

Site Constraints by State

ALABAMA

ALASKA

ARIZONA

- A reclaimed water agent is a person responsible for use of reclaimed water by more than one end user; the agent must have a legally enforceable contract that stipulates the responsibility of the enduser to comply with requirements for specific reuses.
- Reusers can provide additional treatment, and would be permitted accordingly.
- Reusers may apply for approval to blend secondary effluent and higher quality water for reuse.
- Public notice of a preliminary decision to permit a facility is required.
- Irrigation should incorporate methods that minimize public contact and standing water as well as water contact with drinking fountains, water coolers, or eating areas; hose bibbs for reclaimed water must be secured to prevent use by the public.
- Signage is required according to use, as stipulated in a table provided in the regulations. Hose bibbs must be identified in front yards and subdivision entrances where residential irrigation with reclaimed water is installed. School grounds must also have signage for Class A+ or Class A water use, but other open access irrigation sites do not require signage with the use of these high quality waters. All impoundments with open access including lakes, ponds, ornamental fountains, waterfalls, and other water features must be posted with signage regardless of the class of reclaimed water.
- Information about the source of reclaimed water to be used and the annual water volume to be applied at a site must be provided, as well as information about the acreage and type of vegetation to be irrigated.

ARKANSAS

CALIFORNIA

- Suppliers (wholesale or retail) and consumers are required to sign agreements, some terms of which are stipulated in the regulations.
- The regulations provide guidelines for recycled water rates. Recycled water may be sold wholesale to retail water supplies.
- Recycled water distribution lines must be separate from potable water lines, beginning at the point of entry to the private property being served.
- Spray, mist, or runoff is not permitted to reach dwellings, outdoor eating areas, drinking water fountains, or food-handling facilities.
- Irrigation runoff must remain on the use area unless it does not pose a public health threat and is authorized by the regulatory agency.
- Signage is required; size and message are stipulated. Certain waivers are possible.
- No recycled water can be delivered through a dual piping system for internal use, except for fire suppression.

COLORADO

- A Letter of Intent must be submitted prior to applying for a permit. The letter must review any decrees regarding water rights for the source of the water to be reclaimed.
- Direct and windblown spray should be confined to the approved area. Public contact should be minimized by spraying at least 1 h before opening or at hours that minimize public exposure.
- Rates of application should be such that surface and ground water quality are protected and ponding is minimized. No reclaimed water may enter state waters; runoff should be strictly minimized, and no direct or windblown spray should leave the area designated for application.
- Stipulations are provided in the regulations for distribution and transmission system design.
- Precautions should be taken so that spray does not reach undesignated areas such as an occupied building, domestic drinking water facilities, or facilities where food is being prepared.
- Signage is required: Public notice of reclaimed water use must be posted.
- Supplementation of reclaimed wastewater with potable water requires approval.

CONNECTICUT

- The site must be appropriately zoned by the county or municipality with jurisdiction.
- The public must be notified of the application for a permit, and hearings may be held. Permits are issued on a case- by-case basis depending on the site conditions.
- Site-specific conditions related to soil types, geology, hydrology and cultural or historical features about the site must be described. The 100 year flood elevation, existing vegetative cover, and existing land use must be described.
- Soil characteristics must be described, including slope, depth to seasonal high water table, depth to impervious strata, and erodibility.
- The design plans should include information about the nature of the wastewater to be applied, including descriptions of the average and peak daily flows, the biochemical oxygen demand, the chemical oxygen demand, the total organic carbon, the total suspended solids, ammonia, nitrate and nitrite nitrogen, Kjeldahl nitrogen, total phosphorus, chloride, sodium adsorption ratio, electrical conductivity, metals, the presence of any priority pollutants, and the pH.
- The site assimilative capacity for heavy metals must be determined on a constituent by constituent basis to determine the site life for a facility. The number of years wastewater may be applied to a site will be based on the allowable cumulative metal loading rates stipulated by the State. Irrigation must be terminated when any one of the cumulative metal limits is reached.
- Water balance calculations to determine the design water loadings and phosphorus and nitrogen balances consistent with the crop grown and the way it is managed should be provided. The limiting constituent for land application should be identified, as well as the wetted field area and required storage volume. The maximum allowable hydraulic loadings are 2.5 in/wk and 0.25 in/h.
- A plan for groundwater and effluent monitoring must be provided.
- If a perennial stream traverses or bounds a slow-rate land-treatment site, water-quality monitoring upstream and downstream of the wetted field area may be stipulated in a site permit. Domestic wells within 1000 linear ft of the site; irrigation, commercial, industrial, and public wells within 2500 ft of the site; and all abandoned wells within the treatment site must be identified. Shallow and poorly constructed wells must be abandoned and sealed. The permit applicant must demonstrate that the reuse system will not have an adverse effect on the wells.
- Spray field operation must be described in the Plan of Operation and Management. Spray field pressures must be uniform with 10% of the design pressure; otherwise alternate measures must be used to insure uniform application depth.
- Monitoring of daily rainfall, temperature, wind speed and direction may be required.
- If the seasonal high groundwater table is greater than 5 ft, the design percolation rate can be no more than 10% of the mean saturated hydraulic conductivity of the most limiting layer within the first five feet from the surface. If the seasonal high water table is less than 5 ft, drainage improvements must be evaluated.
- Soil samples from the wetted field area must be analyzed for pH, with other tests contingent upon the results. A site assimilative capacity for heavy metals must be determined on a constituent by constituent basis to determine site life.
- No runoff is permitted. If there is point source discharge due to drainage improvements at the site, an NPDES permit may be issued.
- Groundwater elevation data must be submitted on a periodic basis. Groundwater monitoring may be stipulated in the site permit:
 - The parameters and frequency are determined on a case-by-case basis. Tests required might include pH, chemical oxygen demand, nitrate nitrogen, total phosphorus, electrical conductivity, chloride, fecal coliform bacteria, metals and priority pollutants.
 - Groundwater influenced by the system must be monitored; one well is required up-gradient, one must be in the wetted field area of each drainage basin involved, and two wells must be placed down-gradient of the irrigation area, in each drainage basin involved. A monitoring well must also be located upgradient and downgradient of the pond treatment and storage facilities in each drainage basin intersected by the land treatment site. Stipulations are provided for construction and labeling of the wells.
- The site must be protected against flooding, ponding, and erosion. Storm runoff can be channeled through or around the site, but channeling reclaimed water is not permitted.
- If a perennial stream traverses or lies at the boundary of a land treatment site, water quality monitoring of the stream may be required, with sampling upstream and downstream of the wetted field area required.

