

STATE OF CALIFORNIA
STATE WATER RESOURCES CONTROL BOARD

ORDER WQ ~~2016-2018-~~

In the Matter of Review of
Waste Discharge Requirements General Order No. R5-2012-0116
for Growers Within the Eastern San Joaquin River Watershed
that are Members of the Third-Party Group

Issued by the
California Regional Water Quality Control Board,
Central Valley Region

SWRCB/OCC FILES A-2239(a)-(c)

BY THE BOARD:

In this order, the State Water Resources Control Board (State Water Board or Board) reviews on its own motion Waste Discharge Requirements (WDRs) General Order No. R5-2012-0116 issued by the Central Valley Regional Water Quality Control Board (Central Valley Water Board) for Growers within the Eastern San Joaquin River Watershed that are Members of a Third-Party Group (hereinafter "Eastern San Joaquin Agricultural General WDRs" or "General WDRs"). The Eastern San Joaquin Agricultural General WDRs authorize discharges from irrigated lands¹ operations to waters of the state within the Eastern San Joaquin River Watershed and set forth a number of requirements for monitoring and planning, for implementation and evaluation of management practices, and for participation in various education and outreach events. For the reasons discussed herein, the State Water Board generally upholds the structure and requirements of the Eastern San Joaquin Agricultural General WDRs, but directs a number of revisions, primarily to add greater specificity and transparency in reporting of management practice implementation, to require reporting of certain nitrogen application-related data needed for management of excess nitrogen use, and to expand the surface water and groundwater quality monitoring programs of the General WDRs. Many of the revisions to the Eastern San Joaquin Agricultural General WDRs implement the conclusions of an agricultural expert panel that made recommendations to the State Water Board on an appropriate regulatory program for

¹ Irrigated lands are lands irrigated to produce crops or pasture for commercial purposes, nurseries, and privately and publicly managed wetlands. (Eastern San Joaquin Agricultural General WDRs, Attach. E, Definitions, p.3.)

irrigated lands in September 2014 (Agricultural Expert Panel)² while review of the Eastern San Joaquin Agricultural General WDRs was pending before the State Water Board.

I. BACKGROUND

California's agricultural industry produces more than 400 commodities at over 75,000 farms and ranches and is a significant part of the state's economy, providing a large percentage of fruits and vegetables for the nation. Agriculture is especially significant within the Central Valley, where it represents over seven million acres of irrigated lands, approximately one million of which are in the Eastern San Joaquin Watershed. The California grower community has a rich knowledge base of management and business practices, developed over several generations of farming. Because the vast majority of growers plan for the long term, they are naturally motivated to protect natural resources, through stewardship of the land. Over the last few decades, as the impacts of agricultural discharges on water quality have been further studied and understood, growers have collaborated with the regional water quality control boards and the State Water Board (collectively, "water boards"), most commonly through the mechanism of grower coalitions, to find shared solutions to address existing and potential water quality issues. At the same time, the water boards have acknowledged that growers have a legitimate interest in protecting confidential business practices and recognized the need to preserve the tradition of agriculture in California and the ongoing viability of agriculture as an essential driver of the state's economy.

Water quality impacts associated with agriculture are complex and addressing them requires pooling and focusing the knowledge, expertise, and resources of all concerned parties, including growers and their representatives, the regulatory agencies, and the environmental and environmental justice communities. The issues are especially complicated because the same activities that are essential to producing a crucial, reliable food supply – e.g. pesticide use to control pests, nitrogen to fertilize crops, irrigation to water crops – also underlie many of the critical impacts. Pesticide toxicity in surface water threatens the viability of the water bodies to support aquatic and other species. High levels of nitrates found in ~~in~~-drinking water supply wells impact public health. Concentrated levels of salt resulting from long-term irrigation adversely affect the quality of groundwater for irrigation, municipal, and other uses. Collectively, we have a responsibility to acknowledge these impacts and address them, but in a manner that

² Conclusions of the Agricultural Expert Panel, Recommendations to the State Water Resources Control Board pertaining to the Irrigated Lands Regulatory Program (Sept. 9, 2014), available at http://www.swrcb.ca.gov/water_issues/programs/agriculture/docs/ILRP_expert_panel_final_report.pdf (as of ~~Jan~~Oct. 5, 2016, 2017) (Agricultural Expert Panel Report). We take official notice of the Agricultural Expert Panel Report. (Cal. Code Reg., tit. 23, § 648.2.)

preserves the economic viability of agriculture. In some cases, historic agricultural practices have resulted in the impacts we see today. Current practices are also, in some cases, causing impacts and although agricultural practices have generally improved over time, we have an obligation to continue to develop appropriate solutions. This is an ongoing process that requires a thorough understanding of the complex relationship between agricultural practices and water quality impacts gained through collecting and analyzing real-world data and responding to that data with innovations in practices. This data-driven analysis of the issues forms the foundation for fair, even-handed, and reasonable regulation of irrigated lands.

The Central Valley Water Board began engaging the grower community when it adopted its first regulatory program for irrigated lands in 1982. This initial regulatory program, structured as a waiver of waste discharge requirements under Water Code section 13269, conditionally waived the requirement for submittal of a report of waste discharge for irrigation return flow as long as the discharge did not cause toxicity or excess sediment discharges that would violate turbidity objectives. In 2003, in response to revisions to Water Code section 13269,³ the Central Valley Water Board re-examined its original 1982 waiver and significantly changed its regulatory strategy for irrigated lands (2003 Central Valley Agricultural General Waiver).⁴ The 2003 Central Valley Agricultural General Waiver required surface receiving water monitoring of numerous parameters to begin identifying where irrigated lands might be contributing to water quality problems. To take advantage of local knowledge and resources, leverage limited regulatory resources, and minimize costs, the Central Valley Water Board allowed growers to form discharger coalitions, with a third-party representative responsible for grower outreach and education and for implementation of a number of the requirements of the regulatory program, including representative monitoring. In 2006, the Central Valley Water Board modified the 2003 Central Valley Agricultural General Waiver, retaining the third-party structure, but now also requiring submission of management plans when water quality problems were identified (2006 Central Valley Agricultural General Waiver).⁵ The 2006 Central Valley Agricultural General Waiver was renewed for an additional two years in 2011.

³ There were two relevant amendments to Water Code section 13269. The first amendment required the regional water boards to terminate or extend all existing waivers of WDRs on or before January 1, 2003. Thereafter, waivers of WDRs were not allowed to exceed five years in duration. (See Stats. 1999, ch. 686, § 2.) The second amendment required waivers of WDRs to contain monitoring provisions unless the regional water board determined that the discharge did not pose a significant threat to water quality. (See Stats. 2003, ch. 801, § 1.)

⁴ Central Valley Water Board Resolution R5-2003-0105, Administrative Record (AR) 00001-00012. In addition to the 2003 Central Valley Agricultural General Waiver, Resolution R5-2003-0105 adopted a second conditional waiver for individual dischargers that chose not to join a coalition.

⁵ Central Valley Water Board Order No. R5-2006-0053, AR 01037-01069. As in 2003, the Central Valley Water Board also adopted a separate conditional waiver for individual dischargers not joining a coalition. (Central Valley Water Board Order No. R5-2003-0054.)

When the Central Valley Water Board issued the 2006 Central Valley Agricultural General Waiver, the Board committed to preparing an environmental impact report (EIR) pursuant to the California Environmental Quality Act (CEQA) that would comprehensively address discharges of waste from irrigated lands to all waters of the state, both surface water and ground water. The Draft Programmatic EIR was released in July 2010 and the Final Programmatic EIR was certified by the Central Valley Water Board on April 7, 2011.⁶ The Programmatic EIR was challenged by numerous parties, including two of the petitioners in this proceeding. On May 21, 2013, the Sacramento County Superior Court issued a final ruling that rejected the challenges to the Programmatic EIR.⁷ The final ruling was not appealed.

After certification of the Final Programmatic EIR, the Central Valley Water Board began working with a stakeholder advisory workgroup and a groundwater monitoring advisory workgroup to further develop its long-term irrigated lands regulatory program (ILRP). The Central Valley Water Board set out to issue watershed-specific or commodity-specific WDRs instead of one region-wide waiver of WDRs like the 2006 Central Valley Agricultural General Waiver. In April 2012, the Central Valley Water Board issued the first set of draft WDRs for the Eastern San Joaquin River Watershed, conducted several public workshops and multiple meetings with stakeholders and interested parties, and held a hearing in November 2012.

On December 7, 2012, the Central Valley Water Board adopted the Eastern San Joaquin Agricultural General WDRs.⁸ The Eastern San Joaquin Agricultural General WDRs regulate discharges to groundwater from irrigated lands as well as surface water discharges. The Eastern San Joaquin Agricultural General WDRs carry forward many of the program elements from the 2006 Central Valley Agricultural General Waiver. These elements include allowance of

⁶ Central Valley Water Board Resolution No. R5-2011-0017, AR 03720-03721.

⁷ *San Joaquin County Resource Conservation Dist., et al. v. Cal. Regional Water Quality Control Bd., Central Valley Region, et al.* (Super. Ct. Sacramento County, 2013, No. 34-2012-80001186). We take official notice of the final ruling. (Cal. Code Reg., tit. 23, § 648.2.)

⁸ The Central Valley Water Board has since amended the Eastern San Joaquin Agricultural General WDRs ~~four~~five times. We take official notice of the amended versions of the Eastern San Joaquin Agricultural General WDRs. (*Ibid.*) The Central Valley Water Board adopted amendments to the General WDRs on October 3, 2013, on March 27, 2014, on April 17, 2015, ~~and~~ on October 2, ~~2015–2015, and on February 19, 2016.~~ Our references and citations to the Eastern San Joaquin Agricultural General WDRs is to the ~~final amended version.~~ This version effective on October 2, 2015. The amendments on February 19, 2016, are not reflected in this order or its attachments, but those amendments relate only to managed wetlands and irrigated pasture with no external nitrogen inputs and are therefore not affected by our order. The October 2, 2015 version was not submitted as part of the administrative record prepared by the Central Valley Water Board, but is available at http://www.waterboards.ca.gov/centralvalley/board_decisions/adopted_orders/general_orders/r5-2012-0116-r3.pdf (as of ~~Feb~~Oct. 3, 2016-6, 2017). We also note that the October 3, 2013, amendment clarified that any reports approved by or determinations made by the Executive Officer of the Central Valley Water Board in accordance with the terms of the General WDRs are reviewable by the Board itself upon request. (Eastern San Joaquin Agricultural General WDRs, Attach. A, Information Sheet, p.27.) As a result, we do not take up the argument made by Environmental Petitioners regarding improper delegation of certain review and approvals to the Executive Officer.

a third party to represent the growers, outreach and education requirements, representative monitoring of receiving waters (as opposed to farm discharge monitoring), annual reporting, requirements to implement and evaluate management practices, and receiving water limitations. The Eastern San Joaquin Agricultural General WDRs add programs for groundwater monitoring and groundwater protection, including implementation of groundwater management plans.

The requirements of the Eastern San Joaquin Agricultural General WDRs are discussed in greater detail in the sections that follow. In brief summary, the General WDRs assign certain requirements to the individual growers (Members) and certain requirements to the coalition (Third Party).⁹ Each Member must meet receiving water limitations (except where the Third Party is implementing a management plan to address known exceedances caused by agricultural discharges), which prohibit the Member from causing or contributing to exceedances of applicable water quality objectives in surface water and groundwater. Each Member must also implement management practices that minimize waste discharge to surface water and groundwater and protect wellheads from surface water intrusion. Each Member is responsible for conducting farm evaluations, which must document the Member's management practices. Each Member is required to prepare and implement a nitrogen management plan that meets the Eastern San Joaquin Agricultural General WDRs' requirement to minimize nutrient application relative to crop need. Members in areas susceptible to erosion must prepare and implement sediment and erosion control plans.

The Third Party, in turn, must conduct education and outreach activities, collect data from Members regarding management practice implementation and nitrogen application and analyze and report aggregated information on such implementation to the Central Valley Water Board. The Third Party is also responsible for maintaining the collected data and submitting the data to the Regional Board upon request. The Third Party must conduct surface water and groundwater quality monitoring. In response to certain triggers, including exceedances of water quality objectives in surface water or groundwater, the Third Party must prepare and submit to the Central Valley Water Board management plans to address water quality issues in a given area and implement those plans in accordance with a specific schedule for implementation of improved or additional management practices and other tasks by Members. The Third Party that has taken on this responsibility under the Eastern San Joaquin Agricultural General WDRs is the East San Joaquin Water Quality Coalition.

⁹ Throughout this order, references to the "Third Party" are to the third-party group referenced in the Eastern San Joaquin Agricultural General WDRs; references to a "third party," "third-party group," or "third-party approach/structure" are to agricultural coalitions generally.

The Eastern San Joaquin Agricultural General WDRs assign some of the above requirements based on threat to water quality: regulatory requirements are heightened in higher threat geographic areas (called “high vulnerability areas”), whereas lower threat geographic areas have fewer requirements (called “low vulnerability areas”).

In response to the Central Valley Water Board’s adoption of the Eastern San Joaquin Agricultural General WDRs, three timely petitions for review were filed with the State Water Board by Asociación de Gente Unida por el Agua, et al. (AGUA), by the California Sportfishing Alliance and California Water Impact Network (CSPA), and by San Joaquin County Resource Conservation District, et al. (SJCRCD) (collectively “Petitioners”). After deeming the petitions complete, consolidating them for review, receiving a response to the petitions and the administrative record from the Central Valley Water Board, and responses to the petitions from interested persons, we adopted Order WQ 2014-0135 on August 5, 2014, taking this matter up on our own motion. We granted own motion review in order to have sufficient time to adequately review the submissions and to allow for completion of a report by the Agricultural Expert Panel (Agricultural Expert Panel Report) prior to making decisions on related issues raised in the petitions.

The Agricultural Expert Panel Report grew out of a legislative effort to address nitrate in groundwater. In 2008, the Legislature added section 83002.5¹⁰ to the Water Code requiring the State Water Board to develop pilot projects focusing on nitrate in groundwater in the Tulare Lake Basin and the Salinas Valley, and to submit a report to the Legislature. In its report, the State Water Board made fifteen recommendations including Recommendation #11, calling for a task force to identify intended outcomes and expected benefits of a nitrogen mass balance tracking system, and Recommendation #14, calling for a panel of experts to assess existing agricultural nitrate control programs and develop recommendations to ensure that ongoing efforts are protective of groundwater quality.

The task force (Nitrogen Tracking Task Force) was convened by the California Department of Food and Agriculture (CDFA), in coordination with the water boards and with participation by stakeholders and experts from agricultural organizations, academia, and the environmental advocacy community. [The Nitrogen Tracking Task Force issued its final report in December of 2013. The report made recommendations on the appropriate components of an](#)

¹⁰ Added by Stats. 2007-2008, 2nd Ex.Sess., ch. 1 (S.B.1), § 6, eff. March 1, 2009.

effective nitrogen tracking and reporting system, including data elements that should be tracked and reported.¹¹ We consider those recommendations in this order.

The panel of experts (Agricultural Expert Panel) was convened by the State Water Board, in coordination with CDFA, and considered all existing studies, programs, and efforts for agricultural nitrate control, including the recommendations of the Nitrogen Tracking Task Force.

On September 24, 2013, concurrent with the proceedings of the Nitrogen Tracking Task Force, but prior to convening the Agricultural Expert Panel, the State Water Board adopted Order WQ 2013-0101, reviewing the Central Coast Regional Water Board's (Central Coast Water Board) waiver of WDRs for irrigated lands (Central Coast Agricultural Order). We stated in that order that many of our conclusions represented an interim approach to regulation of agriculture, pending further consideration by the Agricultural Expert Panel. As we laid out in Order WQ 2013-0101, we referred a number of additional questions regarding the development of an appropriate agricultural regulatory program to the Agricultural Expert Panel for consideration, primarily questions specific to agricultural nitrate control programs, but also questions regarding appropriate risk or vulnerability determinations for purposes of tiering requirements and regarding effective surface water monitoring.¹²

Many of these questions are relevant to the current proceedings.

The Agricultural Expert Panel held multiple public meetings over a six -month period in Tulare, San Luis Obispo, and Sacramento, to consider the questions posed by the State

¹¹ The Nitrogen Tracking Task Force's final report is available at <https://www.cdfa.ca.gov/environmentalstewardship/PDFs/NTRSTFFinalReport122013.pdf> (as of ~~Jan. 5, 2016~~ Oct. 6, 2017) (Nitrogen Tracking and Reporting Task Force, Final Report (Dec. 2013)) (Nitrogen Tracking Task Force Report). We take official notice of the Nitrogen Tracking Task Force Report. (Cal. Code Reg., tit. 23, § 648.2.)

¹² The following questions were posed to the Agricultural Expert Panel: "1. How can risk to or vulnerability of groundwater best be determined in the context of a regulatory program such as the Irrigated Lands Regulatory Program (ILRP)? 2. Evaluate and develop recommendations for the current approaches taken to assessing risk to or vulnerability of groundwater. 3. How can risk to or vulnerability of surface water best be determined in the context of a regulatory program such as the ILRP? 4. Evaluate and develop recommendations for the current approaches taken to assessing risk to or vulnerability of surface water. 5. What management practices are expected to be implemented and under what circumstances for the control of nitrogen? 6. What management practices are recommended for consideration by growers when they are selecting practices to put in place for the control of nitrogen? 7. Evaluate and make recommendations regarding the usage of various nitrogen management and accounting practices. 8. Evaluate and make recommendations regarding the most effective methods for ensuring growers have the knowledge required for effectively implementing recommended management practices. 9. What measurements can be used to verify that the implementations of management practices for nitrogen are as effective as possible? 10. Evaluate and make recommendations regarding the usage of various verification measurements of nitrogen control. 11. Evaluate the relative merits, and make recommendations regarding the usage of, surface water measurement systems derived from either receiving water or a discharge monitoring approach to identify problem discharges. 12. Evaluate and make recommendations on how best to integrate the results of the Nitrogen Tracking and Reporting System Task Force with any above recommendation regarding management practices and verification measures. 13. Evaluate and make recommendations on the reporting requirements to report budgeting and recording of nitrogen application on a management block basis versus reporting aggregated numbers on a nitrate loading risk unit level." (Agricultural Expert Panel Report, p. i.) Upon request from the Agricultural Expert Panel, the State Water Board provided additional clarification on several of the questions. (See Agricultural Expert Panel Report, Appen. C.)

Water Board. The Agricultural Expert Panel consisted of eight members with various areas of specialization including: an irrigation specialist/agricultural engineer, a soil scientist, a hydrogeologist, an agronomist, a certified crop advisor, a University of California Cooperative Extension farm advisor, a Central Coast grower, and a Central Valley grower. The Agricultural Expert Panel released a draft report in July 2014 considering and answering the questions posed, took written public comment on the draft report, and issued the Agricultural Expert Panel Report on September 9, 2014. The Agricultural Expert Panel Report was presented to us on September 23, 2014, and made a number of recommendations for the regulation of irrigated lands.^{13, 13} In this order, we consider and incorporate a number of those recommendations. ~~The discussed recommendations are appropriate not only for the Eastern San Joaquin Agricultural General WDRs, but also for the next generation of regional water quality control board (regional water board) agricultural regulatory programs statewide, and our conclusions in this precedential order apply statewide (except where a regional water board expressly finds that there are truly significant site-specific conditions that render these requirements inappropriate). The specific recommendations made by the Agricultural Expert Panel and endorsed by us in this order are discussed under the appropriate topics in the next section.~~¹⁴

Many of the findings and directions of this order are appropriate not only for the Eastern San Joaquin Agricultural General WDRs, but also for the next generation of regional water quality control board (regional water board) agricultural regulatory programs statewide. In the sections that follow, we indicate which of our conclusions are precedential and guide irrigated lands programs statewide.¹⁴ Our conclusions are intended to guide irrigated lands programs that directly regulate growers without a third-party intermediary, in addition to third-party based programs, except where specifically noted.

¹³ The Agricultural Expert Panel proceedings are detailed at http://www.swrcb.ca.gov/water_issues/programs/agriculture/ (as of ~~Jan. 5, 2016~~Oct. 6, 2017). In addition to the Agricultural Expert Panel Report, we take official notice of the proceedings of the Agricultural Expert Panel. (Cal. Code Reg., tit. 23, § 648.2.)

¹⁴ Generally, State Water Board petition orders are precedential unless otherwise designated. (State Board Order WR 96-1 (Lagunitas Creek), at fn. 11.) Here, because of the significant variation in agricultural practices statewide, automatic application of all requirements endorsed in this Order to all of the agricultural discharge programs statewide is inappropriate.

The specific recommendations made by the Agricultural Expert Panel and endorsed by us in this order are discussed under the appropriate topics in the next section.¹⁵

II. ISSUES AND FINDINGS

The three petitions raise a number of issues concerning the Central Valley Water Board's adoption of the Eastern San Joaquin Agricultural General WDRs. To the extent petitioners raise issues that are not discussed in this order, either in whole or in part, such issues are dismissed as not raising substantial issues appropriate for our review.⁴⁵¹⁶

In particular, although we have carefully reviewed the petition filed by SJCRCD, we have not taken up the issues raised in that petition, primarily because the issues have already been resolved through a court ruling and through our precedential order WQ 2013-0101 issued since SJCRCD filed its petition. The majority of SJCRCD's arguments relate to the CEQA documents supporting the General WDRs and some of those arguments were resolved by the Superior Court's May 21, 2013, ruling upholding the Programmatic EIR.⁴⁶¹⁷ SJCRCD noted in its petition that its CEQA challenges related to the EIR were already properly pending in the litigation challenging the Programmatic EIR and were only being repeated in the petition in the event that any party or a court disagreed.⁴⁷¹⁸ We agree with SJCRCD that it properly raised those issues in the litigation, and we do not address them again here. SJCRCD also argues that the Central Valley Water Board was required under Water Code 13141 to incorporate an economic analysis on the costs to agriculture of the General WDRs into the relevant water quality control plans. We resolved that question in Order WQ-2013-0101 by finding that section 13141 only applies to an agricultural water quality control program that is adopted within a water quality control plan, not through a permitting action, like the Eastern San Joaquin Agricultural General WDRs.⁴⁸¹⁹

⁴⁴¹⁵ In reviewing the Eastern San Joaquin Agricultural General WDRs, we also take into account some of our precedential determinations in State Water Board Order WQ 2013-0101. While the Central Coast Water Board's approach to regulating irrigated lands has significant differences when compared to the Central Valley Water Board's approach, there are a number of overlapping issues raised by both sets of petitions for review. However, State Water Board Order WQ 2013-0101 is the subject of current litigation. On September 30, 2015, the County of Sacramento Superior Court issued a judgment and peremptory writ of mandate compelling the State Water Board to set aside Order WQ 2013-0101 and reconsider the Central Coast Agricultural Order. The judgment and writ issued in accordance with a Ruling on Submitted Matter, dated August 10, 2015 (*Monterey Coastkeeper et al. v. State Water Resources Control Bd.* (Super Ct. Sacramento County, 2015, No. 34-2012-80001324) (Sacramento Superior Court Ruling) in which the court considered a number of the issues decided in Order WQ-2013-0101. Our appeal of the judgment and writ is currently pending. (*Monterey Coastkeeper et al. v. State Water Resources Control Bd., app. pending.*) Accordingly, we reference our findings and conclusions in Order WQ-2013-0101 in this order only where those findings and conclusions have not been specifically called into question by the Sacramento Superior Court Ruling. We also discuss and reference conclusions of the Sacramento Superior Court Ruling where relevant.

⁴⁵¹⁶ *People v. Barry* (1987) 194 Cal.App.3d 158, 175-177; *Johnson v. State Water Resources Control Bd.* (2004) 123 Cal.App.4th 1107, 1114; Cal. Code Regs., tit. 23, § 2052, subd. (a)(1).

⁴⁶¹⁷ *San Joaquin County Resource Conservation Dist., supra* (Super. Ct. Sacramento County, 2013, No. 34-2012-80001186).

⁴⁷¹⁸ SJCRCD Petition, page 2.

⁴⁸¹⁹ State Water Board Order WQ 2013-0101, p. 16.

Nevertheless, it is important for the regional water boards to consider costs when adopting irrigated lands regulatory programs.⁴⁹²⁰ In this case, the Central Valley Water Board incorporated an analysis of costs in the information sheet.²⁹²¹ We also note that the Central Valley Water Board's Water Quality Control Plan for the Sacramento and San Joaquin River Basins includes an estimate of potential costs and sources of financing for the Central Valley Water Board's long-term irrigated lands program at pages IV.38-IV.39.²⁴²²

We have taken up some of the issues raised by AGUA and CSPA. Because the issues raised by AGUA and CSPA are generally related and appropriate for consideration together, we refer hereinafter to arguments raised by AGUA and CSPA jointly as raised by the "Environmental Petitioners."

We have organized our discussion in this order to correspond to the different categories of requirements set up in the Eastern San Joaquin Agricultural General WDRs. We address the Environmental Petitioners' arguments as well as related recommendations of the Agricultural Expert Panel Report (and, where applicable, the Nitrogen Tracking Task Force Report) under each category.

The Eastern San Joaquin Agricultural General WDRs were issued under authority of the Porter-Cologne Water Quality Control Act (Porter-Cologne Act), specifically Water Code sections 13263 and 13267. Among other mandates, section 13263 requires the Central Valley Water Board to set waste discharge requirements that implement relevant water quality control plans.²²²³ The Eastern San Joaquin Agricultural General WDRs must primarily implement the Water Quality Control Plan for the Sacramento and San Joaquin River Basins (Basin Plan)²³²⁴ which sets the beneficial uses of the surface water bodies and groundwater in the region and sets water quality objectives to be achieved in those waters. The Eastern San Joaquin Agricultural General WDRs must also conform to State Water Board policies.²⁴²⁵ Of relevance here are our

⁴⁹²⁰ Under Water Code 13263 and 13241, "economic considerations" is one of the factors a regional water board must take into account in issuing waste discharge requirements. Additionally, section 13267 requires the regional water board to ensure that "the burden, including costs, of [monitoring] reports shall bear a reasonable relationship to the need for the report and the benefits to be obtained from the reports."

²⁹²¹ Eastern San Joaquin Agricultural General WDRs, Attach. A, pp. 44-48. The analysis is based on an economic study conducted for the Central Valley Water Board in support of its long-term irrigated lands program for the region. (AR 31796- 32232.)

²⁴²² See Eastern San Joaquin Agricultural General WDRs, finding 37, pp. 10-11. SJCRCD also argues that the General WDRs improperly treat crop irrigation water as a discharge of waste. To the contrary, the General WDRs specifically state that "irrigation water, the act of irrigating cropland, and the discharge of irrigation water unto itself is not 'waste' as defined by the Water Code, but . . . irrigation water may contain constituents that are considered to be 'waste' as defined by Water Code section 13050(d)." (*Id.*, p. 1, fn. 1.)

²²²³ Wat. Code, §13263, subd. (a).

²³²⁴ Available at http://www.waterboards.ca.gov/centralvalley/water_issues/basin_plans/sacsjr.pdf (as of ~~Jan-5-~~ **2016 Oct. 6, 2017**), AR 33039-33339. In addition, the Eastern San Joaquin Agricultural General WDRs must implement applicable statewide water quality control plans.

²⁴²⁵ Wat. Code, §13146.

Policy for the Implementation and Enforcement of the Nonpoint Source Pollution Control Program²⁵²⁶ (Nonpoint Source Policy) and our Statement of Policy with Respect to Maintaining High Quality Waters, State Water Board Resolution No. 68-16²⁶²⁷ (Antidegradation Policy). Water Code section 13267 grants the Central Valley Water Board authority to require monitoring and reporting as a component of the Eastern San Joaquin Agricultural General WDRs. The Nonpoint Source Policy additionally directs that any nonpoint source program incorporate monitoring and reporting requirements.

We begin our review of the petitions in Section A with consideration of the Eastern San Joaquin Agricultural General WDRs' consistency with the Water Code in light of the direction provided in the Nonpoint Source Policy as to how to effectuate Water Code requirements in the context of control of nonpoint source discharges. We focus in particular on the Nonpoint Source Policy's direction to require management practices with a high likelihood of leading to attainment of water quality requirements and direction to incorporate sufficient feedback mechanisms to determine if, in fact, the program is meeting its stated purposes. Some of the arguments raised by Environmental Petitioners under the umbrella of compliance with the Antidegradation Policy concern the mandates under that policy for discharges not to unreasonably affect beneficial uses, not to result in water quality less than the quality specified by water quality objectives, and not cause a pollution or nuisance; these arguments are more appropriately considered under compliance with the Water Code and Nonpoint Source Policy and are addressed in Section A. In Section B, we separately consider the Eastern San Joaquin Agricultural General WDRs' compliance with the Antidegradation Policy's mandate to maintain high quality waters except as allowed under the Policy.

