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UNIVERSITY OF KENTUCKY DEPARTMENT OF FORESTRY • KENTUCKY DIVISION OF FORESTRY

FOREST STEWARDSHIP INFORMATION FOR RESPONSIBLE FOREST MANAGEMENT

Forestry Water Quality Plan

PREPARING AN AGRICULTURE WATER QUALITY PLAN FOR YOUR WOODLANDS

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Landowner Water Quality Plans

The Kentucky Agriculture Water Quality Act specifies that landowners must have a written water quality plan that states which best management practices (BMPs) are to be used in forestry operations on their property. Landowners engaged in forestry or agriculture operations and owning 10 or more acres of contiguous property are responsible for writing a plan and ensuring that the plan is implemented. This guide provides information on how to write a water quality plan for woodland operations.¹

Before preparing your plan, read the introductory sections on Water Quality Protection and Types of Water Pollution. These sections provide basic information on the pollutants common to woodland activities and how they can be addressed by proper use of appropriate BMPs. You should also review the BMPs and their minimum requirements. While not all BMPs will be required in a plan, reviewing them will help you to understand the range of practices that can be included in your plan and implemented on your property.

Water Quality Protection

All parties involved in woodland operations, including landowners, loggers, and silvicultural operators, are responsible for water quality protection. Forestry operations include both timber harvesting and traditional silvicultural activities. Silvicultural activities are those used to grow and care for forests and trees. Activities such as tree planting, thinning, timber stand improvement, and any work done to encourage tree regeneration after a timber harvest are considered silvicultural operations.

One of the most effective methods of protecting water quality during forestry operations is to use BMPs. BMPs are guidelines and techniques that, when used properly, can help reduce impact to our waters. They do this by decreasing erosion and the creation of muddy water, keeping chemicals and fluids out of streams, and limiting changes in the woods next to streams. BMP activities include properly designing stream crossings, reshaping and seeding logging roads, trails, and log landings, installing structures to reduce erosion, and reducing use of equipment, chemicals, and fertilizers near streams, ponds, and sinkholes.



Proper stream crossings are critical for reducing water pollution from forestry operations.

Types of Water Pollution

Water pollution from woodland operations is generally considered nonpoint source (NPS) pollution. NPS pollution is a type of pollution not readily identifiable as coming from any one point. Examples of water pollution from forestry activities are given below:

- **Muddy water runoff from logging roads, skid trails, and log decks.** Sediments can settle to the bottom of the stream or pond, choking out plant and animal life.
- **Tree tops, logging, and site preparation debris.** When pushed into streams, they can cause diversion of the streams, resulting in bank erosion and muddy water.

¹ For further information on the Kentucky Agriculture Water Quality Act plan, particularly as it relates to owners engaged in both farming and woodlands operations, contact your county Cooperative Extension Service office or your county conservation district office and consult the Kentucky Agriculture Water Quality Authority Producers' Workbook.

- **Loose fill from roads and log decks.** When pushed over stream banks and into sinkholes, loose fill will be washed into streams or possibly underground waters below sinkholes.
- **Excessive sunlight on streams, ponds, and sloughs.** This can cause an increase in water temperature and a reduction in dissolved oxygen, which can harm sensitive aquatic life.
- **Fertilizers.** Excess nutrients cause nutrient imbalances and suffocating algae blooms.
- **Pesticides.** Applied improperly, they can have a negative impact on aquatic plants and animals.
- **Vehicle fluids such as hydraulic fluid, oil, and gas.** Leaking fluids from operating or resting equipment can make their way into ground or surface water.

The selection of BMPs is based on the type of operation, topography (the shape of the land), and the type of water bodies or drainage channels present. Many times landowners may be directly involved in silvicultural activities and can implement the BMPs themselves. However, in the case of timber harvesting and other large and intensive silvicultural operations, most BMPs are implemented by the logger or silvicultural operator.

Note to Farmers, Christmas Tree Growers, and Fruit and Nut Producers

The Kentucky Agriculture Water Quality Act specifies that landowners with 10 acres or more who are involved in agriculture and forestry production have a written water quality plan for their operations. Christmas tree producers and those having orchards are required to use crop BMPs and should refer to the Crops section in the *Kentucky Agriculture Water Quality Authority Producers' Workbook*, which is available from most agricultural agencies and conservation district offices.

If your operation contains other types of agricultural activities, you also should refer to the *Kentucky Agriculture Water Quality Authority Producers' Workbook*. This document outlines the BMPs needed for all types of agriculture and forestry operations. The producers' workbook helps those engaged in multiple activities determine which BMPs are needed for each type of operation. If in the future you add new activities to your operation, you should then update your water quality plan.

Preparing Your Plan

This guide will take you step-by-step through the process of writing your water quality plan.

