FRUIT•A•SYST

FOR MICHIGAN PRODUCERS

FAS 104 · October 2019

Fruit•A•Syst assesses risks in the field or orchard to groundwater and surface water. It addresses nutrient, erosion, pest, irrigation and other management practices. It also identifies Right to Farm and environmental compliance issues. This assessment shows what is needed for Michigan Agriculture Environmental Assurance Program (MAEAP) Cropping System verification.

For MAEAP Verification:
Contact the MAEAP Office at the Michigan Department of Agriculture & Rural Development

(517) 284-5609

MAEAP

MICHIGAN STATE UNIVERSITY | Extension

Fruit◆A◆Syst

Cropping System Improvement Action Plan

Risk question	List high-risk practice(s) from Fruit◆A◆Syst as well as medium-risk practices that do not meet MAEAP requirements.	Required for MAEAP verification?	Alternative low-risk practice (include potential sources of technical and financial assistance).	Action plan	
				Planned completion date	Indicate date when completed
3.14	(Example) Pesticide spill clean-up kit not available in the orchard.	Yes	Acquire pesticide spill clean-up kit from water stewardship technician for pesticide application area.	March, 2019	**(√)** Completed March 1, 2019

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Fruit◆A◆Syst

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Fruit◆A◆Syst

Cropping System Improvement Action Plan (continued)

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I understand that this cropping system assessment and corresponding Cropping System Improvement Action Plan were developed on the basis that I have disclosed, to the best of my knowledge, all information pertaining to my cropping operations.

Farmstead address:

Street_____

City_____MI, Zip code_____

Watershed name:_____

Producer's signature_____Date_____

Fruit◆A◆Syst conducted by:

Name_____Title_____

Organization_____Date_____

MAEAP Verification Action Plan	Date
Target date for MAEAP verification of **Cropping System**	
Target date for MAEAP verification of **Farmstead System**	
Target date for MAEAP verification of **Livestock System**	
Target date for MAEAP verification of **Forest, Wetlands, & Habitat System**	

For MAEAP Verification - Contact MAEAP Office at the Michigan Department of Agriculture and Rural Development: 517-284-5609

Introduction

Fruit◆A◆Syst will assist growers in developing and implementing a management plan and site improvements that prevent contamination of groundwater and surface water and maintain economic crop production. Plans will be consistent with the Michigan Right to Farm identified current Generally Accepted Agricultural and Management Practices (GAAMPs) as well as applicable state and federal environmental regulations.

Nutrients used in fruit production come from chemical fertilizers and naturally occurring sources such as manure, legumes and biosolids (sewage sludge). Synthetic or naturally occurring nutrients can become mixed with surface water or groundwater by natural processes such as runoff and leaching. Nitrate contamination of groundwater and phosphorus contamination of surface water are problems in some areas of Michigan. Fruit◆A◆Syst will assess current nutrient management practices and identify alternative management practices to reduce nutrient losses to the environment.

Virtually all crops produced in Michigan may be threatened by serious pest problems – disease-producing organisms, insects and weeds. Producers are encouraged to adopt pest management practices that achieve the desired crop quality and yield while minimizing any adverse effects on non-target organisms, humans, and soil and water resources. Fruit◆A◆Syst will assess current pest management practices and identify alternative management strategies to reduce negative impacts to the environment.

The Michigan Agriculture Environmental Assurance Program (MAEAP) is a comprehensive, proactive and voluntary agricultural pollution prevention program.

Producers who complete Fruit◆A◆Syst will be able to determine what structural, management practices or record-keeping changes (if any) that will be needed for their businesses to be environmentally assured through MAEAP. After addressing the risks indicated by the Cropping System Improvement Action Plan, the producer can contact the Michigan Department of Agriculture and Rural Development (MDARD) to request Cropping System verification at (517) 284-5609. An MDARD verifier will schedule a site inspection.

P.A. 451, Part 82, ensures the confidentiality of the producer information provided to the MDARD for verification. Any information connected with the development, implementation or verification of a conservation plan or conservation practice is confidential.

The owner of a MAEAP verified Cropping System will be eligible for various incentives and can enjoy the peace of mind that comes with knowing that Cropping System practices are consistent with the identified current Right to Farm GAAMPs. Verified Cropping Systems are positioned to achieve regulatory compliance with state and federal environmental laws.

For a list of currently available incentives and information on how to get started, contact a local conservation district, MSU Extension or Natural Resources Conservation Services (NRCS) representative.

The Michigan Right to Farm Act authorizes the Michigan Commission of Agriculture and Rural Development to develop and adopt GAAMPs for farms and farm operations in Michigan. These voluntary practices are based on available technology and scientific research to promote sound environmental stewardship. The current Right to Farm GAAMPs are posted on the Michigan Department of Agriculture and Rural Development Web site: **www.michigan.gov/mdard**.

What is the Crop Assessment System for Fruit Producers?

The Crop◆A◆Syst for Fruit Producers (Fruit◆A◆Syst) is a series of risk questions that will help assess how effectively a producer's crop management practices protect groundwater and surface water resources. The risk questions are grouped in the following sections:

Cover Photos: Mirjana Bulatovic-Danilovich, Rufus Isaacs and Mark Longstroth.

	Cropping System Improvement Action Plan
1	Nutrient Management Practices
2	Soil and Water Conservation Practices
3	Pest Management Practices
4	Water Use
5	Irrigation Management Practices
6	Other Environmental Risks in the Cropping System

The answers to the risk questions indicate whether current management practices have a low, medium, or high risk of contamination. Growers are generally recommended to adopt the low-risk management practice. MAEAP local conservation district technicians or horticultural advisors can assist to make the appropriate management changes.

Responses to risk questions that address management practices that are regulated by state or federal law indicate **illegal practices with black bold print**. The numbered footnotes will indicate which regulation is violated (refer to Table 2).

Responses to risk questions that address management practices covered by the GAAMPs indicate a management practice consistent with a specific GAAMPs with ***blue bold italic print***.

A bold box indicates the management level(s) required for MAEAP verification.

MAEAP management requirements are aligned with state and federal environmental regulations. The GAAMPs and environmentally based horticultural management practices are supported by research. The records and/or evidence that indicate the approved management practices have been implemented on the farm are listed in the far right column. This evidence will provide the basis for awarding environmental assurance through MAEAP.

How Does Crop◆A◆Syst Work?

1) Select all relevant risk question sections for the fruit operation.

2) Answer the risk questions by selecting the answer that best describes management practices used on the operation. Indicate the risk level in the column to the right. Skip any questions that don't apply to the Cropping System.

Note: for MAEAP verification, complete the risk questions with a Fruit◆A◆Syst trained individual. Locate a local MAEAP conservation district technician through the county conservation district, MSU Extension, or NRCS office, or at **www.maeap.org**.

3) After completing each section of risk questions, list the practices that present a high risk of contaminating groundwater and surface water resources in the Cropping System Improvement Action Plan (printed inside the front cover of the bulletin). Also include any medium-risk practices that do not meet MAEAP verification requirements.

4) In the Cropping System Improvement Action Plan, list:

- Management practices or site improvements to be implemented that will reduce the identified risk.
- Sources of technical and financial assistance.
- Target dates for accomplishing the changes.
- Target date for MAEAP Cropping System verification.

A Few Final Words

The key to Fruit◆A◆Syst is that, once environmental risks to groundwater and surface water resources are identified, the plan is implemented to reduce the risks. Some of the stewardship practices that will reduce risks may cost very little and take very little time to implement. Other practices may involve additional cost and may not be implemented for a few years. It is important, however, to have a plan to follow. Once the plan is developed and changes are implemented to address the risks, the farm is ready for MAEAP Cropping System verification.

NUTRIENT MANAGEMENT PRACTICES

RISK QUESTION	LOW RISK – 3 (RECOMMENDED)	MEDIUM RISK – 2 (POTENTIAL HAZARD)	HIGH RISK - 1 (SIGNIFICANT HAZARD)	RECORDS OR EVIDENCE FOR MAEAP VERIFICATION	YOUR RISK
1.00) Has there ever been a formal Right to Farm complaint against the farm?	There has never been a Right to Farm complaint, or the concern was not verified, or the concern was resolved.		There was a formal Right to Farm complaint and the concern has not resolved.	Producer's verbal indication of complaint history.	
1.01) How often are fields tested for nutrient levels (P, K, Ca, Mg) and pH?	***All fields*** are ***sampled and tested*** (both tissue and soil) ***on a regular basis,*** at least every 4 years.	***All fields*** are ***sampled and tested*** (either tissue or soil) every 4 years or producer plans to bring tests up to date.	Fields have not been soil or tissue tested within the past 4 years.	Field names or map. Acres in the cropped portions of the field. Up-to-date soil test and tissue analysis reports, or schedule to bring all tests up to date.	
1.02) Do soil sampling procedures adequately represent field conditions?	One composite sample is taken from uniform field areas of less than 40 acres. For tree fruit, samples are taken from under trees (weed sprayed, cultivated or mulched areas).		One composite sample taken from areas greater than 40 acres.		
1.03) Is the soil pH maintained in the desirable range for the crop(s) being grown?	The pH is adjusted to desirable range before planting and maintained for current crop.	Soil pH is maintained and/or adjusted for current crop on the basis of soil analysis after planting.	Soil pH is not maintained in the desirable range.		
1.04) How are all sources of nutrients considered when making fertilization decisions?	***Credit taken for nutrients supplied by organic matter, legumes and manure or other biological materials*** (biosolids). Fertilizer rates are reduced accordingly.	When organic matter, legumes, manure or other biological materials (biosolids) are used, fertilizer rates are sometimes reduced.	When organic matter, legumes, manure or other biological materials (biosolids) are used, rates are not reduced.	Written records available, showing nutrient credits utilized.	

