



**RECOMMENDATIONS ADDRESSING NITRATE
IN GROUNDWATER**

STATE WATER RESOURCES CONTROL BOARD

REPORT TO THE LEGISLATURE

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STATE OF CALIFORNIA

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Executive Summary

This report is being submitted in compliance with Chapter 1 of the Second Extraordinary Session of 2008 (SBX2 1, Perata), which requires the State Water Resources Control Board (State Water Board) to develop pilot projects focusing on nitrate in groundwater in the Tulare Lake Basin and Salinas Valley and to submit a report to the Legislature on the scope and findings of the pilot projects, including recommendations, within two years of receiving funding.

Nitrate pollution in groundwater is a widespread water quality problem that can pose serious health risks to pregnant women and infants if consumed at concentrations above the Maximum Contaminant Level (MCL) of 45 milligrams per liter (mg/L) (as NO₃) set by the California Department of Public Health. Nitrate contaminated groundwater is a particularly significant problem in the Tulare Lake Basin and Salinas Valley areas, where about 2.6 million people, including many of the poorest communities in California, rely on groundwater for their drinking water. Many other areas of the State, however, also have nitrate contaminated groundwater making it the most frequently detected anthropogenic chemical above an MCL in drinking water sources.

SBX2 1 requires the State Water Board to develop the nitrate contamination pilot projects in the Tulare Lake Basin and Salinas Valley to “improve understanding of the causes of groundwater contamination, identify potential remediation solutions and funding sources to recover costs expended by the state for the purposes of this section to clean up or treat groundwater, and ensure the provision of safe drinking water to all communities.” SBX2 1 specifically requires the State Water Board to:

- Identify sources, by category of discharger, of groundwater contamination due to nitrate.
- Estimate proportionate contributions to groundwater contamination [by nitrate] by source and category of discharger.
- Identify and analyze options within the State Water Board’s current authority to reduce current nitrate levels and to prevent continuing nitrate contamination, and to estimate costs associated with exercising this authority.
- Identify methods and costs associated with the treatment of nitrate-contaminated groundwater for use as drinking water.
- Identify methods and costs to provide an alternative water supply to groundwater-reliant communities in the pilot project areas.
- Identify potential funding sources to provide resources for cleanup, treatment, and provision of an alternative drinking water supply.
- Develop recommendations for developing a groundwater cleanup program for the Central Valley Water Quality Control Board Region and Central Coast Water Quality Control Board Region based on the pilot project results.

UC Davis Report

As a first step in the development of the pilot projects, the State Water Board contracted with the University of California, Davis (UC Davis) in 2010 to conduct an independent study on the

nitrate pilot projects in the Tulare Lake Basin and the Salinas Valley. The UC Davis Nitrate Report was delivered to the State Water Board in March 2012 and is included in Appendix B. The associated technical reports are available online at http://www.waterboards.ca.gov/water_issues/programs/nitrate_project/index.shtml. In its report, UC Davis made eight major findings and identified numerous “promising actions” to address the identified problems. The major findings of the UC Davis report are:

1. Nitrate problems will likely worsen for decades. For more than half a century, nitrate from fertilizer and animal waste has infiltrated into Tulare Lake Basin and Salinas Valley aquifers. Most nitrate detected in drinking water wells today was originally applied to the surface decades ago.
2. Agricultural fertilizers and animal wastes applied to cropland are by far the largest regional sources of nitrate in groundwater. Other sources can be locally important.
3. Nitrate loading reductions are possible, some at modest cost. Large reductions of nitrate loads to groundwater can have substantial economic cost.
4. Traditional pump and treat remediation to remove nitrate from large groundwater basins is extremely costly and not technically feasible. Instead, “pump-and-fertilize” and improved groundwater recharge management are less costly long-term alternatives.
5. Drinking water supply actions such as blending, treatment, and alternative water supplies are most cost-effective. Blending will become less available in many cases as nitrate pollution continues to spread.
6. Many small communities cannot afford safe drinking water treatment and supply actions. High fixed costs affect small systems disproportionately.
7. The most promising revenue source is a fee on nitrogen fertilizer use in these basins. A nitrogen fertilizer fee could compensate affected small communities for mitigation expenses and effects of nitrate pollution.
8. Inconsistency and inaccessibility of data prevent effective and continuous assessment of California’s groundwater quality. A statewide effort is needed to integrate diverse water-related data-collection activities by many state and local agencies.