A. Compliance with the Water Code and the Nonpoint Source Policy

Agricultural discharges, including both irrigation water and storm water running off of agricultural fields into surface waters or percolating to groundwater, may carry constituents considered to be waste as defined under Water Code section 13050(d).²⁷²⁸ Water Code section 13260 requires persons "discharging waste, or proposing to discharge waste . . . that could affect the quality of the waters of the state" to file a report of waste discharge. Water Code section 13263 in turn directs a regional water board to prescribe requirements for the discharge that

²⁵²⁶ Available at <http://www.waterboards.ca.gov/water_issues/programs/nps/docs/plans_policies/nps_iepolicy.pdf> (as of ~~Jan. 5, 2016~~ Oct. 6, 2017), AR 36138-36157.

²⁶²⁷ Available at <http://www.waterboards.ca.gov/board_decisions/adopted_orders/resolutions/1968/rs68_016.pdf> (as of ~~Jan. 5, 2016~~ Oct. 6, 2017), AR 35945-35946.

²⁷²⁸ "Waste' includes sewage and any and all other waste substances, liquid, solid, gaseous, or radioactive, associated with human habitation, or of human or animal origin, or from any producing, manufacturing, or processing operation, including waste placed within containers of whatever nature prior to, and for purposes, of disposal." (Wat. Code, §13050, subd. (b).)

“implement any relevant water quality control plans that have been adopted, and that . . . take into consideration beneficial uses to be protected, the water quality objectives reasonably required for that purpose, other waste discharges, and the need to prevent nuisance,” as well as certain additional factors, including economic considerations.²⁸²⁹ ~~The~~A regional water board may prescribe general waste discharge requirements to a category of discharges, such as agricultural discharges, rather than issue individual waste discharge requirements to separate operations.²⁸³⁰

While waste discharge requirements require compliance with the water quality objectives specified in the water quality control plans, such compliance need not be achieved immediately. A time schedule for compliance with water quality requirements is explicitly permitted by Water Code section 13263, which states that WDRs “may contain a time schedule subject to revision in the discretion of the [regional water] board.”³⁰³¹ Further, consistent with Water Code section 13263’s requirement to consider the water quality objectives “reasonably required” to protect beneficial uses, a regional water board has some discretion to determine where and how compliance with a water quality objective must be demonstrated. It is not always necessary for the reasonable protection of beneficial uses that each water quality objective be met at each discrete point in time and space. For example, in determining compliance with water quality objectives in groundwater to protect drinking water beneficial uses, the regional water board may ~~specify a specific well screening interval for monitoring or may rely on averaging take into consideration the fact that many groundwater wells are screened so that they extract groundwater from multiple aquifer levels. Because the different aquifer levels are recharged from different areas over different time intervals, different aquifer levels will have different concentrations of pollutants. Thus, many groundwater wells necessarily induce some mixing of the groundwater they extract.~~ Similarly, the regional water board may determine appropriate averaging periods for surface waters, or rely on monitoring for general surface water quality

²⁸²⁹ In issuing waste discharge requirements, the Water Code requires the Central Valley Water Board to take the factors listed in Water Code section 13241 into consideration, including, but not limited to, “(a) past, present, and probable future beneficial uses of water; (b) Environmental characteristics of the hydrographic unit under consideration, including the quality of water available thereto; (c) Water quality conditions that could reasonably be achieved through the coordinated control of all factors which affect water quality in the area; (d) Economic considerations; (e) The need for developing housing within the region; (f) The need to develop and use recycled water.” See *City of Burbank v. State Water Resources Control Bd.* (2005) 35 Cal.4th 613. As we have already discussed above, the Central Valley Water Board included a thorough discussion of economic considerations in an economic study conducted in support of its long-term irrigated lands program for the region (AR 31796-32232) and at pages 44 through 48 of Attachment A to the Eastern San Joaquin Agricultural General WDRs. While petitioners complained generally about the breadth of the economic analysis, the record does not establish that the costs of complying with the requirements contained in the Eastern San Joaquin Agricultural General WDRs, including the ~~insubstantial~~ additional costs to comply with the requirements added by this order, ~~would~~ warrant relaxation of those requirements.

²⁸³⁰ Wat. Code, §13263, subd. (i).

³⁰³¹ Wat. Code, §13263, subd. (c).

compliance at a point downstream of multiple discharge points, rather than at each and every discharge point.³⁴³²

The Nonpoint Source Policy further guides our interpretation and implementation of Water Code requirements, including Water Code sections 13263 and 13267, in the context of nonpoint source discharges. Nonpoint source discharges, such as irrigated lands discharges, pose unique challenges that are not easily addressed by strategies designed to address point source pollution. The Nonpoint Source Policy explains that nonpoint source discharges typically occur as a result of contact between pollutants and land runoff, precipitation, atmospheric deposition, drainage, seepage, or hydrologic modification.³²³³ Nonpoint sources are thus diffuse and are most effectively addressed by control of the sources of pollution, typically with implementation of management practices, rather than by attempts to treat the discharge at the multiple, and often indeterminate, number of discharge points. The Nonpoint Source Policy further recognizes that, “given the extent and diversity” of nonpoint source discharges, the regional water boards must be creative and efficient in addressing nonpoint source pollution and may rely on third-party programs that are effective in reaching a large number of dischargers.³³³⁴

The Nonpoint Source Policy requires that any nonpoint source pollution control implementation program, including one primarily administered by a third-party group, incorporate several key elements.³⁴³⁵ Key eElement 1 states as follows:³⁵³⁶

1. A nonpoint source control implementation program’s ultimate purpose shall be explicitly stated. Implementation programs must, at a minimum, address nonpoint source pollution

³⁴³² It is important for us to note that the Eastern San Joaquin Agricultural General WDRs regulate current discharges that may be causing or contributing to exceedances of the limitations imposed under the Water Code. Where water bodies already have pollutant levels detrimental to beneficial uses due to historic discharges, the regional water board may rely on other authority, including but not limited to the authority to require cleanup and abatement under Water Code 13304, to address the issue. The Central Valley Salinity Alternatives for Long Term Sustainability (CV-SALTS) initiative, a collaborative, stakeholder process initiated by the Central Valley Water Board, is currently studying and developing alternatives to address existing groundwater salinity problems in the Central Valley. We cautiously endorse this approach, with the expectation that it will eventually bear fruit. We will, of course, be paying close attention to these efforts and other efforts to manage existing groundwater quality and quantity problems, including the substantial work required under the Sustainable Groundwater Management Act of 2014. (~~AB 1739 (Dickinson), SB 1168 (Pavley), SB 1319 (Pavley)–Wat. Code., § 10720, et seq.~~) In the meantime, we will continue to work diligently with communities, especially disadvantaged communities, that are disproportionately impacted by poor drinking water supplies, to find appropriate solutions. We have focused many of our grant and loan programs to provide them with needed assistance while longer term approaches continue to evolve.

³²³³ Nonpoint Source Policy, p. 7, AR 36146.

³³³⁴ *Id.*, p. 9, AR 36148.

³⁴³⁵ The Nonpoint Source Policy uses several acronyms that we have spelled out in this order. These include “NPS” for “nonpoint source,” “MP” for “management practice,” “SWRCB” for “State Water Board,” and “RWQCB” for “regional water board.”

³⁵³⁶ The Nonpoint Source Policy establishes five key elements. Four are discussed here. The fifth key element (“Each regional water board shall make clear, in advance, the potential consequences for failure to achieve a nonpoint source control implementation program’s stated purposes” (Nonpoint Source Policy, pp. 14-15, AR 36153-36154)) is not addressed because no party has raised it as an issue in the proceedings.

in a manner that achieves and maintains water quality objectives and beneficial uses, including any applicable antidegradation requirements.³⁶³⁷

In compliance with Water Code section 13263 and with ~~k~~Key ~~e~~Element 1, the Eastern San Joaquin Agricultural General WDRs set out their ultimate purpose by establishing water quality requirements in Section III. Receiving Water Limitations:

A. Surface Water Limitations

1. Wastes discharged from Member operations shall not cause or contribute to an exceedance of applicable water quality objectives in surface water, unreasonably affect applicable beneficial uses, or cause or contribute to a condition of pollution or nuisance.

B. Groundwater Limitations

1. Wastes discharged from Member operations shall not cause or contribute to an exceedance of applicable water quality objectives in the underlying groundwater, unreasonably affect applicable beneficial uses, or cause or contribute to a condition of pollution or nuisance.

The General WDRs state that these receiving water limitations are effective immediately except where Members are implementing an approved Surface Water Quality Management Plan (SQMP) or Groundwater Quality Management Plan (GQMP), with an approved timeline, as authorized by the General WDRs.³⁷³⁸ The SQMP and GQMP requirements are discussed in greater detail below; a primary purpose of the SQMP and GQMP provisions is to address water quality problems in areas where exceedances of water quality objectives have been detected. The Order allows Members that are part of the SQMP or GQMP plan area up to ten years for compliance with the Receiving Water Limitations.³⁸³⁹ ~~But this~~This allowance does not run counter to the Water Code or the Nonpoint Source Policy. As we already stated, a time schedule for compliance with water quality requirements is explicitly permitted by the Water Code. Further, Key Element 3 of the Nonpoint Source Policy states that, where a regional water board finds that it is necessary to allow time for achievement of water quality requirements, an order implementing a nonpoint source program shall specify a time schedule and quantifiable milestones designed to measure progress toward achieving the water quality requirements.³⁹⁴⁰ Although a time schedule allowed in WDRs must not be any longer than necessary,⁴⁰⁴¹ the Eastern San Joaquin Agricultural General WDRs comply with the Nonpoint Source Policy by

³⁶³⁷ *Id.*, pp. 11-12, AR 36150-36151. Key Element 1 is inclusive of antidegradation requirements. As previously stated, we discuss the Eastern San Joaquin Agricultural General WDRs' compliance with antidegradation requirements separately in section II.B.

³⁷³⁸ Eastern San Joaquin Agricultural General WDRs, § III, fns. 15-16, p. 17.

³⁸³⁹ *Id.*, § XII, p. 37.

³⁹⁴⁰ Nonpoint Source Policy, p.13, AR 36152.

⁴⁰⁴¹ Cal. Code of Regs, tit. 23, §2231.

setting ten years as the maximum time permitted for a time schedule, ~~but and~~ requiring the Third Party to propose a schedule that is “as short as practicable” and is supported by technical or economic justification as to why it is as short as practicable.⁴⁴⁴² The General WDRs require the SQMP or GQMP to incorporate a specific schedule and milestones for the implementation of management practices and tasks and measurable performance goals.⁴²⁴³ Thus the General WDRs’ receiving water limitations are consistent with the Water Code and the Nonpoint Source Policy.⁴³⁴⁴

The receiving water limitations ~~—~~ to not cause or contribute to exceedances of water quality objectives, unreasonably affect beneficial uses, or cause or contribute to a condition of pollution or nuisance ~~—~~ establish clear water quality based requirements for the Eastern San Joaquin Agricultural General WDRs.⁴⁴⁴⁵ But ~~k~~Key ~~e~~Element 1 also requires nonpoint source programs to address nonpoint source pollution “*in a manner* that achieves and maintains water quality objectives and beneficial uses (emphasis added).” A regional water board’s obligation under the Water Code and the Nonpoint Source Policy does not terminate with establishing the appropriate water quality objectives; the regional water board must determine “that there is a high

⁴⁴⁴² Eastern San Joaquin Agricultural General WDRs, § XII, p. 37. The provisions allow the Central Valley Water Board to modify approved schedules where evidence is presented that the compliance date is technically or economically infeasible or where evidence shows that an earlier compliance date is feasible. (*Ibid.*)

⁴²⁴³ *Id.*, Attach. B., MRP, Appen. MRP-1, §§ I.C.d-e, p. 5.

⁴³⁴⁴ Even where the maximum permitted time frame of ten years may be allowed by the Central Valley Water Board, the time schedule is not necessarily unreasonable. This order sets out a number of new metrics and approaches to measuring and reporting on management practices, particularly with regard to nitrogen application, and also requires revisions to both the surface water and groundwater monitoring provisions of the General WDRs. Our direction is intended to strengthen the link between management practice implementation and water quality outcomes so that we have the information needed to guide the program more quickly toward compliance. But development and implementation of the revised monitoring and reporting requires investment of time. And research to determine appropriate nitrogen application metrics is needed, ~~as well as to correlate along with~~ correlation of practices with the data received through the monitoring and the reporting of the nitrogen application data. As a result, we cannot say that ten years is per se an unreasonable time frame for compliance with the receiving water limitations.

⁴⁴⁴⁵ In Order WQ 2013-0101, we added a provision to the Central Coast Agricultural Order to clarify that, in order to comply with the receiving water limitations, “Dischargers must (1) implement management practices that prevent or reduce discharges of waste that are causing or contributing to exceedances of water quality standards; and (2) to the extent practice effectiveness evaluation or reporting, monitoring data, or inspections indicate that the implemented management practices have not been effective in preventing the discharges from causing or contributing to exceedances of water quality standards, the Discharger must implement improved management practices.” (State Water Board Order WQ 2013-0101, p. 26.). The Sacramento Superior Court Ruling questioned whether the requirement to implement “improved” management practices, in the absence of additional standards and verification of what constitutes an improved management practice, would in fact ensure effective reduction of pollution. (Sacramento Superior Court Ruling, pp. 33-35.) The Sacramento Superior Court Ruling appears to read the revision as requiring only nominal improvements without a clear mandate to achieve the receiving water limitations over some defined timeframe. Although we disagree that the revision should be read in that manner, to the extent the Superior Court’s interpretation is affirmed on appeal, we note that the Eastern San Joaquin Agricultural General WDRs are clearer in mandating that discharges may not cause or contribute to exceedances of water quality objectives except where a clearly articulated program of management practice implementation with a finite time schedule is established.

likelihood the implementation program will attain [the regional water board's] stated water quality objectives."⁴⁵⁴⁶

Yet a broad scale nonpoint source regulatory program does not necessarily generate the type of data that facilitates easy determination and enforcement of compliance with receiving water limitations. In a permit for a traditional point-source facility, the water boards set a water quality-based effluent limitation to be met at the discharge point and require monitoring of the discharge to verify that the limitation is being met. As we will discuss in greater detail in the section on surface water and groundwater quality monitoring, in a landscape-based, nonpoint source program such as the irrigated lands program, monitoring the numerous and sometimes indeterminate set of farm discharge points is an impractical, prohibitively costly, and often ineffective method for compliance determination and the Nonpoint Source Policy accordingly does not mandate such monitoring. As a result, a nonpoint source regulatory program does not necessarily yield data establishing whether individual growers are in fact causing or contributing to exceedances. Recognizing this challenge, the Nonpoint Source Policy provides that, although management practice implementation is not a substitute for actual compliance with water quality requirements, a schedule of management practice implementation, assessment, and adaptive management may act as a proxy for assessing regulatory program progress.⁴⁶⁴⁷ This direction is captured in ~~k~~Key ~~e~~lements 2 and 4:

2. A nonpoint source control implementation program shall include a description of the management practices and other program elements that are expected to be implemented to ensure attainment of the implementation program's stated purpose(s), the process to be used to select or develop management practices, and the process to be used to ensure and verify proper management practice implementation.⁴⁷⁴⁸
- ...
4. A nonpoint source control implementation program shall include sufficient feedback mechanisms so that the regional water board, dischargers, and the public can determine whether the program is achieving its stated purpose(s), or whether additional or different management practices or other actions are required.⁴⁸⁴⁹

Accordingly, the management practice implementation requirements form the backbone of any nonpoint source regulatory framework.

⁴⁵⁴⁶ Nonpoint Source Policy, p.11, AR 36150. See also *Asociacion de Gente Unida por el Agua v. Central Valley Water Board* (2012) 210 Cal.App.4th 1255,1260-61 (stating that "[t]he wish is not father to the action" and finding that a prohibition against water quality impacts is insufficient, in and of itself, to meet water quality requirements, in the absence of additional permit measures to implement and verify achievement of the prohibition).

⁴⁶⁴⁷ Nonpoint Source Policy, p.12, AR 36151.

⁴⁷⁴⁸ *Ibid.*

⁴⁸⁴⁹ *Id.*, pp. 13-14, AR 36152-36153.

The Eastern San Joaquin Agricultural General WDRs state that Members “shall implement management practices, as necessary, to protect water quality and to achieve compliance with applicable water quality objectives.”⁴⁹⁵⁰ Members are further required to implement management practices that 1) minimize waste discharge offsite in surface water; 2) minimize percolation of waste to groundwater; and 3) protect wellheads from surface water intrusion.⁵⁰⁵¹ Members prepare Farm Evaluations to document implemented management practices.⁵⁴⁵² Members also propose and implement management practices to minimize excess nutrient application relative to crop need as specified in a Nitrogen Management Plan.⁵²⁵³ Members with potential to cause erosion and discharge sediment that may degrade surface waters propose and implement sediment discharge and erosion prevention practices to minimize or eliminate the discharge of sediment above background levels consistent with a Sediment and Erosion Control Plan.⁵³⁵⁴ Where the Third Party is required to prepare a SQMP or GQMP, specifying additional or improved management practices to address detected exceedances in a given area, Members also implement management practices in accordance with that plan.⁵⁴⁵⁵

Of course, a management practice-based nonpoint source regulatory program will succeed in its ultimate purpose of “achiev[ing] and maintain[ing] water quality objectives and beneficial uses” only to the extent it facilitates implementation of *effective* management practices. Instituting effective management practices requires sufficient monitoring and reporting to determine if existing management practices are leading to compliance with water quality requirements and implementation of improved water quality practices where they are not. This feedback mechanism — that a nonpoint source discharge control program link its implementation requirements, with some level of confidence, to expected water quality outcomes, and incorporate monitoring and reporting sufficient to verify that link — is a fundamental tenet of the Nonpoint Source Policy, captured in Key Elements 1, 2, and 4. But the Nonpoint Source Policy does not specify a particular level of granularity in monitoring and reporting and therefore leaves significant discretion to the water boards to determine the appropriate level of data gathering and reporting for different programs and different program components. The water boards must strike a balance that, on the one hand, requires sufficient data collection and reporting to allow for

⁴⁹⁵⁰ Eastern San Joaquin Agricultural General WDRs, § IV.A.3, p.18.

⁵⁰⁵¹ *Id.*, § IV.B.20, p.20. Under Water Code section 13360, the Central Valley Water Board generally may not specify “the design, location, type of construction, or particular manner in which compliance may be had with” waste discharge requirements. For structural management practices, the Eastern San Joaquin Agricultural General WDRs must therefore strike a balance between setting standards that must be achieved and leaving Members flexibility as to the type of design and construction that may be used to meet those standards.

⁵⁴⁵² Eastern San Joaquin Agricultural General WDRs, § VII.B, pp. 24-25.

⁵²⁵³ *Id.*, § IV.B.8, p.19.

⁵³⁵⁴ *Id.*, § IV.B.7, p.19.

⁵⁴⁵⁵ *Id.*, § IV.B.6, pp.18-19.

meaningful feedback on the program, but, on the other hand, avoids extensive data requirements that demand excessive and unwarranted time and cost to produce and analyze ~~on~~ ~~by~~ the ~~side of~~ ~~the Members~~~~growers~~, the third- party, and water board staff. In striking that balance, the water boards also take into consideration ~~Member~~~~grower~~ concerns with disclosure of trade secrets and proprietary business information.

The particular balance struck on this issue in the Eastern San Joaquin Agricultural Order requires significant reliance on the Third Party. The Third Party fulfills the role of collecting data on the management practices that are implemented by the Members. The Farm Evaluation and a Nitrogen Management Plan Summary Report are submitted by the Members to the Third Party.⁵⁶⁵⁶ The Third Party in turn reports the information in these plans to the Central Valley Water Board with the data identified or aggregated at a township level, without Member identification or location information.⁵⁶⁵⁷ The Third Party must submit a Management Plan Progress Report to the Central Valley Water Board each year reporting on the degree of implementation of management practices and evaluation of the effectiveness of the management practices with the data in aggregated form.⁵⁷⁵⁸ The Third Party also fulfills the role of monitoring surface water and groundwater quality. Such monitoring is regional in scale and all data is reported to the Central Valley Water Board.⁵⁸⁵⁹

We continue to support third-party approaches to regulating agricultural discharges, as permitted by the Nonpoint Source Policy. We stated our reasons for supporting third-party approaches in Order WQ 2013-0101, in which we encouraged the Central Coast Water Board to consider the third-party structure in future iterations of the Central Coast Agricultural Order:

From a resource perspective, third parties allow a regional water board to leverage limited regulatory staff by acting as intermediaries between the regional water board staff and the growers, freeing regional water board resources to focus on problem areas or actors. Third parties also may have the expertise to provide technical assistance and training to growers at a scale that cannot be matched by regional water board staff resources, and, in many cases, third parties already have relationships in place with the dischargers.⁵⁹⁶⁰

Because third parties build on relationships already in place with growers, third parties can engender a high level of trust and more effectively reach out to growers to increase understanding of the permit provisions and to facilitate management practice development and deployment, especially in cases where improved management practices are required of particular

⁵⁶⁵⁶ *Id.*, §§ VII.B, p. 24-25, VII.D, pp. 26-27.

⁵⁶⁵⁷ *Id.*, Attach. B, MRP, § V.C., Report Components (17)&(18), pp.23-24.

⁵⁷⁵⁸ *Id.*, Attach. B, MRP, Appen. MRP-1, § I.F, p. 6.

⁵⁸⁵⁹ *Id.*, Attach. B, MRP, §§ III & IV, pp. 3-20.

⁵⁹⁶⁰ State Water Board Order WQ 2013-0101, pp. 13-14.

growers. In addition, there are a number ~~cost benefits to the growers enrolled in a third-party program. These include centralization of fee collection and the resulting reduction in the growers' annual water board fee, potentially reduced costs in management practice implementation facilitated by access to management practice effectiveness information, significantly reduced monitoring costs due to allowance for regional and trend water quality monitoring by the third party in lieu of individual farm monitoring under an individual permit, and reduced reporting costs when the third party shoulders responsibility for data entry into systems such as CEDEN and GeoTracker.~~⁶⁰ of cost benefits to the growers enrolled in a third-party program. These include centralization of fee collection and the resulting reduction in the growers' annual water board fee, potentially reduced costs in management practice implementation facilitated by access to management practice effectiveness information, significantly reduced monitoring costs due to allowance for regional and trend water quality monitoring by the third party in lieu of individual farm monitoring under an individual permit, and reduced reporting costs when the third party shoulders responsibility for data entry into systems such as CEDEN and GeoTracker.⁶¹ The Agricultural Expert Panel also endorsed the third-party based approach of the Central Valley Water Board irrigated lands program and recommended that other regional water boards follow a similar approach.⁶⁴⁶² ~~For these reasons, we continue to support a third-party based approach to regulation of agricultural discharges. We take our support for third parties one step further in this Order. We believe that a carefully-crafted third party-based approach should be an available option for all of the significant agricultural discharge programs in the state. Therefore, we direct all of the regional water boards to issue general waste discharge requirements or general waivers of waste discharge requirements based on a third-party approach consistent with our description of the roles and responsibilities of a third party in this Order within the next five years. The regional water boards should also continue to issue general waste discharge requirements or general waivers of waste discharge requirements for individual growers that choose not to form a third party or to join an existing third party. Those individual growers would have the same management and reporting obligations that are identified as precedential in this Order, but would not, of course, receive the benefits associated with being a member of a third party.~~

Nevertheless, we acknowledge that there are challenges associated with a third-party based approach to nonpoint source regulation. One such challenge is to ensure sufficient granularity to the data collected and reported to provide meaningful information on the

⁶⁰⁶¹ CEDEN is the State Water Board's data system for surface water quality in California. GeoTracker is a statewide database and geographic information system that provides online access to environmental data. The Eastern San Joaquin Agricultural General WDRs require entry of surface water quality data collected under the General WDRs into CEDEN and groundwater quality data collected into GeoTracker.

⁶⁴⁶² Agricultural Expert Panel Report, p. 27.

performance of the program and on required improvements. Where a third party acts as an intermediary between the growers and the regional water board, the program's success depends not only on whether the third party is collecting appropriate and relevant data, but also on whether the third party is reporting that data to the regional water board with sufficient detail to allow appropriate regulatory oversight as well as transparency in implementation of the program and water quality results. In particular, concerns with privacy and protection of proprietary information may create strong incentives in support of a framework where the third party retains most information on farm-level management practice and water quality performance rather than submitting that information to the regional water board and, by extension, making it available to the public.

The Environmental Petitioners argue that the Eastern San Joaquin Agricultural General WDRs require monitoring and reporting at a level of granularity too general to achieve the feedback mechanism the Nonpoint Source Policy requires: the adopted regulatory program cannot establish that the required management practices have a high likelihood of achieving the receiving water limitations because there is insufficient monitoring and reporting to verify that link or to require appropriate adaptive management to achieve progress. The Environmental Petitioners assert that the weaknesses of the Eastern San Joaquin Agricultural General WDRs are two-fold: First, there is insufficient disclosure and transparency with regard to the management practices being implemented on the ground by the Members because only limited, aggregated data must be reported regarding such practices. Second, the representative and regional monitoring program does not produce specific enough data to determine if any of the implemented management practices are in fact leading to meeting water quality requirements. The Environmental Petitioners advocate for farm-level reporting of data, which, the Environmental Petitioners imply, would provide the necessary detail and accountability to tie management practices implemented by Members with their direct impact on water quality.

In the sections that follow, we review the core requirements of the Eastern San Joaquin Agricultural General WDRs to determine whether the required implementation of management practices have a high likelihood of leading to achievement of the water quality requirements of the General WDRs and, more specifically, whether the monitoring and reporting requirements constitute a sufficient feedback mechanism to verify that appropriate management practices are being proposed and implemented in pursuit of the water quality requirements. We find that the data required to be reported by the Members to the Third Party is generally appropriate, but direct several revisions, primarily with regard to nitrogen application reporting. With regard to reporting of the data from the Third Party to the Central Valley Water Board, we

revise the General WDRs to require reporting of some of the data at a field-level. We also revise elements of the water quality monitoring provisions, ~~although we generally keep the regional, watershed-based approach to monitoring intact and do not require farm-level monitoring.~~ With regard to surface water monitoring, we direct State Water Board staff to convene a panel of experts for further consideration of an appropriate monitoring framework.

Our revisions are based on recommendations of the ~~Agricultural Expert Panel Report and on our own review of the General WDRs.~~ The directed revisions are designed to strengthen the correlation between the management practices implemented, the monitoring and reporting required, and the water quality requirements of the General WDRs, as well as to address the need for transparency. We conclude that the Order is consistent with the Water Code and with the Nonpoint Source Policy with the revisions that we direct. Nitrogen Tracking Task Force Report, the Agricultural Expert Panel Report, and on our own review of the General WDRs. We also relied substantially on a compromise proposal regarding data submission that a group of agricultural representatives and environmental justice organization representatives jointly presented to Board members during the pendency of our own motion review. The directed revisions are designed to strengthen the correlation between the management practices implemented, the monitoring and reporting required, and the water quality requirements of the General WDRs. In particular, the automatic reporting of certain data to the Central Valley Water Board at the field level, rather than only in summary form, is expected to lead to more effective oversight and management of the program by the Central Valley Water Board, as well as provide more transparency for the public.⁶³ We conclude that the Order is consistent with the Water Code and with the Nonpoint Source Policy with the revisions that we direct.

