

**STATE WATER RESOURCES CONTROL BOARD  
BOARD MEETING SESSION – DIVISION OF FINANCIAL ASSISTANCE  
JUNE 16, 2015**

**ITEM 2**

**SUBJECT**

CONSIDERATION OF A PROPOSED RESOLUTION TO ALLOCATE UP TO \$359,100 FROM THE CLEANUP AND ABATEMENT ACCOUNT (CAA) TO THE CITY OF DELANO (CITY) FOR A PILOT FIXED-BED BIOREACTOR WELLHEAD TREATMENT SYSTEM FOR NITRATE AT PARADISE COLONY (PROJECT)

**DISCUSSION**

The City is requesting \$359,100 from the CAA to fund pilot testing of a biological treatment system using a fixed-bed bioreactor (FXB) to address nitrate contamination in drinking water. The purpose of the pilot test is to further the understanding of the suitability of this technology for small drinking water systems located in rural disadvantaged communities with groundwater that exceeds the Maximum Contaminant Level (MCL) for nitrate of 45 mg/L (measured as NO<sub>3</sub>).

Paradise Colony is a small unincorporated community in Tulare County located near the City of Lindsay. This community consists of five houses and approximately 12 residents, who are considered economically disadvantaged. The five connections are served by an existing water supply well which has an average nitrate concentration of approximately 70 mg/L of nitrate. Around five gallons per minute of flow from the existing water supply well will be piped to the pilot FXB. Since this is a pilot test, the treated water will not be provided to the residents.

The State Water Resources Control Board (State Water Board) is currently co-funding a project with the Department of Water Resources (DWR) to pilot-test the FXB technology at the City's Well No. 35, which has a nitrate concentration of 46 mg/L that exceeds the nitrate MCL. Well No. 35 has been shut down due to exceedance of the nitrate MCL and it is needed to help meet the City's water demands and ensure sufficient supply to its users. The pilot test uses a FXB wellhead treatment system and is being conducted in four phases. DWR, through Proposition 50 bond funds, is providing \$4,896,000 for Phases 1 through 3 of the pilot test and the construction of a 200-gpm demonstration bioreactor. The State Water Board contributed \$133,620 from the CAA for Phase 4 of the project to test intermittent operating scenarios. Phase 4 simulated how the treatment system might perform in smaller water systems, which tend to operate intermittently based on system pressure or water levels in a storage tank. Phases 1 through 4 of the pilot test at Well No. 35 have been completed.

The City is now requesting additional funds to utilize the same type of biological fixed-bed treatment system on a smaller scale and in a rural setting at Paradise Colony. The Project would be completed in two phases, with Phase 1 consisting of an evaluation of existing infrastructure and source water characterization, planning, and community outreach. Results from the Phase 1 efforts will be summarized in a Technical Memorandum. Phase 2 of the pilot study consists of designing, installing, operating and monitoring the treatment system, on a pilot scale, for approximately 8 months. Phase 2 will include a Final Report with a summary of capital and operations and maintenance costs as well as an evaluation of the feasibility of using the FXB for small, rural communities.

Biological nitrate treatment has an advantage from a water quality perspective over other traditional forms of nitrate drinking water treatment technologies (e.g., ion exchange, and reverse osmosis) as it does not produce a significant brine/concentrate waste discharge. However, biological treatment systems are operationally more complex than other traditional treatment technologies as they generally require filtration and disinfection steps after the biological treatment stage in order to meet the requirements of the State Water Board's Division of Drinking Water. There has been limited pilot testing or experience with biological nitrate treatment on small systems.

Many small disadvantaged communities in the Tulare Lake Basin rely on drinking water supplies from groundwater that have been contaminated by nitrate exceeding the MCL. While ion exchange and reverse osmosis are used in the Basin to treat nitrate in groundwater, the proper management of waste concentrate or brine from these treatment technologies can be costly. Biological nitrate treatment, with its lack of such saline waste streams and its potential remote operation via telemetry, may prove to be economical for small community systems and provide an alternative that can compete with ion exchange and reverse osmosis.

The Central Valley Regional Water Quality Control Board (Central Valley Regional Water Board) supports the funding request and adopted [Resolution No. R5-2014-0400](#), in July 2014 to support the City's request for funding from the CAA for the Project.

The State Water Board established Program Preferences for CAA funds based on statewide priorities and Strategic Goals outlined in the Strategic Plan Update 2008-2012. The Project meets the following CAA program preference:

- Preference # 2: Projects that address Disadvantaged Communities Environmental Justice Infrastructure needs.
- Preference #8: Completion of a study/plan and/or monitoring addressing significant Statewide water quality problems.

The requested allocation is consistent with the purposes of Water Code Section 13442. Section 13442 provides that the State Water Board may approve the payment of moneys from the CAA to a public agency in order to assist it in cleaning up a waste and abating the effects of a waste on waters of the state.

## **POLICY ISSUE**

Should the State Water Board:

1. Approve up to \$359,100 from the CAA to fund the Project?
2. Make the funds available until December 31, 2016, with any unexpended funds reverting to the CAA as of January 31, 2017, unless the Deputy Director or Assistant Deputy Director of the Division of Financial Assistance authorizes an extension?

