

# How is water reuse defined in your state?

<p><b>Washington</b></p> <p><b>i. Land Treatment:</b> Industrial or municipal wastewater applied at agronomic rates that uses the crop and soil as the final component of treatment.</p> <p><b>ii. "Greywater or gray water":</b> Domestic type flows from bathtubs, showers, bathroom sinks, washing machines, dishwashers, and kitchen or utility sinks. Gray water does not include flow from a toilet or urinal. Regulated under the Department of Health.</p> <p><b>iii. "Industrial reuse water":</b> Water that has been used for the purpose of industrial processing (does not have a domestic component) and has been adequately and reliably treated so that, as a result of that treatment, it is suitable for other uses.</p> <p><b>iv. "Reclaimed water":</b> Water derived in any part from wastewater with a domestic wastewater component that has been adequately and reliably treated, so that it can be used for beneficial purposes. Reclaimed water is not considered a wastewater.</p>	<p><b>Utah</b></p> <p><b>Kinds of Reuse</b></p> <p>a) Wastewater reuse is labeled as "Land Disposal" if the entity has no viable alternative for disposing of their wastewater.</p> <p>b) Wastewater reuse is labeled as "Water Reuse" if the entity has the ability to discharge the wastewater to a surface water body. Water Reuse requires an examination to determine if the wastewater reuse will harm any other entity's water rights.</p> <p><b>Grades of Reuse</b></p> <p><b>a) Type I—Human Exposure Likely:</b> Type I water can be used for: residential irrigation, non-residential landscape, golf course irrigation, toilet flushing, fire protection, irrigation of food crops where the applied water comes in contact with the edible part, pasture irrigation for milking animals, impoundments of wastewater where direct human contact is likely to occur, and all Type II uses.</p> <p><b>b) Type II—Human Exposure Unlikely:</b> Type II water can be used for irrigation of sod farms, silviculture, limited access highway rights-of-way, irrigation of food crops where the applied water is not likely to have contact with the edible part, irrigation of animal feed crops, impoundments of wastewater where direct human contact is not allowed, cooling water, soil compaction and dust control.</p>
<p><b>Idaho</b></p> <p><b>Reuse:</b> The use of recycled water (treated wastewater) for beneficial uses. Water reuse includes the use of recycled water from both municipal and industrial facilities.</p> <p><b>Oregon</b></p> <p>Water that has been used for municipal purposes and, after such use, has been treated in a treatment works that, as a result of treatment, is suitable for a direct beneficial purpose or a controlled use that could not otherwise occur.</p>	<p><b>Colorado</b></p> <p>Regulation 84 defines reclaimed water as domestic wastewater that has received secondary treatment by a domestic wastewater treatment works and such additional treatment as to enable wastewater to meet the standards for approved usage.</p>
<p><b>New Mexico</b></p> <p>Water Reuse is defined as the beneficial use of water that might otherwise be considered wastewater that is disposed.</p> <p><b>Arizona</b></p> <p>Direct reuse is defined as the beneficial use of reclaimed water.</p>	<p><b>Nevada</b></p> <p>Water Reuse is not defined in Nevada. However, Nevada allows for the use of treated effluent under Nevada Administrative Code (NAC) 445A.274 through 445A.280</p>

## Is water reuse allowed in your state?

<b>Washington</b>	<b>Utah</b>
Yes. Regulations depend on the type of wastewater or reclaimed water, and the use.	Water reuse is allowed in the State of Utah.
<b>Idaho</b>	<b>Nevada</b>
Yes.	Use of treated of effluent is allowed under NAC 445A.274 through 445A.280.
<b>Oregon</b>	<b>Colorado</b>
Yes, as long as the OAR 340-055 (wastewater reuse) and/or OAR 340-053 (gray water reuse) are adhered to.	Yes, under the rules of Colorado Regulation 84, Reclaimed Water Control Regulation.
<b>New Mexico</b>	<b>Arizona</b>
Yes, increasingly beneficial reuse of domestic and industrial wastewater is gaining popularity and acceptance in a variety of reuse scenarios provided that the wastewater is properly treated per the guidelines.	Yes.

