

## ISSUE BRIEF

# WHEN IS GROUNDWATER RECHARGE A BENEFICIAL USE OF SURFACE WATER IN CALIFORNIA?

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### SUMMARY OF KEY CONCLUSIONS AND RECOMMENDATIONS

This issue brief considers whether groundwater recharge currently qualifies, or should qualify, as a beneficial use of surface water under a California water right. Currently, the lack of an explicit policy regarding recharge for non-extractive purposes — that is, for purposes such as combatting subsidence, raising regional groundwater levels, or supporting baseflow or ground-water dependent wetlands — creates uncertainty and confusion. To bring much needed clarity, the State Water Resources Control Board (the Board) should provide guidance explaining that recharge for non-extractive purposes can be a beneficial use of water. That guidance should explain the conditions under which recharge for non-extractive purposes is beneficial and the evidence water managers should provide to support a beneficial use determination.

### INTRODUCTION AND OVERVIEW

In order to appropriate surface water in California, a potential diverter must demonstrate that the water will be put to a beneficial use. A beneficial use is a “useful purpose” to which water is applied.<sup>1</sup> While a wide variety of water uses are well established as beneficial, the relationship between beneficial use and groundwater recharge is less clear. Specifically, it is not currently clear that water rights can or will be granted for certain types of groundwater recharge projects, despite direction from the Governor to encourage action on water rights requests related to recharge<sup>2</sup> and suggestions from the Board that such water rights could be approved.<sup>3</sup> This confusion may be hindering the implementation of recharge projects that could provide substantial benefits in groundwater basins that are overdrafted or are at risk of becoming overdrafted.

The use of surface water to recharge groundwater can be divided into two categories based on the purpose of use under the surface water right: 1) extractive use (*e.g.*, for storage and recovery activities, such as groundwater banking), and 2) non-extractive use (*e.g.*, to mitigate subsidence, improve water quality, or support ecosystems).<sup>4</sup> The law surrounding storage and recovery is clear and needs no modification. Storage alone is not a beneficial use.<sup>5</sup> Parties wishing to store water underground for a later extractive use must identify in their water right application how the water will be put to a beneficial use once extracted.<sup>6</sup> In

comparison, the law governing non-extractive uses is much less clear. Because most non-extractive uses are not explicitly listed as beneficial uses in statutes or regulations, the Board determines, on a case-by-case basis, whether a non-extractive use amounts to a beneficial use of surface water.<sup>7</sup> And details on the process for applying for a surface water right or water right change for non-extractive use are slim to non-existent. This may discourage potential rechargers from submitting an application for such a use.

Appropriate groundwater recharge can be facilitated without radical changes to California beneficial use law. The Board need only clarify the law by issuing guidance, potentially reinforced by thoughtfully designed regulations or legislation, to help demystify the beneficial use requirement for those considering recharge projects.

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### Groundwater Recharge Will Be Crucial to SGMA's Success

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California's 2014 Sustainable Groundwater Management Act (SGMA) directs local groundwater sustainability agencies (GSAs) to develop and implement plans to keep groundwater use within their basin's sustainable yield.<sup>8</sup> SGMA defines "sustainable yield" as the amount of water that can be withdrawn annually without causing any of the following undesirable results:

- Chronic lowering of groundwater levels indicating a significant and unreasonable depletion of supply;
- Significant and unreasonable reduction of groundwater storage;
- Significant and unreasonable seawater intrusion;
- Significant and unreasonable degraded water quality;
- Significant and unreasonable land subsidence; and
- Depletions of interconnected surface water that have significant and unreasonable adverse impacts on beneficial uses of the surface water.<sup>9</sup>

For many GSAs this will not be a simple or noncontroversial task. Currently, twenty-one basins in California are considered critically overdrafted,<sup>10</sup> and many others face significant challenges.

GSAs can achieve sustainability by limiting basin groundwater use, increasing basin groundwater supply, or through some combination of both. In some cases, recharge projects may reduce the need for drastic cuts in groundwater use, and in others both significant recharge efforts and significant cuts may be needed to achieve sustainability.

