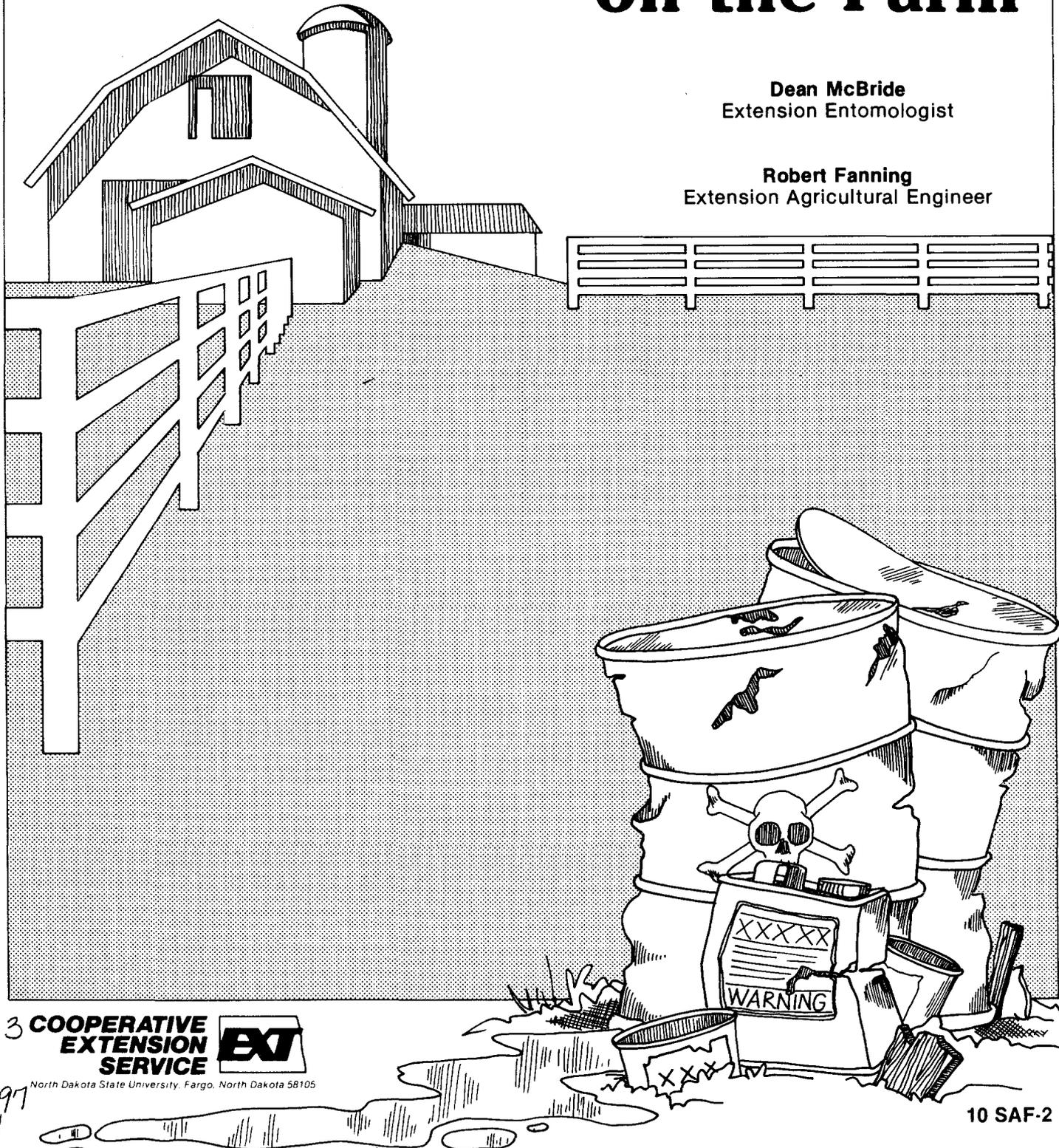




Storage and Disposal of Pesticides and Containers on the Farm

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Chemical pesticides used in crop and animal agriculture must be handled and stored safely to protect the farmer, the farm family and the consumer. The storage and disposal of pesticides and their empty containers is an important part of pesticide usage.

