October 4, 2013

DISCUSSION DRAFT
Groundwater Workplan Concept Paper

The Water Boards are developing a workplan that aligns its current groundwater protection efforts, the ongoing actions of other entities with groundwater management responsibilities, and potential actions that the Water Boards and other entities could pursue. The objective is to ensure that the Water Boards address the groundwater challenges that have the greatest potential to impact beneficial uses, focus limited resources on the most important groundwater problems, and facilitate more efficient local and regional groundwater management and provide support and oversight, where needed.

This concept paper proposes a workplan framework under which the Water Boards' groundwater activities would be organized. Whether implemented at the local, regional, or State level, the Water Boards believe that an effective groundwater management program generally requires five key elements to be in place: thresholds, monitoring and assessment, governance, funding, and enforcement. The State Water Board is interested in your thoughts on the relevance of the proposed framework for groundwater management as well as its applicability to groundwater-related programs statewide. For each element of the proposed framework, this concept paper lists existing actions and suggests potential future actions that the Water Boards and others could take as a starting point for discussion. Many additional recommendations for action have been published in a variety of reports which can be found under reference materials in the website below.

The State Water Board is interested in meeting with various interests to continue the dialogue on this proposed framework, and the combination of existing and proposed actions, in the coming months. For more information please visit our website at:

http://www.waterboards.ca.gov/water_issues/programs/groundwater/workplan.shtml.

1 Managing California's Groundwater – Regional Leadership

Successful groundwater management requires prevention and cleanup of groundwater contamination, maximizing opportunities to recharge high-use basins, and ensuring that pumping occurs at sustainable levels over the long-term. **We envision a future where well-equipped local and regional groundwater management entities use monitoring information and thresholds to manage and maintain groundwater of sufficient quality at sustainable levels over the long-term; and where local and regional management efforts are backed-up by State support and oversight, where needed.** In some cases, management will also involve treatment of groundwater at the point of extraction or use for drinking water purposes, while measures to prevent further contamination are taken and long-term cleanup actions are implemented to address legacy pollution.

2 Implementing the Vision

The Water Boards currently implement a number of successful programs aimed at preventing and cleaning up groundwater pollution, monitoring quality, and encouraging recharge. Additionally, the State Water Board has broad constitutional authority to prevent the waste and unreasonable use of the State's water resources (including groundwater). While California lacks a comprehensive State

groundwater regulatory program, local and regional management of groundwater basins does exist in much of the State. The nature of groundwater and its uses vary widely by area, as does the extent of control. As a result, groundwater management has largely evolved on an as needed basis in a decentralized manner across the State. In spite of this, local and regional groundwater management efforts have produced impressive results in many areas of the State. Groundwater recharge, conjunctive use and cleanup projects have extended local water supplies, and storm water capture and recharge programs are growing around the State.

Effective groundwater management will ensure groundwater quality and quantity is maintained at sustainable levels that support beneficial uses of water over the long-term. Many of the most pressing challenges associated with groundwater quality can be broken down into three categories: (1) nitrate and other salts; (2) industrial chemicals; and (3) naturally-occurring chemicals. Nitrate and salt problems are generally associated with diffuse nonpoint pollution sources, such as agricultural drainage. Industrial pollutants typically originate from discrete point sources. Naturally-occurring chemicals are associated with geologic processes, and human activities often mobilize these pollutants into groundwater. Groundwater quality can also be impacted by pumping and declining water levels. In some areas, pumping may cause polluted groundwater or seawater to migrate or be drawn into areas that would otherwise not be impacted. The greatest challenge for groundwater quantity is overdraft leading to subsidence and the permanent loss of storage capacity. Managing groundwater levels (quantity) and preventing overdraft largely depends on maintaining a balance between the amount of pumping, natural depletion from a basin, and the amount of recharge. These challenges do not lend themselves to a "one size fits all" solution, given the varying physical and institutional characteristics of California's groundwater basins. Therefore, an integrated approach to groundwater management is needed to ensure that appropriate action occurs at all levels of government.

