



AEM Tier 2 Worksheet

Watershed Site Evaluation

Purpose of this Worksheet

The purpose of this worksheet is to help farmers understand their farm's risk of contributing to nonpoint source pollution and to help identify the water resources his/her farm operation may be impacting. It further helps identify specific farming activities that may pose a potential concern to water quality and how the type of soils and topography they farm may increase the risk. This Tier 2 Worksheet should be completed first with the help of an agency conservation staff member or private consultant.

Glossary

Aquifer: Water bearing soil or rock formation that is capable of yielding usable amounts of water.

Best Management Practice (BMP): Methods, measures or practices determined to be the most practical and effective in preventing or reducing the impact of pollutants generated by nonpoint sources. BMPs can be applied before, during or after pollution-producing activities to reduce or eliminate the introduction of pollutants into receiving waters.

(Continued on Page 2)

Background

What Happens on the Land Affects the Water

Every waterbody in New York State has been classified according to its "best use." Each use has a set of standards associated with it that limit the concentrations of various contaminants (pollutants) that can be present in the water. A water quality problem exists where a classified use is negatively impacted. The effects can range from precluding a use (e.g. water unfit for drinking, swimming, etc.) to situations where a waterbody's best use is threatened (e.g. projected change in land use may increase the risk of contamination).

The primary pollutants that can result from land use activities within a watershed include nutrients (phosphorus and nitrogen), sediment, toxic substances (pesticides and petroleum products), pathogens, oxygen-demanding substances (organics such as manure) and elevated water temperatures (thermal stress). In any given watershed there are a number of potential sources of these pollutants such as: agriculture, timber harvesting, construction activities, land disposal of waste, and modifications to streambanks or stream channels.

In many areas of the state there are watershed management plans or aquifer/wellhead protection plans that identify pollutants of concern and land uses or activities that pose a potential risk to water quality.

Glossary continued ...

Concentrated Flow: The rapid flow of water through a field that may result in the formation of gullies..

Contamination: Alteration of a water resource by the introduction of a chemical or other substance or the raising of water temperature so that the water resource is unfit for a specified use.

Erosion: Detachment and movement of soil caused by rain or surface water runoff.

Ground Water Source: Primary or principal aquifer, wellhead or spring.

Hardpan: Also referred to as fragipan, is a dense and brittle layer in soils that owe their hardness mainly to extreme density or compactness rather than high clay content or cementation. Removed fragments are friable, but the material in place is so dense that roots cannot penetrate and water moves through it very slowly.

Highly Erodible Land (HEL): Land containing soils with a high susceptibility to erosion when cultivated based on soil erodibility, slope, slope length and rainfall factors.

Hydrologic Soil Group: Refers to soils grouped according to their runoff and leaching characteristics.

Hydrologic Unit Code (HUC): A numerical designation for cataloging watersheds nationwide used by the U.S. Geological Service and the USDA Natural Resources Conservation Service.

Land Capability Class: Shows in a general way suitability of soils for growing crops. Capability classes are designated by Roman numerals I – VIII. The numerals indicate progressively greater limitations. The subclass “w” indicates that water in or near the soil interferes with plant growth or cultivation.

Leaching Potential: Estimate of the possibility for the downward movement, through the soil, of chemical substances dissolved in water.

Nonpoint Source Pollution: Pollution arising from a non-defined and diffuse source, such as runoff from cultivated fields, pastures or urban areas.

Pathogens: Disease-producing organisms. Examples are E.coli (toxigenic) and salmonella, which can infect any livestock; and Giardia or Cryptosporidium, which are intestinal parasites sometimes found in the feces of young livestock.

Primary Aquifer: Highly productive aquifers (yields greater than 50 gallons per minute, thickness of saturated deposit greater than 20 feet, or area of aquifer 5 to 10 square miles).

Principal Aquifers: Potential sources of public drinking water with yields greater than 10 gallons per minute that are not presently being used intensively as a water source by a major municipal system.

