**Glossary**

**A**

**absolute water right:**  A property right to put water to beneficial use with a specified priority date.

**acre-foot:**  Volumetric measurement of water used for quantifying reservoir storage capacity and historical consumptive use.  This is the amount of water that will cover an acre of land at a depth of a foot (43,560 cubic feet), or 325,851 gallons of water.

**adjudication:**  To hear and settle a case by judicial procedure.

**algae:**  Chlorophyll-bearing nonvascular, primarily aquatic species that have no true roots, stems or leaves: most algae are microscopic, but some species can be large as vascular plants

**alkali:**  A soluble salt or a mixture of soluble salts present in some soils of arid regions in quantity detrimental to agriculture.

**alkalinity:**  Generally, refers to the sum of the concentration of bicarbonate and carbonate of an aqueous solution.

**alluvial aquifer**:  A water-bearing deposit of unconsolidated mater (sand and gravel) left behind by a river or other flowing water.

**alluvial water:**  Ground water that is hydrologically part of a surface stream that is present in permeable soil material, usually small rock and gravel.

**alluvium:**  Deposits of clay, slit, sand, gravel or other particulate rock material left by a river in a streambed, on a flood plain, delta, or at the base of a mountain.

**amalgamation:**  The dissolving or blending of a metal (commonly gold and silver) in mercury to separate it from its parent material.

**ambient:**  Natural concentration of water quality constituents prior to mixing of either point or nonpoint source load of contaminants or completely enveloping.  From a time series of measurements of a parameter at a given location the ambient value is the 85th percentile.

**ammonia:**  A compound of nitrogen and hydrogen (NH3) that is a common by-product of animal waste.  Ammonia readily converts to nitrate in soils and streams.

**anomalies:**  As related to fish, externally visible skin or subcutaneous disorders, including deformities eroded fins, lesions and tumors.

**appropriate:** (verb) To take the legal actions necessary to create a right to take water from a stream, tributary or aquifer for application to beneficial use.

**appropriation:**  Placement of a specified portion of the waters of the state to a beneficial use pursuant to the procedures prescribed by law.  Speculation is prohibited.  The appropriator must have its own use for the water or have a contract to serve the customers that the water will benefit.  a only previously unappropriated surface or tributary groundwater can appropriated.  The appropriator must have a plan to divert; store; or otherwise capture, possess and control the water for beneficial use.

**aquatic guidelines**:  Specific levels of water quality which, if reached, may adversely affect aquatic life.  These are non-enforceable guidelines issued by a governmental agency or other institution.

**aquifer:**  An underground deposit of sand, grave or rock through which water can pass or is stored.  Aquifers supply the water for wells and springs.

**artificial recharge:**  Augmentation of natural replenishment of ground-water storage by some method of construction, spreading of water, or by pumping water directly into a aquifer.

**atmospheric deposition:**  The transfer of substances from the air to the surface of the Earth, either in wet form (rain, fog, snow, dew, frost, hail) or in dry form (gases, aerosols, particles).

**augmentation plan:**  A court-approved plan that allows a water user to divert water out of priority so long as adequate replacement is made to the affected stream system preventing injury to the water rights of senior users.

**augmentation source:**  The supply of water used to replace out-of-priority depletions.

**B ﻿
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**bank:**  The sloping ground that borders a stream and confines the water in the natural channel when the water level, or flow, is normal.

**baseflow:**  Sustained, low flow in a stream; ground-water discharge is the source of base flow in most places.

**basic fixed sites:**  Sites on streams at which stream flow is measured and sample are collected for temperature, salinity, suspended sediment, major ions and metal, nutrients, and organic carbon to assess the broad-scale spatial and temporal character and transport of inorganic constituents of stream water in relation to hydrologic conditions and environmental settings.

**basin:**  See drainage basin.

**basin and range physiographic:**  A region characterized by a series of generally north-trending mountain ranges separated by alluvial valleys.

**bed load:**  Sediment that moves on or near the streambed and is in almost continuous contact with the bed.

**beneficial use:**  Beneficial use is the basis, measure and limit of a water right.  Colorado law broadly defines beneficial use of water as a lawful appropriation that uses reasonably efficient practices to put water to use without waste.