Whether implemented at the local, regional, or State level, effective groundwater management generally requires that the following key elements be in place:

1. **Sustainable thresholds** for water level drawdown and water quality for impacted, vulnerable, and high-use basins;

2. Water quality and water level **monitoring and assessment**, and data management systems, capable of determining if thresholds are being met and evaluating trends;

3. **Governance** structures with the **management** mechanisms needed to prevent impacts before they occur, clean up contamination where it has occurred, provide adequate treatment of contaminated drinking water sources, and ensure that meeting groundwater level and quality thresholds are managed over the long term;

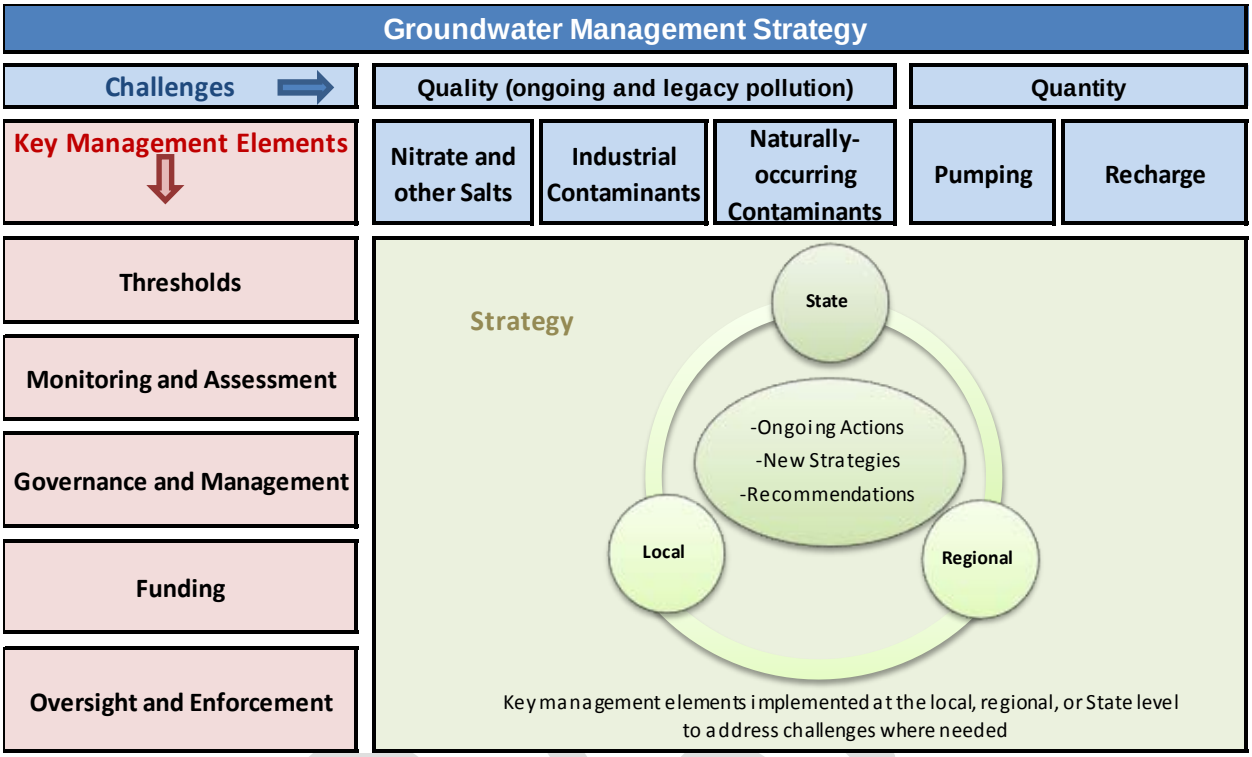
4. **Funding** to support monitoring and governance/management actions; and

5. **Oversight and enforcement** in basins where ongoing management efforts are not protecting groundwater.

This approach to groundwater management is scalable by design because each key management element can be established and implemented at the local, regional, or State level, or through a combination thereof. The Water Boards will focus attention and assistance on high-use basins where thresholds are being exceeded.

*Nitrate Report Recommendation (http://www.waterboards.ca.gov/water_issues/programs/nitrate_project/docs/nitrate_rpt.pdf)

The figure below portrays the application of this management framework to groundwater quality and quantity.



3 Management Elements and Potential Actions

For each of the five key management elements needed for effective groundwater management, this section lists current Water Board and other agency/entity groundwater protection actions. Actions that the Water Boards or other agencies/entities *could take* in the future to enhance current efforts are then provided as a starting point for discussion. The Water Boards are soliciting input on the types of actions needed to ensure viable and effective groundwater management solutions, particularly in areas of greatest need.

