

Req.#	Requirement	DOC	MAN
F-3.1	A water system description shall be available for review.	WP	YES
F-3.2	The water source shall be in compliance with prevailing regulations.		NO
F-3.3	Water systems shall not be cross-connected with human or animal waste systems.		YES

Water Sources and Uses (F-3.1)

A water system description addresses all water sources and the areas that the water sources serve. The description can be a written narrative, a map, photographs or drawings, or a combination. A map is especially handy for showing the water system for easy reference, and can also serve to designate field numbers and structures on the farm. Whatever the format, the description should identify the location of the water source(s), any permanent fixtures of the system (including any above ground or underground water storage tanks), and the flow of water through it. Permanent fixtures, including wells, gates, reservoirs, valves, returns and other above-ground features must be easily identifiable within the system description, including their field location, or location within hydroponic, aeroponic or aquaponic operations. During the audit, the auditor will review the water system description and/or map and verify its accuracy. All water must be sourced from a location and in a manner that is compliant with prevailing regulation for the intended use of the water.

Separation from Waste Water (F-3.3)

Water systems that are intended to convey untreated human or animal waste must be separated from conveyances that deliver water used in crop production and harvesting. Noncompliance with this requirement is an IAR and results in automatic failure of the audit.

F-3 Pre-Audit Checklist:

- Create a map or other written description of all water sources and distribution systems to identify the flow of the water through your operation.

F-4 Water System Risk Assessment

Conducting a water system risk assessment will allow identification of potential hazards associated with your water system. Start by identifying your water source(s) and the uses you make of the water from each source. Microbial contamination from a water source is the primary concern; however, wells and open water sources can also become contaminated by misuse of chemicals, as well as physical contaminants. Surface water sources, such as ponds, lakes, rivers, reservoirs, and canals, should be assessed to determine if an adjacent land use, or wildlife presence, creates any potential contamination risk. Wells must be assessed to ensure that the casings are intact and effectively preventing ground leeching of pathogens into the well water.

Tip

Tap local soil & water agencies to improve water quality.

If your water source is surface water (a pond, lake, stream, creek or river), it is critical to prevent polluted runoff from contaminating that source. Key strategies are berms and/or diversions to direct runoff away from the water source, and maintaining separation of domestic animals and large wildlife from the water with fencing, distance and topography. The Natural Resources Conservation Service (NRCS) provides cost share funding for water quality protection enhancements such as fencing to keep domestic animals out of surface waters, combined with wells, to provide an alternative water source. Berms, windbreaks, micro-irrigation systems, and other enhancements may also be eligible for funding. Contact your local NRCS office or your local soil and water conservation agency for more information about these options.

When assessing water risks, consider whether you are using irrigation methods that result in direct water contact with the edible portion of the crop, such as overhead irrigation (high-risk), or that limit such contact, such as drip irrigation (low-risk). This will determine the frequency with which your water should be tested to meet microbial water standard as defined in your food safety plan. The time between irrigation and harvest may also play a determining factor in water quality impacted by UV rays and drying.

You must conduct a water system risk assessment at least annually, but the USDA HGAP standard requires that you review that assessment seasonally, and any time there is a change made to the system or a situation occurs that could introduce contamination in the system, such as flooding. The guidance provided previously in this manual on conducting a risk assessment is useful in fulfilling the requirements to this question. Use the [Water System Risk Assessment Template](#) and incorporate it into your food safety program. Table 7 below overviews the relative risk levels of various irrigation practices.

TABLE 7: Risk Levels Associated with Common Irrigation Methods

Drip Irrigation:	Low Risk	A type of micro-irrigation where the system emits water at a very slow rate directly to the soil where plant roots are growing. System may be on the soil surface or buried below the surface.
Flood/furrow/surface irrigation:	Medium Risk	Water is pumped or brought to fields and allowed to flow along the ground among the crops.
Micro-irrigation:	Low Risk	A system where water is distributed under low pressure through a piped network in a pre-determined pattern and applied as a small discharge next to or adjacent to each plant. Includes various systems (drip, micro-spray, micro-sprinklers, mini-bubbler) distinguished by the type of emitters used to deliver water to the plants.
Micro-sprinklers/sprays:	Low/Medium Risk	A type of micro-irrigation with fixed micro-sprays that deliver water at a higher rate and cover a larger area than drip emitters. Typically used in tree orchards, also in aeroponic operations.
Overhead/sprinkler irrigation:	High Risk	System where water is piped to one or more central locations and distributed by overhead high-pressure sprinklers or guns. Sprinklers can be fixed or mounted on moving platforms.
Sub-irrigation/seepage irrigation:	Low Risk	A method of artificially raising the water table to allow the soil to be moistened from below the plant root zone. A system of canals, weirs, gates, and pumps are used to increase and decrease water level in a network of ditches, controlling the water table. Hydroponic systems are based on the same principle.