A boxed risk level indicates the level required for environmental assurance verification.
Bold Black print indicates a violation of state or federal regulation.
Bold blue italic print indicates a management practice consistent with a specified 2019 Right to Farm (RTF) Generally Accepted Agricultural Management Practices (GAAMPs).

NUTRIENT MANAGEMENT PRACTICES (CONTINUED)

RISK QUESTION	LOW RISK – 3 (RECOMMENDED)	MEDIUM RISK – 2 (POTENTIAL HAZARD)	HIGH RISK - 1 (SIGNIFICANT HAZARD)	RECORDS OR EVIDENCE FOR MAEAP VERIFICATION	YOUR RISK
1.05) How are fertilizer application rates determined?	***Consistent with Michigan State University*** (MSU) ***recommendations.*** When MSU recommendations are not available, other land-grant university recommendations developed for the region may be used. (Based on site-specific, block-by-block soil and tissue analysis.)	***Consistent with Michigan State University (MSU) recommendations,*** based on composite analysis representing the whole farm.	Fertilizer rates are not based on tissue or soil analysis.	Applications consistent with MSU recommendations (MSU soil test printout or calculated MSU recommendations on file). When MSU recommendations are not available, applications are consistent with industry standards.	
1.06) How are nutrient management plans for each field annually developed and followed?	Annual nutrient plan is developed on a block-by-block basis to meet crop nutrient needs and minimize loss of nutrients to the environment.	A nutrient plan is developed each year for each crop species. Soil or tissue tests are up-to-date.	Nutrient plan is not developed, or the same plan is used for more than four years.	Annual nutrient plan by field or crop grown.	
1.07) Is fertilizer application equipment checked for proper adjustment?	***Application equipment is checked for rate of application and placement.*** Over- and under-applications are monitored and corrected.		Application equipment is not checked.	Name of person responsible for fertilizer applicator adjustments and the dates of adjustments.	

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NUTRIENT MANAGEMENT PRACTICES (CONTINUED)

RISK QUESTION	LOW RISK – 3 (RECOMMENDED)	MEDIUM RISK – 2 (POTENTIAL HAZARD)	HIGH RISK - 1 (SIGNIFICANT HAZARD)	RECORDS OR EVIDENCE FOR MAEAP VERIFICATION	YOUR RISK
1.08) What soil nutrient management records are kept?	***Records of soil tests and tissue analysis reports and quantities of nutrients applied to individual fields*** or blocks ***are maintained.***	Partial nutrient management records are kept. Complete nutrient management records will be kept in the future, for review at time of reverification.	Minimal or no nutrient management records kept.	Three years of records – or five years, if applying manure, - or plans to begin keeping records. - Soil fertility tests and/or plant analysis results. - Previous crop grown and yield harvested. - Date(s) of nutrient application(s). - Nutrient composition of fertilizer or other material used. - Amount of nutrient-supplying material applied per acre. - Method of application and placement of applied nutrients. - The name of the individual responsible for fertilizer applicator. calibrating and the dates of calibration. - Vegetative growth and cropping history of perennial crops.	
1.09) When not in use, where are loaded planting and spray supply vehicles (trailers and trucks) parked to protect water resources from accidental fertilizer and pesticide spills and mischievous activities?	Supply vehicle is returned to a secure location when not in use. Fertilizer and pesticides are properly stored more than 150 feet down gradient from any well.		Fertilizer and pesticide (including treated seed) supply vehicle is left in an unsecured location. Or, Fertilizer and pesticides are **stored less than 150 feet from any well.**[1]	Map showing where vehicle(s) should not be parked adjacent to any well. No evidence vehicles left in an unsecured location.	

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NUTRIENT MANAGEMENT PRACTICES (CONTINUED)

RISK QUESTION	LOW RISK – 3 (RECOMMENDED)	MEDIUM RISK – 2 (POTENTIAL HAZARD)	HIGH RISK - 1 (SIGNIFICANT HAZARD)	RECORDS OR EVIDENCE FOR MAEAP VERIFICATION	YOUR RISK
1.10) Are poly tanks used as intended?	Yes, Vertical (upright) tanks are used for stationary fertilizer storage, and horizontal tanks with tie-down features are used for stationary storage and/or transportation application.		Vertical tanks are used as mobile nurse tanks or other transportation applications. Vertical tanks are designed for stationary storage.		
1.11) Are poly tanks inspected periodically for structural soundness?	Poly tanks are inspected for crazing (spider webbing) and cracking in the spring and again at the end of the season. Damaged tanks are replaced or used for water.	Poly tanks are inspected and periodically replaced as necessary	Tanks are not inspected regularly. High potential for tank failure is present.		
1.12) How are Nitrogen (N) fertilizer applications matched to the demand of the crop and the conditions of the soil?	N rates are based on tree/plant vigor, production quality, pruning practices and periodic tissue analysis, and do not exceed MSU recommendations.	N rates are based on previous practices that match inputs with plant needs, but sometimes exceed MSU recommendations.	N rates are not based on nitrogen monitoring or plant assessment and often exceed MSU recommendations.		
1.13) How are commercial Phosphorus (P) fertilization rates determined?	***Based on soil tests or plant tissue analysis using MSU recommended rates.*** If soil test exceeds 150 ppm Bray P1 (300 lb/A), P is discontinued.		P is applied without regard to soil or tissue analysis.	Commercial P management consistent with Nutrient GAAMPs.	
1.14) How often is commercial Phosphorus (P) fertilizer applied on frozen or snow-covered fields?	P fertilizer is never broadcast on frozen or snow-covered fields.	***Broadcast applications are avoided on frozen or snow-covered fields*** and are not part of the nutrient management plan.	P fertilizer is often broadcast on frozen or snow-covered fields.	Date(s) of application(s) of P fertilizers.	

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NUTRIENT MANAGEMENT PRACTICES (CONTINUED)

RISK QUESTION	LOW RISK – 3 (RECOMMENDED)	MEDIUM RISK – 2 (POTENTIAL HAZARD)	HIGH RISK - 1 (SIGNIFICANT HAZARD)	RECORDS OR EVIDENCE FOR MAEAP VERIFICATION	YOUR RISK
MANURE MANAGEMENT PRACTICES (IF MANURE IS NOT USED, SKIP THIS SECTION.)					
1.15) What manure management records are maintained?	Complete application ***records of manure analysis, soil test results and rates of manure application for individual fields are maintained.***	A minimum of one season of manure application records, or partial application records have been kept. Complete manure application records will be kept immediately and will be available for review at the time of reverification.	Minimal or no records are maintained.	Additional nutrient management records that are needed if manure is used in the cropping system: - Dates(s) of manure application and incorporation, when applicable - Rate of manure application - Weather conditions during application of manure - Field conditions during application of manure - Manure/wastewater quantities produced and nutrient analysis results - Records of rental or other agreements for application of manure/wastewater on land not owned by the producer - Records of manure/wastewater sold or given away to other landowners	
1.16) How is the nutrient content of manure determined?	***Laboratory analysis for percent dry matter (solids), ammonium N, and total N, P and K.***	Book values or standard nutrient content values used.	Manure nutrient content is unknown or not considered.	All manure analysis or book values on file.	
1.17) How are desired manure application rates achieved?	Manure analysis (book value, manure test or mass balance) and ***field application rates are known.***		Manure application rate is not known.	Rate of manure applied known for all spreaders. Records indicate date of calibration.	