3.1 Sustainable Thresholds

Various agencies, including the Water Boards, establish protective levels, or thresholds, that apply to groundwater. These thresholds include State water quality standards, and local or regional basin management objectives (BMOs), that are used for managing and assessing groundwater quality and quantity to support designated beneficial uses and ensure a sustainable groundwater water supply. Thresholds are an important component of groundwater management because they establish quantifiable triggers that, when approached or exceeded, signal a threat or problem. Approaching or exceeding a threshold may trigger management actions needed to address identified threats or problems. *The State Water Board is soliciting comment on whether the current and proposed actions will result in thresholds for groundwater quality and elevation that support assessment of groundwater conditions, evaluation of groundwater quality and quantity trends, and informed management decisions.*

*Nitrate Report Recommendation (http://www.waterboards.ca.gov/water_issues/programs/nitrate_project/docs/nitrate_rpt.pdf)

Existing THRESHOLDS	
Water Boards	• Water Quality Objectives in Basin Plans • Antidegradation Policy
Other State and Federal Agencies	• CDPH Maximum Contaminant Levels, Notification Levels, Response Levels, and Title 22 Water Recycling Criteria • OEHHA Public Health Goals • DWR Critical Overdraft
Regional and Local Entities	• Local Basin Management Objectives • Requirements for adjudicated basins (extraction and recharge measures)

3.1.1 Potential Water Board Actions

1. **Clarify how the State Water Board's Antidegradation Policy (Resolution No. 68-16) applies to groundwater (including effects related to quantity, such as recharge).**
2. **Incorporate into Basin Plans thresholds for salt and nutrients contained in Salt and Nutrient Management Plans.**
3. **Summarize approaches taken towards basin management objectives (BMOs) in existing local groundwater management plans for application in high-use basins where objectives do not exist.**

3.1.2 Potential Actions for Others

1. **CDPH should complete the rulemaking for groundwater recharge with recycled water (indirect potable reuse).**
2. **The Legislature should require local groundwater management entities to establish thresholds for sustainable groundwater management in their local groundwater management plans and to report their progress.**

3.2 Monitoring and Assessment

Groundwater monitoring and assessment evaluates current conditions, can be used to establish groundwater thresholds, and guides management decisions. Without sufficient monitoring, it is almost impossible to determine if groundwater problems exist or to forecast the potential for future problems that may warrant management actions. Many local, regional, and State agencies have statutory responsibility or authority to collect water quality and water use/level data and information; however, monitoring is inconsistent throughout the State, with significant regional variation in parameters monitored, monitoring frequency, and data availability. In spite of this diversity, there are excellent examples of groundwater monitoring programs now being implemented at the local, regional, and State levels. *The State Water Board is interested in understanding whether the existing and proposed actions will result in better integration and accessibility of existing groundwater quality and quantity data to support assessment of groundwater conditions, evaluation of groundwater quality and quantity trends, and informed management decisions.*

*Nitrate Report Recommendation (http://www.waterboards.ca.gov/water_issues/programs/nitrate_project/docs/nitrate_rpt.pdf)

Existing MONITORING AND ASSESSMENT Activities	
Water Boards	• Groundwater Ambient Monitoring and Assessment (GAMA) Program • GAMA Priority (high-use) Basins Project (including mapped Priority Basins) • Hydrogeologically Vulnerable Area Mapping • AB 2222 Report to Legislature (Communities Relying on Contaminated Groundwater) • Central Coast Domestic Well Project • Central Valley Dairy and Irrigated Regulatory Lands Monitoring • Water Rights Groundwater Recordation Program (delegated to local agencies) • Define and identify nitrate high risk areas
Other State and Federal Agencies	• CDPH Drinking Water Program (monitoring of public supply wells, including consumer confidence reports prepared by public water suppliers) • DPR Ground Water Protection Program (pesticides sampling) • DWR California Statewide Groundwater Elevation Monitoring (CASGEM) Program • DWR basins in critical overdraft (Bulletin 118; 1980) • DWR Water Data Library (historical groundwater quality trend data, and CASGEM groundwater level data) • USGS National Water Information System (NWIS) (includes groundwater quality data collected under the GAMA Program) • NASA Central Valley Groundwater Elevation Study
Regional and Local Entities	• Groundwater recordation (Los Angeles, Riverside, San Bernardino, and Ventura counties) • Local agency monitoring for groundwater level as well as quality, and land subsidence in some regions