Pesticide Storage

A properly designed and maintained pesticide storage facility on the farm serves several purposes. Protecting pesticides from theft, temperature extremes, and unauthorized use also protects workers, visitors, and animals from accidental contact with pesticides. Some agricultural pesticides are more toxic and/or are formulated in higher concentrations than products used by homeowners or home gardeners. Keeping people and animals out of the pesticide storage area is the most important function of the storage site.

The volumes and types of pesticides used on the farm will determine the storage facility needed. The type of container will determine how it should be stored and disposed of.

Metal buildings are better than frame construction because of spill cleanup and fire hazard. Floors should be concrete with a smooth finish. A curb can be built into the concrete surface to contain spills, and smooth finish concrete can be decontaminated and resists chemical action (Figure 1).

An existing building can be used for pesticide storage but may require repairs or changes to provide proper protection.

Whether you build a pesticide storage facility or modify an existing structure, these items are recommended to ensure safety and utility of the storage building:

A fence which cannot be climbed, with a locked gate, should surround the storage building to prevent unauthorized entry. Also lock the building itself. The storage area must be child-proof. It should also be isolated, not subject to flooding and away from water supplies and public roads. It should not be used for anything except storing and handling pesticides. Identification signs visible from any approach to the building should be on the fence, on the building, and at each gate, door, or window. Signs legible from at least 50 feet identify the area for the public and fire fighters. The signs should state: "Caution - Hazardous Pesticide Storage Area - Unauthorized Persons Keep Out." Smoke and fire detection equipment connected to an outside light or alarm will warn of problems inside the locked building. Metal shelving for small pesticide container storage and metal racks for drum storage are easier to decontaminate than wood in case of a spill. Wood can be used if painted or otherwise sealed. Store dry or granular pesticides high to reduce contamination in case liquid containers leak or water is spilled.

Bulk pesticides can eliminate many problems associated with usual pesticide storage. Bulk pesticide usage eliminates the triple rinsing of containers and container disposal and