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## I. USING SURFACE WATER FOR RECHARGE REQUIRES A SURFACE WATER RIGHT

Any diversion and use of surface water in California requires a water right. This is as true when the proposed use involves groundwater recharge as it is when the proposed use is directly irrigating crops or providing a community with drinking water. Today, to receive a new water right permit, an entity that wants to appropriate surface water must file an application with the Board.<sup>11</sup> The Board may only approve an application if it determines that 1) the proposed use is reasonable and beneficial,<sup>12</sup> 2) unappropriated water is available to support the proposed use,<sup>13</sup> and 3) granting the application is in the public interest.<sup>14</sup> Where a water right already exists, but the party that holds it wants to change some aspect of it—for example, the purpose of use—the change must not injure other legal users of water and may require Board approval.<sup>15</sup>

The California Water Code<sup>16</sup> and Board regulations<sup>17</sup> identify uses that are generally deemed to be beneficial. Board regulations specifically list domestic use, irrigation, power,

frost protection, municipal use, mining, industrial use, fish and wildlife preservation and enhancement, aquaculture, recreation, water quality improvement, stock watering, and heat control as beneficial uses.<sup>18</sup> The Board determines whether other uses of water meet the beneficial use requirement on an application-by-application basis.<sup>19</sup> Because groundwater recharge is not explicitly listed as a beneficial use in state statutes or regulations, each case must be considered separately.

## II. WHEN IS RECHARGE CONSIDERED A BENEFICIAL USE OF SURFACE WATER?

There is uncertainty about whether—and, if so, under what circumstances—the Board will consider groundwater recharge to be a beneficial use of water under a surface water right. California law makes clear that the act of recharging groundwater, alone, is not a beneficial use of water. Instead, the specific purpose of the recharge is key. Although they may employ the same range of recharge techniques, there are important distinctions between (1) recharge for the purpose of storing water to be subsequently extracted by pumping for above-ground use under the water right and (2) recharge for a non-extractive use without the intention to later directly remove the water from below ground by pumping under the water right.<sup>20</sup>

### Beneficial Use Determinations Related to Recharge for Storage and Recovery (Extractive Use)

In some cases, the primary goal of a recharge project is to temporarily store surface water underground with the intention of recovering (pumping and using) it later for one or more end uses.<sup>21</sup> California law provides that storage in the subsurface, like storing water in a surface reservoir,<sup>22</sup> is not itself a beneficial use of water. According to Water Code Section 1242:

The storing of water underground, including the diversion of streams and the flowing of water on lands necessary to the accomplishment of such storage, constitutes a beneficial use of water *if* the water so stored is thereafter applied to the beneficial purposes for which the appropriation for storage was made.<sup>23</sup>

In other words, anyone who applies for a water right to divert surface water for recharge, storage, and later recovery under that right must designate the beneficial end use of that water. For example, an irrigation district might want to divert flood flows to underground storage for later use in agricultural irrigation,<sup>24</sup> or a municipality might want to store recycled water for later retrieval and distribution to its customers.<sup>25</sup> Demonstrating that a designated end use is beneficial is generally a straightforward exercise because most are clearly identified as such in state statutes or regulations. The Board's determination of beneficial use in these cases is similarly straightforward.

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#### Defining Recharge vs. Storage

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Recharge and storage are two different concepts, but are often mistakenly used interchangeably.

**Recharge** is “the augmentation of groundwater, by natural or artificial means.” Cal. Water Code § 10721(i). That is, recharge simply refers to the action of adding water to an aquifer, regardless of purpose.

In contrast, **storage** implies a specific purpose – temporarily placing water in an aquifer for later extraction and use.