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NUTRIENT MANAGEMENT PRACTICES (CONTINUED)

RISK QUESTION	LOW RISK – 3 (RECOMMENDED)	MEDIUM RISK – 2 (POTENTIAL HAZARD)	HIGH RISK - 1 (SIGNIFICANT HAZARD)	RECORDS OR EVIDENCE FOR MAEAP VERIFICATION	YOUR RISK
MANURE MANAGEMENT PRACTICES (IF MANURE IS NOT USED, SKIP THIS SECTION.)					
1.18) How is manure, and/or compost, generally applied to fields?	***Manure, and/or compost, is incorporated within 48 hours or injected into the soil, and/or conservation practices*** (residue management, perennial crops, cover crops, etc.) ***are used to protect against runoff and erosion losses to surface waters.***	Manure, and/or compost, is generally surface applied and conservation practices are employed to reduce the risk of runoff.	Manure, and/or compost, is applied in a manner that results in ponding, soil erosion losses, or manure runoff to adjacent property, drainage ditches or **discharge directly to surface water.**[4]	Manure, and/or compost, application records.	
1.19) How are streams, wetlands, farm ditches and other water bodies protected from manure runoff?	***Manure is incorporated within 48 hours or injected. Or, surface applications are not done within 150 feet of surface water.*** Or, filter strips, riparian buffer strips, and other conservation practices are maintained between fields and surface waters on the farm and around surface water inlets.	Conservation practices are maintained on some fields.	Manure is applied within 150 feet of surface waters and not incorporated without conservation practices. And/or manure occasionally reaches neighbor's property.	Field maps with setbacks identified. Records of manure incorporation.	
1.20) How are manure Nitrogen (N) application rates managed?	***Manure and N fertilizer are applied at rates that do not exceed the N requirements of the crop*** and are credited toward fertilizer needs.	Manure N credits are considered but not to their full extent.	Commercial N is not reduced to account for manure nitrogen credits.	Manure rates do not exceed crop N needs, consistent with GAAMPs.	
1.21) How are manure Phosphorus (P) application rates managed?	***High testing fields (>150 ppm Bray P1) do not receive manure, and fields between 75 and 150 ppm P receive no more than four years, crop P removal, if one-year application is impractical.***	High testing fields (>150 ppm Bray P1) removed from spreading plan, but crop removal rates are not followed.	Manure application rates are not based on soil tests and/or crop removal rates.	Manure rates do not exceed crop P needs. If developing a Crop Nutrient Management Plan (CNMP), refer to USDA-NRCS 590 Standard.	
1.22) How is manure, and/or compost, <u>temporarily</u> stockpiled in relation to surface water?	***Manure stockpiles are kept at least 150 feet from surface waters or areas subject to flooding unless conservation practices are used to protect against runoff and erosion losses to surface waters.***		Manure stockpiles closer than 150 feet to surface waters or areas subject to flooding, and conservation practices are not used to protect against **runoff and erosion losses to surface waters.**[4]	Appropriate temporary manure stockpiling management demonstrated.	

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NUTRIENT MANAGEMENT PRACTICES (CONTINUED)

RISK QUESTION	LOW RISK – 3 (RECOMMENDED)	MEDIUM RISK – 2 (POTENTIAL HAZARD)	HIGH RISK - 1 (SIGNIFICANT HAZARD)	RECORDS OR EVIDENCE FOR MAEAP VERIFICATION	YOUR RISK
MANURE MANAGEMENT PRACTICES (IF MANURE IS NOT USED, SKIP THIS SECTION.)					
1.23) In the field, what management practices are used to reduce odors and pests from manure temporarily stockpiled?	***Stockpiled manure is at least 150 feet away from non-farm homes and stockpiled manure is covered with a tarp, straw, woodchips or other materials or additives are used to reduce odors and pests.***	***Stockpiled manure is at least 150 feet away from non-farm homes.***	Stockpiled manure is closer than 150 feet to non-farm homes.	Appropriate temporary manure stacking management demonstrated.	
1.24) How long is manure stockpiled in the field?	***Manure is spread as soon as field and weather conditions allow, and does not exceed six months; or twelve months if covered with an impermeable cover.***		Manure stockpiled for more than six months without a cover, or more than twelve months with an impermeable cover.	Appropriate temporary stockpiling management demonstrated.	
1.25) How are fields selected for spreading on frozen and snow-covered ground?	No applications on frozen or snow-covered ground without injection or incorporation.	Manure application risks index (MARI) has been completed for each field receiving manure on frozen or snow-covered ground. Frozen or snow-covered fields receiving manure have met MARI criteria for Low or Very Low rating and ***no liquid manure is applied on slopes greater than 3%, and no solid manure is applied to slopes over 6%.***	Applications are made to fields where runoff to water resources may occur.	MARI completed for each field receiving winter manure application, or spreading plan does not include winter spreading.	
1.26) How are field tiles managed to prevent manure discharge to surface water?	***Liquid manure is prevented from reaching tile lines.*** Management practices are in place to prevent runoff to surface inlets. Tile line outlets are monitored.		Tile outlets are not monitored for manure discharge.	Tiled fields identified on map. Records of tile flow before and after application (flow, rate, color and odor).	

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NUTRIENT MANAGEMENT PRACTICES (CONTINUED)

RISK QUESTION	LOW RISK – 3 (RECOMMENDED)	MEDIUM RISK – 2 (POTENTIAL HAZARD)	HIGH RISK - 1 (SIGNIFICANT HAZARD)	RECORDS OR EVIDENCE FOR MAEAP VERIFICATION	YOUR RISK
MANURE MANAGEMENT PRACTICES (IF MANURE IS NOT USED, SKIP THIS SECTION.)					
1.27) How are manure applications managed to prevent any food safety risk(s)?	Manure application records document manure is incorporated and applied 270 or more days prior to harvest.	Manure application records document manure is incorporated and applied 120 or more days prior to harvest.	Manure is applied less than 120 days prior to harvest.	Note: USDA Good Agricultural Practices ≥120 days before harvest. The Food Safety Modernization Act currently recommends using the National Organic Program guidelines for raw manure pre-harvest application interval.	
1.28) How are biosolids with pathogens prevented from contacting crops grown for human consumption?	Biosolids are not used on crops grown for human consumption or biosolids with pathogens present (Class B biosolids) are applied only to non-bearing trees and plant areas, or harvest restrictions are followed. (Class A biosolids are essentially pathogens free with no restrictions for land application. Class B biosolids have low levels of pathogens and have restrictions and harvest intervals when land applied.)		**Biosolids with pathogens present (Class B biosolids) are applied to active fruit production areas without regard to harvest restrictions.**[4]	Application records kept for Biosolids applications and can be compared with fruit production records.	
1.29) Has nutrient content information on the biosolids applied to the farm been received?	Received laboratory analysis for percent dry matter (solids), ammonium N (NH4-N), and total N, P and K, and utilize nutrient credits when planning nutrient program.		Have not received any biosolids analysis information.	Biosolids analyses on file.	
1.30) How are the rates of biosolids (in gallons or dry tons per acre) and applied biosolids nutrients known?	Received actual biosolids application rates from the biosolids generator or its land application contractor. Nutrient rates are consistent with MSU recommendations.		Have not received any biosolids rate or nutrient application information.	Biosolids application rates on file.	

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Soil and Water Conservation Practices

Risk Question	Low Risk – 3 (Recommended)	Medium Risk – 2 (Potential Hazard)	High Risk - 1 (Significant Hazard)	Records or Evidence for MAEAP Verification	Your Risk
2.01) Have environmentally sensitive areas been identified (land near surface water, highly erodible soils, soils with high leaching or runoff potentials, wells, surface drains and inlets) that require additional management when applying nutrients and pesticides?	Environmentally sensitive areas are identified. Family members, employees, and contractors are aware of and understand the management practices to protect these areas.	Some environmentally sensitive areas are identified.	Environmentally sensitive areas are not considered.	Areas identified on field maps with appropriate management or setbacks. -Next to surface waters -Fields with shallow groundwater -Fields with water wells -Areas near surface water inlets -Fields with highly erodible soils -Fields with highly leachable soils -Fields with high runoff potential Training/communications plan to inform workers and contractors of appropriate management or setbacks.	
2.02) Is soil erosion under control on the farm fields?	Soil erosion losses are within tolerances as documented by the revised universal soil loss equation (RUSLE2) and the Wind Erosion Prediction System (WEPS). Minimal evidence of erosion and no evidence of erosion of concentrated water flows. Cover crop may be in place.	RUSLE2 and WEPS are run on fields that are not: In pasture or hay ground, or no-till planting systems. Receiving fall tillage, with >30% residue on less than 12% slopes. Receiving more than one pass fall tillage that leaves fields rough with >40% residue and less than 8% slopes. And regardless of fall tillage, spring tillage leaves > 20% residue. And for all of the above there is no evidence of sheet, rill or gully erosion.	Excessive soil erosion is occurring on the farm.	RUSLE2 and WEPS calculations completed and on file.	

