



— Water Reuse — TERMINOLOGY



Water Reuse Terminology

Produced by the ACWA Communications Committee

Recycled Water Work Group

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With water reuse playing an increasingly important role in California's water supply portfolio, consistent use of terms and their definitions is critical to public education and outreach. Aligning the way we talk about water reuse can go a long way toward helping the public understand how it fits in a community's overall strategy to improve water supply reliability and resiliency.

To assist in this effort, the ACWA Communications Committee's Recycled Water Work Group worked collaboratively with the California WaterReuse Association and the California Association of Sanitation Agencies to produce a list of terms that could be distributed for use by members of all three organizations.

This document provides public education and outreach professionals with a framework to discuss water reuse with the public and a glossary to help navigate the technical terms frequently encountered. As part of the glossary, each technical term has a definition provided with some background context on how the word is used. Since the conversation about water reuse continues to evolve at a rapid pace, this document is designed to be updated periodically.

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Introduction

All water on Earth is used and reused, over and over, in an elegant water cycle. Water reuse occurs in various ways on a daily basis. It happens when a community's treated wastewater is discharged into rivers or other water bodies. If you live in a community downstream of another, chances are you are reusing water from an upstream town.

Scientifically proven advances in water technology allow communities to capture and reuse water for many different purposes. The level of treatment employed depends on the water's source, its intended use and how it ultimately gets delivered.

Some communities reuse water to replenish groundwater basins. Others use it to augment surface water reservoirs, often blending it with other water supplies or allowing it to remain in storage for a certain amount of time before withdrawing it and cleaning it again at a drinking water plant. Water also is reused by industries and also to irrigate crops or landscapes.

There is no one-size-fits-all approach to taking previously used water and treating it for another use. There are many different scientifically proven processes and options in use by communities today to diversify their local water supply portfolios and meet needs. Consumers can be assured that water reuse involves extensive cleaning, rigorous monitoring and testing, and is good for the environment and scientifically proven to be safe.

Increasingly, communities are viewing water reuse as an asset that can augment the drinking water supply. Examples of various projects – known collectively as potable reuse – can be found on the WaterReuse Association website¹.

Scientists, regulators and water experts often use technical language to explain the various processes involved in treating and reusing water, different types of water reuse projects, types of treatment needed for each, and the ways in which reused water is delivered to a community.

¹ <https://www.watereuse.org/water-reuse-101/global-connections>

This glossary represents a list of words that are often used in public information and technical reports prepared by scientists, engineers, and technologists.

Terms and Definitions

The terms are grouped into categories based on how they are used in public outreach materials and technical reports, and definitions are provided.

Foundational Terms

- **Potable Water** is drinking water that meets or exceeds state and federal drinking water standards.
- **Recycled Water** generally refers to treated domestic wastewater that is used more than once before it passes back into the water cycle. The terms “reused” and “recycled” are often used interchangeably depending on where you are geographically.
- **Reclaimed Water** is previously used water that has been treated for reuse but has not yet been put to another use. Once reclaimed water is put to some purpose it is referred to as recycled or reused water.
- **Water Cycle** describes how water moves on the Earth. Water evaporates from water bodies (such as oceans, lakes, and rivers), forms clouds, and returns to earth as precipitation (rain or snow). The amount of water that evaporates each year and the amount that falls back to the ground are virtually constant, meaning that the amount of water on Earth does not change. Water reuse solutions essentially use technology to mimic the natural cycle and create clean water – faster and more efficiently – than it would otherwise be available.