1. Look over the planning form. While the Kentucky Agriculture Water Quality Act requires that landowners have a written water quality plan, it does not specify the format of the plan. This guide provides a helpful planning form which, when filled out, will meet the requirements for a written plan.
2. Start filling out the form by noting which portions of your property, or woodlands, contain the forestry operations. You may have a timber harvest occurring over your entire woodlands. In this case, the planning form will list only one location. You may have different operations occurring in different parts of your woodlands. For example, you may have an area that is receiving timber stand improvement operations using herbicides, a second area involved in a harvest, and a third area, such as an old field where trees are being planted. Each of these areas should be noted as a separate woodland location.
3. Determine which BMPs should be used in each location. This task is simplified by answering the BMP questions for each location. The BMP questions are answered yes or no. If answered yes, you will be instructed as to which BMPs must be included in your plan. You should record these BMPs for a given location by checking the correct BMP box associated with that area. If you answer a question no, skip to the next question. Go through the questions for each location. When you are finished, you will have the required BMPs checked off for each location and operation on your property. Fill in the projected completion dates, which for most forestry operations is the time at which the operation itself is completed. When the BMPs are completed, record the date in the date completed box. Once filled out, the planning form is your written water quality plan. Keep the plan; you may be asked for it if there is a water quality problem on your property.
4. While not required by law, it is a good idea to fill out the self-certification form included in this publication and send it to your county conservation district office. You also can attach a copy of your water quality plan to the self-certification form if you like. Filing the self-certification form will allow you to receive updates about regulation changes and other important information from your county conservation district office. Regardless, make sure you keep a copy of your plan.

Water Quality Regulations for Silvicultural Operations

All operations must meet Kentucky water quality standards.

Kentucky Agriculture Water Quality Act, KRS 224.71-100 to 224.71-140.

The act requires that persons owning 10 or more contiguous acres engaging in agriculture or silvicultural (forestry) operations must have an individual written water quality plan, regardless of the size of operation. The individual plan must state the

best management practices as specified in the *State Agriculture Water Quality Plan* that will be used to protect water quality. The owner is also responsible for ensuring that the plan will be carried out. This publication was designed to assist landowners in writing a water quality plan for silvicultural operations that will meet the requirements specified in the state plan.

Kentucky Forest Conservation Act, KRS 149.330 to 149.355.

The Forest Conservation Act has provisions for enabling the monitoring of Kentucky's forest resources, promoting forest and forestry education, and regulating timber harvesting operations. The latter requires that a Kentucky Master Logger be on-site and in charge of *commercial* logging operations (with the exception of operations where animals are used as the primary means of skidding). The act also requires that all timber harvesting operators use appropriate best management practices for protection of water quality as specified by the Kentucky Agriculture Water Quality Act. The Kentucky Division of Forestry is charged with the development of administrative regulations and enforcement of the act.

A. Activities Near High-quality Waters and Outstanding National Resources Waters, 401 KAR 5:029, 5:030, and 5:031.

Kentucky water quality standards (401 KAR 5:029) require the use of BMPs to protect high-quality waters and outstanding national resources waters listed in 401 KAR 5:030. In addition, outstanding resource waters that support federally listed threatened and endangered species require protection (see 401 KAR 5:031).

B. Activities Near Wild Rivers, KRS 146.200 et seq. and 401 KAR 4:100-140.

The Kentucky Wild Rivers Act and associated regulations give special protection to streams designated as "wild rivers," including regulation of silvicultural activity. Before undertaking any silvicultural activity in a corridor of a designated wild river, the landowner or logger should contact the Wild Rivers Program of the Kentucky Division of Water for applicable regulations and instructions.

C. Debris in Floodplains, KRS 151.250.

The Kentucky Division of Water has authority over the placement of debris (including logging slash) in floodplains of perennial streams that have a drainage area larger than one-square mile. The Division of Water advises that as long as the BMPs for Streamside Management Zones and logging debris are followed, landowners and loggers will be considered in compliance with floodplain regulations that address debris. If these BMPs are not followed, the Kentucky Division of Water can institute enforcement proceedings.

D. Construction in Floodplains, KRS 151.250.

All structures (bridges, berms, or other construction that could obstruct flood flows) that are to be constructed in the floodplain of a perennial stream that drains more than one-square mile require a floodplain permit from the Kentucky Division of Water.

E. Filling or Draining of Wetlands, U.S. Clean Water Act, Section 404.

The U.S. Army Corps of Engineers regulates all filling or draining of wetlands, streams, lakes, or other bodies of water. Normal ongoing silvicultural activities, including building and maintaining forest roads, do not require individual permits, providing certain conditions are met, including adherence to the federal baseline BMPs for forest roads. For detailed information

on the silvicultural exemption, contact the Kentucky Division of Forestry.

F. Activities around Sinkholes and Cave Entrances, KRS 433.870-433.875.

The Kentucky Cave Protection Act offers protection to any sinkhole, pit, karst window, and/or sinking stream that has an opening large enough for a person to enter a black zone. The Federal Cave Protection Act is used to manage nonrenewable cave resources on federal lands. Management techniques include buffer zones around sinkhole and cave entrances to provide food sources for cave life, regulate thermal variations, and prevent sedimentation. Extremely sensitive karst systems can include the entire recharge area as a buffer zone.