## What types of water reuse opportunities are available in your state?

Arizona	Nevada
<p><b>Direct Reuse:</b></p> <p><b>Class A:</b> Irrigation of food crops, orchards and vineyards, recreational impoundments, residential, schoolground &amp; open access irrigation, toilet and urinal flushing, fire protection systems, commercial closed loop air conditioning systems, vehicle and equipment washing, snowmaking.</p> <p><b>Class B:</b> Golf course irrigation, restricted access landscape irrigation, landscape impoundment, dust control, soil compaction and similar construction activities, pasture for milking animals, livestock watering (dairy animals), concrete and cement mixing, materials washing and steving, street cleaning.</p> <p><b>Class C:</b> Pasture for non-dairy animals, livestock watering (non-dairy animals), irrigation of sod farms, irrigation of fiber, seed, forage and similar crops, silviculture.</p>	<p>Reuse Categories A through E can be found within NAC 445A.274 to 445A.280.</p>
<b>Utah</b>	<b>Colorado</b>
<p>The type of reuse that is most common is Land Disposal because of the water rights issue. Primarily this water is used to grow pasture grasses and alfalfa as an animal food crop.</p>	<p>Landscape irrigation, agricultural non-food crop irrigation, zoo operations, industrial and commercial uses including cooling towers, laundries, and car washes.</p>
<b>New Mexico</b>	<b>Washington</b>
<p>There are currently a number of beneficial reuse projects underway. Use of briny aquifers has been a focus of a pilot desalination project conducted by the Bureau of Land Management with research being conducted on innovative new applications. This served as a prelude to the permitting of a 1MM GPD desalination plant for potable water use in the Tularosa Basin. The City of Rio Rancho was recently permitted for an aquifer restoration project where treated domestic wastewater is being reinjected into the drinking water aquifer. Direct reuse of domestic wastewater into the drinking water system has also been initiated in one New Mexico community, the village of Cloudcroft, and beneficial reuse of domestic wastewater effluent for irrigation projects is common across the State.</p>	<p><b>i. Class A</b> Reclaimed water can be used for most water uses except potable water.  <b>ii. Class B</b> Reclaimed water limits uses to non public contact areas and non food crops.  <b>iii. Industrial Reuse</b> will have similar limits to Class A and Class B reclaimed water depending on the quality.  <b>iv. Greywater</b> seasonal subsurface irrigation with design flow less than 3,500 GPD.  <b>v. Land Treatment:</b> The use is either surface or subsurface irrigation. The crops to be used on depends on whether domestic or industrial wastewater. Domestic can't be used on food crops.</p>
	<b>Idaho</b>
	<p>Landscape and agricultural irrigation, ground water recharge, landscape impoundments, toilet flushing in commercial buildings, and other beneficial uses.</p>
	<b>Oregon</b>
	<p>Depending on the level of treatment, recycled water can be used for a wide variety of uses. This may include: irrigation, industrial/commercial cooling, dust control, fire suppression, car washing, toilet flushing, ornamental fountains and ponds, watering community parks &amp; schoolyards, artificial groundwater recharge, and most recently under special conditions for small batch beer brewing.</p>

## Who administers or permits water reuse projects in your state?

<b>Washington</b>	<b>Utah</b>
Department of Ecology in consultation with the Department of Health permits everything except greywater. Department of Health and UPC regulate Greywater.	Division of Water Quality administers both Operating Permits for Land Disposal and Permits for Water Reuse.
<b>Idaho</b>	<b>Colorado</b>
Department of Environmental Quality issues permits for operation of municipal and industrial reuse facilities. The Idaho State Department of Agriculture manages waste discharges from cattle and dairy operations through its Nutrient Management Plan program. All discharges to surface waters in Idaho are currently permitted by EPA through its NPDES permitting program.	Department of Public Health, Water Quality Control Division.
<b>Nevada</b>	<b>New Mexico</b>
Division of Environmental Protection, Bureau of Water Pollution Control is the permitting authority for the use of treated effluent.	The Pollution Prevention Section of the Groundwater Quality Bureau permits many of the beneficial reuse activities in conjunction with the Drinking Water Quality Bureau and the Office of The State Engineer among others.
<b>Arizona</b>	<b>Oregon</b>
ADWR administers recharge and recovery and ADEQ administers direct reuse.	Department of Environmental Quality is the lead agency for permitting water reuse, however depending on the use other agencies weigh in on the permit. These agencies could include: Water Resources Department, Oregon Department of Human Services, and the Environmental Quality Commission.

# For Recycled Water Use on Processed Food Crops, what treatment requirements (by rule or guidance) does your state have for: 1) Treatment Train; 2) Indicator Organism; 3) Turbidity; 4) TSS; 5) Buffer Zone Requirements?