FLORIDA

- If the treatment plant permittee does not own the property on which reclaimed water will be used or disposed of, the permittee must have a binding agreement with the owner to ensure that construction, maintenance, operation, and monitoring meet the State's legal requirements. Reclaimed water application must be controlled by an agreement with the wastewater management entity or by local ordinance.
- A public notification program, and the regulations stipulate the information that must be included.
- All potable and nonpotable water supply wells and monitoring wells within a 0.5 mile radius of the land application site shall be located and described. All surface waters within one mile of the project area must be located, and their classification, uses, and distance from the site must be identified.
- Measures to minimize aerosols must be taken within 100 ft of outdoor public eating, drinking, and bathing.
- New and expanding distribution systems should carry a minimum of 1.5 times the maximum daily flow of the treatment facility.
- Return of reclaimed water to the distribution system after delivery to the user is prohibited.
- The public must be notified of the use of reclaimed water at an irrigation site, storage impoundment or decorative water feature by the posting of advisory signs, notes on scorecards, and the like. Signs must be in English and Spanish and must read "Do Not Drink" along with an international symbol.
- Swimming pool, hot tub, and wading pool uses are not permitted.

GEORGIA

- A written agreement is required between a reclaimed water user and the permittee; the user applies to the permittee. Irrigation times must be stipulated in the written agreement.
- Public notice of the permit application is required.
- The permittee must advise the purveyor of potable water that reclaimed water is being used in the area.
- New developments desiring reclaimed water shall provide a distribution system.
- No irrigation spray is allowed outside established boundaries. Irrigation requires a permanent underground system; low trajectory nozzles are required to minimize aerosol formation if within 100 ft of eating, drinking, or bathing.
- A pumping pond may not receive other runoff water. No runoff of reclaimed water should occur.
- Signage or other public notification methods are required.
- Users must document their participation in the public information program (i.e., education).
- Groundwater monitoring may be required on a case-by-case basis
- It is permissible for reclaimed water to mix with storm water on the distribution site.
- No reclaimed water may be used in dwelling units; reclaimed water may not be used for human or animal consumption, edible crop irrigation, body contact recreation, or sharing between two properties.

- The producer of recycled water must supply the user with a copy of the state recycled water guidelines. There must also be a written agreement between a producer and a user of recycled water.
- The producer of recycled water is responsible for its quality. The producer must supply the user with a site management plan, but the user is responsible for maintaining all on-site facilities. Inspection, supervision, and employee training must be provided by the user.
- A design proposal must stipulate the schedule of irrigation and irrigation instructions for the operator.
- The user must designate a recycled water user supervisor.
- A public education plan and an employee training plan must be developed. Detailed specifications are provided about the components of the employee training plan.
- A site development proposal must include information about wind, flood plains, and soil characteristics. The locations of exterior drinking fountains must be identified. (Irrigation spray may not contact an external drinking water fountain.)
- Irrigation over a public drinking water aquifer should not exceed consumptive rates.
- Stipulations are provided to help avoid mosquito problems due to recycled water impoundment, or wetlands design or operation. Water should be managed such that uses do not contribute to proliferation of mosquitoes.
- BMPs to prevent ponding must be implemented.
- The maximum grade for spray irrigation is 15% for forage, turf and orchards.
- No discharge, runoff, or overspray is allowed beyond the approved use area boundaries.
- Formation of a Groundwater Management Committee is called for in the guidelines, and the Committee will determine target water quality criteria for aquifers underlying a reuse project, target mass loading rates of specific parameters to protect underlying potable water aquifers, and determine site-specific groundwater monitoring strategies.
 - Nitrate and total phosphorus concentrations in percolate from a lysimeter in the irrigation area must be ≤ 10 mg/L and 1 mg/L, respectively.
 - Stipulations are also provided for monitoring groundwater for heavy metals.
- Maximum grades for spray irrigation are 15% for forage, turf and orchards.
- Irrigation over a public drinking water aquifer should not exceed consumptive rates.
- The design proposal must stipulate the schedule of irrigation, and include irrigation instructions for the operator.
- Nitrate and total phosphorus concentrations in percolate from a lysimeter in the irrigation area must be ≤ 10 mg/L and 1 mg/L, respectively. Stipulations are also provided for monitoring groundwater for heavy metals.
- No runoff may leave the use area.
- Signage is required
- A public education plan and an employee training plan must be developed. Detailed specifications are provided about the components of the employee training plan.
- A Groundwater Management Committee has been established to determine target water quality criteria for aquifers underlying a reuse project, target mass loading rates of specific parameters to protect underlying potable water aquifers, and to determine site-specific groundwater monitoring strategies.

