

Part 1

FARM REVIEW

Part 1 is the Farm Review scope of the audit. This includes the farming operations pertaining to water usage, sewage and its treatment, presence of animals and livestock, use of manure and biosolids and land use history. All farming operations must be reviewed under these questions. It will be necessary to physically visit each crop production area. The audit shall take place during the growing season. One visit may be sufficient for a crop production area when more than one similar commodity or crop is grown on the farm.

All questions covered in the General Questions Section are applicable to this section. If a passing score is not attained in the General Questions Section as the questions pertain to a Farm Review, then the auditee does not meet the minimum requirements for a Farm Review.

Water Usage

Water use in crop production involves numerous field operations including irrigation, applications of pesticides and fertilizers, cooling, and frost control. Inadequate water quality has the potential to be a direct source of contamination and a vehicle for spreading localized contamination in the field, facility, or transportation environments.

Wherever water comes in contact with fresh produce, its quality dictates the potential for pathogen contamination. If pathogens survive on the produce, they may cause food borne illness.

Water can be a carrier of many microorganisms including pathogenic strains of *Escherichia coli*, *Salmonella* spp., *Vibrio cholerae*, *Shigella* spp., *Cryptosporidium parvum*, *Giardia lamblia*, *Cyclospora cayetanensis*, *Toxoplasma gondii*, and the Norwalk and Hepatitis A viruses. Even small amounts of contamination with some of these organisms can result in food borne illness. The quality of water, how and when it is used, and the characteristics of the crop influence the potential for water to contaminate produce. In general, the quality of water in direct contact with the edible portion of produce may need to be of better quality compared to uses where there is minimal

contact. Other factors that influence the potential for contact with waterborne pathogens, and their likelihood of causing food borne illness, include the condition and type of crop, the amount of time between contact and harvest, and post-harvest handling practices. Produce that has a large surface area (such as leafy vegetables) and those with topographical features (such as rough surfaces) which foster attachment or entrapment may be at greater risk from pathogens, if they are present, especially if contact occurs close to harvest or during post-harvest handling. Some sectors of the produce industry use water containing antimicrobial chemicals to maintain water quality or minimize surface contamination.

Water usage on the farm includes irrigation and chemical applications of the product. Auditors must consider the water source and usage when assessing the following statements.

- *What is the source of irrigation water? (Pond, Stream, Well, Municipal, Other)*

Please specify: _____

The farm water source should be shown here. When there are multiple sources, all must be listed. If the irrigation source and the source of chemical application spray water is the same, one statement will be sufficient. If the sources are different, auditors must explain.

- *(1-2) How are the crops irrigated? (Flood, Drip, Sprinkler, Overhead, Other)*

Please specify: _____

The irrigation method and the type of crop will have an effect on the potential for microbial contamination. In order to help assess the potential, auditors must list the irrigation method. Be specific and list all methods if the farm uses multiple methods.

Water Quality Risks - Sources, Testing and Treatment

	Questions	Points	YES	NO	N/A	Doc
1-3	A water quality assessment has been performed to determine the quality of water used for irrigation purposes on the crop(s) being applied.	15				D
1-4	A water quality assessment has been performed to determine the quality of water used for chemical application or fertigation method.	15				D

Farming operations must have knowledge of their water quality in order to determine whether or not the product could become contaminated through irrigation or chemical spraying. Water which comes into contact with the product must not be contaminated with microbial organisms.

Drip irrigation methods or those where the water does not touch the crop are less likely to promote potential contamination than flood irrigation methods. Irrigation with sprinkler methods where the water sprinkles or drenches the crop can be the most risky for causing contamination, especially if the water quality is unknown.

Municipal water sources are viewed as the least likely to be contaminated. Well water that is not regularly tested has a medium to high risk of causing contamination. Surface water has the highest risk of contamination.

Municipal water supplies are regulated by law and are generally required to be potable. Well water may not be potable and may not be microbially safe. Surface water is subject to various uncontrollable influences and shall be considered nonpotable without further testing or treatment to show that the water quality is adequate for its intended use.

The following further discusses testing schedules for sources of farm water.

