Basin Framework for a Multi-benefit Groundwater Replenishment and Water Trading Program

Groundwater sustainability plan chapter Templates

 

**Environmental Defense Fund** is dedicated to protecting the environmental rights of all people, including the right to clean air, clean water, healthy food, and flourishing ecosystems. Guided by science, we work to create practical solutions that win lasting political, economic, and social support because they are nonpartisan, cost-effective, and fair.

**New Current Water and Land, LLC** offers a variety of strategic services to those who want to develop, acquire, transfer, exchange or bank water supplies throughout California, as well as to those seeking to access the unique investment space that is Western water and other Western states agriculture.

© October 2018 Environmental Defense Fund

The report is available online at http://www.edf.org/sgmachaptertemplates

**Introduction:**

The following Groundwater Sustainability Plan (GSP) chapter templates were developed by Environmental Defense Fund and New Current Water and Land, LLC to assist Groundwater Sustainability Agencies (GSAs) with incorporating multi-benefit replenishment and water trading mechanisms into GSPs. These chapter templates provide an initial framework that can be adapted to reflect regional conditions and objectives.

Achieving groundwater sustainability in many overdrafted basins is contingent upon collaboration between landowners/pumpers/operators (“operators”) and GSAs to replenish groundwater. **Chapter [X] Multi-Benefit Groundwater Replenishment** outlines mechanisms to encourage and incentivize operator engagement in groundwater replenishment projects, with opportunities to pair these efforts with community and natural resource values, such as habitat creation and improved drinking water quality.

When properly designed, groundwater trading programs can assist in efficient allocation of scarce resources, while avoiding negative third party impacts. **Chapter [Y]: Water Trading** provides a framework for implementation of groundwater trading programs as a groundwater management mechanism. **Appendix A.** outlines qualifying conditions that allow for streamlined approval of water trades.