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It is important to note that the idea that infiltrating or injecting surface water into an aquifer system allows a party to straightforwardly store all of that water for later retrieval oversimplifies the often complex nature of basin hydrology.<sup>26</sup> An increase in recharge does not always correlate with an equal net gain in groundwater stored. Groundwater moves: recharged water may partially or completely flow out of the area, discharge to a wetland or estuary or to a stream as baseflow, or make its way to another basin. These consequent flows can be beneficial. However, as a result of groundwater movement, not all recharged water can be recovered for subsequent use, either in terms of the specific water molecules recharged or in terms of recovering an equivalent quantity (without impinging on other water rights and causing injury to other water users).<sup>27</sup> And recharging or extracting water at one time or from one location may have very different local and regional impacts than recharging or extracting water at another time or from another location.<sup>28</sup> As a result, the Board should account for site-specific context and impacts when deciding what terms and conditions are needed for a water right related to a storage and recovery project to avoid injuring other water users or ecosystems. Such terms and conditions may include restricting the amount of water that may be recovered based on expected basin flows or restricting the circumstances, such as timing or hydrologic conditions, under which recovery can occur.

### Beneficial Use Determinations Related to Recharge for Non-Extractive Use

Although recharge for storage and recovery may sometimes benefit the basin more broadly (such as by raising area groundwater levels during the period of storage),<sup>29</sup> its distinguishing feature is that the recharging entity has the specific *right and intent to extract water* based on its recharge activities. In contrast, some recharge projects inject or infiltrate surface water, *not for later extraction* and use under the water right, but in order to maintain or improve local or regional conditions for broader public benefit.<sup>30</sup> Examples of such non-extractive uses include, but are not limited to:

- Protecting or enhancing water quality (*e.g.*, repelling saltwater intrusion or diluting nitrate contamination),
- Preventing or reversing land subsidence,
- Protecting or enhancing groundwater dependent ecosystems (*e.g.*, wetlands and estuaries), and
- Protecting or enhancing groundwater levels to ensure that basin residents using private domestic wells, and those that depend on small community water systems, have access to water.

Many of these uses are not clearly identified as beneficial in statutes or regulations,<sup>31</sup> necessitating case-by-case beneficial use determinations by the Board.<sup>32</sup>

Guidance regarding when recharge for a non-extractive use will be considered beneficial is limited. Unlike extractive uses, the implications of Water Code Section 1242 for non-extractive uses are not entirely obvious from the text alone. One potential interpretation is that non-extractive use is distinct from “[t]he storing of water underground,” so that the statute squarely addresses only recharge aimed at storage followed by active recovery (in other words, the statute does not contemplate, and therefore does not directly pertain to, non-extractive uses). Another interpretation is that both recharge for extractive use and recharge for non-extractive use involve what the statute describes as “storage”. The question, then, is whether a non-extractive use would constitute “appli[cation] to the beneficial purposes for which the appropriation for storage was made.”<sup>33</sup>

The Board’s website, though not a source of binding legal pronouncements, does shed some light on how the Board has considered this question to date. The webpage providing information about *Water Rights for Groundwater Recharge* states that non-extractive uses may be beneficial:

[P]rojects that divert water authorized by an appropriative water right require use of the stored water for beneficial use, just as with above-ground surface water storage projects. The beneficial use ordinarily involves extraction of the stored water before putting the water to use, but *beneficial use may also occur in place, such as leaving the water underground to protect water quality by preventing saline water intrusion.*<sup>34</sup>

Additionally, a number of California's Regional Water Quality Control plans contain provisions that identify some non-extractive uses—groundwater recharge to prevent seawater intrusion, or to otherwise protect or improve water quality—as beneficial uses of surface water under the federal Clean Water Act and state water quality law.<sup>35</sup> Although these water-quality-related beneficial use designations are legally distinct from the beneficial use determinations the Board makes in a water rights context, they provide relevant evidence of recognized societal benefits from non-extractive uses. These examples focus on water quality benefits, but there are other positive impacts (or avoidance or mitigation of negative impacts) achieved by recharging groundwater that should be considered beneficial uses.

