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Common Terms In Water Recycling And Agricultural Irrigation

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All water is used and reused naturally in what is called the water, or hydrologic, cycle. There are also many ways to reuse our water supplies using advanced treatment technologies and processes that allow for the safe reuse of water in diverse ways, such as in agricultural irrigation. Thoughtful integration and management planning of all our valuable water resources can minimize environmental impacts and contribute to economic and social endurance, through a concept called One Water. The following glossary covers some of the common terms and concepts used in water reuse and agriculture, technologies and processes, policy and laws, and reflects current regulations in Arizona.

Core Terms And Concepts

ACRE-FOOT: A volume of water equal to one foot in depth covering an area of one acre, or 43,560 cubic feet; approximately 325,851 gallons.

AGRICULTURE: The science, art, and business of cultivating the soil, producing crops, and raising livestock (farming). — Rock et al., 2012

AQUIFER: An underground geological formation, or group of formations, containing water. Are sources of groundwater for wells and springs. — Environmental Protection Agency (EPA), 2009

BENEFICIAL REUSE: The use of recycled water for purposes that contribute to the water needs, economy and/or environment of a community. — WateReuse, 2015

BEST MANAGEMENT PRACTICE (BMP): A practice or combination of practices established as the most practicable means of increasing water use efficiency. — AWE, 2016

CONTAMINANTS OF EMERGING CONCERN (CECs): Broadly defined as any synthetic or naturally occurring chemical or any microorganism that is not commonly monitored in the environment but has the potential to enter the environment and cause known or suspected adverse ecological and(or) human health effects. In some cases, release of emerging chemical or microbial contaminants to the environment has likely occurred for a long time but may not have been recognized until new detection methods were developed. In other cases, synthesis of new chemicals or changes in use and disposal of existing chemicals can create new sources of emerging contaminants. – United States Geological Survey (USGS), 2016b

CENTRAL ARIZONA PROJECT (CAP) CANAL: A canal structure that delivers water to various municipalities (or jurisdictions) from the Colorado River to Central and Southern Arizona. — Central Arizona Project (CAP), 2016

COVERED PRODUCE: Produce that is a raw agricultural commodity (RAC) is covered by the Produce Safety Rule. RAC are any foods that are in their raw and natural state. This includes a produce RAC that is grown domestically, for import, or offered for import in any State or territory of the United States, the District of Columbia, or the Commonwealth of Puerto Rico. This includes fruits, vegetables, and mixes of intact fruits and vegetables. — Produce Safety Alliance (PSA), 2016

CLIMATE: The long-term average of the weather in a given place. While the weather can change in minutes or hours, a change in climate is something that develops over longer periods of decades to centuries. Climate is defined not only by average temperature and precipitation but also by the type, frequency, duration, and intensity of weather events such as heat waves, cold spells, storms, floods, and droughts. — EPA, 2016

DAM: A structure built to hold back a flow of water. Barrier built across a watercourse to impound or divert water. — EPA, 2017a

DROUGHT: A long period of below average precipitation. — USGS, 2016a

ECOSYSTEM: The biotic community and abiotic environment within a specified location and time, including the chemical, physical, and biological relationships among the biotic and abiotic components. — EPA, 2017a

ENDOCRINE DISRUPTING COMPOUNDS (EDCs): Chemicals that can interfere with the normal hormone function in humans and animals. — Columbia Analytical Services (CAS), 2011

ENVIRONMENTAL REUSE: The use of reclaimed water to create, enhance, sustain, or augment water bodies including wetlands, aquatic habitats, or stream flow. — EPA, 2012

ESTUARY: Region of interaction between rivers and near-shore ocean waters, where tidal action and river flow mix fresh and salt water. Such areas include bays, mouths of rivers, salt marshes, and lagoons. These brackish water ecosystems shelter and feed marine life, birds, and wildlife. — EPA, 2009

EUTROPHICATION: The deterioration of an aquatic ecosystem due to high nutrient loads that lead to algal blooms, oxygen depletion, noxious odors, and a loss of biodiversity. — Rock et al., 2012