- Municipal water: Acquire test results from the local water authority annually.
- Well water: Test at a minimum annually and treat the well if fecal coliforms are present. If the well casing is secure and well-maintained, and if livestock and manure storages are excluded from the well recharge and pumping area, then the risk of contamination is greatly reduced.
- Surface water: Test quarterly in warm climates such as California, Florida, Texas and other southern states. 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.

Auditors need to evaluate many factors when answering these two questions. It is never the intent that potable or microbially safe water should be used in every water application on the farm. Chemical applications or irrigation that occur prior to the crop being planted or if the crop is dormant (such as tree fruit) does not require potable water. However chemical or irrigation applications that occur just prior to the crop being harvested must use microbially safe water. Auditors must review the irrigation and spray methods and determine whether or not the auditee has performed a risk assessment regarding the suitability of the spray or irrigation water. Questions 1-3 and 1-4 shall be answered N/A if no irrigation or spray applications are made on the crop.

	Questions	Points	YES	NO	N/A	Doc
1-5	If necessary, steps are taken to protect irrigation water from potential direct and non-point source contamination.	15				

Farming operations should evaluate their surroundings and evaluate the potential of both internal and external sources of contamination to their water source(s). Farms should look at the production areas in terms of their proximity to surrounding land uses that pose a potential for polluted runoff, and take steps to minimize the pollution from contaminating their water source, by use of berms,

swails, diversions, etc. Testing the water until it is known to be adequate, treatment of the water with filtration and/or chemical means or protection of the source from animals or other pollutant sources by fencing or other means may provide sufficient steps to maintain a quality source.

Auditors must secure additional information in the form of documentation of testing or observation of premises in order to answer this question correctly. This statement can only be answered N/A when there is no need to further protect the water supply and no water is being used to irrigate, fertigate or spray the product.

Sewage Treatment

Treatment methods may be municipal treatment or septic systems. Municipal or commercial treatment systems are designed for treatment of large volumes of sewage, such as that generated by small towns to large cities. Septic systems are designed to treat small volumes of sewage, such as that amount coming from a single farm house or facility.

Treating any farm sewage through a municipal system reduces the possibility of contaminating water from wells or other sources. Municipal systems also have regular testing and treatment procedures in place. If the septic system is near the water source, there is a contamination potential, especially if the water source is not sealed.

	Questions	Points	YES	NO	N/A	Doc
1-6	The farm sewage treatment system/septic system function properly and there is no evidence of leakage or runoff.	15				

Most treatment systems consist of a simple septic tank system consisting of a holding tank for solids and leach lines for liquids. If it appears that the system is sealed and there are no leaks near the tank or within the leach field, then it will be considered as functioning properly. If a public

sewage line is present, and the line shows no evidence of leakage, the points can be awarded for this question.

This statement may be answered N/A with a proper explanation in the COMMENTS section if there is no sewage treatment system on the facility operation or sewage treatment is not required. An example of this would be a field or location that is "just a field" with no standing buildings or sewage treatment connections on site. If there is no sewage to treat, this question may be answered N/A.

	Questions	Points	YES	NO	N/A	Doc
1-7	There is no municipal/commercial sewage treatment facility or waste material landfill adjacent to the farm.	10				

This statement shall be answered YES if no municipal or commercial sewage treatment facility is adjacent to the farm. Adjacent means approximately 1/4 mile or closer.

Animals/Wildlife/Livestock

While it is not possible to completely exclude animal life from all fresh produce production areas, many field programs include elements to protect crops from animal damage. Growers should review existing practices and conditions to assess the potential for significant amounts of uncontrolled deposits of animal feces coming into contact with crops. Good agricultural practices for minimizing hazards from livestock include but are not limited to:

- Exclusion of domestic animals from fresh produce fields, vineyards and orchards during the growing season. This would include pet dogs, goats, sheep, cows, horses, fowl, etc.
- Depending on the operation, good management practices may include keeping livestock confined (e.g., in pens or yards) or preventing their entry into fields by using physical barriers such as fences.

- Ensure that animal waste from adjacent fields or waste storage facilities does not contaminate the production area.