IDAHO

- Wells, public and private drinking water supply sources, springs, wetlands and surface waters on the site must be identified.
- 25-, 50-, and 100-year flood plains must be identified.
- Irrigation must occur during periods of non-use by the public.

ILLINOIS

- A site design must identify present and proposed water supply wells, abandoned wells, surface waters and waterways, wetlands, and 10-yr floodplains. No floodplains with a return frequency < 10 yrs may be used unless storage or an alternate irrigation site is available.
- Groundwater must be > 4 ft below the surface.
- A water balance that includes the wastewater, run-on from adjacent areas, precipitation, evapotranspiration, permeability, groundwater recharge rate, and effect on water table depth and subsurface tile drainage must be provided.
- Slopes must be < 8% on sodded fields and forested areas. Steeper slopes must have runoff control that is consistent with Soil Conservation Service recommendations.
- Irrigation equipment specifications are cited; spray equipment must be specified and information about the design pressure, wind velocity, height of spray, and spray mist drift distances must be provided.
- The irrigation spray must be uniformly distributed; a design wind velocity of 15 mph must be used for sites in urban areas.
- The design daily percolation rate should be < 10% of the minimum soil permeability. The design must provide for alternate wetting and drying periods and maintenance of aerobic conditions in the topsoil.
- There must be > 10 ft of earth cover over bedrock.
- Nitrogen application should be within agronomic rates and include any application of chemical fertilizer.
- Irrigation must not contribute runoff. No discharge to wetlands, streams, waterways or other surface waters is allowed.
- No spray irrigation is allowed during precipitation.
- Signage is required at 100 yd intervals.
- Existing groundwater must be chemically analyzed, and potential impacts on existing groundwater movement and quality must be evaluated.
- Groundwater monitoring is required, with stipulations about location of wells, well construction, sampling depths, and parameters to be monitored. Water quality must be compliant with groundwater standards.

INDIANA

- A site-specific land application permit is required.
- Application in a flood plain is not permitted unless the water will not enter a wetland or other waters of the state.
- Slope must be $\leq 6\%$.
- No irrigation is permitted if:
 - the seasonal high water table is within 18 in. of soil surface, or if the seasonal high water table is within 36 in of the soil surface AND any soil layer between 18 in and 36 in below the surface has a permeability of greater than 2 in/hr.
 - No application of irrigation water is permitted if the moisture holding capacity of the soil has been exceeded.
- A minimum depth of 20 in soil over bedrock is required.
- The pH of the receiving soil must be at least 5.5. Methods for calculating the maximum allowable nitrogen loading rates are provided, and heavy metal maximum loadings are stipulated. If the water contains PCBs ≥ 2 mg/dry kg, irrigation is prohibited.
- Irrigation water may not leave the land application site.
- Irrigation on frozen or snow-covered land is not permitted unless the water will not enter a wetland or other waters of the state. Irrigation is not permitted where it is likely to adversely affect a threatened or endangered species or its critical habitat, or where an historic preservation designation requirement prohibits it.
- Unauthorized access to off-site storage must be prevented by locks or fencing and signage.

IOWA

- Preliminary groundwater and soil testing are required. There must be >5 ft soil overlaying any sand or gravel layers at the site. The user must specify the need for under-drainage or withdrawal, the effects of the system on the direction and rate of groundwater flow, the extent of the recharge mound. Irrigation in areas prone to floods at a frequency greater than once every ten years require alternate land for disposal. Groundwater table must be > 5 ft below the surface.
- Design must achieve uniform distribution.
- Slope must be < 5% or a runoff control plan must be developed according to SCS and approved by the Soil Conservation District.
- No public access is permitted during spraying.
- Spray equipment must minimize aerosols.
- Hydraulic loading rate requires compliance with stipulated water balance calculations repeated for each month of application. Application must be < 1/2 design sustained permeability rate and < 1 inch/hr. Water percolation is limited to < 10 inches monthly. Nitrogen, phosphorus, salinity, and trace element loadings are stipulated.
- The wetted disposal area must have soil at least 15 ft overlaying any rock, limestone, or impermeable structure.
- No application is allowed during frost or rainfall.
- Drinking water fountains must be protected from direct or windblown reclaimed wastewater spray.
- Signage is required, and trespassing is forbidden. Notification on golf scorecards is required; signage at water hazards is also required.
- Groundwater monitoring is required, adjacent to the site, at upstream and downstream locations. The quality of groundwater after dilution with affected native groundwater is stipulated; no significant detrimental change in groundwater is allowed. Discharge effluent from the irrigation process requires an NPDES permit.
- Golf course irrigation is given as an example of a permissible application of slow rate land application to public use areas.