**best management practice (BMP):** An agricultural practice that has been determined to an effective practical means of preventing or reducing nonpoint source pollution.

**biomass:**  The amount of living matter, in the form of organisms, present in a particular habitat, usually expressed as weight per unit area.

**biota:**  Living organisms.

**bureau of land management (BLM):**  Federal agency within the U.S. Department of Interior that manages most public lands in Colorado that are not national forest.

**bureau of reclamation (USBR/BOR):**  Federal water development agency within the U.S. Department of Interior.

**bypass flow:**  Water that is allowed to flow past a diversion structure or storage facility.

[**C**](http://backtotop/)

**call:**  Demand for administration of water rights.  In times of water shortage, the owner of a decreed water right will make a "call" for water.  The call results in shut down orders against undecreed water uses and decreed junior water rights as necessary to fill the beneficial use need of the decreed senior calling right.

**canopy angle:**  Generally, a measure of the openness of a stream to sunlight.  Specifically, the angle formed by an imaginary line from the highest structure (for ex: tree, shrub, or bluff) on one bank to eye level at mid channel to the highest structure on the other bank.

**carbonate rocks**:  Rocks (such as limestone or dolostone) that are composed primarily of minerals (such as calcite and dolomite) containing the carbonate ion.

**center pivot irrigation:**  An automated sprinkler system involving a rotating pipe or boom that supplies water to a circular area of an agricultural field through sprinkler heads or nozzles.

**channelization:**  Modification of a stream, typically by straightening the channel, to provide more uniform flow; often done for flood control or for improved agricultural drainage or irrigation.

**clean water act:**  The federal law that sets forth how the United States will restore and maintain the chemical, physical and biological integrity of the country's waters (oceans, lakes, streams and rivers, ground water and wetlands).  The law provides protection to the country's surface waters from both point and non-point sources of pollution.

**climate:** The sum total of the meteorological elements that characterize the average and extreme conditions of the atmosphere over a long period of time at any one place region of the Earth's surface.

**Colorado Department of Natural Resources (DNR):**  State department with overall responsibility for water resources development and administration.

**Colorado Department of Public Health and Environment (CDPHE):**  State department with overall responsibility for water quality, including drinking water and wastewater.

**Colorado Revised Statutes (C.R.S.):**  The annual compilation of Colorado statutes and court rules published by the Colorado General Assembly.

**Colorado Doctrine:**  see appropriation.

**Colorado Water Conservation Board:**  The state agency vested with the authority to appropriate water of streams and lakes in amounts that are determined to be necessary to preserve the natural environment to a reasonable degree.

**Colorado Water and Protective Development Association (CWPDA):**  State agency created to fund water development, including water projects, drinking water treatment plants, and wastewater treatment plants.

**combined sewer overflow:**  A  discharge of untreated sewage and storm water to a stream when the capacity of a combined storm/sanitary sewer system is exceeded by storm runoff.

**compact:**  An agreement between two or more states approved by their state legislatures and the U.S. Congress.  Compacts are akin to treaties between states.  A water compact is a contract between two or more states setting the terms for sharing the waters of an interstate stream.

**compact call:**  The requirement that an upstream state cease or curtail diversions of water from the river system that is the subject of the compact to satisfy the downstream state's compact entitlements.

**concentration:**  The amount or mass of a substance present in a given volume or mass of sample.  Usually expressed as microgram per liter (water sample) or micrograms per kilogram (sediment or tissue sample).

**conditional water right:**  The legal preservation of a priority date that provides a water user time to develop his or her water right, but reserves a more senior date.  A conditional right becomes an absolute right when water is actually put to beneficial use.

**conjuctive use:**  Coordinated use of surface and ground water supplies to meet demand so that both sources are used more efficiently.

**conservation:**  Obtaining the benefits of water more efficiently, resulting in reduced demand for water.  Sometimes called "end-use efficiency" or "demand management".

**conservancy district:**  Established by decree of a court under the Water Conservancy District Act of 1937.  A conservancy district can obtain rights-of-way for works; contract with the United States or otherwise provide for construction of facilities; assume contractual or bonded indebtedness; administer, operate, and maintain physical works; have authority to conserve, control, allocate, and distribute water supplies, and have contracting and limited taxing authority to derive the revenues necessary to accomplish its purpose.  There are currently 45 conservancy district in Colorado.