3.2.1 Potential Water Board Actions

1. **Add a basin assessment module to GeoTracker GAMA that provides publicly-accessible information on groundwater quality and is capable of analyzing trends in high-use basins.**
2. **Work with the Department of Conservation's (DOC) Division of Oil, Gas, and Geothermal Resources (DOGGR) on monitoring and assessment requirements for hydraulic fracturing, pending the outcome of proposed legislation.**
3. **Require groundwater level data coming to the State Water Board to be submitted directly to CASGEM.**
4. Require all groundwater quality data submitted pursuant to Water Board requirements to be in a format compatible with GeoTracker GAMA.*

3.2.2 Potential Actions for Others

1. **DWR could create a searchable electronic database to submit well completion reports and associated data.**
2. **The Legislature could expand the State Water Board's Groundwater Recordation Program, which requires reporting of groundwater pumping, to basins subject to critical overdraft.**

*Nitrate Report Recommendation (http://www.waterboards.ca.gov/water_issues/programs/nitrate_project/docs/nitrate_rpt.pdf)

3. **Complete CASGEM Program implementation, including: (1) statewide prioritization of basins; (2) conducting groundwater elevation monitoring in areas where voluntary monitoring is not occurring; and (3) identifying basins subject to critical overdraft.**
4. **Update assessments and develop projections on the condition of California's groundwater basins, based on current groundwater management practices.**
5. **Develop estimates of storm water capture and groundwater recharge potential, and a tracking database to inform water resource planning and permitting decisions.**
6. The Legislature should enact legislation that establishes a framework of statutory authority for the Water Boards, in coordination with other State and local agencies, to improve the coordination and cost effectiveness of groundwater quality monitoring and assessment, enhance the integration of monitoring data across departments and agencies, and increase public accessibility to monitoring data and assessment information.*
7. The Legislature should require State and local agencies to notify groundwater users in nitrate high-risk areas and recommend that the well owners test their wells to evaluate drinking water quality. The Water Boards, California Department of Public Health (CDPH), and local public health agencies will coordinate in identifying private domestic wells and small, unregulated water systems in nitrate high-risk areas.*
8. The Legislature should require property owners with either a private domestic well or other unregulated groundwater system (2 to 14 service connections) to sample their well and disclose its water quality as part of a point of sale inspection before property title transfer or purchase.*

3.3 Governance and Management

In vulnerable and high-use basins, groundwater management is necessary to ensure that thresholds for water quality and quantity are not exceeded. In some situations, actions are needed to avert potential problems or to rectify existing problems. Pollution prevention, which can help alleviate future impacts to groundwater, is the most effective and affordable form of groundwater quality control; however, once contamination occurs, more costly cleanup actions may be needed. Managing groundwater levels (quantity) generally requires maintaining a balance between pumping, natural depletion, and recharge at the basin scale over the long-term. Such a balance can effectively be achieved through conjunctive use, demand management (e.g., water conservation, reduced pumping), or a combination of both. Various local, regional, and State agencies, including the Water Boards, have authority and responsibility for managing and regulating groundwater. The ongoing actions of these agencies have proven effective in many areas, but additional management action and controls may be needed to address current and potential future challenges associated with groundwater quality and quantity. *The State Water Board is interested in understanding whether the existing and potential actions in this section will result in the sustainable management of groundwater quality and quantity in high-use basins.*

Existing GOVERNANCE AND MANAGEMENT Activities	
Water Boards	• Expert Panel review of agricultural nitrate programs • Onsite Wastewater Treatment Systems (OWTS) Policy • Low-Threat Underground Storage Tank (UST) Case Closure Policy

*Nitrate Report Recommendation (http://www.waterboards.ca.gov/water_issues/programs/nitrate_project/docs/nitrate_rpt.pdf)

	• Recycled Water Policy • Waste Discharge Requirements (WDR) Program • NPDES Storm Water Program (including LID requirements) • Recycled Water Permits • Irrigated Lands Regulatory Program (ILRP) • Confined Animal Facilities (CAF)/Concentrated Animal Feeding Operations (CAFO) Program • Land Disposal Program • Tank Tester Licensing Program • UST Program • Site Cleanup Program (SCP) • Department of Defense (DoD) Cleanup Program • Prohibitions • Water Rights Administration (subterranean streams and interconnected groundwater) • Aquifer Storage and Recovery (ASR) Permit • Evaluate WDRs to determine protectiveness of groundwater quality*
Other State and Federal Agencies	• DTSC Green Chemistry and Cleanup • DTSC/CalRecycle Solid Waste Landfill Program • DPR Pesticide Regulations • DOC Promulgation of Hydraulic Fracturing Regulations • USEPA Underground Injection Control Program • CDFA nitrogen mass balance taskforce*
Regional and Local Entities	• Local Oversight Program (UST, SCP) • Local and Regional Groundwater Management (ordinances, GWMPs, UWMPs, AWMPs, IRWMPs)

