

TABLE 14-9

SUMMARY OF TREATED WATER RECHARGE TECHNOLOGIES

TECHNOLOGY	REGULATORY REQUIREMENTS	FLEXIBILITY	EASE OF IMPLEMENTATION	EFFLUENT QUALITY & PERFORMANCE	MAINTENANCE REQUIREMENTS	LAND REQUIREMENTS	ANTICIPATED PUBLIC ACCEPTANCE	RELATIVE CAPITAL COSTS	RELATIVE O&M COSTS
Sand Infiltration Beds	Permitting and monitoring of treated water recharges and design requirements. Disinfection may be required by MassDEP.	Flexibility is possible with multiple beds.	Relatively simple to implement.	Effluent is already treated and sand beds provide some additional treatment.	Treated water recharge is reliable throughout the year and easy to maintain.	Moderate at large wastewater flows when compared to subsurface leaching.	Potential for low acceptance from residents who are impacted by bed siting and construction.	Relatively low due low land area and easier construction.	Low due to low energy requirements and minimal maintenance.
Subsurface Infiltration	Disinfection is not required prior to recharge, unless required to meet the Proposed Reclaimed Water Regulations 314 CMR 20.00.	May be suitable for remote recharge.	Relatively simple to implement.	Effluent is already treated and infiltration facilities provide additional treatment. Effluent should be filtered before recharge.	Repair of the beds would be difficult because they are below the surface.	Relatively high. Land surface above the infiltration system can be used for other purposes	Acceptance should be high due to minimal visual impacts and potential reuse of land area.	Relatively high due to highest land area and extensive piping.	High due to pumping requirements and potentially high repair/ cleaning costs.
Spray Irrigation And Drip Irrigation	Permitting and monitoring of treated water recharges and design requirements. Disinfection may be required by MassDEP.	May be suitable to handle additional summer flows.	Must have redundant back-up facilities for winter recharge.	Effluent is already treated. Spray irrigation provides further uptake of nitrogen in the effluent.	Moderate maintenance to maintain piping. Spray irrigation cannot be used in freezing weather.	Relatively high. Land above system can be used for other purposes when spray irrigation is turned off.	The public will want to see recycling of the effluent though they may be concerned about possible health threats.	Relatively low due to minimal excavation, and minimal need to reshape the land.	Moderate due to maintenance and pumping requirements.
Ocean Outfall	The Massachusetts Ocean Sanctuaries Act prohibits discharge of municipal wastewater into an ocean sanctuary.	Prohibited by the Ocean Sanctuaries Act.	Not possible.	Disinfection may be required for the outfall.	Maintenance similar to a large force main.	Minimal.	Low, based on the opposition to the Deer Island outfall and the Ocean Sanctuaries Act.	Relatively high due to extensive permitting and pumping requirements and potential pipe construction.	Moderate due to pumping requirements.
Well Injection	Permitting and monitoring of treated water recharges and design requirements. MassDEP is not supportive of this technology.	It is not suitable due to MassDEP reluctance.	Difficult due to MassDEP's position on technology.	Effluent must be well treated (filtered and chlorinated) before recharge.	Uncertain reliability due to few operating installations and increased maintenance due to potential of plugging of injection point with solids.	Relatively low compared to sand infiltration beds and subsurface leaching.	Land area requirements and visual impacts are minimal.	Relatively low due to minimal excavation, and minimal need to reshape the land.	Moderate due to pumping requirements and maintenance needs.

TABLE 14-9 (continued)

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TECHNOLOGY	REGULATORY REQUIREMENTS	FLEXIBILITY	EASE OF IMPLEMENTATION	EFFLUENT QUALITY & PERFORMANCE	MAINTENANCE REQUIREMENTS	LAND REQUIREMENTS	ANTICIPATED PUBLIC ACCEPTANCE	RELATIVE CAPITAL COSTS	RELATIVE O&M COSTS
Wick Well Technology	Permitting and monitoring of treated water recharges and design requirements. MassDEP is not supportive of this technology.	May be suitable for existing beds at WWTF site.	May be possible for existing beds.	Pilot testing would be needed to demonstrate performance.	Uncertain reliability due to few operating installations and increased maintenance due to potential of plugging of injection point with solids.	Land area requirements and visual impacts are minimal.	Relatively low due to minimal excavation, and minimal need to reshape the land.	Relatively low compared to sand infiltration beds and subsurface leaching.	Moderate due to pumping requirements and maintenance needs.
Wetland restoration	Significant permitting hurdles.	Could be very suitable for restoring base flow in a watershed.	Difficult due to permitting hurdles.	There is minimal precedent for this type of recharge in Massachusetts.	Repair of the beds would be difficult.	Acceptance would increase if walking trails were integrated with the facility.	Moderate due to wetland construction.	Relatively low compared to sand infiltration beds and subsurface leaching.	Moderate due to maintenance and pumping requirements.