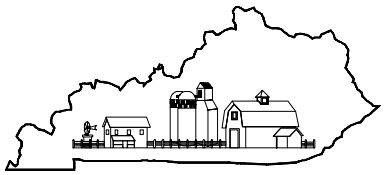

WATER QUALITY
and
KENTUCKY AGRICULTURE

WATER QUALITY TERMS

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AGENCY ACRONYMS

FSA *Farm Service Agency (formerly ASCS)*
CES *Cooperative Extension Service*
EPA *Environmental Protection Agency*
NRCS *Natural Resource Conservation Service (formerly SCS)*
USDA *United States Department of Agriculture*
USGS *United States Geological Survey*

WATER QUALITY LEGISLATION

CWA *Clean Water Act.* This is the major legislation dealing with the quality of the nations water supply. Amendments in 1987 specifically targeted groundwater protection and quality as important priorities. This Act is being revised in the 1995 Congress.

FIFRA *Federal Insecticide, Fungicide, and Rodenticide Act.* This act regulates the marketing and use of pesticides including testing, risk assessment, registration, and labeling of pesticides, as well as establishes certification for their use.

RCRA *Resource Conservation and Recovery Act.* This act covered the handling, transport, and disposal of solid and hazardous wastes as well as regulating underground storage tanks.

SB 271 *KY Senate Bill 271.* This was a Kentucky Bill enacted in 1990 which provides for the University of Kentucky College of Agriculture to assess the influence of agricultural practices upon groundwater, and then establish both basic and applied research programs to determine the agricultural management practices that may be necessary to protect groundwater resources.

SDWA *Safe Water Drinking Act.* This legislation and its amendments developed drinking water regulations including maximum contaminant levels and treatment techniques for public water supplies, and protection of groundwater supplies.

SB 241 *KY Senate Bill 241.* This Kentucky Bill is known as the Agriculture Water Quality Act. This act establishes the Agriculture Water Quality Authority to improve best management practices, establish a statewide water quality plan, and promote soil and water conservation activities. It requires all landusers with 10 or more acres to establish a water quality protection plan.

HB 377 *KY House Bill 377.* This Kentucky Bill couples with SB 241 and provides a state-funded cost-share program.

The Farm Bill. The Farm Bill is the name given to the federal programs and legislation related to agriculture. This bill includes a number of programs related to soil conservation, wetlands management, water quality, and other environmental issues. It is revised every five years and will be revised in the 1995 Congress.

GENERAL WATER QUALITY TERMS

Aquifer An underground rock zone or layer of soil that contains usable amounts of groundwater.

Best Management Practices BMPs These are recommended farm practices that lower or limit the amount of agriculture's adverse impact on the environment in terms of soil loss, nutrient and pesticide recommendations, and management of animal wastes. BMPs are generally used in voluntary compliance approaches.

COOPERATIVE EXTENSION SERVICE University of Kentucky College of Agriculture
agriculture home economics 4-H development

Cistern A water collection system where rain water is captured (usually from a roof) and stored in a tank. Cisterns are often found in rural areas where public water or well water are not available.

Community Water System Any public water system that has year round service.

Confined Aquifer An aquifer that is overlain by a confining bed.

Confining Bed A rock or soil layer that because of its low permeability restricts the movement of water into or out of adjacent aquifers.

Discharge Any of several ways in which groundwater comes back to the surface. These include springs, creeks, and wells.

Discharge Area The zone where ground water moves to the land surface. Streams and springs are typical areas for ground water discharges.

Geology Types of sediment and rocks on and below the surface of the land. The geology of an area influences the movement of groundwater.

Groundwater Any water that is found under the surface of the earth. Over 95% of the fresh water supply, and the source of drinking water for over half of the U.S. population is found as ground water.

Hardness A measure of the minerals dissolved in water that affect its soap-neutralizing characteristics and the formation of scale on pipes and in boilers.

Hydrologic Cycle The way in which the earth recycles water from the atmosphere down to (and through) the earth and back to the atmosphere.

Integrated Crop Management ICM This is a farm management approach that treats the farm operation as a total system, including best management practices on the timing and application of fertilizers and pesticides, handling and storage of agricultural chemicals, and management of animal wastes.

Integrated Pest Management IPM This is a farm management approach primarily geared towards the safe and effective use of pesticides in farm production. IPM emphasizes limited use of pesticides at strategic times to increase effectiveness, lower costs, and reduce adverse impacts on the environment.

Karst Area An area whose geology is predominantly limestone which leads to large cracks and fissures in the underground rock. The Mammoth Cave area in Kentucky is a karst area.

Leachate Any liquid that has leaked from a landfill or dump that contains dissolved substances from waste materials.

Noncommunity Water System A public water system that does not provide service year round, such as a campground.

Nonpoint Source Pollution This is pollution that comes from a number of sources spread over a wide geographic area. Generally, each source only contributes a small amount of contamination, but the sum impact may be substantial. Agriculture, mining, forestry, urban runoff, and construction all contribute to nonpoint source pollution. A single source for the pollution is not readily identifiable.

Overwithdrawal A situation where too much groundwater has been pumped from an aquifer.

Perched Water Table A local source of water occurring above the main water table because the downward percolation of water is limited by an impermeable layer of rock or soil.