INTEGRATED RESOURCE PLANNING (IRP): A method for looking ahead using environmental, engineering, social, financial, and economic considerations; includes using the same criteria to evaluate both supply and demand options while involving customers and other stakeholders in the process. — Rock et al., 2012

IRRIGATION: The beneficial use of water or reclaimed water, or both, for growing crops, turf, or silviculture, or for landscaping. — Arizona Department of Environmental Quality (ADEQ), 2017

MAXIMUM CONTAMINANT LEVEL (MCL): Maximum level of a contaminant allowed in water delivered to any user of a public water system. — EPA, 2017a

MICROGRAMS PER LITER (µg/L): A measurement describing the amount of a substance (such as a mineral, chemical or contaminant) in a liter of water. It is expressed in terms of weight per volume. One µg/L is equal to one part per billion.

MILLIGRAMS PER LITER (mg/L): A measurement describing the amount of a substance (such as a mineral, chemical, or contaminant) in a liter of water. One milligram per liter is equal to one part per million.

NANOGRAMS PER LITER (ng/L): A measurement describing the amount of a substance (such as a mineral, chemical, or contaminant) in a liter of water. One nanogram per liter is equal to one part per trillion.

MILLION GALLONS PER DAY (MGD): A measure of water flow.

ONE WATER: Integrated and inclusive approaches to water resource management that exemplify the view that all water has value and should be managed in a sustainable, inclusive, integrated way. The aim is to integrate planning and management of water supply, wastewater, and stormwater systems in a way that minimizes the impact on the environment and maximizes the contribution to social and economic vitality. — Howe & Mukheibir, 2015

PATHOGENS: Disease-causing organisms, such as some bacteria, viruses, or protozoa. — EPA, 2017a

PARTS PER BILLION (ppb): A unit of measure for contamination concentration (parts of contamination per billion parts of water water). One thousand parts per billion is equal to one part per million.

PARTS PER MILLION (ppm): A unit of measure for contamination concentration (parts of contamination per million parts of water). One part per million is equal to one milligram per liter. (This term is becoming obsolete as instruments measure smaller particles.)

PHARMACEUTICALLY-ACTIVE COMPOUNDS (PhACs): A group of compounds that include hormones, antibiotics and painkillers that can pass into the environment. — Rock et al., 2012

PHARMACEUTICALS AND PERSONAL CARE PRODUCTS (PPCPs): Products include pharmaceuticals; personal care products like shampoo, dish soap, perfume, and baby wipes; plastic products; and a host of other household products. As a result of human use, these compounds make their way into wastewater at generally minute concentrations. — Rock et al., 2012

RESERVOIR: A body of water used to collect and store water, or a tank or cistern used to store potable water. Any natural or artificial holding area used to store, regulate, or control water. — Rock et al., 2012; EPA, 2009

REUSE: Treating water to sufficient levels to allow it to be used more than once. — WateReuse 2011; EPA, 2012

RUNOFF: Surface flow of water from a specific area. — AWE, 2016

SALINITY: Generally, the concentration of mineral salts dissolved in water. Salinity may be measured by weight (total dissolved solids - TDS), electrical conductivity, or osmotic pressure. Where seawater is known to be the major source of salt, salinity is often used to refer to the concentration of chlorides in the water. — Rock et al., 2012

SEAWATER INTRUSION: The movement of salt water into a body of fresh water. It can occur in either surface water or groundwater basins. — USGS, 2016a

TOTAL DISSOLVED SOLIDS (TDS): A measure of the residual minerals dissolved in water that remain after evaporation of a solution. Usually expressed in milligrams per liter. — Rock et al., 2012

TOTAL SUSPENDED SOLIDS (TSS): A measure of the suspended solids in wastewater, effluent, or water bodies, determined by tests for "total suspended non-filterable solids." Usually expressed in milligrams per liter. — EPA, 2009

TURBIDITY: A measure of suspended solids in water; cloudiness. Usually expressed as NTUs (*see NTU under Treatment Technology section*). — Rock et al., 2012