Growers should determine whether surrounding fields and farms are used for animal production. They may need to consider measures to ensure that animal waste from adjacent fields or waste storage facilities does not contaminate the produce production areas during heavy rains, especially if fresh produce is grown in low-lying fields or orchards. Measures might include physical barriers, such as ditches, mounds, grass/sod waterways, diversion berms, and vegetative buffer areas that prevent flowing or splashing water from contaminating crops.

High concentrations of wildlife (such as deer or waterfowl in a field) or domestic animals (cows, sheep, horses, fowl) may increase the potential for microbial contamination by significant or uncontrollable amounts of fecal material.

Control of wild animal populations in the field may be difficult, especially where crop production areas are adjacent to wooded areas, open meadows, and waterways. It is important for the auditor to be aware that fencing, vegetation removal, and destruction of habitat may result in adverse impact to the environment. As always, auditors are not to make any recommendations or suggestions. They should refer the auditee to check for local, state and federal laws that protect riparian habitat, restrict removal of vegetation or habitat, or restrict construction of wildlife deterrent fences in riparian areas or wildlife corridors.

	Questions	Points	YES	NO	N/A	Doc
1-8	Crop production areas are not located near or adjacent to dairy, livestock, or fowl production facilities unless adequate barriers exist.	15				

Currently, there is not any conclusive science to validate the exact distance needed between crop production areas and sources of potential contamination. Auditors need to use their best judgment and be observant to the presence of dairy or livestock production facilities, including feedlots (beef, swine, chickens, etc.). Concentrated feeding operations are defined by EPA and will have

bare ground not covered by vegetation. When these types of facilities are within approximately one to two miles of the crop production area, factors such as topography, wooded areas or other natural barriers shall be taken into consideration when answering this question. For example, if the farm being audited sits on top of a hill and a dairy operation is downwind at the bottom of the hill, the distance between the two operations can be closer than if the farm locations were reversed. As a guide, if crop production areas are closer than 1 mile to an animal production area and no natural barriers exist, this question shall be answered NO. For enclosed greenhouses the auditor should consider the type of barriers in place (grass, slope, trees, etc.).

	Questions	Points	YES	NO	N/A	Doc
1-9	Manure lagoons located near or adjacent to crop production areas are maintained to prevent leaking/overflowing, or measures have been taken to stop runoff from contaminating the crop production areas.	10				

Where it is possible that manure lagoons from adjacent or close dairy or livestock facilities can be a possible source of contamination, operations must take some measures to prevent the contamination.

Lagoons must be of sufficient construction to prevent leaking or overflowing or operations must protect the crop growing area. Measures might include physical barriers, such as ditches, mounds, grass/sod waterways or diversion berms. In locations where the farming operation is on higher elevation ground than the lagoon, there will be little need for such barriers, as the elevation is a barrier itself.

This statement shall be answered N/A, when there are no near or adjacent manure lagoons.

	Questions	Points	YES	NO	N/A	Doc
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1-10	Manure stored near or adjacent to crop production areas is contained to prevent contamination of crops.	10				
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Manure is a major source of potential contamination. Manure storage areas should be constructed to contain any potential leaching and runoff from entering the crop production areas.

	Questions	Points	YES	NO	N/A	Doc
1-11	Measures are taken to restrict access of livestock to the source or delivery system of crop irrigation water.	10				

In certain cases, it is possible that livestock may have access to the source of the water supply (wellhead area or pond/stream) or to the delivery system (canal/ditch). Where this is the case, operators should take measures to keep such livestock away. Where there are only a few head of livestock and access is random, they should not come within approximately 200 feet of the water source.

This statement shall be answered N/A, when there are no livestock present or dairy/livestock production facilities are not adjacent or nearby.

	Questions	Points	YES	NO	N/A	Doc
1-12	Crop production areas are monitored for the presence or signs of wild or domestic animals entering the land.	5				R

Regularly completed "notes," "scouting lists," or "crop maintenance reports" may include this information. This task does not need to be completed on a daily basis, but a regular schedule that shows the producer has an awareness of the animal populations in the production areas. This question may only be answered N/A for fully enclosed greenhouses.