Idaho	Washington
<p>There are no treatment train, turbidity or TSS requirements for application of municipal recycled water to processed food crops. The Recycled Water Rules, IDAPA 58.01.17, allow five classes of municipal recycled water on processed food crops including Class A, B, C, and D. As mentioned above, Class A and B require oxidation, clarification, filtration, and disinfection. Class C and D require oxidation and disinfection. Class D is the lowest level of treatment allowed for processed crops and requires disinfection to a 3-day median Total Coliform of 230 organisms/100ml or less. Industrial treatment requirements are determined on a case-by-case basis. Most industrial reuse facilities fall into this category and apply on forage crops or processed food crops such as alfalfa and grass hay, silage corn, and small grains.</p>	<p>The Class B technology-based standards shall apply to irrigation uses for food crops that are processed by physical or chemical methods sufficient to destroy all pathogenic agents before distribution, sale, or use except that the total coliform bacteria standard is 240 MPN/100ml as a seven day median and 400 MPN/100ml as a sample maximum. The lead agency may approve standard analytical methods and criteria that are equivalent to these MPN values. The minimum setback distance between the area subject to spray or surface irrigation and any public use area is fifty feet, and ten feet minimum setback to public use areas subject to subsurface drip irrigation.</p> <p><b>1) Treatment Train:</b> Class B reclaimed water requires biological oxidation followed by disinfection.</p> <p><b>2) Indicator Organism:</b> Total coliform bacteria must be measured in the final, disinfected reclaimed water before distribution. Grab samples must not exceed a seven-day median reported as 23 MPN/100mL or a sample maximum of 240. The lead agency may approve other standard methods and criteria on a case-by-case basis.</p> <p><b>3) Turbidity:</b> None.</p> <p><b>4) TSS:</b> 30 and 45mg/l.</p> <p><b>5) Buffer Zone Requirements:</b> Yes, 50 ft for surface and 10 for subsurface from public areas.</p>
<p><b>Colorado</b></p> <p>Categories 1, 2 and 3 are allowed for use in the irrigation of crops and trees, excluding crops produced for direct human consumption, crops where lactating dairy animals forage, and trees that produce nuts or fruit intended for human consumption.</p> <p><b>1) Treatment Train:</b> There are no requirements other than the treatment requirements in the reclaimed water definition. Categories 2 and 3 require filtration.</p> <p><b>2) Indicator Organism:</b> The indicator organism used in Colorado is E.coli. The least restrictive Category of water allowed for this use has a limit of 126/235 max mpn.</p> <p><b>3) Turbidity:</b> Turbidity monitoring is not required for Category 1. Turbidity requirements for Categories 2 and 3 are not to exceed 3 NTU as a monthly average and not to exceed 5 NTU in more than 5 percent of the individual analytical results during any calendar month.</p> <p><b>4) TSS:</b> TSS monitoring is only required for Category 1, with limits 30 mg/L daily max.</p> <p><b>5) Buffer Zone Requirements:</b> None at this time.</p>	<p><b>Arizona</b></p> <p><b>1) Treatment Train:</b> Secondary treatment, filtration and disinfection (Class A)</p> <p><b>2) Indicator organism:</b> No detectable fecal coliform organisms in four of the last seven daily reclaimed water samples taken and the single sample maximum concentration of fecal coliform organisms in a reclaimed water sample is less than 23/100ml.</p> <p><b>3) Turbidity:</b> The 24-hour average turbidity of filtered effluent is two NTUs or less and the turbidity of filtered effluent does not exceed five NTUs at anytime.</p> <p><b>4) TSS:</b> None.</p> <p><b>5) Buffer Zone Requirements:</b> No, however reclaimed water can only be used on the permitted reuse site and cannot run off-site.</p>
<p><b>Oregon</b></p> <p><b>1) Treatment Train:</b> OAR 340-055-0012.5(b) This water would need to meet at a minimum the Class C criteria which states: Recycled water must be an oxidized and disinfected wastewater that meets the following criteria: must not exceed a median of 23 total coliform organisms per 100 ml in the last seven days of sample collection nor exceed 240 total coliform organisms per 100 ml in two consecutive samples. Samples must be collected once per week at a minimum.</p> <p><b>2) Indicator Organism:</b> Total coliform.</p> <p><b>3) Turbidity:</b> None for this recycled water class.</p> <p><b>4) TSS:</b> None for this recycled water class.</p> <p><b>5) Buffer zone requirements:</b> Yes. For Class C, water applied directly to the soil, there is a 10 ft minimum set back from the edge of the site and a minimum of 100 ft setback from a drinking water supply source such as a well/spring. For sprinkler irrigation there must be a minimum of 70 ft setback to the edge of the site and from areas where food is being prepared or served or where a drinking fountain is located, and a minimum of 100 ft setback from a water supply source such as a well/spring.</p>	<p><b>Utah</b></p> <p><b>1) The treatment train:</b> Must be capable of meeting the standard.</p> <p><b>2) Indicator Organism:</b> E. Coli: weekly median E.coli &lt;= 9 organisms / 100 ml</p> <p><b>3) Turbidity:</b> &lt;= 5 NTU</p> <p><b>4) TSS:</b> Monthly arithmetic mean &lt;= 25 mg/L determined by composite sampling conducted once per week. The weekly mean total suspended solids concentration shall not exceed 35 mg/L.</p> <p><b>5) Buffer zone requirements:</b> The treatment requirements for processed food crops and edible food crop requirements are the same in the State of Utah. No buffer zone is required for this type of water reuse.</p>
<p><b>Nevada</b></p> <p>Use of Recycled Water on Edible Food Crops is not allowed in Nevada (NAC 445.2749 Limitation on meaning of "agricultural purposes." and, 445A.2768 Reuse category D: Approved uses).</p>	<p><b>New Mexico</b></p> <p>No differentiation between raw and processed foods.</p>