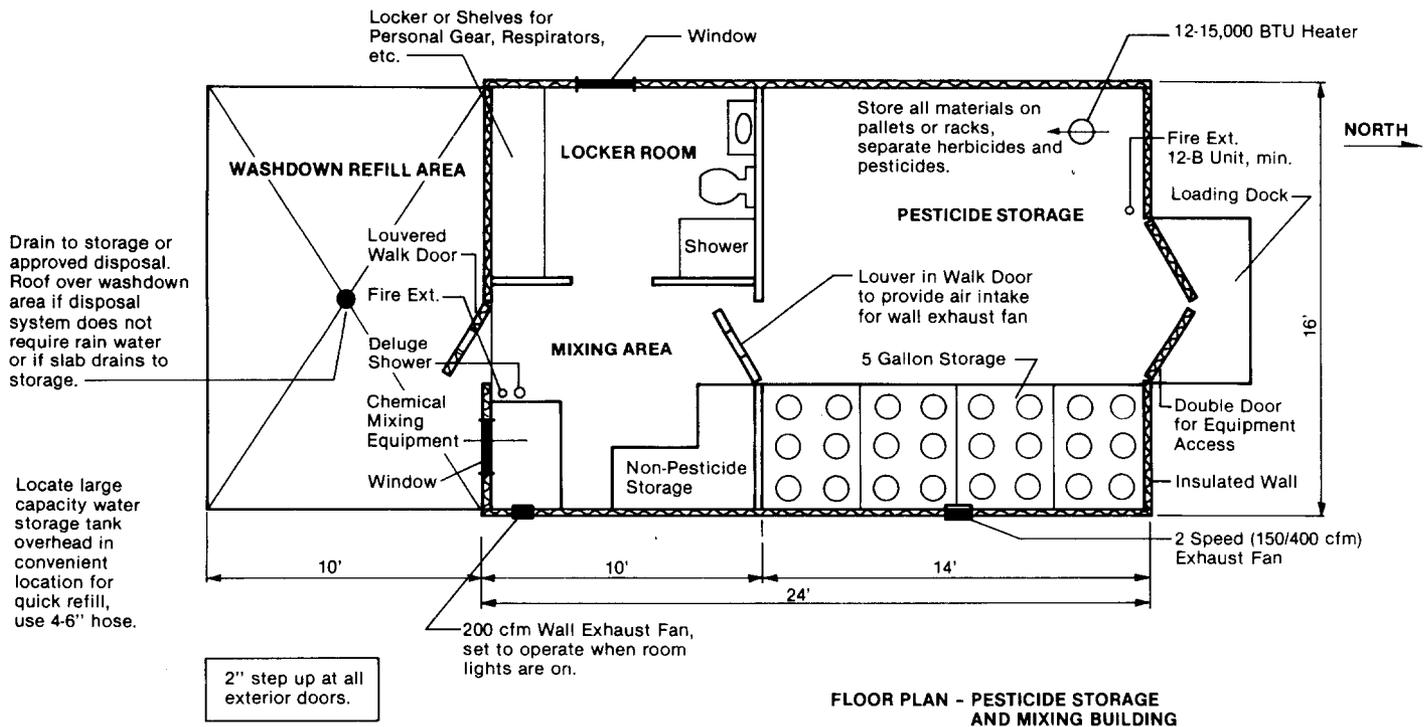


Figure 1. MW Plan #74002, "Pesticide Storage and Mixing Building," has been developed by the Midwest Plan Service. This plan is available from your County Extension Office.

can save storage space. The bulk storage area must meet a number of requirements:

It must have a means of secondary containment large enough to hold 110 percent of the largest bulk storage tank. State fire code specifies for any material with a flashpoint less than 200 degrees F; the diking must be non-flammable; the bulk storage tank must be vented directly outside; no open flames, static or heat friction may be in the area. Contact the State Department of Agriculture (224-2231) or the State Fire Marshall's Office (224-2434) to clarify any questions.

When using bulk pesticides, use good judgement in purchasing. Some pesticides should not be frozen; therefore, unless the storage area is heated, purchase only quantities that will be used during a single season and use smaller containers to complete treatment. If label and state requirements are met, bulk pesticides can save time, money and problems usually associated with pesticide usage.

Five gallon cans, metal drums, and cardboard cartons containing metal, glass, plastic, or paper packages are the usual types of pesticide containers stored on the farm. Inspecting packages when you buy them and while handling them at the storage site will indicate if any packages are broken or leaking. Also inspect stored containers during the off-season for leakage. It is important to store only clean packages that do not have exposed pesticide residues to lessen the danger of skin contact. Wearing the recommended protective clothing even while handling clean, unbroken pesticide packages is a sure way to reduce the chance of accidental contact.

The toxicity class of the pesticide being handled determines the type of protective clothing you need for protection against accidental contact with the pesticide. The label on the product lists the protective clothing needed. "Danger," "Poison," and the skull and crossbones are the signal words and symbols used on the most toxic pesticides; the signal word "Warning" indicates moderately toxic, and "Caution" indicates low toxicity. Unlined natural rubber gloves, rubber boots, goggles, face shield, respirator or gas mask and other items may be indicated. General instructions such as "avoid skin contact," "keep from breathing dust or fumes," "wash hands and face after handling" and "keep out of eyes" imply that protective clothing is needed to reduce the risk of contact. The label instructions are the best guide to safe handling, but only if they are read and followed.

You must wear protective clothing when handling packages that have been opened for use or are broken, leaking, or contaminated by a spill. How much protection you need depends on the material involved, but skin, eye, and lung protection are almost always necessary.

Broken package storage includes containers that have been opened and containers that are leaking because of mechanical injury, corrosion, temperature extremes, and chemical breakdown. Position leaking containers to stop the leak. Turn up or rotate a can or drum that has been punctured to put the hole on top to stop the contents from escaping. Inform co-workers of the leak, mark the container, and plan to use the chemical as soon as possible if it is not contaminated. A metal container that is leaking through a rusted out spot must be carefully handled because the whole container may be weak and may collapse if roughly handled. When you find a leak, move the other containers that have not been contaminated out of the area. This gives room to work and prevents clean containers from being contaminated. Stop the leak and confine the spill with an absor-

bent material. Use the cleanup procedures recommended for the particular product that has been spilled (Figure 2).

