do I read water test results?

Please see Appendix A for guidance on how to read water test results.

Can I use a presence/absence test?

An auditee is welcome to have a water test done which only reports presence or absence of bacteria (no numerical results). These types of tests are most useful for drinking and post-harvest water where an auditor will be looking to determine the water source is free from a specific microorganism.

Auditees who set a numerical threshold for their pre-harvest water other than 0* may not find a presence/absence test to be useful, since the result will not indicate if they are above

or below their threshold. Although not required in pre-harvest water situations, a quantified test will provide the numerical value of the target organism in the water, if present.

*For purposes of GAP audit microbiological testing, USDA deems 0 to be equivalent to non-detectable, absent and <1 (less than detection limit).

What are indicator organisms and why do we test for them?

Indicator organisms are non-pathogenic microorganisms (those don't cause illness) but indicate that a water source may have contamination which could include pathogens (bacteria, viruses, or parasites which can cause illness). Bacterial indicator organisms are used for water testing because they exist in higher numbers than bacterial pathogens and therefore are easier to detect, and faster and less expensive to test for. They serve as a more efficient test for auditees than testing directly for pathogens. Typically, indicator organisms are chosen from the same family of bacteria as the pathogen of concern – for pathogenic *E. coli* those indicator organisms were historically total coliform, fecal coliform, and generic *E. coli*. However, current research suggests that coliforms and even generic *E. coli* can be found more broadly in growing environment (not necessarily associated with animal hosts). Therefore, individual water test results should be considered within the broader context of historical water testing trends.

Do I need to test for chemical contaminants (e.g., nitrate, radon)?

The need to test for chemical contaminants will be directed by the risk assessment. If an auditee is sourcing their water from an area where there is a known risk of chemical contaminants, then they should be monitoring their water to ensure that high levels of chemical contaminants do not contaminate the produce. For example, an auditee who pulls irrigation water from a river where there is a manufacturing plant upstream may wish to monitor for potential chemical contaminants discharged by the plant.

What requirements does the water testing laboratory need to meet?

The USDA Harmonized and Harmonized GAP Plus+ audits require that any laboratory used by an auditee, must pass a Good Laboratory Practices (GLP) audit, or participate in a proficiency test program and must use recognized/validated methods of detection or quantification. It is not required that a laboratory be ISO certified but this would be one way for a laboratory to demonstrate that they meet these requirements. State accreditation is another way that some laboratories can demonstrate proficiency. An auditee should be able to document how their laboratory meets these criteria, which could include a statement on their webpage or on the test results, or a statement from the laboratory in an email or letter that outlines which audit or proficiency testing program they take part in.

What do I do if my water test comes back with high bacterial levels?

This should be dictated by the corrective actions outlined in an auditee's water risk assessment. A water test that comes back with bacterial levels above the threshold set by an auditee does not necessarily mean the auditee will not pass their audit, or that the water cannot be used, but instead an auditee should follow their pre-determined corrective actions to identify the cause of the spike and, if necessary, reduce the risk of using the potentially contaminated water source.

I use municipal/county water, what documentation do I need to have?

If an auditee sources water from a local water authority (e.g., municipality, county) they will be asked to provide a copy of the most recent annual water report, or other documentation showing that the water is being monitored for potential contamination by the local authority. This documentation is often available on their website, or by contacting them directly.

I use ice to cool my product, what do I need to consider and document?

First, it is important to know the quality of the water being used to make the ice. This can be documented through a sales receipt, a COA/letter of guarantee from the supplier, or a water test.

There should be cleaning and maintenance procedures for all tools and equipment used for making, handling, transporting, and/or storing ice. These items should not be used for other purposes which cause them to become contaminated by microorganisms or chemicals without being sanitized between use and stored in a manner to prevent contamination. If ice is made on site, there should be both a cleaning and a maintenance schedule and as well as procedures for the equipment used to make the ice.

