

GROUNDWATER

Building an understanding of groundwater
at Santa Susana Field Laboratory



GLOSSARY^a

Adsorption Isotherm	A curve relating the amount of solute sorbed on the solid phase (S) to the concentration in the liquid phase (C) at equilibrium and at a constant temperature.
Advection	The process by which solutes are transported by the motion of flowing groundwater
Alluvium	Loose, unconsolidated (not cemented together into a solid rock), soil or sediments, eroded, deposited, and reshaped by water in some form in a non-marine setting.
Anisotropy	The condition under which one or more of the hydraulic properties of an aquifer vary according to the direction of flow.
Aquiclude	A low-permeability unit that forms either the upper or lower boundary of a groundwater flow system.
Aquifer	Rock or sediment in a formation that is saturated and sufficiently permeable to transmit economic quantities of water to wells and/or springs.
Aquifer, confined	An aquifer bounded above and below by confining beds. The confining bed has a significantly lower hydraulic conductivity than the aquifer.
Aquifer, perched	A region in the unsaturated zone where the soil may be locally saturated because it overlies a low-permeability unit.
Aquifer, unconfined	An aquifer bounded above by the water table and below by a confining bed.
Aquitard	A low-permeability unit that can store groundwater and also transmit it slowly from one aquifer to another.
Average Linear Velocity	The specific discharge divided by the effective porosity. The average linear velocity is an estimate of the mean rate that water molecules or non-reactive tracers transport.

Baseflow	That part of stream discharge from groundwater seeping into the stream.
Boring	A hole advanced into the ground by means of a drilling rig.
Capilarity	The relative attraction of the molecules of the liquid for each other and for those of the solid.
Capillary fringe	The zone immediately above the water table, where water is drawn upward by capillary attraction.
Capture zone	The area surrounding a well that will supply groundwater to that well when pumped at a specified rate for a specified period of time.
Chatsworth Formation Operable Unit	SSFL is divided into two operable units for the purposes of site characterization and cleanup. CFOU refers to the groundwater and unweathered bedrock portions of the site.
Colloid	A substance microscopically dispersed evenly throughout another substance
Comprehensive Environmental Response, Compensation, and Liability Act of 1980, also known as Superfund, a US federal law designed to clean up sites contaminated with hazardous substances.	
Cone of Depression	A conical lowering of the water table or pressure surface in an aquifer resulting from water withdrawal, such as pumping.
Confining layer	A body of material of low hydraulic conductivity that is stratigraphically adjacent to one or more aquifers. It may lie above or below the aquifer.
Dense Non Aqueous Phase Liquid	A separate phase (immiscible in water) liquid consisting of a solution of organic compounds (e.g., chlorinated hydrocarbons) and which is denser than water.
Darcy's Law	An equation that can be used to compute the quantity of water flowing through an aquifer.
Dense Non Aqueous Phase Liquid	A separate phase (immiscible in water) liquid consisting of a solution of organic compounds (e.g., chlorinated hydrocarbons) and which is denser than water.
Diffusion	The process by which both ionic and molecular species dissolved in water move from areas of higher concentration to areas of lower concentration.

Dispersion	The phenomenon by which a solute in flowing groundwater is mixed with uncontaminated water and becomes reduced in concentration. Dispersion is caused by both differences in the velocity that the water travels at the pore level and differences in the rate at which water travels through different strata in the flow path.
Drawdown	A lowering of the water table of an unconfined aquifer or the potentiometric surface of a confined aquifer caused by pumping of the groundwater from wells.
Evaporation	The process by which water passes from liquid to the vapor state.
Evapotranspiration	The sum of evaporation plus transpiration.
Fracture	A general term for any break in a rock, which includes cracks, joints and faults.
Fracture Tracer	Visible on aerial photographs, fracture traces are natural linear-drainage, soil-tonal, and topographic alignments that are probably the surface manifestation of underlying zones of fractures.
Groundwater	The water contained in subsurface at pressure greater than the atmosphere..
Heterogeneous	Pertaining to a substance having different characteristics in different locations.
Homogeneous	Pertaining to a substance having identical characteristics everywhere.
Hydraulic conductivity	A measurement of the rate at which water can move through a permeable medium.
Hydraulic gradient	The change in total head with a change in distance in a given distance in the direction which yields a maximum rate of decrease.
Hydraulic Head	The elevation in a well in reference to a specific datum; represents potential energy per unit weight of water.
Hydrogeology	The study of the interrelationships of geologic materials and processes with water , especially groundwater.
Hydrophilic	Having a strong affinity for water.
Hydrophobic	Having a strong aversion for water.
Infiltration	The flow of water downward from the land surface into and through the upper soil layers.