3.3.1 Potential Options for New Water Board Actions

1. **Expand the use of general orders to focus on high priority discharges to improve efficiency of regulation and better protect groundwater.**
2. **Prioritize cleanup cases based on threat and whether they are located in a hydrogeologically vulnerable area.**
3. **Focus regulatory activities to control discharges in hydrogeologically vulnerable areas that overlay high-use basins.**
4. **Work with DTSC to extend the cleanup oversight Memorandum of Agreement (MOA) between DTSC and the Water Boards for brownfields to include enforcement lead sites to align cleanup authorities with the type of contamination and route of exposure.**
5. **Incentivize permits to promote storm water infiltration and protect infiltrative capacity of hydrogeologically vulnerable areas.**
7. Continue to provide technical assistance for the CDFA's ongoing work with the University of California Cooperative Extension (UCCE) and other experts in establishing a nitrogen management training and certification program that recognizes the importance of water quality protection.*

*Nitrate Report Recommendation (http://www.waterboards.ca.gov/water_issues/programs/nitrate_project/docs/nitrate_rpt.pdf)

3.3.2 Potential Recommendations to Others

1. **Assess legal obstacles and associated liability for groundwater recharge with sources that contain low level contaminants.**

2. **Assist DWR in conducting an evaluation of local groundwater management programs in high-use basins and identify where gaps in control exist that should be addressed with further action and develop guidelines for best practices in groundwater management.**

3. **Enact legislation that would allow for the establishment of Active Management Areas with specific requirements governing the management of groundwater including withdrawal, use, storage and monitoring/reporting.**

4. **Create a standardized set of authorities that districts with groundwater management responsibilities could draw upon to effectively and actively manage groundwater.**

5. The Legislature should enact legislation to establish a framework of statutory authorities for CDPH, regional organizations, and county agencies to have the regulatory responsibility to assess alternatives for providing safe drinking water and to develop, design, implement, operate, and manage these systems for small DACs impacted by nitrate.*

3.4 Funding

Successful groundwater management requires access to sufficient funding for development and implementation of groundwater management plans, monitoring (e.g., statewide programs such as GAMA and CASGEM), facilities (e.g., drinking water treatment systems, groundwater recharge facilities, storm water capture, etc.), ongoing operation and maintenance of infrastructure, pollution prevention and cleanup measures, as well as oversight or enforcement, by local and regional management agencies. In many cases, management entities have the authority to assess fees to cover the costs of local and regional management. However, the authority to assess fees is often contingent on voter approval at the local level in conformance with Proposition 218 and, therefore, approval can be difficult to achieve. In addition to local revenue sources, significant funding for conjunctive use projects, groundwater recharge facilities, groundwater treatment and monitoring, and groundwater basin management activities has been made available through various water bond measures and both State and federal funding. *Please refer to the existing and potential actions in commenting on whether adequate funding will be available to implement the suggested management framework (developing thresholds, conducting monitoring and assessment, managing and controlling groundwater quality and quantity, and oversight/enforcement).*

Existing FUNDING Activities	
Water Boards	• Clean Water State Revolving Fund (CWSRF) Program • Small Community Wastewater Grant Funding • Small Disadvantaged Community Wastewater Technical Assistance • Underground Storage Tank Cleanup Fund (USTCF) Program • UST/Orphan Site Cleanup Fund (OSCF) • Replacing/Repairing/Upgrading Underground Storage Tank (RUST)

*Nitrate Report Recommendation (http://www.waterboards.ca.gov/water_issues/programs/nitrate_project/docs/nitrate_rpt.pdf)