Technical Terms for Different Types of Water Reuse

- **Beneficial Reuse** is the use of recycled water for purposes that contribute to the water needs, economy and/or environment of a community.
- **Potable Reuse** is the use of recycled water for drinking water purposes. The water is purified sufficiently to meet or exceed federal and state drinking water standards and is safe for human consumption.
- **Nonpotable Reuse** is the use of recycled water for purposes other than drinking purposes, such as irrigation and industrial uses.
- **De-facto, Unacknowledged or Unplanned Potable Reuse** occurs when water intakes draw raw water supplies downstream from discharges of clean water from wastewater treatment plants, water reclamation facilities, or resource recovery facilities. For example, if you are downstream of a community, that community's used water gets put back into a river or stream and is delivered downstream to your community and after further treatment becomes part of your drinking water supply.
- **Planned Potable Reuse** is publicly acknowledged as an intentional project to use recycled water for drinking water. It is sometimes further defined as either **direct or indirect potable reuse**. It commonly involves a more formal public process and public consultation program than is observed with de-facto or unacknowledged reuse.
 - **Indirect Potable Reuse (IPR)** involves blending recycled water with other environmental systems such as a river, reservoir or groundwater basin, before the water is reused for drinking water.
 - **Direct Potable Reuse (DPR)** involves putting recycled water directly into a potable water supply distribution system downstream of a water treatment plant or into the source water supply immediately upstream of the water treatment plant.

Terms To Describe Different Types of Water

- **Advanced Purified Water or Purified Water** has passed through proven treatment processes and has been verified through monitoring to be safe for augmenting drinking water supplies. The source water for advanced treatment is often clean water from a wastewater treatment or resource recovery plant. Purification processes can involve a multistage process such as microfiltration, reverse osmosis and advanced oxidation, as well as Soil Aquifer Treatment. Any of these options are capable of producing water quality that has been verified through monitoring to be safe for augmenting drinking water supplies.
- **Greywater** is the term used to describe water segregated from a domestic wastewater collection system and reused on site. This water can come from a variety of sources such as showers, bathtubs, washing machines, and bathroom sinks. It contains some soap and detergent, but is clean enough for nonpotable uses. Water from toilets or wash water from diapers is not considered to be greywater. Kitchen sink water is not considered greywater in many states. Many buildings or individual dwellings have systems that capture, treat and distribute greywater for irrigation or other nonpotable uses.
- **Raw Water** is surface or groundwater that has not gone through an approved water treatment process.
- **Recycled Water** is water used more than once and has been treated to a level that allows for its reuse for a beneficial purpose.
- **Sewage** is the used water of a household and commercial businesses that contains human waste. The term sewage is distinguished from industrial wastewater. The term sewage can be used interchangeably with wastewater.

- **Wastewater** is the used water of a community or industry that contains dissolved and suspended matter. There are different types of wastewater: domestic, commercial, and industrial.
 - **Domestic Wastewater/Sewage** is used water from washing our food, dishes, clothes and bodies, and toilet flushing. The used water that goes down the drain or is flushed down the toilet is called sewage. Because a considerable amount of water is used to carry away only a small quantity of waste, domestic sewage is mostly water. It is referred to as “wastewater” in most places.
 - **Industrial Wastewater and Commercial Wastewater/Sewage** is the liquid waste generated by industries, small businesses and commercial enterprises and can be discharged to a sewer upon approval of a regulating authority. Some industrial wastewater may require pretreatment before it can be discharged into the sewer system, while other industrial and commercial wastewaters are explicitly excluded. Controlling the release of harmful chemicals into the wastewater collection system is known as source control.

Terms To Describe Water Treatment Technology

- **Advanced Oxidation** is one of the processes that can be used as a safety barrier in the water purification process. Hydrogen peroxide, ultraviolet (UV) light and other processes are used in combination to form a powerful oxidant that provides further disinfection of the water and breaks down the remaining chemicals and microorganisms and provides further disinfection of the water.
- **Dual Media Filtration** is a filtration method that uses two different types of filter media, usually sand and finely granulated anthracite.
- **Granular Activated Carbon** is a process used to remove chemicals that are dissolved in the used water.