# For Recycled Water Use on Parks and Playgrounds, what treatment requirements (by rule or guidance) does your state have for: 1) Treatment Train; 2) Indicator Organism; 3) Turbidity; 4) TSS; 5) Distribution Line Requirements?

	New Mexico	Arizona
<p>Must meet either class 1A or class 1B for parks and playgrounds.</p> <p><b>Class 1A:</b></p> <ol style="list-style-type: none"> <li><u>Treatment Train:</u> None.</li> <li><u>Indicator Organism:</u> Fecal coliform; 5 per 100mL for 30-day average, 23 per 100 mL max.</li> <li><u>Turbidity:</u> None.</li> <li><u>TSS:</u> 10 mg L<sup>-1</sup> or less for 30-day average; 15 mg L<sup>-1</sup> max.</li> <li><u>Post Treatment Distribution:</u> No setback to occupied structures; no access control; low pressure/low trajectory spray or surface drip.</li> </ol> <p><b>Class 1B:</b></p> <ol style="list-style-type: none"> <li><u>Treatment Train:</u> None.</li> <li><u>Indicator Organism:</u> Fecal coliform; 100 per 100mL for 30-day average, 200 per 100 mL max.</li> <li><u>Turbidity:</u> None.</li> <li><u>TSS:</u> 30 mg L<sup>-1</sup> or less for 30-day average; 45 mg L<sup>-1</sup> max.</li> <li><u>Post Treatment Distribution:</u> 100 foot setback to occupied structures; no access control but irrigate at times when public access is unlikely; low pressure/low trajectory spray or surface drip.</li> </ol>	<p><b>Utah</b></p> <ol style="list-style-type: none"> <li><u>The treatment train:</u> Must be capable of meeting the standard.</li> <li><u>Indicator Organism:</u> E. Coli: weekly median E.coli &lt;= 126 organisms / 100 mL as determined from daily grab samples and no sample shall exceed 500 organisms / 100 mL</li> <li><u>Turbidity:</u> No requirement.</li> <li><u>TSS:</u> Monthly arithmetic mean &lt;= 25 mg/L determined by composite sampling conducted once per week. The weekly mean total suspended solids concentration shall not exceed 35 mg/L. BOD: BOD &lt;= 25 mg/L as determined by composite sampling conducted once per week. Composite samples shall be comprised of at least six flow proportionate samples taken over a 24-hour period.</li> <li><u>Distribution line requirements:</u> Disinfection to destroy, inactivate, or remove pathogenic microorganisms by chemical, physical, or biological means. Disinfection may be accomplished by chlorination, ozonation, or other chemical disinfectants, or UV radiation.</li> </ol>	<ol style="list-style-type: none"> <li><u>Treatment Train:</u> Secondary treatment, filtration and disinfection (Class A).</li> <li><u>Indicator organism:</u> No detectable fecal coliform organisms in four of the last seven daily reclaimed water samples taken and the single sample maximum concentration of fecal coliform organisms in a reclaimed water sample is less than 23/100ml.</li> <li><u>Turbidity:</u> The 24-hour average turbidity of filtered effluent is two NTUs or less and the turbidity of filtered effluent does not exceed five NTUs at anytime</li> <li><u>TSS:</u> None.</li> <li><u>Post Treatment Distribution:</u> No, however reclaimed water can only be used on the permitted reuse site, it cannot run off-site and signage at point of reuse is required.</li> </ol>
		<p><b>Oregon</b></p> <ol style="list-style-type: none"> <li><u>Treatment Train:</u> OAR 340-055-0012.7(b) This water would need to meet the Class A criteria which states: Recycled water must be an oxidized, filtered, and disinfected wastewater that meets the following criteria: not exceed an average turbidity of 2 NTU within 24 hr period, 5 NTU more than five percent of the time within a 24 hr period, and 10 NTU at any time. Nor can it exceed a median of 2.2 total coliform organisms per 100 ml in the last seven days nor exceed 23 total coliform organisms per 100 ml in any single samples. Total coliform samples must be collected once per day at a minimum. Turbidity must occur once per hour at a minimum.</li> <li><u>Indicator Organism:</u> Total coliform.</li> <li><u>Turbidity:</u> Average of 2 NTU per 24 hrs and max of 10 NTU.</li> <li><u>TSS:</u> None.</li> <li><u>Post Treatment Distribution:</u> Yes, all work must meet local building codes which require pipe to be purple in color and labeled non-potable and all piping, valves and other portions of the recycled water use system must be constructed and marked in a manner to prevent cross connection with a potable water system. There is also a 10 ft horizontal and 1 ft vertical separation between buried potable water lines and recycled water lines.</li> </ol>
	<p><b>Idaho</b></p> <p>Class A and B recycled water can be used on parks, playgrounds, and school yards. For Class A, there are no public access restrictions for use on parks and playgrounds, but for Class B, the recycled water must be applied during periods of non-use.</p>	<p><b>Nevada</b></p> <p>Reuse Category A: only total coliform regulations.</p> <p><b>Washington</b></p> <p>Same as food crop.</p> <p><b>Colorado</b></p> <p>Class A; same as non-food crop.</p>