General procedures for spill cleanup include outlining the spill area with chalk or crayon. You can tell if you are spreading or confining the spill if it is in a marked area. Put sweeping compound on a dry spill and carefully sweep to the center of the spill area. Shovel up the residue and repeat sweeping with more sweeping compound until the spilled material is removed. Use a decontamination solution recommended by the manufacturer of the product. Full strength household bleach, hot soapy water, lye water, and solvents are some of the decontamination solutions you may use.

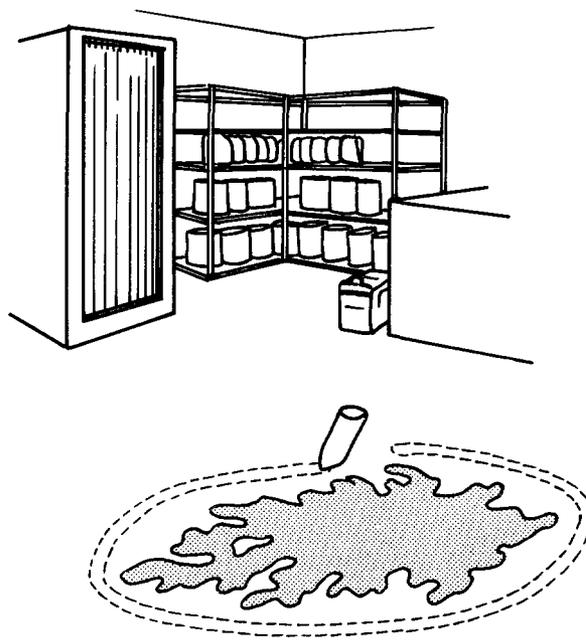


Figure 2. Outlining the spill site with chalk will identify the area to be cleaned up.

Always wear protective clothing, including eye and lung protection, when cleaning a spill or using a decontamination solution. Lye is a strong caustic and can burn skin, eyes, or lungs, so handle decontamination solutions with caution. After decontamination, rinse with clean water. Dispose of mop heads and any other cleaning equipment used that cannot be decontaminated. The sweepings, decontamination solution, and rinse water must all be disposed of in a sanitary landfill or packaged and hauled to a hazardous waste disposal site. If in doubt as to the disposal requirements, contact the Division of Hazardous Waste Management and Special Studies of the North Dakota State Department of Health (224-2366).

A liquid spill should also be outlined with chalk or crayon and the liquid soaked up with an absorbent material. You can use sawdust, industrial absorbent, cat litter, or even dry soil to soak up the liquid spill. Shovel up and repeat until visible residues are removed and decontaminate the area with decontamination solutions. Finally, rinse with clean water and dispose of contaminated absorbent, equipment, and rinse water as explained earlier.

The cleanup kit should contain everything needed for a spill cleanup: chalk, broom, mop, shovel, buckets, absorbent materials, sweeping compound, disposable protective clothing, gloves, boots, face shield or goggles, respirator or mask, and decontamination solution ingredients. If you use the spill cleanup kit, decontaminate and replace tools and used items so the kit will be complete for the next use.

The companies that manufacture the pesticides you have in storage can supply you with specific cleanup and decontamination procedures for spills. Have the information on hand so you can handle an emergency situation with no delay.

Available Disposal Methods

If you cannot use pesticide materials, permanent disposal as soon as possible is the best arrangement. Temporary disposal by storing in the storage facility until you can arrange a permanent disposal has disadvantages. Temporary disposal by storage may cause problems if containers begin to leak and contaminate other containers or the storage area. The occupied storage area may be needed to store new pesticides or simply for the space to operate safely.

