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Source Water Protection Practices Bulletin

Managing Small Quantity Chemical Use to Prevent Contamination of Drinking Water

Many small businesses, government agencies, and academic institutions use chemicals to carry out their business functions. Although varying greatly in purpose, these small quantity chemical users share in their ability to potentially contribute to the pollution of drinking water. Many small businesses understand their day-to-day business operations but may lack familiarity with procedures for proper use and management of chemicals. This fact sheet provides an overview of prevention measures and demonstrates how precaution must be taken in all areas regarding chemical use. Businesses that generate hazardous waste, as it is defined under the Resource Conservation and Recovery Act, should consult with their State hazardous waste agency regarding proper handling and disposal.

PLACES WHERE SMALL QUANTITY CHEMICAL USE OCCURS

Small quantity chemical users include dry cleaners, beauty shops, photo finishers, vehicle repair shops, printers, laboratories, water supply facilities, academic institutions, nursing homes, medical facilities, and many others. It is the daily practices of these businesses that use chemicals and produce chemical waste. Degreasing, cleaning, polishing, paint preparation, rust removal, and photo processing are just a fraction of the activities in which small businesses are engaged.

Improper disposal of chemicals from these users can reach ground or surface water through a number of pathways. If substances from these businesses are accidentally or intentionally discharged into sewers, contamination of ground and surface waters can occur. Improper disposal into sewers can also endanger the ability of publicly-owned treatment works (POTWs) to properly treat wastewater. Chemicals poured into septic systems or dry wells can leach into ground water or contribute to treatment system failure. Chemical users should always ensure that haulers they hire to carry their waste off-site are properly licensed and that they deliver the waste to appropriate disposal sites.

WHY IS IT IMPORTANT TO MANAGE SMALL QUANTITY CHEMICAL USE NEAR THE SOURCES OF YOUR DRINKING WATER?

Many ordinary businesses use chemicals and produce chemical waste that can be harmful to humans if ingested. Types of chemicals used by these businesses include solvents, corrosives, dry cleaning agents, heavy metals and inorganics, inks and paint, lead-acid batteries, plating chemicals, cyanide, and wood preserving agents. Each set of contaminants has its own environmental and health hazards. For example, a dry cleaning filtration residue, perchloroethylene, causes kidney and liver damage in both humans and animals. It is among the most common contaminants in ground water and a very small amount can contaminate many thousands of gallons of water. Used cyanide, a common waste product of metal finishing, is considered an acutely hazardous waste and can be toxic in very small doses. Chemical manufacturers can supply Material Safety Data Sheets (MSDS) which list these kinds of dangers and help to categorize products and their waste.

AVAILABLE PREVENTION MEASURES TO ADDRESS SMALL QUANTITY CHEMICAL USE

Due to the large number and variety of businesses that use chemicals, there are a vast number of prevention measures, many of which are specific to the facility of interest. This fact sheet discusses some prevention measures that are common to most chemical using facilities. Before a facility can implement any pollution prevention practice, it must first assess what kinds of chemicals are used and how they are used. Monitoring chemical use can help operators decide which option will be the most beneficial. Businesses should start with easy and inexpensive practices before considering more costly measures such as equipment and process modifications. Some of the easiest and least expensive practices can produce the most effective pollution prevention results.

Please keep in mind that individual prevention measures may or may not be adequate to prevent contamination of source waters. Most likely, individual measures should be combined in an overall prevention approach that considers the nature of the potential source of contamination, the purpose, cost, operational, and maintenance requirements of the measures, the vulnerability of the source waters, the public's acceptance of the measures, and the community's desired degree of risk reduction.

Ways to Avoid Excess Chemical Use

Good waste reduction and management strategies can significantly reduce the threat of hazardous materials to drinking water sources. Make sure employees carefully follow the manufacturer's directions when mixing or using chemicals to prevent producing large quantities of useless material that must be disposed of as waste. The toxicity of waste can be reduced by using the least hazardous or least concentrated products available to accomplish their processes. Such substitutions include the use of water based paints, or high solids solvent based paints when water based paints are not available. Cleaning products and solvents, which can contain highly toxic or harsh chemicals, can be replaced with less hazardous counterparts. Printing businesses can use nontoxic inks that are free of heavy metal pigments.