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Soil and Water Conservation Practices (continued)

Risk Question	Low Risk – 3 (Recommended)	Medium Risk – 2 (Potential Hazard)	High Risk - 1 (Significant Hazard)	Records or Evidence for MAEAP Verification	Your Risk
2.03) Are all streams, wetlands, farm ditches, and other bodies of water on the farm protected from polluted runoff and sediment with conservation practices?	Filter strips, riparian buffer strips, grassed waterways and other conservation practices are maintained between fields and all surface waters on the farm.	Conservation practices are maintained on some fields.	No conservation practices are maintained. Farm is immediately next to surface waters, drainage ditches and roads.		
2.04) Are cover crops planted to prevent soil erosion, trap nutrients and pesticides, and improve soil quality?	Cover crops are included in the crop rotation to protect soil and water resources and control erosion.	Cover crops are used occasionally.	Cover crops are not used.		
2.05) Are soil quality indicators evaluated?	Soil quality indicators (e.g., earthworm populations, water infiltration rates, soil compaction, percent plant and residue cover, pH, cation exchange capacity [CEC] and percent organic matter) are evaluated on all fields.	Some soil quality indicators are evaluated.	No soil quality indicators are evaluated.		
2.06) Are conservation and management practices routinely inspected and evaluated?	Owner or trained individual routinely inspects and evaluates conservation and management practices.	Conservation and management practices are informally evaluated during field operations.	Practices are not inspected nor evaluated.		

Pest Management Practices

Continuing Education and Knowledge					
3.01) How does the grower stay current on new pest management practices and strategies for weeds, insects and diseases?	Attend educational meetings, read educational materials provided by the university or other reliable sources. At least one new pest management practices adopted on a trial basis each year.	Occasionally attend educational meetings and read new pest management materials.	Rely on outdated pest management practices.		

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Pest Management Practices (continued)

Risk Question	Low Risk – 3 (Recommended)	Medium Risk – 2 (Potential Hazard)	High Risk - 1 (Significant Hazard)	Records or Evidence for MAEAP Verification	Your Risk
Pest Prevention and Avoidance					
3.02) Does the grower consult with a pest management consultant or service during the growing season?	Employs and independent crop consultant throughout the growing season that is knowledgeable of IPM. OR, Utilizes public reports and services from the university, local agribusiness or other reliable providers.		Relies on outdated pest management practices.		
3.03) Does the grower review previous growing season pest management activities and results?	Previous pest populations, pest suppression activities/pesticide usage and crop yield/injury are reviewed. Records used for future pest management plans.	No.			
3.04) When available, are certified seed or plant materials (tubers, crowns, transplants, etc.) used that are insect, weed and disease-free?	Certified or quality seed and planting materials used whenever possible.	Bin-run or uncertified planting material that is cleaned and treated.	Use saved seed or planting materials that is untreated and potentially infected with insects, weed and/or disease pests.		
3.05) Are crops (and plant families) rotated to break pest cycles and to maximize crop yields?	Three year or longer rotations are utilized to break pest cycles and to reduce the need for pest suppression practices.	Short (< 3 year) rotations are utilized because of intensive cropping systems. Cover crops utilized whenever possible to improve system.	No rotation followed. Continuous cropping system results in increased pest pressures and reduced yields.		
3.06) Are pest resistant and tolerant varieties planted?	Pest resistant and tolerant varieties are planted when available.	Varieties without resistance and tolerance are planted, resulting in the need for pest suppression practices.			
Monitoring					
3.07) Are fields scouted for pests during the growing season?	All fields are scouted on a weekly schedule, by a qualified individual trained in IPM. Scouting reports and records are filed.	Fields are scouted at critical times, but not on a weekly basis.	Fields are not scouted.		

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PEST MANAGEMENT PRACTICES (CONTINUED)

RISK QUESTION	LOW RISK – 3 (RECOMMENDED)	MEDIUM RISK – 2 (POTENTIAL HAZARD)	HIGH RISK - 1 (SIGNIFICANT HAZARD)	RECORDS OR EVIDENCE FOR MAEAP VERIFICATION	YOUR RISK
MONITORING (CONTINUED)					
3.08) Are weather conditions relevant to pest management monitored? (i.e. air and soil temperature, precipitation, soil moisture, wind speed and direction, leave wetness, etc.)	On-farm weather station(s) provide data to assist with crop and pest management decisions. OR, MSU Enviro-weather (**www.enviroweather.msu.edu**) or other weather-based models are used to assist with crop and pest management decisions.	Consumer weather information used for crop and pest management decisions.	Weather conditions are not considered when making crop and pest management decisions.		
PEST APPLICATION					
3.09 Are soil characteristics and field conditions considered when making pesticide applications?	Soil characteristics (texture and organic matter) and field conditions (wind speed and direction, slope and moisture) are assessed when deciding on pesticide application practices. Site-specific or variable-rate technology may be used.	Whole-field application rates are based on the most vulnerable soil type in the field and field conditions.	Pesticides are applied at full labeled rates without regard to vulnerable soil characteristics or field conditions.		
3.10) How are surface and groundwater protected in and near fields from pesticide contamination?	Pesticide labels with groundwater and surface water advisory statements are followed.		**Labeled directions are not followed.**[18] Spray is applied adjacent to or over the top of surface water, tile drain inlet or well. Other field restrictions are ignored.	Field maps indicating pesticide label setbacks and other restrictions are followed. Plan identifies sensitive areas and how they are treated. Drift management plan available.	
3.11) Are leaching/runoff and toxicity potentials considered when making pesticide decisions?	Pesticides with the lowest potentials for leaching, runoff and non-target toxicity are always selected for use in fields. Some spray applications delayed to non-rainy periods. Mulches and ground covers used under trees to prevent leaching.	Leaching/runoff and toxicity potentials are occasionally considered when selecting soil-applied pesticides.	Pesticide choice is not based on leaching/runoff and toxicity potentials. Only cost and effectiveness are considered.		

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PEST MANAGEMENT PRACTICES (CONTINUED)

RISK QUESTION	LOW RISK – 3 (RECOMMENDED)	MEDIUM RISK – 2 (POTENTIAL HAZARD)	HIGH RISK - 1 (SIGNIFICANT HAZARD)	RECORDS OR EVIDENCE FOR MAEAP VERIFICATION	YOUR RISK
PEST APPLICATION (CONTINUED)					
3.12) Are the purchasers and applicators of restricted-use pesticides (RUP) certified applicators?	***The purchaser and applicator of RUP comply with certification requirements.***		**Non-certified and unsupervised applicators use RUP.**[6]	RUP certification confirmed.	
3.13) How are workers and pesticide handlers protected from exposure to pesticides?	***Workers and handlers:*** ***-Follow specific label requirements.*** ***-Are provided decontamination supplies.*** ***-Are trained or certified applicators.*** ***-Are informed of pesticide applications.*** ***-Are provided personal protective equipment.*** ***-Are provided emergency assistance, if needed.***	**Worker Protection Standard requirements are partially met.**[20]	**Worker Protection Standard requirements are ignored.**[20]		
3.14) If pesticides are mixed and loaded in the field, how are they handled?	A mixing and loading pad is used. Mixing and loading is done more than 150 feet from any well and more than 50 feet from surface waters.	Mixing and loading are done in different locations in the field, more than 150 feet from a private well, more than 800 feet from a public well* and more than 50 feet from surface waters. A mixing and loading pad is not used.	Pesticides are mixed and loaded at the same spot in the field year after year without a pad.	Proper pesticide mixing and loading demonstrated.	

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PEST MANAGEMENT PRACTICES (CONTINUED)

RISK QUESTION	LOW RISK – 3 (RECOMMENDED)	MEDIUM RISK – 2 (POTENTIAL HAZARD)	HIGH RISK - 1 (SIGNIFICANT HAZARD)	RECORDS OR EVIDENCE FOR MAEAP VERIFICATION	YOUR RISK
PESTICIDE APPLICATION (CONTINUED)					
3.15) How are empty pesticide containers rinsed and disposed?	***Containers are triple-rinsed or power rinsed, punctured*** and returned to dealer, properly recycled, or disposed of in a licensed landfill. Bags are returned to dealer or taken to licensed landfill. Properly rinsed containers can be disposed in a dumpster that is taken to a licensed landfill.	**Disposal of empty containers and bags on the farm property.**[8,18]	**Disposal of partially filled containers. Burning of containers on the farm property.**[8,18]	Evidence of containers being recycled.	
3.16) Do pesticide applicators read and follow the label instructions?	***Everyone using pesticides follows label and labeling instructions.***		**Label and labeling instructions are not always followed.**[18]	Evidence that labels are followed.	
3.17) What management practices are used to prevent the development of pest resistance to certain pesticides.	Pesticides with different modes of action are rotated within a season or from one season to the next or used in tank mixes where permitted. Pesticides at highest risk of resistance are not used when alternatives are available. Refuge requirements for transgenic seed are followed.	Some but not all pesticide modes of action are rotated or tank mixed. Pesticides at highest risk of resistance are used sparingly.	Pest resistance is not considered when selecting pesticides. Refuge requirements for transgenic seed are ignored.		
3.18) Is a spill kit immediately available to pesticide applicators in the field?	***A spill kit*** containing a shovel, absorbent material, PPE and a container ***is immediately available.***		**No spill kit is available** or no plan is in place to contain spills.[6]	Adequate spill kit present.	
3.19) How is excess spray mixture or rinse water from the interior of the spray system disposed?	***Spray mixture is applied to labeled site at or below labeled rate of application*** or appropriately stored for later use.		**Spray mixture dumped at farmstead or in nearby field or pond.**[4]	Satisfactory explanation of procedures for excess spray mixtures.	