	Program • Agricultural Drainage Loan Program (ADLP) • Agricultural Drainage Management Loan Program (ADMLP) • Nonpoint Source (NPS) Pollution Control Program • State Water Pollution Cleanup and Abatement Account (CAA) • Water Recycling Funding Program (WRFP) • Stormwater Grant Program • Seawater Intrusion Control Program • SRF and bond funding for storm water and groundwater recharge projects
Other State and Federal Agencies	• DWR Local Groundwater Assistance (LGA) Grant Program, Integrated Regional Water Management (IRWM) Grant Program, etc. • CDPH Safe Drinking Water SRF (for public water systems) • CDFA Fertilizer Research and Education Program (FREP) (funds studies on fertilizer use, plant nutrient efficiency, and nitrogen management) • DTSC Brownfields Loan Fund • USEPA Brownfields Grants Program • California Pollution Control Financing Authority (CPCFA) Brownfields Assessment and Redevelopment Program and California Recycle Underutilized Sites (CALReUSE) Program • USDA Rural Assistance Program for Drinking Water • CDFA mill fee collection for fertilizer research and education*
Regional and Local Entities	• General and Special District Fee Assessments

3.4.1 Potential Options for New Water Board Actions

None.

3.4.2 Potential Recommendations to Others

1. **Establish a funding source that also addresses liability for cleanup of contaminated sites where responsible parties are unavailable, unable, or unwilling to pay for cleanup.**
2. **Local and regional groundwater management agencies should assess fees, where needed, to cover costs of monitoring and managing groundwater.**
3. The Legislature should provide a stable, long-term funding source for provision of safe drinking water for small DACs.*
4. DWR should give preference in the Proposition 84 Integrated Regional Water Management (IRWM) Grant Program to proposals with IRWM Plans that include an evaluation of nitrate impacts, including the access of safe drinking water to small DACs, for areas that have been identified as nitrate high-risk areas.*
5. The Legislature should enact legislation that establishes a funding source for the State Water Board's Groundwater Ambient Monitoring and Assessment (GAMA) Program.*
6. Continue to increase access to safe drinking water funding sources for small DACs by streamlining funding applications, providing planning grants, and providing technical assistance.*

*Nitrate Report Recommendation (http://www.waterboards.ca.gov/water_issues/programs/nitrate_project/docs/nitrate_rpt.pdf)

3.5 Oversight and Enforcement

Oversight and enforcement encourages dischargers and groundwater pumpers to operate in a manner consistent with relevant regulations, plans, policies, and permits. To address violations of management plan provisions or regulatory requirements, federal, State, and local agencies provide oversight of pollution cleanup, and take enforcement actions of varying types and levels of stringency. Local and regional groundwater management entities may also need to take additional oversight actions when monitoring data demonstrate that thresholds are or will likely be exceeded within their jurisdictions. *The State Water Board, along with the Department of Water Resources and the California Department of Fish and Wildlife, can exercise, in varying degrees, constitutional and statutory authorities to protect the public trust, prevent the waste and unreasonable use of the State's water resources, and initiate actions to protect those resources. In addition to the actions suggested below, the State Water Board is soliciting input on whether these authorities should be integrated into its workplan for groundwater*.

Existing ENFORCEMENT AND OVERSIGHT Activities	
Water Boards	• Enforcement and cleanup of nitrate and industrial pollutants in high-use basins and in groundwater reliant areas • UST Fund Fraud, Waste, and Abuse Program • Waste Discharge Requirements enforcement • Underground Storage Tank (UST) Leak Prevention and Cleanup • Legacy Site Cleanups • Initiate adjudication to protect groundwater quality • Undertake proceedings to prevent waste and unreasonable use • Water Right Permit enforcement
Other State and Federal Agencies	• CDPH enforcement and oversight of public water systems • DTSC enforcement action for violations of hazardous waste requirements • DTSC site cleanups • USEPA enforcement for violations of federal Safe Drinking Water Act • Watermaster enforcement of adjudications
Regional and Local Entities	• CUPA enforcement activities of environmental and emergency management programs • Local agency enforcement of tank testing requirements, GWMPs, and groundwater monitoring, reporting, and pumping requirements

3.5.1 Potential Options for New Water Board Actions

1. **Target groundwater quality regulatory program enforcement on legacy sites in hydrogeologically vulnerable areas.**
2. **Evaluate and report on the effectiveness of enforcement of well design and destruction standards to eliminate conduits for contamination.**
3. **Establish an interagency task force to improve the integration of agency authorities that could be used to address groundwater overdraft.**
4. Use Porter-Cologne authority to order parties responsible for nitrate contamination to provide replacement water.*

3.5.2 Potential Recommendations to Others

None.

*Nitrate Report Recommendation (http://www.waterboards.ca.gov/water_issues/programs/nitrate_project/docs/nitrate_rpt.pdf)