Appendix A is a copy of the Eastern San Joaquin Agricultural General WDRs with revisions directed by us shown in red in underline/strikeout format. We reference Appendix A throughout our discussion below and hereinafter refer to it as the “Modified Eastern San Joaquin Agricultural General WDRs.” In addition to the revisions referenced specifically in this order, Appendix A contains a number of conforming revisions to make other sections of the Modified Eastern San Joaquin Agricultural General WDRs consistent with the directed revisions (such as

⁶³ As will be discussed in detail in the sections that follow, we have not required the initial reporting of field-level data with name or location identifiers. For the reasons discussed below, we find that the effective management of a nonpoint source program for agricultural discharges is not necessarily dependent on tying each data point to a discharger identified by name, or to a specific location. However, we find it is essential to continue to allow the Central Valley Water Board to require submittal of specific names or locations, or names or locations generally, should the Central Valley Water Board make a determination that it is necessary.

revisions to ~~Attachment A, Information Sheet, and~~ Attachment E, Definitions), as well as additional substantive and non-substantive minor revisions throughout.⁶²⁶⁴

1. Vulnerability Determinations

Before we proceed with our step-by-step review of the core requirements of the Eastern San Joaquin Agricultural General WDRs, we take up an issue that informs a number of the requirements. One premise of the Eastern San Joaquin Agricultural General WDRs is that regulatory requirements, and limited resources for regulatory oversight, should be concentrated on those activities or conditions that constitute the highest risk to water quality. Throughout, the General WDRs impose requirements in part based on whether an operation is in an area that has high or low vulnerability for water quality impacts. The term “high vulnerability” is defined for surface water and groundwater (see discussion that follows);⁶³⁶⁵ the Third Party is tasked with designation of the areas, with review by the Executive Officer.⁶⁴⁶⁶

The vulnerability approach of the Eastern San Joaquin Agricultural General WDRs is similar to the risk-based tier designations of the Central Coast Agricultural Order that we reviewed in Order WQ-2013-0101. The Central Coast Agricultural Order assigns dischargers to one of the three tiers based on a number of criteria intended to capture the risk posed by the operation to water quality and imposes increasingly more stringent requirements from Tier 1 to Tier 2 to Tier 3. The Central Coast Agricultural Order also requires determination of a nitrate loading risk level and uses that determination to further focus requirements. In Order WQ 2013-0101, we acknowledged that neither the tier determinations nor the nitrate loading risk level determinations were exact proxies for actual risk to water quality, but we found them to be reasonable and declined to substitute another imperfect but reasonable set of criteria for those chosen by the Central Coast Water Board. We tasked the Agricultural Expert Panel with evaluating methodologies for determining risk in the context of an agricultural regulatory program.⁶⁵⁶⁷

In considering the appropriateness of risk-based tiering in agricultural regulatory programs, the Agricultural Expert Panel focused on the Eastern San Joaquin Agricultural General

⁶²⁶⁴ We note that this order provides the rationale for the significant revisions to the Eastern San Joaquin Agricultural General WDRs. We have not updated all findings of the General WDRs and supporting documents, including in particular the Information Sheet, related to the revisions. Nor have we updated the findings of the General WDRs and supporting documents to reflect all new and changed information since the issuance of the General WDRs.

⁶³⁶⁵ Eastern San Joaquin Agricultural General WDRs, Attach. E, Definitions, §§13-14, pp. 2-3.

⁶⁴⁶⁶ *Id.*, finding 22, p. 6; see also *id.*, Att. B, MRP, §IV, pp. 12-13.

⁶⁵⁶⁷ State Water Board Order WQ 2013-0101, pp. 20, 43. In reviewing Order WQ 2013-0101, the Sacramento Superior Court Ruling stated that the fact that only a small number of growers are subject to Tier 3 was “a fundamental problem with the Waiver” (at 35); however, the court did not find issue generally with a risk-based tiering structure.

WDRs' high vulnerability definition for groundwater. A high vulnerability groundwater area is an area identified by the Third Party "where known groundwater quality impacts exist for which irrigated agricultural operations are a potential contributor or where conditions make groundwater more vulnerable to impacts from irrigated agricultural activities." Additionally, areas are considered high vulnerability areas for groundwater if "(1) there is a confirmed exceedance (considering applicable averaging periods) of a water quality objective or applicable water quality trigger limit . . . in a groundwater well and irrigated agriculture may cause or contribute to the exceedance; (2) the Basin Plan requires development of a groundwater quality management plan for a constituent or constituents discharged by irrigated agriculture; or (3) the Executive Officer determines that irrigated agriculture may be causing or contributing to a trend of degradation of groundwater that may threaten applicable Basin Plan beneficial uses."⁶⁶⁶⁸

The Agricultural Expert Panel found that this definition of high vulnerability in the General WDRs was vague, ambiguous, circular, and not supported by a sound technical rationale. In particular, the Agricultural Expert Panel pointed to the difficulty of directly linking water supply well nitrate concentrations to above-ground practices. In many cases groundwater nitrate concentrations reflect a mixture of waters with wide-ranging spatial and temporal origins. Therefore, groundwater wells exhibiting exceedances of water quality standards may not provide the information needed to directly link groundwater conditions to land uses in the immediate area.⁶⁷⁶⁹

More significantly, the Agricultural Expert Panel further found that good nitrogen management is essential in all areas, not just high vulnerability areas, and recommended against differential requirements for nitrogen management based on risk. The Agricultural Expert Panel Report stated:

Because deep percolation of nitrates is universal within irrigated agriculture, a good regulatory program must encompass all irrigated areas, not only lands directly above high nitrate aquifers, those previously identified to be in a high vulnerability area, or those with a certain farm or field size.⁶⁸⁷⁰

The Agricultural Expert Panel thus effectively rejected risk categorization for groundwater requirements, recommending that uniform requirements apply to all dischargers.

We agree with the Agricultural Expert Panel's conclusion that distinguishing between high vulnerability and low vulnerability areas for groundwater is at best an inexact science and that groundwater protection requirements (inclusive, in our opinion, of reporting

⁶⁶⁶⁸ Eastern San Joaquin Agricultural General WDRs, Attach. E, Definitions, §13, pp. 2-3. Water quality trigger limits are limits developed by the Central Valley Water Board staff to implement narrative Basin Plan objectives. (*Id.*, Attach. B, MRP, § VIII, pp. 26-27.)

⁶⁷⁶⁹ Agricultural Expert Panel Report, p. 18.

⁶⁸⁷⁰ *Id.*, p. 26.

~~requirements designed to inform protection and track effectiveness and progress~~) should instead apply uniformly to all areas. In most instances, groundwater is vulnerable to agricultural nitrate impacts, regardless of the time it takes for those impacts to appear in groundwater due to soil conditions, geologic conditions, and/or depth to groundwater. We will direct revisions to the Eastern San Joaquin Agricultural General WDRs throughout this order to ~~remove the distinction between the requirements for high vulnerability and low vulnerability groundwater areas and to~~ impose the requirements currently imposed only on Members in high vulnerability groundwater areas on all Members. These revisions are discussed under the headings for each set of core requirements.

The Agricultural Expert Panel did not consider whether the terms high vulnerability and low vulnerability should continue to be used in the context of surface water requirements. The Eastern San Joaquin Agricultural General WDRs' determination of high vulnerability areas for surface water is based on exceedances of water quality objectives or water quality triggers twice in a three year period in the area, any Basin Plan requirements for development of a water quality management plan for an irrigated lands related constituent in the area, or an Executive Officer determination that discharges from irrigated lands may be causing or contributing to a trend of degradation of surface water in the area.⁶⁹⁷¹ Determining whether an area is a high vulnerability area for surface water does not necessarily suffer from the same level of technical uncertainty as the determination of high vulnerability areas for groundwater. Nevertheless, we will ~~remove the not rely on that~~ distinction ~~from in~~ the Eastern San Joaquin Agricultural General WDRs because, in light of our revisions to ~~eliminate the distinction between~~ ~~impose many of the same requirements in~~ high and low vulnerability ~~areas~~ for groundwater, the categories for surface water are left with little utility in the General WDRs.⁷⁰⁷² We note these revisions under the appropriate discussion.

The Agricultural Expert Panel Report left open the possibility that the concept of high vulnerability or similar risk-based category may be used for prioritization where requirements need to be phased in for sets of dischargers over time.⁷⁴⁷³ We are cognizant that much of the work to designate high and low vulnerability areas in the Eastern San Joaquin River Watershed

⁶⁹⁷¹ Eastern San Joaquin Agricultural General WDRs, Attach. E., Definitions, §14, p.3.

⁷⁰⁷² There are only two provisions where the distinction between high and low vulnerability areas for surface water are called out in the Eastern San Joaquin Agricultural General WDRs – the requirement to participate annually in outreach events applies only to Members in high surface water or groundwater vulnerability areas (*id.*, § IV.B.4, p.18) and only Members in high surface water or groundwater vulnerability areas must update the Farm Evaluation annually (*id.*, § VII.B, pp.24-25.). ~~By eliminating the distinction between high and low groundwater vulnerability areas, we have imposed these requirements uniformly on all Members and rendered the question of whether the Members are in a high or low surface water vulnerability area moot.~~

⁷⁴⁷³ Agricultural Expert Panel Report, pp. 16-17.

has already been completed. ~~Although we will no longer require designation of high and low vulnerability areas, we leave open the possibility that the designations may be used as the basis for prioritizing areas to comply with the requirements of the Eastern San Joaquin Agricultural General WDRs, where such prioritization is permissible under the conditions of the General WDRs. In particular, under our revisions, the high/low vulnerability designations may continue to be used for prioritization in the context of the groundwater monitoring requirements, as we will discuss in section II.A.6 of this order.⁷²We are also cognizant that the expanded reporting obligations will result in increased costs to the growers in low vulnerability areas and to the Third Party, which must now work with a larger set of growers to assist in form submission and must now collect and analyze a larger set of grower data. Accordingly, we will provide for additional time, as specified under each relevant section below, for requirements currently imposed only in high vulnerability areas to also apply to low vulnerability areas. Additionally, under our revisions, the high/low vulnerability designations may continue to be used for prioritization in the context of some of the groundwater monitoring requirements, as we will discuss in section II.A.8 of this order.⁷⁴ Further, the criteria forming the definition of high vulnerability will continue to inform the requirement to prepare a water quality management plan for both surface water and groundwater.~~

~~For a number of other requirements of the Eastern San Joaquin Agricultural General WDRs that are currently phased in, we direct the use of a simpler set of categories, based on operation size, rather than risk, for the phasing. We revise Attachment E to define three categories of Members based on size of the operation. The category of “Members with Small Farming Operations” (less than 60 acres) is already defined in the Eastern San Joaquin General WDRs.⁷³ This category represents roughly 61% of the Members but only 6% of the irrigated lands acreage in the area covered by the Eastern San Joaquin General WDRs.⁷⁴ We additionally define the categories of “Members with Medium Farming Operations” (60 acres or more but less than 250 acres) and “Members with Large Farming Operations” (250 acres or more), with the threshold acreage for the categories chosen to roughly divide the remaining operations in two for phasing purposes. The Medium Farming Operations represent roughly 22% of Members and approximately 14% of the acreage, while the Members with Large Farming~~

⁷²⁷⁴ The groundwater monitoring requirements of the Eastern San Joaquin Agricultural General WDRs, discussed in section II.A.7,8, are carried out by the Third Party and implemented and phased in in part based on determinations of high and low vulnerability. Because of the time and resources that have already been invested by the Third Party and Central Valley Water Board in setting up the vulnerability-based framework for the groundwater monitoring programs, we continue to allow phasing based on vulnerability for those requirements.

⁷³ Eastern San Joaquin Agricultural General WDRs, Attach. E, Definitions, §36, p.5.

⁷⁴ *Id.*, finding 12, p.3.

~~Operations represent roughly 17% of Members and approximately 80% of the acreage. Under the revised provisions, Members with Small Farming Operations are allowed additional time to implement certain requirements as compared to Members with Medium Farming Operations and Members with Large Farming Operations.⁷⁵~~

~~We find that phasing by size is an appropriate tool for the Eastern San Joaquin Agricultural General WDRs for two reasons: First, as acknowledged by the Central Valley Water Board, small operations have limited resources and less access to technical experts and may require additional time to prepare relevant plans.⁷⁶ Second, time is needed to train relevant professionals or Members for certification of required plans.⁷⁷ The uniform application of requirements for groundwater protection shall be precedential for irrigated lands programs statewide. But we leave open the possibility that risk-based designations continue to be used for differentiating surface water protection requirements and for phasing in groundwater protection requirements. We also decline to direct a uniform set of criteria for risk designation and leave the regional water boards with considerable discretion to design reasonable frameworks for differentiation and prioritization. In addition to the high/low vulnerability approach of the Eastern San Joaquin Agricultural General WDRs, such criteria may, for example, include the risk-based tier designations in the Central Coast irrigated lands programs or possibly categories based on farm-size.⁷⁵~~

~~We indicate where farm size based phasing will be used as appropriate in the sections that follow.~~

~~Finally, we acknowledge, as further discussed in Section II.A.5.b below, that there may be uniquely-situated categories of growers for whom the requirement for nitrogen reporting is inappropriate. Our order revisions allow a category of growers to be exempted from the nitrogen applied and removed reporting requirements subject to a demonstration that applied nitrogen is not expected to seep below the root zone in amounts that would, even over multiple decades, reach groundwater, and is further not expected to discharge to surface water.~~

2. Requirement to Participate in Outreach Events

Under the Eastern San Joaquin Agricultural General WDRs, members in high vulnerability areas are required to participate in outreach events and review outreach materials to

⁷⁵ ~~In this order, we have grouped deadlines for Large Farming Operations and Medium Farming Operations together because we are revising a permit already in place with established, past deadlines. In future permits, we expect that it will be appropriate to stagger compliance dates for each category of operation size.~~

⁷⁶ ~~Id., Attach. A, Information Sheet, p. 24.~~

⁷⁷ ~~Although we are requiring the Central Valley Water Board to phase in some requirements based on farm size, we acknowledge that there may be other appropriate criteria for phasing. We find, however, that any phasing method adopted by irrigated lands programs should lead to initial compliance of⁷⁵ Phasing by farm size leads to initial compliance by a large number of acres represented by a small number of growers.~~

become informed of any known water quality problems and the management practices that are available to address those problems.⁷⁸⁷⁶ ~~The result of removing the high and low vulnerability distinctions is that all Members are required to participate in outreach events. This is consistent with the direction of the Agricultural Expert Panel for the development of a “very strong, comprehensive, and sustained educational and outreach program.”⁷⁹ We extend the requirement to participate in outreach events to all Members. This is consistent with the direction of the Agricultural Expert Panel for the development of a “very strong, comprehensive, and sustained educational and outreach program.”⁷⁷ However, we recognize the additional burden on some Members created by applying the outreach participation requirement uniformly. Because all Members must now participate in third-party outreach events, at least annually, we also revise the provision to allow for the possibility of participation to occur without in-person attendance and on the Third Party created by applying the outreach participation requirement uniformly. Because all Members must now participate in third-party outreach events, at least annually, we revise the provision to allow for the possibility of participation to occur without in-person attendance. We also phase in the requirement to participate in outreach events in low vulnerability areas by requiring participation beginning only in 2020. This delay will provide the Third Party an opportunity to increase staffing and funding for outreach events. As appropriate depending on the anticipated grower audience, we expect that the outreach events and outreach materials will be provided in multiple languages.~~

The requirement for uniform participation in outreach events shall be precedential for irrigated lands programs statewide.

The directed revisions are indicated at Appendix A, Modified Eastern San Joaquin Agricultural Order, section IV.B.4, page 20-19.

3. Farm Evaluation

The Eastern San Joaquin Agricultural General WDRs require that all Members complete a Farm Evaluation describing management practices implemented to protect surface water and groundwater quality. The Farm Evaluations also include information such as the location of the farm, surface water discharge points, and the location of wells. Farm Evaluations are required of all Members, but only Members in high vulnerability areas must update the Farm Evaluation annually. The Farm Evaluation must be prepared by the Member and submitted to the Third Party. The Member must keep a copy and must produce it upon request by the Central Valley Water Board staff.⁸⁰⁷⁸ The Third Party aggregates and summarizes information collected

⁷⁸⁷⁶ Eastern San Joaquin Agricultural General WDRs., § IV.B.4, p.18.

⁷⁹⁷⁷ Agricultural Expert Panel Report, p.27.

⁸⁰⁷⁸ Eastern San Joaquin Agricultural General WDRs., § VII.B, pp. 24-25.

from Farm Evaluations in the annual Monitoring Report submitted to the Central Valley Water Board.⁸⁴⁷⁹ We make several revisions to the Farm Evaluation provisions as laid out below.

a. *Requirement for All Members to Annually Update the Farm Evaluation Farm Evaluation Update Frequency*

~~Since we have eliminated the high and low vulnerability area distinction, under our revisions, all Members will now be required to update the Farm Evaluation annually. We find that annual updates to the Farm Evaluations are appropriate for all Members given that the Farm Evaluations are the mechanism for identification of the on-farm management practices implemented to achieve the General WDRs' management practice performance standards and that iterative updating of the management practices implemented is a key component of a nonpoint source program. The Farm Evaluations are the mechanism for identification of the on-farm management practices implemented to achieve the General WDRs' management practice performance standards. As such, they constitute an essential component of the General WDRs. However, we find that annual submission of the Farm Evaluations is necessary only when water quality problems indicate the need for iterative updating of implemented management practices. Based on the experience of the East San Joaquin Water Quality Coalition to date, most implemented management practices otherwise remain fairly stable from year to year.~~

~~The Eastern San Joaquin Agricultural General WDRs phase in the requirement to prepare a Farm Evaluation based on vulnerability determinations and farm size. We will also phase in the requirement, but will base the phasing solely on farm size. Under the General WDRs, Members that are not small farming operations submitted a Farm Evaluation on or prior to March 1, 2015.⁸² We keep this past deadline in the Modified General WDRs. We also make no revision to the deadline for Members with Small Farming Operations to begin implementing the Farm Evaluation elements of the General WDRs by March 1, 2017. However, we allow Members who were previously not required to update the Farm Evaluation annually until March 1, 2017, to commence annual updates of the Farm Evaluation.⁸³~~

For this reason, we require submission of the Farm Evaluations only every five years for Members in both high vulnerability areas and low vulnerability areas, except where the Executive Officer determines that more frequent reporting is warranted.⁸⁰ In turn, we strengthen the requirements for management practice implementation data reporting for fields covered by an SQMP or GQMP. As will be discussed under section 9 below (Surface Water and Groundwater

⁸⁴⁷⁹ *Id.*, Attach. B, MRP, § V.C, Report Component (18), pp.23-24.

⁸² Members in high vulnerability areas were required to submit the Farm Evaluation by May 1, 2014.

⁸³ Appen. A, Modified Eastern San Joaquin Agricultural Order, § VII.B, p. 26, fn. 25.

⁸⁰ The Executive Officer may, for example, require more frequent update and submission of the Farm Evaluation where a Member is an outlier for nitrogen application.

Quality Management Plans), we require submission of a separate Management Practice Implementation Report (MPIR) for Members in areas for which the third party is implementing a SQMP or GQMP. The Central Valley Water Board, with input from the Third Party, will have discretion to determine appropriate reporting frequency for the MPIR based on the life cycle of the management practices being implemented, but we expect that the reporting will be annual or more frequent. We also move the reporting of irrigation practices and nitrogen application practices to the Irrigation and Nitrogen Management Summary Report so that these practices continue to be reported on an annual basis.

The requirement for submission by all growers of management practice implementation information shall be precedential for irrigated lands programs statewide, however, the regional water boards shall continue to have discretion as to the frequency of such submissions.

The directed revisions are indicated at Appendix A, Modified Eastern San Joaquin Agricultural General WDRs, section VII.B, ~~page 26~~ pages 25-26, section VII.G, p. 31, Attachment B, MRP, section VI.B, INMP Components (4) and (5).

b. Content of Farm Evaluation Template

In terms of the content of the Farm Evaluation, we direct changes to the information fields of the ~~Farm Evaluation template. The Central Valley Water Board has approved a template for the Farm Evaluation.⁸⁴ The Farm Evaluation Template lists management practices appropriate for pesticide application, irrigation, nitrogen management, and sediment and erosion management and directs Members to identify those management practices employed at their operations. We expand the list of management practices a Member should consider with the purpose of making the list more comprehensive. We additionally revise the Farm Evaluation Template to add two questions inquiring whether the Member has been identified as having a significantly higher than average nitrogen application value and whether the Member has been identified as being part of an area subject to a SQMP or GQMP. (Those requirements are discussed in section II.A.8 of this order.) The additional questions are designed to verify that the Third Party is effectively communicating with the Member where there is a need for improved management practices.~~ template. The Central Valley Water Board has approved a template for the Farm Evaluation. The Farm Evaluation template lists management practices appropriate for pesticide application, irrigation, nitrogen management, and sediment and erosion management and directs Members to identify those management practices employed at their

⁸⁴ ~~Farm Evaluation Survey, East San Joaquin Water Quality Coalition, available at http://www.waterboards.ca.gov/centralvalley/water_issues/irrigated_land/forms/eastside_sjr_coalition/2014_0117_fe_survey.pdf (as of Jan. 5, 2016).~~

operations. We expand the list of management practices a Member should consider with the purpose of making the list more comprehensive. However, we also move questions regarding irrigation and nitrogen management to the Irrigation and Nitrogen Management Plan Summary Report, discussed in section 5, since these management practices are most relevant in that context and should be reported annually along with nitrogen-related data on that form.

The Third Party and the Central Valley Water Board retain the flexibility to propose and approve any Farm Evaluation template that meets the minimum requirements specified in the General WDRs. The content specified for the Farm Evaluation template in this Order is not intended to be precedential for irrigated lands programs statewide.

The directed revisions are indicated at Appendix A, Modified Eastern San Joaquin Agricultural General WDRs, section VIII.C.1, ~~page 33 and Attachment B, MRP, section VI.A, page 29.~~ Additionally, ~~a template for the Farm Evaluation is attached as new Attachment B, Appendix MRP 3, pages 32-33, section VII.G, p. 31, Attachment B, MRP, section VI.A, page 31, section VI.B, INMP Components (4) and (5), p.33, and Attachment B, MRP-1, section F, page 7.~~

c. Submission of Farm Evaluations to the Central Valley Water Board

~~Our most significant revision to the Farm Evaluation requirement is the addition of provisions directing the Third Party to submit to the Central Valley Water Board field-specific Farm Evaluation data identified by location. As discussed in the introduction to this section, waste discharge requirements must implement the relevant water quality control plans and consider the beneficial uses and water quality objectives specified in those plans. The Nonpoint Source Policy allows reliance on management practice implementation to control sources of pollution, but specifies that a nonpoint source program relying on management practice implementation must incorporate a feedback mechanism whereby a nonpoint source discharge control program links its implementation requirements, with a high level of confidence, to expected water quality outcomes, and adaptively manages the program to institute improved management practices where additional measures are needed to meet the water quality requirements. That feedback mechanism relies on the availability of information on the management practices currently being implemented and the changes and improvements made to those management practices from year to year.~~

As we have previously stated, the Eastern San Joaquin Agricultural General WDRs require Members to implement management practices that minimize waste discharge offsite in surface water, minimize percolation of waste to groundwater, and protect wellheads from surface water intrusion.⁸⁵⁸¹ The General WDRs require the Members to submit Farm

⁸⁵⁸¹ Eastern San Joaquin Agricultural General WDRs, § IV.B.20, p.20.

Evaluations, which include implemented management practices, to the Third Party. ~~The Third Party summarizes and aggregates the data, conducts a quality assessment of the information, and submits the summary to the Central Valley Water Board. The Third Party additionally submits the individual data records used to develop the summary in an electronic format, but the data is submitted to the Central Valley Water Board identified at a township level rather than by field location.⁸⁶ The Central Valley Water Board may, however, at any time request the underlying data for a particular Member or area.⁸⁷~~

The Third Party summarizes and aggregates the data, conducts a quality assessment of the information, and submits the summary to the Central Valley Water Board. . . . The Central Valley Water Board may, however, at any time request the underlying data for a particular Member or area.⁸² We generally affirm this framework for reporting of the Farm Evaluation data to the Central Valley Water Board, but require that individual data records also be submitted to the Central Valley Water Board associated with unique anonymous Member identifiers. The Third Party is directed to permanently associate each Member with a unique, anonymous identifier (Anonymous Member ID).⁸³ The Third Party is directed to submit the management practice implementation data from the Farm Evaluation to the Central Valley Water Board for each field, linked with the Anonymous Member ID. An example of a data set for management practice implementation is attached as sample data Table 1,⁸⁴ solely for illustrative purposes.

As discussed in the introduction to this section, waste discharge requirements must implement the relevant water quality control plans and consider the beneficial uses and water quality objectives specified in those plans. The Nonpoint Source Policy allows reliance on management practice implementation to control sources of pollution, but specifies that a nonpoint source program relying on management practice implementation must incorporate a feedback mechanism whereby a nonpoint source discharge control program links its implementation requirements, with a high level of confidence, to expected water quality outcomes, and adaptively

⁸⁶ ~~*Id.*, Attach. B, MRP, § V.C, Report Component (18), pp. 23-24.~~

⁸⁷~~⁸² *Id.*, § X, p. 36. The Central Valley Water Board has the discretion to request underlying data for a specific area with or without the identification of the Members, depending on the purpose of the request.~~

⁸³ ~~In Section 5.e, we require nitrogen application data to be reported with an anonymous APN-based location identifier in addition to separately reporting nitrogen application data with an Anonymous Member ID, for the reasons discussed in that section. At this time, we are only requiring the management practice implementation data to be reported by an Anonymous Member ID. We may consider adding an APN-based location identifier to the reporting requirements in the future if we determine that it is important for practices to be pinpointed to a location.~~

⁸⁴ ~~Table 1 additionally illustrates the data sets to be obtained from the reporting of management practices associated with irrigation and nitrogen management, which are now reported with the Irrigation and Nitrogen Management Plan Summary Report as discussed above and from management practice implementation through SQMPs and GQMPs as will be discussed in section II.A.9 below.~~

manages the program to institute improved management practices where additional measures are needed to meet the water quality requirements. That feedback mechanism relies on the availability of information on the management practices currently being implemented.

The aggregation and summary provided by the Third Party is a useful analysis for characterizing the trends in management practice implementation in the Eastern San Joaquin River Watershed and we acknowledge the key role of the Third Party in facilitating and compiling the analysis.⁸⁸ ~~This notwithstanding, we will additionally require the Third Party to submit the Farm Evaluation data to the Central Valley Water Board at field level and identified by location. Our intent in doing so is to allow for meaningful evaluation of management practices and their effectiveness with regard to improving water quality. Where, for example, surface water monitoring indicates toxicity in a given area, the Central Valley Water Board should review the pesticide management practice implementation information submitted for fields within the area. Linking the management practice implementation and water quality monitoring data for the area in this scenario significantly enhances the Central Valley Water Board's ability to determine whether Member implemented management practices are in fact minimizing waste discharges to surface water and to exercise reasonable oversight over the Third Party in its follow-up engagement with the Members to require improved management practices through outreach or through a SQMP. Availability of the underlying individual field-level data to the Central Valley Water Board is important for verification of the data and the analyses prepared by the Third Party as well as ensuring that the Third Party is following up appropriately with the Members that warrant additional assistance. The individual field-level data will also support Central Valley Water Board analyses to identify effective and ineffective management practices.~~

~~The most direct manner in which to link management practice implementation at the field level with water quality data is to use location as the common identifier. In particular, identifying field-level data by location allows for location-based analyses, enabling layering of multiple sets of data geographically within the watershed, including water quality monitoring data and other data such as the nitrogen application data that we will discuss extensively in Section II.A.5 of this order. When such correlation of management practice implementation data and~~

⁸⁸ ~~We acknowledge that the underlying individual data will be made available to the Central Valley Water Board (but without location information) for verification of the analysis. Additionally, we recognize that the Eastern San Joaquin Agricultural General WDRs currently require the Third Party to identify, as part of its annual Membership List submission, Members who have failed to implement improved water quality management practices within the timeframe specified by an applicable SQMP or GQMP. (*Id.*, § IV.C.9, p. 21.) This already required information is significant in that it allows the Central Valley Water Board to follow up with or take enforcement against Members in violation of the SQMP or GQMP requirements, but it does not replace the need for a broader set of data, including data for management practices implemented in the absence of a SQMP or GQMP, to support effective program implementation.~~

~~surface water and groundwater quality data is completed at a watershed, regional, or even statewide level, the water boards will be able to identify effective and ineffective management practices under a variety of conditions. Use of the complete, correlated data sets makes it possible to identify effective management practices under a variety of conditions, unlike field studies conducted under location-specific conditions. Use of the complete, correlated data sets additionally enables the water boards and others to study the effect of management practice implementation on trends in water quality throughout the entire watershed. This will be critical for the ongoing development and improvement of the irrigated lands regulatory program to appropriately protect water quality.~~

~~We recognize that there may be other means of identifying field data by location that would retain some of the privacy protections currently built into the Eastern San Joaquin Agricultural General WDRs and still allow for a sufficiently robust feedback mechanism to link management practices and water quality requirements for purposes of the General WDRs. For example, we could require the Third Party to link the data using a non-location identifier and provide this to the Central Valley Water Board so that the link between management practices, nitrogen application data, and water quality monitoring is established without disclosure of location information; we could additionally build in triggers that automatically require the data, as linked, to be reported to the Central Valley Water Board by location where the field is identified as having significantly higher than average nitrogen application values or where surface water or groundwater monitoring indicates an exceedance. This option would allow the Central Valley Water Board to look at management practice data in conjunction with water quality data in cases where there is a water quality problem and exercise oversight over necessary actions to address the problem, without allowing the Central Valley Water Board automatic access to all of the data. However, this option is less compelling because it limits use of the data to analysis and oversight where management practices have failed and does not allow for the more complete analysis and identification of effective management practices described above.~~

~~Although we recognize the strong and genuine concern among growers with regard to privacy, we are not persuaded that submission of management practice information to the Central Valley Water Board runs counter to competitive advantage and trade secret concerns. While a Member may develop and use planning and management documents that contain sensitive information, those documents need not be submitted to the Central Valley Water Board. Rather, the Farm Evaluation form in Appendix MRP-3 is designed to require the submission of only generalized information that will be used by the water boards for water quality protection purposes, none of which is likely to raise significant privacy concerns. In Order WQ 2013-0101, we retained the requirement for growers to make available to the Central Coast Water Board~~

~~information related to management practice implementation. In doing so, we recognized growers' arguments that such reporting could lead, through a Public Records Act⁸⁹ request, to disclosure of sensitive business information. However, we found that the existing exceptions to the Water Code and to the Public Records Act, which allow withholding of information deemed trade secrets and secret processes, was sufficient to protect the most sensitive submitted data.⁹⁰ As with the Central Coast Agricultural Order, any database system developed to receive member data under the Eastern San Joaquin Agricultural General WDRs will allow submitters to specify that certain information is exempt from disclosure, subject to review by the water boards.⁹¹~~

~~In sum, we revise the Eastern San Joaquin Agricultural General WDRs to require the Third Party to report to the Central Valley Water Board field-specific data submitted on the Farm Evaluations by location. We require the Third Party to submit the data for years 2016 through 2018 by May 1, 2019, and for subsequent years on May 1 annually thereafter. We delay submission of the first two years' data in part because time is needed to develop a database that can receive the data⁹² and in part because the farm evaluation data is only a component of the full dataset, which will not be complete until 2019, as described further in Section II.A.5.e. In the interim, in order to eliminate the possibility that the data could be lost or compromised, the Third Party is directed to propose and implement a mechanism for backing up and storing the data in a secure offsite location managed by an independent entity that specializes in the protection of data. Further, the Executive Officer of the Central Valley Water Board continues to have the discretion to request the data at any time.⁹³~~

~~In section II.A.10 of this order, we set out our direction to the Central Valley Water Board on the appropriate use of the submitted data. requirement to submit Member-specific field-level management practice implementation data to the regional water board shall be precedential statewide. For third-party programs only, the data shall be submitted with Anonymous Member IDs unless the regional water board finds that there is a compelling~~

⁸⁹ Gov. Code, § 6250 et seq.