Req.#	Requirement	DOC	MAN
F-4.1	An initial risk assessment shall be performed and documented that takes into consideration the historical testing results of the water source, the characteristics of the crop, the stage of the crop, and the method of application.	A	YES

F-4 Pre-Audit Checklist:

- Conduct a water risk assessment addressing any potential physical, chemical and biological hazards and hazard control procedures for the water distribution system.

F-5 Water Management Plan

Build your water management plan from the results of your water system risk assessment. A water management plan is a written procedure to minimize contamination risks, taking into account your water sources, your intended uses for the water, and your methods of delivery. The plan should include: water testing/sampling frequencies; acceptable microbial load limits; monitoring procedures; verification activities; corrective actions; preventive actions to avoid contamination; and documentation activities. You must review the management plan following any system changes identified in your water system risk assessment, and adjust the management plan as necessary to ensure microbial water quality.

All employees whose duties include overseeing the water system must be trained according to those responsibilities, and retrained in the event there is an oversight leading to potential contamination in the water system.

Req.#	Requirement	DOC	MAN
F-5.1	There shall be a water management plan to mitigate risks associated with the water system on an ongoing basis.	WP	YES
F-5.2	Water testing shall be part of the water management plan, as directed by the water risk assessment and current industry standards or prevailing regulations for the commodities being grown.	WP	YES
F-5.3	Water testing shall be part of the water management plan, as directed by the water risk assessment and current industry standards or prevailing regulations for the commodities being grown.	WP	YES
F-5.4	If water is treated to meet microbiological criteria, the treatment is approved and effective for its intended use, and is appropriately monitored.	R	YES
F-5.5	If post-harvest handling is used to achieve microbial criteria, Operation has documentation supporting its use.	R	YES

Req. #	Requirement	DOC	MAN
F-5.6	If Operation uses an alternative approach to regulatory microbiological testing, Operation has scientific data or information to support the alternative.	R	YES

The auditor will review the water management plan for accuracy and completeness relative to the risk assessment results. This will include verifying that a water testing program is in compliance with the risk assessment and current industry standards or prevailing regulations, and that the water testing program is outlined in the water management plan.



Photo 5: Example of a portable water treatment system used for irrigation.

The standard does not specifically dictate the target organism that your production water should be tested for; the acceptable limits for any target organism; or the frequency of testing. You must make these decisions based on your water risk assessment, and any regulatory requirements applicable to your farm. For outdoor production systems, generic *E. coli* testing, with results reported with a numeric count, not merely presence/absence, is likely the best target organism to measure.

F-5 Pre-Audit Checklist:

The water management plan must contain:

- Preventive controls
- Monitoring and verification procedures
- Corrective action plans
- Documentation of
 - Water test results
 - [Post-harvest Water Treatment and Monitoring Record](#)
 - Post-harvest handling records (to document microbial die-off or removal rates) and monitoring records
 - Supporting documentation for alternate approaches to any microbiological testing required by prevailing regulations
- Circumstances that will trigger review of the plan
- Training requirements
- Written water test procedure

What to do if You Fail Your Water Test

If testing shows a water source is failing the microbial quality standard in your food safety plan that is relevant for how you use the water, you should conduct an environmental survey to find the cause and retest the water source as soon as possible after resolving the issue. Issues to investigate could include: a crack in your well casing, a faulty well seal, contaminated runoff, wildlife contamination, or other causes.

Steps to mitigate these circumstances could include: treating the water source with an approved disinfectant; repairing the well casing; providing a riparian buffer for livestock around an irrigation pond; fencing livestock out of irrigation ponds and their drainage basins; or switching to another source of water until test results meet the acceptance criteria in your food safety plan.

A more aggressive sampling program (i.e., sampling once per week instead of once per month) may be necessary if an explanation for the contamination is not readily apparent. Do not use water from that water system in a manner that directly contacts edible portions of crops until the water can meet the outlined acceptance criteria for its use.

If treatment of the water source is necessary, the disinfectant or other treatment method must be: approved for use in treating water; delivered in a manner to ensure that the treated water is consistently safe and of adequate sanitary quality for its intended use, or consistently meets the relevant microbial quality criteria; and monitored at a frequency adequate to ensure that the treated water is consistently safe and of adequate sanitary quality for its intended use, or consistently meets the relevant microbial quality criteria.

F-6 Animal Control

Animals, whether they are your pets, wildlife or livestock, are potential sources of microbial food safety hazards for farm operations growing fresh produce. You must evaluate the risk that these hazards will result in contamination of your produce and implement prevention steps to minimize that risk.

Req. #	Requirement	DOC	MAN
F-6.1	The Operation has a written risk assessment on animal activity in and around the production area.	A	YES
F-6.2	The Operation routinely monitors for animal activity in and around the growing area during the growing season.	R	YES
F-6.3	Based on the risk assessment, there shall be measures to prevent or minimize the potential for contamination from animals, including domesticated animals used in farming operations.	WP, R	YES