Consideration should be given to how and where iced product is stored. As the ice used on product begins to melt it can drip onto anything stored below and potentially carry contamination present on the product, packaging, pallets, or storage equipment and shelving. If possible, iced product should not be stored above other items to eliminate this route of potential cross contamination. If iced product is racked above other product, mitigation strategies (such as use of drip pans or covering of the product below) should be used. If a there is dripping from of a pallet of iced product that racked onto another pallet of product, this will be considered an automatic unsatisfactory or immediate action required.

Dripping ice can also create pooled water on floors if there is not sufficient drainage, which can be a reservoir for microorganisms, such as *Listeria*, as well as a hazard for employees.

I operate a hydroponic growing operation. What requirements do I need to meet for my water?

The USDA GAP audit programs do not set additional or alternate requirements for hydroponic growers. It is important that growers carefully consider the risks of water in a hydroponic operation, as they are different from the risks in a traditional growing operation.

Water testing should be part of the water management plan. This testing should be representative of the microbial quality of the water that contacts the crop. While source testing may be useful, additional risks to the water system, such as nutrients added and handling practices that may introduce contamination to the system should also be considered when deciding where water samples are to be taken. For example, if water entering the system from a municipal source is added to growing ponds, the operation may choose to use a water test from the municipality and conduct microbial testing of the water in the ponds on a routine basis.

The water used during hydroponic growing may be considered pre-harvest water unless that water is likely to or intended to contact the edible portion of the crop during or after harvest. Many hydroponic operations use growing systems, like floats, which may allow the water to contact the edible portion of the crop near to or during harvest which must be considered post-harvest water and accounted for in the risk assessment. If the roots are packaged with the crop, they may retain water which will contact the edible portion of the crop after harvest; an auditee who harvests crops with the root system must consider this post-harvest water and include this in their risk assessment.

The cleaning and sanitation of growing beds must be considered as part of the water management plan. A water change schedule for all water used in growing beds should also be established in the water management plan.

I operate an aquaponic growing operation. What requirements do I need to meet for my water?

You can find more information about our guidance for aquaponic growers on the USDA GAP webpage.

I use a dump tank or flume. Do I need to monitor my water temperature?

Some commodities may be subject to infiltration by water if the pulp temperature of the product is greater than the temperature of the water. The temperature differentials which

allow for infiltration may be unique to individual commodities. Any microorganisms that exist in water can be moved inside the product if infiltration occurs, making it impossible to remove. If there is scientific evidence that the commodity you produce is subject to infiltration and associated existing commodity standards, water and pulp temperatures should be monitored to prevent infiltration – for example, tomato industry best practices require that water temperature be at least 10°F warmer than the pulp temperature of the tomato. This may require heating dump tank water or pre-cooling the product to avoid a large temperature differential.

What is considered reused water?

The USDA GAP program considers water which contacts more than one batch or lot to be reused water. This can include both water which is continuously pumped through a system (e.g., a flume, a spray bar where the water is collected and passed through more than once) or stagnant water which is not drained between lots (e.g., dump tank, wash sink). Since reused water contacts multiple batches/lots, it has the potential to spread contamination across all the product and therefore should be carefully considered in a post-harvest water risk assessment (see question below).

I use reused water. How can I meet the requirements of the Harmonized Standard?

If an auditee is using recirculated or reused water, it is expected that the water will be treated with a sanitizer to prevent cross contamination of product/lots.

For more information on sanitizers, the Produce Safety Alliance has created an Excel tool for Label Sanitizers for Produce available on their resources webpage. This tool shows the different uses each sanitizer has been approved for, the active ingredient, links to EPA labels (where available), produce information, and whether it can be used in organic operations.

It is important to remember that these water sanitizers are intended to reduce cross-contamination, not sanitize the product. Adding sanitizer to the water may not remove microorganisms from an already contaminated product, but will help prevent the water from spreading contamination onto every other product that is contacted by the water.

Specific commodities have demonstrated that adding sanitizer to the water is an ineffective tool for reducing risk due to the high soil load that is added to the water by the commodity (e.g., potatoes). In these specific industries, alternate risk reduction practices as specified in published industry standards need to be used in lieu of sanitizers.