⁹⁰ Wat. Code, § 13267, subd. (b)(2); Gov. Code, § 6254, subd. (k); Evid. Code, § 1060; see State Water Board Order WQ 2013-0101, p. 28. Our discussion regarding proprietary information addressed the requirement for growers to make available to the Central Coast Water Board a farm plan upon request, but we also retained the requirement to report management practice implementation to the Central Coast Water Board through the annual report. (We recognize that, in that case, there was no third party group acting as an intermediary between the growers and the Central Coast Water Board.) Our conclusions as to how to address proprietary information in the context of an agricultural regulatory program were not questioned by the Sacramento Superior Court Ruling.

⁹¹ The Eastern San Joaquin Agricultural General WDRs establish at section IX.4 (p. 37) the process by which a Member may assert that all or a portion of a report is exempt from public disclosure.

⁹² To the extent GeoTracker or another electronic database is not available to receive the data by May 1, 2019, the Third Party is directed to submit electronic copies of the Farm Evaluations in pdf format.

⁹³ Eastern San Joaquin Agricultural General WDRs, § X, p. 36.

grower-specific or location-specific reason why the data should be submitted with name or location identifiers.

The directed revisions are indicated at Appendix A, Modified Eastern San Joaquin Agricultural General WDRs, section VIII.D, page 34, Attachment B, MRP, section V.C, pages 23-24, and section V.E, Report Component (1918), pages 27-28-page 30.

4. Sediment and Erosion Control Plan

Under the Eastern San Joaquin Agricultural General WDRs, Members with potential to cause erosion and discharge sediment that may degrade surface waters must propose and implement sediment discharge and erosion prevention practices to minimize or eliminate the discharge of sediment above background levels, consistent with a Sediment and Erosion Control Plan.⁹⁴⁸⁵ The Sediment and Erosion Control Plan must be prepared by the Member and must either conform to a site-specific recommendation from the Natural Resources Conservation Service or be certified. The Plan must be kept on site to be produced upon request by the Central Valley Water Board staff.⁹⁵⁸⁶

Members with potential to cause erosion and discharge sediment must already report management practices implemented to minimize or eliminate sediment and erosion on the Farm Evaluation; ~~as a result, the information is made available to the Central Valley Water Board through our revisions to the Farm Evaluation provisions.~~ We find that the Sediment and Erosion Control Plan requirements of General WDRs are appropriate as written and do not direct any revisions to the provisions.⁹⁶

The requirement for implementation of sediment and erosion control practices by Members with the potential to cause erosion and discharge sediment that may degrade surface waters shall be precedential for irrigated lands programs statewide; however, the regional water boards shall continue to have discretion as to how these practices are documented and reported.

5. Nitrogen Management Plans

The Eastern San Joaquin Agricultural General WDRs require Members to “implement practices that minimize excess nutrient application relative to crop need.”⁹⁷⁸⁷ This requirement is implemented in part by preparation of a Nitrogen Management Plan. All Members must prepare a Nitrogen Management Plan and all Members must keep the Nitrogen Management Plan on site and make it available to Central Valley Water Board staff upon request.

⁹⁴⁸⁵ Id., § IV.B.7, p.19.

⁹⁵⁸⁶ Id., § VII.C, p.25.

⁹⁶ ~~However, for consistency we change “all Other Members” to “Members with Medium and Large Farming Operations” when referencing members that are not Members with Small Farming Operations. (Appen. A, Modified Eastern San Joaquin Agricultural General WDRs, § VII.C.2, p. 27.)~~

⁹⁷⁸⁷ Eastern San Joaquin Agricultural General WDRs, § IV.B.8, p.19.

Members in high vulnerability groundwater areas have additional requirements for certification of the Nitrogen Management Plan and submittal to the Third Party of a Summary Report of the past year's implementation of the Plan.⁹⁸⁸⁸ The Third Party in turn must report aggregated data to the Central Valley Water Board summarizing the range of nitrogen consumption ratios (i.e. nitrogen available for crop uptake divided by the estimated crop consumption of nitrogen) by crop types and soil conditions reported by the Members on the Summary Report. The data is aggregated at the township level and need not identify the Member and associated parcel for a particular nitrogen consumption ratio.⁹⁸⁸⁹ The Central Valley Water Board may, however, at any time request the underlying data for a particular Member or area.⁴⁰⁹⁹⁰

The nitrogen management provisions of the Eastern San Joaquin Agricultural General WDRs are of particular significance because nitrate pollution in groundwater is a significant public health threat in the Central Valley.⁴⁰⁴⁹¹ Nitrates consumed at a concentration above the maximum contaminant level (MCL) of 10 milligrams per liter (mg/L) of nitrate+nitrite as N⁴⁰²⁹² pose serious risks to pregnant women and infants. Nitrate contamination in groundwater in the Central Valley was extensively documented in the 2012 Report "Addressing Nitrate in California's Drinking Water" (UCD Nitrate Report)⁴⁰³⁹³ prepared for the Legislature. ~~The Agricultural Expert Panel was proposed as one of the recommendations in the State Water Board's Report to the Legislature accompanying the UCD Nitrate Report and the Panel addressed multiple questions posed to it regarding nitrogen management. We make significant revisions to the nitrogen planning and reporting requirements of the Eastern San Joaquin Agricultural General WDRs as detailed below, primarily to address recommendations by the Agricultural Expert Panel.~~ Nitrogen Tracking Task Force and the Agricultural Expert Panel were proposed as recommendations in the State Water Board's Report to the Legislature accompanying the UCD Nitrate Report. As discussed, the Nitrogen Tracking Task Force made recommendations for a nitrogen mass balance tracking system and the Agricultural Expert Panel addressed multiple questions posed to it regarding nitrogen management. We make revisions to

⁹⁸⁸⁸ *Id.*, § VII.D, pp. 26-28.

⁹⁸⁸⁹ *Id.*, Attach. B, MRP, § V.C, Report Component (17), p.23.

⁴⁰⁹⁹⁰ *Id.*, § X, p. 36.

⁴⁰⁴⁹¹ Fertilizers may contain nitrogen in multiple forms (i.e. ammonia, nitrate, etc.), but the form of nitrogen that moves through the soil to groundwater is nitrate. (Nitrite may also be present but typically in very small quantities and is often discounted in general discussions.)

⁴⁰²⁹² The MCL is also expressed as 45 mg/L of nitrate as NO₃. The authority to set the MCL for nitrate previously resided with the California Department of Public Health (CDPH) (and the Department of Health Services prior to the establishment of CDPH), but the authority to set the MCL for nitrate is now within the purview of the State Water Board.

⁴⁰³⁹³ Harter, T. et al. *Addressing Nitrate in California's Drinking Water*. (UC Davis Groundwater Nitrate Project, March 2012) (Harter Report). The Harter Report is included in the administrative record of the proceedings to adopt the Eastern San Joaquin Agricultural General WDRs, submitted to the State Water Board by the Central Valley Water Board. (AR 34141-35717.)

the nitrogen planning and reporting requirements of the Eastern San Joaquin Agricultural General WDRs as detailed below, primarily to address recommendations by the Agricultural Expert Panel. We have also carefully considered the recommendations of the Nitrogen Tracking Task Force, in particular to ensure consistency generally with the recommended data tracking and reporting approach, although, as discussed below, we require more dis-aggregated data reporting than contemplated by the Nitrogen Tracking Task Force.

a. Consideration of Irrigation Practices

We first add several required planning elements to facilitate crop irrigation management planning, including consideration of irrigation method, crop evapotranspiration, and anticipated crop irrigation. The Agricultural Expert Panel emphasized that nitrogen management must be done hand-in-hand with irrigation management, pointing out that water movement through the soil is the mechanism for nitrate transport.⁴⁰⁴⁹⁴ We will hereinafter refer to the plan as revised in the Modified Eastern San Joaquin Agricultural General WDRs as the Irrigation and Nitrogen Management Plan or “INMP,” and to the summary submitted to the Third Party as the “INMP Summary Report.” As stated under section 3 (Farm Evaluation), we also move reporting sections related to irrigation management and nitrogen management from the Farm Evaluation to the INMP Summary Report. Finally, we add a question inquiring whether the Member has been identified in the past year as an outlier for nitrogen application, a concept we discuss in greater detail below. The addition of this question assists in verifying that the Third Party and the Members are communicating effectively and alerts the Central Valley Water Board that the Member may have been required to update or improve management practices related to irrigation and nitrogen management.

The requirement for incorporation of irrigation management elements into nitrogen management planning shall be precedential for irrigated lands programs statewide.

The directed revisions are indicated at Appendix A, Modified Eastern San Joaquin Agricultural General WDRs, Attachment B, MPR, section VI.B, pages 32-37.

b. Extension of Certification and Summary Reporting Requirements to All Members

We next make revisions to the nitrogen management provisions of the Eastern San Joaquin Agricultural General WDRs to remove the distinction in requirements for high and low vulnerability groundwater areas. This revision means that all Members must now have a *certified* INMP and must submit an INMP Summary Report to the Third Party. We ~~allow phasing of the requirements based on farm size. Members with Medium or Large Farming Operations~~

⁴⁰⁴⁹⁴ Agricultural Expert Panel Report, p.ii.

~~must have completed an INMP by March 1, 2015, complete a certified INMP by March 1, 2016, and complete and submit the INMP Summary Report by March 1, 2016, as already established in the General WDRs. However, some Members with Medium or Large Operations may have been previously considered to have also specified certification language for the INMP that states that the preparer used sound irrigation and nitrogen management planning practices to develop irrigation and nitrogen application recommendations and that the recommendations are informed by applicable training for meeting the crop's agronomic needs while minimizing nitrogen loss to surface water and groundwater.⁹⁵ However, we allow Members in low vulnerability areas and therefore not required to meet the March 1, 2015, and March 1, 2016, deadlines. The Modified Eastern San Joaquin Agricultural General WDRs allow these Members two additional years to comply with the requirements. Members with Small Farming Operations are permitted two additional years to begin implementing nitrogen management provisions of the General WDRs, as compared to Members with Large Farming Operations. The phasing allows limited certification resources to continue to focus on the greatest amount of acreage while available training develops to match the demand for certification until March 1, 2020, to complete a certified INMP, and until March 1, 2021, to submit the INMP Summary Report. The phasing allows limited certification resources to continue to focus on the higher priority acreage while available training develops to match the demand for certification. The training needs to continue to evolve to better incorporate the concepts related to irrigation and nitrogen management planning expressed in this Order and recognized by the Expert Panel.⁹⁶ The phasing also allows the Third Party additional time to expand its staffing and funding to accommodate outreach and processing for nitrogen application submissions.~~

~~The directed revisions are indicated at Appendix A, Modified Eastern San Joaquin Agricultural General WDRs, section VII.D, pages 28-31.~~

~~The requirement for all Members to prepare certified irrigation and nitrogen management plans and to submit summary data from the plans to the party shall be precedential statewide. The certification language shall also be precedential statewide.~~

⁹⁵ ~~In expanding the certification requirement, we are also sensitive to the concerns expressed by professionals certifying the INMP regarding potential liability for groundwater nitrate impacts, as well as the scope of their professional insurance coverage. With regard to liability under the Water Code, we note that consultants to dischargers are generally not considered to be dischargers of waste and therefore not liable for violations of the dischargers' waste discharge requirements. With regard to third-party liability, we direct the Central Valley Water Board and the Third Party to include specific language in the certification aimed to limit such liability. (See App. A, Modified Eastern San Joaquin Agricultural General WDRs, Attach. B, MRP, § VI.B, INMP Component (26), page 35-36, Attach. E, Def., 7 & fn. 2, p.2.) The certification language additionally states that the certification does not create liability for environmental violations.~~

⁹⁶ ~~Agricultural Expert Panel Report, pp. 29-30.~~

However, we recognize that there may be uniquely-situated categories of growers for whom the requirement for nitrogen management is inappropriate because applied nitrogen is not expected to seep below the root zone in amounts that would, even over multiple decades, reach groundwater, and is further not expected to discharge to surface water. We will not distinguish these categories based on high and low vulnerability as the Eastern San Joaquin Agricultural General Order currently does. Instead, any category of Members (such as growers of a particular crop or growers in a particular area) seeking to be exempted from irrigation and nitrogen planning and reporting requirements shall make a demonstration, for approval by the relevant regional water board, that nitrogen applied to the fields does not percolate below the root zone in any significant amount and does not migrate to surface water through discharges, including drainage, runoff, or sediment erosion.⁹⁷ The criteria for determining categories of growers that may be exempted from the irrigation and nitrogen planning and reporting requirements shall also be precedential statewide.

c. *New Metric for Nitrogen Application Management*

We make additional revisions to the nitrogen management provisions of the Eastern San Joaquin Agricultural General WDRs in response to recommendations made by the Agricultural Expert Panel regarding methodologies for measuring appropriate nitrogen application and assessing nitrogen over-application. The purpose of the nitrogen management planning requirements in the Eastern San Joaquin Agricultural General WDRs is two-fold. First, the INMP aids Members in projecting the total nitrogen a given crop will require for a single growing season. This is done by considering the nitrogen already available in soil and irrigation water, which allows a grower to plan for the appropriate amount of fertilizer to be applied to meet crop requirements. Such planning helps avoid over-application of nitrogen fertilizer that may lead to excess loss of nitrogen to groundwater. Second, the data made available to the Third Party and the Central Valley Water Board through the INMP Summary Report enables those entities to consider the range of nitrogen application values reported for similar crops and allows the Third Party to identify outliers for follow-up actions with the goal of reducing over-application.

We considered nitrogen application planning and reporting in the Central Coast Agricultural Order in Order WQ 2013-0101. In that case, we struck a requirement for Central

⁹⁷ Based on written and verbal comments received on a February 8, 2016, draft of this order, we have been made aware that rice growers in the Central Valley region may have already made the required demonstration, but that will be a determination for the Central Valley Water Board to make in the first instance. Similarly, members in the San Joaquin County and Delta Water Quality Coalition may have demonstrated that nitrogen applied to the fields does not percolate below the root zone, but must, at a minimum, additionally demonstrate that the applied nitrogen does not migrate to the surface water before the Central Valley Water Board could exempt them from the irrigation and nitrogen planning and reporting requirements.

Coast dischargers to “make progress toward” a target ratio of nitrogen application to nitrogen uptake in favor of requiring all Tier 2 and Tier 3 dischargers to report total nitrogen applied by fields or management blocks. We stated that the directed revisions “reflect[ed] our best judgment as to temporary measures required to keep work on this important public health and environmental issue moving forward” but that we would look to the Agricultural Expert Panel to “propose a comprehensive, consistent approach that will inform agricultural regulatory programs statewide.”⁴⁰⁵⁹⁸ In reviewing the Eastern San Joaquin Agricultural General WDRs, we now have the benefit of the Agricultural Expert Panel Report, and make revisions to the General WDRs consistent with the Panel’s recommendations on nitrogen management.

The Agricultural Expert Panel, ~~after reviewing the crop uptake ratio we rejected in Order WQ 2013-0101, the nitrogen consumption ratio in the Eastern San Joaquin Agricultural General WDRs, and the difficulties associated with determining field level nitrogen balances,~~⁴⁰⁶ reviewed the crop uptake ratio we rejected in Order WQ 2013-0101 and the nitrogen consumption ratio in the Eastern San Joaquin Agricultural General WDRs, and considered the difficulties associated with determining field level nitrogen balances.⁹⁹ ~~proposed a different metric for evaluating appropriate nitrogen management. The metric proposed by the Agricultural Expert Panel as the simplest metric of good management is the multi-year ratio of nitrogen applied to the field to nitrogen removed from the field, or the A/R ratio. The nitrogen applied includes nitrogen from any source (i.e. organic amendments, synthetic fertilizer, and/or nitrogen in irrigation water). The nitrogen removed includes the nitrogen present in all harvested materials removed from the field (including any prunings, removed vegetation, etc.) plus, in the case of perennial crops, the nitrogen sequestered in the permanent wood.~~⁴⁰⁷ The Agricultural Expert Panel additionally considered the recommendations of the Nitrogen Tracking Task Force, including the recommendation that growers track values for total nitrogen applied to the field, actual yield, and nitrogen removed from the field through primary and secondary harvest yields.¹⁰⁰ The Agricultural Expert Panel proposed a refinement on the nitrogen applied and nitrogen removed calculations as the simplest metric of good management – the multi-year ratio of nitrogen applied to the field (A) to nitrogen removed from the field (R), or the A/R ratio. The nitrogen applied includes nitrogen from any source (i.e. organic amendments, synthetic fertilizer, and/or nitrogen in

⁴⁰⁵⁹⁸ State Water Board Order WQ 2013-0101, p. 42. The Sacramento Superior Court Ruling stated that the court “is not persuaded that an adequate Waiver necessarily must include nitrogen balancing ratios,” but questioned the State Water Board’s rationale in removing them as reportable milestones. (Sacramento Superior Court Ruling at 36.) As we discuss in this order, the Agricultural Expert Panel, building on work by the Nitrogen Tracking Task Force, proposed a metric for nitrogen balancing which we now direct all irrigated lands programs to adopt.

⁴⁰⁶⁹⁹ Agricultural Expert Panel Report, pp. 21-22.

¹⁰⁰ Nitrogen Tracking Task Force Report, p. 17.

irrigation water). The nitrogen removed includes the nitrogen present in all harvested materials removed from the field (including any prunings, removed vegetation, etc.) plus, in the case of perennial crops, the nitrogen sequestered in the permanent wood.¹⁰¹ Nitrogen removed is based on a measurable value of yield. Crop yield is multiplied by a coefficient determined via direct testing of the harvested materials. The nitrogen removed coefficient expresses the amount of nitrogen for a given crop per unit of crop yield.

The multi-year A/R ratio, as proposed by the ~~panel~~Agricultural Expert Panel and implemented in this order, is distinguished from previous ratios in two ways. First, it utilizes removed nitrogen instead of nitrogen uptake/consumption. This is an important simplification as it is based on a measurement instead of an estimate. The basis of any good performance metric is that it relies on quantitative measurements that can be performed simply and repeatedly with relative accuracy and that it is easy to understand. The uptake/consumption of nitrogen by a crop as it was employed by the previous orders was based on estimation, not a measurement. Often the published guidance regarding plant uptake/consumption has wide ranges of values from which to select, with variation from low to high values ranging as much as 40 percent. Because of these inherent complexities and inaccuracies, using uptake/consumption as part of a performance metric is problematic. Second, utilizing the measurements of applied and removed nitrogen over several years allows for variations that happen from year to year to cancel out and the carryover of nitrogen in soil to become insignificant for purposes of tracking and reporting. A multi-year approach to a performance metric related to nitrogen management serves to simplify some of the inherent complexity of trying to perform a nitrogen balance on an annual basis and justly account for nitrogen present in its many varied states within a field and crop system.

When evaluated over multiple years, the A/R ratio provides a reliable measurement of the nitrogen left in the field. In each consecutive year, the nitrogen left in the field from the prior year, as approximated by the A/R ratio, will either be utilized by the next crop or move further down in the soil column with potential to be leached to groundwater. If, over several years, the ratio of nitrogen applied and nitrogen removed from the field remains high, a significant portion of the nitrogen applied to the field is remaining in the field and potentially reaching groundwater over time through percolation.⁴⁰⁸¹⁰² A high multi-year A/R ratio thus alerts the ~~grower~~Member, the third-party group, and the regional water board to the need to address over-application at the field level. As recommended by the Agricultural Expert Panel, a multi-year A/R ratio may also provide the basis for acceptable multi-year A/R ratio target values, with

⁴⁰⁷¹⁰¹ *Id.*, p. 28.

⁴⁰⁸¹⁰² *Ibid.*

reduction in the multi-year A/R ratio toward the target ratio for an area over time acting as a proxy for reduction in nitrate discharge to groundwater.⁴⁰⁹¹⁰³ The Agricultural Expert Panel Report identified a shift to using the A/R ratio in nitrogen management as critical in reducing nitrogen leaching to groundwater because the multi-year A/R ratio will provide a fairly accurate picture of the amount efficiency of the nitrogen being left application on the field and the potential over-application of nitrogen over several years. Similarly, the trend in the multi-year A/R ratio over time will inform whether practices are working to reduce the amount of nitrogen being left on the field and the corresponding potential for discharge to groundwater.

Although not considered by the Agricultural Expert Panel, we find that the multi-year A/R ratio will be rendered more informative if additionally paired with an A-R difference value (pounds of nitrogen applied minus pounds of nitrogen removed) to further tease out the magnitude of any potential nitrogen over-application, especially in cases where use of only the multi-year A/R ratio may mask significant quantities of nitrogen left in the field.¹⁰⁴ Further, the A-R difference, whether considered at the scale of a field, a township, or an alternative geographic unit, provides useful information on the magnitude of the amount of nitrogen left in the soil with potential to reach groundwater. This data in turn allow the Third Party and regional water board to better focus follow-up and management practice implementation as well as research and modeling on groundwater loading.

We find that the INMP should ~~require recording, and the INMP Summary Report should require reporting, include recording, and the INMP Summary Report should include reporting, of the data supporting the calculation~~ of the multi-year A/R ratio and ~~of the data supporting its calculation.⁴⁴⁰A-R difference.¹⁰⁵ We also find that the multi-year A/R ratio will be rendered more informative if additionally paired with an A-R difference value (nitrogen applied minus nitrogen removed) to further tease out potential nitrogen over-application in cases where use of only the multi-year A/R ratio may mask significant quantities of nitrogen left in the field.⁴⁴¹ We therefore additionally require recording and reporting of the A-R difference. We revise the Eastern San Joaquin Agricultural Order to eliminate reporting on the nitrogen consumption ratio and to instead require recording and reporting of the AR data. We will require Members to~~

⁴⁰⁹¹⁰³ *Id.*, pp. iii, 24, 38.

¹⁰⁴ For example, a grower applying 75 pounds of nitrogen and removing 50 has the same A/R ratio of 1.5 as a grower applying 450 pounds of nitrogen and removing 300. But the nitrogen left in the field by the second grower is six times the magnitude of the nitrogen left in the field by the first grower.

⁴⁴⁰¹⁰⁵ We refer herein to "AR data" to encompass the multi-year A/R ratio and all data required to be reported in support of that ratio, including the A-R difference.

⁴⁴¹ For example, a grower applying 75 pounds of nitrogen and removing 50 has the same A/R ratio of 1.5 as a grower applying 450 pounds of nitrogen and removing 300. But the nitrogen left in the field by the second grower is six times the magnitude of the nitrogen left in the field by the first grower.

~~determine nitrogen applied and nitrogen removed values¹⁴² and to calculate and report annual A/R ratio and A-R difference values. We will require the Third Party to additionally calculate a three-year running average for the A/R ratio and A-R difference for each Member. We revise the Eastern San Joaquin Agricultural Order to eliminate reporting on the nitrogen consumption ratio and to instead require recording and reporting of the AR data. We will require Members to determine and report nitrogen applied and crop yield.¹⁰⁶ Based on this data, we will require the Third Party to calculate annual A/R ratio and A-R difference values as well as a three-year running average, where feasible,¹⁰⁷ for these values for each Member for each field. The Third Party shall communicate the calculated values back to the Members.~~

We specify the minimum requirements for the templates for the INMP and the INMP Summary Report as revisions to the General WDRs. ~~We also provide templates that meet those requirements. These may be used by the Third Party, or alternative templates may be proposed by the Third Party and used with approval from the Central Valley Water Board.~~ Templates may be proposed by the Third Party and used with approval from the Central Valley Water Board.

~~The requirement for calculation of annual and multi-year A/R ratio and A-R difference parameters for each Member by field shall be precedential for irrigated lands programs statewide; the regional water boards shall retain discretion as to the division of responsibilities among the growers, third parties, and regional water boards for determination of the values, provided that the values are known to both the growers and the third parties.~~

The directed revisions are indicated at Appendix A, Modified Eastern San Joaquin Agricultural General WDRs, section VII.D, pages ~~28-29; Attachment B, MRP, section V.E, Report Component (18), pages 26-27, section VI.B, pages 29-34.~~ Additionally, ~~templates for the INMP and INMP Summary Report are attached as new Attachment B, Appendix MRP 4.27-29; Attachment B, MRP, section VI.B, pages 32-37.~~

d. Requirement for Third Party to Determine Nitrogen Removed Coefficients

One short-term challenge to using the multi-year A/R ratio ~~and A-R difference~~ is that certain information and data gaps need to be filled. There is insufficient information currently available to calculate ~~multi-year A/the R ratios~~value for most crops. This data needs to be

¹⁴² ~~See discussion in the next section regarding reporting where a coefficient for calculation of nitrogen removed is not yet available.~~

¹⁰⁶ ~~At this early stage in adoption of the AR data reporting, we find it is appropriate to ask Members to report only measured values and not values that require calculation. However, we will require the Third Party to report individual A/R ratio and A-R difference values back to the Members so that the Members have the benefit of the information these values provide.~~

¹⁰⁷ ~~We recognize that fields are not always planted with the same crop for three consecutive years and further that the boundaries of a fields may change from year to year.~~

gathered over time. At this time, it is not a common practice for a grower to track the amount of nitrogen removed during harvest. Terminology currently used for nitrogen application recommendations focuses on crop nitrogen uptake or crop nitrogen need with the goal of maximizing crop yield. Use of the multi-year A/R ratio and A-R difference thus requires a change in nitrogen application recommendations and terminology.⁴⁴³¹⁰⁸

Research is required to determine crop removal values ~~and to identify attainable multi-year A/R ratios for a range of crops and conditions~~. The Agricultural Expert Panel recommended research by third-party groups, commodity groups, and institutions to develop the data.⁴⁴⁴¹⁰⁹ Such research would determine values for how many pounds of nitrogen are contained in a unit of crop yield (e.g. lbs-N/ton of almonds). This can be expressed as a coefficient, that, when multiplied with a crop harvest, will estimate the nitrogen removed. The research will ultimately need to be completed for all harvested crop materials, including secondary, or complementary, harvests (i.e. prunings, removed vegetation, etc.).