The fact that particular non-extractive uses—like preventing land subsidence that would damage surface infrastructure and permanently reduce the storage capacity of an aquifer system, or enhancing base flow to a stream that supports important aquatic habitat—are not explicitly listed in statutes or regulations does not mean they are *not* beneficial uses. As explained above, a party can still seek a water right permit (or a water right change) to support a non-extractive use and ask the Board to determine that it is beneficial on a case-by-case basis. But under existing law, regulations, and guidance, the outcome of that determination is not certain. The resulting uncertainty may keep recharge projects that could provide substantial public benefits from happening, or result in unnecessary delays.

### III. THE BOARD CAN CLARIFY THAT RECHARGE FOR NON-EXTRACTIVE USES WITH BROAD BENEFITS IS A BENEFICIAL USE OF WATER

As discussed above, current beneficial use law governing groundwater recharge for extractive use (storage and recovery) is well established. However, ambiguities in the law exist for non-extractive uses. These ambiguities create uncertainty for water users, but they also create room for reasonable interpretation. Specifically, the Board can address these ambiguities by clarifying that recharge is a beneficial use of water when it is done for a non-extractive purpose that provides broad public benefits.

This could be accomplished, without statutory or regulatory changes, through administrative guidance and redesigned water right application and change petition forms. The guidance and forms would help those who are considering recharge projects to understand (1) the differences between (a) a surface water right for recharge that supports storage and recovery under that right and (b) a surface water right for recharge that supports a non-extractive use to enhance local hydrologic conditions and *does not* allow extractive use under that right and (2) what documentation they will need to provide to demonstrate beneficial use for these different purposes. The Table below suggests some key distinctions this guidance might draw between water rights for recharge that is directed at non-extractive use and recharge for storage and recovery.

**Differences between Water Rights for Recharge to Support a Non-Extractive Use vs. Water Rights to Support Recharge for Storage and Recovery**

	<b>RECHARGE FOR NON-EXTRACTIVE USE<sup>36</sup></b>	<b>RECHARGE FOR STORAGE AND RECOVERY (EXTRACTIVE USE)<sup>37</sup></b>
Beneficial Use	<p>Non-extractive use(s) identified in the water right permit, e.g.:</p> <ul style="list-style-type: none"> <li>• Protecting or enhancing water quality</li> <li>• Preventing or reversing land subsidence</li> <li>• Protecting or enhancing groundwater dependent ecosystems</li> <li>• Protecting or enhancing groundwater levels to ensure that basin residents using private domestic wells and those that depend on small community water systems have access to water.</li> <li>• Other non-extractive uses which provide basin-wide benefits</li> </ul>	<p>End use(s) identified in the water right permit, e.g.:</p> <ul style="list-style-type: none"> <li>• Agricultural irrigation</li> <li>• Aquaculture</li> <li>• Domestic use</li> <li>• Fish and wildlife preservation</li> <li>• Frost protection</li> <li>• Heat control</li> <li>• Mining</li> <li>• Municipal / industrial use</li> <li>• Power generation</li> <li>• Recreation</li> <li>• Stock watering</li> <li>• Other beneficial extractive uses</li> </ul>
Place of Use	Within the aquifer system, or at locations where water flows passively from the aquifer system	Location(s) of identified end use(s)
Status of Recharged Water	Left in the aquifer system <i>(factored into the basin's sustainable yield)</i>	Considered stored surface water <i>(not factored into the basin's sustainable yield)</i>
Right to Subsequent Extraction	None (under this water right)	Includes the right to recover stored water for the identified end use(s) under this water right
Distribution of Benefits	Water is recharged to achieve one or more broad public benefits, not for the specific extractive benefit of the water right holder. <sup>38</sup>	Water is recharged for the future extractive benefit of the water right holder, but may provide broader incidental benefits.