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PEST MANAGEMENT PRACTICES (CONTINUED)

RISK QUESTION	LOW RISK – 3 (RECOMMENDED)	MEDIUM RISK – 2 (POTENTIAL HAZARD)	HIGH RISK - 1 (SIGNIFICANT HAZARD)	RECORDS OR EVIDENCE FOR MAEAP VERIFICATION	YOUR RISK
PESTICIDE APPLICATION (CONTINUED)					
3.20) Where is the exterior of the spray equipment and tractor washed if there is accumulated residue?	Washed in containment or washed in the field in different locations >200' from surface water, catch basins, or tile inlets and >150' from a well.		Washed in the same location without collection, or in the field <200' from surface water, catch basins or tile inlets or <150' from a well.	Satisfactory explanation of procedures for washing spray equipment.	
3.21) How is accumulated spray building wastewater or other comingled rinsates that cannot be directly applied to growing crops disposed?	Applied to a site where there is growing vegetation or where a crop will be planted following labeled setbacks at or below labeled rates. Application areas are rotated and records of contents of material and application site are kept. Or taken to a hazardous waste landfill.		**Dumped at the farmstead, in the field, or direct discharge to surface water.**[4]	Records of application provided.	
3.22) How is the proper and safe operation of pesticide application equipment ensured?	***Equipment is correctly calibrated at least annually and leaks are minimized to apply intended rate and distribution pattern.***		**Pesticide application equipment is not properly calibrated.**[6]	Date of annual equipment calibration recorded.	
3.23) How are pesticide applications assured to remain on-target and minimize off-target pesticide spray drift?	***A written drift management plan is utilized that minimizes off-target drift.***	Pesticide applications follow labeled instructions for target pests, but no drift management plan is utilized.	**Spraying operations are completed regardless of weather conditions or forecast, and regardless of the potential of off-target drift.**[7]	Written drift management plan on file.	
3.24) How is pesticide spray drift minimized when using an air blast sprayer?	Do not spray when the wind speed is greater than 10 mph. Do not spray during thermal inversions. Cut off spray for missing trees in the row.		Drift minimization is not considered when using an air blast sprayer.		

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PEST MANAGEMENT PRACTICES (CONTINUED)

RISK QUESTION	LOW RISK – 3 (RECOMMENDED)	MEDIUM RISK – 2 (POTENTIAL HAZARD)	HIGH RISK - 1 (SIGNIFICANT HAZARD)	RECORDS OR EVIDENCE FOR MAEAP VERIFICATION	YOUR RISK
PEST MANAGEMENT PRACTICES - PESTICIDE APPLICATION (CONTINUED)					
3.25) What pesticide application records are kept?	***Accurate records are maintained of all agricultural crop applications of pesticides for at least three years.***	Partial pesticide records are kept. Complete pesticide application records will be kept in the future, for review at the time of reverification.	No pesticide records kept. Chemicals used are known by memory or invoices only.	Pesticide records for the past three years on file (or plans to maintain records). - Date of application - Time of application - Pesticide brand/product name - Pesticide formulation - EPA registration number - Active ingredient(s) - Restricted-entry interval - Rate per acre or unit - Crop, commodity, stored product, or site that received the application - Total amount of pesticide applied - Size of area treated - Applicator's name - Applicator's certification number - Location of the application - Method of application - Target pest - Carrier volume per acre Additional optional records: - Full or alternate-row application - Weather conditions - Pest monitoring records and predictive model timing used - Follow-up evaluation of action taken	

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PEST MANAGEMENT PRACTICES (CONTINUED)

RISK QUESTION	LOW RISK – 3 (RECOMMENDED)	MEDIUM RISK – 2 (POTENTIAL HAZARD)	HIGH RISK - 1 (SIGNIFICANT HAZARD)	RECORD OR EVIDENCE FOR MAEAP VERIFICATION	YOUR RISK
PESTICIDE APPLICATION (CONTINUED)					
3.26) Are pesticides selected and applications timed to minimize impact on beneficial insects (natural enemies and pollinators)?	Pesticide toxicity to beneficial insects is considered. Pesticide applications timed to avoid injury to beneficial insect populations.		Broad spectrum pesticides used on a calendar schedule and not timed to avoid beneficial insects.		
3.27) Are areas of the farm set aside as habitat for pollinators?	At least two acres is devoted to conservation of native bees and other pollinators by providing flowers through the season, and this is planted with a specific mix of wildflowers for this purpose.	Some areas of the farm are set aside to provide flowers for bees and other pollinators.	No habitat is provided for pollinators.	Note: Cost share is available through enrollment in the USDA pollinator conservation programs (E.g., USDA's Farm Service Agency [FSA] Conservation Reserve Program-State Areas for Wildlife Enhancement [CRP-SAFE] pollinator program).	
3.28) Is habitat provided to enhance populations of natural enemies and beneficial organisms?	Ground cover plantings/mulches used under plants and in drive rows for alternative nutrient management and beneficials. Flowering plants provide for season-long nectar and pollen, and habitat provided to enhance natural enemy populations.	Ground covers/mulches used under plants.	Management of beneficial organism is not considered.		
3.29) Are cultural practices managed to enhance populations of beneficial natural enemies (NE)?	Use alternate-row mowing method for insect control, NE enhancement and pollinator preservation. Maintain mow-free strips around planting perimeter for natural enemy and pollinator preservation.	Maintain mow-free strips around planting perimeter for natural enemy and pollinator preservation.	Beneficial insect management is not considered.		

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PEST MANAGEMENT PRACTICES (CONTINUED)					
RISK QUESTION	LOW RISK – 3 (RECOMMENDED)	MEDIUM RISK – 2 (POTENTIAL HAZARD)	HIGH RISK - 1 (SIGNIFICANT HAZARD)	RECORDS OR EVIDENCE FOR MAEAP VERIFICATION	YOUR RISK
PEST MANAGEMENT PRACTICES - PESTICIDE APPLICATION (CONTINUED)					
3.30) If a soil fumigant pesticide is used on the farm, is a fumigation management plan (FMP) utilized?	A written, site-specific fumigation management plan that meets US EPA requirements is prepared and utilized before fumigation begins.		**A FMP is not prepared.**[18]		
3.31) How are agricultural pollution emergencies handled?	Call 911, sheriff, fire or emergency services department for personal safety issues. ***All uncontained spills or releases should be reported to the MDARD Agriculture Pollution Emergency Hotline: 1-800-405-0101***, or the EGLE Pollution Emergency Alerting System: 1-800-292-4706.		**No contact to state or local authorities. Spill discharges directly to surface water.**[4]	Farm emergency plan on file, or local emergency telephone numbers immediately available.	
WATER USE					
4.01) If the groundwater and surface water pumps have a combined capacity to pump more than 100,000 gallons per day (70 gallons per minute) for agricultural purposes, has water use been registered and reported to the State of Michigan?	Pump capacity is less than 100,000 gallons per day (70 gallons per minute). Or, Register and report annual water use to Michigan Department of Agriculture and Rural Development by April 1.		**Pump capacity is greater than 100,000 gallons per day (70 gallons per minute) and water use is not reported to the State of Michigan.**[13]	Farm records indicate compliance.	

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WATER USE (CONTINUED)

RISK QUESTION	LOW RISK – 3 (RECOMMENDED)	MEDIUM RISK – 2 (POTENTIAL HAZARD)	HIGH RISK - 1 (SIGNIFICANT HAZARD)	RECORDS OR EVIDENCE FOR MAEAP VERIFICATION	YOUR RISK
4.02) Have new or increased large quantity water withdrawals been registered (pumping capacity greater than 70 gpm or 100,000 gallons per day for systems established after July 9, 2009)?	The Water Withdrawal Assessment Tool (WWAT) was used to determine if a proposed withdrawal or expansion is likely to cause an Adverse Resource Impact, and to register the water withdrawal with MDEGLE, prior to beginning the withdrawal. The WWAT and registration site is: http://www.miwwat.org/		**Pump capacity is greater than 100,000 gallons per day (70 gallons per minute) and water use is not reported to the State of Michigan.**[13]	Producer's verbal indication of compliance with regulation.	
4.03) Is there an unused well located in the cropping area?	No unused well, or abandoned well properly sealed.	Unused well temporarily abandoned properly: -Meets minimum isolation distances -Is disconnected from any water distribution piping. -Has the top of the casing securely capped.	**Unused, unsealed well in cropping area.** [1]	Unused well(s) properly sealed or temporarily abandoned.	