G. Endangered Species in Caves, Federal Register 55:6184-6229 and 56:58804-58836.

The Kentucky State Nature Preserves Commission maintains the list of Kentucky plants and animals that are considered endangered, threatened, and of special concern. The U.S. Fish and Wildlife Service administers the federal Endangered Species Act of 1973, as amended in 1990, and the 1991 Candidate Review. Many species protected by these acts live in caves and can be threatened by pollutants entering sinkholes.

H. Modified Sinkholes.

Any sinkhole that has been modified to receive additional storm water runoff can be classified as a Class V Underground Injection Control Well, which must be registered and/or permitted by the U.S. Environmental Protection Agency Underground Injection Control Program.

I. Cave Streams and Other Underground Surface Waters.

Kentucky surface water statutes and regulations have defined subterranean streams that flow underground and have discrete banks and channels, such as cave streams, as surface waters. Several karst groundwater basins in the Mammoth Cave National Park that extend well outside of the Park's boundary have been designated as Outstanding Resource Waters and receive the same special protection of species as the blind shrimp in Mammoth Cave.

J. Karst Groundwater Basin Protection.

The federal and state Wellhead Protection Programs are developing karst groundwater basin protection plans for public water supplies that use karst springs or groundwater as their water source.

K. Application of Sludge.

The application of some organic materials, such as sludge, can require a permit for compliance with federal and/or state regulations. For more information regarding permits required for the application of sludge, contact the Kentucky Division of Waste Management.

L. Application of Pesticides.

Use only pesticides approved by the Environmental Protection Agency for use in Kentucky. Follow all pesticide label directions. Application of some chemicals can require applicator certification and/or licensing.

Silviculture BMP Questions

1. As part of any timber harvesting and/or silvicultural operation, will you or the logger need to construct, use, and/or maintain roads, skid trails, and/or log landings on your property?

Helpful hint: Logging roads, skid trails, and landings generally are used in timber harvesting operations in Kentucky, and this question is normally answered yes.

Yes No

If yes: BMPs No. 1 and No. 5

2. Does the area where the silvicultural operation is to occur contain perennial or intermittent streams or other bodies of water?

Helpful hint: Perennial streams flow all year round. Intermittent streams have defined banks and flow only during the wet portions of the year and directly after rainfall in dry summer months.

Yes No

If yes: BMPs No. 3 and No. 5

3. Does the boundary or tract where the silvicultural operation is to occur contain sinkholes?

Yes No

If yes: BMPs No. 4 and No. 5

4. In conjunction with your silvicultural operation, are there disturbed or otherwise bare areas (including roads, trails, and landings) that need to be revegetated to prevent and/or control soil erosion?

Helpful hint: This question pertains to areas where bare mineral soil is exposed and susceptible to erosion. Generally, landings, roads, and highly used skid trails need revegetation. This question usually does not pertain to areas where groundcover is being killed to aid in tree planting or to encourage natural reforestation.

Yes No

If yes: BMP No. 2

5. Will you conduct any silvicultural activities in areas classified as wetlands by the Natural Resources Conservation Service (NRCS) or the U.S. Army Corps of Engineers?

Helpful hint: It is sometimes difficult for an untrained individual to determine if an area is a wetland. Many bottomland hardwood forests on floodplains are considered wetlands. Generally, soils that stay wet near the surface indicate a wetland. If you have an area that you suspect is a wetland, you can contact the Corps of Engineers, your local district conservationist with the Natural Resources Conservation Service, your county Cooperative Extension Service agent, or personnel from the Kentucky Division of Forestry for help.

Yes No

If yes: BMP No. 10

6. Will you, an operator, or a vendor working for you engage in site preparation activities prior to, or as part of, reforestation

practices on your property?

Helpful hint: Site preparation activities are forestry practices used to help establish a new crop of trees, whether it be in a forested area or in a field. These activities include shearing, raking, and drum chopping tree tops and stumps and similar practices completed with heavy machinery as well as prescribed burning and the use of herbicides to control competing vegetation.

Yes No

If yes: BMPs No. 6 and No. 9

7. Will you or a contractor working for you be applying pesticides, including herbicides or fertilizers, in connection with your silvicultural activities?

Helpful hint: This question usually pertains to silvicultural operations for culturing tree plantings or timber stand improvement work. Timber harvesting operations might include the use of fertilizers to help ensure successful revegetation of roads, trails, or landings. If this is the case, use only BMP No. 7, which is the fertilizer BMP. BMP No. 8 is for pesticides, which include herbicides.

Yes No

If yes: BMPs No. 7 and No. 8, and consult the Pesticides and Fertilizer section of the Kentucky Agriculture Water Quality Authority Producers' Workbook (Appendix D). This section deals with storage, mixing, and disposal and generally reflects label specifications.