**conservation:**  Obtaining the benefits of water more efficiently, resulting in reduced demand for water .  Sometimes call "end-use efficiency" or "demand management."

**conservation district:**  Established under specific status by the Colorado General Assembly. There are currently three conservation districts in Colorado; the Colorado River Water Conservation District, the Southeastern Water Conservation, and the Rio Grande Water Conservation District.  The mission is to oversee the conservation, use, and development of water in large geographical areas of the state.

**consumptive use:**  Water use that permanently withdraws water from its source and is no longer available because it has evaporated, been transpired by plants, incorporated into products or crops, consumed by people or livestock, or otherwise removed from the immediate water environment.

**Continental Divide:**  An imaginary boundary line that runs north-south along the crest of the Rocky Mountains, separating river and drainages that flow west to the Pacific Ocean from those that flow south and east toward the Gulf of Mexico and the Atlantic Ocean.

**cubic feet per second (cfs):**  Measurement of flow rate of water in a running stream or taken as direct diversion from the stream.  Water flowing at 1 cubic feet per second will deliver 448.8 gallons per minute or 648,000 gallons per day or approximately 2 acre-feet per day.

**cumulative impact analysis:**  A review of the cumulative environmental, social, and economic impacts of proposed water projects and activities associated with development within an ecosystem or drainage area.

**D

decree:**A court decision about a water right that is then administered by Colorado's Water Resources Department.

**Designated ground water:**  Ground water which in its natural course would not be available to and required for the fulfillment of decreed surface rights, or ground water in areas not adjacent to a continuously flowing natural stream wherein ground water withdrawals have constituted the principal water usage for at least 15 years preceding the date of the first hearing on the proposed designation of the basin, and which in both cases is within the geographic boundaries of a designated ground water basin.

**designated ground water basin:** An area established by the Colorado Ground Water Commission as containing designated ground water, which is assumed not to affect the major surface river basin to which the designated basin would otherwise be tributary.  Much of eastern Colorado is located within designated basins.

**developed or imported water:** Water brought into a stream system from another unconnected source, for example, transmountain diversion water or non-tributary well water.  This type of water can be reused and successively used to extinction, and is often used in augmentation or exchange plans.  In contrast, native basin water is subject to one use, and the return flow belongs to the stream system to fill other appropriations, unless a decree was obtained for the right to reuse and successively use return flows.

**diligence:**Reasonable progress toward making a conditional water right absolute by putting unappropriated water to a beneficial use.  Must be proved in a water court proceeding through an application initiated every six years after entry of the conditional decree or most recent diligence decree.  Account demonstrating diligence include engineering, permitting, financing, and contruction of water facilities needed to complete water diversion and delivery to the place of use.

**direct flow (also direct right):**  Water diverted from a river or stream for use without interruption between diversion and use except for incidental purpose, such as settling or filtration.

**discharge:**  Rate of fluid flow passing a given point at a given moment in time, expressed as volume per unit of time.

**diversion or divert:**  Removing water from its natural course or location, or controlling water in its natural course or location, by means of water structure such as canal, flume, ditch pipeline, pump, reservoir, conduit, or well.  The Colorado Water Conservation Board may appropriate instream flows without diversion, and local governmental agencies may make recreational in-channel diversions, under specified statutory procedures.

**division engineer:**  Official appointed by the State Engineer to administer water rights within one of the state's seven water divisions, which generally correspond to major river basins.

**drainage basin:**  The portion of the surface of the Earth that contributes water to a stream through overland run-off, including tributaries and impoundments.

**drawdown:**  The difference between the water level in a well before pumping and the water level in the well during pumping.  Also, for flowing wells, the reduction of the pressure head as a result of the discharge of water.

**drinking water standard or guideline:**  A threshold concentration in a public drinking-water supply, designed to protect human health. As defined here, standards are U.S. Environmental Protection Agency regulations that specify the maximum contamination levels for public water systems required to protect the public welfare; guidelines have no regulatory status and are issued in an advisory capacity.