Of note, the suggested guidance would only clarify the principles that will be used in making beneficial use determinations related to water right applications or change petitions involving recharge, and the evidence that parties should submit to support these determinations. It would not result in applications or change petitions for recharge being categorically granted. Instead, applicants would still be required to demonstrate, with specific evidence, how the proposed recharge activities will provide benefits. The Board would still need to find that each individual application or petition meets the reasonableness and public interest requirements and to include appropriate terms and conditions to ensure that these determinations bear out

in practice. For example, the Board could potentially require that water rights be re-evaluated after a time to see if recharge projects are, in fact, providing the alleged benefits and require permittees to track them. This could include direct observations coupled with the results of rigorous calculations and modeling that demonstrate how recharge has helped to maintain or improve hydrologic conditions. In cases where water right permits are issued for recharge to achieve SGMA compliance, evidence, analysis, and monitoring provisions contained in groundwater sustainability plans (GSPs) could be used to meet these requirements.

It may be tempting to declare that all recharge is beneficial, on the assumption that all water put into the ground, for whatever length of time and for whatever purpose, provides a public benefit. This approach has the theoretical advantage of simplicity, but it also carries significant and unnecessary risks. First, recharging water to an aquifer does not always produce a benefit. It can cause harm if it raises groundwater levels enough to, for example, cause damage to crop roots, flood basements, lead to standing water in undesirable places, or cause the flow of poor-quality groundwater into a surface waterway. Second, as outlined above, the law regarding beneficial use and recharge for storage and recovery is already clear, and storage and recovery activities are not guaranteed to provide a net benefit to the public.

Declaring that all recharge is a beneficial use would upend California's sensible rule that storage alone is not a beneficial use. Doing so would effectively eliminate a critical protection against speculation and hoarding. All appropriative surface water rights are subject to forfeiture if the water is not actually put to the designated beneficial use within a five year period (as part of California's "use it or lose it" mandate).<sup>39</sup> In that case, the water will revert, becoming unappropriated water that is available to others.<sup>40</sup> The reversion requirement is meant to discourage water speculation to maximize the beneficial use of California's limited water supplies.<sup>41</sup> Those who purport to store water underground for a later beneficial use claim the right to pump that water at a later date. No one else has the right to use that "stored" water. If recharge itself is deemed a beneficial use, then there is no possibility of forfeiture and reversion. This could encourage those with access to surface water to divert more than they can use within a reasonable time period, while purporting to take up storage space that may not hydrologically exist, at the cost of "decreas[ing] the remaining storage capacity available for recharge that is considered part of the basin's . . . [sustainable] yield" and infringing on the rights of groundwater users.<sup>42</sup>

Therefore, the far better path would be for the Board to promulgate new guidance or regulations concerning non-extractive uses, while leaving the rules and regulations regarding recharge for storage and recovery unchanged.

#### IV. CONCLUSIONS AND RECOMMENDATIONS

The Board can encourage the appropriate use of surface water for groundwater recharge by issuing guidance clarifying that recharge for non-extractive purposes can constitute a beneficial use of surface water. This will entail:

- Writing guidance or promulgating regulations that help define non-extractive beneficial uses of groundwater;
- Creating standards which clearly articulate the benefits expected from any recharge permit and how applicants or petitioners might demonstrate those benefits; and
- Creating water right applications and change petition forms that are tailored to groundwater recharge projects for non-extractive beneficial uses including, but not limited to, projects for achieving groundwater sustainability goals under SGMA.

Defining the basis by which certain non-extractive uses could be considered to be beneficial would encourage useful groundwater recharge projects that could help make California's water systems more sustainable and resilient for people, agriculture, industry, and the environment.