KANSAS

- For crop irrigation, no tail water runoff to state surface waters is allowed, and no ponding is permitted.
- Public access is not allowed while irrigating, unless fecal coliform limits are reduced to 20 cfu/100 mL.
- Signage is required around any reclaimed wastewater holding pond. Notification on golf scorecards is also required.
- Crops for direct human consumption may not be irrigated with reclaimed water.

KENTUCKY

LOUISIANA

MAINE

- A public hearing is required to review the permit application.
- Subsurface geology, including the hydraulic conductivity and porosity of soil and rock formations must be reported. The groundwater flow direction must be identified, and the location of nearby private wells must be identified. Existing groundwater quality must be reported before a permit is approved. The soil texture must be USDA clay loam to sandy loam; site must drain moderately well to very well.
- At least one monitoring well must be installed in an area up gradient from the disposal site. The well must be screened from the seasonally high groundwater table downward 15 ft.
- Specifications are provided for monitoring well materials and installation and for sample withdrawal.
- Present or future effects of domestic or commercial pumping on the groundwater flow must be evaluated.
- Depth to groundwater or bedrock must be greater than or equal to 4 ft, except on the Eastern Shore, where a minimum of 2 ft must exist between the soil surface and the groundwater table.
- The most restrictive soil horizon must permit permeability rates of 0.2-6 in/h
- Slope must be less than or equal to 15% on cultivated lands and 25% on uncultivated (forested) land.
- A complete vegetation cover is required.
- Annual average application rate will generally range between 0 and 2 in/wk.
- A reserved area of 25% of the total wetted field area should be provided for future adjustment of the application rate.
- Recommended loading cycle is 1-day load and 6-day rest.
- If groundwater degradation becomes evident, steps must be taken to determine the cause, and any necessary corrective measures must be taken.

MASSACHUSETTS

- The Producer must enter into an approved binding agreement with the User to ensure that construction, operation, maintenance and monitoring of the reclaimed water meets the requirements of the Groundwater Discharge Permit (GWDP) and the Reclaimed Water Interim Guidelines. Contracts with spray irrigating system vendors are recommended as part of a Best Management Plan (BMP).
- The location of all local and regional water resources within 0.5 miles of the proposed project must be identified. A mounding analysis must demonstrate that there is sufficient zone of aeration between the bottom of the leaching or disposal area and the historically high water table. The fate of the discharge must be identified, with a description of its anticipated effect on groundwater quality.
- Spray is not permitted during operational hours.
- A BMP must be submitted demonstrating how the operation of the distribution system will be managed to minimize exposure to humans and prevent direct contact with reclaimed water. The BMP should consider:
 - Utilization of low trajectory sprayers, spray irrigation during non-use hours,
 - Signage indicating reclaimed water use,
 - A nutrient management plan reflecting fertilizer application and nutrients in sprayed wastewater,
 - Storage ponds designed for maximizing water quality,
 - Procedure for immediate switch-over to a non-growing season disposal system
 - Locking caps provided on outside plumbing fixtures with signage
 - Plans to correlate irrigation with wind speed measures
 - An education plan for facility personnel responsible for irrigation
- A monitoring plan must be in place that detects the impacts of the project on ground and surface water quality (and on the quality of the water after it has been treated by the soil, if that is part of the intention of the system).
- Golf course fertilization practices should include a reduction in applied fertilizer if nutrients in the reclaimed irrigation water are retained to provide fertilizer value.
- A public awareness program is required that includes: fact sheet/brochures, color coding of all plumbing, and signage (multilingual and pictorial).

MICHIGAN

- The discharger must sign a legal covenant to the effect that groundwater beneath the irrigation site will not be used for human consumption unless the groundwater meets state and federal standards for a potable water supply.
- All wells, stream flows, springs, wetlands, and water bodies on the site must be identified.
 - The permit application must indicate whether discharge is to an area underlain by a usable aquifer, an unusable aquifer, or groundwater not in an aquifer.
- A waste characterization study may be required before a permit to discharge is issued.
- Daily application rate should be $\leq 24 \times$ permeability. The discharge to a land treatment system shall be limited so that the discharge volume combined with the precipitation from a 10-year frequency/24-hour duration rainfall event does not overflow the designed discharge area.
- For slow rate and overland flow treatment systems, the pH of the plow layer within the discharge area shall be maintained between 6.0 and 7.5 standard units. Operation must prevent the developing of sodic conditions. The discharge area must be tested annually for cation exchange capacity, available Bray-P1 phosphorus, pH, and sodium.
- No runoff, ponding, flooding of adjacent property permitted, and no resultant erosion or nuisance conditions are allowed.
- Groundwater quality tests must indicate the specific conductance, concentrations of stipulated inorganics, and pH.