What documentation do I need if I use a chemical to treat my water?

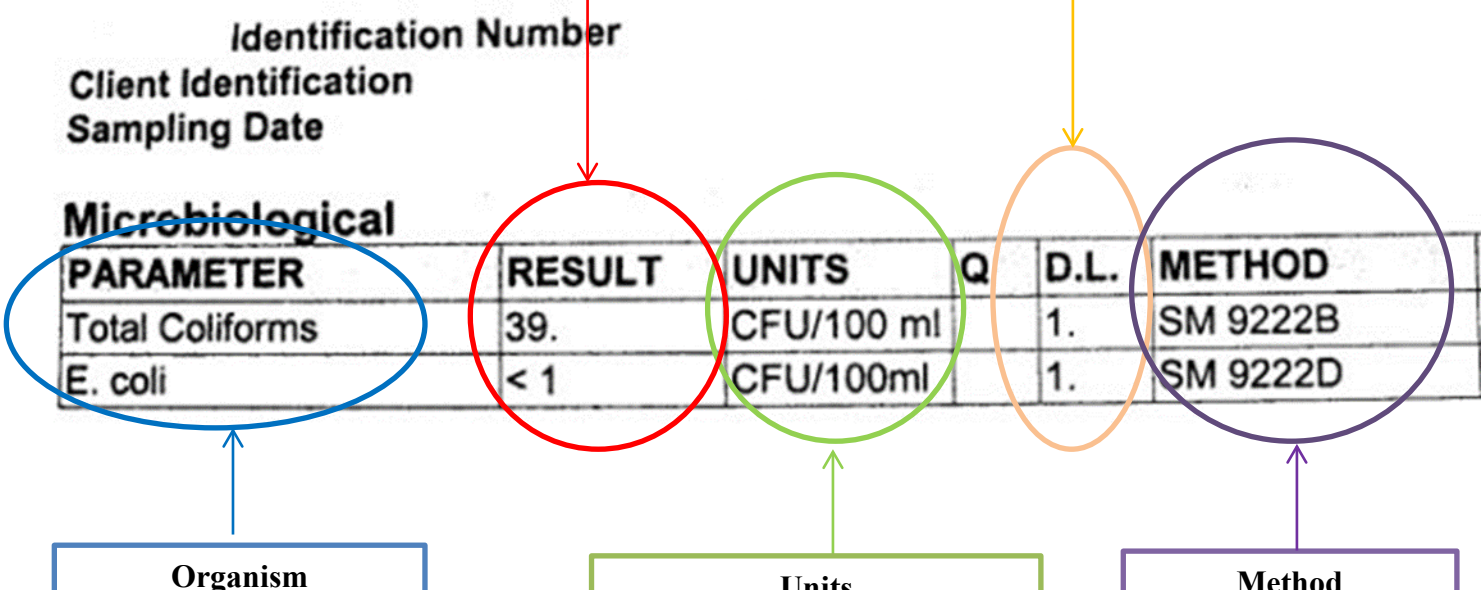
For all chemicals used, including water treatment chemicals, an auditee must have access to the chemical's label. The label needs to show that the chemical has been approved for how the auditee is using it – there are different label approvals for use on food contact surfaces, for produce washing, and for the treatment of water.

Additional documentation will be based on the sanitizer and should demonstrate that the auditee is following the label directions for what needs to be monitored. Monitoring criteria may include concentration, contact time, pH, oxidation-reduction potential (ORP), free chlorine, water temperature, turbidity, and whether the product is rinsed with potable water after the use of the sanitizer.

APPENDIX A: HOW TO READ A WATER TEST

Numerical Results
This is the report of how many microorganisms were found in the water sample. This number will be compared against the appropriate regulation or standard from the auditee's food safety plan.

Detection Limit
The smallest number of microorganisms which can be detected in a sample. Many labs will report < the detection limit when no microorganisms are found. < DL can be treated as absence of the target microorganism.