State Water Board Report to Legislature

In this report, the State Water Board makes specific recommendations for addressing nitrate contaminated groundwater. In developing this report, the State Water Board relied on the UC Davis report as a foundation, and obtained significant input from the Interagency Task Force (ITF), which included representatives from the California Department of Public Health, the Department of Food and Agriculture, the Department of Pesticide Regulation, California Environmental Protection Agency, and local environmental health agencies. Recommendations were also informed by the findings of a task force convened by the Governor’s office to address safe drinking water issues.

The State Water Board makes 15 recommendations to address the issues associated with nitrate contaminated groundwater. These recommendations are reflected in Table ES-1.

These recommendations reflect a comprehensive strategy focused on the following key areas:

- **Providing Safe Drinking Water.** Creating a reliable, stable funding source, integrated with institutional changes, to provide long-term safe drinking water infrastructure and interim solutions for the small disadvantaged communities impacted by nitrate contamination.
- **Monitoring, Assessment, and Notification.** Developing and managing the data necessary to identify and effectively manage nitrate contaminated groundwater, with particular attention focused on (1) defining nitrate high-risk areas in order to prioritize regulatory oversight and assistance efforts in these areas, (2) notifying groundwater users in nitrate high-risk areas, and (3) requiring property owners to sample their well as part of a property title transfer or purchase.
- **Nitrogen Tracking and Reporting.** Developing and implementing a nitrogen mass balance tracking and reporting system to manage the application of nitrogen fertilizing materials.
- **Protecting Groundwater.** Developing an effective system for minimizing discharges of nitrates to groundwater including (1) establishing a nitrogen management training and certification program which recognizes the importance of water quality protection, (2) continuing and improving agricultural nitrate education and research programs, (3) convening a panel of experts to recommend improvements in agricultural nitrate control programs and implementing the recommendations, and (4) evaluating the effectiveness of existing permits to address nitrate contamination in high-risk areas.

Funding to Implement Recommendations

Many recommendations in this report will require a source of funding. The regulatory, monitoring, education and research recommendations fall within existing programs with defined funding sources, but the increased level of effort to implement some of these recommendations will require augmentation of these funding sources. Expansion of existing funding sources will be proposed by the responsible state agencies and considered through the state budget process.

The provision of safe drinking water for disadvantaged communities, however, will require a new funding source. The funding sources presently available for these communities are the Safe Drinking Water State Revolving Fund (SRF), which is capitalized with federal grants, and state bond funds. Experience shows that these sources cannot meet the drinking water needs of disadvantaged communities. The first recommendation in this report addresses the need for a new funding source, which can be used in combination with existing funding sources, to design, build, operate and maintain safe drinking water systems for disadvantaged communities. This action is critical to meet the goals of Chapter 524, Statutes of 2012 (Assembly Bill 685, Eng) which specified the policy of the state that every human being has the right to safe, clean, affordable, and accessible water adequate for human consumption, cooking, and sanitary purposes.

Table ES-1: Water Board Recommendations to Address Nitrate in Groundwater

| Water Board Recommendation | Lead Agencies/ Participants | Requires Legislation? |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|
| <p>Providing Safe Drinking Water <i>An impediment to providing safe drinking water to small Disadvantaged Communities (DACs) impacted by nitrate contamination is the lack of a stable, long-term funding source. A stable funding source integrated with institutional changes is critical in providing long-term safe drinking water infrastructure and interim solutions for the small DACs impacted by nitrate contamination.</i></p> | | |
| <p>1. The most critical recommendation in this report is that a new funding source be established to ensure that all Californians, including those in DACs, have access to safe drinking water, consistent with AB 685. The Legislature should provide a stable, long-term funding source for provision of safe drinking water for small DACs. Funding sources include a point-of-sale fee¹ on agricultural commodities, a fee on nitrogen fertilizing materials, or a water use fee. In addition, the Legislature also should authorize CDPH to assess a fee in lieu of interest on Safe Drinking Water State Revolving Fund loans, or to assess other fees associated with these loans, to generate funds for expanded assistance to water systems.</p> | <p>California Department of Public Health (CDPH), Water Boards, California Department of Food and Agriculture (CDFA), and Local Government Agencies</p> | <p>Yes</p> |
| <p>2. The State Water Board and Regional Water Quality Control Boards (collectively referred to as “the Water Boards”) will use their authority under the Porter-Cologne Water Quality Control Act (Porter-Cologne) (Water Code, §13000 et seq.) to order parties responsible for nitrate contamination to provide replacement water to impacted communities, as appropriate.</p> | <p>Water Boards, CDPH</p> | <p>No</p> |
| <p>3. 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.²</p> | <p>CDPH, County Agencies</p> | <p>Yes</p> |
| <p>4. State funding agencies should continue to increase access to safe drinking water funding sources for small DACs by streamlining funding applications, providing planning grants, and providing technical assistance.</p> | <p>CDPH, Department of Water Resources (DWR)</p> | <p>No</p> |