8. Do you allow livestock to have access to your forested areas or to forested areas in streamside corridors or around lakes or ponds?

Helpful hint: The Kentucky Agriculture Water Quality Act requires that you adhere to livestock BMPs if cattle are grazing around streams in woodlands. However, if you are concerned about timber production, you should limit livestock access to woodlands, because they will damage standing trees and destroy seedlings in the understory.

Yes No

If yes, refer to the appropriate BMP in the Livestock section of the Kentucky Agriculture Water Quality Authority Producers' Workbook.

9. Will low water stream crossings be constructed, or will gravel, sediments, or logjams be removed from a stream?

Yes No

If yes, refer to the Streams and Other Waters section of the Kentucky Agriculture Water Quality Authority Producers' Workbook.

10. Will you conduct a prescribed fire, or will you construct fire lines?

Yes No

If yes: BMPs No. 12 and 13. Also contact the Kentucky Division of Forestry and refer to Kentucky Forest Practices Guidelines for Water Quality Management (FOR-67).

Forest Stewardship Water Quality Plan

Attach additional forms if more than two woodland locations are involved.

Name _____

Address _____

Date _____

This form, when completed, meets the written water quality plan requirements of the Kentucky Agriculture Water Quality Act. Retain this plan and submit the Self-Certification Form inserted in this publication to the office of your county conservation district.

The BMPs that are checked off should be implemented in the appropriate areas. Minimum requirements for the BMPs are found in the *Kentucky Agriculture Water Quality Authority Producers' Workbook* and the statewide water quality plan developed by the Kentucky Agriculture Water Quality Authority. BMP details and further information are found in *Kentucky Forest Practice Guidelines for Water Quality Management (FOR-67)* and associated field guides and publications, including *Field Guide to Best Management Practices for Timber Harvesting in Kentucky (FOR-69)*, available from your county Cooperative Extension office or the Kentucky Division of Forestry district office.

Woodland Location (from Stewardship Plan if available)			
BMP Number	BMP Checkoff	Date to Complete	Date Completed
1 Access Roads, Trails, and Landings			
2 Vegetative Establishment			
3 Streamside Management Zones			
4 Sinkholes			
5 Logging Debris			
6 Tree Planting by Machine			
7 Fertilizers			
8 Application of Pesticides			
9 Site Preparation			
10 Wetlands			
Sensitive Area Checklist			
<input type="checkbox"/> Perennial Stream	<input type="checkbox"/> Wetland		
<input type="checkbox"/> Intermittent Stream	<input type="checkbox"/> Kentucky Wild River		
<input type="checkbox"/> Ephemeral Channel	<input type="checkbox"/> Coldwater Aquatic Habitat		
<input type="checkbox"/> Sinkhole	<input type="checkbox"/> Outstanding Natural Resource Waters		

Woodland Location (from Stewardship Plan if available)			
BMP Number	BMP Checkoff	Date to Complete	Date Completed
1 Access Roads, Trails, and Landings			
2 Vegetative Establishment			
3 Streamside Management Zones			
4 Sinkholes			
5 Logging Debris			
6 Tree Planting by Machine			
7 Fertilizers			
8 Application of Pesticides			
9 Site Preparation			
10 Wetlands			
Sensitive Area Checklist			
<input type="checkbox"/> Perennial Stream	<input type="checkbox"/> Wetland		
<input type="checkbox"/> Intermittent Stream	<input type="checkbox"/> Kentucky Wild River		
<input type="checkbox"/> Ephemeral Channel	<input type="checkbox"/> Coldwater Aquatic Habitat		
<input type="checkbox"/> Sinkhole	<input type="checkbox"/> Outstanding Natural Resource Waters		

Property or Boundary Map *(not required)*

This space has been provided to allow you to sketch the property that designates areas where different operations are being undertaken. A forest stewardship map can be used as well.

Outline of Kentucky's Silvicultural BMPs

A full description of Kentucky's silvicultural best management practices can be found in *Kentucky Forest Practice Guidelines for Water Quality Management* (FOR-67). The BMPs were developed to guide silvicultural and timber harvesting operations in a manner that helps protect water quality. The following is a list of the Kentucky Agriculture Water Quality Act minimum requirements associated with each of the silvicultural best management practices.

The minimum requirements must be implemented (if the associated activity is occurring on your property) in order to be in compliance with the Kentucky Agriculture Water Quality Act. Under some circumstances, it may be necessary to implement practices above and beyond the minimum requirements to avoid water quality problems. To obtain detailed information concerning the silvicultural best management practices, you should refer to the *Kentucky Forest Practice Guidelines for Water Quality Management* (FOR-67) and the associated BMP guides such as the *Field Guide to Best Management Practices for Timber Harvesting in Kentucky* (FOR-69).