#### Reviewers

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## ENDNOTES

- 1 *Nicholl v. Rudnick*, 72 Cal. Rptr. 3d 879, 887 (Cal Ct. App. 2008) (citing *Haight v. Costanich*, 194 P. 26, 28 (Cal. 1920)). See also *State ex rel. Office of State Eng'g v. United States*, 296 P.3d 1217, 1222 (N.M. App. 2012), cert. denied, 299 P.3d 862 (explaining that beneficial use requires "actual use for some purpose that is socially accepted as beneficial").
- 2 Cal. Exec. Order No. B-36-15 (Nov. 13, 2015), available at [https://www.govca.gov/wp-content/uploads/2017/08/11.13.15\\_EO\\_B-36-15.pdf](https://www.govca.gov/wp-content/uploads/2017/08/11.13.15_EO_B-36-15.pdf).
- 3 See, *Water Rights for Groundwater Recharge*, STATE WATER RES. CONTROL BD., [https://www.waterboards.ca.gov/waterrights/water\\_issues/programs/applications/groundwater\\_recharge/](https://www.waterboards.ca.gov/waterrights/water_issues/programs/applications/groundwater_recharge/) (last updated Aug. 1, 2018).
- 4 For a table summarizing the differences between extractive and non-extractive uses, see Table 1 at page 8, *infra*.
- 5 See, Cal. Water Code § 1242.
- 6 See, Cal. Water Code § 1242.
- 7 Cal. Code Regs. tit. 23, § 659.
- 8 Plans must be implemented in order "to meet the sustainability goal" of the basin, Cal. Water Code § 10727(a), where "sustainability goal" is defined as "the existence and implementation of one or more groundwater sustainability plans that achieve sustainable groundwater management by identifying and causing the implementation of measures targeted to ensure that the applicable basin is operated within its sustainable yield." Cal. Water Code § 10721(u). In turn, "sustainable yield" is defined as "the maximum quantity of water, calculated over a base period representative of long-term conditions in the basin and including any temporary surplus, that can be withdrawn annually from a groundwater supply without causing an undesirable result." Cal. Water Code § 10721(w).
- 9 Cal. Water Code § 10721(x)(1)-(6).
- 10 See Cal. Dept. of Natural Resources, *Groundwater Basins Subject to Critical Overdraft*, Oct. 18, 2016, available at [https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Groundwater-Management/Bulletin-118/Critically-Overdrafted-Basins/Files/COD-basins\\_2016\\_Dec19.pdf](https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Groundwater-Management/Bulletin-118/Critically-Overdrafted-Basins/Files/COD-basins_2016_Dec19.pdf) (map of groundwater basins currently considered to be critically overdrafted). See also Cal. Dept. of Water Resources, *Bulletin 118, Groundwater Basins in California: A Report to the Legislature in Response to Water Code Section 12924*, at 11 (1980), available at [https://water.ca.gov/LegacyFiles/pubs/groundwater/bulletin\\_118/ground\\_water\\_basins\\_in\\_california\\_bulletin\\_118-80/b118\\_80\\_ground\\_water\\_ocr.pdf](https://water.ca.gov/LegacyFiles/pubs/groundwater/bulletin_118/ground_water_basins_in_california_bulletin_118-80/b118_80_ground_water_ocr.pdf) (defining a basin to be "subject to critical conditions of overdraft when continuation of present water management practices would probably result in significant adverse overdraft-related environmental, social, or economic impacts"). See also John Brechhoeft, et al., *Groundwater: The Water-Budget Myth*, 40 *GROUNDWATER* 51-57 (1980) (defining overdraft as the sum of all outputs, including pumping, which exceeds the sum of all inputs, including recharge).
- 11 Cal. Water Code § 1252; see also Cal. Water Code §§ 1260-1266 (describing application requirements).