Percolate To filter or ooze through a porous material.

Permeable Allowing the passage of fluids. Porous materials that allow water to easily pass through are called permeable.

Persistence An important characteristic of agricultural chemicals that relates to how long the chemical takes to break down into component parts. Persistence influences a chemical's ability to contaminate groundwater.

Plume A slow moving contaminant in groundwater.

Point of Entry Treatment Treatment of water at the entry to a home or business.

Point of Use Treatment Treatment of water at the source of use, such as at the kitchen tap.

Point Source Pollution This is pollution that can be directly attributed to a single contributor at a specific area. A discharge pipe from a factory is a point source of pollution.

Porous Having open spaces, holes, or voids through which water can pass.

Primary Drinking Water Standards Standards for maximum limits of pollutants in drinking water that have been set by the Environmental Protection Agency. Public water systems must meet these standards.

Public Water System Water that comes from a public utility or municipality that serves either 15 households or a minimum of 25 people for at least 60 days a year. Public water systems are regulated and monitored for pollutants at the treatment plant. (Semi-public water systems with connections commercially serving food or beverage shall also be considered a public system.)

Recharge Water that comes back into the groundwater system, such as rain soaking into the ground.

Riparian Zone An area of trees, woody shrubs, grasses and other vegetation located next to and up-gradient from streams, rivers, wetlands, sinkholes, and impounded water bodies. Reduces sediment, organic material, pesticide, and nutrient movement into nearby streams by slowing surface runoff and shallow groundwater flow.

Saturated Zone The area below the water table which is filled with groundwater.

Secondary Drinking Water Standards Standards for contaminants in drinking water that cause problems in odor, taste, color, and corrosivity, but do not pose health risks. Secondary standards are encouraged by the Environmental Protection Agency but are not enforced.

Semi-Public Water System A water system made available for drinking or domestic use which serves more than three families but does not qualify as a public water system.

Septic Tank A sewage treatment system using an underground tank for decomposing some of the waste and a drainfield through which liquid waste filters through the soil.

Soil Adsorption (also known as "sorption") An important characteristic of agricultural chemicals that relates to how easily a chemical will attach itself to the soil and therefore not move into groundwater.

Solubility An important characteristic of agricultural chemicals that relates to how easily the chemical moves with water, thereby increasing the likelihood of movement into the groundwater.

Spring Water that seeps out of the ground because the water table intersects the ground surface.

Surface Water Water that is found on the earths surface, such as streams, rivers, ponds, lakes, and oceans.emphasizes practices that minimize environmental damage.

Sustainable Agriculture An approach to agriculture that This approach generally recommends using lower chemical inputs and practices that are regenerative.

Toxic Substances Chemicals that can make people or animals ill, even to the point of death.

Topography The contour of the surface land. Topography is one factor in the movement of groundwater.

Understanding Drinking Water Standards

The Environmental Protection Agency of the US government was authorized to set two types of drinking water standards. The first are called ***Primary Standards*** and are set for contaminants that pose a health risk.

Primary standards are based on the agency's best knowledge of acceptable daily intakes of a contaminant a person could consume over the course of a lifetime without suffering any adverse health effects. Based on this information, **Maximum Contaminant Levels (MCL)** are set for each contaminant. If the MCL for a contaminant is not yet set, the EPA issues a **Health Advisory Level (HAL)** that is based on best available knowledge.

The EPA also sets ***Secondary Standards*** for contaminants that do not pose a health threat, but can result in problems that interfere with the quality of drinking water. These include staining, odor, and taste. Secondary standards serve as guidelines for private well water users.

Unsaturated Zone The area between the ground surface and the water table in which the pores are not completely filled with water. This is also referred to as the zone of aeration.

Water Conservation Any number of methods to reduce the unnecessary waste of water, such as reducing consumption, reducing water flow, or recycling water.

Water Table The plane where the unsaturated zone meets the saturated zone. The water table is represented by the level of water in unused wells.

Water Table Aquifer An aquifer that is only partially filled with water. The upper surface of the saturated zone is free to rise and decline in water table aquifers in response to variations in the amount of recharge. Water table aquifers are also known as unconfined aquifers.

Well A drilled or dug entry into the groundwater to discharge water. A well must reach past the water table in order to have a sufficient supply.

Zone of Aeration The soil region above the water table that may be moist, but only partially contains water.

VARIOUS FORMS OF NITROGEN

Name	Symbol	MCL
Nitrate	NO_3	44 mg/l
Nitrate-Nitrogen	NO_3-N	10 mg/l
Nitrite	NO_2	1 mg/l
Nitrate+Nitrite	NO_3+NO_2	10 mg/l

Understanding Test Concentration Levels

Typically testing laboratories give a report of the concentrations of contaminants as parts per million (or billion), or as amounts per liter. However, different laboratories may use different measures of concentration in their reports. The following table will help you understand how concentrations are expressed.

Most Tests	**ppm** parts per million **mg/l** milligram per liter Note, ppm = mg/l **ppb** parts per billion **µ/l** microgram per liter Note, ppb = µ/l
Hardness	**grains per gallon** **mg/l** milligrams per liter Note, 17.17 mg/l = 1 grain per gal
Coliform Bacteria	**cfu** colony forming unit per 100 cc **tnc** too numerous to count

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