## Where in the wastewater treatment cycle is the point of compliance in your state if there is storage?

<b>Washington</b>	<b>Arizona</b>
<p>For Class A it is at the distribution line for Class B it is after disinfection.</p>	<p>Reclaimed water needs to meet the Class requirements for the particular kind of impoundment prior to being delivered to the impoundment. All wastewater treatment plants producing reclaimed water have to have an Individual Aquifer Protection Permit which classifies the effluent for a particular class of reclaimed water (A, A+, B, B+, or C-). The monitoring and reporting requirements for reclaimed water are in the Aquifer Protection Permit. This way, the end-users don't have to do any monitoring and reporting of the quality of the reclaimed water.</p>
<b>Idaho</b>	<b>Colorado</b>
<p>The Recycled Water Rules specify the point, or points, of compliance for municipal recycled water, which vary depending on the level of treatment as follows:</p> <p><u>i. Class A and Class B:</u> The point of compliance shall be at any point in the system following final treatment and disinfection contact time. Additionally, it is recommended (but not required) that the recycled water also be disinfected following storage.</p> <p><u>ii. Class C and Class D:</u> The point of compliance shall be at any point in the system following final treatment and disinfection contact time. Due to the lower level of treatment and greater potential for re-growth, DEQ recommends that the point of compliance be established downstream of storage and prior to entering the distribution system during periods of reuse.</p> <p><u>iii. Class E:</u> Municipal recycled water is of primary effluent quality and the Recycled Water Rules do not specify a disinfection requirement or applicable coliform standard. However, keep in mind that discharge or beneficial reuse of Class B, C, D, or E municipal effluent must be performed under a reuse permit, and the permit will specify various points of compliance which may include effluent quality requirements, hydraulic and constituent loading rate limits, nutrient removal requirements, ground water quality points of compliance, and public access restrictions and buffer zones to protect human health and the environment.</p>	<p>The point of compliance for reclaimed water is after treatment before distribution. There are no requirements for monitoring after storage.</p>
<b>Utah</b>	<b>New Mexico</b>
<p>The point of compliance can be either prior to or after storage.</p>	<p>After last treatment.</p>
	<b>Nevada</b>
	<p>The last available point of delivery is the point of compliance.</p>
	<b>Oregon</b>
	<p>Point of compliance is identified in the facility's permit. Recycled water stored prior to application may require chlorination to prevent bacterial growth and is addressed in the facility's Recycled Water Use Plan which is reviewed and approved by DEQ and becomes enforceable.</p>