- 12 Cal. Water Code §§ 1240, 1375(c). A use is generally considered "reasonable" if the amount of water is "actually used and reasonable necessary for a useful purpose to which the water has been applied." *Nicholl v. Rudnick*, 72 Cal. Rptr. 3d 879, 887 (Cal Ct. App. 2008) (citing *Haight v. Costanich*, 194 P. 26, 28 (Cal. 1920)). For the purposes of this issue brief, our focus is on the "beneficial" requirement.
- 13 Cal. Water Code § 1375(d). Unappropriated waters have either never been appropriated or have previously been appropriated and subsequently abandoned after the appropriator failed to put the water to an approved beneficial use. Water is also considered "unappropriated" if, once appropriated, it flows back into an underground channel or any surface water body. Cal. Water Code § 1202.
- 14 Cal. Water Code §§ 1253, 1255-1257; see also Cal. Water Code §§ 1254, 1257.5-1259.
- 15 See, Cal. Water Code §§ 1700-1707.
- 16 See, e.g., Cal. Water Code §§ 1004, 1005.1, 1005.2, 1005.4, 1010, 1011.5, 1017, 1202, 1242.5-1244, 1257, 1425, 1435, 1727, 1745.07; see also Cal. Water Code § 12581.
- 17 See, Cal. Code Regs. tit. 23, § 659 (stating that beneficial uses of water include those defined in the Board's regulations); see also Cal. Water Code §§ 1058, 1252.
- 18 See, Cal. Code Regs. tit. 23, §§ 660-672.
- 19 Cal. Code Regs. tit. 23, § 659 ("The board will determine whether other uses of water are beneficial when considering individual applications to appropriate water.").
- 20 Water recharged for a non-extractive use is not actively removed by human activity (e.g., pumping). However, it is possible that water may subsequently move naturally to reach the surface.
- 21 For example, groundwater banking is a type of aquifer storage and recovery. In groundwater banking, users "deposit" water into an aquifer, and "deposits" are associated with a right to withdraw water at a later time. M. KIPARSKY, A. T. FISHER, ET AL., *RECHARGE NET METERING TO ENHANCE GROUND SUSTAINABILITY*, Center for Law, Energy, & the Environment, UC Berkeley School of Law, (April 2018), available at <https://doi.org/10.15779/J2792D> or [law.berkeley.edu/ReNeM](http://law.berkeley.edu/ReNeM).
- 22 See, e.g., *Millview Cnty. Water Dist. v. State Water Res. Control Bd.*, 229 Cal. App. 4th 879, 904-05 (2014); *Casitas Mun. Water Dist. V. United States*, 708 F.3d. 1340, 1356 (Fed Cir 2013).
- 23 Cal. Water Code § 1242 (emphasis added); see also Cal. Water Code §§ 1242.5; 1243; Cal. Regs. tit. 23 § 659 *et seq.*
- 24 See Cal. Code Regs. tit. 23, § 661.
- 25 See Cal. Code Regs. tit. 23, § 663.
- 26 See generally Robert G. Maliva, *Groundwater Banking: Opportunities and Management Challenges*, 16 *WATER POL'Y* 144 (2014).
- 27 See *id.* at 145-46, 152-55.
- 28 See *id.* at 154; see also NELL GREEN NYLEN, MICHAEL KIPARSKY, KELLY ARCHER, KURT SCHNIER & HOLLY DOREMUS, *TRADING SUSTAINABLY: CRITICAL CONSIDERATIONS FOR LOCAL GROUNDWATER MARKETS UNDER THE SUSTAINABLE GROUNDWATER MANAGEMENT ACT* 28-29 (2017), available at <https://www.law.berkeley.edu/research/clec/research/wheeler/trading-sustainably/> (discussing the spatial and temporal dimensions of groundwater extraction and use).
- 29 It is not a given that recharge for storage and recovery will produce broader benefits. For example, although groundwater recharge can fill storage space emptied during earlier times, it can also displace other water that was, or could be, stored in an aquifer system and would otherwise be available to groundwater users. See GREEN NYLEN, et al., *supra* note 28, at 17. And recharge that raises the water table could be harmful to others if it cause damage to plant roots, flows into basements or other structures, leads to standing water in undesirable places, or causes poor quality groundwater to discharge into a surface waterway.