Responsible purchasing can also drastically decrease the amount of waste for disposal. This includes ordering materials on an as-needed basis and returning unused portions back to vendors. A facility may unwittingly create excess harmful materials by mixing hazardous with

nonhazardous waste. Avoiding this practice can significantly reduce the toxicity of waste disposed and increase the possibility of recycling materials. Another method of waste reduction is trading waste with other businesses. ***Waste exchanges*** reduce disposal costs and quantities, reduce the demand for natural resources, and increase the value of waste.

Proper Use and Handling of Chemicals

Reading the label on chemical containers is one of the simplest and most important prevention measures. The label provides information on proper use, storage, and disposal and may provide emergency information in the event the product is accidentally spilled or ingested. In cases where the chemical is highly dangerous, the label will contain special warnings or use restrictions.

Employee training is critical in preventing source water pollution by chemical using facilities. While many preventive measures seem simple and straightforward, if they are not followed or employees are unaware of them, significant consequences can result. All staff should be trained to store materials properly and be aware of spill control and response protocols. Employees can be encouraged to learn and retain proper procedures through periodic drills, pollution prevention training workshops, and company incentive or reward programs.

Proper Storage and Disposal of Chemicals

Chemical audits are a good starting point. It is important to understand chemical needs for the facility and compare these to the chemical supply on hand. Where appropriate, excess chemicals should be removed (and properly disposed), or future purchasing adjusted to reduce stored inventories. A ***chemical management plan*** that includes a list of chemicals used, the method of disposal such as reclamation or contract hauling, and procedures for assuring that toxic chemicals are not discharged into source water should be implemented.

Proper on-site storage of hazardous substances helps to prevent accidental leaks and applies to both storage areas and containers. Designated storage areas should have paved or impervious surfaces, a protective cover, and secondary containment around all containers to catch spills. Containers should have clear and visible labels which include purchase date and all information presented on the distributer's original label. Dating materials allows facilities to use older materials first. When not in use, storage containers must be sealed to prevent spills and evaporation. Storage areas and containers should be thoroughly inspected on a weekly basis and secured against unauthorized entry. Care should be taken that chemical storage and handling areas do not allow for contamination of storm water flows. EPA has developed extensive guidance providing BMPs for storm water management in industrial settings.

Hazardous waste should never be discharged into floor drains, storm drains, toilets, sinks, other improper disposal areas, or other routes leading to public sewers, septic systems, or dry wells. Chemical waste should be disposed of according to the manufacturer's directions and State and local requirements. Many local communities sponsor household hazardous waste events to collect and properly dispose of small quantities of chemicals.

A useful tool for making disposal decisions is the ***Material Safety Data Sheet*** (MSDS). These sheets provide important information regarding contents of commercial products and enable a facility to determine whether materials will produce hazardous waste. MSDS data (i.e., chemical name, ingredients, possible carcinogens, and other known hazards) are also important for chemical use, storage and spill control. MSDS documents can be obtained from manufacturers and should be kept readily accessible.

When hazardous substances are unintentionally released, the event is considered a spill and must be treated appropriately. ***Spill prevention and control*** includes spill response plans which serve as guidance for employees in the event of a large spill. A good plan minimizes environmental impact and reduces liability for clean-up costs and possible bodily injuries. It should be kept where it can be easily viewed by employees near mixing and storage areas. Besides detailed instructions for staff, a spill response plan includes a diagram showing the location of all chemicals, floor drains, exits, fire extinguishers, and spill response supplies. Spill response supplies (e.g., mop, pail, sponges, absorbent materials) should also be listed. Someone trained in these procedures must be on site or easily reachable during hours of operation.

Other practices to control spills include the use of funnels when transferring harmful substances and drip pans placed under spigots, valves, and pumps to catch accidental leakage. Sloped floors allow leaks to run into collection areas. Catch basins in loading dock areas, where nearly one third of all accidental spills occur, can help recapture harmful chemicals. All practices should be performed in a way that allows the reuse or recycling of the spilled substance.

FOR ADDITIONAL INFORMATION

These sources contain information on small quantity chemical use pollution prevention practices. All of the documents listed are available free of charge on the Internet.