BMP No. 1—Access Roads, Skid Trails, and Landings

Kentucky Agriculture Water Quality Act Minimum Requirements:

The landowner should ensure that loggers or others working on the property:

- Not operate skidders or other logging equipment off hard-surfaced roads under conditions that may cause the development of excessive rutting. Excess rutting is defined as a point where ruts cannot be resurfaced with available equipment.
- Construct roads and skid trails so that grades are kept to a minimum. When possible, access roads should not exceed a grade of 15% except for short stretches of 200 feet or less, where grades should not exceed 18%.
- Install water bars, culverts, or other drainage structures at intervals appropriate to remove water from the road or skid trail to prevent damage and erosion to the surface of the road, trail, or the forest floor from channelized flow.
- Cross streams or ephemeral channels at right angles where bridges or culverts are not used.
- Not leave disturbed soil or concentrated logging slash in ephemeral channels.
- Locate yards and landings outside of streamside management zones (SMZs) and ensure they have adequate drainage (see minimum requirements of Silvicultural BMP No. 3).
- Promptly reshape and revegetate roads, trails, and log landings after silvicultural activities are complete. Efforts should be made to restrict access to these areas.

Refer to Regulatory Requirements A, D, and E (see page 3 for a list of regulatory requirements).

BMP No. 2—Vegetative Establishment on Silviculturally Disturbed Areas

Kentucky Agriculture Water Quality Act Minimum Requirements:

The landowner should ensure that after activities are completed by the operator:

- Revegetation of sediment-producing, erodible, or severely eroded areas such as logging roads, skid trails, and log landings takes place as soon as possible; revegetation should be sufficient to adequately control and to significantly abate erosion from the site. Erodible areas are defined as those with slope equal to or greater than 10 percent.

Refer to Regulatory Requirements A and B.

BMP No. 3—Streamside Management Zones (SMZs)

Kentucky Agriculture Water Quality Act Minimum Requirements:

The landowner should ensure that during operations:

- In no case stream beds are used as roads for the skidding of logs except where site conditions (rock walls, notches, or other limiting factors) leave no other alternatives for access or where road or skid trail placement in normally recommended locations is either impossible or will cause a higher degree of water quality degradation.
- If an exception due to physical site conditions is necessary, stream channels may be used only as roads or for skidding for the minimum distance required.
- In areas adjacent to perennial streams, lakes, and ponds, maintain forest buffers for a surface distance of 25 to 55 feet on ground with less than 15% slope and for a minimum surface distance of 55 to 90 feet on ground with slope of 15% or greater. Management activities are acceptable in these areas; however, equipment operation should be avoided except at designated crossings. At least 50% of the original tree overstory (canopy cover) should be retained to shade the water and to maintain water temperature. Where minimum distances are not possible, roads, trails, and landings can be located at less than the recommended distance but should be constructed to protect water quality. Take precaution to prevent tree debris, such as tops from harvested trees, from remaining in or being washed into perennial streams.
- In areas adjacent to intermittent streams, complete removal of overstory trees is acceptable. Equipment operation should be avoided in a zone of at least 25 feet on each side of an intermittent stream except for designated crossings. Where minimum distances are not possible, roads, trails, and landings can be located at less than the recommended distances but should be constructed to protect water quality. Mechanical site preparation should be excluded from areas adjacent to intermittent streams to maintain the duff layer and filtering capacity. Take precautions to prevent tree debris, such as tops from harvested trees, from remaining in or being washed into intermittent streams.
- Coldwater Aquatic Habitats (CAHs) (high-quality trout streams), as designated by the Kentucky Division of Water, need additional protection.

- CAHs should have a minimum of 75% of the original tree overstory (canopy cover) retained within the 60-foot-wide strip on either side of the stream.
- Understory vegetation immediately adjacent to CAH streams should be left undisturbed.
- Fertilizers and pesticides should only be applied in the SMZs in compliance with guidelines for use of forest chemicals.

Refer to Regulatory Requirements A, B, and C.

BMP No. 4—Sinkholes

Kentucky Agriculture Water Quality Act Minimum Requirements:

The landowner should ensure that operators:

- Leave a buffer zone between any disturbed area and the open swallet of a sinkhole. Thirty feet should be left for areas with 5% slope. An additional 10 feet in width should be added to this zone for each 10% increase in slope.
- Divert runoff from haul/access roads, skid trails, and log landings so as not to drain directly into sinkholes, sinking streams, or caves. (Note: if runoff does enter a sinkhole, a UIC permit may be required).
- Not push soil, logging debris, and/or other waste material into the bottom of a sinkhole or into any noticeable sinkhole opening.
- Not drain fluids from equipment onto the ground. They should be collected in a container, transported off site, and recycled or properly disposed.
- Maintain a buffer zone along sinking streams or in sinkholes with an open swallet if there is fertilizer and/or pesticide use in the vicinity.

Refer to Regulatory Requirements F, G, H, I, and J.