**drip irrigation:**An irrigation system in which water is applied directly to the root zone of plants by means of applicators (orifices, emmitters, porous tubing, perforating pipe, and so forth) operated under low pressure.  The applicators can be placed on or below the surface of the ground or can suspended from supports.

**drought:**  A long period of below-average precipitation.

**due diligence:**  The efforts necessary to complete a water appropriation action that demonstrates a good faith action to complete a diversion of water within a reasonable time period.

**duty of water:**  The amount of water that through careful management and use, without wasteage, is reasonably required to be applied to a tract of land for a length of time that is adequate to produce the maximum amount of the crops that are ordinarily grown there.

**E

ecologicial studies:**Studies of biological communities and habitat characteristics to evaluate the effects of physical and chemical characteristics of water and hydrologic conditions on aquatic biota and to determine how biological and habitat characteristics differ among environmental settings.

**effluent:**  Outflow from a particular source, such as a stream that flows from a lake or liquid waste that flows from a factory or sewage-treatment plant.

**effluent limits:**  Limitations on the concentration and/or mass of specific pollutants that a facility is allowed to discharge.

**effluent exchange:**  The practice of using wastewater effluent from transbasin water, non-tributary water sources, or other sources without causing injury to other water rights as a replacement source of water for diversion of water farther upstream that would otherwise have been out of priority.

**Endangered Species Act:**  The federal law that governs how animal and plant species whose populations are dangerously in decline or close to extinction will be protected and recovered.  The law protects not only threatened and endangered species, but also the ecosystems upon which they depend.

**Energy Policy Act (EPACT):**  A 1992 federal law that states, among other things, that no toilet for household used manufactured after Jan 1, 1994, shall use more that 1.6 gallons per flush and that shower heads and faucets manufactured after Jan 1 1994, may not use more than 2.5 gallons per minute.

**equitable apportionment:**  A division of the waters of an interstate stream between two or more states made either by the U.S. Supreme Court or the U.S. Court or the U.S. Congress.

**exchange:**  A process by which water, under certain conditions, may be diverted out of priority at one point by replacing it with a like amount of water at another point.

**exempt wells:**  those wells that are exempt from water rights administration under a priority system (examples of exempt wells are household use only, domestic and livestock wells, and pre 1972 unregistered wells).

**F

firm annual yield:** The yearly amount of water that can be dependably supplied from the raw water sources of a given water supply system.

**futile call:**  Determination made by the state or division engineer to lift a shutdown order if cessation of diversions by junior decreed water rights will not result in making water available to the senior calling right.

**G

ground water:**Water located beneath the surface of the earth, typically withdrawn for use through wells.

**H

headwaters:**The small streams, generally in the mountains, that are the sources of a river; the first and smallest tributaries of a river.

**hydrologic cycle:**  The movement of water from the atmosphere to the earth and back again to the atmosphere.  The three stages are precipitation, runoff or infiltration and evaporation.

**I**

**injury:**  The action of another that causes or may cause the holders of decreed water rights to suffer loss of water at the time, place, and amount they would be entitled to use under their water rights if the actions had not occurred.  Injury is a significant issue in any water court proceeding and in determinations of the State and Division Engineer.

**instream flows:**   Water flowing in its natural stream bed, such as water required for maintaining flowing streams, or for fish.

**interstate compacts:**  see compacts

**J**

**junior rights:**  Water rights that are more recently and therefore are junior in priority to older or more senior rights.

**M**

**mean discharge (MEAN):**  The arithmetic mean of individual daily mean discharges during a specific period, usually daily, monthly, or annually.

**miner's inch or statutory inch:**  A measurement of water flow.  In Colorado, 38.4 miner's inches is considered equivalent to one cubic foot per second.
monitoring well:  A well designed for measuring water levels and testing ground-water quality.

**N

National Pollution Discharge Elimination System (NPDES) Permit:**A permit required under Section 401 of the Clean Water Act regulating discharge of pollutants to the nation's waterways.

**National Environmental Policy Act (NEPA):**  The federal law enacted in 1969 to ensure federal agencies consider environmental impacts in their decision making.