Identification Number
Client Identification
Sampling Date

Microbiological

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD
Total Coliforms	39.	CFU/100 ml		1.	SM 9222B
E. coli	< 1	CFU/100ml		1.	SM 9222D

Organism
The target organism will depend on the prevailing regulations, the intended use of the water, and the auditee's food safety plan and risk assessment.

Units
Will often be listed in CFU (colony forming units) or MPN (most probable number) depending on the type of test used. MPN and CFU can be considered interchangeable for test interpretation purposes.

Most water standards set limits per 100 mL – look to see if results are reported per 100 mL or per 1mL. If reported per 1mL, the numerical result will need to be multiplied by 100.

Method
This code refers to the method used by the lab for testing. More information about testing methods can be found on the EPA website, if necessary.

Test Results
These results are reported as presence or absence of microorganisms in the sample, instead of a numerical value. P shows presence of Coliform; whereas A shows absence of *E. coli*.

Organism
The target organism will depend on the prevailing regulations, the intended use of the water, and the auditee's food safety plan and risk assessment.

PARAMETERS		RESULTS	REQUIREMENTS MCL/SMCL	ANALYTICAL METHOD
HARDNESS	*#	264.0	75 mg/l	SM2340C
IRON	*	0.11	0.3 mg/l	EPA 200.8
MANGANESE	*#	0.51	0.05 mg/l	EPA 200.8
pH	*#	7.2	6.5 - 8.5	EPA 150.1
CHLORIDE	*#	89.8	250 mg/l	EPA 300.0
TURBIDITY	**#	<1.0	1 NTU***	EPA 180.1
COPPER	**#	<0.5	1.3 mg/l	EPA 200.8
SODIUM	*#	28.2	250 mg/l	EPA 200.8
NITRATE	**#	1.5	10 mg/l	EPA 300.0
COLIFORM	**#	P	ABSENCE/100 ml	P/A COLISURE
E-COLI	**#	A	ABSENCE/100 ml	P/A COLISURE
COLOR	*	0	15 C.U.	HACH 8025
ODOR	*	ND	3 O.T.	SM2150B
LEAD	**#	<0.005	0.015 mg/l	EPA 200.8
ARSENIC	**#	<0.005	0.010 mg/l	EPA 200.8
FLUORIDE	**#	<0.5	4.0 mg/l	EPA 300.0
CALCIUM	*#	100.1	100.0 mg/l	EPA 200.8
NITRITE	**#	<0.5	1.0 mg/l	EPA 300.0

*** 5 NTU is allowed for well water.

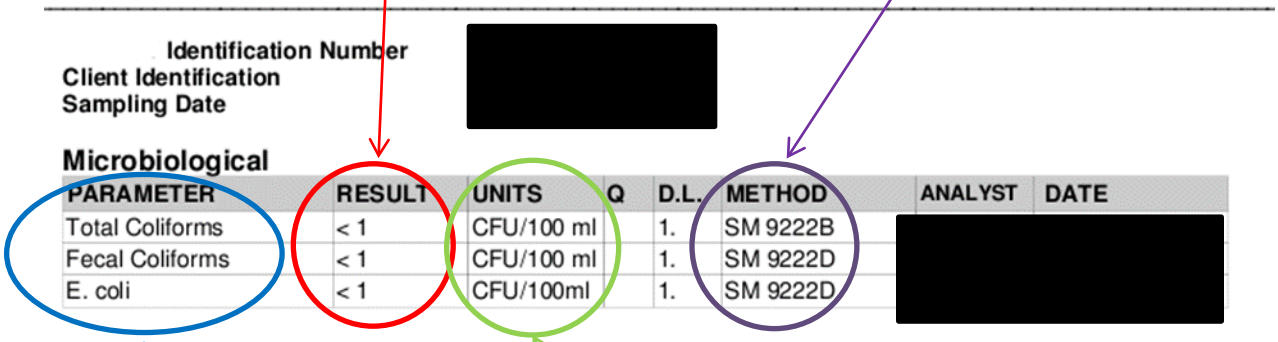
THIS SAMPLE DOES NOT MEET EPA REQUIREMENTS.
These parameters exceed the MCL* or are out of range:
Hardness, Manganese, Coliforms,
RECEIPT TEMP: 17.0C ON ICE.
A = Absent; P = Present ** EPA Primary standards are standards that are related to health issues. (www.epa.gov/safewater/mcl.html#mcls) *
EPA Secondary standards are aesthetic in quality and should not affect healthy individuals. (www.epa.gov/safewater/mcl.html#mcls)
NOTE: pH analysis exceeds holding time.(Regulation is 15 minutes)