IRRIGATION MANAGEMENT PRACTICES

(IF IRRIGATION IS NOT USED, SKIP THIS SECTION.)

SYSTEM MANAGEMENT					
5.01) Are all sprinkler systems operated to minimize drift and off-target application?	***All sprinkler systems are operated to minimize drift and off-target application.*** No off-target irrigation application present.	Most sprinkler systems operated to minimize drift and off-target application. Few off-target irrigation applications occur.	Sprinkler systems are often operated under windy conditions. Water is sprayed over roads, adjacent property or structures.	No field evidence of off-target applications.	

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IRRIGATION MANAGEMENT PRACTICES (CONTINUED)

RISK QUESTION	LOW RISK – 3 (RECOMMENDED)	MEDIUM RISK – 2 (POTENTIAL HAZARD)	HIGH RISK - 1 (SIGNIFICANT HAZARD)	RECORDS OR EVIDENCE FOR MAEAP VERIFICATION	YOUR RISK
SYSTEM MANAGEMENT					
5.02) Is noise control provided when needed?	***Noise control is provided*** when needed.	In most areas of concern, noise control is provided when needed.	Noise control is not provided when needed.		
RECORD KEEPING					
5.03) Are proper irrigation system management records collected and retained for use in decision-making and for reference in case of complaints?	Irrigation system management records are collected and retained, including: ***- Crop type and location.*** ***- Source of the water used.*** ***- Date,*** method ***and amount of each irrigation water application.*** ***- All system inspections and repairs that influence uniformity and leaks.*** ***- Calibration of fertigation and chemigation equipment, if used.*** ***- Records on system uniformity evaluation.***	Most of irrigation system management records are collected and retained. Plan to maintain complete irrigation records.	Few or no irrigation system management records are collected or retained.	Irrigation records on file, or plans to maintain records.	
IRRIGATION SCHEDULING					
5.04) How is irrigation scheduling used to determine when it is necessary to irrigate and how much water should be applied during each irrigation event?	Irrigation water is scheduled on the basis of: ***- Available soil water for each unit scheduled.*** ***- Depth of rooting for each crop irrigated.*** ***- Allowable soil moisture depletion at each stage of crop growth.*** ***- Measured, estimated or published evapotrans-piration data to determine crop water use.*** ***- Measured rainfall in each field irrigated.***	Irrigation water is scheduled on the basis of observed soil moisture content and/or daily water crop usage.	Irrigation water is applied at a set rate per week if no precipitation is received.	Scheduling system evident by records.	

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IRRIGATION MANAGEMENT PRACTICES (CONTINUED)

RISK QUESTION	LOW RISK – 3 (RECOMMENDED)	MEDIUM RISK – 2 (POTENTIAL HAZARD)	HIGH RISK - 1 (SIGNIFICANT HAZARD)	RECORDS OR EVIDENCE FOR MAEAP VERIFICATION	YOUR RISK
APPLICATION PRACTICES TO AVOID RUNOFF AND LEACHING					
5.05) Is there a rain gauge in every irrigated field?	***Every field is being managed for irrigation has a rain gauge in the field.*** Rain events are observed and used in conjunction with irrigation scheduling.	Most fields have a rain gauge; plan to have gauge in all fields.	No rain gauges OR only one rain gauge at the farmstead.	Rain gauges in all irrigated fields, or plan to maintain in all fields.	
5.06) Is irrigation water runoff and ponding minimized?	***Sprinkler application rates are below the soil infiltration rate.*** Nutrient leaching is minimized.	Most sprinkler application rates are below the soil infiltration rate. Some runoff and ponding is present.	Sprinkler application rates exceed the soil infiltration rate. Runoff and ponding is commonly visible.	No indication of significant runoff or ponding in irrigated fields.	
5.07) Have all irrigation systems been evaluated for application uniformity?	***All irrigation systems have been evaluated for uniformity.*** Corrections are made to the system to improve uniformity.	Some irrigation systems have been evaluated for uniformity. Remainder of systems scheduled to be evaluated.	Irrigation system uniformity has not been evaluated.	Uniformity tests on file. Schedule for evaluating systems that have not been evaluated.	
5.08) How is the amount of irrigation water delivered accurately determined?	***All water applications are accurately determined:*** -by knowing actual flow delivered (GPM) and time of application. -or, by using a flow meter. -or, by average output caught with system evaluation.	Water applications are estimated or based on rates given by the irrigation vendor or installation company.	Water application amounts not determined. Excess application occurs.	Irrigation water delivered by irrigation system is accurately determined.	
5.09) Are split applications of nitrogen fertilizer used when nitrogen is applied in an irrigated field?	***Split applications of nitrogen fertilizer are made when nitrogen is used in an irrigated field.*** N application does not exceed MSU recommendations.		Nitrogen fertilizers are applied through irrigation on the basis of visual crop symptoms. Total N applied exceeds MSU recommendation.		

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IRRIGATION MANAGEMENT PRACTICES (CONTINUED)

RISK QUESTION	LOW RISK – 3 (RECOMMENDED)	MEDIUM RISK – 2 (POTENTIAL HAZARD)	HIGH RISK - 1 (SIGNIFICANT HAZARD)	RECORDS OR EVIDENCE FOR MAEAP VERIFICATION	YOUR RISK
APPLICATION PRACTICES TO AVOID RUNOFF AND LEACHING (CONTINUED)					
5.10) How far is the fertilizer/pesticide chemigation storage or fertigation/chemigation system located from surface water (ponds, streams, rivers, drains, etc.)?	***200 feet or greater.***	Less than 200 feet with appropriate security measures.	Less than 200 feet.	Appropriate chemigation storage or fertigation/chemigation system isolation from surface water.	
5.11) Is excess irrigation avoided?	***Irrigation water applications in excess of the quantity of water needed to replace the soil/substrate moisture deficit are avoided.***	Excess irrigation water applications may occur occasionally.	Excess irrigation water applications are common.		
WELLHEAD PROTECTION					
5.12) Is the irrigation well adequately protected from contamination from pesticides and fertilizers when fertigation and chemigation are used?	***Anti-backflow device is installed,*** including a reduced pressure zone (RPZ) valve, double check valve assembly, or chemigation valve with an internal air gap, and agricultural chemical/fertilizer storage and preparation areas are at least 150 feet from the well, or at least 150 feet from the well, or at least 50 feet from the well, with secondary containment. Air gap is twice the diameter of the fill pipe or 6 inches, whichever is greater.	***Anti-backflow device is installed,*** including a reduced pressure zone (RPZ) valve, double check valve assembly, or chemigation valve with an internal air gap, and agricultural chemical/fertilizer storage and preparation areas have secondary containment, but **storage and preparation areas are less than 50 feet from the well.**[1] Air gap is twice the diameter of the fill pipe or 6 inches, whichever is greater.	**No anti-backflow device,**[1] no secondary containment and **less than 150 feet isolation distance from irrigation well.**[1]	Adequate protection of the well provided.	

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IRRIGATION MANAGEMENT PRACTICES (CONTINUED)

RISK QUESTION	LOW RISK – 3 (RECOMMENDED)	MEDIUM RISK – 2 (POTENTIAL HAZARD)	HIGH RISK – 1 (SIGNIFICANT HAZARD)	RECORDS OR EVIDENCE FOR MAEAP VERIFICATION	YOUR RISK
WELLHEAD PROTECTION (CONTINUED)					
5.13) If the irrigation well is interconnected with a surface water source, is the well protected from backflow (back-pressure and back-siphonage) from the surface water into the well?	***Anti-backflow device installed,*** including a reduced pressure zone (RPZ) valve, double check valve assembly, or chemigation valve with an internal air gap that protects the well from back-pressure and back-siphonage into the well. Air gap is twice the diameter of the fill pipe or six inches, whichever is greater.	***Anti-backflow device installed,*** including a reduced pressure zone (RPZ) valve double check valve assembly, or chemigation valve with an internal air gap, to protect some irrigation water sources. Air gap is twice the diameter of the fill pipe or six inches, whichever is greater.	**No anti-backflow device installed.**[1]	Anti-backflow device installed, including a reduced pressure zone (RPZ) valve, double check valve assembly, or chemigation valve with an internal air gap.	
5.14) How far is the irrigation fuel tank from a storm drain, surface water or designated wetland?	Tank is more than 50 feet away or has some other engineering control present that would control or divert a spill from reaching a storm drain, surface water or designated wetland.		**Tank is 50 feet or less away from surface water**[16] and without an engineering control in place.	Appropriate fuel storage isolation distance from surface water. Engineering control, such as double-walled tank or dike.	