We task the Third Party with conducting the appropriate testing ~~and research to determine the relevant coefficients for calculating nitrogen removed by crop. We direct the Third Party to publish nitrogen removed coefficients for crops that cover 95% of acreage within the General WDRs' boundaries in time for use in the INMP Summary Reports due 1 March 2019 and 99% of the acreage in time for use in those due 1 March 2021 (with estimated coefficients based on similar crops being acceptable for crops covering the remaining 1%). In the interim, where the coefficient needed to calculate nitrogen removed is not yet available, the Member may report crop yield as a proxy. When the coefficient values become available, the Third Party must use those values to retroactively calculate the A/R ratio, both past annual reported values, and the three-year running average based on the three prior years. Thus, beginning in 2019, multi-year A/R ratios will be available for most of Member acreage in the Eastern San Joaquin River Watershed or research¹¹⁰ to determine the relevant coefficients for calculating nitrogen removed by crop. We direct the Third Party to publish nitrogen removed coefficients for crops that cover 95% of acreage within the General WDRs' boundaries in time for use with the INMP Summary Reports due 1 March 2021 and 99% of the acreage in time for use with those due 1 March 2023 (with estimated coefficients based on similar crops being acceptable for crops covering the remaining 1%). The coefficients shall be approved by the Central Valley Water Board Executive Officer, in consultation with State Water Board staff, following an opportunity for public review and comment. Once approved, the Third Party must use those values to retroactively calculate~~

⁴⁴³¹⁰⁸ Agricultural Expert Panel Report, pp. 27-28.

⁴⁴⁴¹⁰⁹ *Id.*, p.40.

¹¹⁰ Published values for many crop coefficients are already available in the scientific literature.

the A/R ratio and A-R difference, both past annual reported values, and the three-year running average for the A/R ratio based on the three prior years.

The requirement for use of coefficients for conversion of yield to nitrogen removed values shall be precedential statewide. In determining the appropriate coefficients, the regional water boards must approve the values, but may rely on their own research or on the research of the third party, including a review of the scientific literature, and further may consider for approval coefficients evaluated by other regional water boards.

The directed revisions are indicated at Appendix A, Modified Eastern San Joaquin Agricultural General WDRs, Attachment B, MRP, Section ~~VI.B, INMP Component (23)V.D~~, page ~~33-25~~.

e. Expansion of Reporting Requirements

i. Rationale for Field-Level Nitrogen Application Data Reporting to the Central Valley Water Board

The Eastern San Joaquin Agricultural General WDRs require Members to report nitrogen application data in the INMP Summary Report that is submitted to the Third Party; the Third Party in turn aggregates that data and reports it to the Central Valley Water Board in a manner that characterizes the input, uptake, and loss of the nitrogen application by specific crops, but summarizes the data at the township level, rather than by Member or field.⁴⁴⁵¹¹¹ Because the multi-year A/R ratio will provide a concrete, measurable, and reliable benchmark by which progress in reducing groundwater nitrate impacts can be determined, we find that the data should be reported to the Central Valley Water Board by field, ~~identified by location (although, as we discuss in more detail later, we allow for the field-level data to be reported with anonymous identifiers, rather than Member name or location).~~

Similar to the aggregated data reporting for management practices, the aggregated reporting of nitrogen application data required in the Eastern San Joaquin Agricultural General WDRs allows the Central Valley Water Board to analyze trends in nitrogen application and may indicate whether an area as a whole is making progress toward reducing the potential for nitrates to reach the groundwater.⁴⁴⁶¹¹² The aggregation and analysis by the Third Party is thus an important task that leads to valuable information. There are nevertheless compelling

⁴⁴⁵¹¹¹ Eastern San Joaquin Agricultural General WDRs, Attach. B, MRP, § V.C, Report Component (17), p.23.

⁴⁴⁶¹¹² Aggregated data reporting may, however, under some circumstances obscure the on-the-ground reality of how much aggregate nitrogen is being left in the fields because of the averaging effect of reporting fields with over-application along with fields with under-application of nitrogen. For example, the averaging may suggest a net effect of zero, whereas in reality significant nitrogen is left in the field in the first instance, and likely crop failure in the second instance does not act to mitigate the impacts from the nitrogen left in the first field.

reasons for the non-aggregated nitrogen application data to also be reported to the Central Valley Water Board at a field level.

Most significantly, access to the full field-level data set will allow the Central Valley Water Board to develop the multi-year A/R ratio target values that were recommended by the Agricultural Expert Panel. As multi-year A/R ratio data becomes available over the next few years, we direct the Central Valley Water Board to determine acceptable ranges for multi-year A/R ratio target values by crop. (We lay out our specific direction to the Central Valley Water Board in the sections that follow.) In describing the assumptions underlying its recommendations, the Agricultural Expert Panel stated that, while there is currently insufficient information to assign target values to the multi-year A/R ratio, “[i]t will be a regulatory goal to learn what the ranges of these multi-year ratios are for multiple crops and situations, in order to define acceptable target values” and that “[i]t will be a regulatory goal to reduce the average value of this A/R metric in regions.”⁴⁴⁷¹¹³ Development of acceptable multi-year A/R ratio target values is warranted because the multi-year A/R ratio is the most reliable measure of the potential for nitrogen to reach groundwater that is currently available to us. The AR data captures a particular set of management practices that require implementation at the individual operation and field level. However, the multi-year A/R ratio ~~additionally acts as a proxy for groundwater quality monitoring, as we will discuss further in section II.A.6 of this order, by representing the amount of nitrogen in the soil that could potentially reach the groundwater. In the absence of an extensive—and expensive—shallow groundwater monitoring network, the multi-year A/R ratio is currently the most promising method for determining whether implemented management practices are leading to a meaningful reduction in the nitrogen that has the potential to reach groundwater. Given this dual purpose served by the AR data, and given the magnitude of the problems due to nitrate impacts in groundwater, multi-year A/R ratio target values are expected to provide a valuable tool in irrigated lands programs for fair and even-handed consideration of nitrogen application practices. As the agency with primary oversight over water quality in the Eastern San Joaquin River Watershed, the Central Valley Water Board is the appropriate party to develop the acceptable target values; furthermore, in developing the target values, we expect the Central Valley Water Board to analyze data gathered through irrigated lands regulatory programs throughout the region, not just data gathered through the Eastern San Joaquin Agricultural General WDRs, and to collaborate with other regional water boards to share and compare data~~

⁴⁴⁷¹¹³ Agricultural Expert Panel Report, p. 24.

~~with support from the State Water Board.¹⁴⁸ , analyzed in concert with the data for the A-R difference, additionally provides information on the amount of nitrogen in the soil that could potentially reach the groundwater. In the absence of an extensive – and expensive – shallow groundwater monitoring network, the multi-year AR data is currently the most promising method for determining whether implemented management practices are leading to a meaningful reduction in the nitrogen that has the potential to reach groundwater. Given this dual purpose served by the AR data, and given the magnitude of the problems due to nitrate impacts in groundwater, multi-year A/R ratio target values are expected to provide a valuable tool in irrigated lands programs for fair and even-handed consideration of nitrogen application practices. We find that this consideration should be employed to inform Members' practices on a field basis, in addition to a township or broader basis.¹¹⁴~~

~~An additional reason we direct the Third Party to submit field-level data, identified by location, to the Central Valley Water Board, is that it allows for appropriate oversight by the Board. Access to the full field level data set enables auditing of the Third Party and allows the Central Valley Water Board to verify the accuracy and completeness of the Third Party's calculations and analyses. Further, it facilitates responding to indications of over-application by any given Member. We continue to believe that the Third Party is best suited (both in terms of expertise and in terms of developed relationships) for the role and responsibility of initial follow up with Members to address any potential over-application. The Third Party is the lead in outreach and education and as part of that responsibility will be expected to follow up with Members that have high multi-year A/R ratios. However, the Central Valley Water Board should exercise reasonable oversight over the process, including confirming that the appropriate Members have been identified and contacted. The Central Valley Water Board cannot exercise this type of oversight with only aggregated data. Under the framework of Eastern San Joaquin Agricultural General WDRs, the Central Valley Water Board is not precluded from access to the full field level data set, but must specifically request it from the Third Party anytime the Board finds it necessary to exercise oversight;¹⁴⁹ with our revisions the data set is available to the Central Valley Water~~

~~¹⁴⁸ Field studies are not a substitute for access to a complete data set of field-level A/R ratio data. A field study may result in determination of an acceptable A/R ratio target value for a specific set of conditions, but does not anticipate the variability in conditions throughout a region.~~

~~¹¹⁴ As the agency with primary oversight over water quality in the Eastern San Joaquin River Watershed, the Central Valley Water Board is the appropriate party to develop the acceptable target values; furthermore, in developing the target values, we expect the Central Valley Water Board to analyze data gathered through irrigated lands regulatory programs throughout the region, not just data gathered through the Eastern San Joaquin Agricultural General WDRs, and to collaborate with other regional water boards to share and compare data with support from the State Water Board. Field studies are not a substitute for access to a complete data set of field-level A/R ratio data. A field study may result in determination of an acceptable A/R ratio target value for a specific set of conditions, but cannot anticipate the variability in conditions throughout a region.~~

~~¹⁴⁹ Eastern San Joaquin Agricultural General WDRs, § X, p. 36.~~

~~Board without the need for a request.⁴²⁰ to the Central Valley Water Board is that it allows for appropriate oversight by the Board. Access to the full field level data set enables the Central Valley Water Board to verify the accuracy and completeness of the Third Party's calculations and analyses. It also allows the Board to exercise reasonable oversight to confirm that the appropriate Members have been identified as outliers for follow up by the Third Party and, if warranted, the Central Valley Water Board.~~

~~Finally, as with the management practice implementation data, availability of location information additionally permits the field-level AR data to be entered into GeoTracker and to be linked not just with the management practice implementation information, but also with water quality data available through that system, so that a full data set is available to inform the irrigated lands regulatory program. The correlated data set will allow the Central Valley Water Board to gauge the effectiveness, and ineffectiveness, of implemented management practices in reducing nitrogen left in the soil. The correlated data set will also allow for watershed-based modeling for nitrate loading to groundwater. Such modeling may be expanded beyond the boundaries of the Eastern San Joaquin Agricultural General WDRs when linked to similar data sets developed in other coalition boundaries. The data set will have uses beyond the short-term needs of the water boards; for example, researchers may use the data to conduct studies advancing the science supporting future developments in the regulatory program, environmental justice groups may use the data to assist in planning for areas that may need drinking water assistance in the future, and local agencies may use the data in groundwater quality management efforts.~~
the data set will have uses beyond the short-term needs of the water boards; for example, researchers may use the data to conduct studies advancing the science supporting future developments in the regulatory program, environmental justice groups may use the township-level data to assist in planning for areas that may need drinking water assistance in the future, and local agencies may use the data in groundwater quality management efforts.

We recognize that the Nitrogen Tracking Task Force recommended that data related to nitrogen application be aggregated prior to being reported to the regional water board.⁴²⁴¹¹⁵ However, the Nitrogen Tracking Task Force issued its recommendation before the Agricultural Expert Panel was established, so the Nitrogen Tracking Task Force could not have anticipated that the Agricultural Expert Panel Report would recommend that nitrogen application data be used to develop acceptable multi-year A/R ratio target values. As explained above, in order to develop the target values, the Central Valley Water Board needs access to the field-level

~~⁴²⁰ We also note that housing the data set with the Central Valley Water Board supports the long-term security and integrity of the data set, given public agencies' obligations for record retention.~~

⁴²⁴¹¹⁵ Nitrogen Tracking Task Force Report, pp. 15-16.

data. The Nitrogen Tracking Task Force was working with a different metric, a nitrogen mass balance, which is reported annually rather than on a multi-year basis, is complicated by uncertainty associated with how much nitrogen residual in the soil has the potential to percolate to groundwater, and is therefore not suitable as a performance measure. Because the Nitrogen Tracking Task Force's proposed nitrogen mass balance approach would not have been used to develop a performance measure, it would not have been necessary for the regional water boards to receive field-level data related to the nitrogen mass balance. Even so, the Nitrogen Tracking Task Force acknowledged that, "if access to more fine-grained data is needed for quality control or problem-solving purposes, the Water Boards can reach down to access growers' original raw data at field scale"⁴²²¹¹⁶ and further that the regional water boards are "responsible for ensuring the accuracy of the data they receive and may consider developing an audit mechanism."⁴²³¹¹⁷ The Agricultural Expert Panel found that the AR data needed to be tracked at a field level to be meaningful,⁴²⁴¹¹⁸ but the Panel did not specifically speak to whether the field-level data should be reported to a third-party group or to the regional water board. As we discussed in the previous section, the multi-year A/R ratio does not suffer from the uncertainties of previously proposed metrics; and, since the multi-year A/R ratio is less susceptible to misinterpretation or misrepresentation, the argument in favor of providing only aggregated data is less compelling.

~~We find that field-level data, by location, should be submitted to the Central Valley Water Board for the reasons we have articulated: to support development of acceptable multi-year A/R ratio target values for crops grown in the Eastern San Joaquin River Watershed, to inform whether implemented nitrogen management practices are achieving the appropriate water quality results, and to allow for appropriate oversight over follow-up when they are not. In making this finding, we are acting on the cumulative knowledge gained through the proceedings of the Nitrogen Tracking Task Force⁴²⁵¹¹⁹ In any case, anonymous reporting of field-level nitrogen application data, as discussed in the next section, ameliorates some of the concerns expressed by the Nitrogen Tracking Task Force that led to the recommendation of aggregated data reporting to the Regional Board, including the imprecise nature of the reported data and Member confidence in the reporting process.¹¹⁹ and the Agricultural Expert Panel as well as the Water Boards'~~

⁴²²¹¹⁶ *Id.*, p. 19.

⁴²³¹¹⁷ *Id.*, p. 21.

⁴²⁴¹¹⁸ Agricultural Expert Panel Report, pp. 37-38.

⁴²⁵¹¹⁹ We note that our direction maintains the majority of the recommendations of the Nitrogen Tracking Task Force. The Agricultural Expert Panel only modified two reporting items as recommended by the Nitrogen Tracking Task Force. The Panel eliminated reporting of residual soil nitrogen credits and added reporting of irrigation method. In addition to these two items, our direction departs from the Nitrogen Tracking Task Force's recommendations primarily in the requirement to submit field-level, in addition to aggregated, data to the regional water board.

~~experience in implementing both the Central Coast Agricultural Order and the irrigated lands programs in the Central Valley, with consideration to our overarching obligation to protect water quality and to provide transparency and accountability in that process.—~~

~~Additionally, and as with the management practice implementation information reported in the Farm Evaluation,~~We also note here that we are not persuaded that the INMP Summary Report data constitutes proprietary business information. In Order WQ-2013-0101 we similarly rejected the argument made by some petitioners that total nitrogen applied is sensitive proprietary information not appropriate for reporting and deferred to the protections for sensitive business information created by the Legislature in the Water Code and the Public Records Act, rather than carve out additional exceptions within the permit.⁴²⁶¹²⁰ In that case, we required each discharger to report total nitrogen applied directly to the Central Coast Water Board and noted that the timing and frequency of nitrogen applications, rather than data regarding the total amount, was more likely to implicate competitive business practices. The additional information required to be reported here, i.e., the nitrogen removed from the field, does not significantly alter the balance that we must strike between the need for transparency and measurable benchmarks on the one hand, and the need for the agricultural community to protect trade secrets and other sensitive information on the other hand.⁴²⁷¹²¹ We note that the INMP Summary Report contains only specific, limited data that is necessary for use by the Central Valley Water Board for the purposes described above. We are not requiring that the entire INMP be submitted, nor are we requiring that other planning and management documents that Members may develop and use for operational purposes be submitted. Our purpose in requiring submission of field-level AR data to the Central Valley Water Board is to address, in an even-handed, data-driven manner, a crucial water quality and public health issue – nitrates in groundwater – by minimizing over-application of nitrogen to the fields, while at the same time preserving Members' need to manage their operations in accordance with confidential business practices and determinations.

In sum, we find that field-level data should be submitted to the Central Valley Water Board for the reasons we have articulated: to support development of acceptable

⁴²⁶¹²⁰ State Water Board Order WQ 2013-0101, p. 45, fn.103; see also *id.*, p. 28. The relevant code provisions are Water Code, section 13267, subdivision (b)(2), Government Code section 6254, subdivision (k), and Evidence Code section 1060. Our conclusions as to how to address proprietary information in the context of an agricultural regulatory program were not questioned by the Sacramento Superior Court Ruling. We also note that section IX.4 (p.36) of the Eastern San Joaquin Agricultural General WDRs establishes a process by which a Member may assert that all or a portion of a report is exempt from public disclosure.

⁴²⁷¹²¹ Under Order WQ-2013-0101, we limited nitrogen reporting to total nitrogen applied because we found that the ratio otherwise required to be reported in the Central Coast Agricultural Order relied on speculative values for crop nitrogen uptake (p. 49). As we have discussed above, the A/R ratio does not suffer from the same deficiency; while development of the appropriate coefficients for calculation for nitrogen removed from the field will require further data gathering and research, once the values are available, the multi-year A/R ratio is expected to be a reasonably accurate representation of nitrogen remaining on the field.

multi-year A/R ratio target values for crops grown in the Eastern San Joaquin River Watershed, to inform whether implemented nitrogen management practices are reducing the nitrogen that may potentially reach groundwater, and to allow for appropriate oversight over the Third Party's response to the data.

ii. *Data Sets Required to be Reported from the Third Party to the Central Valley Water Board*

While we direct reporting of field-level data, rather than aggregated data, to the Central Valley Water Board, at this early stage in the development of the multi-year AR data framework, we will not require the individual field data to be routinely identified by name or location. We are satisfied that the goals of the program can be carried out effectively if field-level data is linked to anonymous identifiers, with the Third Party withholding name and location data, at least in the early stages of the program. We heard extensive testimony in these proceedings from third parties and growers stressing that the continuation of a third-party framework in irrigated lands programs depends in part on an expectation of confidentiality for growers who prefer to interface with a third party rather than the regulatory agency. As we described in Section II.A., we believe and emphasize that third parties serve an extensive set of functions for growers beyond the maintenance of confidentiality, and we are not persuaded that the maintenance of confidentiality, in and of itself, is a legitimate goal of a regulatory program that must have transparency and accountability to the public.

We will, however, proceed cautiously at this time and not require more information than we find is necessary to effectively manage the irrigated lands regulatory program and provide the public with the essential assurance that we are doing so. We will periodically evaluate whether the framework we set out here is, in fact, sufficient to enable the oversight and transparency necessary to ensure measurable progress toward achieving water quality requirements and may require disclosure of name and location data in the future if we find it is not. (See requirement in Section II.A.11 for periodic Central Valley Water Board reporting to the State Water Board on this question.) For now, however, we expect that the value of a fully-functioning third party will more than offset the additional burdens that are associated with receiving data that is largely anonymous.

The Modified Eastern San Joaquin Agricultural General WDRs will require submission by the Third Party of three data sets to the Central Valley Water Board. Examples of the three data sets are attached to this order as sample data Tables 2, 3, and 4, solely for illustrative purposes.

The first data set associates each field with a Member-specific anonymous identifier, the Anonymous Member ID discussed in the section on the Farm Evaluation, and displays the crop grown, the annual A/R ratio, the annual A-R difference, and the three-year A/R ratio, as well as some of the underlying data, on a per acre basis. This data set facilitates comparison of the reported A/R ratio and A-R difference for Members growing the same crop. The data set allows the Central Valley Water Board to verify the Third Party's calculations and analyses with regard to Member performance, and specifically to verify that the Third Party is identifying and following up with Members that are applying nitrogen at substantially higher levels than other Members growing the same crop. Over several years, the data set additionally provides trend data to ensure that Members are adjusting nitrogen application in response to follow up and training efforts.

The second data set associates each field with a location by assigning one or more anonymous location-identifiers tied to the APN for the parcel(s) that the field partially or completely overlays (Anonymous APN ID). Since APNs are not coextensive with fields, each field may be associated with more than one Anonymous APN ID and each Anonymous APN ID may be associated with more than one field. This data set also displays the crop grown, the annual A/R ratio, the annual A-R difference, the three-year A/R ratio, as well as some of the underlying data for those numbers as above, on a per acre basis. The purpose of this data set is to track nitrogen application data and its potential impacts with regard to a physical location, where Member data obscures such impacts because Members may be changing the fields they operate from year to year. This data set allows the Central Valley Water Board and stakeholders to flag situations where the A/R ratio and/or A-R difference may be significantly higher than other locations in the short term and higher than acceptable ranges of multi-year A/R ratio values in the long term, providing an indicator of potential nitrate impacts to underlying groundwater. The Central Valley Water Board can then ensure that the Third Party is responding appropriately and that the values associated with the location show a trend toward acceptable nitrogen application values.

The third data set does not utilize anonymous identifiers, but aggregates the data at a township level, similar to the current reporting under the Eastern San Joaquin Agricultural General WDRs. This data set sets out A-R difference data by crop aggregated at the township level, average A/R ratio data by crop at the township level, and some of the underlying data by crop again aggregated at the township level. The purpose of this data set is to provide researchers and other interested persons township-level data to facilitate trend analysis and nitrogen loading modeling.

Taken together, the data reporting set forth above enhances efficacy and accountability, while preserving many benefits of data collection and assimilation by the Third Party. The State Water Board finds that use of the anonymous identifiers and aggregated data as outlined here and set out in the Modified Eastern San Joaquin Agricultural General WDRs retains the privacy protections of the existing order. At the same time, the revisions provide a more detailed set of field-specific data available to the Central Valley Water Board for oversight of the program and provide more transparency and assurance of progress for interested persons outside of the regulatory agency.

~~We will require the Third Party to compile the INMP Summary Reports and submit them to the Central Valley Water Board without aggregating or otherwise obscuring the INMP Summary Report data, so that the data for total nitrogen applied, total nitrogen removed, the ratio, and the difference are available to the Central Valley Water Board. The Third Party must submit the INMP Summary Report data to the Central Valley Water Board commencing in May 2019. By May 1, 2019, the Third Party will be required to submit the data for years 2016-2018; thereafter the Third Party shall submit the data annually by May 1. The delayed submission of the first two years' data will allow for the development of a database to receive the data.¹²⁸ The delayed submission further recognizes that the Member reporting requirements of the Modified Eastern San Joaquin Agricultural General WDRs are phased in such that only partial datasets of the AR data will be available in the first years of implementation, and further that the majority of coefficients for nitrogen removed calculations will not be available until 2019. Finally, because the A/R ratio should be analyzed as a multi-year value, for purposes of determining potential over-application of nitrogen to a field, the AR data has only limited utility prior to 2019. Because of the delayed submission of the data in the initial years of implementation of the Modified General WDRs, and in order to eliminate the possibility that the data could be lost or compromised, the Third Party is directed to propose and implement a mechanism for backing up and storing the data in a secure offsite location managed by an independent entity that specializes in the protection of data. Further, the Executive Officer of the Central Valley Water Board continues to have the discretion to request the data at any time.¹²⁹ In particular, we anticipate that the anonymous field-level data is sufficient for the Central Valley Water Board to verify that implemented management practices are making progress toward achievement of the water quality goals of the program. Where the Central Valley Water Board finds its oversight function requires a more proactive effort, we note that the Central Valley Water Board may at any~~

¹²⁸ ~~To the extent the State Water Board GeoTracker database is not ready for uploading the data by May of 2019, the coalition shall submit the data in excel and pdf format.~~

time request the names and locations corresponding to the anonymous identifiers.¹²² This option allows the Board to effectively follow up with individual Members where the data indicates that insufficient progress is being made by the Third Party's follow-up efforts with a Member.

In section II.A.~~4011~~ of this order, we set out our direction to the Central Valley Water Board on how the submitted data shall be utilized.

In addition to submitting the underlying data, we direct ~~the Third Party to continue to aggregate and analyze the data. We direct the Third Party to evaluate the data, providing comparisons of the A/R ratio and A-R difference by crop type, and within crop type, by irrigation method, soil condition, and farming operation size. The Third Party must identify the mean and standard deviation and report values that are higher than one standard deviation removed from the mean. The Third Party is directed to report this information by May 1 annually.~~ the Third Party to evaluate the data, providing comparisons of the A/R ratio and A-R difference by crop type, and within crop type, by irrigation method, soil condition, and farming operation size and other appropriate evaluations as directed by the Executive Officer.

The Third Party is directed to report the data sets set out above in accordance with the schedule set out in Appendix A, Modified Eastern San Joaquin Agricultural General WDRs.

The requirement for field-level AR data submission to the regional water board consistent with the data sets and analysis of those data sets described in this Order shall be precedential for irrigated lands programs statewide. For third-party programs only, the data shall be submitted with anonymous identifiers unless the regional water board finds that there is a compelling grower-specific or location-specific reason why the data should be submitted with name or location identifiers. With regard to the aggregated dataset, the regional water board is not limited to aggregating the data at the township level, but may choose a smaller or larger area unit based on region-specific and program-specific considerations.

The directed revisions are indicated at Appendix A, Modified Eastern San Joaquin Agricultural General WDRs, section VIII.D, p. 34, Attachment B, MRP, section V.D, pages 23-24,24-27, section V.E, Report Component (~~4817~~), pages 26-27-29-30.

f. Required Follow-Up

We further revise the Eastern San Joaquin Agricultural General WDRs to require specific actions of ~~Members reporting three-year running average A/R ratio values that vary from the mean value for the relevant crop by more than one standard deviation. The Third Party must inform such Members that they are potentially over-applying nitrogen to their fields. Following receipt of notification, these Members must either attend additional INMP self-certification training~~

¹²⁹¹²² Eastern San Joaquin Agricultural General WDRs, § X, p. 36.

~~in person or work with an irrigation and nitrogen management plan specialist for certification of the next INMP prepared following notification. These Members must also report on the next annual update to the Farm Evaluation that they were notified of a high three-year A/R ratio. The Farm Evaluation will then be expected to reflect additional or improved management practices implemented to address potential over-application of nitrogen. the Third Party and of the Member when a Member is determined to be an outlier based on reported AR data.~~

Outliers will be identified by the Third Party annually based on the INMP Summary Report data submitted for that particular year. Eventually, it is our expectation that outliers will be determined with reference to the ranges for the multi-year A/R ratio and A-R difference target values developed by the Third Party and the Central Valley Water Board. At this early stage, we recognize that the limited data available, as well as the variation in conditions from field to field and from year to year, mean that any definition of outliers is imperfect. We will not specifically define the term in Appendix A, Modified Eastern San Joaquin Agricultural General WDRs, but will direct the Third Party to propose and the Central Valley Water Board to approve a set of Members with whom the Third Party will follow up. The Third Party may choose to set a standard, approved by the Central Valley Water Board, that it applies annually for a period of years to determine outliers or may propose and seek approval of a specific set each year. A Member will not be identified as an outlier based on high AR data solely due to application of nitrogen in irrigation water.

The Third Party must inform such outlier Members that they are potentially over-applying nitrogen to their fields. Following receipt of notification, these Members must either attend additional INMP self-certification training in person or work with an irrigation and nitrogen management plan specialist for certification of the next INMP prepared following notification. These Members must also report on the next annual INMP Summary Report that they were notified as outliers for reported AR data. The INMP Summary Report will then be expected to reflect additional or improved management practices implemented to address potential over-application of nitrogen.

We continue to believe that the Third Party is best suited (both in terms of expertise and in terms of developed relationships) for the role and responsibility of follow up with Members to address any potential over-application. The Third Party is the lead in outreach and education and as part of that responsibility will be expected to follow up with Members who are outliers for reported AR data. If Third Party follow up does not yield sufficient progress in water quality in the coming years, we will reevaluate this approach and consider adding to the program

a trigger, such as three consecutive years of high A/R ratios, that will require non-anonymous reporting of that Member to the Central Valley Water Board.

The requirement for follow up and appropriate training for AR data outliers and for identification of repeated outliers as set out above shall be precedential in irrigated lands programs statewide, except that the regional boards will be responsible for the follow up and training for irrigated lands programs that directly regulate growers without a third-party intermediary.

The directed revisions are indicated at Appendix A, Modified Eastern San Joaquin Agricultural General WDRs, section IV.C.8.c, ~~pages 22-23~~, page 22, section VII.D, page 3029; Attachment B, MRP, section ~~VI.A.V.D~~, page 24, section VI.B, INMP Component (3), page 29-33.

6. Recordkeeping Requirements

The Eastern San Joaquin Agricultural General WDRs require that the Third Party shall maintain any reports and records required for a period of five years. We revise the General WDRs to require maintenance of the reports and records for ten years and to require the Third Party to back up the field-specific data submitted on the Farm Evaluations, the INMP Summary Reports, and the MPIRs in a secure offsite location managed by an independent entity. This requirement is needed because it is critical that the Central Valley Water Board have the ability to access outlier Members' names and locations if warranted at a future date.