## Can recycled water be used for aquifer storage and recovery in your state?

<p><b>Idaho</b></p> <p>Municipal recycled water must be treated to Class A standards in order to be used for ground water recharge. In addition, for ground water recharge, the recycled water maximum total nitrogen is 10 mg/L and the maximum BOD5 (monthly mean) is 5 mg/L. For reference, Section 614 of the Recycled Water Rules states:</p> <p><b>Ground Water Recharge: Class A Recycled Water:</b> All ground water recharge systems shall comply with IDAPA 58.01.11, "Ground Water Quality Rule." The minimum requirements for site location and aquifer storage time shall be based on site-specific modeling and any source water assessment zone studies for public drinking water wells in the area. The owners of these systems must control the ownership of this down gradient area to prohibit future wells from being drilled in the impact zone of the ground water recharge system. Authorization from the Department of Water Resources is required for ground water injection wells.</p> <p>The Department of Water Resources (IDWR) regulates injection wells in the State of Idaho. Per IDAPA 37.03.03.070.c.i(6) water used for injection cannot contain or be suspected of containing fecal contaminants of human origin, therefore, injection wells cannot be used to recharge recycled water.</p> <p>Concerning recovery of stored/recharge water The Idaho Department of Water Resources (IDWR) administers the use of surface water and groundwater, conjunctively, through water rights (prior appropriations - first in time, first in right). Recharge is deemed a beneficial use; therefore, a water right can be obtained specifically for recharge of surface water. However, once the recharge water reaches the aquifer it becomes part of the ground water and is administered as such. Idaho does not distinguish between recharged water and groundwater; therefore, there is no designation of stored water or specific recovery of stored water.</p>	<p><b>Arizona</b> Yes.</p> <p><b>Colorado</b></p> <p>Not under Regulation 84. There is some de facto aquifer recovery from land application under the Groundwater Permitting program.</p> <p><b>New Mexico</b> Yes.</p> <p><b>Utah</b></p> <p>Theoretically possible but the question has not yet been asked by a permittee.</p> <p><b>Nevada</b></p> <p>At this time, recycled water cannot be used for aquifer storage and recovery.</p> <p><b>Oregon</b></p> <p>Oregon does not allow recycled water to be directly injected into an aquifer. However Oregon does allow "Artificial Groundwater Recharge", as long as it is outside Oregon's Groundwater Management Areas. In addition, it must be Class A recycled water and receive approval from the regional hydrologist and OWRD. This artificial groundwater recharge is recycled water applied to either a surface infiltration basin or through a drywell that is constructed to discharge to the vadose zone.</p> <p><b>Washington</b></p> <p>Reclaimed and reuse water can be used for aquifer storage.</p>
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## What are the aquifer storage/withdrawal regulations in your state?

<b>Washington</b>	<b>Arizona</b>
<p>Pink drop in Pink drop out. You can only withdraw the same water you put in. You have to demonstrate through modeling how much water stays where you put it so you can access it.</p>	<p>Department of Water Resources, who administers the Recharge/Aquifer Storage and Recovery Program, does not have any water quality requirements for the withdrawal/recovery of stored effluent. In order to withdraw stored water, ADWR requires an entity to get any well that will be used to recover/withdraw stored water permitted as a recovery well.</p>
<b>Colorado</b>	<b>Idaho</b>
<p>None.</p>	<p>IDWR regulates the use of surface water to recharge an aquifer and the withdrawal of groundwater for compliance with water rights. Once water is recharged to the aquifer groundwater withdrawal permits determine the volume and priority of the groundwater withdrawal. There is no regulatory "link" between recharged groundwater and groundwater withdrawal.</p>
<b>New Mexico</b>	<b>Nevada</b>
<p>All projects are in pilot stage.</p>	<p>None.</p>
<b>Utah</b>	
<p>This would be a water rights issue that would have to be settled by our Division of Water Rights and the State Engineer.</p>	
<b>Oregon</b>	
<p>OAR 340-055 (recycled water rules), OAR 340-040 (groundwater Rules), OAR 340-044 (Underground Injection Control Rules).</p>	

## Can recycled water be used in irrigation canals as conveyances in your state?

<p><b>Washington</b></p> <p>Dischargers can discharge reclaimed water to an irrigation canal under an NPDES permit. Once the discharger loses control of the water, they would need water right to use the water. So if they discharge to an irrigation canal, they no longer have control of the water even if they are using the canal as a conveyance, they would need a water right to withdraw the water. We do have some food producers that do not want industrial water discharged to the irrigation canal. They have concerns about the risks of litigation if the reuse water is responsible for affecting the quality of the crop (i.e. E. Coli or other contaminant to the food crop).</p>	<p><b>Arizona</b></p> <p>Yes. However, canals designated as waters of the US require an AZPDES permit.</p>
<p><b>Idaho</b></p> <p>EPA regulates discharges to surface waters, including canals, through the NPDES permit program. Irrigation canals are also regulated by the Department of Water Resources. The owners, whether state agency, local irrigation district, or private company/cooperative, of irrigation canals must also authorize discharges into their systems. Recent litigation indicates irrigation companies might not accept highly treated recycled water in their conveyance systems.</p>	<p><b>Utah</b></p> <p>This would be considered a surface water discharge and would require a NPDES permit.</p> <p><b>Oregon</b></p> <p>Potentially. Public or private irrigation canals located wholly or partially within or bordering the state are Waters of the State [OAR 340-055-0010(18)]. Recycled water discharges to irrigation canals are permitted as surface water discharges using a NPDES permit. However, private irrigation ditches which are lined and do not combine or effect a junction with natural surface or underground waters are considered distribution systems, and may be permitted as conveyance under the Recycled Water Use Rules.</p>
<p><b>New Mexico</b></p> <p>Reclaimed water cannot be mixed with other water sources. Reporting of a amount of reclaimed water applied is usually required based on TN concentrations.</p>	<p><b>Nevada</b></p> <p>Currently, Nevada does not have a permitted irrigation canal as a conveyance of recycled water.</p>
	<p><b>Colorado</b></p> <p>Yes.</p>