- 30 For example, water recharged in the Pajaro Valley as part of an ongoing pilot project is intended to provide the basin with an overall benefit, and is not claimed by any particular party. See, M. KIPARSKY, A. T. FISHER, ET AL., *RECHARGE NET METERING TO ENHANCE GROUND SUSTAINABILITY*, Center for Law, Energy, & the Environment, UC Berkeley School of Law, (April 2018), available at <https://doi.org/10.15779/J2792D> or [law.berkeley.edu/ReNeM](http://law.berkeley.edu/ReNeM).
- 31 Exceptions include water quality uses (see, e.g., Cal. Code Regs. tit. 23, § 670; Cal. Water Code § 12581 (mentioning "repulsion of salt water" as a beneficial use)) and ecosystem uses (see, e.g., Cal. Code Regs. tit. 23, § 666).
- 32 See Cal. Code Regs. tit. 23, § 659.
- 33 Cal. Water Code § 1242.
- 34 See *Water Rights for Groundwater Recharge*, STATE WATER RES. CONTROL BD., [https://www.waterboards.ca.gov/waterrights/water\\_issues/programs/applications/groundwater\\_recharge/](https://www.waterboards.ca.gov/waterrights/water_issues/programs/applications/groundwater_recharge/) (last updated Aug. 14, 2018) (emphasis added).
- 35 See San Francisco Bay Plan, Ch. 2.1.7: [https://www.waterboards.ca.gov/sanfranciscobay/water\\_issues/programs/planningmdls/basinplan/web/docs/BP\\_all\\_chapters.pdf](https://www.waterboards.ca.gov/sanfranciscobay/water_issues/programs/planningmdls/basinplan/web/docs/BP_all_chapters.pdf) (last visited Aug. 14, 2018); Central Coast Plan, Ch. 2.2.5 [https://www.waterboards.ca.gov/centralcoast/publications\\_forms/publications/basin\\_plan/docs2017/2017\\_basin\\_plan\\_r3\\_complete.pdf](https://www.waterboards.ca.gov/centralcoast/publications_forms/publications/basin_plan/docs2017/2017_basin_plan_r3_complete.pdf) (last visited Aug. 14, 2018). Note that Cal. Water Code § 12581 also describes "repulsion of salt water" as a beneficial use, although it does not specifically mention this in the context of recharge.
- 36 These changes would require action from the Board. As discussed *infra*, that action would include the publication of a guidance document.
- 37 See Cal. Water Code § 1242. The beneficial uses listed under this category are found in Cal. Code Regs. tit. 23, §§ 660-672.
- 38 In some basins, it may be necessary to couple recharge activities with groundwater pumping limits in order to ensure that the benefits of recharge are achieved.
- 39 See Cal. Water Code § 1241 ("If the person entitled to the use of water fails to use beneficially all of any part of the water claimed by him or her, for which a right of use has vested, for the purpose for which it was appropriated or adjudicated, for a period of five years, that unused water may revert to the public and shall, if reverted, be regarded as unappropriated public water.").
- 40 See *id.*
- 41 See Sandra Zellmer, *The Anti-Speculation Doctrine and Its Implications for Collaborative Water Management*, 8 *Nev. L.J.* 994, 998 (2008) (concluding that such controls play a critical role in "curb[ing] the worst potential abuses of market forces by forcing transacting parties to articulate how and when the water will be applied to actual, beneficial uses, and by providing an administrative or judicial 'check' on speculative transactions that adversely affect third parties and ecological needs by depriving them of water.").
- 42 See NELL GREEN NYLEN, MICHAEL KIPARSKY, KELLY ARCHER, KURT SCHNIER & HOLLY DOREMUS, *TRADING SUSTAINABLY: CRITICAL CONSIDERATIONS FOR LOCAL GROUNDWATER MARKETS UNDER THE SUSTAINABLE GROUNDWATER MANAGEMENT ACT* 17 (2017), available at <https://www.law.berkeley.edu/research/clec/research/wheeler/trading-sustainably/>. In basins "with little unused storage capacity or rapid flow-through, storage... and related withdrawals based on incorrect water accounting assumptions could have significant negative unintended consequences." *Id.*