MINNESOTA

MISSISSIPPI

MISSOURI

- Public notification is required of intent to issue a permit to a site.
- The design and layout of a system must show existing and proposed buildings, roads, ground or surface water supplies and wells within ½ mi of the site; distance from the treatment and storage facilities to the application site; proximity of the site to industrial, commercial, residential developments; surface water streams; potable water wells; public use areas such as parks and cemeteries; groundwater conditions; existing vegetation; and slopes.
 - If the planned application rate is > 24in/yr, a geology report and a report of soil types and characteristics are required.
 - The design and plan should show evidence that areas of potential erosion have been considered.
 - A site inspection by the state Ground Water Quality Section is required to confirm the suitability of a proposed site for land application.
 - An area that floods at a frequency > once/10 yr may not be the sole site for land application.
- The maximum allowable slope in the application area is 20%.
- The public may not be in an irrigation area when the spray is applied.
- Spray equipment must minimize the formation of aerosols.
- Application rates are stipulated based on the design sustained soil permeability rate, the slope, the soil moisture holding capacity, antecedent rainfall and depth to the most restrictive soil permeability layer.
 - In no case can the application rate exceed 1 in per day or 3 in per week.
 - The maximum annual application rate must not exceed a range of 4-10% of the design sustained soil permeability rate for the number of days per year when soils are not frozen.
- The wetted application area must have a soil mantle of at least 5 ft overlying any sand or gravel layers.
- Nitrogen application rates may not exceed the amount of nitrogen that can be used by the cover vegetation.
- The application rate may not result in the runoff of applied wastewater during or immediately following application.
- Irrigation is not permitted during periods of ground frost, frozen soil, or rainfalls.
- Wells located on the application site must be adequately protected from the irrigation spray.
- The design and operating plan must show the proposed irrigation rate, the crops or vegetation to be grown, and plans for cultivation.
- Irrigation piping must be drainable to prevent freezing if pipes are located above the frost line.
- A suitable structure is required for a portable pumping unit or a permanent pump, and the pumping system must provide the capability to vary the withdrawal depth and meet other stipulated specifications.
- Signage is required, with the spacing and message content and format specified.
- A groundwater monitoring program is required that indicates the number and location of existing and proposed monitoring wells; the parameters that will be monitored; and the monitoring frequencies.

MONTANA

- Representative data on the chemical quality of the wastewater must be submitted in the project proposal. A list of inorganic compounds required in the report is stipulated.
- The hydraulic, nitrogen and trace element loading rates must be justified in the project proposal. Designated methods must be used to determine the hydraulic and nitrogen loading rates, with the design hydraulic loading based on the wettest year in 10 yrs.

NEBRASKA

- A proposal to irrigate with reclaimed wastewater must stipulate the nature of the land access (purchased, leased, contracted) and the type of control that will be maintained by the owner of the wastewater treatment facility. The name of the landowner must be provided, along with any lease or contract agreement between the producer and the landowner or consumer.
- Among the site characteristics that must be identified are abandoned and active drinking water wells, residences or occupied dwellings, surface waters, abandoned or active wells and test holes, the approximate distance from ground surface to the seasonal high ground water table and the approximate depth to the drinking water aquifer, and the direction of groundwater flow.
- Initial groundwater quality measures may be required.
- Loading rates are considered on a case-by-case basis, but they should be less than 4 in/wk; the ratio of application time to rest time should be 1:3 in most cases.
- Nitrogen loading calculations are stipulated to determine the allowable nitrogen loading; allowable trace element concentrations in the irrigation water are stipulated.

NEVADA

- The sprinklers should be operated in a manner that avoids entry of treated effluent into the buffer zones.
- Runoff of treated effluent is not permitted.
- Signage must be posted that warns the general public to avoid contact with the reclaimed water.

NEW HAMPSHIRE

NEW JERSEY

- A User/Supplier agreement is required.
- Low trajectory nozzles are required within 100 ft of outdoor public eating, drinking and bathing facilities.
- The hydraulic loading rate shall not exceed a maximum annual average of 2 inches per week. Loading rates can be increased based on a site-specific evaluation.
- For spray irrigation, chlorination levels for disinfection should be continually evaluated to ensure chlorine residual levels do not adversely impact vegetation. A chlorine residual of 0.5 mg/L or greater in the distribution system is recommended to reduce odors, slime, and bacterial re-growth.
- No surface runoff or ponding is allowed at the site.
- Special stipulations are provided for irrigation of landscaped areas with a tank truck.
- Signage or scorecard notification is required.

NEW MEXICO

- Application must be during times when public contact is not likely to occur.
- Standing or pooling water should be avoided (liquid or frozen, is prohibited).
- All domestic wastewater lines and appurtenances used for irrigation purposes must be conspicuously labeled as nonpotable and be so secured when not in use that the public cannot inadvertently allow a discharge.
- (• A system is required that uniformly marks all components of the reuse system. All markings, signs, and labels should be color-coded, and text should be in English and Spanish.
 - The signs and labels shall clearly state: "Caution: Nonpotable Water – Do Not Drink."
 - Signage should indicate that additional information can be obtained by calling the NM Environment Dept. or Dept. of Health.
 - Signs are required at least every 100 ft.)