You can permanently dispose of pesticides in several ways. The best method of disposal is to use the material according to label recommendations. Even if the pesticide is not needed or is applied at label rates to bare ground, this method of disposal is usually acceptable. If this is not possible, deliver the material for burial at an approved sanitary landfill if state or local regulations permit. If not, arrange to have the pesticide transported to a hazardous waste disposal site. The Hazardous Waste Management and Special Studies division of the North Dakota State Health Department (224-2366) can help you determine the best disposal method for the type and amount of chemical you need to dispose of. The cost of disposal with any of the methods available added to the purchase cost of a pesticide makes it very important for the pesticide applicator to buy only what is needed and will be used.

Empty pesticide container disposal is an ongoing activity and responsibility for the pesticide applicator. The disposal method needed may be influenced by the type of container involved. The first step in the disposal of an empty liquid pesticide container is triple rinsing the container. After you have emptied the pesticide container into the spray tank, let it drain completely. To rinse the container, fill it one-fifth to one-fourth full of water or oil, close, then up-end the container so that all inside surfaces are rinsed. Empty the rinse water into the spray tank. Let the container drain completely, at least 30 seconds. Repeat the rinsing procedure two more times, adding the rinse water to the spray tank each time.

Bags, boxes or other parcels containing dry or granular pesticides should be emptied as completely as possible. Shake or tap the container to remove as much of the material as possible.

In many cases it will be necessary to store the empty containers. This temporary disposal by storage allows the accumulation of empty containers for more economical disposal. Very few containers used for pesticides can be returned to the manufacturer for reuse. Most pesticide labels state "Do not reuse the container"; therefore, containers

must be disposed of or salvaged as scrap. Empty containers must be stored with the same care as full containers.

Crushed metal containers and broken glass containers take less storage space than the intact containers. You can use open ended barrels to hold the crushed containers. Keep metal and glass separate if the metal is to be sold as scrap.

Remember when handling empty containers to follow the label recommendations on protective clothing needed to protect you from pesticide contact.

Permanent disposal of containers usually means burn or bury. Some paper or cardboard packages can be burned if allowed by the label instructions and not prohibited by local ordinances. If burning is allowed, use caution, keeping out of the smoke and burning in isolated areas. Remember that fire alone is a hazard; prevent forest or grass fires by burning in a clear area and do not leave fires unattended. Be sure the fire is completely out before you leave and that the containers have been completely burned up.

Directions on the product label in the storage and disposal section or the environmental statement will have instructions for burying empty containers.

Guidelines that specify the distance needed from water sources, cropland areas, or houses are not available. You must consider many things when selecting a burial site for empty pesticide containers. Soil type, water table height, isolation, future land use and possible development are a few of the factors that determine burial site location. Using good judgment and maintaining a properly managed burial site should provide for years of pesticide container disposal on the ranch or farm. Unless you have a desirable burial site for the disposal of triple rinsed containers, it may be more convenient to dispose of them in a sanitary landfill. Not all sanitary landfills accept triple rinsed pesticide containers, and the North Dakota State Department of Health has designated some landfills as unacceptable due to a high potential for groundwater contamination. Landfills that accept triple rinsed pesticides containers are listed at the end of this publication.

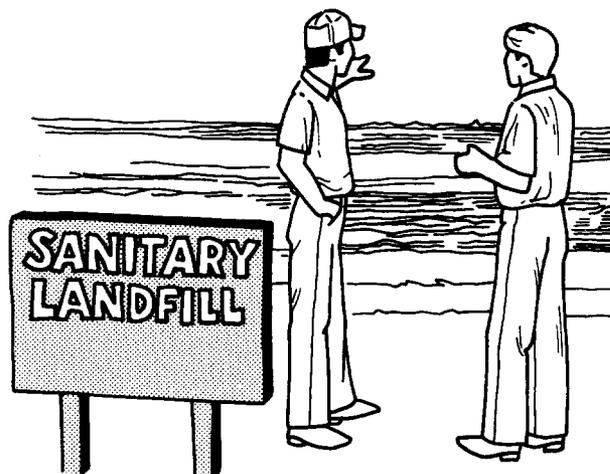


Figure 3. Burial at a sanitary landfill is the best pesticide container disposal option available to most pesticide applicators.

