

STATE OF CALIFORNIA
CALIFORNIA REGIONAL WATER QUALITY CONTROL
BOARD SAN FRANCISCO BAY REGION

STAFF SUMMARY REPORT – Alec Naugle
MEETING DATE: December 13, 2017

ITEM: 9

SUBJECT: **Sustainable Groundwater Management in the San Francisco Bay Region – Status Report**

DISCUSSION: The San Francisco Bay Region is home to about 7 million residents, who use 1.5 million acre-feet of water per year. The Region’s groundwater basins supply about 20% of this total, most of which is from municipal/community supply wells, with a lesser contribution from private domestic and irrigation wells. The Basin Plan identifies 35 groundwater basins and subbasins in our Region (Figure 1). The most heavily used basins include Santa Clara Valley, Niles Cone (in the Fremont area), Livermore Valley, Napa Valley, Sonoma Valley, Clayton Valley in Contra Costa County, and the Westside Basins in San Francisco and San Mateo counties.

Our agency’s interest in sustainable groundwater management is in the nexus between groundwater quantity and quality and the recognition that the groundwater management activities of local agencies can affect how we prioritize site cleanups, regulate waste discharges, and protect stream/wetland habitat. This status report describes our approach and progress toward developing a deeper understanding of local plans and baseline groundwater conditions and better informing our regulatory activities.

Our Approach:

We have formed a multi-divisional staff team to evaluate the Region’s groundwater basins. The process includes: 1) engaging local groundwater agencies and reviewing their groundwater management plans, 2) evaluating baseline conditions including beneficial uses, supply well impacts, localized salt and nutrient areas of concern, and other water quality/habitat threats, and 3) documenting findings for each groundwater basin in a *fact sheet* for information sharing and coordination with local agencies and the public.

We’ve selected 14 groundwater basins (Table 1) for initial evaluation based on their relative priorities under the 2014 Sustainable Groundwater Management Act (SGMA), the State Water Board’s 2003 Groundwater Ambient Monitoring and Assessment (GAMA) program, and Board staff’s assessment of community groundwater reliance.

In addition to the above work, this multi-divisional “groundwater management” team is sharing information amongst our Region’s regulatory programs and making recommendations for source control efforts and grant funding

opportunities for local agencies under Proposition 1 (the Water Quality, Supply, and Infrastructure Improvement Act of 2014) and the SB445 Site Cleanup Subaccount Program.

Sustainable Groundwater Management Act (SGMA)

Traditionally, local groundwater management was voluntary and focused on ensuring municipal water supply while protecting against overdraft, subsidence, and saline water intrusion. In 2014, the State Legislature passed SGMA to address the threat of groundwater over-pumping and its associated negative impacts highlighted during the State's recent multi-year drought. Mandatory water quality protections include the avoidance of "significant and unreasonable degradation of water quality" and "surface water depletions that have significant and unreasonable adverse impacts on beneficial uses."

SGMA requires the formation of local Groundwater Sustainability Agencies (GSAs) and the development of Groundwater Sustainability Plans (GSPs) to balance long-term pumping and recharge in a way that supports beneficial uses and maintains good water quality. It gives the Department of Water Resources authority to approve plans and develop regulations and the State Water Board authority to enforce over-pumping restrictions.

By 2022, each high and medium priority groundwater basin must have a GSP to achieve sustainability within 20 years. Under SGMA, seven basins in our Region require GSPs: Santa Clara Valley, Niles Cone, Livermore Valley, the East Bay Plain from Hayward to Richmond, and the Napa, Sonoma, and Petaluma valleys (Table 1). These same seven basins plus the San Mateo peninsula's Westside basin previously developed groundwater management plans under the 1992 Local Groundwater Management Act (AB3030). We anticipate that local agencies will revise these plans in accordance with the new regulations to focus on sustainability and water quality concerns.

The remaining basins in the Region are essentially unmanaged despite having important municipal, domestic, and agricultural groundwater reliance. Examples include the Kenwood, Clayton, and Ygnacio valleys, and the coastal basins of Pescadero and Half Moon Bay (Figure 1). This presents a challenge, particularly to avoid negative impacts due to over-pumping or salt or nutrient buildup.