**Chapter [X]: Multi-benefit Groundwater Replenishment**

1. Introduction
	1. The GSA will coordinate as needed with resource management agencies and other government entities, including but not limited to cities and counties, the Department of Water Resources (DWR), the State Water Resources Control Board (SWRCB), and the Natural Resource Conservation Service (NRCS), to implement replenishment projects with multiple benefits with operators.
2. Multi-benefit Groundwater Replenishment Program Conditions and Actions
	1. Importance and contribution to GSP measurable objectives
		1. The GSA has documented a need for groundwater replenishment projects in order to ensure the basin is operated within its sustainable yield and has determined to leverage operators’ capacity to meet that objective.
	2. The GSA will collaborate with water agencies to determine feasible and allowable replenishment projects based on water availability, conveyance infrastructure, and impact to third parties. The GSA will take into account water agency capacity when encouraging (see Section III) and cooperating with operators to implement direct replenishment methods, including the following:
		1. Recharge basins
		2. Flooding temporarily fallowed or agricultural lands in production
		3. Instream and canal replenishment
		4. Aquifer injection
	3. The GSA will encourage (see Section III) and cooperate with operators to implement indirect replenishment methods, which result in a reduction in groundwater pumping in the basin, including the following:
		1. In-lieu recharge by importing surface water
		2. Temporary fallowing, such as removing permanent plantings or landscaping and delaying replanting for a defined time or rotational fallowing of annual crops
		3. Reducing consumptive use by conversion to less water intensive plantings
		4. Permanent land retirement
	4. The GSA will encourage and cooperate with operators and water districts to obtain and deliver water supplies for direct replenishment and in-lieu recharge, including the following:
		1. Imported surface water
		2. Flood flows, reservoir flood control releases, storm water capture
		3. Recycled water
		4. Desalination water
		5. Groundwater allocation transfers
	5. The GSA will cooperate with the operator to avoid or mitigate third party impacts associated with replenishment projects.
	6. The GSA will cooperate with operators to adhere to applicable regulatory processes (federal, state, and local) and state water rights laws.
	7. The GSA will coordinate with local, state, and federal agencies to access any available financial and technical assistance for water replenishment projects and management actions.
3. Crediting and Accounting for Operator Replenishment
	1. To incentivize operator participation in groundwater replenishment, the GSA will develop appropriate crediting and compensation mechanisms that:
		1. Allow operators to document through a written agreement with the GSA the terms and conditions of the replenishment program, including the amount of water to be credited or other form of compensation to the operator.
		2. Provide a documented right for the operator to utilize or market a defined portion of the developed water; and
		3. Establish a basin-wide accounting framework for each operator’s developed groundwater supply. If the GSA has established extraction limits, the framework shall account for the operator's groundwater allocation as well as credits to the operator’s accounts for developed water.
	2. The GSA will credit replenishment subject to the following conditions and limitations:
		1. Replenishment projects must be approved by the GSA to receive credit for future use or marketing of the developed water. The operator’s application will include the following:
			1. Demonstration of recharge suitability
			2. Compliance with Irrigated Lands Regulatory Program
			3. History of use of the parcel
				1. Nutrient management – which fields have low residual soil N levels?
			4. Crop type, if applicable
			5. Conveyance infrastructure available to deliver water to the project
			6. Irrigation infrastructure: can the farm quickly distribute large volumes of water across the recharge field(s)? Does the farm have a functioning flood pipeline, one that can be quickly repaired, or a temporary pipeline that can be added to the field that will be monitored?
			7. Willingness to apply heavy irrigations: does the grower have experience with recharge? If they are considering on-farm recharge, are they comfortable applying excess water to their crop, and are they flexible with the timing of their cultural practices while implementing on-farm recharge?
				1. Example: GSAs could consider setting a threshold, such as grower must apply at least 120% crop ETc for it to count toward recharge
			8. Demonstration that the project will create multiple benefits, such as those described in Chapter X, section IV
			9. Established water measurement system in place for replenishment and other benefits
			10. Demonstration that there are no negative impacts to adjacent properties or other beneficial uses
			11. CEQA readiness
			12. Project funding availability
			13. Past performance of the applying entity in developing replenishment projects
		2. The GSA will seek to integrate the reporting process of requirements in (i) with other regulatory programs such as Senate Bill 88 and the Irrigated Lands Regulatory Program.
		3. Replenishment will be credited to the operator’s account less a “leave-behind” subject to the following conditions:
			1. A percentage of replenished water, set in accordance with modeling and thresholds to avoid significant and undesirable results elsewhere in the GSP, will be left to the basin to account for groundwater migration and operational and evaporative losses, as well as to buffer against impacts to neighboring well operation.
			2. An additional percentage of replenished water may be voluntarily left to the basin to accomplish basin-wide sustainability objectives, such as:
				1. Ending overdraft and/or restoring groundwater levels around disadvantaged communities.
				2. Maintaining or reestablishing interconnected surface and groundwater ecosystems.
			3. The GSA may cover the cost of replenished water in (2).
		4. Extraction rates may need to be limited in accordance with pumping thresholds identified elsewhere in the GSP to avoid significant and undesirable results.
		5. The GSA may credit recharge projects that occurred prior to the initiation of the GSP.
		6. Operators within the basin but outside the GSA may participate in the replenishment program and receive credits, provided their participation does not lead to any significant and unreasonable results across the basin.
		7. Operators participating in existing water banks subject to established regulatory review to measure replenishment and avoid third party impacts are exempt from complying with the requirements of (i) – (v) above, given that existing banks will coordinate with the GSA and be addressed within the GSP.
	3. The operator may draw upon the credits, provided such use does not create a significant and undesirable result, as follows:
		1. For application to land overlying the basin, subject to any applicable limitation of state law or local ordinance.
		2. For sale, transfer, or exchange for use within the designated basin boundaries of the GSP and subject to the market established pursuant to Chapter [Y] below.
4. Community and Natural Resource Benefits
	1. The GSA, in cooperation with other agencies, will assist operators in implementing groundwater replenishment projects in a manner that promotes local community and natural resource benefits.
	2. Management of direct replenishment projects
		1. The GSA will provide recommended management strategies that may be implemented in conjunction with direct replenishment projects to enhance multiple benefits for conservation and/or community resources such as water quality or supply reliability for local community water systems, wetland habitat for migratory birds, and flood risk management.
		2. The GSA will work with operators to develop appropriate baseline management conditions and practices for direct replenishment methods, such as recharge ponds and on-farm recharge, to minimize sediment buildup, mosquito propagation, and other undesirable outcomes.
	3. Management of fallowed or retired lands
		1. The GSA will provide recommended management strategies that may be implemented in conjunction with indirect replenishment projects to provide multiple benefits such as the creation of upland species and pollinator habitat through alternative land use programs.
		2. The GSA will work with participating operators to develop appropriate baseline management conditions and practices for fallowed land to avoid undesirable outcomes for the community, such as invasive plant infestations or dust emissions.
	4. Voluntary agreements and assurances for management of fallowed or retired lands
		1. Voluntary commitments to provide natural resource and/or community values may be reflected in appropriate agreements or easements depending upon the nature and duration of the commitment.
			1. The GSA commits to working with appropriate resource management agencies to provide operators assurances that future activities will not be inhibited by providing for such conservation and/or community resource values.
		2. Where possible, the GSA will aid in the development of programmatic voluntary conservation agreements (e.g., Safe Harbor Agreements). Operators will be able to choose to enter into such land management agreements in exchange for assurances that further land management requirements and associated costs will not be imposed on the operator.
	5. Other land use issues
		1. As groundwater replenishment efforts often require changes in land use management, these actions may require local, state, and federal natural resource management agency approvals. The GSA will assist coordination between operators interested in replenishment projects and the appropriate agencies. Specifically, the GSA will prepare and publicize a timeline for multi-benefit replenishment projects that addresses the following:
			1. Deadlines for each permit (local, state, and/or federal) required to implement the project.
			2. Estimated time required to approve each permit.
			3. Duration of each permit.
			4. When the GSA will credit replenished water to an operator’s account.
	6. Incentives
		1. Where possible, state, federal, and private financial incentives can be used to support the creation of habitat and community benefits.

