

Glossary

(Terms in definitions that are defined elsewhere in the Glossary are shown in boldface within the definition.)

apparent groundwater age The time elapsed since the recharge water became isolated from the atmosphere. The term “age” is normally qualified with the word “apparent” to signify that the accuracy of the determined age is dependant on many variables (Plummer and others, 1993; Plummer and Friedman, 1999)

aquifer A geologic formation, group of formations, or part of a formation that contains sufficient saturated permeable material to yield significant quantities of water to springs and wells.

assimilation A biochemical or abiotic process that uses nitrate or ammonium to form plant proteins and other nitrogen-containing compounds.

biogenic nitrate Nitrate (NO_3^-) that is formed by the process of nitrification in which ammonium is oxidized to nitrate.

chemigation An agricultural practice of injecting chemicals (such as fertilizers) directly into the irrigation water for application of the chemicals through the irrigation system to the crop of field.

confining unit A **hydrogeologic unit** of impermeable or distinctly less permeable material within an aquifer or bounding one or more aquifers.

degrade A new compound formed by transformation of a pesticide by chemical, photochemical, or biological reactions.

denitrification A microbially facilitated process of nitrate reduction to nitrogen gas (N_2) through a series of intermediate steps. It is the most important natural sink for nitrate in groundwater.

diffuse recharge A type of **recharge** that occurs when precipitation or melting snow infiltrates across a uniform area of an aquifer and percolates relatively uniformly through the **unsaturated zone**, eventually intercepting the **water table**.

discharge See **groundwater discharge**.

drawdown The vertical distance the water-table elevation is lowered because of the withdrawal or pumping of **groundwater**.

focused recharge A type of **recharge** that occurs by rapid movement of water through the soil and **unsaturated zone** that bypasses a large portion of the soil and unsaturated-zone matrix.

groundwater Water beneath land surface in the **saturated zone**.

groundwater age See **apparent groundwater age**.

groundwater availability A function not only of the quantity and quality of **groundwater** in an **aquifer** but also the physical structures, laws, regulations, and socioeconomic factors that control the demand and use of groundwater (Reilly and others, 2008).

groundwater discharge Flow of water from the **saturated zone**.

groundwater recharge The flux of water to **groundwater**. As used in this report, recharge is the vertical, volumetric flux of water across the **water table** or **saturated zone** of an **aquifer**. Rates of recharge are often expressed in units of length per time (mm yr^{-1}).

groundwater sustainability The amount of **groundwater** that will be available to support future uses of a particular aquifer or groundwater resource. Alley and others (1999) state that groundwater sustainability is the development and use of groundwater in such a manner that can be maintained for an indefinite time without causing unacceptable environmental, economic, or social consequences.

hydraulic properties Those properties of rock or sediment that govern the entrance of water and the capacity to hold, transmit, and deliver water.

hydrogeologic unit A distinct soil or rock unit or zone which by virtue of its **hydraulic properties** has a distinct influence on the storage or movement of **groundwater**.

hydrogeology The geologic and hydrologic features characteristic of a hydrogeologic unit that control the movement of water, solutes, and small particles through the **subsurface**.

hydrologic system The assemblage of pathways by which water travels as it circulates beneath, at, and above the Earth's surface through various processes such as precipitation, runoff, evaporation, infiltration, transpiration, and **groundwater recharge** and **discharge**.

infiltration The process of precipitation or melting snow entering soil or rock across its interface with the atmosphere.

irrigation return flow The part of artificially applied water that is not consumed by evapotranspiration and that migrates to an aquifer or surface-water body.

land-use study The land-use studies are used to measure and explain the quality of recently recharged groundwater in irrigated cropland and urban settings by sampling water-table monitoring wells installed as part of the NAWQA Program.

major-aquifer study The major-aquifer studies are used to broadly assess water-quality conditions in the aquifer by sampling networks of randomly selected, areally distributed existing private wells.

Maximum Contaminant Level (MCL) A drinking-water standard that is legally enforceable and that sets the permissible concentration of a specific compound delivered to any user of a public-water system. In this report, only values established by the U.S. Environmental Protection Agency (USEPA) are used.

milligrams per liter (mg/L) A unit expressing the concentration of chemical constituents in solution as weight (milligrams) of solute per unit volume (liter) of water; equivalent to one part per million in most surface water and groundwater. One thousand micrograms per liter equals 1 mg/L.

natural attenuation The reduction in constituent concentration in the environment that is caused by naturally occurring physical, chemical, and (or) biological processes.

nonpoint sources A diffuse and widely dispersed location at which one or more contaminants are known to be released into the **hydrologic system**, such as agricultural runoff or atmospheric deposition.

pesticide A chemical applied to crops, rights-of-way, lawns, or residences to control weeds, insects, fungi, nematodes, rodents, and other “pests.”

point source A specific location at which one or more contaminants are known to be released into the **hydrologic system**.

predevelopment The time prior to substantial groundwater development for irrigation. McGuire and others (2003) estimate that 1957 was the median year defining predevelopment across the High Plains.

public-supply well A privately or publicly owned well that provides water for public use to: (A) community water systems, (B) transient noncommunity water systems, such as campgrounds, or (C) nontransient, noncommunity systems, such as schools.

recently recharged groundwater In this report, refers to groundwater that was recharged during the past approximate 50 years, as indicated by tritium concentrations in **groundwater** greater than 0.5 **tritium unit**.

recharge See **groundwater recharge**.

reduction-oxidation (redox) Chemical reactions that involve a change in the oxidation number (state) of atoms. Redox processes in groundwater often are microbially facilitated.

regional-transect study The regional-transect studies are used to characterize vertical gradients in groundwater chemistry and apparent groundwater age in the thickest areas of the High Plains aquifer and to identify major biogeochemical reactions affecting the quality of water along groundwater flow paths leading from recharge areas to down gradient wells.

saturated zone The subsurface region in the aquifer in which all the interstices or voids are filled with water under a pressure equal to or exceeding that of the atmosphere.

Secondary Maximum Contaminant Level (SMCL) A drinking-water guideline that is not legally enforceable for “secondary” contaminants, which is set by the U.S. Environmental Protection Agency (USEPA). A secondary contaminant is a concern for the esthetic qualities of drinking water.

sodium adsorption ratio (SAR) A measure of irrigation water sodium hazard. It is the ratio of sodium to calcium plus magnesium adjusted for valence. The SAR value of water is considered along with specific conductance in determining suitability for irrigation.

Study Unit A major hydrologic system of the United States, geographically defined by surface- or groundwater features, in which NAWQA sampling studies are focused.

subsurface The region of material beneath the land surface that encompasses the soil, **unsaturated**, and **saturated zones**.

transit time The time required for water or a chemical to travel between two locations.

tritium unit (TU) A measure of the concentration of tritium (^3H), equal to 1 ^3H atom in 10^{18} atoms of hydrogen (H), or 3.24 picocuries per liter (pCi/L).

unsaturated zone The subsurface zone between land surface and the water table, characterized as containing water under pressure less than that of the atmosphere. The matrix of the unsaturated zone is not completely filled with water; thus, gases exist in the pore spaces of the unsaturated zone.

unsaturated-zone study The unsaturated-zone studies are used to measure the amount of chemicals stored in the subsoil above the water table of the High Plains aquifer and determine their transit times from land surface to the water table in rangeland and irrigated settings.

water table The point below land surface at which groundwater is first present and below which the aquifer material is saturated.