In 2016, the groundwater management team provided comments on the sustainability analysis for the Napa Valley, noting particular concerns about potential declining groundwater contributions (base flow) affecting several Napa River tributaries that provide important aquatic species habitat. The plan, which is required under SGMA, is currently under review by the Department of Water Resources. The team is also closely following groundwater evaluations in the San Mateo Plain and Westside basins of the San Mateo peninsula. While these basins are not subject to SGMA requirements, there is a growing recognition of the need to manage future groundwater development in these basins.

Salt and Nutrient Management

The State Water Board's 2009 Recycled Water Policy requires local agencies to develop salt and nutrient groundwater management plans (SNMPs). SNMPs must identify and quantify existing and potential future salt and nutrient sources, such as agricultural and landscape fertilizer applications, livestock operations, wastewater disposal, irrigation with recycled water, managed aquifer recharge, and seawater intrusion. These plans must also include an evaluation of each basin's long-term capacity to assimilate additional salt and nutrient loads, actions needed to restore or protect water quality, and a comprehensive groundwater-monitoring program.

Since December 2014, this Board has adopted resolutions of support for three SNMPs. These include the Sonoma Valley plan (December 2014), the Livermore Valley plan (March 2016), and the Santa Clara Valley plan (November 2016). We anticipate bringing a similar resolution for Board consideration next spring for the Niles Cone basin in the Fremont area. The team is also working with Napa County to develop a plan for the Napa Valley.

Evaluating local agency plans is proving to be extremely valuable as it is informing our priority-setting and decision-making regarding the permitting of wastewater disposal and recycled water projects and the development of local agency management plans for onsite wastewater systems. For example, in the Livermore Valley and Coyote Valley near Morgan Hill, SNMPs identified elevated nutrient (i.e., nitrate) areas of concern from current and past agricultural land uses and septic systems. For these areas, the groundwater management team is working with the local water districts to develop a path forward for further pollutant source investigation and control.

Water Supply Well Impacts

Two recent changes have vastly improved Board staff's ability to evaluate water quality in a groundwater basin. The first change was the transfer of the State's drinking water program to the State Water Board's Division of Drinking Water (DDW) from the Department of Public Health in 2014. The second change was recent improvements to the State Water Board's GeoTracker-GAMA database, where groundwater data from all Board programs is stored. As a result, Board staff now has direct access to sampling data for nearly 1300 water supply wells in the Region. The vast majority are municipal/community supply wells that are often deeper than private irrigation or domestic wells. Private wells remain unregulated and are sampled only on a voluntary basis.

The groundwater management team is mapping the supply well data to identify industrial chemical impacts and salt and nutrient conditions in each basin. The findings are driving pollutant source investigations and prioritization of SNMPs. In addition, the team is coordinating directly with State Board's GAMA staff to customize data queries and access well completion reports and with DDW staff for real-time notification of supply well sample results that exceed drinking water standards. This streamlined approach allows Board staff to drive pollutant source investigation more quickly, while also recommending to DDW possible changes to the sampling program for a particular supply well,

such as including additional pollutants or increasing sampling frequency.

Managed Aquifer Recharge

Aquifer recharge is an important component of sustainable groundwater management. Typically, local agencies use percolation ponds, spreading basins, in-stream recharge, and injection wells to recharge aquifers.

Five of the seven most heavily used basins in our Region have been relying on managed aquifer recharge for decades to replenish groundwater supply. Santa Clara Valley, Livermore Valley, and Niles Cone use old quarries, percolation ponds, and in-stream recharge. The Alameda County Water District also manages groundwater in the Niles Cone by pumping and treating saline groundwater to control saline water intrusion from the Bay. Sonoma Valley and the Westside Basins rely on “in-lieu” recharge, delivering excess surface water to golf courses and other groundwater users in exchange for decreased pumping. This allows aquifers to recharge naturally over time.

More recent management efforts include the Bayside Groundwater Project in San Lorenzo, which the Board approved in 2007. This aquifer storage and recovery (ASR) project has the capacity to inject up to one million gallons per day of treated potable water into the East Bay Plain basin and extract it for emergency or drought use. The East Bay Municipal Utility District is considering plans for project expansion. At the same time, the Sonoma County Water Agency is planning a similar project in the Sonoma Valley using treated potable water from the Russian River that could eventually recharge up to ten percent of the total groundwater used in Sonoma Valley. The groundwater management team is working closely with the Water Agency to permit a 1-year pilot test of the Sonoma Valley ASR project. If successful, full-scale implementation could begin in 2019.