URBAN RUNOFF: Water from an urban area that neither infiltrates the soil nor is consumed, but flows into a storm sewer or open waterway. Stormwater from city streets and adjacent domestic or commercial properties that carries pollutants of various kinds into the sewer systems and receiving waters. — Rock et al., 2012; EPA, 2017a

WATER CONSERVATION: The US Water Resources Council defines water conservation as activities designed to (1) reduce the demand for water, (2) improve efficiency in use

and reduce losses and waste of water, and (3) improve land management practices to conserve water. Sometimes called "end-use efficiency" or "demand management". — AWE, 2016; Rock et al., 2012

WATER (HYDROLOGIC) 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. — WateReuse, 2015

WATERSHED: The land area from which water drains into a stream, river, or reservoir. — EPA, 2012

WATER STORAGE: Water held in a reservoir for later use. — Rock et al., 2012

WETLANDS: Areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas. — USGS, 2016a

XERISCAPE: Landscaping that involves seven principles: proper planning and design; soil analysis and improvement; practical turf areas; appropriate plant selection; efficient irrigation; mulching; and appropriate maintenance. Vegetation is suited to soils and climate and requires less water than traditional landscaping. — EPA, 2017a; Rock et al., 2012

Types Of Water And Water Reuse

ADVANCED PURIFIED WATER OR PURIFIED WATER: Water that 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. — WateReuse, 2015

AGRICULTURAL WATER: Water used on produce [agronomic purposes; to sustain livestock], normally consumed raw in activities such as growing (including irrigation water directly applied, water used for preparing crop sprays, and water used for growing sprouts), harvesting, packing, and holding (including water used for washing or cooling harvested produce and water used to prevent dehydration). Agricultural water is intended or likely to contact produce normally consumed raw or food-contact surfaces. — Food and Drug Administration (FDA), 2013

AGRICULTURAL WATER REUSE: 1). FOOD CROPS: The use of reclaimed water to irrigate food crops that are intended for human consumption. 2). PROCESSED FOOD CROPS AND NON-FOOD CROPS: The use of reclaimed water to irrigate crops that are either processed before human consumption or not consumed by humans. — EPA, 2012

BRACKISH WATER: Distastefully salty but less saline than seawater (between 1,000 to 10,000 ppm [parts per million] in total dissolved solids [TDS]). In addition to certain surface water settings such as estuaries, brackish water can be found in aquifers. — National Ground Water Association (NGWA), 2010

CLASS A+ RECYCLED/RECLAIMED WATER: Wastewater that has undergone the most treatment of a minimum secondary treatment, nitrogen removal treatment, and high levels of disinfection. It is the highest quality of recycled water and can be used for food crop and landscape irrigation, fire protection systems, snowmaking, toilet flushing, vehicle and equipment washing, and commercial closed loop air conditioning systems. – ADEQ, 2017; ADEQ, 2016

DESALINATED WATER: Saline water that has had its dissolved salts removed. — USGS, 2017

DEVELOPED WATER: Water that has been captured in reservoirs, diverted from rivers / streams, or accessed by wells for use by society. — AWE, 2016

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. — WateReuse, 2015

FINISHED WATER: Water that has been treated and is ready to be delivered to customers. Considered safe and suitable for delivery to consumers. — EPA, 2017a; Rock et al., 2012

GRAY WATER: Wastewater that has been collected separately from a sewage flow and that originates from a clothes washer or a bathroom tub, shower or sink but that does not include wastewater from a kitchen sink, dishwasher, or toilet. — ADEQ, 2017

GROUNDWATER: Water that has seeped beneath the earth's surface and is stored in the pores and spaces between alluvial materials (sand, gravel or clay). — AWE, 2016

GROUNDWATER RECHARGE: Naturally occurring as part of the water cycle and may be enhanced by using constructed facilities to add water into a groundwater basin. — WateReuse, 2015

IMPORTED WATER: Water that has originated from one hydrologic region and is transferred to another hydrologic region. — Rock et al., 2012