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IRRIGATION MANAGEMENT PRACTICES (CONTINUED)					
RISK QUESTION	LOW RISK – 3 (RECOMMENDED)	MEDIUM RISK – 2 (POTENTIAL HAZARD)	HIGH RISK – 1 (SIGNIFICANT HAZARD)	RECORDS OR EVIDENCE FOR MAEAP VERIFICATION	YOUR RISK
WELLHEAD PROTECTION					
5.15) Is a horizontal sock well (HSW) present in the cropping system?	-HSW outlets are clearly identified as not being suitable for human consumption. -HSW is completely separated (no common piping) from any potable water supply system. -HSW meets isolation distance requirements the entire horizontal length of the HSW -Both ends of the HSW are identified.	-HSW outlets are clearly identified as not being suitable for human consumption. -HSW is completely separated (no common piping) from any potable water supply system. -HSW meets isolation distance requirements the entire horizontal length of the HSW, except for chemigation/fertigation systems during active use season that have ***backflow prevention device installed,*** including a reduced pressure zone (RPZ), double check valve assembly, or chemigation valve with an internal air gap installed and secondary containment. -Both ends of the HSW are identified	**HSW is being used for human consumption, shares common piping with a potable water supply, does not have both ends clearly identified, or does not meet State of Michigan, for isolation distances,** or MAEAP Standard, **for its entire horizontal length.**[1,3]	Low or medium risk criteria are present or demonstrated.	

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Other Environmental Risks in the Cropping System

Risk Question	Low Risk – 3 (Recommended)	Medium Risk – 2 (Potential Hazard)	High Risk – 1 (Significant Hazard)	Records or Evidence for MAEAP Verification	Your Risk
6.01) Is a live, restricted, or prohibited species on the land or in the waters owned by producer?	Such species is not known to be present.	Such species is present, but was not knowingly introduced, It was introduced under a permit, OR It is possessed under a permit.	**Such species is present because it was knowingly introduced without a permit,** **OR** **It is possessed without a permit.**[14]		
6.02) Does the farm business have a food safety plan that is followed to reduce the risk of foodborne illness?	A written food safety plan exists and is being implemented.	Food safety practices are generally followed, but not documented in a written plan.	A food safety program is not available.	Note: This is a GAP (Good Agricultural Practices) requirement. USDA will not certify the farm without a documented food safety program. Not required by Food Safety modernization Act but is recommended.	
6.03) Does the farm business have a person designated to implement and oversee a food safety plan?	The farm business has a designated food safety person(s) and they have gone through the Produce Safety Alliance grower training or equivalent.	The farm business has a designated food safety person(s).	There is no designated food safety person.	Note: This is a GAP (Good Agricultural Practices) requirement. USDA will not certify the farm without a food safety designee.	
6.04) Are there other activities, products, processes/equipment, services, byproducts and/or wastes in the cropping areas that pose contamination risks to groundwater or surface water?	No risk(s) identified.	Risk(s) identified and plan to mitigate the contamination risk(s).	No plan to mitigate contamination risk(s).	No other environmental risks found in cropping areas.	

A boxed risk level indicates the level required for environmental assurance verification.
Bold Black print indicates a violation of state or federal regulation.
Bold blue italic print indicates a management practice consistent with a specified 2019 Right to Farm (RTF) Generally Accepted Agricultural Management Practices (GAAMPs).

Table 1. Federal, state and local environmental requirements for operation of this farm business.
This table contains the typical requirements for a farm business. There may be additional environmental requirements due to the type of operation and location. Contact the local or state permitting agencies for further information: Environmental Assistance Hotline —1-800-622-9278, and MDARD Information — 1-800-292-3939.

Environmental Regulatory Requirements	Description	Frequency	Administering Agency	Your Expiration Date
Air use permit	Permit to install and operate equipment or processes which may emit air contaminants (incinerators for burning animal carcasses or manure, and biodigesters and associated equipment are examples).	Before construction	EGLE/Air Quality Division	N.A.
Farm motor vehicle fuel storage tanks greater than 1,100 gallon capacity (above- and below-ground tanks)	Fuel storage tanks have to be certified (aboveground) or registered (underground); a site plan has to have been submitted to the LARA before the installation is placed into service. Smaller tanks have other requirements to be met.	Annual	Department of Licensing and Regulatory Affairs (LARA)	
Groundwater discharge permit	Any discharge of waste or waste effluent into or onto the ground (e.g., egg wash water and milk cooling water [over 10,000 gallons/day] that is discharged) and any livestock facility over 5,000 animal units.	5 years	EGLE Water Resources Division	
Land and water interface construction permits	Construction activities (dredging, filling, draining, construction, structure placement) in, across, under water.	Before construction	EGLE/Water Resources Division	N.A.
Pesticide safety training for pesticide workers	The federal Worker Protection Standard for agricultural pesticides requires employers of pesticide handlers and workers to train employees on pesticide safety. Agricultural employers must be able to verify compliance.	Each employee must be trained every 5 years	MDARD/Pesticide and Plant Pest Management Division (PPPM)	
Private pesticide applicator certification	Any persons using or supervising the use of restricted-use pesticides (RUP) in the production of an agricultural commodity on their own or their employer's land must be a certified pesticide applicator.	3 years	MDARD/PPPM	
Septic permit (house and farm operation)	The first step in the process of determining if a piece of land that does not have municipal wastewater services available can be considered for an on-site septic system.	Before construction	Local health department	N.A.
Soil erosion and sedimentation control permit	Earth change activities within 500 feet of a lake or a stream, or that will disturb an area greater than 1 acre in size.	Before construction	County soil erosion permitting agency	
Water use reporting	Agricultural water users with the capacity to withdraw surface or ground-water that exceeds 100,000 gallons per day (70 gallons per minute) are required to report actual water withdrawals annually.	Annual	MDARD	
Identification guides for some species regulated by Part 413.	http://mnfi.anr.msu.edu/invasive-species/aquaticsfieldguide.pdf https://mnfi.anr.msu.edu/invasive-species/InvasivePlantsFieldGuide.pdf			

(continued on next page)

Table 1. Federal, state and local environmental requirements for operation of this farm business (continued).

Environmental Regulatory Requirements	Description	Frequency	Administering Agency	Your Expiration Date
Water Withdrawal Assessment – new or increased large quantity withdrawal	The Water Withdrawal Assessment Tool (WWAT) is designed to estimate the likely impact of a water withdrawal on nearby streams and rivers. Use of the WWAT is required of anyone proposing to make a new or increased large quantity withdrawal (over 70 gallons per minute) from the waters of the state, including all groundwater and surface water sources, prior to beginning the withdrawal. The WWAT and registration site is **www.deq.state.mi.us/wwat**.	Before construction	EGLE Water Resources Division	The registration is valid for 18 months.
Well permit	A person who installs a well, pump or pumping equipment shall comply with applicable laws, regulation, ordinances and codes.	Before construction	Local health department	
Environmental Guidelines	**Description**	**Frequency**	**Administering Agency**	**Your Expiration Date**
Cranberry production	The Michigan Right to Farm Act (Act 93 of 1981) requires the establishment of generally accepted agricultural and management practices (GAAMPs). Agricultural producers who voluntarily follow these practices are provided protection from public or private nuisance litigation. The GAAMPs are reviewed annually. The latest GAAMPs can be accessed at: **www.michigan.gov/mdard**.	Guidelines reviewed annually	MDARD	N.A.
Irrigation water use				
Farm market				
Manure management and utilization				
Nutrient utilization				
Pesticide utilization and pest control				
Site selection and odor control for new and expanding livestock production facilities				
MAEAP verification: livestock, farmstead, and cropping systems	MAEAP systems information and requests for verification available at **www.maeap.org** or by calling MDARD **517-284-5609**.	Five years	MDARD	

Table 2. Legal citations for environmental risks in Crop◆A◆Syst for Orchards and Fruit Producers

Footnote	Michigan Law	Description
1	Public Health Code, Public Act 368 of 1978	Part 127: Water Supply and Sewer Systems
2		Part 138 Medical Waste Regulatory Act
3	Safe Drinking Water Act, Public Act 399 of 1976	
4	Natural Resources and Environmental Protection Act, Act 451 of 1994	Part 31: Water Resources Protection
5		Part 55: Air Pollution Control
6		Part 83: Pesticide Control
7		Part 111: Hazardous Waste Management
8		Part 115: Solid Waste Management
9		Part 117: Septic Waste Servicers
10		Part 121: Liquid Industrial Waste
11		Part 169: Scrap Tires
12		Part 201: Environmental Response
13		Part 327: Great Lakes Preservation
14		Part 413: Wildlife Conservation
15	Bodies of Dead Animals Act, Public Act 239 of 1982 as amended	
16	Fire Prevention Code Public Act 207 of 1941	Storage and Handling of Flammable and Combustible Liquids
17	Grade A Milk Law, Public Act 266 of 2001	
	Federal Law	
18	Federal Insecticide, Fungicide and Rodenticide Act (FIFRA)	
19	Title III of the Superfund Amendments and Reauthorization Act of 1986, also known as the Emergency Planning and Community Right-to-Know Act	
20	Worker Protection Standard for Agricultural Pesticides	
21	Clean Water Act	
22	Food Safety Modernization Act Food Safety Rule	

