



With an expanding urban environment, horse owners must diligently protect water quality and present a good image to their neighbors.

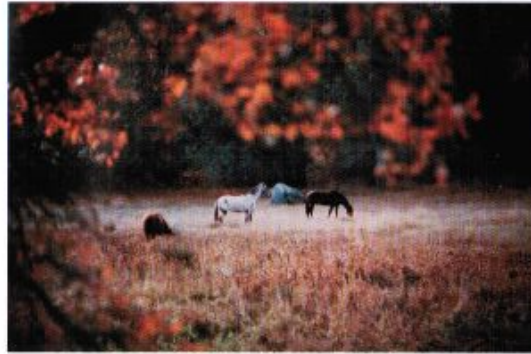
### What is voluntary compliance?

Both State and Federal laws, such as the Chesapeake Bay Preservation Act and the Clean Water Act set standards for handling of animal waste to provide protection of surface and underground water resources. Currently, regulatory and enforcement agencies encourage owners and managers of animal feeding or confinement operations, as well as individual horse owners, to follow a program of "voluntary compliance" to achieve these "clean water" standards without more formal regulatory action.

Voluntary compliance means voluntarily undertaking the necessary and appropriate management practices to minimize the release of pollutants into local waters without the necessity of obtaining site-specific waste discharge requirements. Horse owners and facility managers should evaluate the effectiveness of their existing erosion control, stormwater management, and waste management practices to minimize transport of pollutants. Voluntary compliance allows the horse community the opportunity to demonstrate responsible stewardship of natural resources while avoiding stricter enforcement of regulations. Voluntary compliance does not mean that water quality concerns can be ignored.

This brochure was written by the Council of Bay Area Resource Conservation Districts in California and was reprinted with their permission.

Working with horse owners to protect natural resources.



Horse owners can eliminate the need for any further regulation by taking responsibility to manage horse waste, limit erosion, control stormwater runoff, and protect aquatic habitat.

#### For more information in your area contact:

##### Fairfax County

Northern Virginia Soil & Water Conservation District (SWCD) and USDA Natural Resources Conservation Service (NRCS) (703) 324-1460

##### Prince William County

Prince William SWCD and NRCS (703) 594-3621  
Piedmont Environmental Council (703) 367-0069

##### Loudoun County

Loudoun SWCD and NRCS (703) 777-2075

##### Fauquier County

John Marshall SWCD and NRCS (540) 347-3120 ext. 3

##### Culpeper, Rappahannock, Orange, Madison, and Greene Counties

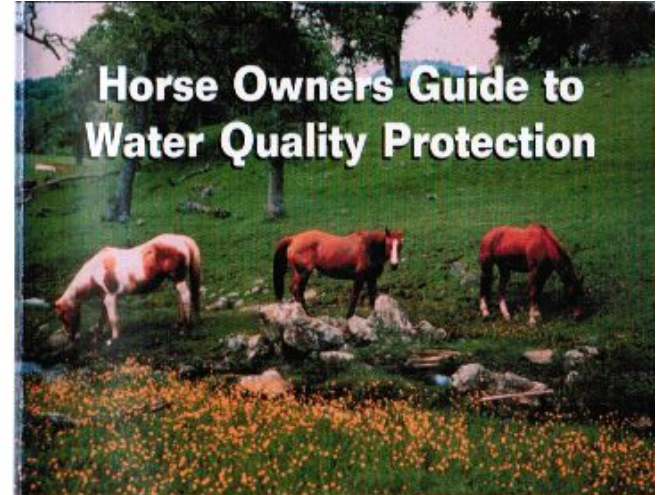
Culpeper SWCD (540) 825-8591  
NRCS (540) 825-4200 ext. 3

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The USDA Natural Resources Conservation Service and Soil & Water Conservation Districts are equal opportunity providers and employers. SWCDs are non regulatory, special districts governed by a volunteer board of directors. In addition to educational programs, SWCDs provide landowners and the public with technical assistance in natural resource management, at minimal or no cost. The Commonwealth of Virginia supports SWCDs through financial and administrative assistance provided by the Department of Conservation and Recreation.



## Horse Owners Guide to Water Quality Protection



Conservation practices that protect water quality at horse facilities increase property value, promote horse health, build good relations between neighbors, and discourage new regulations.

Horse operations can contribute to the total pollutants entering local waterways. Therefore, horse owners and facility managers bear the responsibility to minimize water pollution through:

1. Facility design and siting
2. Horse waste management
3. Stormwater runoff management
4. Pasture and paddock care
5. Waterbody protection

Implementation of conservation practices does not need to be costly. Often a slight change in operations will achieve the desired result. How can horse waste and erosion affect water quality? How well are you, as a horse owner, protecting water quality? What more can you do?