	Questions	Points	YES	NO	N/A	Doc
1-13	Measures are taken to reduce the opportunity for wild and/or domestic animals from entering the crop production areas.	5				R

Farming operations are never going to be able to completely exclude wild and/or domestic animals from entering crop production areas. However, every effort should be made to limit the access to the production areas. Ideally, when there are only a few animals on adjacent land, there is a low risk of contamination. Occasional entry by normally seldom seen animals is tolerable.

When needed, measures should be taken to reduce the entry into crop production areas by wild and domestic animals, including poultry and pets. This can be accomplished many ways, which can include such items as noise cannons or scare balloons to scare away birds and migratory water fowl, or fencing or other barriers to limit wildlife access. Auditors should understand that federal, state, or local environmental laws or policies may regulate certain species of animals, and that producers may have limited options for their control.

Where there is open entry on a frequent basis or an operation has allowed frequent visits by wild or domestic animals without a positive attempt of deterrence, there is a greater likelihood of fecal contamination and this question must be answered NO.

This statement may be answered N/A only when monitoring verifies there is very infrequent or no animal entry and it is not necessary to take proactive measures to deter or stop access. If question 1-12 is answered N/A then this question shall also be answered N/ A.

When farm service animals horses oxen and mules are used an operation shall address possible sources of contamination caused b these animals and remediation that will be taken if the cause an contamination through a risk assessment and documented SOP's to control those risks.

Manure and Municipal Biosolids

Animal manure and human fecal matter represent a significant source of potential contamination. Properly treated manure or biosolids can be an effective and safe

fertilizer. Untreated, improperly treated, or recontaminated manure or biosolids used as a fertilizer, used to improve soil structure, or that enters surface or ground waters through runoff, may contain pathogens of public health significance that can contaminate produce. Crops in or near the soil are most vulnerable to pathogens which may survive in the soil. Low growing crops that may be splashed with soil during irrigation or heavy rainfall are also at risk if pathogens in manure persist in the soil. Produce where the edible portion of the crop generally does not contact soil is less at risk of contamination provided that produce that does contact the ground (e.g., windfalls) is not harvested. As with agricultural water, physical characteristics of produce that foster entrapment or attachment also affect risk.

Growers using manure or biosolids need to follow good agricultural practices to minimize microbial hazards. Growers also need to examine their specific growing environment to identify obvious sources of fecal matter that could be a source of contamination. When answering the section on manure/biosolids, please follow title instructions as outlined below and on the checklist.

Manure and Municipal Biosolids

Please choose one of the following options as it relates to the farm operation:

_____ Option A. Raw manure or a combination of raw and composted manure is used as a soil amendment.

_____ Option B. Only composted manure/treated municipal biosolids are used as a soil amendment.

_____ Option C. No manure or municipal biosolids of any kind are used as a soil amendment.

Only answer the following manure questions (questions 1-14 to 1-22) that are assigned to the Option chosen above. DO NOT answer the questions from the other two options. The points from the manure and municipal biosolids are worth 35 of a total 190 points, and answering questions from the other two options will cause the points to not calculate correctly.

Option A: Raw Manure

	Questions	Points	YES	NO	N/A	Doc
1-14	When raw manure is applied, it is incorporated at least 2 weeks prior to planting and a minimum of 120 days prior to harvest.	10				R

1-15	Raw manure is not used on commodities that are harvested within 120 days of planting.	10				R
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DO NOT harvest vegetables or fruits until 120 days after raw manure application. Remember to document rates, dates, and locations of manure applications.

If it is necessary to apply manure or slurry to vegetable or fruit soil, incorporate it at least two weeks prior to planting and observe the 120-day pre-harvest interval. If the 120-day waiting period is not feasible, such as for short season crops like lettuce or leafy greens, apply only properly composted manure.

Auditors must assess whether or not raw manure is properly used, according to the recommendations. They must review manure application records in order to adequately answer

this question.

	Questions	Points	YES	NO	N/A	Doc
1-16	If both raw and treated manure are used, the treated manure is properly treated, composted or exposed to reduce the expected levels of pathogens	10				R

In a farming operation that uses both raw and composted manure, it will be necessary to review documentation to verify that the manure has been properly treated to kill pathogens. See question 1-18 for specific composting information. This question may be answered N/A if no composted/treated manure is used.