## **FISCAL IMPACT**

Prior to the signing of the emergency drought relief package, the uncommitted CAA balance at the end of Fiscal Year 2014/15 was projected to be about \$14 million. The projected uncommitted CAA balance equals projected revenue plus cash on hand minus expenditures and funding commitments, including funds set aside for approved projects. Funds committed to a project are generally expended over several years, so a commitment to fund a project does not result in the actual cash balance in the CAA being reduced until an expenditure on the project occurs – i.e., the State Water Board pays an approved invoice.

As a result of the recently signed emergency drought relief package, specifically Assembly Bill (AB) 91 (adding Items 3940-002-0679, 3940-101-0679 and 3940-102-0679 to Section 2.00 of the Budget Act of 2014), \$19.9 million has been appropriated from the CAA to provide interim emergency drinking water to disadvantaged communities with contaminated water supplies and to address drought-related drinking water emergencies or threatened emergencies.

With \$19.9 million allocated for emergency drinking water purposes, the end of Fiscal Year 2014/15 projection for the CAA is that there will be \$5 million less in the CAA than has been committed to projects.

Since most funds committed to projects are expended over several fiscal years and additional revenue comes into the CAA each year, there should be sufficient cash on hand to pay for actual expenditures for current CAA project commitments, this Project, and emergency drinking water projects. However, if sufficient funds are not available to pay for project commitments, AB 91 includes a provision that allows the State Water Board to borrow sufficient funds for cash purposes from its other special funds. Borrowing such funds requires the approval and order of the Director of Finance.

## **REGIONAL WATER BOARD IMPACT**

Yes, the Central Valley Regional Water Board staff will oversee the Project as the Technical Project Manager and will review applicable Project Deliverables.

## **STAFF RECOMMENDATION**

Staff recommends that the State Water Board adopt the proposed Resolution.

<p>State Water Board action on this item will assist the Water Boards in reaching Goal 4 of the Strategic Plan Update: 2008-2012, Goal 4: To comprehensively address water quality protection and restoration, and the relationship between water supply and water quality, and describe the connections between water quality, water quantity, and climate change, throughout California's water planning processes.</p>
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# DRAFT

## STATE WATER RESOURCES CONTROL BOARD RESOLUTION NO. 2015-

ALLOCATE UP TO \$359,100 FROM THE CLEANUP AND ABATEMENT ACCOUNT (CAA) TO THE CITY OF DELANO (CITY) FOR A PILOT FIXED-BED BIOREACTOR WELLHEAD TREATMENT SYSTEM FOR NITRATE AT PARADISE COLONY (PROJECT)

### WHEREAS:

1. The City is requesting \$359,100 from the CAA to fund pilot testing of a biological treatment system using a fixed-bed bioreactor (FXB) to better understand the suitability of this technology for small drinking water systems, especially those located in rural disadvantaged communities, with groundwater that exceeds the Maximum Contaminant Level (MCL) for nitrate of 45 mg/L (measured as NO<sub>3</sub>);
2. Paradise Colony is a small unincorporated community in Tulare County located near the City of Lindsay. This community consists of five houses and is home to approximately 12 residents. The five connections are served by an existing water supply well which has an average nitrate concentration of approximately 70 mg/L of nitrate;
3. The State Water Resources Control Board (State Water Board) is currently co-funding a project with the Department of Water Resources (DWR) to pilot-test the FXB technology at the City's Well No. 35. The Project will test a smaller water system, which tends to operate intermittently. Simulation of intermittent operation has been conducted as part of the Well No. 35 demonstration;
4. The Project will produce a report with a summary of capital and operations and maintenance costs, as well as an evaluation of the feasibility of using the FXB for other small, rural communities;
5. An advantage that biological nitrate treatment has over other traditional forms of nitrate drinking water treatment technologies (e.g., ion exchange, and reverse osmosis) is that it does not produce a significant brine/concentrate waste discharge requiring disposal;
6. Many small disadvantaged communities in the Tulare Lake Basin rely on drinking water supplies from groundwater that have been contaminated by nitrate exceeding the MCL;
7. The State Water Board and the Central Valley Regional Water Quality Control Board support the evaluation of innovative drinking water treatment technologies that are simple, reliable, economical and minimize required operational oversight, especially for small rural communities; and
8. The requested allocation is consistent with the purposes of Water Code (WC) section 13442. WC section 13442 provides that the State Water Board may approve the payment of moneys from the CAA to a public agency in order to assist it in cleaning up a waste and abating the effects of a waste on waters of the state.

# **D R A F T**

THEREFORE BE IT RESOLVED THAT:

The State Water Board:

1. Approves up to \$359,100 from the CAA to fund the Project.
2. Makes the funds available until December 31, 2016, with any unexpended funds reverting to the CAA as of January 31, 2017, unless the Deputy Director or Assistant Deputy Director of the Division of Financial Assistance authorizes an extension.

## **CERTIFICATION**

The undersigned, Clerk to the Board, does hereby certify that the foregoing is a full, true, and correct copy of a resolution duly and regularly adopted at a meeting of the State Water Board held June 16, 2015.

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Jeanine Townsend  
Clerk to the Board