

PROJECTS AND MANAGEMENT ACTIONS

Project/Management Action Type	Description	Pros	Cons	Critical questions
Groundwater Recharge Basin	Lagoon or pond (usually manmade) where surface water is pooled to seep down (percolate) into the ground and raise groundwater levels.	<ul style="list-style-type: none"> • Can recharge a lot of groundwater if there are ample surface water supplies available. • Can be used to do “groundwater banking”: storing large amounts of water in the ground through recharge or injection wells, so that large quantities of groundwater are available in the future. 	<ul style="list-style-type: none"> • If surface water is contaminated, or the soil through which water will percolate is contaminated, could cause contamination in groundwater. • Not feasible where there is no surface water available, or no canals or infrastructure to convey the water to the basin. 	<ul style="list-style-type: none"> • <i>Where will the recharge basin be built? Need to acquire property?</i> • <i>Where will the surface water come from?</i> • <i>Does the surface water contain contaminants?</i> • <i>Are there nitrates or other contaminants in the soil through which the water will percolate?</i>
Injection Wells	Wells are used to inject surface water into the ground to raise groundwater levels.	<ul style="list-style-type: none"> • Can recharge a lot of groundwater if there are ample surface water supplies available. • Can be used to do “groundwater banking”: storing large amounts of water in the ground through recharge or injection wells, so that large quantities of groundwater are 	<ul style="list-style-type: none"> • If surface water is contaminated, could cause contamination in groundwater. • Not feasible where there is no surface water available, or no canals or infrastructure to convey the water to the basin. • Requires expensive technology 	<ul style="list-style-type: none"> • <i>Where will the well be built? Need to acquire property?</i> • <i>Where will the surface water come from?</i> • <i>Does the surface water contain contaminants?</i>

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		available in the future.		
“In lieu recharge”: using surface water instead of groundwater	Importing more surface water into the sub-basin so that agricultural, municipal, domestic and industrial activities can use surface water instead of groundwater.	<ul style="list-style-type: none"> • Depending on the amount of surface water, could drastically decrease reliance on groundwater. 	<ul style="list-style-type: none"> • Purchasing more surface water could be very expensive • Only available where there are canals that can bring the surface water to users. • Surface water may not be a reliable source of water in times of drought. 	<ul style="list-style-type: none"> • <i>Is surface water available to us? Do we have canals to convey the surface water to users?</i> • <i>How can our GSA purchase surface water rights? Do we have enough money?</i> • <i>Will surface water supplies be stable, or decrease in times of drought?</i>
Groundwater allocations	Restricting water use by only allowing groundwater users to use a certain amount. Could be the same allocation for every acre, or different allocations based on how the water is used (agricultural, domestic, industrial) or historical use of groundwater.	<ul style="list-style-type: none"> • Can drastically decrease the amount of groundwater used. • Can ensure equitable access to groundwater for users of different types, if allocated based on use and priority. 	<ul style="list-style-type: none"> • If allocations are too strict and limited, users will not be able to comply and will violate restrictions. 	<ul style="list-style-type: none"> • <i>What will allocations be based on? Same allocation for every acre in the sub-basin, or different allocations based on type of water use or historical use, or other factors?</i> • <i>How can we ensure that allocations are equitable, and that drinking water is protected?</i> • <i>How can we ensure that allocations are something that users in the sub-basin can reasonably comply with?</i>
Groundwater market	Combined with groundwater allocations, groundwater markets allow groundwater users to buy and sell their rights to pump their allocation of groundwater.	<ul style="list-style-type: none"> • Has the potential to reallocate limited resources in an efficient way 	<ul style="list-style-type: none"> • Could lead to externalizes such as concentrating increased pumping in one area, causing localized impacts to communities, the 	<ul style="list-style-type: none"> • <i>Will the initial allocation adequately address my needs? How many people are served by my water district? What is the minimum baseline drinking water amount needed to adequate provide water for my community?</i>

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			environment, and other stakeholders	<ul style="list-style-type: none"> • <i>Are there areas in the region that are more vulnerable to lowering of groundwater levels? Would it be useful to establish a maximum pumping/trading limit in certain areas?</i>
Crop conversion	Requiring or giving financial incentives to farmers to convert their crops to less water-intensive crops.	<ul style="list-style-type: none"> • Could decrease groundwater use drastically 	<ul style="list-style-type: none"> • Could mean less profit for the local agricultural industry 	<ul style="list-style-type: none"> • <i>What are the crops that are currently grown? How easy or expensive would it be for farmers to convert to less water-intensive crops?</i> • <i>Should this be mandatory, or voluntary?</i> • <i>How can the GSA enforce crop conversion?</i> • <i>How can the GSA provide support to farmers who want to transition to less water-intensive crops?</i>
Agricultural water conservation	Requiring or providing financial incentives to farmers to change their irrigation practices to less water-intensive techniques.	<ul style="list-style-type: none"> • Could decrease groundwater use significantly 	<ul style="list-style-type: none"> • Could decrease agricultural production • Could require investment in new technology and practices 	<ul style="list-style-type: none"> • <i>What irrigation practices are local farms currently using?</i> • <i>What other techniques are available that would conserve water?</i> • <i>How much would that cost?</i> • <i>How much water would it save?</i> • <i>Should the GSA require new water-saving irrigation techniques, or incentivize such practices?</i>
Domestic and municipal water conservation	Requiring or providing financial incentives for domestic and municipal water users to decrease the amount	<ul style="list-style-type: none"> • Could decrease groundwater use 	<ul style="list-style-type: none"> • Could restrict critical drinking water needs if too restrictive 	<ul style="list-style-type: none"> • <i>How much water do local communities need for drinking water? How do we protect their human right to drinking water?</i>

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	of water they use in their homes.		<ul style="list-style-type: none"> • Could restrict water available for aesthetic elements of healthy neighborhoods such as watering lawns, parks and landscaping. 	<ul style="list-style-type: none"> • <i>How much landscaping are city and communities willing to sacrifice? Can the GSA help facilitate less water intensive landscaping?</i>