Method
This code refers to the method used by the lab for testing. The P/A in this code indicates that the test is presence/absence only.

Requirements
This test shows the requirements for the EPA Drinking Water Requirements, and whether the sample meets these requirements. This can be useful for post-harvest water samples, but may be stricter than the GAP requirements.

Numerical Results
This is the report of how many microorganisms were found in the water sample. This number will be compared against the appropriate regulation or standard from the auditee's food safety plan.

Method
This code refers to the method used by the lab for testing. More information about testing methods can be found on the EPA website, if necessary.



Identification Number [redacted]
Client Identification
Sampling Date

Microbiological

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Total Coliforms	< 1	CFU/100 ml		1.	SM 9222B	[redacted]	
Fecal Coliforms	< 1	CFU/100 ml		1.	SM 9222D		
E. coli	< 1	CFU/100ml		1.	SM 9222D		

Organism
The target organism will depend on the prevailing regulations, the intended use of the water, and the auditee's food safety plan and risk assessment.

Units
Will often be listed in CFU (colony forming units) or MPN (most probable number) depending on the type of test used. MPN and CFU can be considered interchangeable for test interpretation purposes. Most water standards set limits per 100 mL – look to see if results are reported per 100 mL or per 1 mL. If reported per 1 mL, the numerical result will need to be multiplied by 100.

Organism
The target organism will depend on the prevailing regulations, the intended use of the water, and the auditee's food safety plan and risk assessment.

Units
Will often be listed in CFU (colony forming units) or MPN (most probable number) depending on the type of test used. MPN and CFU can be considered interchangeable for test interpretation purposes. Most water standards set limits per 100 mL – look to see if results are reported per 100 mL or per 1 mL. If reported per 1 mL, the numerical result will need to be multiplied by 100.

Parameter	Method	Analyzed	Result	Units	Interpretation
Microbiological Analysis					
Coliform, total	SM 9223 B (Colilert Qtray)-97	[redacted]	**38.4**	MPN/100 mL	Unsafe
E. Coli	SM 9223 B (Colilert Qtray)-97	[redacted]	<1	MPN/100 mL	Safe