This recordkeeping requirement shall be precedential statewide for all third-party irrigated lands programs.

The directed revisions are indicated at Appendix A, Modified Eastern San Joaquin Agricultural General WDRs, section X, page 40.

7. ~~6-~~Surface Receiving Water Monitoring

The Eastern San Joaquin Agricultural General WDRs do not require water quality monitoring of discharges coming off the farms, but require monitoring in the receiving waters. The watershed is divided into six zones. Two “core” sites and several “represented” sites are designated in each zone. ~~The~~In theory, the represented sites are sites with characteristics similar to the core sites such that a water quality issue detected at the core site may be an indication of a similar issue at a represented site. The two core sites are continuously monitored on an alternating basis. An exceedance at a core site triggers the requirement to monitor at the represented sites within the same zone.⁴³⁰¹²³

⁴³⁰¹²³ *Id.*, Attach. B, MRP, § III.A, pp. 3-6. The Third Party or the Executive Officer may additionally designated “Special Project Sites” to be monitored as part of a SQMP or to address a TMDL. (*Ibid.*)

The Environmental Petitioners argue that the surface water quality monitoring is ineffective as a feedback mechanism that can tie management practice implementation with the water quality goals of the Eastern San Joaquin Agricultural General WDRs. We took up the question of the appropriate approach to surface water quality monitoring in State Water Board Order WQ 2013-0101. The Central Coast Agricultural Order incorporates both regional receiving water monitoring and, for Tier III discharges, edge-of-farm discharge monitoring. In Order WQ 2013-0101, we declined to revise the surface water discharge monitoring requirements but we also expressed our concerns with the approach:

We are skeptical that the Central Coast Water Board has adopted the monitoring program best suited to meet the purpose of identifying and following up on high-risk discharges. The variability in the composition of end-of-field discharges makes it difficult to characterize such discharges through sampling at a limited number of locations and in a limited number of sampling events. Further, even though the surface water discharge monitoring requirements are targeted to the highest risk dischargers, problem discharges and areas are likely to be found outside of the influence of farms operated by Tier 3 dischargers. The better approach may be to rely on receiving water monitoring data and to require the third party monitoring groups administering receiving water monitoring to pursue exceedances with increasingly focused monitoring in upstream channels designed to narrow down and identify the sources of the exceedances.⁴³⁴¹²⁴

We presented the question of the appropriate surface water monitoring framework to the Agricultural Expert Panel. The Agricultural Expert Panel agreed that monitoring of surface water discharges from individual fields or farms is costly and complicated, as well as subject to serious challenges in identifying the appropriate timing for periodic sampling and coordinating with shifting field crew operations, pesticide applications, and sediment runoff events, and with schedules for lab operations. The Agricultural Expert Panel Report stated:

For surface water issues, the Panel recommends water quality monitoring of receiving water and a clear understanding of the watershed hydrology. Sufficient samples should be taken in the watershed streams to detect if problems do indeed exist. The sampling should be of sufficient density (spatially and temporally) to identify general locations of possible pollution. This is recommended rather than sampling at each discharge point. For example, a single measurement point at the downstream discharge of a very large

⁴³⁴¹²⁴ State Water Board Order 2013-0101, pp. 37-38. The Sacramento Superior Court Ruling stated with regard to surface water monitoring: "Petitioners have failed to persuade the court that surface discharge monitoring of all discharges is required—or even possible given that there are approximately 435,000 acres of irrigated land and approximately 3000 agricultural operations generating discharges of waste." (Sacramento Superior Court Ruling at 41.) Although the Ruling held that the State Water Board had struck an appropriate balance in requiring individual surface discharge monitoring for Tier 3 dischargers only, the court did not hold that discharge monitoring for high risk discharges is a required element of a surface water monitoring program. To the contrary, the court held that "both the Water Code and the NPS policy expressly allow the use of cooperative or watershed-based monitoring. . . While individual monitoring might provide more information, it would be complicated, costly, and would threaten to overwhelm Regional Board staff." (*Ibid.*)

watershed would be insufficient. When/if problems are identified, sampling should move upstream to locate the source of the problem.⁴³²¹²⁵

~~We continue to support receiving water monitoring over surface water discharge monitoring in irrigated lands regulatory programs for the reasons articulated by us in Order WQ-2013-0101 and by the Agricultural Expert Panel. When an exceedance is detected through receiving water monitoring, the source or sources causing or contributing to the exceedance at the monitoring site will not necessarily be apparent in the absence of further investigation, but as long as sampling subsequently moves upstream to locate the source of the problem, receiving water monitoring is a more reliable and effective methodology for identifying water quality issues than costly, variable, and inexact end-of-field measurements. We believe that receiving water monitoring is generally preferable to field-specific surface water discharge monitoring in irrigated lands regulatory programs for the reasons articulated by us in Order WQ-2013-0101 and by the Agricultural Expert Panel. Receiving water monitoring, if done correctly, is a reliable and effective methodology for identifying water quality issues without resorting to more costly end-of-field measurements.~~

~~We thus continue to endorse surface receiving water quality monitoring generally as appropriate for an agricultural monitoring program. This notwithstanding, having now carefully reviewed the particular surface water monitoring framework established in the Eastern San Joaquin Agricultural General WDRs, we cannot find that it is, in fact, “of sufficient density (spatially and temporally) to identify general locations of possible pollution.” The General WDRs rely not on regional or watershed-based sampling, but on “representative monitoring.” The Third Party monitors only a few “core” sites, asserted to be representative of “represented” sites elsewhere in the watershed. The Third Party proceeds to monitor the represented sites only where a core site has an exceedance. There are two problems with this approach: First, in theory, because the core site and the represented sites have similar cropping, practices, and conditions, an exceedance at a core site would be indicative of an exceedance at a represented site. But we see no basis for this proposition in practice. Even if the crops, conditions, and practices in the core sites and the represented sites are roughly similar, a grower in one of the core site areas could cause a water quality problem exclusive of the represented site area and vice versa. Second, and perhaps more significantly, it is not clear that, even collectively, the core and represented monitoring sites have sufficient spatial density or distribution to be able to reasonably identify exceedances throughout the watershed. This notwithstanding, having now carefully reviewed the particular surface water monitoring framework established in the Eastern~~

⁴³²¹²⁵ Agricultural Expert Panel Report, p. 41.

San Joaquin Agricultural General WDRs, we cannot find that it is, in fact, “of sufficient density (spatially and temporally) to identify general locations of possible pollution.” The General WDRs rely not on regional or watershed-based sampling, but on “representative monitoring.” The Third Party monitors only a few “core” sites, asserted to be representative of “represented” sites elsewhere in the watershed. The Third Party proceeds to monitor the represented sites only if a core site has an exceedance.

There are two problems with this approach: First, in theory, because the core site and the represented sites have similar hydrology, crop type, land use, soil type, and rainfall, and are assumed to be managed similarly, an exceedance at a core site would be indicative of an exceedance at a represented site. But the data does not bear this out. As an example, an examination of the reported monitoring data shows that monitoring at a represented site reveals exceedances for a different set of pollutants than the monitoring at the core site that triggered the requirement for sampling the represented site in the first place. Even where the physical characteristics of a core site and a represented site are similar, this monitoring program is meant to also capture human behavior in management practices, beyond just physical site characteristics, and the data suggests that there is enough variability in field-by-field practices to yield significantly varied monitoring results from core sites to represented sites. We have reviewed the monitoring design guidance prepared in 2007 to support the Central Valley irrigated lands regulatory program and believe that, in its current form, the surface water monitoring program strays from the recommended approach.¹²⁶

Second, it is not clear that, even collectively, the core and represented monitoring sites have sufficient spatial density or distribution to be able to reasonably identify exceedances throughout the watershed.

The approach taken by the Eastern San Joaquin Agricultural General WDRs may be effective in monitoring for a narrower set of purposes, such as determining the effectiveness of a certain set of management practices, but it does not appear to be comprehensive enough to identify problem areas throughout the watershed. We recognize that water quality monitoring at core and represented sites is supplemented by additional, potentially upstream, monitoring under an SQMP, when triggered. But the problem is that a SQMP may not be triggered until an exceedance is detected at a core or represented site, and water quality exceedances upstream or

¹²⁶ Monitoring Design Guidance for the Central Valley Irrigated Lands Regulatory Program, October 2007, available at http://www.waterboards.ca.gov/rwqcb5/water_issues/irrigated_lands/water_quality/monitoring_design_guidance_20nov07.pdf.

in an adjacent portion of the watershed to that of the core and represented sites may go undetected in the interim.⁴³³¹²⁷

The Nonpoint Source Policy does not require any particular framework for monitoring and does not necessarily even require comprehensive ambient monitoring. But the nonpoint source implementation program must “include sufficient feedback mechanisms so that the [regional water board], dischargers, and the public can determine whether the program is achieving its stated purpose(s), or whether additional or different [management practices] or other actions are required.”⁴³⁴¹²⁸ The representative monitoring of the General WDRs ~~is~~ does not ~~likely appear~~ to meet that mandate. Especially given that monitoring to date has indicated that discharges from irrigated lands are leading to some exceedances of receiving water limitations, we find that the monitoring results of the Eastern San Joaquin Agricultural General WDRs indicate that a more comprehensive ambient monitoring program is ~~in order~~ necessary.

In coming to this conclusion, we are cognizant of the argument, advanced by the Central Valley Water Board and the East San Joaquin Water Quality Coalition, that the current surface water monitoring provisions of the General WDRs reflect a studied decision by the Central Valley Water Board to reduce the Third Party’s monitoring costs in favor of increasing funds for management practice implementation. At least in one respect, we support this compromise. In Order WQ-2013-0101, as quoted above, we stated that an effective receiving water monitoring program must pursue exceedances in upstream channels and narrow down the source of the exceedances. The General WDRs eschew this framework in favor of requiring management practice improvements of all Members in the affected watershed. We find that this approach is reasonable in the first couple of iterations of attempts to correct exceedances, although identification of individual sources should be required if improvements are not sufficient.¹²⁹ In other respects, we are not confident that the balance between monitoring on the one hand and increased funding for management practice implementation on the other hand has been appropriately struck. The General WDRs must ensure that existing and developing water quality problems are in fact detected and subsequently corrected and must provide for sufficient density of monitoring to achieve that purpose.

Unlike with all other provisions of the Eastern San Joaquin Agricultural General WDRs, we will not make the specific revisions to the Surface Water Monitoring provisions of the General WDRs ~~but will instead direct the Central Valley Water Board to review and reconsider~~

⁴³³¹²⁷ Eastern San Joaquin Agricultural General WDRs, § VIII.H.2.1, p. 33.

⁴³⁴¹²⁸ Nonpoint Source Policy, p. 13, AR-36452-13.

¹²⁹ We note that the Agricultural Expert Panel also set an expectation that monitoring would move upstream to identify sources as needed. (Agricultural Expert Panel Report, p. 41.)

~~the provisions and reopen the General WDRs by March 1, 2017, to adopt a revised program. Any revised program must be on a scale sufficient to track water quality progress across the entire basin and collect data sufficient to cover conditions throughout the watershed. The revised program must incorporate monitoring elements that require the Third Party to pursue exceedances with increasingly focused monitoring in upstream channels designed to narrow down and identify the approximate area and sources of the exceedances. To the extent the Third Party relies on monitoring in a SQMP to identify and focus on sources of exceedances, the monitoring program should clearly state how that will be accomplished through the SQMP provisions. In the interim, the Central Valley Water Board and the Third Party shall continue to implement the existing program in this Order. We will instead convene a panel of experts to make recommendations on a framework for surface receiving water monitoring to inform irrigated lands programs statewide. We expect the panel to be charged with answering the following questions, which may evolve as the State Water Board, through its Office of Information Management and Analysis, develops the project proposal for the expert panel:~~

- ~~What are the management decisions that need to be answered by monitoring and data assessment in the irrigated lands program?~~
- ~~How should a monitoring program be designed to provide defensible data for the relevant management decisions, yet recognize the need to control the costs of monitoring and assessment? Topics should cover temporal and spatial monitoring design, analyte selection, analytical methods, data analysis, and synthesis.~~
- ~~What processes for evaluating monitoring program effectiveness could be implemented for continuous improvement?~~
- ~~What new monitoring and assessment tools and technologies are relevant to the irrigated lands program and how can the water boards acquire the tools and knowledge to use them?~~
- ~~What skills and knowledge do water board staff need to manage the irrigated lands monitoring and assessment program?~~
- ~~How can data submittal consistency and accessibility be improved?~~
- ~~How do the conclusions and recommendations of the expert panel inform other regulatory programs with a landscape scale requirement for monitoring and assessment such as programs for forestry and grazing? Do they have applicability to other Water Board programs such as the Stream Pollution and Trends program?~~

~~We expect the panel to be composed of members having knowledge, skills, and abilities to address the following topics of needed expertise, which may evolve as the State Water Board, through its Office of Information Management and Analysis, develops the project proposal for the expert panel:~~

- Landscape-based water quality modeling: Expertise in predictive modeling of potential contamination using pesticide use reports, soil, weather, and crop information to help determine chemical, temporal, and spatial potential for contamination and effect
- Agronomy: Expertise on cultural practices, pest management, BMPs, soil, plant, and nutrient information
- Data science and statistics: Expertise to ensure that the monitoring design is a targeted design and to enable analysis of existing data from the program to determine variability in support of the temporal and spatial design of the program
- Toxicology, biology, chemistry: Expertise to address selection of test methods and test species appropriate for the chemicals selected to be monitored, including some expertise on the fate and transport of these particular elements in the typical receiving waters of California.

Once convened, the expert panel will report to the State Water Board on the monitoring and program data needed to inform the expert panel's review and determinations. The Executive Director of the State Water Board may then issue a monitoring and reporting program order under Water Code section 13267 to the Eastern San Joaquin Coalition and to other third parties in the irrigated lands programs requesting the data recommended by the expert panel. In the interim, the Central Valley Water Board and the Third Party shall continue to implement the existing program.

8. ~~7~~-Groundwater Quality Monitoring

The Eastern San Joaquin Agricultural General WDRs contain a set of requirements for groundwater quality monitoring and management practice assessment and evaluation. The General WDRs first require preparation of a Groundwater Quality Assessment Report, which provides a baseline for groundwater quality conditions in the watershed by assessing all existing data.⁴³⁵¹³⁰ Second, the General WDRs require implementation of a Management Practice Evaluation Program in which targeted studies are conducted to evaluate management practices that are protective of groundwater quality.⁴³⁶¹³¹ Third, the General WDRs require Groundwater Quality Trend Monitoring, based on sampling of a network of existing wells, to determine current and long-term regional groundwater quality trends.⁴³⁷¹³²

We add to the groundwater monitoring provisions of the Eastern San Joaquin Agricultural General WDRs a set of monitoring and reporting requirements designed specifically to address identification of on-farm drinking water supply wells with nitrate concentrations that are detrimental to public health. We then make several revisions to the Groundwater Quality

⁴³⁵¹³⁰ Eastern San Joaquin Agricultural General WDRs, Attach. B, MRP, § IV.A, pp.13-15.

⁴³⁶¹³¹ *Id.*, Attach. B, MRP, § IV.B, pp. 15-17.

⁴³⁷¹³² *Id.*, Attach. B, MRP, § IV.C, p.17.

Assessment, Management Practice Evaluation Program, and Groundwater Quality Trend Monitoring provisions of the General WDRs, but these modifications are comparatively minor.

a. Drinking Water Well Monitoring

Nitrates consumed at concentrations above the MCL of 10 milligrams per liter (mg/L) of nitrate+nitrite as N¹³³ can pose serious health risks to pregnant women and infants. In State Water Board Order WQ 2013-0101 we recognized the importance of making accurate, reliable nitrate concentration data available to the consumers of well water and established a framework where the nitrate concentration for every drinking water well was determined through existing data, direct sampling, or a statistically valid projection, and where users were notified of exceedances. We now add drinking water well monitoring provisions to the Eastern San Joaquin Agricultural General WDRs similar to those established for the Central Coast by Order WQ 2013-0101.

~~The new provisions require Members to monitor all drinking water supply wells on their property. Two rounds of sampling are required within the first year of monitoring, except where existing drinking water supply well sampling data is available from the prior five years. Where existing data or sampling data from initial rounds of sampling indicate nitrate concentration is at or above 8 mg/L nitrate+nitrite as N, a repeat sample must be taken within 12 months and annually thereafter unless an alternative sampling schedule is approved by the Executive Officer. Results of the drinking water supply well monitoring must be included in the Annual Monitoring Report submitted to the Central Valley Water Board by the Third Party. (As with other exceedances of a water quality objective in a groundwater well, the reported exceedance may trigger the requirement for the Third Party to develop a GQMP.¹³⁹) initially sample all on-farm drinking water supply wells for nitrate concentrations annually. In lieu of one or more annual samples, the Member may rely on drinking water supply well sampling data available from any time within the prior five years. Where existing data or sampling data indicates that the nitrate concentration was below 8 mg/L for three consecutive annual sampling events, the member may thereafter sample every five years instead of annually. An alternative sampling schedule may be required by the Executive Officer at any time. Results of the drinking water supply well monitoring must be submitted by the laboratory directly to GeoTracker. Results of any existing sampling data must be reported to GeoTracker directly by the Member.~~

The new provisions require that users receive notification if a drinking water ~~exceeds 10 mg/L of nitrate+nitrite as N. The Member or Third Party must provide notification well~~

¹³³ As stated previously, the MCL is also expressed as 45 mg/L of nitrate as NO₃.

¹³⁹ Eastern San Joaquin Agricultural General WDRs, § VIII.H.2, pp. 33-34.

~~exceeds 10 mg/L of nitrate+nitrite as N. The Member must provide notice to users within ten days of the exceedance and send a copy of the notice to the Central Valley Water Board. Where the Member is not the property owner, the Member may choose to provide the notice or instead pass on the results to the property owner within 24 hours of learning of the exceedance. Where the Member is the property owner, the Member must provide notice to users within ten days of the exceedance; where the Member is not the property owner, the Central Valley Water Board will promptly notify users of the exceedance. The State Water Board expects that the Central Valley Water Board will, where appropriate, act promptly to require the Member to provide users with safe drinking water for consumption.; the property owner must then notify the users within nine days of the exceedance and copy the Central Valley Water Board.¹³⁴ The State Water Board expects that the Central Valley Water Board will, where appropriate, act promptly to require the Member to provide users with safe drinking water for consumption.~~

Unlike in Order WQ 2013-0101, where we permitted a statistically valid projection of well nitrate levels, with this order we require actual sampling of all wells. The ultimately unsuccessful effort to characterize drinking water supply wells through representative monitoring under the Central Coast Agricultural Order has borne out that obtaining a statistically valid projection for nitrates is a subjective and problematic process in the absence of an extensive set of data points. We conclude that, given the public health risk associated with drinking water that exceeds the MCL levels, the only way to ensure that public health is fully protected is to require sampling of every drinking water supply well.⁴⁴⁰¹³⁵

¹³⁴ Finding 2 of the Eastern San Joaquin Agricultural General WDRs states that enforcement action for non-compliance may be taken against both the owner and the operator, even when the owner is not enrolled as a Member.

⁴⁴⁰¹³⁵ In June 2015, Senate Bill 83 amended Water Code section 13752 to mandate public access to well completion reports. Well completion reports are required to be filed with the Department of Water Resources (DWR) for all groundwater wells at the time that they are constructed. The reports are required to contain information regarding each well's location and construction, and the lithology of the subsurface, among other items. As a result of the amendment, all well completion reports are available to the public, except that personal information (e.g., an individual's name and address) must be redacted. In the past, the State Water Board has obscured from public view in its online groundwater information systems, including GeoTracker, the precise locations of water supply wells for public water systems and some private domestic wells by providing a randomly-generated point within approximately one mile of the well's precise location. In addition, the State Water Board's Division of Drinking Water has not released records that identify the precise location of water supply wells used by public water systems. Since well completion reports, including information about the location of the wells, are now publicly available by request from DWR, ~~the State Water Board~~we announced our decision that, as of January 10, 2017, we will no longer obscure public water system groundwater well location information on ~~its~~our online groundwater information systems or withhold other records that identify the precise location of water supply wells used by public water systems. Not only will this beWith this Order, we extend our decision to all other groundwater wells. Henceforth, we will cease obscuring the location of any groundwater wells, absent exceptional circumstances. Not only is this consistent with the Legislature's clear policy direction regarding the transparency of groundwater data, it ~~will~~ also helps to facilitate efforts by governmental agencies and nongovernmental organizations to identify individuals and communities that are in need of infrastructure and replacement water supplies, and general research regarding groundwater quality.

We are aware of ongoing discussions and proposals among interested persons to address drinking water well contamination and the provision of replacement water through legislation that would more broadly address private drinking water supply wells, not only on-farm drinking water supply wells, as the Modified Eastern San Joaquin Agricultural General WDRs does. In order to allow some time for consideration of legislative proposals, the requirements for on-farm drinking water well monitoring will not take effect, if, prior to January 1, 2019, the State Water Board determines that the legislature has established a comprehensive statewide program that assures that private drinking water wells will be routinely monitored for nitrate contamination and users of those wells will be notified of the results.

The Environmental Petitioners argue that the Eastern San Joaquin Agricultural General WDRs disproportionately impact low-income communities and communities of color, are discriminatory, and are null and void by virtue of denying enjoyment of those communities' residence, landownership, and tenancy, because Latino and low-income communities are more likely to have drinking water contaminated by nitrates and less likely to have access to health care, treatment, or substitute water sources.⁴⁴⁴¹³⁶ With the revisions we have made to the General WDRs, including the additional drinking water well monitoring provisions added with this section, we find that the discharges of waste authorized by the General WDRs will not disproportionately impact or discriminate against Latino and low-income communities, or deny their enjoyment of their residences, property, or tenancy. We make this finding in particular because the Modified Eastern San Joaquin Agricultural General WDRs require (1) calculation and reporting of field-level AR data; (2) implementation and reporting of management practices where the Member is identified as having a significantly higher than average multi-year A/R ratio in order to reduce over-application of nitrogen; (3) monitoring of on-farm drinking water supply wells to determine if they exceed public health standards; (4) prompt notification of users if a well exceeds public health standards. Further, although Water Code section 106.3, by its terms, does not apply to the issuance of a water quality order, it is appropriate for us to consider the human right to water in this context,⁴⁴²¹³⁷ and we find that our adoption of the order supports the basic human right "to safe, clean, affordable, and accessible water adequate for human consumption, cooking, and sanitary purposes," expressed in Water Code section 106.3, for the same reasons articulated in this paragraph.

In sum, after January 1, 2019, Members must initiate sampling of private drinking water supply wells located on their property. The requirements of this section will not take

⁴⁴⁴¹³⁶ See Gov't Code, §§ 11135, 12900 et seq., & 65008.

⁴⁴²¹³⁷ See State Water Board Order WQ 2013-0101, pp. 67-68.

effect if, prior to January 1, 2019, the State Water Board determines that the legislature has established a comprehensive statewide program that assures that private drinking water wells will be routinely monitored for nitrate contamination and users of those wells notified of the results.

The requirement for on-farm drinking water supply well monitoring shall be precedential statewide.

The directed revisions are indicated at Appendix A, Modified Eastern San Joaquin Agricultural General WDRs, section VII.E, p. 30, section VIII.DE.1, page 3534; Attachment B, MRP, section IV.A, pages 14-15, section V.E, Report Component (17), page 26-15.

- b. Removal of High/Low Vulnerability Distinctions Groundwater Quality Assessment Report

The Groundwater Quality Assessment Report, which serves the purpose of providing the technical basis informing the scope and level of effort for implementation of the General WDRs groundwater monitoring and implementation provisions, was approved by the Central Valley Water Board on December 14, 2014. We make no revisions to the requirements at this point.

The preparation of a Groundwater Quality Assessment Report shall not be precedential statewide.

c. Management Practice Evaluation Program

~~We make several revisions to the remainder of the groundwater monitoring provisions, primarily to de-emphasize the distinction the Eastern San Joaquin Agricultural General WDRs makes between high vulnerability and low vulnerability areas. Under our revisions, the Groundwater Quality Assessment Report no longer requires determination of high and low vulnerability areas. The Groundwater Quality Assessment Report must establish priorities for implementation of the management practice evaluation program and groundwater quality management plans, but such prioritization is no longer limited to high vulnerability areas, and the determination of high and low vulnerability is an optional prioritization tool rather than the basis for application of the implementation requirements. The scope and purpose of the Management Practice Evaluation Program (MPEP) has evolved since the adoption of the Eastern San Joaquin Agricultural General WDRs and is continuing to evolve. We are reluctant to make any significant revisions to the MPEP requirements so that the Central Valley Water Board retains continued flexibility to refine the program. We expect that the MPEP will initially focus on the determination of the crop-specific coefficients for conversion of yield to nitrogen removed and then on the determination of acceptable ranges for the multi-year A/R ratio target values by crop.~~

~~We further expect the MPEP will help identify specific management practices appropriate for specific conditions to assist Members in minimizing surface water and groundwater impacts, particularly in areas with SQMPs and GQMPs. We revise the MPEP to require study of management practice effectiveness in all areas, not just areas designated as high vulnerability areas, although we explicitly acknowledge that prioritization may be based on the high vulnerability determination. The Central Valley Water Board stated as follows in a comment letter submitted in response to a February 8, 2016, draft of this order, which had proposed removal of the high/low vulnerability distinctions:~~

~~[T]he Central Valley Water Board does not oppose abolishing the high/low vulnerability distinction and is not disputing the State Water Board's rationale for doing so. The Central Valley Water Board has found that the high/low vulnerability distinction in the exiting General WDRs has become problematic because only Members within high vulnerability areas are required to participate and fund the MPEP . . . , even though the Board intended for these activities to be funded by all Members. Removing the designation would therefore allow the obligations to be funded in a more equitable manner.¹³⁸~~

¹³⁸ Comment Letter, Central Valley Water Board, June 1, 2016, p. 17, available at http://www.swrcb.ca.gov/public_notices/comments/a2239ac/patrick_pulupa.pdf (as of Oct. 6, 2017). The comment letter implies that the same concern may apply to the Groundwater Quality Trend Monitoring Program, but we read the requirements for that program as not limited to high vulnerability areas.

In response to other comments we received, we reinstated the high/low vulnerability distinctions in the Eastern San Joaquin Agricultural General WDRs generally with this order, but we will remove them for purposes of the MPEP requirements.

Similarly, we revise the Management Practice Evaluation Program to require study of management practice effectiveness in all areas, not just areas designated as high vulnerability areas, although we explicitly acknowledge that prioritization may be based on the high vulnerability determination. We also require that any groundwater monitoring data supporting the Management Practice Evaluation Program be collected through shallow groundwater monitoring because shallow groundwater exhibits a more rapid response to practices on the field.¹⁴³ We also require that any groundwater monitoring data supporting the Management Practice Evaluation Program be collected through shallow groundwater monitoring because shallow groundwater exhibits a more rapid response to practices on the field.¹³⁹

Finally, we make minor revisions to the Groundwater Quality Trend Monitoring to clarify again that high and low vulnerability designations are optional prioritization tools rather than a requirement of the Modified Eastern San Joaquin Agricultural General WDRs. The MPEP requirements shall not be precedential statewide.

The directed revisions are indicated at Appendix A, Modified Eastern San Joaquin Agricultural General WDRs, section VIII.E.3, p. 35, Attachment B, MRP, section IV.B-E, pages 15 pp. 20-21.

d. ~~e.~~ Trend Monitoring Constituents Groundwater Quality Trend Monitoring

In addition to nitrate + nitrite as N, the Groundwater Quality Trend Monitoring provisions require monitoring for conductivity, pH, dissolved oxygen, temperature, total dissolved solids, and general minerals.¹⁴⁴¹⁴⁰ The Environmental Petitioners have asked us to expand the list of constituents further and argue specifically that the Groundwater Quality Trend Monitoring constituents should include pesticide run-off pesticides and degradation products from

¹⁴³¹³⁹ We define shallow groundwater as groundwater located less than ten feet below the soil surface. As we discuss below, the Agricultural Expert Panel Report found that groundwater quality monitoring will not provide useful data for purposes of evaluating the effectiveness of above-ground practices, except in very limited circumstances. (Agricultural Expert Panel Report, p. 8.) Monitoring of shallow groundwater constitutes the scenario in which the data is most likely to be meaningful. We note that the Agricultural Expert Panel's conclusions were with regard to impacts associated with farming, and not with impacts from other potentially more concentrated sources, such as holding ponds at dairies.