Our regulatory approach to permitting recharge projects largely depends on the quality of the source water and its potential impact on the quality of the receiving groundwater. For example, treated potable water may contain disinfection by-products that could present a concern when injected directly into an aquifer in large quantities. For recharge with recycled water or urban stormwater, there are concerns about the source water’s levels of industrial chemicals, contaminants of emerging concern, and salts and nutrients. Furthermore, the type of source water and the recharge method could liberate naturally-occurring arsenic or chromium in an aquifer.

Waste discharge requirements or waivers are our tools to regulate recharge projects. In 2012, the State Water Board adopted general waste discharge requirements specifically for ASR projects using treated potable water. In 2014, the State Department of Public Health’s drinking water program (now part of State Water Board’s DDW) adopted regulations for indirect potable reuse (IPR) that involves recharging highly treated, recycled water into drinking water aquifers.

While we do not have any pending applications for IPR projects, agencies such as the Santa Clara Valley Water District are considering them. Additionally,

researchers continue to develop tools to help State and local agencies evaluate the use of captured stormwater to augment local groundwater supplies.

Groundwater Monitoring

In 2001, the State developed the Groundwater Ambient Monitoring and Assessment program (GAMA) to evaluate the quality and vulnerability of aquifers tapped for municipal supply. GAMA, along with DDW, monitors municipal, domestic, and agricultural supply wells. The U.S. Geological Survey implements GAMA with bond funding from Proposition 50 (2002) and, more recently, the State Water Board's Waste Discharge Permit Fund. Monitoring data are stored in the GeoTracker-GAMA database: <http://geotracker.waterboards.ca.gov/gama/>.

GAMA uses ultra-low detection limits in the part-per-trillion range. For comparison, allowable drinking water standards for many toxic compounds are in the part-per-billion range, so GAMA's detection limits are ten to a thousand times more sensitive. Baseline surveys of the deeper public supply aquifers in the most heavily used basins in our Region are now complete, and "trends" monitoring will occur at three and ten-years after baseline establishment. In 2012, shallower aquifers tapped by domestic and irrigation wells were assessed in Napa and Sonoma counties.

Findings indicate that naturally-occurring trace elements such as arsenic and boron are more prevalent than any other constituent above benchmarks. Statewide, this occurs in 15% to 20% of the public supply resource; in our Region, we estimate this is somewhat less. Nitrate exceeds benchmarks less often but is more likely to occur at shallower groundwater depths. Industrial pollutants, such as solvents, petroleum-based compounds and fuel additives, and pesticides, are less prevalent still, with high concentrations occurring in less than 1% of the deeper resource. These findings are extremely relevant and helpful in improving the basis on which we prioritize our groundwater cleanup and protection actions.

Future Priorities

Identifying baseline conditions, supply well impacts, and localized salt and nutrient hotspots is essential to protecting and restoring the beneficial uses of groundwater in our Region. Understanding groundwater use and plans can affect our cleanup and restoration decisions and timeframes. Therefore, engaging the local agency and its planning process, while selectively using our regulatory tools to control discharges and drive further pollutant source identification and abatement, are important priorities. The SB445 Site Cleanup Subaccount Program now provides some limited funding for Board staff's time to cover these previously unfunded activities.

In sum, recent regulatory and legislative initiatives provide us with new tools to better protect and restore our groundwater resources and ensure that they are sustainably managed. The Board will need to review and/or approve some of the products of these initiatives in the future, and we will regularly update the Board on our efforts to ensure sustainable groundwater management in our Region.

RECOMMEN-
DATION:

This is an information item only and no action is necessary.

File No. 1210.47 (AWN)

Attachment:

