

WATER

Pathogens

Soil

Water

Excess Water

Insufficient Water

Water Quality Degradation

Nutrients

Pesticides

Pathogens

Salts

Petroleum and Heavy Metals

Sediment

Elevated Water Temperature

Air

Plants

Animals

Energy

Water Quality Degradation - Pathogens

Pathogens, pharmaceuticals, and other chemicals are carried by soil amendments that are applied to the land and are subsequently transported to receiving waters in quantities that degrade water quality and limit use for intended purposes. This resource concern also includes the off-site transport of leachate and runoff from compost or other organic materials of animal origin.

What is it?

Many potential pathogens (disease-causing microorganisms) can be found in manure. These pathogens include bacteria, protozoa, and viruses. If effected soil amendments are not adequately treated and contained, pathogens may enter ground or surface water posing a potential risk to human and animal health.

Why is it important?

Pathogens can be transmitted to humans directly through contact with animals and animal waste or indirectly through contaminated water or food. Human illness and death has resulted from exposure to pathogens from livestock and poultry manure. Pathogens can also be transmitted to domestic and wild animals with similar results.

What can be done about it?

The most effective tool in eliminating pathogens from manure, from both practical and economic standpoints, is time. If manure is allowed to sit undisturbed in storage or in soil, the concentration of pathogens will decrease with time as they die off or are overgrown by native microbes. Managing manure for pathogens is approached in two phases: 1) collection and storage and 2) land treatment. In the collection and storage of manure, pathogens can be addressed by biological control (composting, anaerobic digesters, etc.), chemical methods, and control of runoff and leaching. It is also important to manage livestock access to streams, rivers and water bodies. Land application is commonly a critical process in manure management. Pathogens from manure can threaten humans who are exposed to runoff, have direct contact with manure, or consume food or water contaminated with manure. Application rate and seasonal conditions are important factors contributing to the transfer of pathogens from lands where manure has recently been applied to nearby surface water. Managing the rate, timing and method of application of manure are critical elements in managing for pathogens. Keeping a buffer zone or setback distance between manure application areas and water bodies is a common practice that greatly decreases the transport of pathogens to those water bodies.

Pathogens at a Glance

Problems / Indicators - Storage, handling, and application of manure, bio-solids, or compost	
Causes	Solutions
<ul style="list-style-type: none"> Collection, handling and storage of manure Land application of manure 	<ul style="list-style-type: none"> Biological treatment (anaerobic storage, composting, anaerobic digesters) Vegetative filter strips, setbacks and buffer zones Managing livestock access to water Managing the rate, timing, and method of application of manure