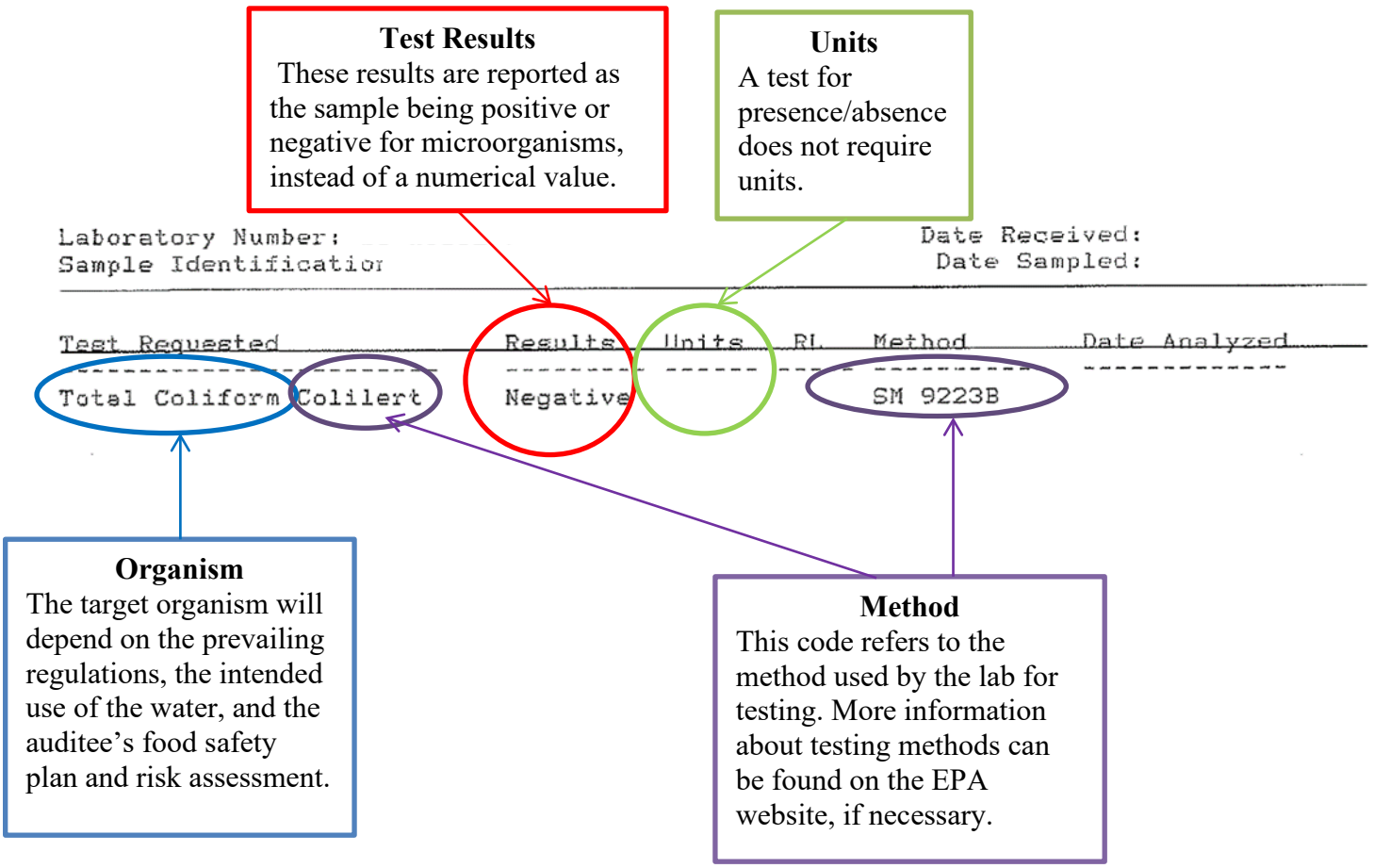
Method
This code refers to the method used by the lab for testing. More information about testing methods can be found on the EPA website, if necessary.

Numerical Results
This is the report of how many microorganisms were found in the water sample. This number will be compared against the appropriate regulation or standard from the auditee's food safety plan.

Interpretation
This test shows whether the sample meets the microbial standards of the EPA Drinking Water Requirements. This can be useful for post-harvest water samples.

Interpretation:
The interpretation, based on the EPA Drinking Water Requirements, is already listed on the righthand side of the water test. This water sample contains more coliform (38.4) than the EPA Drinking Water Requirements and is therefore deemed 'unsafe'. The water contains less than the detectable amount of *E. coli* per 100 mL (<1 organism). This water source would meet the EPA recreational water standards.

While this water would meet the USDA GAP and FSMA requirements of no detectable *E. coli*/100 mL, the presence of coliform can indicate contamination of the water source and the auditee will need to assess their water system and may need to take additional risk mitigation prior to using it for post-harvest purposes (e.g., treating the water).