Assistance is available to communities wishing to enact ordinances to protect water supplies from contamination due to small quantity chemical use or to small businesses seeking to improve their operations with management measures. Local fire departments or departments of health have the authority to pass ordinances or regulations covering chemical use and safety. Contact local government authorities in your area to see if there are ordinances in place to manage small quantity chemical use. Numerous examples of local source water protection-related ordinances for various potential contaminant sources can be found at http://www.epa.gov/r5water/ordcom/, http://www.epa.gov/owow/nps/ordinance/, and http://www.epa.gov/owow/nps/ordinance/links.htm. The Small Business Environmental Home Page (http://www.smallbiz-enviroweb.org/fundstat.html) provides links to financial assistance programs and other available assistance in all 50 States.

The following resources provide information on selection and design of specific management measures:

Massachusetts Department of Environmental Protection, Bureau of Resource Protection, Drinking Water Program. (1996, June). *Tips for Protecting Your Drinking Water Supply*. Retrieved February 26, 2001, from the World Wide Web: http://www.state.ma.us/dep/brp/dws/files/donts.htm

Minnesota Pollution Control Agency. (1999, July). *Disposal of Industrial Wastewater and Alternatives*. UICP/8-02/July 1999. Retrieved February 21, 2001, from the World Wide Web: http://www.pca.state.mn.us/water/pubs/8-02.pdf

New Hampshire Department of Environmental Services. (1999, February). *Best Management Practices (BMPs) for Groundwater Protection*. WD-WSEB-22-4. Retrieved February 26, 2001, from the World Wide Web: http://www.des.state.nh.us/factsheets/ws/ws-22-4.htm

New York State Department of Environmental Conservation, Pollution Prevention Unit. (1998, March). *Environmental Compliance and Pollution Prevention Guide for Small Quantity Generators*. Retrieved January 2001, from the World Wide Web: http://www.dec.state.ny.us/website/ppu/ecppsqg.pdf

Ohio Environmental Protection Agency, Division of Hazardous Waste Management. (1997, August). *Your Business and Hazardous Materials Management*. Retrieved February 21, 2001, from the World Wide Web: http://www.epa.state.oh.us/dhwm/dwatt/brochure.htm

U.S. EPA, Envirosense. (1993, February). *Case Study: Preventing Ground Water Contamination.* #1903. Retrieved February 21, 2001, from the World Wide Web: http://es.epa.gov/techinfo/case/michigan/michcs15.html

U.S. EPA, New England. (2000, April). *What Role Does Your Business Have in Protecting Drinking Water Sources*. EPA-901-F-00-001. Retrieved February 21, 2001, from the World Wide Web: http://www.epa.gov/region01/eco/drinkwater/sourcewater.pdf

U.S. EPA, Office of Solid Waste. (1996, April). *Understanding the Hazardous Waste Rules*. EPA530-K-95-001. Retrieved May 1, 2001, from the World Wide Web: http://www.epa.gov/epaoswer/hazwaste/sqg/handbook/sqg_pdf.pdf

U.S. EPA, Office of Wastewater Management. (1992, September). *Storm Water Management for Industrial Activities: Developing Pollution Prevention Plans and BMPs*. Retrieved May 1, 2001, from the World Wide Web: http://www.epa.gov/owm/sw/indguide/index.htm

The following sites provide information on preventive measures for small quantity chemical use:

downthedrain.org is a site dedicated to reducing the threat of hazardous materials to our drinking water supply. http://www.downthedrain.org

The Miami-Dade Department of Environmental Resource Management provides several best management practices fact sheets for various types of facilities. http://www.co.miami-dade.fl.us/derm/

The Small Business Environmental Home Page (http://www.smallbiz-enviroweb.org) helps small business access environmental compliance and pollution prevention information. Its publication section provides documents and web sites for various small quantity chemical users.

The U.S. EPA's Office of Enforcement and Compliance Assistance (http://es.epa.gov/oeca/main/compasst/index.html) provides documents and links related to small quantity chemical users.

Information on waste exchange can be found on U.S. EPA's Envirosense web site for Materials/Waste Exchange. http://es.epa.gov/program/iniative/waste/waste.html.