BUSINESS NAME:_____
BUSINESS OWNER NAME:_____
BUSINESS PHONE:_____
EXTENSION:_____
BUSINESS WEB SITE:_____
DESCRIPTION:_____

BUSINESS ADDRESS INFORMATION (Main Office or Home Address)
(MAILING) STREET:_____
(MAILING) P.O. BOX:_____
(MAILING) CITY:_____
(MAILING) STATE:_____
(MAILING) ZIP CODE:_____

OWNERS CONTACT INFORMATION
SALUTATION: (Circle one)
MR or MRS or MS
FIRST NAME:_____
LAST NAME:_____
CONTACT ROLE:_____
EMAIL ADDRESS:_____

HOME PHONE NUMBER:_____-_____-_____
MOBILE/CELL NUMBER: _____-_____-_____
(MAILING) STREET:_____
(MAILING) P.O. BOX:_____
(MAILING) CITY:_____
(MAILING) STATE:_____
(MAILING) ZIP CODE:_____

FARM MANAGER CONTACT INFORMATION
SALUTATION: (Circle one)
MR or MRS or MS
FIRST NAME:_____
LAST NAME:_____
CONTACT ROLE:_____
EMAIL ADDRESS:_____

HOME PHONE NUMBER:_____-_____-_____
MOBILE/CELL NUMBER: _____-_____-_____
(MAILING) STREET:_____
(MAILING) P.O. BOX:_____
(MAILING) CITY:_____
(MAILING) STATE:_____
(MAILING) ZIP CODE:_____

FARM INFORMATION
FARM NAME:_____
(If no physical address, please use Section, Township, Range, ***and*** Latitude and Longitude)
FARM SITE STREET ADDRESS:_____
FARM SITE CITY:_____
STATE: **MICHIGAN** (ONLY) (Mailing Address May Vary)
FARM SITE ZIP CODE:_____
FARM SITE COUNTY:_____
FARM SITE TOWNSHIP:_____
LATITUDE:_____ LONGITUDE:_____
SECTION:_____ TIER:_____ RANGE:_____

(If there is no mailbox at the farm site location or not a place that receives mail.)
FARM MAILING ADDRESS:_____
(MAILING) STREET:_____
(MAILING) P.O. BOX:_____
(MAILING) CITY:_____
(MAILING) STATE:_____
(MAILING) ZIP CODE:_____

ADDITIONAL NOTES:

FARM NAME: _____

Is there Evidence of Discharge: Yes or No

FARMSTEAD

Fuel Storage: (Gallons) _____ (Pounds)_____
Fertilizer Storage: (Gallons) _____(Pounds)_____
Pesticide Storage: (Gallons) _____ (Pounds)_____
Farmstead Wells (each): _____
EHS Threshold: Yes or No

CROPPING

NMP (Acres): _____
Manure Applied (Acres): _____
Fertilizer Applied (Acres): _____
Pesticide Applied (Acres): _____
Irrigation (Acres): _____
Buffer Strips (Linear Feet): _____
Cover Crops (Acres): _____
No Till (Acres): _____
Conservation Tillage (Acres): _____
Grade Stabilization (Each): _____
Manure Applied (Gallons/Year): _____
Manure Purchased (Gallons/Year): _____
Manure N (Lbs/Year): _____
Manure P (Lbs/Year): _____
Manure K (Lbs/Year): _____

LIVESTOCK

CNMP (Acres): _____
CNMP Written By: _____
Date of CNMP Approval: _____
CNMP Reviewed By: _____
Name of Farm(s) Covered In CNMP: _____
Manure Applied (Acres): _____
Fertilizer Applied (Acres): _____
Pesticide Applied (Acres): _____
Irrigation (Acres): _____
Buffer Strips (Linear Feet): _____
Cover Crops (Acres): _____
No Till (Acres): _____
Conservation Tillage (Acres): _____
Grade Stabilization (Each): _____
Milkhouse Discharge (Gallons/year): _____
Livestock Exclusion (Linear Feet): _____
Silage Pad (Acres): _____
Manure Produced (Gallons/Year): _____
Manure Sold (Gallons/Year): _____
Manure Manifested (Gallons/Year): _____
Manure N (Lbs/Year): _____
Manure P (Lbs/Year): _____
Manure K (Lbs/Year): _____

GREENHOUSE

NMP (Square Feet): _____
Manure Applied (Square Feet): _____
Fertilizer Applied (Square Feet): _____
Pesticide Applied (Square Feet): _____
Irrigation (Square Feet): _____
Buffer/Filter Strips (Square Feet): _____
Annual Cover Crop (Square Feet): _____
No Till (Square Feet): _____
Conservation Tillage (Square Feet): _____
Grade Stabilization (Square Feet): _____
Greenhouse Size (Square Feet): _____
Fuel Storage: (Gallons)_____ (Pounds) _____
Fertilizer Capacity: (Gallons)_____ (Pounds)_____
Pesticide Capacity: (Gallons)_____ (Pounds)_____
Greenhouse Wells (Each) _____
EHS Threshold: Yes or No

FOREST, WETLANDS, AND HABITAT

Land Management Plan (Acres) _____
Plan Type: Forest Wetland Habitat All Three
Plan Writer:_____
Date Plan Written:_____
Date Plan Expires: _____
Forestland (Acres):_____
Grassland (Acres) _____
Wetland (Acres) _____
Restored/Improved Wetland Habitat (Acres): _____
Restored Non-Wetland Habitat (Acres): _____
Management for Invasive Species (Acres):_____
Managed as Buffers (Acres): _____
Length of Streambanks/Shorelines (Feet): _____

Notes:_____
_____
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_____

Farm Name: _____

Animal Unit (AU) Conversion Factors by Animal Type and Class			
Animal Type	**Class**	**Average Animal Weight**	**Quantity**
1,000 Beef cattle or cow/calf pairs = Large CAFO	CALF	450	
	HIGH FORAGE	750	
	HIGH ENERGY	750	
	HIGH FORAGE	1100	
	HIGH ENERGY	1100	
	COW	1000	
700 Mature dairy cattle (whether milked or dry cows), or 1,000 Veal calves = Large CAFO	CALF	150	
	CALF	250	
	HEIFER	750	
	HEIFER	1000	
	LACTATING COW	1400	
	DRY COW	1400	
	VEAL	250	
30,000 Laying hens or broilers liquid, or 125,000 Chickens dry (other than laying hens), or 82,000 Laying hens dry = Large CAFO	DRY SYSTEM		
	LIQUID SYSTEM		
	PULLETS		
55,000 turkeys = Large CAFO	ALL		
500 horses = Large CAFO	ALL	1000	
2,500 swine each weighing over 55 pounds, or 10,000 swine weighing less than 55 pounds = Large CAFO	NURSERY PIG	25	
	GROW-FINISH	150	
	GESTATING	275	
	LACTATING	375	
	BOAR	350	
	OTHER		
10,000 sheep or lambs	ALL	100	

OTHER LIVESTOCK TYPE:	OTHER LIVESTOCK QUANTITY:
OTHER LIVESTOCK TYPE:	OTHER LIVESTOCK QUANTITY:

Farm Name: _____

Crop Commodities					
Crop Name	Acres	Crop Name	Acres	Crop Name	Acres
Alfalfa		Cucumbers, Fresh		Oats	
Apples		Cucumbers, Pickling		Peaches	
Apricots		Dry Beans		Pears	
Asparagus		Fruit, Other		Potatoes	
Blueberries		Grapes, Juice		Rye	
Carrots		Grapes, Wine		Small Grain, Other	
Cherries, Sweet		Green Beans		Soybeans	
Cherries, Tart		Greenhouse, Annual		Squash/Pumpkin	
Christmas Trees		Greenhouse, Perennial		Sugar Beets	
Clover, Seed		Greens, Herbs		Sunflower	
Corn, Grain		Hay/Pasture		Vegetable, Other	
Corn, Seed		Hops		Wheat	
Corn, Silage		Mixed Garden		Other:	
Corn, Sweet		Nursery		Other:	
Note: Express acres to the closest quarter acre.					

Notes:

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10:19 – 600 – HJ/BP