BMP No. 5—Logging Debris

Kentucky Agriculture Water Quality Act Minimum Requirements:

The landowner should:

- Not allow tree debris, such as tops from harvested trees, to be left in or washed into perennial streams.
- Not leave equipment on stream banks or change equipment fluids in such a manner that pollutants may wash into streams.
- Dispose of cans, bottles, lunch bags, oil filters, or air filters and all other trash properly.

Refer to Regulatory Requirements A, B, and C.

BMP No. 6—Proper Planting of Tree Seedlings by Machine

Kentucky Agriculture Water Quality Act Minimum Requirements:

The landowner should:

- Operate mechanical tree planters only on the contour during tree planting operations.

Refer to Regulatory Requirements A and B.

BMP No. 7—Fertilization

Kentucky Agriculture Water Quality Act Minimum Requirements:

The landowner should:

- Use only the amount of fertilizer necessary, and no fertilizer should be used on bodies of water or those areas immediately adjacent to them.
- Avoid using fertilizers in SMZs or within 30 feet of any noticeable sinkhole opening.

Refer to Regulatory Requirements A, B, and K.

BMP No. 8—Application of Pesticides

Kentucky Agriculture Water Quality Act Minimum Requirements:

The landowner should:

- Follow label directions.
- Not clean equipment or dump excess materials near bodies or water.
- Remove empty containers from the woods and dispose of them properly.
- Avoid using pesticides in SMZs or within 30 feet of any noticeable sinkhole opening.

Refer to Regulatory Requirements A, B, and L.

BMP No. 9—Site Preparation for Reforestation

Kentucky Agriculture Water Quality Act Minimum Requirements

The landowner should:

- When possible, use only low-impact methods of site preparation during tree planting activities. Low-impact methods are defined as those practices that cause a minimum of site disturbance.

Refer to Regulatory Requirements A and B.

Table 9-1. Site Preparation Methods Impacting Water Quality.

Site Preparation Method	Hazard Level
Herbicide injection	Little or no hazard
Clear felling with chain saw	Little or no hazard
Herbicide spraying	Has potential if BMP No. 8 "Application of Pesticides" not followed
Drum chopping	Medium potential
Drum chopping with burning	Medium potential
Shearing and windrowing	High potential
Disking	High potential

BMP No. 10—Silviculture in Wetland Areas

Kentucky Agriculture Water Quality Act Minimum Requirements:

The landowner should ensure that loggers:

- Minimize the construction of permanent roads and locate log landings on higher ground.
- Restrict vehicle traffic to a minimum.
- Avoid crossing of streams and sloughs if possible.
- Leave 50 to 70% of the overstory trees to shade perennial streams and sloughs.

Refer to Regulatory Requirements A and B.

The following BMPs are not included in the Kentucky Agriculture Water Quality Act for silviculture, but they are good management practices that should be followed to protect water quality and maintain forest productivity.

BMP No. 11—Livestock Management

Livestock should be managed in such a way that enough cover to protect the soil from erosion is maintained and sedimentation of nearby bodies of water is prevented. It is important to protect, maintain, or improve the quantity and quality of the plant resources, to maintain soil productivity, and to prevent soil compaction.

BMP No. 12—Fire Lines for Wildfire Control

Fire lines and fire lanes are constructed to restrict and control wildfire or to manage areas to be treated with prescribed burning in such a way as to minimize soil erosion and protect nearby bodies of water from sedimentation.

BMP No. 13—Prescribed Burning

Prescribed burning is used to modify a forest stand or to reduce forest residue to some desired level in a manner that minimizes soil erosion and protects nearby bodies of water from sedimentation. Prescribed burning can be used on forested sites for reduction of hazardous accumulations of fuel to lessen wildfire potential, for improvement of wildlife habitat, for discouragement of undesirable plant growth that can inhibit natural or artificial regeneration of a stand of trees, and for creation of a seedbed favorable to natural or direct seeding reforestation.

Glossary of Terms

Access road

A temporary or permanent road over which timber is transported from a loading site to a public road. Also known as a haul road.

Best Management Practices

For agriculture operations, the most effective, practical, and economical means of reducing and preventing water pollution provided by the United States Department of Agriculture/Natural Resources Conservation Service (USDA/NRCS), the Kentucky Soil and Water Conservation Commission, and the Kentucky Agriculture Water Quality Authority. Best management practices shall establish a minimum level of acceptable quality for planning, siting, designing, installing, operating, and maintaining these practices.

Buffer strip

Area adjacent to a stream or other body of water where minimal management activity takes place in order to protect the stream or body of water from nonpoint source pollution.

Coldwater aquatic habitat

Body of water that has characteristically cool water and is considered high-quality trout water by the Kentucky Division of Water.

Concentrated logging slash

The unwanted, unused, and generally unmerchantable accumulation of woody material, such as large limbs, tops, cull logs, and stumps, that remain as forest residue after timber harvesting.

Debris

See *concentrated logging slash*.

Deep water break (water bar)

Deep, reverse grade water control structure used in the retirement of skid trails.