*Horses in the wild may roam up to twenty-five miles a day for food, water and shelter. Their continual movement disperses manure and urine and allows for regrowth of vegetation. However, with domestic horses, thoughtful owners provide food and shelter, and, consequently, relatively large numbers of horses can be kept in a small area. If not carefully managed, horse waste and sediment from horse facilities could enter waterways or infiltrate ground water to create conditions detrimental to drinking water supplies, recreational activities, and the environment.*

### **What can horse owners do to minimize adverse water quality impacts?**

Be informed and proactive. Analyze possible water quality impacts of your operations before and during rains. Learn how to perform simple water quality monitoring tests. Implement conservation practices if necessary. Carefully consider potential water quality problems before expanding your facility. Schedule a workday at your stables to install roof gutters, improve drainage channels, set up a new manure storage system, or revegetate a creek. Volunteer to maintain public trails. Encourage your friends and horse clubs to do the same.

Remember, any complaint about horses reflects on all horse owners. Realize that not everyone loves horses. Consider yourself an ambassador for horses by demonstrating good stewardship of land and water resources. Care of natural resources in your local area will initiate an expanding ripple.

### **How can horse waste impair water quality?**

Although horse wastes (manure, urine and soiled bedding) are organic, biodegradable materials, many of their biological and chemical properties can be detrimental to fish, insects, and other aquatic life if those wastes get into local waterbodies.

All aquatic life depends on the small amount of **dissolved oxygen** that naturally exists in water. The atmosphere contains 20% oxygen, but water saturated with oxygen contains only 11 parts per million (ppm) at 50°F, and even less, 9 ppm, at 70°F. The addition of any decomposable organic material to water stimulates the growth of aerobic bacteria that break down or consume the organic matter. The respiratory demand of the resultant bacterial population can become large enough to overwhelm the water's oxygen dynamics, leaving little or no dissolved oxygen for other aquatic life.

Many of the **nutrients** ingested by animals, not just horses, return to the environment in feces and urine. On land, moisture and atmospheric oxygen support the bacterial conversion of these wastes to nutrients available for plants. However, when carried by stormwater runoff to streams and lakes, excessive amounts of these same nutrients can stimulate unwanted **algae blooms**. Algae produce oxygen by photosynthesis, but only during sunny times of the day do they produce more oxygen than they consume. Thus, algal respiration, like the bacterial decomposition of organic material, uses up dissolved oxygen in water.

**Ammonia** is an intermediate byproduct of bacterial conversion of urea, a principal constituent of urine and other nitrogenous materials excreted by animals. A very small amount of ammonia dissolved in water can kill fish. State, Federal, and international criteria

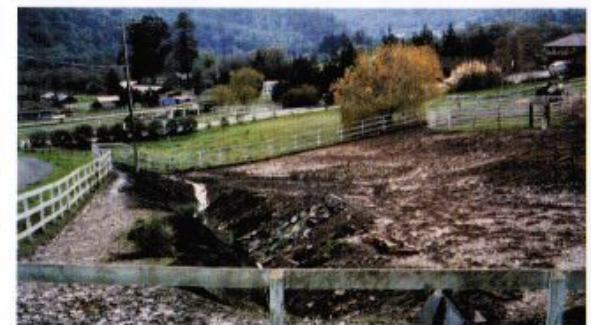
recognize that waters which support a balanced population of fish and aquatic life have an almost undetectable un-ionized ammonia concentration of 0.025 parts per million or less.

**Salts** contained in all animal waste do not break down and can be carried by rain runoff into local surface and ground waters. The presence of salts in soils of animal confinement areas can increase the salt load to local streams, limiting the species of fish, amphibians, and invertebrate life.

**Bacteria and viruses** in horse manure rarely cause health problems for people. However, the potential for spread of disease to other horses or susceptible wildlife through water may be of concern.

### **How does erosion affect water quality?**

Activities, such as over grazing or trampling, that remove the soil's vegetative cover and thus expose the soil surface to the energy of raindrops, water runoff, and wind, accelerate the natural process of erosion. Once mobilized into a stream, excessive sediment can fill pools, smother fish spawning beds, cover or obscure food supplies, reduce the amount of sunlight reaching aquatic plants, increase water temperature, and clog fish gills. In addition, heavy metals and other toxic contaminants can temporarily bind to sediments and be carried along into water.