- **Multi-barrier Processes** are purification processes that consist of several barriers to ensure sufficient reduction and/or elimination of the various substances that need to be controlled. As in all processes, monitoring is important in order to check that the processes are working properly and efficiently. Membrane filtration, reverse osmosis, advanced oxidation, riverbank filtration, soil aquifer treatment, and constructed wetlands all may be parts of a multi-barrier purification process. Not all of these processes are needed in all situations.
- **Ozonation** is the process of applying ozone (O₃) for the disinfection of water. Ozone (O₃) is a strong oxidant.
- **Reverse Osmosis** is a method of removing dissolved salts and other constituents from water. Pressure is used to force the water through a semi-permeable membrane that transmits the water but stops most dissolved materials from passing through the membrane. This treatment method is commonly used in desalination, a process that takes salt out of seawater.
- **Soil Aquifer Treatment** occurs when water, including recycled water, soaks into the ground and is purified by the physical, chemical, and biological processes that naturally occur in soil.

Terms To Describe Water Treatment Processes and Products

Treatment facilities may be referred to as wastewater treatment plants, water reclamation facilities, or resource recovery facilities depending on the types of treatment technology used at the facility.

- **Biosolids** is the nutrient-rich organic material (byproduct) made from the stabilized sewage sludge of a wastewater treatment or resource recovery facility. Biosolids can be recycled as a soil amendment for crops, and may also be used as final or alternative daily cover at landfills. Increasingly, biosolids may also be used as an alternative energy source. Biosolids are generally used in one of four forms: as a nutrient-rich liquid, moist solid, dried pellet, or compost.
- **Discharge** is the release of effluent, which meets regulatory standards, and designated by a regulatory permit to be safely discharged into the environment without causing harm.

- **Effluent** is the liquid that flows out of something, particularly from a wastewater treatment plant. Depending on the amount of treatment it has had, its quality can vary and can even meet or exceed drinking water standards.
- **MGD** is the abbreviation for million gallons per day. This term is often used to describe the volumes of water treated and discharged from a treatment plant.
- **Primary Treatment** is a process where solid matter is removed. The remaining liquid may be discharged or subjected to further treatment.
- **Secondary Treatment** is a process where dissolved and suspended biological matter is removed to a nonpotable level so that the water may be disinfected and discharged into a stream or river, or used for irrigation at controlled locations.
- **Sewage Sludge** refers to the residual, semi-solid material that is produced as part of primary and secondary treatment. Sewage sludge is further treated by aerobic or anaerobic digestion and dewatered at a wastewater treatment plant or resource recovery facility to produce biosolids and other byproducts such as methane gas and struvite recovery.
- **Tertiary Treatment or Advanced Water Treatment** refers to processes that purify water for uses such as irrigation or for water blended with other environmental systems such as a river, reservoir, or groundwater basin prior to reuse. It can also include treatment processes to remove nitrogen and phosphorus in order to allow discharge into a highly sensitive or fragile ecosystem (estuaries, low-flow rivers, coral reefs, etc.)

Additional Terms

- **Augmentation** is the process of adding recycled water into an existing raw water supply (such as a reservoir, lake, river, wetland, and/or groundwater basin).
- **Groundwater Recharge** occurs naturally as part of the water cycle and may be enhanced by using constructed facilities to add water into a groundwater basin.

- **Retrofit** is the process of constructing and separating potable and recycled water pipelines that allow recycled water to be used for non-drinking purposes. This also includes the process of preparing customer use sites for recycled water use.
- **Title 22 Standards** are the requirements established by the California Department of Health Services (now the State Water Resources Control Board) for the production and use of recycled water. Title 22, Chapter 3, Division 4 of the California Code of Regulations, outlines the level of treatment required for allowable uses for recycled water. The most typical uses include irrigation, firefighting, residential landscape watering, industrial uses, food crop production, construction activities, commercial laundries, toilet flushing, road cleaning, recreational purposes, lakes, ponds and decorative fountains. Section 13550 of the California Water Code is a declaration by the State Legislature that the use of potable water is a waste if recycled water is available.