Drainage structure

Structure that acts as a water catchment and drainage channel on access roads and skid trails, including pipe culverts, open-faced culverts, and reverse-grade drainage structures.

Drum chopping

Process of crushing debris or breaking it apart in order to flatten residual trees and branches.

Ephemeral channel

A channel formed by water during or immediately after precipitation events as indicated by an absence of forest litter and exposure of mineral soil, which conveys surface water directly or indirectly to surface or subsurface streams.

Felling

The process of cutting down standing trees.

Grade (gradient)

The slope of a road or trail expressed as percentage of change in elevation per unit of distance traveled.

Intermittent stream

Has a well-defined channel but flows only during the wet portions of the year. Denoted by a broken blue line on a U.S. Geological Survey topographic map.

Karst

Areas with limestone bedrock that are prone to have sinkholes and/or underground stream systems.

Landing

A place in or near the forest where logs are gathered for further processing or transport. The act of depositing a turn of logs into a landing or log deck.

Log deck

See *landing*.

Logging debris (slash)

The unwanted, unused, and generally unmerchantable accumulation of woody material, such as large limbs, tops, cull logs, and stumps, or other logging operation waste products, that remain as forest residue after timber harvesting.

Logging road

See *access road*.

Nonpoint source pollution

Pollution that comes from a number of sources spread over a wide geographic area. Generally, each source only contributes a small amount of contamination, but the sum impact may be substantial. Agriculture, mining, forestry, urban runoff, and construction all contribute to nonpoint source pollution. A single source for the pollution is not readily identifiable.

Overstory

Composition of the dominant trees in a forest, which shade the understory and forest floor.

Perennial stream

Has a well-defined channel and flows all year or nearly all year under typical climatic conditions. Denoted by a continuous blue line appearing on a U.S. Geological Survey 7.5 minute topographic map.

Pesticides

Chemicals, including insecticides, herbicides, fungicides, rodenticides, and nematocides, used to destroy, prevent, or control woody or herbaceous vegetation and forest pests.

Planting slit

A closed furrow produced by a mechanical tree planter.

Sediment

The result of erosion. It is the solid material, both mineral and organic, that is in suspension, being transported, and creates pollution problems.

Sedimentation

The process of sediments entering and settling to the bottom of a stream or other body of water.

Silvicultural activity

Any activity, following accepted silvicultural principles, whereby the tree species constituting forests are tended, harvested, and replaced.

Sinkhole

Open or closed circular depressions in karst (limestone) areas where surface waters flow to join an underground drainage system.

Sinking stream

A stream that disappears from the surface and flows underground instead of draining into another aboveground body of water.

Site preparation

Practices used to prepare a site for planting or regenerating trees. These practices are used to reduce or eliminate unwanted and/or competing vegetation that would threaten the survival or proper development of planted tree seedlings.



When BMPs are used properly, streams are protected from sediment and debris.

Skid or Skidding

Short-distance moving of logs or felled trees from the stump to a point of loading.

Skid trail

A temporary pathway used to drag felled trees or logs to a landing or concentration point, resulting in duff (the partially decomposed organic materials of the forest floor) and ground disturbance sufficient to cause erosion.

Slough

A slow-moving channel of water in or near a wetland.

Streamside management zone (SMZ)

A strip of land adjacent to either side of a stream or surrounding a lake or pond. These areas are carefully maintained and managed to protect water quality by filtering sediment, to provide shade, to maintain water temperatures, and to trap logging debris. They also provide wildlife travel lanes. Also referred to as a riparian area.

Swallet (swallow hole)

Used in a loose sense to indicate the place where a sinking stream goes underground. Swallow holes come in many sizes and shapes. Some are places where major streams abruptly go underground, either vertically through their beds or laterally into their banks. Some swallow holes are pits, some are open cave entrances, and some are choked; others are simply reaches of stream bed where water is lost. Upstream from the swallow hole the stream flows at its full volume; downstream the stream is reduced, or the bed is dry. In between is an intermediate reach, where the water is lost gradually in the stream bed alluvium. Often there is no "hole" associated with the swallet.

Yards

See *landing*.

Water bar

See *deep water break*.

Wetland

Geographic areas that characteristically support vegetation suited to life in saturated soil conditions and have hydric (wet) soils and some saturation or flooding during the growing season.

Agriculture Water Quality Plan Self-Certification

I understand my obligations under the Agriculture Water Quality Act to implement the applicable requirements of the statewide water quality plan, and I have developed a Forest Stewardship Water Quality Plan for my individual operations based on its guidance. I am aware of the need to review my plan periodically to record those practices or measures that I have completed and to modify my plan as a major changes are made in my operation. If my management practices are questioned by regulatory agencies or through civil actions, these updated records will serve as documentation of my efforts to improve and protect natural resources. This plan will entitle me to:

- **The Corrective Measures Process.** A process to correct any identified water quality problems that may be the result of activities conducted on my operation.
- **Availability of technical assistance** through the conservation districts to develop or modify as needed my water quality plan, practices, and/or measures or to recommend changes to the statewide water quality plan.
- **Financial assistance** needed for implementation of my plan as resources become available.
- **Possible extension of time for compliance** with a water quality plan based on the availability of technical and financial assistance.