Figure 1 – Groundwater Basins in the San Francisco Bay Region

Table 1 – Groundwater Management Planning in the San Francisco Bay Region

Figure 1. Groundwater Basins in the San Francisco Bay Region

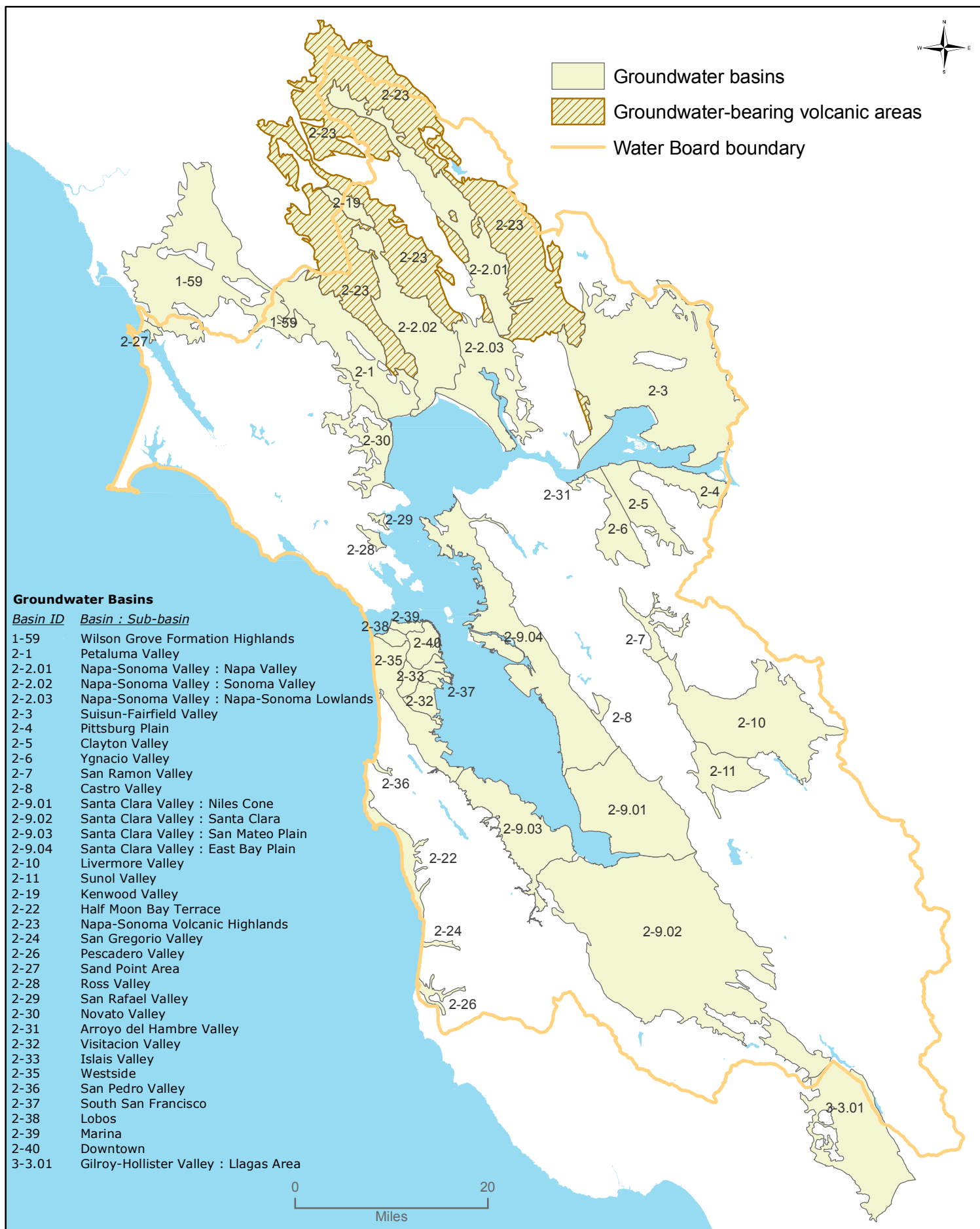


Table 1 – Groundwater Basin* Management in the San Francisco Bay Region

Groundwater Basin/Subbasin	SGMA Priority	High Community Reliance	Local Groundwater Management Agencies	Groundwater Management Plans	Salt/Nutrient Management Plan	Managed Aquifer Recharge
Petaluma Valley 2-01	Yes	Yes	Petaluma Valley Groundwater Sustainability Agency (GSA)	There is no existing GMP. A SGMA GSP is required by 2022.	No.	No. Natural infiltration of precipitation is the primary source of aquifer recharge.
Sonoma Valley 2-02.02	Yes	Yes	Sonoma Valley Groundwater Sustainability Agency (GSA)	A GMP (2012) prepared by the Sonoma County Water Agency (SCWA) will provide the basis for a SGMA GSP required by 2022.	Yes (2014). The Water Board approved the plan in December 2014.	Sonoma Valley relies on “in-lieu” recharge to optimize natural infiltration of precipitation as the primary source of aquifer recharge. The SCWA has proposed a pilot test for an aquifer storage and recovery project in 2018.
Niles Cone 2-09.01	Yes	Yes	Alameda County Water District (GSA)	A GMP (2014) prepared by the Alameda County Water District (ACWD) will provide the basis for a SGMA GSP required by 2022.	A draft plan (2016) is currently under review.	Yes. ACWD operates passive recharge using streambed infiltration and quarries to recharge natural streamflow and imported surface water.
Santa Clara 2-09.02	Yes	Yes	Santa Clara Valley Water District (GSA)	A GMP (2016) prepared by the Santa Clara Valley Water District (SCVWD) will provide the basis for a SGMA GSP required by 2022.	Yes (2014). The Water Board approved the plan in November 2016.	Yes. SCVWD operates passive recharge using streambed infiltration and percolation basins to recharge natural streamflow and imported surface water.
East Bay Plain 2-09.04	Yes	Yes	City of Hayward/East Bay Municipal Utility District (GSA)	A GMP for the South East Bay Plain Basin (2013) prepared by the East Bay Municipal Utility District (EBMUD) will provide the basis for a SGMA GSP required by 2022.	No.	Since 2007 EBMUD has operated the Bayside Aquifer Storage Recovery groundwater banking project.
Livermore Valley 2-10	Yes	Yes	Zone 7 Water Agency (GSA)	A GMP for the Livermore-Amador Valley Groundwater Basin (2005) prepared by the Zone 7 Water Agency (Zone 7) will provide the basis for a SGMA GSP required by 2022.	Yes (2005 & 2015). The Water Board approved the SMP in 2005 and the NMP in March 2016.	Yes. Zone 7 operates passive recharge using streambed infiltration and quarries to recharge natural streamflow and imported surface water.