INDIRECT POTABLE REUSE (IPR): The blending of recycled water with other environmental systems such as a river, reservoir or groundwater basin, before the water is reused for drinking water. — WateReuse, 2015

INDUSTRIAL WATER: Water used for fabrication, processing, washing, and cooling in industries including but not limited to chemical, food, mining, paper, petroleum refining, and steel industries. — USGS, 2016a

IRRIGATION WATER: Includes water that is applied by an irrigation system to sustain plant growth in all agricultural and horticultural practices. Irrigation also includes water that is used for pre-irrigation, frost protection, application of chemicals, weed control, field preparation, crop cooling, harvesting, dust suppression, and leaching salts from the root zone. — USGS, 2016a

NONPOTABLE WATER: Recycled water for purposes other than drinking purposes, such as irrigation and industrial uses. — WateReuse, 2015

NONTRADITIONAL WATER: Any water source other than groundwater including agricultural runoff, treated wastewater, recycled water, produced water, untreated surface water**, and brackish surface and groundwater. — USDA, 2017a

PLANNED WATER RECYCLING: Projects developed with the goal of beneficially reusing a recycled water supply. — EPA, 1998

POSTHARVEST WATER: Water used during or after harvest of produce usually eaten raw. Includes water used in the field as well as packing and holding activities. – PSA, 2016

POTABLE WATER: The water is purified sufficiently to meet or exceed federal and state drinking water standards and is safe for human consumption. — WateReuse, 2015

PROCESS WATER: Water used by industrial water users for producing products. Can include water used in manufacturing processes, water used for testing, cleaning and maintaining equipment and water used to cool machinery or buildings used in the manufacturing process. — AWE, 2016

PRODUCTION WATER: Water that contacts produce usually eaten raw during growth. Irrigation, fertigation, foliar sprays, and frost protection. — PSA, 2016

RAW WATER: Surface or groundwater that has not gone through an approved water treatment process. — WateReuse, 2015

RECLAIMED WATER: Water that has been treated or processed by a wastewater treatment plant or an on-site wastewater treatment facility. If it is appropriately treated by an advanced reclaimed water treatment facility to become potable water, it is not considered "reclaimed water". — ADEQ, 2017

RECYCLED WATER: A processed water that originated as a waste or discarded water, including reclaimed water and gray water, for which the Department has designated water quality specifications to allow the water to be used as a supply. Grey water, industrial water, and reclaimed water are separate and unique categories of recycled water. — ADEQ, 2017

RETURN FLOW: Surface and subsurface water that leaves a field after the application of irrigation water. — EPA, 2017a

SURFACE WATER: Water located on the Earth's surface. All water open to the atmosphere (rivers, lakes, reservoirs, streams, impoundments, seas, estuaries, etc.) and all springs, wells, or other collectors that are directly influenced by surface water. — PSA, 2016.

TAIL WATER: The runoff of irrigation water from the lower end of an irrigated field. — EPA, 2009

TAILWATER RECOVERY: An irrigation system in which all facilities utilized for the collection, storage, and transportation of irrigation tailwater for reuse have been installed. —USDA, Natural Resources Conservation Service, 2008.

UNPLANNED WATER RECYCLING: Occurs when cities draw their water supplies from rivers that receive wastewater discharges upstream from those cities. Water from these rivers has been reused, treated, and piped into the water supply a number of times before the last downstream user withdraws the water. — EPA, 1998

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. — WateReuse, 2015

DOMESTIC WASTEWATER/SEWAGE: The 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. — WateReuse, 2015

INDUSTRIAL WASTEWATER AND COMMERCIAL WASTEWATER/SEWAGE: 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. — WateReuse, 2015

PROCESS WASTEWATER: Water that comes into contact with a raw material, product, or byproduct including manure, litter, feed, milk, eggs, or bedding and water directly or indirectly used in the operation of an animal feeding operation for any or all of the following: a. Spillage or overflow from animal or poultry watering systems; b. Washing, cleaning, or flushing pens, barns, manure pits, or other animal feeding operation facilities; c. Direct contact swimming, washing, or spray cooling of animals; or d. Dust control. — ADEQ, 2017