Isotropy	The condition in which hydraulic properties of the aquifer are equal in all directions
Immiscibility	The inability of two or more substances or liquids to readily dissolve into one another, such as soil and water.
Joint	A fracture along which there has been no relative movement.
Light Non-Aqueous Phase Liquid	A separate phase liquid (immiscible in water) consisting of a solution of organic compounds (e.g., gasoline) and which is less dense than water.
Maximum contaminant level	The highest concentration of a chemical permissible in a public water supply.
Micrograms per liter	A measure of the amount of dissolved solids in a solution in terms of micrograms of solute per liter of solution.
Monitoring Well	A well used to obtain water quality samples or measure groundwater levels.
Oxidation (Chemical)	Addition of an oxygen (or removal of electron) on a molecule.
Perched Groundwater	Groundwater situated on a relatively low permeability feature above the regional groundwater system.
Permeability (Intrinsic)	The ease at which a fluid will flow through a porous medium.
Phreatophyte	A type of plant typically has a high rate of transpiration by virtue of a taproot extending to the water table.
Piezometer	A well used to measure water level (hydraulic head).
Pore Space	The volume between mineral grains in a porous medium.
Porosity	The ratio of the volume of void spaces in a rock or sediment to the total volume of the rock or sediment.
Potable water	Drinking water
Recharge	The process by which water infiltrating from the surface adds to the volume of groundwater.
Reduction (Chemical)	The addition of a hydrogen (or electron) to a molecule.
Resource Conservation and Recovery Act	Enacted in 1976, is the principal Federal law in the United States governing the disposal of solid waste and hazardous waste .

Retardation	The process by which a solute travels at a slower rate than water because of partitioning onto the solid phase of the porous medium.
Safe yield	The amount of naturally occurring groundwater that can be economically and legally withdrawn from an aquifer on a sustained basis without impairing the native groundwater quality or creating an undesirable effect such as environmental damage.
Saturated zone	The zone in which the voids in the rock or soil are filled with water at a pressure greater than atmospheric.
Sediment	An assemblage of individual mineral grains that were deposited by some geologic agent such as water, wind, ice, or gravity.
Seepage velocity	The rate of movement of fluid particles through porous media along a line from one point to another.
Sorption	A general term referring to adsorption or absorption, the partitioning of a solute to solid surface.
Spring (or seep)	A natural outflow of ground water to a point on the surface.
Storage, specific	The amount of water related from or taken into storage per unit volume of a porous medium per unit change in head.
Storativity	The volume of water an aquifer releases from or takes into storage per unit surface area of the aquifer per unit change in head.
Stream, gaining	A stream, the flow of which is being increased by inflow of groundwater. Also known as an effluent stream
Stream, losing	A stream that is losing water by seepage into the ground. Also known as an influent stream
Superfund	The common name for the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), a United States federal law designed to clean up sites contaminated with hazardous substances
Trichloroethylene	A hydrocarbon with three chlorine atoms commonly used as an industrial solvent.
Transmissivity	The rate at which water of a prevailing density and viscosity is transmitted through a unit width of an aquifer or confining bed under a unit hydraulic gradient.
Transpiration	The process by which plants give off water vapor through their leaves.

Unsaturated Zone	The zone between the land surface and the water table also referred as the vadose zone.
Vadose Zone	The region below the surface and above the water table. Water in the vadose zone is below atmospheric pressure.
Volatile Organic Compounds	Organic chemical compounds which have large vapor pressures and which can affect the environment and human health.
Water Budget	An evaluation of all the sources of supply and the corresponding discharges with respect to an aquifer or a drainage basin.
Water Table	The depth at which pore water is at atmospheric pressure. The water table is the surface that divides the vadose and groundwater zones.
Watershed	An area of land surface over which all water flows to a specific drainage point.

^a Some definitions modified from: Fetter, C. W. Applied Hydrogeology, Third Edition. Upper Saddle River: Prentice-Hall, Inc., 1995