Table 1 – Groundwater Basin* Management in the San Francisco Bay Region

Groundwater Basin/Subbasin	SGMA Priority	High Community Reliance	Local Groundwater Management Agencies	Groundwater Management Plans	Salt/Nutrient Management Plan	Managed Aquifer Recharge
Napa Valley 2-02.01	Yes	Yes	Napa County, Groundwater Resources Advisory Committee	The Napa Valley Groundwater Sustainability Plan (2017) is a SGMA GSP alternative.	Under development.	No. Natural infiltration of precipitation is the primary source of aquifer recharge.
San Mateo Plain 2-09-.03	No	Yes	City of East Palo Alto	The City of East Palo Alto prepared a GMP in 2015 for a sub area known as the San Francisquito Cone. San Mateo County is leading an effort to evaluate groundwater resources in the entire subbasin.	No.	No. Natural infiltration of precipitation is the primary source of aquifer recharge.
Westside 2-35	No	Yes	San Francisco Public Utilities Commission (GSA)	The North Westside Basin developed a GMP in 2005 and the South Westside Basin developed a GMP in 2012	No.	The Westside basin relies on “in-lieu” recharge to optimize natural infiltration of precipitation as the primary source of aquifer recharge.
Kenwood Valley 2-19	No	Yes	Sonoma Valley Groundwater Sustainability Agency (GSA)	None identified	No.	No. Natural infiltration of precipitation is the primary source of aquifer recharge.
Half Moon Bay Terrace 2-22	No	Yes	None identified	The Montara Water and Sanitary District proposes to develop the Mid-Coastside Multi-Basin GMP.	No.	No. Natural infiltration of precipitation is the primary source of aquifer recharge.
Pescadero Valley 2-26	No	Yes	None identified	None identified	No.	No. Natural infiltration of precipitation is the primary source of aquifer recharge.
Clayton Valley 2-05	No	Yes	None identified	None identified	No.	No. Natural infiltration of precipitation is the primary source of aquifer recharge.
Ygnacio Valley 2-06	No	Yes	None identified	None identified	No.	No. Natural infiltration of precipitation is the primary source of aquifer recharge.

GSA – Groundwater Sustainable Agency (SGMA)
 GSP – Groundwater Sustainability Plan (SGMA)
 GMP – Groundwater Management Plan (AB 3030)
 S/NMP – Salt/Nutrient Management Plan
 MAR – Managed Aquifer Recharge

* Based on Board staff’s initial evaluation of 14 of 35 groundwater basins and subbasins in the SF Bay Region.