Treatment Technologies, Processes, And Products

ADVANCED OXIDATION: Process 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. — WateReuse, 2015

ADVANCED TREATMENT: Additional treatment provided to remove suspended and dissolved substances that persist through conventional secondary treatment. Often this term is

used to mean additional treatment after tertiary treatment for the purpose of further removing contaminants of concern to public health. In many cases, this includes membrane filtration, reverse osmosis (RO), and advanced oxidation/disinfection with ultraviolet light (UV) and hydrogen peroxide (H2O2). — Rock et al., 2012

ADVANCED WATER TREATMENT FACILITY: A facility that treats and purifies Class A+ or Class B+ reclaimed water to produce potable water suitable for distribution for human consumption. Potable water produced by an advanced water treatment facility is not considered reclaimed water. — ADEQ, 2017

AUGMENTATION: Process of adding recycled water into an existing raw water supply (such as a reservoir, lake, river, wetland, and/or groundwater basin). — WateReuse, 2015

BACKFLOW PREVENTION: The prevention of contamination to potable water supplies from the reverse flow of water from an irrigation system or other customer activity back into the potable distribution system. — AWE, 2017

BIOCHEMICAL OXYGEN DEMAND (BOD): A measure of the amount of oxygen consumed in the biological processes that break down organic matter in water. Used as an indicator of the amount of organic material in the waste stream. Usually expressed in milligrams per liter. — CAS, 2011

BIOFOULING: The formation of bacterial film (biofilm) on fragile reverse osmosis membrane surfaces. The accumulation of undesirable organisms, including bacteria, fungi, diatoms, algae, plants or animals, causing surfaces to become encrusted, clogged or otherwise degraded. — Rock et al., 2012; USDA, NAL, 2017b

CHLORINATION: The process of adding chlorine gas or chlorine compounds to wastewater for disinfection. — EPA, 2004

DIRECT INJECTION: Injecting recycled water through an injection well directly into a groundwater basin. If the water will later be used for drinking, the recycled water will receive advanced treatment prior to injection. — Rock et al., 2012

DISCHARGE: The release of effluent, which meets regulatory standards, and designated by a regulatory permit to be safely discharged into the environment without causing harm. — WateReuse, 2015

DISINFECTION: A process that destroys or inactivates potentially harmful bacteria. —Rock et al., 2012; EPA, 2017

DUAL MEDIA FILTRATION: Filtration method that uses two different types of filter media, usually sand and finely granulated anthracite. — WateReuse, 2015

FILTRATION: A process that separates small particles or microorganisms from water by using a porous barrier to trap the particles while allowing water to pass. — Rock et al., 2012

GRANULAR ACTIVATED CARBON: Process used to remove chemicals that are dissolved in the used water with activated carbon. — WateReuse, 2015

MICROFILTRATION: A physical separation process where tiny, hollow, straw-like membranes separate particles from water. It is used as a pretreatment for reverse osmosis. The pore size of a microfiltration filter has a pore size of 0.1 micron. — WateReuse, 2015

MULTI-BARRIER PROCESSES: 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. — WateReuse, 2015

NANOFILTRATION: A filtration process that utilizes membranes that is used most often with low total dissolved solids water such as surface water and fresh groundwater, with the purpose of softening (polyvalent cation removal) and removal of disinfection by-product precursors such as natural organic matter and synthetic organic matter. It is commonly used in conjunction with desalination. The pore size of a nanofiltration filter has a pore size of 0.001 micron.

NEPHELOMETRIC TURBIDITY UNIT (NTU): A unit of measure related to the individual particles suspended in water. Measured by the amount of light that is deflected through a sample.