NEW YORK

NORTH CAROLINA

- If reclaimed water is used on a site not owned by the producer, a contractual agreement between the user and the producer must be in place.
- Public notification at least 30 days is required, prior to issuance of a general permit.
- The rate of application may be determined based on the maximum soil absorption and/or the maximum water needs of a receiving crop.
- The public must be notified that reclaimed water is in use at a site and that the water is not potable.
- If reclaimed water is used for industrial purposes, employees must be notified and informed that the water is not intended for drinking.

NORTH DAKOTA

- If chlorination is used, irrigation may take place at any time.
- Signs should be posted in visible areas during irrigation and for two hours after irrigation. The signs should advise the public that the water is non-potable and should not be used for drinking, bathing.
- Soil salinity monitoring is recommended.
- Effluent from the irrigation site may not be disposed of in areas readily accessible to humans or animals, such as pastures being grazed, hay crops ready for harvesting, or garden crops for human consumption.

OHIO

- Streams, waterways, wetlands, springs, ponds, and lakes should be identified. The 10-year flood frequency, depth to seasonal water table (should be greater than 1 ft), depth to bedrock (should be greater than 2 ft), and direction of groundwater flow should all be evaluated.
- Background levels of specified inorganics in soil should be reported.
- Slope recommendations are: < 20% for turf or pasture, and < 40% for timber.
- There should be no standing surface water.
- Guidelines are provided for calculating required land area based on hydraulic loading rates that are determined through a water balance analysis. Application should not occur when the ground is frozen, and application rates should not exceed 4 in/wk.
- Nutrient loading rates must be calculated, and nitrate levels in the groundwater beneath the site should not exceed 10 mg/L.
- Irrigation should be restricted to times of the day or year when people are not present. A management plan should incorporate such practices.

OKLAHOMA

- Application must occur during times of non-use; application of treated water is also not permitted during periods of precipitation, or while the soil is saturated or frozen.
- Application is not permitted if it is likely to adversely affect a threatened or endangered species.

OREGON

- No spray is permitted on areas where food is prepared or served, or where drinking fountains are located.
- No direct public contact with the water is permitted during the irrigation cycle.
- Signage is required around perimeter and other locations.

PENNSYLVANIA

- If the treatment area and storage cells are not on property owned by the permittee, the permittee must either secure a 20-yr lease renewable for an additional 20 years, or acquire development rights and perpetual rights for the amount of land required.
- All potential surface waters that could be affected by the irrigation of treated wastewater must be identified, including lakes, ponds, impoundments, wetlands, springs, seeps, drainage swales, surface relief channels, and other natural conveyances.
 - The locations of rock outcrops and sinkholes, depths to water table and to bedrock, the direction of groundwater flow, and the locations of groundwater discharge points must be identified.
- Floodplains on the site must be identified.
- The design and operating plan must consider the limiting geologic conditions, the most restrictive horizons, the potential for groundwater mounding, and the potential for contaminant transport to groundwater.
 - Soil characteristics such as pH, buffering capacity, action exchange capacity, sodium absorption ratio, exchangeable sodium percentage, organic content, carbon to nitrogen ratio, base saturation and base metal concentrations must be considered in the site plan. Soil test probes must be used to characterize the soil, and additional tests may be requested depending upon initial results.
 - The plan must show evidence that slope, topography, soil erosion characteristics, presence or absence of floodplains and springs, stream flow patterns, and prevailing wind directions were considered in the design.
- A maximum slope of 8% is typical, although proposals may be submitted for spray irrigation on slopes up to 25%.
- The site design should incorporate small diameter or low trajectory sprinkler heads or other applicators that keep effluent closer to the ground surface and away from areas impacted by the wind.
- The site operating plan should call for the system operator to record the weather conditions during each day of above-ground effluent application, including temperature, precipitation form and amount, wind direction, and wind speed.
- If site-specific design modifications or other methods cannot be used to overcome wind drift limitations, wind velocity and direction criteria must be included in the design and operating plan that will cause cessation of land application and diversion of treated effluent to storage. A wind break should be used to reduce wind velocity across the irrigation site.
- The design and management plan must evaluate the hydraulic budget and the hydraulic acceptance rate based on wet weather conditions.
- Guidelines are provided for estimating hydraulic, nutrient, organic and solids loading rates.
- Effluent application may not cause groundwater mounding or runoff from the site. A method and schedule for applying stored effluent during appropriate weather conditions must also be addressed.
- Effluent may not be applied if more than 0.5 in of rain falls during the previous 24 h, and it may not be applied if snow cover exceeds 1 in.
- The monitoring plan should characterize the wastewater, estimate the direction of groundwater flow, and describe the proposed monitoring methods for groundwater, soil moisture, and the weather. Stipulations are provided for groundwater well construction, sampling, and monitoring.
- Plans for establishment of temporary and final vegetation must be described. Stipulations are provided for determining the assimilative capacity (nutrients, metals, organics) and management of vegetative cover on a site. A plan for management of the vegetative cover must be included in the design.