The cost of labor and burial on the farm may justify the expense of hauling to the landfill. Preparation of the container before burial may be specified if different from the usual triple rinsing and puncturing or crushing the container. Follow the practice outlined on the label of the container you are discarding.

An alternative to disposal by burying of rinsed pesticide containers is their reclamation as scrap metal. Crushed containers may be sold as scrap metal. It is good management to look at the different disposal options on a cost basis and select the least expensive method. Don't overlook the value of the land used for a burial site, the holding area cost if temporary storage before hauling is a factor, and the cash outlay for labor and hauling costs.

Most agricultural pesticides state on the label "do not reuse the container." The 30 and 55 gallon drums of most of these chemicals are non-returnable containers. Drum reconditioners may or may not accept pesticide drums; check with the drum reconditioning company to determine if the drums you expect to accumulate are suitable for reconditioning. They can also inform you of the telephone number for pickup and other requirements.

Cautions and Dangers

The danger of handling, storing, or disposing of pesticides or pesticide containers is reduced if precautions are followed. Good work habits and common sense help prevent exposure. Working alone while handling pesticides is an added risk. For example, an eye injury may render a person helpless, and delay in decontamination or first aid procedures may result in permanent disability.

Most pesticide labels have a precautionary statement or caution or warning statements. These statements outline hazards to humans and domestic animals, environmental hazards, and physical or chemical hazards. A statement of practical treatment, a note to physicians or both may also be included in the precautionary statement.

The space on the label is limited, and detailed instructions are usually not provided, but the items listed make it clear that the responsibility of the user includes the areas mentioned. A single word such as "flammable" in the precautionary statement is sufficient to require the buyer or user to protect that product from high temperatures, sparks, pilot lights, electrical switches, or motors and to have a fire protection plan for the storage facility. Fire protection requirements and fire fighting procedures are available from pesticide manufacturers for their products. You should get this information and make it available to the local fire authorities. Containment of water used for fire fighting by a dike or levee is needed to protect water supplies and environment from contamination in case of fire.

Environmental responsibility is usually included in the precautionary statements. Fish, birds, beneficial insects, or wildlife may be mentioned with a statement about toxicity and place or time of application. You can prevent contamination by application or disposal of wastes by following label instructions.

Laws and Regulations

The amended Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) in Section 12, titled "Unlawful Acts," subsection (2) (G) states, "It shall be unlawful for any person to use any registered pesticide in a manner inconsistent with its labeling."

The directions for use on the label instruct reading of the entire label. Use pesticides strictly in accordance with precautionary statements and directions and with applicable state and federal regulations. The label section on storage and disposal then lists prohibitions, instructions for storage, pesticide disposal, container disposal, and general instructions.

The North Dakota Century Code contains the following regulations for disposal of hazardous wastes:

33-20-05-05. STANDARDS FOR DISPOSAL OF HAZARDOUS WASTES.

1. Disposal of hazardous wastes shall be the responsibility of the owner of such wastes. Hazardous wastes may not be deposited in a disposal operation site except in amounts normal in household wastes, unless approved by the North Dakota State Health Department. The department may provide technical assistance to the owner for storage, transportation, and disposal of hazardous wastes.
2. Nonreturnable empty pesticide containers shall be rinsed and punctured in order to avoid secondary use of such containers, if such punctured containers will not endanger humans, animals, or the environment.