OZONATION: Process of applying ozone (O3) for the disinfection of water/wastewater. Ozone is a strong oxidant. — WateReuse, 2015

PRETREATMENT: A process in wastewater treatment where metal screens are used to remove large objects and chunks of debris. — Rock et al., 2012

PRIMARY TREATMENT: Process where solid matter is removed. The remaining liquid may be discharged or subjected to further treatment. — WateReuse, 2015

RETROFIT: 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. — WateReuse, 2015

REVERSE OSMOSIS: Method of removing dissolved salts, ions 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. The pore size of a reverse osmosis filter has a pore size of 0.001 micron. — WateReuse, 2015

SECONDARY TREATMENT: 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. — WateReuse, 2015

SOIL AQUIFER TREATMENT: When water, including recycled water, soaks into the ground and is purified by the physical, chemical, and biological processes that naturally occur in soil. — WateReuse, 2015

TERTIARY TREATMENT OR ADVANCED WATER TREATMENT: 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.). — WateReuse, 2015

ULTRAFILTRATION (UF): A membrane filtration process that falls between reverse osmosis (RO) and microfiltration (MF) in terms of the size of particles removed. The pore size of ultrafiltration filter is 0.01 micron. — Rock et al., 2012

ULTRAVIOLET TREATMENT (UV): The use of ultraviolet light for disinfection or as part of an advanced oxidation process. This usually renders the pathogens inactive (changes the DNA so that the pathogens cannot replicate). — WateReuse, 2015

ZERO-VALENT IRON (ZVI) BIOSAND FILTERS: Iron hydroxides, oxides and oxyhydroxides are formed from ZVI's reactions with dissolved oxygen and protons in water. The hydroxides, oxides and oxyhydroxides have high pHpzc (point of zero charge) that strongly adsorb viruses and negatively charged microorganisms. Unlike other chemical treatments, ZVI does not create potentially harmful by-products. — Ingram et al., 2012.

Laws, Regulations, & Policies

CLEAN WATER ACT (CWA): The federal law that establishes how the United States will restore and maintain the chemical, physical, and biological integrity of the country's waters (oceans, lakes, streams and rivers, groundwater, and wetlands). Regulates the discharges of pollutants into these water systems. — Rock et al., 2012; EPA, 2017b

ENDANGERED SPECIES ACT: The federal law that sets forth how the United States will protect and recover animal and plant species whose populations are in dangerous decline or close to extinction. The law protects not only threatened and endangered species but also the habitat upon which those species depend. — Rock et al., 2012

ENVIRONMENTAL IMPACT STATEMENT (EIS): Detailed analysis of the impacts of a project on all aspects of the natural environment required by federal National Environmental Policy Act for federal permitting or use of federal funds. — Rock et al., 2012

FOOD SAFETY MODERNIZATION ACT (FSMA) PRODUCE SAFETY RULE: Signed into law on January 4, 2011, to ensure food safety in the U.S. It focuses on responding to contamination rather than simply responding to it. Establishes science-based minimum standards for the safe growing, harvesting, packing, and holding of produce grown for human consumption to minimize contamination. — FDA, 2017

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES): A federal permit authorized by the Clean Water Act, Title IV, which is required for discharge of pollutants to navigable waters of the United States, which includes any discharge to surface waters-lakes, streams, rivers, bays, the ocean, wetlands, storm sewer, or tributary to any surface water body. — Rock et al., 2012; EPA, 2017b

SAFE DRINKING WATER ACT (SDWA): Federal legislation passed in 1974 that regulates the treatment of water for human consumption and requires testing for and reduction and/or elimination of contaminants that might be present in the water. — Rock et al., 2012

WATER AUDIT: 1) An on-site survey of an irrigation system or other water use setting to measure hardware and management efficiency and generate recommendations to improve its efficiency. 2) For water distribution systems, a thorough examination of the accuracy of water agency records and system control equipment to identify, quantify, and verify water and revenue losses. — AWE, 2016

*The term "nontraditional water" defined by the USDA includes untreated surface water to emphasize that its quality can be impacted by external environmental factors such as runoff. The agricultural community (dependent upon region and availability) already uses surface water to irrigate, and considers surface water to be a "traditional water" source.

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