	Questions	Points	YES	NO	N/A	Doc
1-17	Manure is properly stored prior to use.	5				

Any untreated manure that is stored at the facility must be stored in a way that ensures that it does not leach or runoff into adjacent crop production areas. The auditor should investigate to verify that raw manure cannot contaminate treated manure.

Option B: Composted Manure

	Questions	Points	YES	NO	N/A	Doc
1-18	Only composted manure and/or treated biosolids are used as a soil amendment.	10				R

Records shall be reviewed to verify that only com posted manure or biosolids are used. If any raw manure is used, the auditor shall not use this option and use the questions for option A.

	Questions	Points	YES	NO	N/A	Doc
1-19	Composted manure and/or treated biosolids are properly treated, composted, or exposed to environmental conditions that would lower the expected level of pathogens.	10				D

There are various methods used to treat manure so that it is safer as a fertilizer than raw manure. The following discussion is from "The Guide."

2.1.1 Passive treatments

Passive treatments rely primarily on the passage of time, in conjunction with environmental factors, such as natural temperature and moisture fluctuations and ultraviolet (UV) irradiation, to reduce pathogens.

To minimize microbial hazards, growers relying on passive treatments should ensure manure is well aged and decomposed before applying to fields. Holding time for passive treatments will vary depending on regional and seasonal climatic factors and on the type and source of manure.

Passive treatments such as aging should not be confused with actively managed treatments such as composting.

2.1.2 Active treatments

Active treatments generally involve a greater level of intentional management and a greater input of resources compared with passive treatments. Active treatments include pasteurization, heat drying, anaerobic digestion, alkali stabilization, aerobic digestion, or combinations of these.

Composting is an active treatment commonly used to reduce the microbial hazards of raw manure.

It is a controlled and managed process in which organic materials are digested, aerobically or anaerobically, by microbial action. When composting is carefully controlled and managed, and the appropriate conditions are achieved, the high temperature generated can kill most pathogens

in a number of days. Thus, the risk of microbial contamination from composted manure is reduced compared to untreated manure.

Composting should not be confused with simpler passive treatments such as aging. In general, passive treatments, such as aging, will require a significantly longer period of time to reduce microbial hazards compared to active treatments which expose pathogens to lethal conditions, such as high temperature or high pH. In addition, much of the research on the composting of manure and application of manure to field crops has focused on the effects of different practices on soil fertility and crop quality.

Research on pathogen survival in untreated manure, treatments to reduce pathogen levels in manure, and assessing the risk of cross-contamination of food crops from manure under varying conditions is largely just beginning. Some pathogens tolerate higher temperatures than others. In addition, management practices required to achieve the time and temperature necessary to eliminate or reduce microbial hazards in manure or other organic materials may vary depending on seasonal and regional climatic factors (such as ambient temperature and rainfall) and on the specific management practices of an individual operation.

Auditors must review any documentation that indicates the product has been sufficiently treated to

	Questions	Points	YES	NO	N/A	Doc
1-20	Composted manure and/or treated biosolids are properly stored and are protected to minimize recontamination.	10				

reduce process explanations and microbial testing reports for active treatment methods. the pathogens. This would include time charts for passive type treatment or time and temperature charts,

Products used to fertilize fruit or vegetable crops may not be stored at the production/application site prior to use. In some cases, they may be brought directly from the treatment site and applied from the same conveyance at the time of delivery.

When they are delivered to the production site and stored for future application, they must be properly stored to reduce recontamination and the likelihood of contaminating the production area or adjacent fields. Growers may use the following methods to reduce potential contamination.

Consider barriers or physical containment to secure manure storage or treatment areas where contamination from runoff, leaching, or wind spread is a concern. Physical containment may include concrete block or soil berms, pits, or lagoons. Practices such as storage on concrete slabs or in clay lined lagoons may reduce the potential of leachate entering groundwater. Such storage must be away from irrigation, spray dilution or processing water sources.

Consider good agricultural practices to minimize leachate from manure storage or treatment areas contaminating produce. Rainfall onto a manure pile can result in leachate, potentially containing pathogens. Growers may want to consider covering manure piles, such as storing manure under a roof or covering piles with an appropriate covering.