## Facility Siting

Keeping horses close to streams, in flood-prone areas, or on steep hillsides increases the potential for the runoff of manure and sediment. One does not always have an ideal site, given the constraints of topography, soil, rainfall patterns or existing structures; but conscientious management can often offset site shortcomings. New facilities should be sited and designed to address water quality concerns. Work to upgrade existing facilities.

## Stormwater Runoff Management



- Keep "clean water clean." Use grassed ditches, berms, or sub-surface drains to divert "clean" runoff around barns, manure storage areas, and paddocks.

- Install and maintain a system of properly sized roof gutters, downspouts, and drains to prevent "clean" roof water from becoming "contaminated" by mixing with barnyard manure and sediment.

- Divert "contaminated" runoff from manured areas away from waterways and to low-gradient vegetated buffer areas.

- Separate barnyards, paddocks, and manure storage areas from any waterway with buffer strips of vegetation to filter sediments and absorb nutrients in runoff.

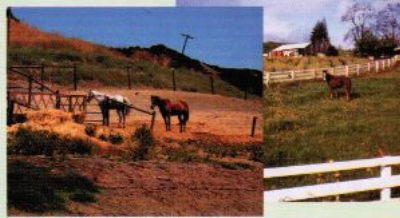
- Construct or repair trails, arenas, roads, parking areas, their associated ditches, and culverts to drain water in a non-erosive manner.

- With a little training, horse owners can use simple water quality test kits to monitor their operations.

- Additional benefits of runoff management include a drier barnyard, a healthier horse environment, and better working conditions.



## Pasture and Paddock Care



*Vegetation protects water quality by slowing the rate of stormwater runoff, which increases absorption into soil, increases bacterial conversion of toxic or consumptive constituents, and lessens the risk that soil and manure solids will be carried into streams.*

**Grazing Management** - Maintain pasture productivity by controlling the number of horses and the amount of time they spend on a pasture. In most cases, pastures provide an exercise area and not the primary food source. For this reason, pasture management should focus on protecting the pasture's soil and vegetative cover. Prevent bare areas from forming. Allow grass time for regrowth. Cross fence to divide pastures into smaller areas, which can be grazed in rotation. Inexpensive and moveable electric fencing works well to define grazing areas. During the growing season, graze grass to a height of 3-4 inches and allow regrowth to 6-8 inches before returning horses to the pasture. Manage grazing so that a cover of dry residual vegetation protects soil from the first rains.

**Soil Compaction** - A porous soil improves plant vigor by allowing the infiltration of water, air, and nutrients. Hoof impact and machinery operation on water saturated land compact soil particles and cause loss of porosity.



**Paddocks as a Sacrifice Area** - Use turnout paddocks as "sacrifice areas" to preserve pastures. This strategy reduces churning and compaction of wet soils and overgrazing when pastures require rest. If possible, locate paddocks back from waterways, and avoid swales where overland flows can wash away bare soil or manure. Maintain a vegetated border around paddocks to help filter contaminants. Be sure paddocks provide horses with adequate exercise room.

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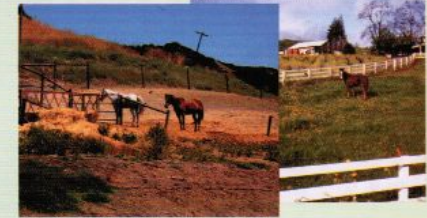
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## Protection of Resource Protection Areas and Other Waterbodies

**Riparian Buffer Strips** - Protect or restore a vegetated riparian (streamside) corridor with grass, trees, shrubs, and/or groundcover to filter sediments and horse waste, stabilize streambanks, reduce solar heating of the water, and enhance aquatic habitat.

### Limit Horses' Access to Waterways -

Provide other sources of water and shade. The direct deposit of manure into water can harm aquatic life.



Trampling physically breaks down streambanks and destroys vegetative cover, which can increase sedimentation. The loss of streamside vegetation may also result in excessive solar heating of the water, which can harm cold water fish. Design stream crossings to minimize erosion. Exclusionary fencing and seasonal grazing of riparian corridors are possible management choices.

**Protect Small Tributaries** - Ditches and drainage swales carry a large amount of rain runoff. These tributaries also require vegetation to filter sediment and reduce the erosive energy of water. Fencing may be necessary to exclude horses from these smaller waterways.

**Wetlands** naturally filter contaminants from water and provide excellent wildlife habitat. Protect wetlands from grazing and trampling during the rainy season.

**Chemicals** in horse grooming and health products, detergents, disinfectants, herbicides, and pesticides can harm aquatic life. Follow instructions for correct application. Minimize use whenever possible. Be careful to avoid direct application or airborne transport of sprays to waterbodies. Do not let horse wash water drain directly into waterways.