Runoff: That portion of precipitation; such as rain, snowmelt or irrigation water; that flows over the land surface.

Sinkhole: A natural depression in a land surface that connects with a subterranean passage. Sinkholes usually occur in limestone regions and are formed by solution or collapse of a cavern roof.

Soil Map: A map showing where various soil types are distributed in a given area (most often published in a county report).

Waterbody: A lake, pond, stream, river, reservoir, wetland or bay.

Watercourse: Water flowing over a non-vegetated channel to a waterbody.

Watershed: The geographic region within which water drains to a particular river, stream, or body of water. Large watersheds may be composed of several sub-watersheds.

Why be concerned?

The topography and soil types found on a farm influence the type of farming done, the inputs needed and the results. The type of farm activities undertaken, along with a farm's soils, topography, and location within a watershed, affect the farm's potential for pollution of ground and surface water.

How can this worksheet be used?

Information gathered from filling out this worksheet can help determine which Tier 2 Assessment Worksheets should be completed next for the farm. Completing the additional Tier 2 worksheets will help identify which farm management practices a farmer is already doing that are good for water quality and which practices may need to be adjusted to lessen their potential to negatively impact nearby surface or groundwater resources.

Part 1, Potential Water Resource Concerns, identifies the water resources that should be of concern for the farm and which farm activities may pose a risk to water quality. **Part 2, Farm Soils/Topography**, identifies the type of soils and topography that if present on the farm can affect a farm's potential risk of contaminating surface or ground water. **Part 3, Other Natural Resource Concerns**, identifies additional conservation issues that should be addressed on the farm.

Part 1: Potential Water Resource Concerns for the Farm

Potential Farm Groundwater Issues

Has there been groundwater contamination or concerns about groundwater issues near the farm? Yes ____ No ____

If yes, explain _____

Are fields that are farmed next to homes that rely on wells or spring developments for drinking water? Yes ____ No ____

If yes, describe locations: _____ Approximate distance of cropped fields from well or spring: _____.

Are the fields upslope from the home's water supply? Yes ____ No ____

Does the farm sit atop a primary or principal aquifer? Yes ____ No ____

NYSDOH Source Water Assessment Report

The New York State Department of Health has conducted a susceptibility analysis of each source of water that is used to supply drinking water to the public. The analysis involved evaluating the likelihood that a source of public drinking water could become contaminated. The goal of the State's source water protection efforts under the Federal Safe Drinking Water Act is to prevent contaminating a water supply by reducing the potential pollution risk. *Note: assessment reports and supporting data were provided to Soil & Water Conservation Districts by the NYSDOH in February 2005 that contain the source water assessments for all the public water systems in the county.*

Use the table below to summarize the potential sources of contamination for those public water supply sources such as rivers, lakes or reservoirs downstream from the farm or municipal wellheads within one mile of the farm that the NYSDOH has determined to be at risk from agricultural activities.

| Source Water Assessment Summary of Significant Findings | | | |
|--|--|--------------------------------|--------------------|
| Name of public drinking water supply _____ | | | |
| Water Source (e.g. spring, well, river, lake, reservoir) _____ | | | |
| Potential Sources of Contamination | Potential Impacts to Water Source | Contaminates of Concern | Description |
| | | | |
| | | | |
| | | | |

Refer to Table 1 found on pages 6 & 7 of this worksheet to identify which practices on the farm being assessed may have potential to pollute groundwater based on the “contaminate of concern” identified above. Each of the farm practices identified in Table 1 has a corresponding AEM Tier 2 Worksheet that should be filled out to determine the current level of potential concern. Record on page 9 under the section entitled Worksheet Summary/Next Steps which worksheets need to be filled out next.