General Authority
NDCC 23-29-04

Law Implemented
NDCC 23-29-04

Municipal Waste Disposal Facilities

Permit	Name	Address	City	State	Zip	Comments
SW-319	Adams County Landfill	Box 589	Hettinger	ND	58639	
SW-245	Alexander	P.O. Box 534	Alexander	ND	58831-0137	
SW-005	Alsen	P.O. Box 137	Alsen	ND	58311-0137	
SW-269	Ashley		Ashley	ND	58413	
SW-329	Bauer, Robert	Box 98	Wilton	ND	58579	
SW-013	Beach	P.O. Box 278	Beach	ND	58621	
SW-276	Beulah	P.O. Box 910	Beulah	ND	58523-0910	
SW-017	Bismarck	P.O. Box 5503	Bismarck	ND	58502	Facility does not accept asbestos for disposal
SW-281	Bottineau	115 West 6th Street	Bottineau	ND	58318	
SW-317	Casselton (New Site)	P.O. Box 548	Casselton	ND	58012-0548	
SW-243	Cathay		Cathay	ND	58422	
SW-278	Columbus	P.O. Box 174	Columbus	ND	58727	
SW-044	Devils Lake	P.O. Box 1048	Devils Lake	ND	58301-1048	
SW-315	Dickinson	P.O. Box 1037	Dickinson	ND	58601-1037	
SW-260	Fargo-Ron Olson, Garbage Utility	2301 8th Avenue North	Fargo	ND	58102	
SW-223	Flasher	P.O. Box 227	Flasher	ND	58535-0227	
SW-327	Gierman, Ewald	Box 834	Riverdale	ND	58565	
SW-065	Glen Ullin	P.O. Box 70	Glen Ullin	ND	58631-0070	
SW-068	Grafton	P.O. Box 578	Grafton	ND	58237	
SW-069	Grand Forks	P.O. Box 1518	Grand Forks	ND	58201	Approval suspended until operation is upgraded.
SW-071	Halliday	P.O. Box 217	Halliday	ND	58636-0127	
SW-073	Hazelton		Hazelton	ND	58544	
SW-270	Hazen	P.O. Box 717	Hazen	ND	58545-0717	
SW-287	Hebron	P.O. Box V	Hebron	ND	58638	
SW-213	Jamestown	203 1st Street West	Jamestown	ND	58401	
SW-324	Jenson, Harold Jr.		Neche	ND	58265	
SW-083	Killdeer	P.O. Box 515	Killdeer	ND	58640-0515	Not approved for pesticide cans
SW-285	Mandan (New Site)	203 2nd Avenue NW	Mandan	ND	58554	
SW-229	Mayville	P.O. Box 220	Mayville	ND	58257-0220	
SW-326	McDaniel Landfill Inc.	1800 Parkside Drive	Minot	ND	58701	
SW-272	Minot	Civic Center	Minot	ND	58701	
SW-244	Mohall	P.O. Box 476	Mohall	ND	58761-0476	
SW-274	Monson, Ronald	Rural Route 1, Box 18	Bottineau	ND	58318	
SW-280	Murphy Service - Murphy/Coleman Site	P.O. Box 104-A, Route 1	Rolla	ND	58367	
SW-271	Murphy Service - Turtle Mountains Site	P.O. Box 104-A, Route 1	Rolla	ND	58367	
SW-275	Napoleon	P.O. Box 31	Napoleon	ND	58561-0031	
SW-109	New Rockford	811 1st Avenue North	New Rockford	ND	58356	
SW-110	New Salem	P.O. Box 393	New Salem	ND	58563-0393	
SW-237	Northwest Solid Waste Management Council c/o Dick Ross	Box 67	Ray	ND	58849	
SW-001	Pulver Sanitation - Ed Pulver	P.O. Box 740	Underwood	ND	58576	
SW-242	Sykeston	P.O. Box 531	Sykeston	ND	58486-0531	
SW-328	Theodore Roosevelt Medora Foundation	P.O. Box 198	Medora	ND	58645	
SW-204	Titus, David	433 North 6th	Oakes	ND	58474	
SW-144	Valley City	P.O. Box 390	Valley City	ND	58072-0390	
SW-309	Volk, Casper	307 2nd Street SE	Rugby	ND	58368	
SW-152	Watford City	P.O. Box 494	Watford City	ND	58854-0494	
SW-303	Williston (New Site)	P.O. Box 2437	Williston	ND	58802	

Commercial Industrial Waste Disposal Facilities

Permit	Name	Address	City	State	Zip	Comments
SU-079	Dishon Disposal	Route 3, Box 64	Williston	ND	58801	
SU-088	Hexom Construction	Route 3, Box 238	Williston	ND	58801	
SU-063	Prairie Disposal	1109 2nd Avenue East	Williston	ND	58801	