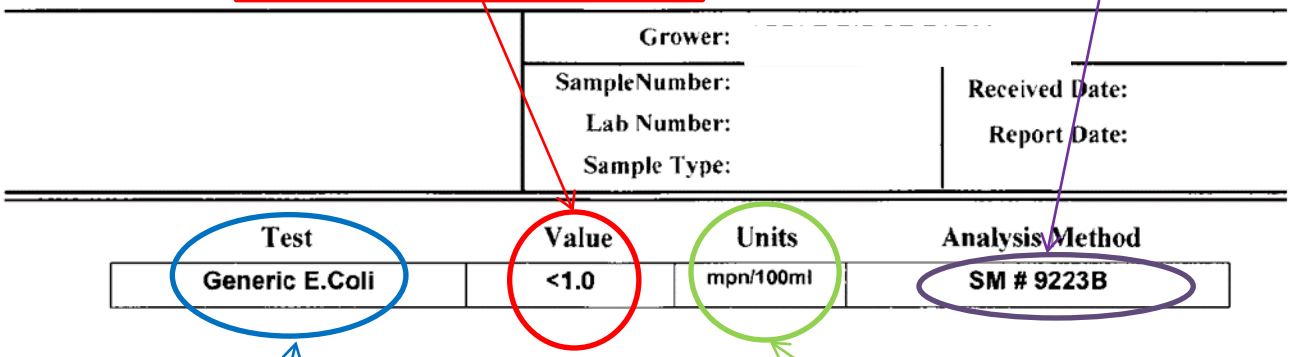


Interpretation:
This water test did not find any coliform bacteria in the water sample. This water source would meet the EPA total coliform rule for drinking water.

This water would be appropriate for use pre-harvest or post-harvest.

Numerical Results
This is the report of how many microorganisms were found in the water sample. This number will be compared against the appropriate regulation or standard from the auditee's food safety plan.

Method
This code refers to the method used by the lab for testing. More information about testing methods can be found on the EPA website, if necessary.



Organism
The target organism will depend on the prevailing regulations, the intended use of the water, and the auditee's food safety plan and risk assessment.

Units
Will often be listed in CFU (colony forming units) or MPN (most probable number) depending on the type of test used. MPN and CFU can be considered interchangeable for test interpretation purposes. Most water standards set limits per 100 mL – look to see if results are reported per 100 mL or per 1 mL. If reported per 1 mL, the numerical result will need to be multiplied by 100.

Interpretation:
This water test did not find any coliform bacteria in the water sample. This water source would meet the EPA total coliform rule for drinking water.

This water would be appropriate for use pre-harvest or post-harvest.

REFERENCE LINKS **Version Date (Printed for distribution)**

☐ **International Fresh Produce Association**
Assessing Risk of Pre-Harvest Agriculture Water: _____
https://www.freshproduce.com/siteassets/files/food-safety/assessing-risk-of-pre-harvest-agricultural-water-1.pdf

☐ **International Fresh Produce Association**
Commodity-Specific Resources: _____
https://www.freshproduce.com/resources/food-safety/commodity-specific-resources/

☐ **CA LGMA Resources:** _____
https://lgmatech.com/resources/

☐ **AZ LGMA Guidelines for Food Safety:** _____
https://www.arizonaleafygreens.org/guidelines

☐ **International Fresh Produce Association**
Harmonized Post-Harvest Treatment Summary: _____
https://info.unitedfresh.org/hubfs/Food%20Safety%20Resources/FINAL_Harmonized%20Postharvest%20Water%20Treatment%20Summary_Feb%202021_revised.pdf

☐ **Federal Register Notice: PSR Extension of Compliance Dates for Subpart E:** _____
https://www.federalregister.gov/documents/2019/03/18/2019-04652/standards-for-the-growing-harvesting-packing-and-holding-of-produce-for-human-consumption-extension

☐ **OSHA Standard 1910.141:** _____
https://www.osha.gov/laws-regs/regulations/standardnumber/1910/1910.141

☐ **EPA National Primary Drinking Water Regulations:** _____
https://www.epa.gov/ground-water-and-drinking-water/national-primary-drinking-water-regulations

☐ **Aquaponics Operation Good Agricultural Practices (GAP):** _____
https://www.ams.usda.gov/sites/default/files/media/AquaponicOperationGAP.pdf

☐ **Produce Safety Alliance General Resource List:** _____
https://producesafetyalliance.cornell.edu/resources/general-resource-listing/
Checked Materials have been printed from the links in this manual and included for reference.

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