¹⁴⁴¹⁴⁰ Eastern San Joaquin Agricultural General WDRs, Attach. B, MRP, § IV.E, pp. 19-20.

pesticides.¹⁴⁵¹⁴¹ We will not expand the monitoring constituents to include pesticides and degradation products from pesticides ~~because where~~ the Central Valley Water Board can rely instead on the monitoring conducted by the Department of Pesticide Regulation (DPR) for data on these constituents. We address that issue through a revision to the GQMP provisions under section II.8.9. However, we direct the Central Valley Water Board to consider adding monitoring for parameters that are not covered by DPR but are known groundwater contaminants associated with agriculture, in particular 1,2,3-TCP and DBCP.

The requirement for groundwater quality trend monitoring shall be precedential statewide; however, the specific requirements and the monitored constituents specified in the General WDRs shall not be precedential.

e. ~~d-~~The Multi-Year A/R Ratio as a Proxy for Groundwater Monitoring for Nitrates and A-R Difference as Indicators of Nitrogen Loading to Groundwater

It is important to note in our discussion of groundwater quality monitoring that the role of groundwater quality monitoring in any agricultural regulatory program is primarily one of trend monitoring. Groundwater quality monitoring does not yield data responsive enough to above-the-ground impacts to allow correlation of management practices and water quality outcomes, except under very limited conditions. The Agricultural Expert Panel stated that monitoring of first-encountered groundwater as an indication of the effectiveness of above-ground practices is meaningful only in a context where “sampled groundwater volume can be attributed to a defined recharge area, which must be contained within the area where the regulated discharge occurs” and further that such attribution is meaningful primarily in “areas of very shallow groundwater tables, relatively steady groundwater flow directions, high recharge, large regulated units, and a strong introduced discharge signal.”¹⁴⁶¹⁴² Where these conditions are present, there are opportunities for studies of management practice effectiveness, as with the Management Practice Evaluation Program of the General WDRs. But another tool is needed to track the effectiveness of implemented practices in reducing discharges to groundwater under a broader set of regional conditions. Although one such tool may be conducting a soil profile

¹⁴⁵¹⁴¹ The Groundwater Quality Trend Monitoring constituents specified in the Eastern San Joaquin Agricultural General WDRs are conductivity, pH, dissolved oxygen, temperature, nitrate as N, total dissolved solid, and general minerals. (*Id.*, Attach. B, MRP, table 3, pp. 19-20.) In addition to advocating for addition of pesticides and degradation products from pesticides to that list, the Environmental Petitioners argue that the Groundwater Quality Trend Monitoring constituents should include deleterious minerals. On this point, we agree with the Central Valley Water Board’s conclusion that the presence of nitrates at elevated levels (plus general minerals) serves as an indicator of other potential problems associated with irrigated agricultural discharges. (*Id.*, Attach. A, Information Sheet, p. 15.)

¹⁴⁶¹⁴² Agricultural Expert Panel Report, p. 8.

analysis by monitoring soil samples for presence of constituents of concern, obtaining a statistically significant number of samples on an annual basis would be prohibitively expensive.

~~With this order, we are directing the regional water boards to instead use the multi-year A/R ratio as a proxy for groundwater quality monitoring with regard to nitrogen discharges as the feedback mechanism for determining the effectiveness of nitrogen management practices. The multi-year A/R ratio is both a cost-effective and a reliable methodology for tracking the amount of nitrogen left in the soil over a period of time. The multi-year A/R ratio identifies the upper limit of nitrogen that may enter the groundwater from the soil. Trends in the multi-year A/R ratio are expected to follow changes in management practices on the field, providing a reliable indication of whether management practices are working to reduce the potential for nitrogen loss to groundwater. The multi-year A/R ratio is thus an appropriate metric for determining measurable progress toward ensuring agricultural discharges are not causing or contributing to exceedances of water quality standards in the groundwater. The information obtained through the multi-year A/R ratio in a given area may also subsequently be matched with the groundwater quality trend monitoring data to evaluate and verify the results and conclusions of the methodology.~~

In contrast, the multi-year A/R ratio, analyzed in concert with the A-R difference, is both a cost-effective and a reliable methodology for tracking the amount of nitrogen left in the soil over a period of time, and that may enter the groundwater from the soil. Trends in the multi-year A/R ratio are expected to follow changes in management practices on the field, providing a reliable indication of whether management practices are working to increase efficiency in nitrogen application and to reduce the potential for nitrogen loss to groundwater. The A-R difference further informs the magnitude of any potential over-application of nitrogen. The multi-year A/R ratio and the A-R difference are thus appropriate metrics for determining measurable progress toward ensuring agricultural discharges are not causing or contributing to exceedances of water quality standards in the groundwater. The information obtained through the multi-year A/R ratio and A-R difference in a given area may also subsequently be matched with the groundwater quality trend monitoring data to evaluate and verify the results and conclusions of the methodology.

The ~~multi-year A/R ratio~~AR data is, of course, specific to nitrogen impact, and the groundwater monitoring provisions of the Eastern San Joaquin Agricultural General WDRs consider impacts from a wider set of constituents and remain an indispensable component of the regulatory program. However, with regard to nitrogen, we expect the multi-year A/R ratio and A-R difference to be the primary tools for management, reporting, and oversight going forward.

The agricultural representatives and environmental justice organization representatives who presented the compromise proposal for data reporting to us also proposed development of a methodology for determining targets for nitrogen loading on a township by township basis. The group has committed to working on the proposal and we welcome their input. We direct the East San Joaquin Coalition to develop a project scope and timeline to further flesh out the proposal, in consultation with the Central Valley Water Board, for approval within two years of the adoption of this Order.

9. ~~8.~~ Surface Water and Groundwater Quality Management Plans

Under the Eastern San Joaquin Agricultural General WDRs, the Third Party proposes and implements a SQMP or GQMP in an area in response to certain triggers indicative of water quality problems related to agricultural discharges to surface water or groundwater. Once triggered, a SQMP or GQMP must have a specific schedule of management practices and tasks to be implemented to achieve compliance with receiving water limitations and a monitoring system designed to measure whether management practice changes are in fact effective at achieving the requirements of the General WDRs.⁴⁴⁷¹⁴³ In general, we do not disturb these provisions because we find that the triggers are appropriate for identifying areas in which additional or alternative management practice implementation and additional monitoring, above and beyond the baseline conditions of the General WDRs, is necessary to address exceedances.⁴⁴⁸¹⁴⁴ ~~However, we remove the references to high and low vulnerability area determinations, except as criteria for prioritization.~~ In the previous section, we declined to expand groundwater monitoring constituents to include pesticides and degradation products from pesticides, but indicated that we would instead rely on data collected by DPR on pesticide impacts. That data is available in GeoTracker.⁴⁴⁹¹⁴⁵ We will add to General WDRs a clarification that a GQMP may be triggered based on exceedances detected through monitoring programs outside the scope of the Eastern San Joaquin Agricultural General WDRs provisions. We will additionally direct that the Executive Officer consider the State Water Board Hydrogeologically Vulnerable Areas and the DPR Groundwater Protection Areas when determining if an area should be subject to a GQMP.⁴⁵⁰¹⁴⁶

⁴⁴⁷¹⁴³ Eastern San Joaquin Agricultural General WDRs., Attach. B, MRP, Appen. MRP-1, §§ I.C-D, pp. 4-6.

⁴⁴⁸¹⁴⁴ The triggers for the preparation of SQMPs and GQMPs are based on the same criteria as the high vulnerability determinations. Although we have found that the baseline requirements of the General WDRs should be applied uniformly, for purposes of prioritizing areas for additional management practices, the criteria are appropriate.

⁴⁴⁹¹⁴⁵ Although the DPR data in GeoTracker is not available by precise location, the exceedances are correlated with a small enough area to be appropriate as a trigger for a GQMP. See also discussion of DPR's groundwater quality monitoring program at Eastern San Joaquin Agricultural General WDRs, Attachment A, Information Sheet, p. 17.

⁴⁵⁰¹⁴⁶ Appen. A, Modified Eastern San Joaquin Agricultural General WDRs, § VIII.H.2, pp. 37-38.

The SQMP and GQMPs are primary vehicles for requiring implementation of new and improved management practices under the General WDRs, but reporting on practices implemented with the SQMP and GQMP lacks specificity.⁴⁵⁴¹⁴⁷ The Third Party is directed to report “a summary of management plan grower outreach conducted” and a “summary of the degree of implementation of management practices.”⁴⁵²¹⁴⁸ ~~But as discussed in the section on Farm Evaluations, we are already strengthening the requirements for reporting of management practice implementation to make it easier to verify the correlation between new or improved management practice implementation and water quality improvements. Because management practice implementation will be reported based on Farm Evaluation submissions and because the Central Valley Water Board may thus review the management practice implementation of those Members required by an SQMP or GQMP to implement more stringent requirements, we will not make revisions to the SQMP or GQMP reporting requirements themselves.~~

We add a provision to the SQMP and GQMP to make the requirement to report the degree of implementation of management practices more explicit. Members in a SQMP and/or GQMP areas shall submit a Management Practice Implementation Report (MPIR) to the Third Party at least annually, laying out new or improved management practices implemented to address the particular water quality issues identified in the area. The Third Party will prepare an appropriate form specific to each SQMP or GQMP with appropriate reporting frequency based on the implementation cycle of the applicable management practices. For the SQMP and the GQMP already approved by the Central Valley Water Board, submission of MPIRs shall commence in 2019. Similar to the submission associated with the Farm Evaluations, the Third Party will submit a data set based on the MPIRs to the Central Valley Water Board with Anonymous Member IDs and Anonymous APN IDs.¹⁴⁹

SQMPs and GQMPs shall not be precedential statewide.

⁴⁵⁴¹⁴⁷ Over the next several years, we expect that improvements made in response to a high multi-year A/R ratio, rather than in response to a GQMP, to become the primary vehicle for implementing improved management practices addressing nitrate impacts. However, the GQMP, or an equivalent approach, will continue to have a significant role in agricultural regulatory programs in addressing impacts from pollutants other than nitrates. There may also be some fields in areas with conditions -- soil types and depth to groundwater -- that lead to nitrate impacts even with a low multi-year A/R ratio. In those cases, programs would have to rely on the GQMP or an equivalent approach to require improved practices in the area.

⁴⁵²¹⁴⁸ Eastern San Joaquin Agricultural General WDRs, Attach. B, MRP, Appen. MRP-1, § I.F, p. 6.

¹⁴⁹ We recognize that the Eastern San Joaquin Agricultural General WDRs currently require the Third Party to identify, as part of its annual Membership List submission, Members who have failed to implement improved water quality management practices within the timeframe specified by an applicable SQMP or GQMP. (*Id.*, § IV.C.9, p. 21.) This already required information is significant in that it allows the Central Valley Water Board to follow up with or take enforcement against Members in violation of the SQMP or GQMP requirements, but it does not replace the need for a broader set of data, including data for management practices implemented under a SQMP or GQMP as well as in the absence of a SQMP or GQMP, to support effective program implementation.

The directed revisions are indicated at Appendix A, Modified Eastern San Joaquin Agricultural General WDRs, section VIII.H.2., pages ~~36-37-38~~ and footnotes ~~38-39-35-36~~; Attachment B, MRP-1.

10. ~~9-Monitoring and Reporting Requirements and Water Code Section 13267~~

The revisions we have directed in the above sections ~~expand the monitoring and reporting requirements of the General WDRs. Water Code section 13267 states that “[t]he burden, including costs, of [monitoring and reporting] shall bear a reasonable relationship to the need for the report and the benefits to be obtained from the reports.” This order revises the monitoring and reporting requirements of the General WDRs primarily as follows: (1) Members in low vulnerability areas must now submit annual Farm Evaluation Forms, obtain certification of the INMP, and submit INMP Summary Reports (these requirements are phased in to allow additional time for Members exempt under the General WDRs); (2) Members must fill out a Farm Evaluation that is expanded modestly from the Farm Evaluation currently used as a template; (3) Members must include irrigation related information on the INMP and the INMP Summary Report; (4) the Third Party must identify by location the field level data on management practice implementation from the Farm Evaluations (the General WDRs already require submissions to the Central Valley Water Board of this data, but identified by township); (5) Members must substitute the recording and reporting of AR data for recording and reporting of data supporting the nitrogen consumption ratio; (6) the Third Party must take the additional step of submitting to the Central Valley Water Board the data it receives from the INMP Summary Reports; (7) all Members must collect two initial water quality samples from on-farm drinking water wells; some Members may have an obligation for annual sampling and some Members may be required to provide notification of high nitrate levels. We find that the additional costs and burden associated with these revisions are not substantial.~~ modify many of the monitoring and reporting requirements of the General WDRs. Water Code section 13267 states that “[t]he burden, including costs, of [monitoring and reporting] shall bear a reasonable relationship to the need for the report and the benefits to be obtained from the reports.” This order revises the monitoring and reporting requirements of the General WDRs primarily as follows:

~~We also find that the non-substantial additional burden bears a reasonable relationship to the benefits to be obtained from the expanded monitoring and reporting requirements. These benefits have been discussed at length in the sections above. In brief summary, the data reported is expected to be used as follows:~~

For Members:

1. Members in high vulnerability areas must submit a Farm Evaluation only every five years instead of annually;
2. Members in a SQMP or GQMP areas must submit management practice implementation information to the Third Party on the MPIR;
3. Members must include irrigation management practice information and other irrigation-associated data and nitrogen management practice information in the INMP and the INMP Summary Report (previously reported on the Farm Evaluation);
4. Members in low vulnerability areas must now obtain certification of the INMP and submit INMP Summary Reports (these requirements are phased in to allow additional time for Members exempt under the General WDRs);
5. Members who do not have existing sampling data must sample on-farm drinking water supply wells annually for at least three years; some Members may be required to provide notification of high nitrate levels.

For the Third Party:

1. The Third Party must develop unique Anonymous Member IDs and Anonymous APN IDs and maintain and track the IDs from year to year;
2. The Third Party must submit to the Central Valley Water Board management practice implementation data reported on the MPIRs by Anonymous Member ID;
3. The Third Party must submit to the Central Valley Water Board management practice implementation data reported on the Farm Evaluations and INMP Summary Reports by Anonymous Member ID;
4. The Third Party must identify and develop coefficients for conversion of yield into nitrogen removed;
5. The Third Party must calculate values for each field for nitrogen removed, A/R, A-R, and multi-year A/R;
6. The Third Party must submit to the Central Valley Water Board the data it receives from the INMP Summary Reports and from its calculations by Anonymous Member ID, by anonymous APN ID, and by township;
7. The Third Party must arrange for storage of field-specific data submitted in a secure offsite location managed by an independent entity.

The increased costs for the Third Party may be passed onto the Members in the form of higher membership fees.

We received comments on a February 8, 2016, draft of this order estimating projected increased costs based on the revisions to the monitoring and reporting provisions

proposed in that draft.¹⁵⁰ We made a number of additional revisions in response to the comments to the provisions to minimize some of the potential cost increases. We now find that, while there will be an additional burden due to the revised monitoring and reporting requirements as compared to the existing requirements in the General WDRs, that additional burden bears a reasonable relationship to the benefits to be obtained from the expanded monitoring and reporting requirements.

With regard to revisions to the reporting of management practice implementation data, we find that, for Members in high vulnerability areas, the reporting burden is actually decreased by reduction of Farm Evaluation submission from annually to every five years, although some management practice implementation data will continue to be reported on the INMP Summary Report annually and, where applicable on the MPIR, according to a schedule to be determined by the Third Party. For Members in low vulnerability areas, irrigation practices and nitrogen practices must now be reported annually through the INMP Summary Report, which we consider below.

The costs with regard to nitrogen application reporting do not change for Members in high vulnerability areas. Members in low vulnerability areas have to prepare an INMP under the existing General WDRs. Under our revisions, they will be required to have the INMP certified; however, Members have the option of self-certification after attending an approved training program. Based on comments received, professional certification for a farm ranges in cost from \$1,500 to \$4,500 based on size.¹⁵¹ Self-certification ranges from \$440 to \$960, which represents a range of hourly salaries for eight hours for a Member's employee to attend the training class.¹⁵² Members in low vulnerability areas must now also submit an INMP Summary Report to the Third Party. The INMP Summary Report primarily requires transferring data already recorded in the

¹⁵⁰ Comments on the February 8, 2016 draft are available at

<http://www.swrcb.ca.gov/public_notices/comments/a2239ac/> (as of Oct. 6, 2017). Comments presenting cost projections include, but are not limited to: Patrick Pulupa, Central Valley Water Board, pp. 17-19 (June 1, 2016) (Central Valley Water Board Comment Letter); Theresa Dunham, Somach Simmons & Dunn on behalf of East San Joaquin Water Quality Coalition, pp. 36-39 (June 1, 2016) (East San Joaquin Coalition Comment Letter); William Thomas, Best Best & Krieger on behalf of the Southern San Joaquin Valley Water Quality Coalition, pp. 22-25 (May 3, 2016); Ed Sills, Placer-Nevada-South Sutter-North Sacramento Subwatershed Group, pp. 2-3 (April 22, 2016); Nicole Bell, Kern River Watershed Coalition Authority, pp. 18-22 (May 30, 2016) (Kern River Coalition Comment Letter). In addition, several speakers at scheduled public workshops (see, e.g. Jennifer Markarian, Cost Notes, (May 17, 2016) available at <https://www.waterboards.ca.gov/public_notices/petitions/water_quality/docs/a2239/workshops/markarian.pdf> (as of Oct. 6, 2017)) and a number of parties meeting with Board members in disclosed ex parte meetings (see, e.g. Theresa Dunham, Somach Simmons & Dunn, on behalf of California Rice Commission, Ex Parte Disclosure (Sept. 12, 2016) available at <http://www.swrcb.ca.gov/public_notices/petitions/water_quality/docs/a2239/ex_parte/exparteseptember12.pdf> (as of Oct. 6, 2017) (September 12, 2016, Rice Commission Submission) presented cost information.

¹⁵¹ These costs are estimated based on data provided in the Kern River Coalition Comment Letter, Table 1, p. 19.

¹⁵² The hourly salary range used in this calculation is based on a low of \$55 per hour (September 12, 2016 Rice Commission Submission) and a high of \$120 per hour (Kern River Coalition Comment Letter, Table 1, p. 19).

INMP to a separate sheet. We estimate that Summary Report preparation represents between two and eight hours of Member employee time, with a cost range of \$110 to \$960.

While Members will incur some additional direct compliance costs, the increased workload associated with field-level reporting of management practice information and AR data will be borne primarily by the Third Party, which, we recognize, must pass on its increased costs to Members in the form of membership fees. Increased costs will be due to additional staff for outreach and training, especially in low vulnerability areas, increased costs of mailings, the work associated with assigning anonymous identifiers to field-level data and compiling the data sets, cost of the secure, off-site storage of the data, and other expenses. In comments submitted on the February 8, 2016, draft, the East San Joaquin Coalition estimated that a similar set of requirements would lead to an annual cost increase in the range of \$310,000, which, according to our rough calculations translates to a 10% increase in the Coalition's annual budget and would result in a similar increase in Member fees.¹⁵³ We acknowledge that this is not an insignificant increase in costs. We note, however, that the applicable requirements will not be phased in completely until 2021, allowing the Third Party an opportunity to ramp up slowly and consider the most cost-effective approaches as the program develops.

Members will incur new costs for on-farm drinking water well sampling. That cost is estimated based on two to four hours of a Member's employee's time with a cost range of \$110 to \$480, and \$40 in sampling costs per well. Not all farms have drinking water supply wells and it is anticipated that the bulk of the farms that do will have only one well. We also note that these costs will be incurred beginning in 2019 only if a legislative solution to drinking water well monitoring is not in place prior to that date.

The Central Valley Water Board also submitted cost projections in response to the February 8, 2016, draft, based on increased staffing needs.¹⁵⁴ The Central Valley Water Board stated that such increased regulatory costs would result in higher annual waste discharge permit fund fees for Members. One significant driver of increased staffing predicted by the Central Valley Water Board was the workload associated with providing notification to users of on-farm drinking water supply wells with exceedances. That draft requirement applied only where the

¹⁵³ These figures represent a rough estimate based on figures provided in the East San Joaquin Coalition Comment Letter at pages 36-39. Expenses projected in that comment letter that are no longer relevant include individual well data management. The entry of field-level data into Geotracker is also no longer a requirement under this order; however, we have retained \$25,000 of those costs in the calculations to account for the Third Party's work in preparing and submitting electronic data tables to the Central Valley Water Board. In addition, the costs representing the addition of a professional to assist members with self-certification and INMP requirements is deducted from the East San Joaquin Coalition estimates because the costs are already assigned to the Members above.

¹⁵⁴ Central Valley Water Board Comment Letter, pp. 17-19.

Member was not the owner of the irrigated lands. In response, we replaced the requirement for the Central Valley Water Board to provide notification with a requirement that the non-Member owner provide such notification if requested by the operator. Another driver of increased staffing needs was projected to be the work to compile paper submissions of field-level data. This order makes it clear that all field-level data will be submitted to the Central Valley Water Board in an electronic format. With regard to review of the field-level data, the Central Valley Water Board's role at this point is to review the data to facilitate oversight of Third Party analyses and follow up determinations. We expect the sortable and searchable nature of the data to allow more efficient review, to focus the Central Valley Water Board's evaluation of Member compliance and oversight over Third Party activities, and to facilitate measurement of progress towards improved water quality. We find that the review is achievable within existing Central Valley Water Board staffing resources and does not add to existing workload associated with oversight of the regulatory program.¹⁵⁵

While we acknowledge above that Members will incur additional costs, under our revisions to the Eastern San Joaquin Agricultural General WDRs, the additional burden bears a reasonable relationship to the burden of the new monitoring and reporting requirements. These benefits have been discussed at length in the sections above. In brief summary, the data reported is expected to be used as follows:

- The multi-year A/R ratio will provide the Member and the Third Party with a reliable metric for any field-level nitrogen over-application and will more effectively target Third Party follow up for potential nitrate impacts, facilitating water quality improvements.
- The multi-year A/R ratio will provide the Member with an efficiency metric that can be used to support cost-savings in nitrogen application. The inclusion of irrigation management practice implementation reporting in the INMP may additionally improve efficiency in irrigation water usage.
- The field-level anonymous management practice implementation data and the AR data will allow the Central Valley Water Board and stakeholders to verify that the Third Party is following up with appropriate Members and that the Members are implementing improved practices in response to the follow up.
- The field-level anonymous AR data will allow the Central Valley Water Board and stakeholders to verify that the Third Party's summary analyses accurately represent conditions and trends.

¹⁵⁵ As discussed, we also revised the outreach requirements of the General WDRs such that Members in low vulnerability areas, like members in high vulnerability areas, must now participate in outreach events annually. These are not strictly monitoring and reporting requirements but costs should nevertheless be considered consistent with other provisions of the Water Code. (Wat. Code §§ 13241, 13263.) To minimize any increases in costs, we additionally revised the outreach requirements to make it clear that Members could participate remotely, as well as phased in the outreach requirements for low vulnerability areas so that they are effective only after two years.

- The field-level anonymous AR data will enable the Central Valley Water Board to determine appropriate multi-year A/R ratio ranges by crop for potential incorporation into future regulatory programs.
- ~~The drinking water well data will allow for notification of users consuming drinking water with nitrate levels above the public health standards.~~
- The Central Valley Water Board will be able to correlate management practice implementation data ~~with multi-year A/R ratio data, surface water quality monitoring data, and groundwater quality monitoring (including drinking water well) data for use in statistically valid analyses to:~~ from the INMP Summary Report and MPIR with AR data for use in statistically valid analyses to identify effective and ineffective management practices to reduce nitrate loading.
 1. ~~Identify effective management practices to minimize impacts to surface water and groundwater generally;~~
 2. ~~Identify effective management practices to reduce nitrate loading specifically;~~
 3. ~~Identify ineffective management practices.~~
- The ~~Central Valley Water Board may use the correlated data set~~ township level AR data set will be available to researchers to perform watershed-based modeling for nitrate groundwater loading, both within the Third Party boundaries and in the entire basin (by using data from other coalitions).
- The ~~correlated township-level AR~~ data set will be available to researchers to conduct relevant studies that may help advance the science supporting future developments in the regulatory program, to local agencies to support groundwater quality management efforts, and to cities, counties, and non-governmental organizations to aid in anticipating areas, especially disadvantaged communities, that may need drinking water assistance.
- The drinking water well data will allow for notification of users consuming drinking water with nitrate levels above the public health standards.

11. ~~10.~~ Direction to Central Valley Water Board Regarding Use of Submitted Data

As a result of the revisions we have directed in the above sections, the Central Valley Water Board will receive ~~two~~ several data sets commencing in May of 2019, in addition to the water quality monitoring data submitted to the Central Valley Water Board under the existing Eastern San Joaquin Agricultural General WDRs: a data set with management practice implementation reported by Members on the Farm Evaluation, INMP Summary Report, and aMPIR, three data sets with ~~A/R ratios~~ AR data reported by Members on the INMP Summary Report, one associated with Anonymous Member IDs, one associated with Anonymous APN IDs, and one associated with townships. We direct the Central Valley Water Board to use the data in several specific ways.

First, the Central Valley Water Board is directed to use the data to verify the accuracy and completeness of the analyses and summaries submitted by the Third Party based on the Farm Evaluations and the INMP Summary Reports. Second, the Central Valley Water

Board is directed to use the data to confirm that the Third Party is appropriately following up with its Members, including those ~~with high multi-year A/R ratios, those failing to implement appropriate management practices, and those that fail to timely submit required reports.~~ Third, the Central Valley Water Board is directed to evaluate the correlation between management practice implementation data, A/R ratios, and water quality monitoring data. The evaluation should be designed to provide useful information regarding the effectiveness of current management practices in reducing over-application of nitrogen and in protecting surface water and groundwater quality. who are AR data outliers, those failing to implement appropriate management practices, and those that fail to timely submit required reports. Third, the Central Valley Water Board is directed to make the anonymous field-level data tables available to researchers and stakeholders to support studies and analyses, including modeling of nitrate loading to groundwater.

Finally, we direct the Central Valley Water Board, in consultation with the Third Party and other coalitions formed under the Central Valley irrigated lands regulatory program, to evaluate the AR data submitted by the Third Party for the purposes of developing acceptable ranges for the multi-year A/R ratio target values for crops grown in the Eastern San Joaquin River Watershed. The Central Valley Water Board is directed to develop, in coordination with the State Water Board and other regional water boards, target values for each crop within three years of the availability of the nitrogen removed coefficient for that crop. It is expected that the multi-year A/R ratio target values will be further refined over time for different conditions (e.g., irrigation method, soil conditions) for each crop.

The Central Valley Water Board is directed to report annually to the State Water Board commencing September 1, ~~2019, on data received and progress toward identifying effective management practices and developing acceptable ranges for multi-year A/R ratio target values.~~ 2020, on data received and progress toward identifying effective management practices and developing acceptable ranges for multi-year A/R ratio target values. To the extent stakeholders proceed on the proposal to develop township level targets for nitrogen loading, the Central Valley Water Board shall include discussion of progress on that proposal in its annual report. Commencing on September 1, 2022, and every two years thereafter, the Central Valley Water Board shall also report to the State Water Board on whether anonymous field-level reporting is providing sufficient information for oversight of and progress in the regulatory program.

It is premature at this point to project the manner in which the multi-year A/R ratio target values might serve as regulatory tools. That determination will be informed by the data

collected and the research conducted in the next several years. If we move forward with a new regulatory approach in the future, we expect to do so only after convening an expert panel that can help evaluate and consider the appropriate use of the acceptable ranges for multi-year A/R ratio target values in irrigated lands programs statewide.