Potential Farm Surface Water Issues

Which watershed or sub watershed is the farm located in? *Note: the farm may be in more than one watershed, if so list all watersheds. Also delineating farm and watershed boundaries on a USGS Topographic Map is an excellent way to demonstrate how different sections of the farm drain to different watersheds.*

Name of Eleven Digit HUC Watershed(s) _____

Name of stream(s) _____

Name of river _____

Name of lake/reservoir, bay or estuary _____

NYSDEC Waterbody Inventory & Priority Waterbodies List

In order to fulfill certain requirements of the Federal Clean Water Act the New York State Department of Environmental Conservation must provide regular, periodic assessments of the quality of the water resources of the state. These assessments are conducted on a 5 year rotating basis for each of the state's major river basins (i.e. Susquehanna, Mohawk, etc.). This information has been compiled into an inventory data base used to record current water quality information, characterize known or suspected water quality problems and issues, and track progress toward their resolution.

Are the waterbody(s) listed above included on NYSDEC's Waterbody Inventory/Priority Waterbody List (WI/PWL)? Yes _____ No _____.

If yes, summarize information available from the Waterbody Inventory Data Sheet in the table below:

| Waterbody Name | Classified Use | Use Impairment | Severity (level of impact) | Pollutants of Concern | Suspected Sources (circle if primary) |
|----------------|----------------|----------------|----------------------------|-----------------------|---------------------------------------|
| | | | | | |
| | | | | | |

Refer to Table 1 found below to identify which practices for the farm being assessed may have the potential to pollute surface water based on the “pollutants of concern” identified above. Each of the farm practices identified in Table 1 has a corresponding AEM Tier 2 Worksheet that should be filled out to determine the current level of potential concern. Record on page 9 under the section entitled Watershed Summary/Next Steps which worksheets should be filled out next. If the worksheet was already checked on page 9, because of a groundwater concern identified earlier, please circle the check to indicate that this farm practice is also a surface water concern for the watershed.

| Table 1: Relationship of Type of Contaminant, Agricultural Practice, and Potential Impact on Surface Water or Groundwater Resources | | | | | | |
|--|---|-------------------------|-------------------|-------------------|-----------------|-----------------|
| Resource Impact Key: GW = Groundwater *** SW = Surface Water B = Both Groundwater and Surface Water | | | | | | |
| Agricultural Practice <i>(circle practices identified AEM Tier 1)</i> | Type of Contaminant/Potential Impact ** <i>(circle contaminant(s) of concern)</i> | | | | | |
| | Pathogens | Toxic Substances | Nitrogen * | Phosphorus | Sediment | Organics |
| Livestock Manure Application: Surface Applied Incorporated | B GW | | B GW | SW SW | | SW |
| Barnyard Management | B | | B | SW | SW | SW |
| Fertilizer Storage | | | GW | SW | | |
| Fertilizer Application: Broadcast Incorporated | | | B GW | SW SW | | SW |
| Process Wash Water (milkhouse, egg processing, potato washing, etc...) | SW | SW | SW | SW | SW | SW |
| Pesticide Storage | | GW | | | | |
| Pesticide Application | | B | | | | |

(Table 1 continued on next page)

Continuation of Table 1 from page 6:

| Relationship of Type of Contaminant, Agricultural Practice, and Potential Impact on Surface Water or Groundwater Resources | | | | | | |
|---|--|------------------|------------|------------|----------|----------|
| Resource Impact Key: GW = Groundwater *** SW = Surface Water B = Both Groundwater and Surface Water | | | | | | |
| Agricultural Practice (circle practices identified AEM Tier 1) | Type of Contaminant/Potential Impact** (circle contaminant(s) of concern) | | | | | |
| | Pathogens | Toxic Substances | Nitrogen * | Phosphorus | Sediment | Organics |
| Tillage Practices (soil management) | | | GW | SW | SW | SW |
| Grazing Practices (pasture management) | SW | | | SW | SW | SW |
| On-farm Waste (disposal and junkyards) | | GW | | | | |
| Timber Harvest and Forest Management | | | | | SW | SW |
| Silage Storage | | | B | SW | | SW |
| Petroleum Products Storage | | GW | | | | |
| Irrigation Water Management | | B | B | SW | SW | |
| Notes: | | | | | | |
| * Primary surface water impact is on coastal waters. | | | | | | |
| ** This table reflects what is generally the impact on waters under typical circumstances. Specific site conditions may affect local impacts. | | | | | | |
| *** Potential impact on groundwater depends on soil types and surficial geology of the area. | | | | | | |

Part 2: Farm Soils/Topography (Optional)

Soils on a farm vary in their ability to transmit water. The potential for surface runoff or leaching to groundwater can be assessed for different soil types by referring to the County Soil Survey Report available from your USDA Service Center or County Soil and Water Conservation District Office.