RHODE ISLAND

- A public entity must own the system and be responsible for the operation, maintenance and replacement of all components unless otherwise approved. If a private entity or person owns a system, a decision to issue a permit will be made on a case-by-case basis. DHEC will also require financial assurances for the operation and maintenance of the system.
 - Proof of ownership of the application site must be provided, OR
 - a contract lease or agreement for a period of at least 30 years with an automatic right of renewal for an additional 30 years must be provided.
- Public notification is required of intent to issue a permit to a site.
- A site inspection by the SC Ground Water Quality Section is required to confirm the suitability of the proposed site for land application.
 - A proposed design plan must show the facility, intake and discharge structures, hazardous waste facilities (if any), any wells where fluids are injected underground, and those wells, springs, other surface water bodies, and drinking water wells listed in public records or otherwise known to the applicant.
 - Soil borings may be required to characterize the subsurface.
 - The site may not be located in the 100-yr flood plain, unless there is a permitted secondary year-round disposal option.
 - A description of the water to be land applied must be provided, and if it is not strictly domestic, a detailed characterization must be provided.
- For irrigation sites, slopes must not exceed 10%.
- The distribution system must be designed so that uniform application of spray is optimized.
- Design and operation plans must show the planned application rate and the intended frequency of application in times per day, week, or other period.
 - Maximum allowable application rates are stipulated as a function of depth to the seasonal high water, although higher rates may be permitted for the application of reclaimed water.
- A groundwater monitoring program is required that indicates the number and location of existing and proposed monitoring wells; the parameters that will be monitored; and the monitoring frequencies.
 - For land application on golf courses with secondary effluent limits, nine monitor wells must be provided for 18 fairways (or one groundwater well per two fairways for differing course sizes).
- Groundwater monitoring reports must include information about concentrations of chloride, ammonia, nitrate, pH and sodium; they must also indicate the water table elevation and depth.
- No runoff is permitted outside the irrigation area.
- No effluent may be applied during periods when the ground is frozen, ponded, there is standing water on the application site, or the ground is flooded.

SOUTH DAKOTA

- All existing and proposed residences, commercial or industrial development, roads and ground or surface water supplies within 0.5 mi of the proposed site must be identified. In addition:
 - The vertical distance between the surface of the disposal fields and the maximum height of the ground-water table should be a minimum of 6 ft unless under drains are provided so that the minimum can be reduced to 4 ft. Initial ground-water quality data may be required.
 - Representative percolation and infiltration data of the topsoil and the subsoil layers must be provided.
 - Information about the irrigation site geology, soil conditions and hydrology must be provided.
 - Representative data on the chemical and bacteriological quality of the ground-water must be provided, including the elevation of the water table and the rate and direction of flow under existing and proposed conditions of use.
 - Design of the area required for disposal should consider soil types, percolation and infiltration data, evapotranspiration data, available rainfall data, the maximum disposal period and application rates, plus an allowance for system maintenance and for drying and harvesting cover crops where applicable.
 - Climatological site data must be provided.
- The distribution pressure and devices for the sprinkler equipment must be installed in such a manner as to minimize wind drift of effluent and formation of aerosols.
- Maximum effluent application rates are stipulated, and rates may also be set using the S.D. Soil Conservation Irrigation Guide. A maximum application rate to determine land requirements should be 24 in/acre/yr. Application rates should not exceed 0.25 in/hr or 2 in/acre/week.
- The process design manual for Land Treatment of Municipal Wastewater, October 1981, U.S. EPA should be used to determine the total annual nitrogen loading.
- Surface runoff of effluent should be prevented.
- No application is permitted during periods of heavy or prolonged rainfall, snow cover, or when the ground is frozen.
- Extraneous surface water should be prevented from entering the disposal area.
- Signage is required to inform the public of the nature of the facility.

TENNESSEE

- No direct discharge to surface water is permitted.
- Sites may not be located within the 10-yr flood plain.
- The site location must take into account dwellings, roads, and streams.
- A design plan must indicate the design wastewater flow, wastewater characteristics, treatment scheme, and area to be irrigated. All storage ponds, pumps, valves and process control points must be identified.
- A plan of the distribution system must be provided.
- Soils that are poorly drained, have high groundwater tables or restrictive subsurface soil layers are not suitable unless drainage improvements are made.
- Information about the infiltration rate, soil permeability, and chemical properties of the first 5-10 ft of the soil profile must be provided.
- The elevation of the seasonal high water table, the groundwater flow direction and gradient, and any subsurface conditions that could limit drainage must be identified. A minimum of one sample per acre should be collected to develop a soils map of the site.
- A saturated vertical hydraulic conductivity test is required for the most limiting horizon of each soil series present, and in certain instances, a horizontal conductivity test will also be required. Test methods and sampling methods are stipulated.
- Soil pH, cation exchange capacity, and percent base saturation must be provided, along with soil nitrogen, phosphorus, and potassium may also be required.
- Procedures are stipulated for determining the design wastewater loadings, based on a water balance and nutrient balance, and the field area requirements.