12. 41. Summary

We have directed significant revisions to the Eastern San Joaquin Agricultural General WDRs in the above discussions. With those revisions, the Modified General WDRs have the following key components:

1. The Modified General WDRs require compliance with receiving water limitations that prohibit discharges from causing or contributing to an exceedance of applicable water quality objectives, unreasonably affecting applicable beneficial uses, or causing or contributing to a condition of pollution or nuisance. The Members must show immediate compliance with the receiving water limitations except where the Member is implementing a SQMP or a GQMP for specified waste parameters in accordance with an approved time schedule.
2. The Modified General WDRs' first step in achieving compliance with the receiving water limitations is to impose baseline requirements on all Members:
 - Members must implement management practices that minimize waste discharge offsite in surface water, minimize percolation waste to groundwater, and protect wellheads from surface water intrusion. Members plan and document the management practices by preparing a Farm Evaluation, an Erosion and Sediment Control Plan, and an INMP. Members participate in outreach activities to learn about management practice options.
 - Members report these management practices at the field level through submission of the Farm Evaluation and the INMP Summary Report to the Third Party. The INMP Summary Report also reports on the AR data of the Member by field.
3. The Modified General WDRs' second step in achieving compliance with the receiving water limitations is to impose additional requirements on Members where there are indications of water quality problems:
 - Where a Member ~~reports a high multi-year A/R ratio, the Member must to obtain additional training or employ an expert for certification of the INMP.~~ is an AR data outlier, the Member must to obtain additional training or employ an expert for certification of the INMP.
 - Where surface water or groundwater quality monitoring required to be conducted by the Third Party shows an exceedance, the Third Party must prepare a SQMP or GQMP that imposes additional management practice implementation requirements on Members in the area.
4. The Modified General WDRs' third step in achieving compliance with the receiving water limitations is to verify that implemented management practices are effective in addressing water quality problems.
 - The Third Party submits the field-level data from the Farm Evaluations and the INMP Summary Reports ~~by location~~ to the Central Valley Water Board with anonymous identifiers.

- ~~• The Central Valley Water Board correlates the field-specific management practice implementation data, the AR data, and available water quality monitoring data using the location identifier.~~
- The correlated field-level data sets allows the Central Valley Water Board to verify that ~~identified~~ Members are implementing additional management practices and that such implementation is leading to either an improved multi-year A/R ratio or improved water quality results.
- The correlated field-level data sets additionally allows the Central Valley Water Board to verify that the Third Party is identifying the appropriate set of Members for follow up and additional requirements.
- Finally, the correlated township-level data sets allows the Central Valley Water Board to identify/predict trends in water quality, both potential degradation and improvement, and to associate the trends with management practice implementation so that a more complete set of information regarding the effectiveness of management practices and of the program as a whole is available.

We find that the approach in the Modified Eastern San Joaquin Agricultural General WDRs complies with the Water Code and of the Nonpoint Source Policy. The Modified General WDRs require compliance with receiving water limitations, but accomplish that compliance through implementation of management practices and through implementation of improved management practices where Members are not in compliance with the receiving water limitations. The Modified General WDRs ensure that the Third Party and the Central Valley Water Board have the feedback mechanism needed to link management practice implementation to water quality results so that the effectiveness of the management practices required can be verified. As a result, we find that there is a high likelihood that the Modified Eastern San Joaquin Agricultural General WDRs will lead to attainment of the receiving water limitations.

B. Compliance with the Antidegradation Policy

The Environmental Petitioners argue that the Central Valley Water Board failed to comply with the Antidegradation Policy in many respects when it adopted the Eastern San Joaquin Agricultural General WDRs. As explained above, several of these contentions are more appropriately considered under the rubric of compliance with the Water Code and the Nonpoint Source Policy in Section II.A of this order. By its terms, the Antidegradation Policy applies only to waters that are high quality; it supplements the Water Code requirements discussed above by adding additional antidegradation requirements that apply if the receiving waters are considered to be high quality. We will discuss the Environmental Petitioners' remaining arguments that relate only to high quality waters in this section.

High quality waters are those surface waters or areas of groundwater that have a baseline water quality better than required by water quality control plans and policies. The Antidegradation Policy required the Central Valley Water Board to issue WDRs that maintain the high quality of those waters unless it finds that any degradation of water quality (1) will be consistent with maximum benefit to the people of the state; (2) will not unreasonably affect present or probable future beneficial uses of such water; and (3) will not result in water quality less than prescribed in water quality control plans or policies. In addition, the WDRs must require that discharges to high quality waters result in the best practicable treatment or control necessary to assure that no pollution or nuisance will occur and the highest water quality consistent with the maximum benefit to the people of the State will be maintained. We have already addressed the requirements to not unreasonably affect beneficial uses, not result in water quality less than the quality specified by water quality objectives, and not cause a pollution or nuisance in Section II.A, above. While we found merit in several of the Environmental Petitioners' contentions discussed above and accordingly made several modifications to the General WDRs, we find no merit in the remainder of their contentions discussed below. To the contrary, we find that the Central Valley Water Board properly identified and complied with the remaining requirements of the Antidegradation Policy when it adopted the Eastern San Joaquin Agricultural General WDRs.

1. Application of Antidegradation Policy to Nonpoint Source Discharges

The State Water Board has, to date, provided relatively little specific direction to the regional water boards on how to apply the Antidegradation Policy to nonpoint sources.⁴⁵³¹⁵⁶ The Nonpoint Source Policy's only reference to the Antidegradation Policy simply states that nonpoint source control implementation programs must be designed to meet water quality requirements, which include "water quality objectives established to protect beneficial uses and any higher level of water quality needed to comply with the State's antidegradation policy."⁴⁵⁴¹⁵⁷ We recently explained that a traditional antidegradation analysis for a discrete point source discharge has limited value when considering antidegradation in the context of storm water discharges from diffuse sources, conveyed through multiple outfalls, with multiple pollutants impacting multiple water bodies within a region.⁴⁵⁵¹⁵⁸ These same practical considerations also make it inappropriate to apply a discrete point source discharge approach in the context of a general order regulating both surface water and groundwater discharges from irrigated

⁴⁵³¹⁵⁶ As correctly noted by the Central Valley Water Board, Administrative Procedures Update 90-004 applies to discharges regulated under the federal Clean Water Act's National Pollutant Discharge Elimination System. It does not apply to nonpoint source discharges. *Asociacion de Gente Unida por el Agua v. Central Valley Water Board*, *supra*, 210 Cal.App.4th at 1270.

⁴⁵⁴¹⁵⁷ Nonpoint Source Policy, p.12, AR 36151.

⁴⁵⁵¹⁵⁸ State Water Board Order WQ 2015-0075 (*Los Angeles MS4*), p.27.

agriculture operations across a large landscape.⁴⁵⁶¹⁵⁹ The Central Valley Water Board included an excellent synopsis of relevant existing guidance, and appropriate findings, regarding the application of the Antidegradation Policy to the Eastern San Joaquin General WDRs in Attachment A.⁴⁵⁷¹⁶⁰ We concur with that synopsis, which is generally applicable to all nonpoint source general orders, and also augment it by further addressing specific nonpoint source antidegradation issues below.

2. Baseline Water Quality

The baseline water quality considered in making the appropriate findings is the best quality of the water since 1968, the year of the adoption of the Antidegradation Policy, or a lower level if that lower level was allowed through a permitting action that was consistent with applicable antidegradation policies.⁴⁵⁸¹⁶¹ The Environmental Petitioners contend that the Central Valley Water Board's assessment of baseline water quality throughout the area regulated by the General Order is too general and vague. We disagree.

When assessing baseline water quality for a general order, we find a general review and analysis of readily available data is sufficient. Regional water boards need not generate new data or take extraordinary steps to search for existing data. It is unusual to find substantial amounts of high quality historical data from the 1970's and 1980's, let alone 1968, for such ~~an~~ extensive areas as ~~that those~~ covered by the Central Valley Water Board's Eastern San Joaquin Agricultural General WDR. While new ambient surface water and groundwater quality data are constantly being produced, there will always be substantial data gaps. Generation and synthesis of new data to fill all these gaps would be time intensive and costly, delaying the ultimate implementation of what would likely be a vastly similar program with or without the data. If existing data has already been synthesized or analyzed, or can be done so with minimal effort, then the regional water boards should consider those syntheses or analyses. Regional water boards should not delay the implementation of a regulatory program in order to conduct a comprehensive baseline assessment and analysis — especially where, as here, the general order imposes essentially the same iterative approach for management practices and other requirements regardless of whether or not the receiving water is high quality.

In almost all cases, it will be impossible for the regional water boards to establish an accurate numeric baseline for potentially hundreds of waterbodies and dozens of waste

⁴⁵⁶¹⁵⁹ The diffuse, landscape level groundwater discharges regulated under the Eastern San Joaquin Agricultural General WDRs are unlike the concentrated discharges from dairy retention ponds and corral areas that were the subject of *Asociacion de Gente Unida por el Agua v. Central Valley Water Board, supra*, 210 Cal.App.4th 1255.

⁴⁵⁷¹⁶⁰ Eastern San Joaquin Agricultural General WDRs, Attachment A, Information Sheet, pp. 31-44. Due to its length, we decline to reprint it here. The synopsis, ~~with minor revisions~~, is included in Appendix A to this order.

⁴⁵⁸¹⁶¹ State Water Board Order WQ 2015-0075, p.24.

constituents in an area covered by a general order. Instead, regional water boards must conduct a general assessment of the existing water quality data that is reasonably available. Here, the Central Valley Water Board appropriately assessed thousands of surface water and groundwater data points and concluded that at least some of the surface waters and groundwater in the Eastern San Joaquin River watershed were high quality. Based on this finding, the Central Valley Water Board acted appropriately by then conducting a general antidegradation analysis for the General WDRs.

3. Maximum Benefit

The Central Valley Water Board appropriately found that the degradation allowed⁴⁵⁹¹⁶² by the General WDRs is consistent with the maximum benefit to the people of the state.⁴⁶⁰¹⁶³ The Programmatic Environmental Impact Report for the Central Valley Irrigated Lands Regulatory Program supports this finding, noting that the state depends on Central Valley agriculture for food and that Central Valley communities rely on agriculture for employment.⁴⁶⁴¹⁶⁴ The Central Valley Water Board considered social costs of the discharges and reasonably concluded that the General WDRs' requirements to address all exceedances of water quality objectives according to the terms of a time schedule, implement best practicable treatment and control where irrigated agricultural waste discharges may cause degradation, and the inclusion of performance standards that work to prevent further degradation of surface and groundwater quality, should ensure that local communities not incur any additional treatment costs associated with the limited degradation authorized by their Order. As discussed above, while dischargers are working to comply with the time schedule, if monitoring of drinking water supply wells indicates that MCLs are being exceeded, we expect dischargers that are causing or contributing to the exceedance to provide replacement water to the affected population. Given that the considerable societal benefits outweigh the costs associated with the effects of irrigated agriculture under the Modified General WDRs, any degradation allowed by the Modified General WDRs is consistent with the maximum benefit to the people of the state.

4. Best Practicable Treatment or Control

The Environmental Petitioners argue that the General WDRs fail to demonstrate that discharges to existing high quality waters will result in best practicable treatment or control. The General WDRs require farm evaluations for all growersMembers and development of

⁴⁵⁹¹⁶² Contrary to the Environmental Petitioners' assertion, the General WDRs do not automatically authorize all surface waters and groundwater to become degraded up to the water quality objectives. The General WDRs include requirements that dischargers implement management practices that minimize waste discharge offsite in surface water and minimize percolation waste to groundwater, among other requirements.

⁴⁶⁰¹⁶³ Eastern San Joaquin Agricultural General WDRs, Attachment A, p. 43.

⁴⁶⁴¹⁶⁴ Programmatic EIR, Appendix A, AR 31907-32232.

management plans when trends indicate degradation is threatening beneficial uses.⁴⁶²¹⁶⁵ Management plans will evolve over time as monitoring and other feedback leads to new practices being developed and refined as part of the Management Practice Evaluation Program that the General WDRs require. The General WDRs require ~~growers~~Members to implement practices found to be protective of groundwater through the Management Practice Evaluation Program. In addition, use of the multi-year A/R ratio will be required in the Modified General WDRs as it will drive the implementation of more effective management practices over time and identify ~~dischargers whose~~ management practices that are less effective. The Modified General WDRs also require implementation of irrigation and nitrogen management plans and use of the multi-year A/R ratio in conjunction with the other management practices required by the Modified General WDRs. We find that these requirements, in combination with the other key components of the Modified General WDRs described in Section II.A.9₁, satisfy the best practical treatment or control standard. Not only do these requirements represent the present best approach in the view of our Expert Panel, we are not aware of any more protective requirements for large scale irrigated agricultural operations elsewhere.

III. ORDER

For the reasons discussed in this order:

1. The Central Valley Water Board shall post and circulate a revised version of the Eastern San Joaquin Agricultural General WDRs as indicated in redline/strike-out format in Appendix A, and also incorporating the Central Valley Water Board's amendments dated February 19, 2016.
- ~~2. The Central Valley Water Board shall review and reconsider the provisions of the General WDRs addressing surface water quality monitoring and reopen the General WDRs by March 1, 2017, to adopt a revised program consistent with the direction of this order.~~
2. ~~3. Commencing in May 2019, on September 1, 2020, the Central Valley Water Board shall report annually to the State Water Board on data received and progress toward identifying effective management practices and developing acceptable ranges for multi-year A/R ratio target values. Commencing on September 1, 2022, and every two years thereafter, the Central Valley Water Board shall create and use a correlated set of field level management practice implementation data, AR data, and water quality monitoring data to assist it with verifying that the Third Party is appropriately following up with Members, evaluating the effectiveness of management practices in reducing over-application of nitrogen and in protecting surface water and groundwater, and developing, in coordination with the State Water Board and other regional water boards, acceptable ranges for multi-year A/R ratio target values. Commencing in September 2019, the Central Valley Water Board shall report annually to the State Water Board on data received and progress toward identifying effective management~~

⁴⁶²¹⁶⁵ Eastern San Joaquin Agricultural General WDRs, §§ III.B, pp. 24-25, VIII.H.2, pp.33-34, and Attachment A, pp. 41-42.

practices and developing acceptable ranges for multi-year A/R ratio target values. also report to the State Water Board on whether anonymous field-level reporting is providing sufficient information for oversight of and progress in the regulatory program.

CERTIFICATION

The undersigned, Clerk to the Board, does hereby certify that the foregoing is a full, true, and correct copy of an order duly and regularly adopted at a meeting of the State Water Resources Control Board held on _____.

AYE:

NO:

ABSENT:

ABSTAIN:

DRAFT

Jeanine Townsend
Clerk to the Board

TABLE 1
Sample Field-Level Management Practice Data Reported to the Regional Board by Anonymous Member ID*
(Second Staff-Proposed Draft Order)

ID	Data from INMP Summary Report						Data from Farm Evaluation			Data from MPIR			
Anonymous Member ID	Crop	Outlier Notification? (Annual)	INMP Certification Method (Annual)	Irrigation Method	Irrigation Practices (Annual)	Nitrogen Management Practices (Annual)	Pest Management Practices (Every Five Years)	Sediment and Erosion Management Practices (Every Five Years)	Irrigation wells? Abandoned wells? (Every Five Years)	In a SQMP area? (Annual)	Practices implemented to comply with SQMP	In a GQMP area?	Practices implemented to comply with GQMP
243721	Tomato ₁	Yes	CCA	Drip	Measured soil moisture	Evaluated crop nitrogen need; used fertigation	Followed label restrictions	Used off season cover crop	Yes, No	No	NA	No	NA
243721	Tomato ₂	No	CCA	Drip	Weather-based measured soil moisture	Used tissue/petiole testing	Used drift control agents	Stabilized creek and stream banks	Yes, Yes	No	NA	No	NA
243721	Corn	No	Self	Furrow	Tailwater return	Used split fertilizer applications	none	No irrigation drainage	Yes, Yes	No	NA	No	NA
341962	Almond	No	NRCS	Drip	Weather-based scheduling	Used split fertilizer applications	Used buffer zones	Field is lower than surrounding terrain	Yes, No	Yes	Limited edge of field spraying	Yes	Used split fertilizer application
810619	Corn	No	CCA	Furrow	Tailwater return	Tested irrigation water nitrogen concentration	Used vegetated drain ditches	Flow dissipaters, stabilized creek and stream banks	No, No	Yes	integrated pest management	No	NA
810619	Alfalfa	Yes	Self	Border flood	Laser-leveled fields	none	Applied no pesticides	Used in-furrow dams	No, Yes	Yes	integrated pest management	No	NA
781936	Almond ₁	No	CCA	Sprinkler	Measured soil moisture	Tested soil for residual nitrogen	Mapped sensitive areas	irrigated with drip or micro irrigation syst.	Yes, No	No	NA	Yes	Compost added to soil
781936	Almond ₂	No	CCA	Flood	Irrigation based on crop water need	Tested soil for residual nitrogen	Used end-of-row sprayer shutoff	Planted cover crops or native vegetation	Yes, Yes	No	NA	Yes	Compost added to soil

*The data in this table is for illustrative purposes only and does not represent actual data collected.

TABLE 2

Sample Field-Level Nitrogen Data Reported to the Regional Board by Anonymous Member ID*

(Second Staff-Proposed Order)

Anonymous Member ID	Crop for each field	N Applied			Total Nitrogen Applied (lbs/ac)	Nitrogen Removed (lbs/ac)	A/R	A-R (lbs/ac)	3 yr A/R
		N Applied via Fertilizer (lbs/ac)	N Applied via Organics/Compost (lbs/ac)	N Applied via Irrigation (lbs/ac)					
243721	Tomato ₁	180	10	6	196	148	1.3	48	1.3
243721	Tomato ₂	150	0	45	195	60	3.3	135	3.7
243721	Corn, silage	230	0	17	247	210	1.2	37	1.4
341962	Almond	180	5	22	207	140	1.5	67	1.3
810619	Corn, grain	200	0	5	205	120	1.7	85	1.6
810619	Alfalfa	0	0	35	35	510	0.1	-475	0.1
781936	Almond ₁	250	0	0	250	130	1.9	120	2.1
781936	Almond ₂	135	10	31	176	54	3.3	122	3.6

*The data in this table is for illustrative purposes only and does not represent actual data collected.

TABLE 3
Sample Field-Level Nitrogen Data Reported to the Regional Board by
Anonymous APN ID*
(Second Staff-Proposed Order)

Anonymous APN ID	Crop for each field	N Applied			Total Nitrogen Applied (lbs/ac)	Nitrogen Removed (lbs/ac)	A/R	A-R	
		N Applied via Fertilizer (lbs/ac)	N Applied via Organics/Compost (lbs/ac)	N Applied via Irrigation (lbs/ac)				(lbs/ac)	3 yr A/R
AQRTM	Tomato ₁	180	10	6	196	148	1.3	48	1.3
AQRTM	Tomato ₂	150	0	45	195	60	3.3	135	3.7
AQRTM	Corn, silage	230	0	17	247	210	1.2	37	1.4
GJZQN	Almond	180	5	22	207	140	1.5	67	1.3
MNOPR	Almond	180	5	22	207	160	1.3	47	1.2
CFRMO	Corn, grain	110	0	5	115	92	1.3	23	1.6
QZIFE	Corn, grain	110	0	5	115	92	1.3	23	1.6
QZIFE	Alfalfa	135	10	31	176	54	3.3	122	3.6
ROTBM	Almond	250	0	0	250	130	1.9	120	2.1
LGTVI	Almond	135	10	31	176	54	3.3	122	3.6

*The data in this table is for illustrative purposes only and does not represent actual data collected.

TABLE 4
Sample Township-Level Nitrogen Data Reported to the Regional Board*
(Second Staff-Proposed Order)

Township Range (TR)	Crop	Total Acreage (ac)	N Applied via Fertilizer (total lbs)	N Applied via Organics/Compost (total lbs)	N Applied via Irrigation (total lbs)	Total Nitrogen Applied (total lbs)	Nitrogen Removed (total lbs)	A/R	A-R (total lbs)
02S07E	Almonds	88	20000	60	2390	22450	22400	1.0	50
02S07E	Corn, silage	54	12420	0	650	13070	11340	1.2	1730
02S07E	Walnuts	35	5250	0	500	5750	3575	1.6	2175
05S14E	Almonds	115	20700	0	3540	24240	16100	1.5	8140
05S14E	Corn, grain	600	66000	250	0	66250	55200	1.2	11050
05S14E	Grapes	112	2800	75	200	3075	3140	1.0	-65
05S14E	Oats	32	--	--	--	--	--	--	--
05S14E	Pistachios	1293	155160	0	3550	158710	108612	1.5	50098
05S14E	Wheat	1040	156000	200	900	157100	104000	1.5	53100
06S09E	Almonds	38	5700	0	705	6405	2052	3.1	4353
06S09E	Corn, grain	2144	235840	0	9858	245698	197248	1.2	48450
07S11E	Almonds	4696	657440	2000	3250	662690	422640	1.6	240050
07S11E	Tomatoes	891	160380	0	9928	170308	131868	1.3	38440
07S11E	Walnuts	105	15750	45	0	15795	8400	1.9	7395
08S13E	Barley	400	57000	200	400	57600	32000	1.8	25600
10S15E	Almonds	9328	2000000	800	14048	2014848	1679040	1.2	335808
10S15E	Corn, grain	387	42570	250	0	42820	35604	1.2	7216
10S15E	Tomatoes	91	12000	30	500	12530	17900	0.7	-5370
10S15E	Walnuts	80	11500	0	50	11550	9600	1.2	1950
11S17E	Almonds	9817	1511000	0	820	1511820	1079870	1.4	431950
11S17E	Corn, silage	54	12420	0	650	13070	11340	1.2	1730
11S17E	Walnuts	760	140000	300	6000	146300	66500	2.2	79800
13S17E	Almonds	1724	410000	0	3760	413760	258600	1.6	155160
13S17E	Tomatoes	186	19500	10	0	19510	1467	13.3	18043
13S17E	Walnuts	189	30000	200	1550	31750	6250	5.1	25500

*The data in this table is for illustrative purposes only and does not represent actual data collected.

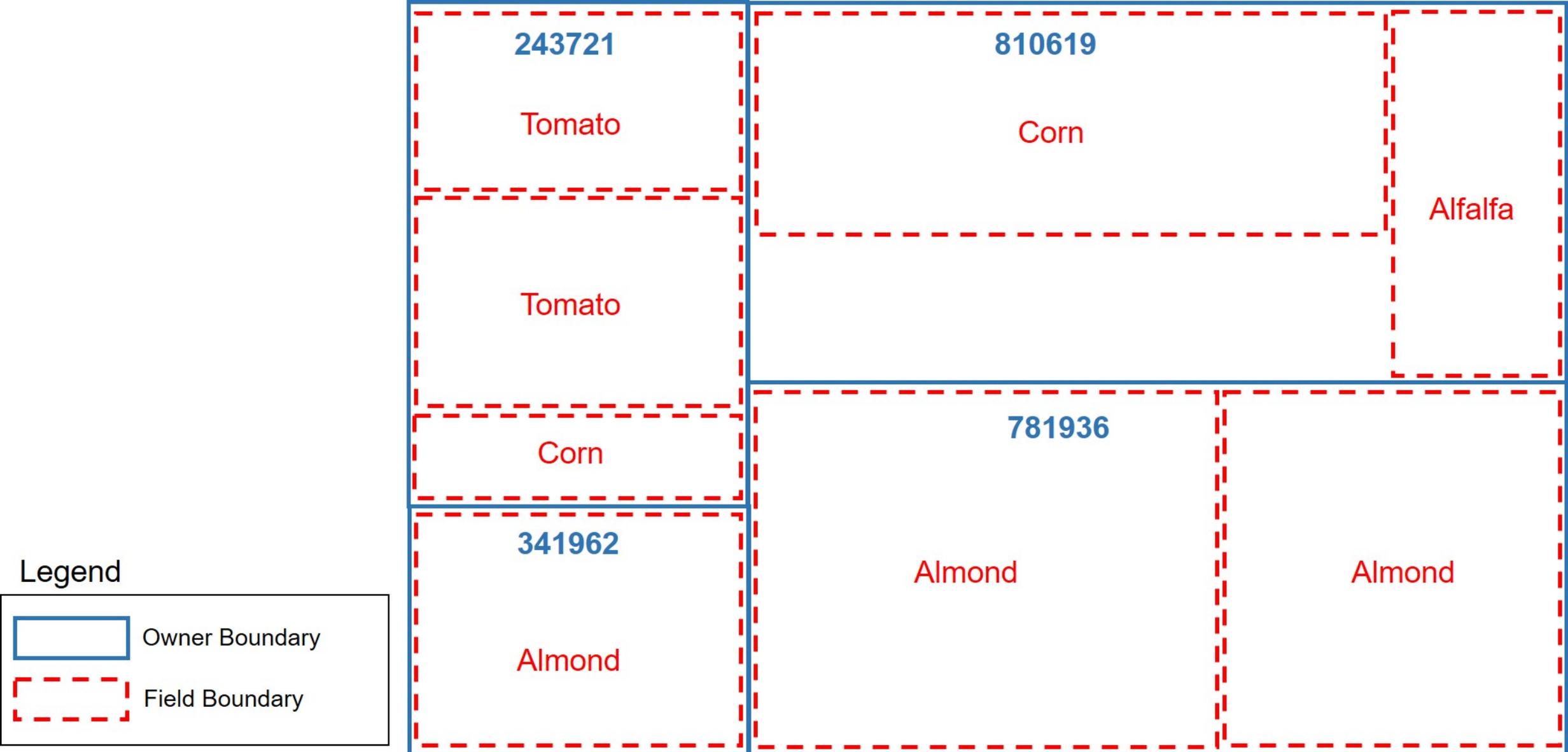


Figure 1. Illustration of Anonymous Member ID, corresponding to Tables 1 and 2

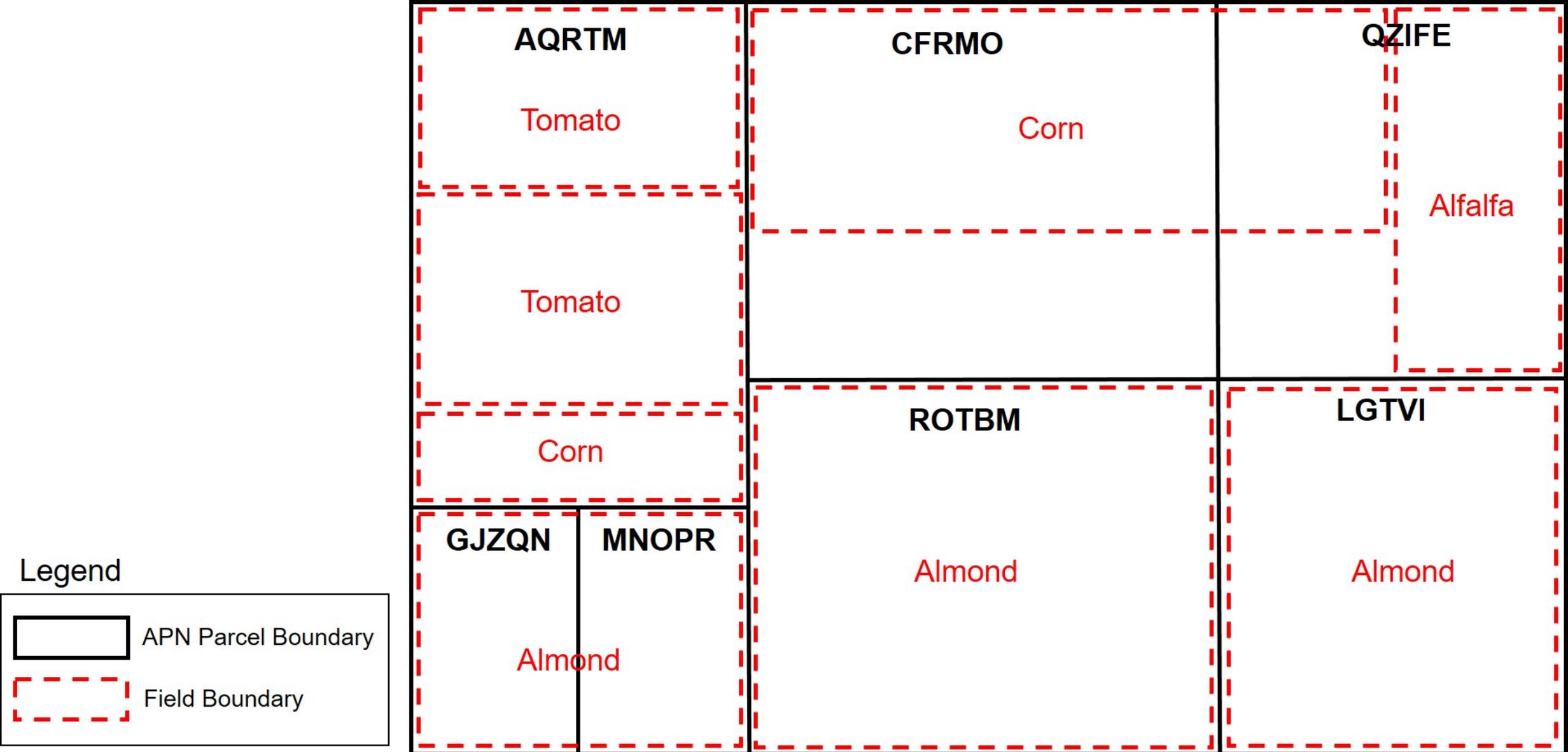


Figure 2. Illustration of Anonymous APN ID, corresponding to Table 3