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| 5. 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 | DWR | No |
| Monitoring, Assessment, and Notification <i>A groundwater monitoring and assessment program is a critical element in effectively managing groundwater quality.</i> | | |
| 6. The Water Boards will define and identify nitrate high-risk areas in order to prioritize regulatory oversight and assistance efforts in these areas. ² | Water Boards | No |
| 7. 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. ² | Water Boards, other State and local agencies | Yes |
| 8. The Legislature should enact legislation that establishes a funding source for the State Water Board's Groundwater Ambient Monitoring and Assessment (GAMA) Program. | Water Boards | Yes |
| 9. 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, CDPH, and local public health agencies will coordinate in identifying private domestic wells and small, unregulated water systems in nitrate high-risk areas. ² | Water Boards, CDPH, local public health agencies | Yes |

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| <p>10. The Legislature should require property owners with private domestic wells or other unregulated groundwater systems (2 to 14 service connections) to sample their well as part of a point of sale inspection before property title transfer or purchase.</p> | <p>Water Boards, CDPH, local public health agencies</p> | <p>Yes</p> |
| <p style="text-align: center;">Nitrogen Tracking and Reporting <i>According to the UC Davis Nitrate Report, nitrogen fertilizing material application is the main source of nitrate in groundwater. A system to track the application of nitrogen fertilizing materials is a critical element in managing groundwater quality.</i></p> | | |
| <p>11. CDFA, in coordination with the Water Boards, should convene a Task Force to identify intended outcomes and expected benefits of a nitrogen mass balance tracking system in nitrate high-risk areas. The Task Force should identify appropriate nitrogen tracking and reporting systems, and potential alternatives, that would provide meaningful and high quality data to help better protect groundwater quality.</p> | <p>CDFA, Water Boards, county agriculture commissioners, local agencies</p> | <p>No</p> |
| <p style="text-align: center;">Protecting Groundwater <i>Contaminated groundwater results in treatment, well closures, or new well construction, which increases costs for consumers and the public. Regulating groundwater is essential in maintaining a safe drinking water supply.</i></p> | | |
| <p>12. The Water Boards should continue to provide technical assistance for CDFA’s ongoing work with 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.²</p> | <p>CDFA</p> | <p>No</p> |
| <p>13. CDFA should maintain the mill fee on fertilizing materials at its fully authorized amount to support and develop crop-specific nutrient application rates, Best Management Practices (BMPs), and nutrient management programs via the Fertilizer Research and Education Program (FREP). The information should continue to be made available on-line.</p> | <p>CDFA</p> | <p>No</p> |

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| 14. The Water Boards will convene a panel of experts to assess existing agricultural nitrate control programs and develop recommendations, as needed, to ensure that ongoing efforts are protective of groundwater quality. The Water Boards and CDFA will use the findings to inform ongoing regulatory and non-regulatory efforts. ² | Water Boards, CDFA | No |
| 15. The Water Boards will evaluate all existing Waste Discharge Requirements to determine whether existing regulatory permitting is sufficiently protective of groundwater quality at these sites. The Water Boards will use the findings to improve permitting activities related to nitrate. ² | Water Boards | No |

¹ Although the term fee is used throughout this report, it is beyond the scope of this report to assess whether the fee is a fee or tax under Proposition 26. The term is simply used for convenience and consistency.

² Additional funding will be required to adequately implement these strategies.