**For Recycled Water Use on Edible Food Crops, what treatment requirements (by rule or guidance) does your state have for: 1) Treatment Train; 2) Indicator Organism; 3) Turbidity; 4) TSS; 5) Post Treatment Distribution Line Requirements?**

Washington	Idaho
<p><b>1) Treatment Train:</b> Traditional treatment methods consisting of biological oxidation, followed by coagulation, filtration, and disinfection. Can use membrane filtration with biological oxidation. Alternative treatment must demonstrate equivalent minimum treatment performance standards.</p> <p><b>2) Indicator Organism:</b> Class A requirements from the draft Reclaimed Rule:</p> <p>(5) Total coliform bacteria performance standards. Total coliform bacteria must be measured in the final, disinfected reclaimed water at the entry point to the distribution system. Grab samples must not exceed a seven-day median reported as 2.2 MPN/100mL or a sample maximum of 23. The lead agency may approve other standard methods and criteria that are equivalent to these MPN values.</p> <p>(6) Virus study. The virus study must demonstrate that the disinfection treatment component(s) is able to remove or inactivate viruses in the reclaimed water.</p> <p>(a) The engineering design of the virus study must assure that the proposed reclaimed water disinfection method will reliably achieve minimum disinfection performance criteria including:</p> <ul style="list-style-type: none"> <li>(i) 5-log virus removal or inactivation following filtration; or</li> <li>(ii) 4-log virus removal or inactivation following filtration if preceded by coagulation, flocculation and sedimentation unit processes; or</li> <li>(iii) 4-log removal or inactivation following micro-filtration (MF) or ultra-filtration (UF) membrane processes.</li> </ul> <p>(b) The disinfection method design shall assure conformance with:</p> <ul style="list-style-type: none"> <li>(i) Accepted empirical design standards and practices; or</li> <li>(ii) A challenge study or pilot facility demonstration specific to the project conditions; or</li> <li>(iii) An acceptable third-party challenge study or equipment verification study acceptable to the lead agency; or Design and operation limits from other regulatory programs applied to the production of reclaimed or recycled water equivalent to Class A reclaimed water as deemed acceptable by the lead agency.</li> <li>(iv) Design and operation limits from other regulatory programs applied to the production of reclaimed or recycled water equivalent to Class A reclaimed water as deemed acceptable by the lead agency.</li> </ul> <p><b>3) Turbidity:</b> Monthly average of 0.2 NTU or not exceed 0.5 NTU reading for more than 5 consecutive minutes.</p> <p><b>4) TSS:</b> 30 and 45mg/l prior to tertiary treatment then we apply a turbidity standard.</p> <p><b>5) Post Treatment Distribution Line:</b> Requires a chlorine residual in the distribution system.</p>	<p>Rule requirements and guidance recommendations differ for industrial and municipal recycled water. The use of industrial recycled water on edible (raw, or unprocessed) food crops is determined on a case by case basis. Currently there are no industrial facilities that apply on edible, raw food crops.</p> <p>Municipal recycled water can be applied to edible food crops if treated to one of the <b>two highest levels of treatment, known as Class A or Class B Recycled Water</b>. The treatment requirements for Class A and B are as follows:</p> <p><b>i. Class A:</b> Requires treatment train redundancy, oxidation, clarification, filtration to 0.2 – 2 NTU (depending on filtration technology used), disinfection to a total coliform 7-day median of 2.2 organisms/100mL or less. Distribution systems must be 'purple pipe systems' with caution labelling to not use for drinking water. Disinfection contact time, nitrogen, BOD5, and pH requirements also apply to Class A depending on the type of reuse activity. TSS limits are not specified. Chlorine residual in the distribution system is not required, however the rules recommend that Class A recycled water be disinfected following storage.</p> <p><b>ii. Class B:</b> Must also be oxidized, clarified, filtered and disinfected. Class B has the same Total Coliform limits as Class A and filtration to 5 NTU or less, but does not require treatment train redundancy. 'Purple pipe' and caution labels are required. TSS, BOD5 and pH limits are not specified. A chlorine residual is required at the point of compliance for total coliform for Class B. The rules recommend that Class B recycled water be disinfected following storage.</p>