**CHAPTER [Y]: Water Trading**

1. Groundwater Trading Program
	1. Importance and contribution to GSP measurable objectives
		1. The GSA has determined that a trading program for groundwater shares and/or allocations will serve as an appropriate mechanism for efficiently distributing scarce groundwater among operators and minimizing economic dislocation.
		2. To ensure the program’s effectiveness, adaptability, and equal accessibility, it is important to design the program to be consistent, transparent, efficient, and in alignment with the GSA’s policies in a manner to avoid significant and undesirable results.
	2. The GSA will develop and administer a robust groundwater trading system covering the following:
		1. Water available pursuant to credits acquired by participating in activities authorized by Chapter [X] above, including those accrued pre-GSP adoption.
		2. Groundwater that may be available when the GSA places a cap upon pumping equal to the sustainable yield and apportions pumping shares and/or allocations among existing operators.
	3. When developing and administering the groundwater trading system, the GSA will take into consideration the following elements to accommodate local basin conditions:
		1. Groundwater rights
		2. How to evaluate trading impacts in order to minimize adverse impacts on third parties
	4. The GSA will establish and enforce trading rules, including the following:
		1. No transfer of credits or pumping allocations (either on a temporary or permanent basis) shall occur without the approval of the GSA.
			1. The GSA will establish a process and criteria for transfers that would qualify for streamlined approval (see Appendix A).
			2. Transfer approval will be conditioned on the GSA finding it consistent with avoidance of significant and undesirable results (e.g., depth to groundwater and groundwater quality impacts) as they are defined elsewhere in the GSP.
		2. The GSA will facilitate the trading of water shares and allocations on short-term and permanent bases.
		3. The GSA will determine carryover rates for unused credits and allocations (i.e., a landowner trading current use for future use) that cause no impact to third parties.
		4. If management zones are established, trading will occur subject to ratios that correspond to each zone. The GSA will revise these as necessary as basin conditions vary. Trading ratios may depend upon whether trading occurs within zones of confined or unconfined aquifers or between zones, or upon protections in place for community and natural resource values.
		5. Approval of transfers will be conditioned on the trading parties publicly reporting the following information:
			1. Share, or volumetric allocation, being transferred
			2. The location of the property that is the source of the share or allocation being transferred
			3. The name of the operator and location of the property that shall receive the share or allocation being transferred
			4. The duration of the transfer
			5. Identification of any community water systems proximate to the property that is the origin and destination of the share or allocation
			6. Identification of any natural resources proximate to the property that is the source and destination of the share or allocation
		6. The GSA may additionally require trading parties to publicly report the price at which the share or allocation is being transferred to ensure all operators have equal knowledge of trading opportunities and greater certainty of the cost of water to inform management decisions.
	5. The GSA will ensure the trading parties have groundwater allocation, credits, or banked supplies available to transfer and the environmental review and other applicable regulatory requirements pertaining to the transaction have been addressed.
	6. The GSA will establish monitoring protocols to evaluate how groundwater trading has impacted the basin’s sustainability indicators.
	7. Oversight and enforcement
		1. The GSA will ensure operators are not over-extracting beyond their allocations, and will ensure that trading rules are followed.
		2. Penalties for non-compliance will be imposed by the GSA.
		3. The GSA will provide corrective measures for non-compliant operators.
	8. Adaptive management
		1. The GSA will periodically assess the effectiveness of the trading program in meeting sustainability goals.
		2. The GSA will consider updating the trading program structure, process, and/or rules on an annual basis, or as significant information regarding basin sustainability indicators is made newly available.
		3. GSA may have to adjust banked credits if sustainability objectives require adjustment of safe yield estimates up or down.
	9. The GSA will ensure that all information regarding trading applications and completed trades is made public, and that operators are engaged in decision-making processes of the groundwater trading program.
	10. The GSA may provide an online trading platform that connects willing buyers and sellers of groundwater shares and allocations.

**Appendix A. Criteria for streamlined approval of water trades**

1. Chapter Y (II)(d)(i)(1) requires the GSA to establish a process and criteria that, if met, would qualify proposed transfers for streamlined approval.
2. The GSA will consider the following criteria in setting conditions for streamlined approval:
	1. If management zones are established, the transfer occurs between operators within the same zone.
	2. The transfer’s purpose is to provide temporary benefit to the environment or a local community’s water supply.
	3. The transfer occurs within a wet water year.
	4. The transfer duration is short enough to not cause any significant or unreasonable impacts to the basin (i.e., transfers may only be subject to expedited review if their duration is less than X months).
	5. The volume being transferred is small enough to not cause any significant or unreasonable impacts to the basin (i.e., transfer may only be subject to expedited review if less than X% of allocation or X% of basin sustainable yield).