Alternatively, growers may consider collecting water that leaches through manure that is being stored or treated. Collecting leachate allows the grower to control its disposal (e.g., on a vegetative grassway) or use (e.g., to control moisture during composting). Leachate may pose a microbial hazard similar to the manure from which it originates. Growers using manure leachate or manure tea in fresh produce production areas should follow good agricultural practices, such as maximizing time between application and harvest, to minimize microbial hazards.

Auditors must complete a site review when manure or biosolid materials are stored on site prior to application.

	Questions	Points	YES	NO	N/A	Doc
1-21	Analysis reports are available for composted manure/ treated biosolids.	5				R

Natural fertilizers, such as composted manure, and fertilizers containing natural components, should be processed and handled in a manner to reduce the likelihood of introducing pathogens into produce production areas. Growers and manure suppliers should apply good agricultural practices that ensure that all materials receive an adequate treatment, such as thorough mixing and turning outside edges into the center of a compost pile. Cold spots or other pockets that do not receive an adequate treatment can cause recontamination of the rest of the batch. Growers treating or composting their own manure should have some type of procedure to follow. Growers purchasing manure should obtain a specification sheet from the manure supplier for each shipment of manure containing information about the method of treatment. Auditors shall review specification sheets from sourced manure in order to answer this question. This question cannot be answered *N/A*.

Option C: No Manure/Biosolids Used

	Questions	Points	YES	NO	N/A	Doc
1-22	No animal manure or municipal biosolids are used.	35				P

This option shall only be used if no manure (raw or treated) or biosolids are used on the farm.

Soils

	Questions	Points	YES	NO	N/A	Doc
1-23	A previous land use risk assessment has been performed.	5				R

Auditors should review the previous land use history with the operator.

	Questions	Points	YES	NO	N/A	Doc
1-24	When previous land use history indicates a possibility of contamination, preventative measures have been taken to mitigate the known risks and soils have been tested for contaminants and the land use is commensurate with test results.	10				R

In most cases the land will have been used as crop land or fallow land for many previous years. There is a minimum risk of contamination if there is no recent dumping, use as a dairy, livestock, or poultry feedlot or no evidence of improper use of animal wastes. Auditor should visually look for evidence of old building sites or other risk factors when on site. Recent land use history may indicate that the land was used as a dairy, feedlot or other waste site. Operators should have the soil tested for microbial contaminants and adjust their use of the land for crops that will have minimal contact with the soil.

If the land use history assessment does not indicate a possibility of contamination, this question shall be answered N/A.

	Questions	Points	YES	NO	N/A	Doc
1-25	Crop production areas that have been subjected to flooding are tested for potential microbial hazards.	5				R

Flood waters can carry potential contamination from areas outside the crop production areas and spread it over a wide area. Fields that have been flooded should be tested for harmful pathogens prior to use to determine the suitability of its use. In answering this question, auditors should consider whether the crop is an annual that will be planted and harvested in the same season, or a perennial that will be planted but not harvested for several seasons, as the annual crops are at greater risk than perennial crops. Auditors should observe site for signs of flooding or locations where flooding could easily occur such as along stream beds, swamps, etc., and ask if/when flooding last occurred. This question may be answered N/A if no flooding has occurred on the farm.

	Questions	Points	YES	NO	N/A	Doc
1-26	Each production area is identified or coded to enable traceability in the event of a recall.	10				R

A map or record that shows the crops grown in each field or production area should be available. The record should allow traceability of the product forward or back to the next step in the marketing chain.

Auditors must explain all questions for which a NO or N/A answer was noted.

Any additional comments pertaining to interviewed persons or to observations made during the audit should be made here. Auditors must be specific when making comments about YES answers to questions, as an additional statement here may indicate that the question might be better

answered_NO instead.

Total points earned for PART 1 = _____.

Total Possible **= 190** *The total number of points possible for this section.*

Subtract "N/A" - _____ *Enter the additive number of N/A points (+ points) here.*

Adjusted Total = _____ *Subtract the N/A points from the Total possible points.*

Multiply the Adjusted Total by .8 and show it as the Passing Score.

Passing Score _____

(please circle one) Pass / Fail