TEXAS

- Application of reclaimed water on public access facilities is controlled by agreement with the reclaimed water provider or by local ordinance. A description of the intended use, quantity, quality, origin and location and purpose of intended use must be provided to the regulatory agency.
- The user or provider must determine and document typical irrigation demands for a proposed use. The user must provide reasonable control of the application rates to avoid surface runoff or excessive percolation below the root zone.
- Reclaimed water use may not degrade ground water quality to a degree adversely affecting its actual or potential uses.
- Distribution, use and/or storage of reclaimed water may not result in nuisance conditions.
- The provider or user is responsible for ensuring that irrigation overflow, crop stress, and undesirable soil contamination by a salt does not occur.
- Guidelines are provided to assist with the calculation of appropriate irrigation rates.
- A site must be maintained with a vegetative cover or be under cultivation during times when reclaimed water is applied.
- Irrigation practices must prevent incidental ponding or standing water.

UTAH

- A copy of the contract with the user must be provided to the DWQ. The contract must state how the requirements of the regulations will be met.
- Reclaimed water lines should be installed with a minimum burial depth of 3 ft. Reclaimed water lines parallel to sanitary sewer lines shall be installed at least 10 ft horizontally from the sanitary sewer line if the sanitary sewer line is located above the reclaimed water main and 3 ft horizontally from the sanitary sewer line if the sanitary sewer line is located below the reclaimed water main.
 - At crossings, the order of the lines from lowest in elevation to highest should be: sanitary sewer line, reclaimed water line, and potable water line.
 - A minimum 18 inches of vertical separation between these utilities shall be provided as measured from outside of pipe to outside of pipe. The crossings shall be arranged so that the reclaimed water line joints will be equidistant and as far as possible from the water line joints and the sewer line joints.
 - If the reclaimed water line must cross above the potable water line, the vertical separation shall be a minimum 18 inches and the reclaimed water line shall be encased in a continuous pipe sleeve to a distance on each side of the crossing equal to the depth of the potable water line from the ground surface.
 - If the reclaimed water line must cross below the sanitary sewer line, the vertical separation shall be a minimum of 18 inches, and the reclaimed water line shall be encased in a continuous pipe sleeve to a distance on each side of the crossing equal to the depth of the reclaimed water line from the ground surface.
- Drinking fountains and other public facilities (picnic tables, food establishments) shall be placed out of any spray irrigation area or otherwise protected from contact.
- Signage is required where reclaimed water is stored or impounded, or used for irrigation in public areas. Signs must contain as a minimum, ½ inch purple letters on a white or other high contrast background notifying the public that the water is unsafe to drink. The signs shall include the international symbol for Do Not Drink.
- Residential irrigation, irrigation of food crops where the applied reclaimed water is likely to have direct contact with the edible part, and impoundments of wastewater where direct human contact is likely to occur are all allowed.

VERMONT

VIRGINIA

WASHINGTON

- When the reclamation distribution system or use area is not under direct control of the permittee, a binding agreement among the parties involved is required to ensure that construction, operation, maintenance, and monitoring meet all appropriate requirements.
- The public and employees must be notified of the use of reclaimed water at all use areas. This must be accomplished by posting advisory signs, placement of notices on scorecards, distribution of written notices to residents or employees, or by other methods.
- Unplanned ponding of reclaimed water must be prevented.
- For irrigation, the hydraulic loading rate must be based on a water balance analysis, and the calculations and design assumptions must be submitted for approval.
- Runoff and spray must stay on the designated use area.
- Reclaimed water lines should be a minimum of 10 ft horizontally from potable water lines. When such lines cross, a minimum vertical separation of 18 in must be maintained between them, and the potable water line must be above the reclaimed water line.
- No application of irrigation water is permitted when the ground is saturated or frozen.
- No aerosol spray should reach people, buildings, passing vehicles or drinking water fountains.
- Appropriate measures should be taken to avoid breeding of vectors, creation of odors, slimes, or aesthetically displeasing deposits.
- Reclaimed water valves, storage facilities, and outlets must be tagged or labeled to warn the public or employees that the water is not potable. The signage must be colored purple with white or black lettering.
- Impoundments and storage ponds must not contribute to groundwater contamination where the groundwater is used as or suitable to be used as a source of domestic water supply. Such facilities may be unlined if it can be demonstrated that such contamination will not occur.
- A groundwater monitoring program may be required.

WEST VIRGINIA

WISCONSIN

WYOMING

- The producer of treated wastewater must demonstrate that all of the regulatory requirements will be met through steps such as management practices, record keeping and reporting; even if some of these activities are the responsibility of another person who will apply the treated wastewater, the producer must demonstrate that the requirements are being met.
 - If the producer is outside of the state of Wyoming, they must obtain a permit from the State to land apply in accordance with these regulations, or provide the wastewater to a person who has a permit.
 - The demonstration must be in the form of either a written agreement with the applier, specifying his or her responsibilities, or a separate permit application from the applier.
- Wind drift must not leave the application site.
- No surface runoff may leave the application site or enter surface waters of the State.
- Treated wastewater applied for the purpose of beneficial reuse should not exceed the irrigation need or demand of the vegetation at the site. Winter irrigation is considered to be beneficial reuse.
- Signage and fencing are required on land with "moderate potential for public exposure" (accessible to the public, but access is limited during irrigation), because the water quality limits are less stringent than those outlined here; they are not required on "land with a high potential for public exposure," such as public parks, ball fields, cemeteries, plant nurseries, turf farms, or golf courses that meet the limits summarized here.