If potential ground water concerns were identified in Part 1 of this worksheet there may be a heightened risk of groundwater pollution if soils are farmed that (check below):

- Are glacial outwash or well drained alluvial soils over sand or gravel deposits.
- Are less than 20” to fractured bedrock.
- Contain sinkholes, or are less than 40” deep over limestone.
- Adjacent to/or above the farm’s water supply (well or spring).

Or, if surface water concerns were identified in Part 1 there may be a heightened risk of polluting nearby waterbodies if soils are farmed that (check below):

- Have slopes greater than 8 percent, or are highly erodible (HEL) that lack best management practices for controlling surface runoff.
- Are predominately clay soils, or shallow soils over hardpan or unfractured bedrock.
- Have seasonal concentrated flows or conservation practices such as subsurface drainage tile that directly outlet into a waterbody.
- Are seasonally saturated (land capability class 2w or wetter).
- Are within 100 feet of a waterbody.
- Flood frequently (once every 2 years).

Those areas checked above are considered hydrologically sensitive areas. These areas can have a high potential for transporting pollutants to surface and groundwater depending on their location (proximity to a waterbody) and type of farming conducted on them. **If these soils exist on the farm please identify their locations under the section entitled Watershed/Summary/Next Steps on page 9.** How these hydrologically sensitive areas are managed on a farm can dramatically affect whether the farm contributes to water quality pollution problems. **Completing the additional Tier 2 worksheets checked on page 9 of this worksheet can help identify whether a higher level of management may be needed to reduce the potential pollution risk from farming these hydrologically sensitive areas.**

Part 3: Other Natural Resource Concerns (Optional)

Are there additional natural resource concerns (soil, water, air, plants, animals or human) identified for the watershed where the farm is located that could be addressed on the farm such as loss of riparian forest buffers along streams, livestock odor, neighbor relations, loss of farmland to development etc.? If so please list concerns: _____

Watershed/Farm Summary - Next Steps:

Using the results from Parts 1 and 3 (if filled out), check below those Tier 2 Worksheets that should be filled out next based on watershed concerns:

Agriculture and the Community___ Manure Management___ Barnyards___ Silage Storage___ Process Wash Water___ Management of Feed Nutrients___ Water-Borne Pathogens___ Soil Management___ Fertilizer Management___ Pasture Management___ Waste Disposal___ Pesticide Use___ Pesticide Storage, Mixing and Loading___ Farmstead Water Supply Evaluation___ Stream and Floodplain Management___ Petroleum Product Storage___ Forest Management___ Livestock Odor Management___ Other (list)_____

Note: Use the "Other" category above to list the additional worksheets that should also be filled out if the operation is a greenhouse, horse operation, vineyard, vegetable, small fruit or orchard.

List areas of the farm to be assessed further based on the results of Part 2 of this worksheet, as these areas of the farm may be hydrologically sensitive and should be a priority for further Tier 2 assessment and Tier 3 planning: _____

Additional References:

The following references may also be helpful when filling out this worksheet:

- Your county's AEM Strategic Plan
- USDA Natural Resource Conservation Service (NRCS) County Soil Survey Report, Soil and Water Features Table;
- NRCS Field Office Technical Guide, Sections I and II;
- 7.5 minute U.S. Geological Survey (USGS) Topographic Map;
- GIS based aquifer maps for NYS: <http://www.nysgis.state.ny.us/inventories/health.htm>
- Regional scale surficial & bedrock geology maps for NYS: <http://www.nysm.nysed.gov/gis/>