**non-consumptive use:**  Water drawn for use that is not consumed, such as water diverted for hydroelectric generation.  It also includes such uses as boating and fishing, where water is still available for other uses at the same site.

**Non-exempt wells:**  those that are governed by the priority system and may be curtailed (included any other type of well not considered exempt).

**non-point source:** A diffuse source of water pollution, such as general runoff over the land surface; a pollution source that does not meet the definition of a "point source".

**non-tributary ground water:**Ground water outside of the boundaries of any designated ground water basin, the withdrawal of which will, within 100 years, deplete the flow of a natural stream at an annual rate greater than one-one-tenth of a one percent of the annual rate of withdrawal.

**P

parshall flume:**A specially shaped structure that can be installed in a channel to measure the water flow rate.  The flume was developed by Ralph Parshall at Colorado State University early in the last century.

**point source:**  A pipe, channel, conduit, or other discrete conveyance from which pollutants are discharged of various types.

**pollutant:**  Any waste or other contaminant that adversely affects water quality.

**pollution:**  The man-made or man-induced alteration of the chemical, physical, biological, and radiological integrity of water.

**potable:**  Water that does not contain pollution, contamination, objectionable minerals, or infective agents and is considered safe for domestic consumption; drinkable.

**precipitation:**  Any or all forms of water particles that fall from the atmosphere, such as rain, snow, hail and sleet.

**prior appropriation doctrine:**  The water law doctrine that confers priority to use water from natural streams based upon when the water rights were acquired.  Water rights in Colorado and other western states are confirmed by court decree; holders of senior rights have first claim to withdraw water over holders who have filed later claims.

**priority**:  The ranking of a water right vise-a-vise all other water rights drawing on the surface stream and tributary ground water system priority is determined by the year in which the application for the water right was filed.  The date the appropriation was initiated determines the reltive priority of water rights for which the applications were filed in the same year.  Priority is the most valuable aspect of a water right because priorities determine who may divert and use water in time of short water supply.

**priority date:**  The date of establishment of a water right.  The rights established by application have the application date as the date of priority.

**R**

**raw water:**Untreated water.

**reasonable diligence:**  The efforts necessary to bring an intent to appropriate water to fruition; actions that demonstrate a good-faith intention to complete a diversion of water within reasonable time.

**recharge:**  Water that infiltrates the ground and reaches the saturated zone.

**reservoir:**  A structure used to collect and store water, or a tank or cistern used to store potable water.

**return flows:**  Water that returns to streams and rivers after it has been applied to beneficial use.  It may return as a surface flow, or as an inflow of tributary ground water.

**reuse:**  To use again, recycle; to intercept, either directly or by exchange, water that would otherwise return to the stream system, for subsequent beneficial use.

**revegetate:**  To provide barren land with a new vegetative cover.

**reviewable waters**:  Colorado surface waters that have not been designated "outstanding water" or "use-protected," the right to put to beneficial use surface water adjacent to one's land.  Riparian rights are most common in states east of the Mississippi River and do not exist in Colorado.

**riparian water law:**  A legal system that permits water use only by those who own land along the banks of a stream or lake.  The right is for reasonable use and is correlative with the right of every other property owner to prohibit unreasonable use that diminishes the instream quantity or quality of water.  Colorado law does not recognize riparian rights.

**runoff:**  Water that flows on the earth's surface into streams, rivers, lakes, and oceans.

**S**

**Safe Drinking Water Act (SDWA):**  Federal legislation that regulates the treatment of water for human consumption.  Requires testing for and elimination of contaminants to levels for the protection of human health.

**sediment:**Particles, derived from rocks or biological materials, that have been transported by a fluid or other natural process, suspended or settle in water.

**senior rights:**  Water rights that are staked the earliest with the water court.

**sole source aquifer:**  A ground water system that supplies at 50 present of the drinking water to a particular human population:  the term is used to denote special protection requirements under the Safe Drinking Water Act and may be used by approval of the U.S. Environmental Protection Agency.

**specific conductance:**  A measure of the ability of a liquid to conduct an electrical current.

**spill water:**  Water released from a reservoir because the reservoir lacks sufficient storage capacity.

**State Engineer's Office (SEO):**  Agency that administers water rights within the Division of Water Resources, Colorado Department of Natural Resources.