<p align="center"><b>Oregon</b></p> <p><b>1) Treatment Train:</b> OAR 340-055-0012.7(b) This water would need to meet the Class A criteria which states: Recycled water must be an oxidized, filtered, and disinfected wastewater that meets the following criteria: not exceed an average turbidity of 2 NTU within 24 hr period, 5 NTU more than five percent of the time within a 24 hr period, and 10 NTU at any time. Nor can it exceed a median of 2.2 total coliform organisms per 100 ml in the last seven days nor exceed 23 total coliform organisms per 100 ml in any single samples. Total coliform samples must be collected once per day at a minimum. Turbidity monitoring must occur once per hour at a minimum.</p> <p><b>2) Indicator Organism:</b> Total coliform.</p> <p><b>3) Turbidity:</b> Average of 2 NTU per 24 hrs and max of 10 NTU.</p> <p><b>4) TSS:</b> None for this recycled water class.</p> <p><b>5) Post Treatment Distribution:</b> Yes, all work must meet local building codes which require pipe to be purple in color and labeled non-potable and all piping, valves and other portions of the recycled water use system must be constructed and marked in a manner to prevent cross connection with a potable water system. There is also a 10 ft horizontal and 1 ft vertical separation between buried potable water lines and recycled water lines.</p>	<p align="center"><b>Arizona</b></p> <p><b>1) Treatment Train:</b> Secondary treatment, filtration and disinfection (Class A).</p> <p><b>2) Indicator Organism:</b> No detectable fecal coliform organisms in four of the last seven daily reclaimed water samples taken and the single sample maximum concentration of fecal coliform organisms in a reclaimed water sample is less than 23/100ml.</p> <p><b>3) Turbidity:</b> 24-hour average turbidity of filtered effluent is two NTUs or less and the turbidity of filtered effluent does not exceed five NTUs at anytime.</p> <p><b>4) TSS:</b> None.</p> <p><b>5) Post Treatment Distribution:</b> No.</p>
<p align="center"><b>Nevada</b></p> <p>Use of Recycled Water on Edible Food Crops is not allowed in Nevada (NAC 445.2749 Limitation on meaning of "agricultural purposes." and, 445A.2768 Reuse category D: Approved uses).</p>	<p align="center"><b>New Mexico</b></p> <p>Irrigation of food crops shall only be allowed where there is no contact between the edible portion of the crop and the wastewater. Spray irrigation is prohibited for food crops. Must meet class 1A requirements.</p> <p><b>1) Treatment Train:</b> None, it is up to the permittee to provide a treatment that will meet discharge (Reuse) requirements.</p> <p><b>2) Indicator Organism:</b> Presently using fecal coliform bacteria as the indicator organism, but realize E. coli is the indicator bacteria that is becoming more the norm.</p> <p><b>3) Turbidity:</b> Must meet a 30-day average of 3 NTU or less with a maximum not to exceed 5 NTU.</p> <p><b>4) TSS:</b> Must meet a 30-day average of 3 NTU or less with a maximum not to exceed 5 NTU.</p> <p><b>5) Post Treatment Distribution:</b> None.</p> <p align="center"><b>Colorado</b></p> <p>The use of recycled water is not currently allowed for the use of irrigation of edible crops.</p> <p align="center"><b>Utah</b></p> <p><b>1) The treatment train:</b> Must be capable of meeting the standard.</p> <p><b>2) Indicator Organism:</b> E. Coli: weekly median E.coli &lt;= 9 organisms / 100 mL</p> <p><b>3) Turbidity:</b> &lt;= 5 NTU.</p> <p><b>4) TSS:</b> Monthly arithmetic mean &lt;= 25 mg/L determined by composite sampling conducted once per week.</p> <p><b>5) Distribution line requirements:</b> Disinfection to destroy, inactivate, or remove pathogenic microorganisms by chemical, physical, or biological means. Disinfection may be accomplished by chlorination, ozonation, or other chemical disinfectants, or UV radiation. TRC =&gt; 1 mg/L after 30 minutes of contact time at peak flow or equal for other disinfection methods.</p>