I would like to be kept informed, through the conservation districts mailing list, of new information as it becomes available regarding: resource needs, water quality, environmental conditions, new or more effective best management practices, new and beneficial technologies, and new or expanded sources of technical and financial assistance such as cost share or incentive programs.

_____ County Conservation District, KY _____
(Farm I.D. #)

(Name, Landowner/Land User)

_____ *(Date)* _____ *(Address)*

Instructions: File this form with your county conservation district (see phone numbers on back). While you can attach a copy of your water quality plan, it is not required. Regardless, make sure you keep a copy of your plan.

Kentucky County Conservation District Phone Numbers

Adair	270-384-6628	Grant	859-823-2291	Meade	270-422-3183
Allen	270-237-5363	Graves	270-247-9529	Menifee	606-768-2541
Anderson	502-839-5667	Grayson	270-259-3738	Mercer	859-734-6889
Ballard	270-665-5994	Green	270-932-4244	Metcalf	270-432-3391
Barren	270-678-6811	Greenup	606-473-7194	Monroe	270-487-6589
Bath	606-674-2121	Hancock	270-927-6622	Montgomery	859-498-5654
Bell	606-337-6320	Hardin	270-765-2273	Morgan	606-743-3194
Boone	859-586-7903	Harlan	606-573-2838	Muhlenberg	270-338-3743
Bourbon	859-987-2311	Harrison	859-234-5876	Nelson	502-348-3363
Boyd	606-325-3138	Hart	270-524-5482	Nicholas	859-289-2234
Boyle	859-238-7461	Henderson	270-827-5157	Ohio	270-298-3340
Bracken	606-735-3256	Henry	502-845-2890	Oldam	502-222-5123
Breathitt	606-666-5138	Hickman	270-653-6457	Owen	502-484-2719
Breckinridge	270-756-2776	Hopkins	270-821-4464	Owsley	606-593-5183
Bullitt	502-543-7810	Jackson	606-287-8314	Pendleton	859-654-3376
Butler	270-526-3784	Jefferson	502-499-1900	Perry	606-436-3731
Caldwell	270-365-5533	Jessamine	859-885-4673	Pike	606-437-7879
Calloway	270-735-5151	Johnson	606-789-5263	Powell	606-663-2896
Campbell	859-635-9587	Kenton	859-586-7903	Pulaski	606-678-5416
Carlisle	270-628-5429	Knott	606-785-0113	Robertson	606-724-5822
Carroll	502-732-0070	Knox	606-546-3393	Rockcastle	606-256-2541
Carter	606-474-5184	LaRue	270-358-3132	Rowan	606-784-5375
Casey	606-787-2017	Laurel	606-864-2180	Russell	270-343-3343
Christian	270-885-8688	Lawrence	606-673-3800	Scott	502-863-2466
Clark	859-744-2322	Lee	606-464-8480	Shelby	502-633-3640
Clay	606-598-5132	Leslie	606-672-2357	Simpson	270-586-5914
Clinton	606-387-5196	Letcher	606-633-4448	Spencer	502-477-2867
Crittenden	270-965-3921	Lewis	606-796-3831	Taylor	270-465-8554
Cumberland	270-864-2606	Lincoln	606-365-9418	Todd	270-265-2867
Daviess	270-685-1707	Livingston	270-928-2149	Trigg	270-522-3304
Edmonson	270-597-2761	Logan	270-726-2618	Trimble	502-255-7114
Elliott	606-738-6222	Lyon	270-388-7653	Union	270-389-1981
Estill	606-723-5104	McCracken	270-554-5242	Warren	270-834-1112
Fayette	859-233-2761	McCreary	606-376-5017	Washington	859-336-7777
Fleming	606-845-9387	McLean	270-273-3655	Wayne	606-348-9385
Floyd	606-886-3128	Madison	859-624-1981	Webster	270-639-5763
Franklin	502-223-2024	Magoffin	606-349-1919	Whitley	606-549-3242
Fulton	270-236-2418	Marion	270-692-2431	Wolfe	606-668-3113
Gallatin	859-567-4441	Marshall	270-527-3236	Woodford	859-873-4941
Garrad	859-792-2620	Martin	606-298-3595		
		Mason	606-759-5570		

References

- Kentucky Agriculture Water Quality Authority Producers' Workbook*. 1997. Frankfort, Ky.: Kentucky Division of Conservation.
- Kentucky Forest Practice Guidelines for Water Quality Management (FOR-67)*. 1997. Lexington, Ky.: University of Kentucky Cooperative Extension Service.
- Field Guide to Best Management Practices for Timber Harvesting Operations in Kentucky (FOR-69)*. 1998. Lexington, Ky.: University of Kentucky Cooperative Extension Service.