**stream flow:**  A type of channel flow, applied to that part of surface runoff in a stream whether or not it is affected by diversion or regulation.

**storage:**  Water held in a reservoir for late use.

**stormwater runoff:**  Rainfall or snowmelt that runs off over the land surface, potentially carrying pollutants to streams, lakes, or reservoirs.

**substitute supply plan:**  A State Engineer approved temporary plan of replacement supply allowing an out of priority diversion.  The State Engineer may approve substitute water supply plans while a plan for augmentation is pending in water court, for water exchanges, water uses that will not exceed five years, and in limited emergency situations affecting public health or safety.

**subsurface drainage:**  A shallow drain installed in an irrigated filed to intercept the rising ground water level and maintain the water table at an acceptable depth below that land surface.

**surface water:**  Water present on the earth's surface.

**system loss:**  An amount of water, expressed as a percentage, lost from a water storage or distribution system due to leaks, evaporation, seepage and unauthorized use.

**T**

**temporary modification:**  A temporary relaxation of numerical water quality standards allowing time for actions to improve water quality and achieve a long term standard.

**total maximum daily load (TMDL);**  A calculation of the total amount of pollutants that can be added to a water body from all sources while still meeting water quality standards.

**transbasin diversion:**  The conveyance of water from its natural drainage basin into another basin for beneficial use.

**transmountain diversion:**  The conveyance of water from one drainage basin to another across the Continental Divide.

**treated water:**  Water that has been filtered and/or disinfected; sometimes used interchangeable with "potable".

**tributary:**  A stream or river that flows into a larger one.

**tributary drainage:**The are from which water naturally drains by gravity into a water course.

**tributary ground water:**  Water present below the earth's surface that is hydrologically connected to a natural surface stream.

**U**

**urban runoff:**  Excess water that doesn't infiltrate the soil, but flows to a storm sewer or open waterway.

**use attainability analysis (UAA):**  A structured, scientific assessment of factors that may affect the ability to achieve a particular use of water.  The analysis may consider physical, chemical, biological, and economic factors that affect whether a use can be attained.

**use classification:**  A formal designation of the uses (aquatic life, recreation, water supply, and agriculture) for which the water quality in a stream, lake, or reservoir will be protected.

**use protected waters:**  Water bodies that are not subject to anti-degradation review, but rather are protected only for their classified uses.

**W**

**water bank:**  A pilot program operating under rules of the State Engineer in the Arkansas River Basin to facilitate the lease, exchange, or loan of legally stored water as an alternative to sale of water rights, while protecting against injury to other water rights.

**water commissioner:**Official appointed by the Division Engineer to administer water rights in a water district, which generally coincides with a significant watershed, sub-basin, or tributary.

**Water Quality Control Commission (WQCC):**  Appointed board within the Colorado Department of Public Health and Environment that establishes rules and regulations for the protection of water quality within the state.

**Water Quality Control Division (WQCD):** State agency within the Colorado Department of Public Health and Environment that administers the state's water quality and drinking water programs.

**water and sanitation districts:**  A special taxing district formed by the residents of the district for the appropriation of the same.

**water right:**  A right to use, in accordance with its priority, a portion of the waters of the state by reason of the appropriation of the same.

**waters of the state:**  All surface and underground water in or tributary to all natural streams within the state of Colorado, except for designated ground water.

**watershed:**  An area from which water drains and contributes to a given point on a stream or river.

**well:**  Any structure or device used for the purpose or with the effect of obtaining ground water for beneficial use from an aquifer.  Ever well required a State Engineer-issued permit.

**Wellhead Protection Program:**  An amendment to the federal Safe Drinking Water Act in 1986.  Initiated to minimize the potential for contamination of public ground water supplies.

**wetlands:**  Areas near the margin between water and land (such as swamps and marshes) that are wet enough to support plant growth typically found in saturated soil conditions.

**X**

**Xeriscape:**  A landscape concept to describe beautiful landscaping that has low water needs.  The term was developed by Denver Water in 1981.  It is derived from the Greek word xeros, meaning dry.