

## Chapter 7 Pesticide and Chemical Management for Water Quality

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### **Introduction**

Properly managing petroleum, pesticides and other agricultural chemicals is important for protecting water quality as well as farm family, employee and livestock health. Even low-level contamination of ground water used for drinking supplies can result in chronic health effects.

A small gasoline leak of one drop per second can often go unnoticed, but it could result in the release of about 400 gallons of gasoline in one year. Not only does this cause economic loss, but it also causes environmental and health problems. The improper introduction of these chemicals and fuels to your animal waste storage area can taint the manure resource, rendering it unusable on crops and requiring a farmer to clean it up as a hazardous waste.

Every site has unique geologic and hydrologic conditions that can affect ground water movement. How quickly a chemical such as fuel reaches ground water also depends upon local soils. The more porous the soil is (sands and gravels, for example), the faster the rate of downward movement to ground water. The further the distance to your water source, the more assurance you have that contaminated water will not reach it. The direction of groundwater flow frequently follows the surface topography. In other words, ground water usually flows downhill. If possible, the tank should also be located downhill from the well.

Some simple measures can help keep pesticides, petroleum products and other chemicals out of water resources and manure storages. A lagoon or manure storage is an engineered structure designed for treatment or temporary containment of a valuable resource; it is not a catch-all dumping site. Under no circumstances should it be used for disposal of agricultural chemicals or petroleum products. Antifreeze jugs, oil cans and other trash floating in a lagoon or pond are examples of very poor stewardship and sure fire ways to attract attention from regulatory agencies.

### **Storage**

**Pesticides:** Store in a secure and lockable dry place with protection from activities that may tear break containers. Some sort of secondary containment should be used in storage areas; this can be a constructed structure like an impermeable floor with 4 inch curbing or a plastic tub, bin or child's pool that can contain a spilled material. Secondary containment should be able to hold 125% of the stored material. Pallets should be used to elevate containers off the floor. Storage buildings should be 100 feet away from drinking water wells.

The chemical storage area must be posted with signs around the area and entrance stating "DANGER: PESTICIDES," "KEEP OUT," "NO SMOKING AREA" or similar notices. Access to this facility must be limited to only one, two or three individuals. Never store pesticides where food, feed, seed, fertilizers or other products can become contaminated. Store dry pesticides on top shelves and liquids on lower shelves. Always store chemicals in their original and properly labeled containers. Make sure they're tightly sealed.

Nearly three-fourths of all pesticide accidents occur to non-users of the materials. Each year there are several cases of children, livestock and pet poisonings from accidental contacts with improperly stored pesticides. These accidents cause human suffering and economic losses; improper storage is illegal. The pesticide label describes the proper storage environment for each product. Read the label: It is the law.

**Petroleum:** Above ground storage tanks should be protected from traffic by posts or fencing. Tanks should be at least 6 inches off the ground and clear of brush and debris to reduce the chance of fire and to more easily detect leaks. Generally, you should try to locate your storage tanks at least 500 feet from any well to provide adequate assurance that subsurface flow or seepage of contaminated water will not reach your water. "DANGER: FLAMMABLE," "NO SMOKING AREA" and signs identifying the specific type of fuel or product being stored should be utilized around tanks and drum storage areas. Local petroleum dealers can advise on what signs should be displayed for their farm and bulk customers.

### Mixing and Loading

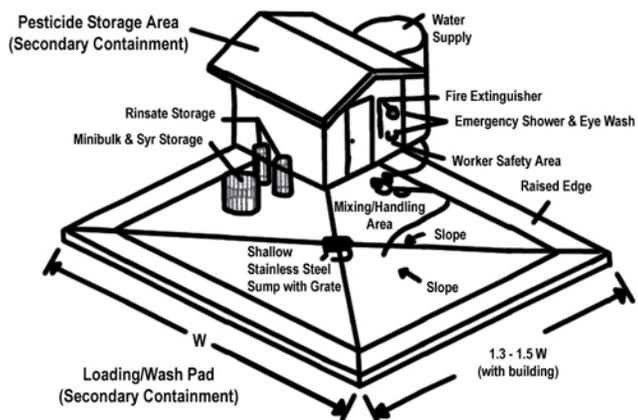
**Pesticides:** Field loading of chemicals moves the handling site farther from the farmstead and potentially from the well. Use a nurse tank to supply water to fill the sprayer and add chemicals at the field location. Field loading of chemicals will be exempt from secondary containment if you vary the location of the mixing/ loading site. The law requires you to report and clean up spills. The liability associated with and the cost of clean-up falls to the person or firm responsible for the spill.

When finishing a field, mix only the amount required to finish spraying the field. Clean the tank by adding water, at least 10 percent of tank volume, to remove chemical residue. This creates a 2 to 3 percent labeled solution. Then you can spray this material back over the field. Wash the exterior at the same time, but avoid repeated washing in the same location; stay clear of wells, surface water bodies and field drains. This will allow for the residue to be left in the field of pesticide destination. Moving the site each time the sprayer is filled will prevent chronic spills from saturating the site.

A mixing/loading facility will be required if chemicals are mixed and loaded at one location. Mixing/ loading pads consist of a pad containing a sump and a set of tanks to hold water containing pesticide solution. The secondary containment volume needed in the pad area will depend on the size of rinsate tanks or sprayer tank size. It should be able to hold 110 to 125 percent of the volume of the largest tank within the containment area.

This could either be a sprayer tank or a rinsate tank. This allows for a margin of safety.

Mixing/loading pad sizes and shapes depend on the functions performed, and the



orientation and boom width of the equipment. As a general rule, pads should extend at least 5 feet on each side of the edges of the spray equipment's extended boom to catch any splashed water or boom sprays. You may need extra space for workers to easily move around or in between pieces of equipment. A simple concrete pad that drains to a single sump in the center of the pad may meet the containment needs. Pads can incorporate a small pesticide storage building on or adjacent to them. When connected as an extension to the pad with its own containment, these buildings provide needed storage without increasing the pad size.

### **Fueling and Lubricating**

Petroleum: Fueling equipment should be well maintained and free of leaks. When changing oil or other lubricants, use catch basins or tubs of sufficient size to contain the material being changed. Use funnels or a proper pump when transferring petroleum products from different drums or containers. Floor drains in the garage or workshop should be covered and sealed while working with petroleum products (floor drains in workshops and garages are generally a bad idea and a major water quality threat). It is also a good idea to have absorbent granules and chemical/petroleum spill clean-up kits on hand.

### **Container Disposal**

Pesticides: Used pesticide containers should be triple rinsed with small volumes of water; the rinsate should be used to mix the next load of the same chemical. After containers have been properly rinsed and puncture they can be taken to a collection site for recycling or taken to a licensed landfill.

Petroleum: Empty containers should be properly disposed of in a licensed landfill. Recycling opportunities may exist and are preferable where available. Large drums may be returned to the distributor or used for other purposes after they have been cleaned with any residue being disposed off in a licensed facility.

### **Recycling, Re-use and Waste Products**

Pesticides: When at all possible, pesticides should be used for their intended purpose. Even rinse water can go back into mixing that chemical the next time. If surplus or expired material is unavoidable, watch for a chemical collection amnesty day. If there are no such collections organized in your community, call the local landfills to see where you may take unused pesticides for disposal. Once again, never dump such products into the manure storage areas for disposal.

Petroleum: For spent and surplus engine fluids, use a reputable recycling service or collection program to collect used oil. Spent engine fluids may also be burned in a waste oil heater (heat work shop or greenhouse). Follow all of the manufacturer's recommendations regarding suitable fuels and operation. Prevent oil and other petroleum products from being contaminated (and thus becoming hazardous waste) through contact with other wastes.

### **Purchasing and Inventory Control**

Keeping a large inventory of chemicals and potential hazardous materials on farm is a liability. While purchasing in bulk is preferable from an economic and environmental

standpoint, one should carefully consider how much of a product can be used before it expires. Maintain a current inventory of all materials in storage, along with a label of all materials, in a secure area away from the storage area. Date and identify all pesticides when they are placed into storage, and store no more than will be needed for one season. Establish a policy of first-in, first-used, so that pesticides do not become outdated.

**References: excerpts taken from GA Farm\*A\*Syst publications “Pesticide Storage and Handling” and “Petroleum Storage and Handling”. See Chapter 12, Resources for more information.**