

**STATE OF CALIFORNIA
REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL COAST REGION**

STAFF REPORT FOR REGULAR MEETING OF MAY 12, 2006
Prepared on March 30, 2006

ITEM NUMBER: 22

**SUBJECT: Moss Landing Power Plant Backflushing Settlement, Monterey County,
Supplemental Environmental Projects, Request for Funding**

KEY INFORMATION

Moss Landing Power Plant Backflushing Settlement Fund	Project Fund	Monitoring Fund
Initial Value of Fund Account	\$2,850,000	\$950,000
Encumbered by Contracts	\$1,966,809	\$700,104
Unencumbered Value of Fund	\$ 883,191	\$249,896
Funds requested	\$500,000	\$136,380

This Action: Approve proposed projects for funding

SUMMARY

This item recommends approval for two grant proposals that will demonstrate the effectiveness of agricultural best management practices. If the Board approves these projects, funding will come from the Moss Landing Power Plant backflushing settlement (see Discussion section, below). The Resource Conservation District of Monterey County submitted both proposals. The first proposal, for \$500,000, includes four projects: two vegetated treatment systems, a stream channel stabilization project, and a sediment basin. The goal of these projects is to improve water quality on a local scale by implementing best management practices, and improve water quality on a larger scale by demonstrating best management practices that apply to other areas.

The second proposal, for \$137,000, will perform toxicity monitoring to evaluate the effectiveness of the vegetated treatment systems mentioned above.

Staff recommends approval of these proposals because they will provide tangible water quality results that apply to agricultural operations on hundreds of thousands of acres in the Central

Coast Region. The proposed projects directly apply to documented pollution problems (Total Maximum Daily Load listings) in the lower Salinas and Elkhorn Slough areas, including nutrients, pesticides and sediments.

DISCUSSION

Background

The Regional Board and Pacific Gas & Electric (PG&E) agreed to settle a dispute regarding alleged violations of National Pollutant Discharge Elimination System permits (NPDES permits) held by PG&E from 1974 through 1998 for the company's operation of the Moss Landing Power Plant in Monterey County. The alleged violations supported assessment of civil liability pursuant to Water Code Section 13385.

PG&E and the Water Board agreed to settle the alleged violations via a consent judgment, which required PG&E to provide \$5,000,000 for the following supplemental environmental projects:

a) Payment of \$2,850,000 to establish a "Non-Point Source Projects Fund" (Projects Fund) through the Community Foundation for Monterey County. The judgment requires that a portion of the fund be used to administer the funding program. This fund pays for projects focused on education and on-farm management practices that prevent and reduce polluted run-off.

b) Payment of \$950,000 to establish a "Nonpoint Source Monitoring Fund" (Monitoring Fund) with the Community Foundation for Monterey County. These Funds pay for water quality monitoring associated with determining the effectiveness of on-farm management practices, and pay for watershed level monitoring.

c) Payment of \$950,000 to establish a Fund with the Community Foundation for Monterey County to supplement the Central Coast Ambient Monitoring Program's (CCAMP) activities in Monterey Bay and associated watersheds; and

d) Payment of \$250,000 to fund Water Board staff oversight costs.

On July 11, 2003, the Central Coast Regional Water Quality Control Board (Water Board) approved criteria for evaluating supplemental environmental projects proposals for funding from the Moss Landing Power Plant backflushing settlement fund. The court-approved settlement requires these funds be spent: (1) to improve water quality primarily via projects that reduce pollution from agricultural sources and (2) to monitor the effectiveness of those projects. The criteria also state that the Water Board itself will review and approve proposals with a budget over \$50,000. The Executive Officer may approve proposals with a budget of \$50,000 or less. For reference, the criteria is included here as Attachment 1. Staff uses the criteria to rank proposals for consideration by the Water Board.

Funding Cycle and Status

The Water Board first approved grant proposals on December 2, 2004. There are now two funding cycles per year; the funding cycles will continue until the funds are fully allocated. Currently, there are 18 projects funded through

the Project fund, and 7 projects funded through the Monitoring fund.

Summary of Two Proposals Recommended for Funding

Proposal One: Vegetated treatment systems, stream channel stabilization and sediment basin.

Vegetated Treatment Systems

The Monterey RCD requests \$500,000 to implement four projects. They include two vegetated treatment systems, a stream channel stabilization project and a sediment basin. Attachment three provides the line item budget for these projects.

The Monterey RCD proposes to install two vegetated treatment systems, each approximately 500 feet in length, within the Blanco drain and Elkhorn Slough areas. These projects will convert existing on-farm drainage canals and ditches into vegetated treatment systems for surface water. Vegetated treatment systems function by creating oxygen-deficient zones, which reduce nitrates. They also provide vegetation to sorb pesticides and a carbon source for bacteria, which break down pesticides. Flow, oxygen and carbon sources must be appropriately manipulated in these systems in order to maximize pollution reduction potential. Therefore, these projects entail not only the installation of vegetation and water control structures, but also careful monitoring to optimize the systems.

Several scientific studies have demonstrated the capacity of off-farm vegetated treatment systems to improve water quality with respect to nutrients and turbidity. Projects located in Florida, Maryland and other states east of the Mississippi River had a marked impact on water quality, including reducing nitrate-nitrogen concentrations by over 50 percent, water column toxicity by 40 to 99 percent, certain pesticides concentrations by over 80 percent, and turbidity by over 50 percent. The RCD expects similar reductions for the proposed treatment systems. They also anticipate further nutrient reductions in total

phosphorous load. Although we have evidence that these types of treatment systems do improve water quality, these types of systems have not been incorporated into the working landscape of the farm. We are unaware of efforts underway to establish and evaluate any type of treatment wetlands for agriculture in California, except for two other projects on the Central Coast and one in the Central Valley. Out of these three projects, only one will implement a vegetated treatment system on the farm. The development and evaluation of on-farm vegetated treatment systems on the Central Coast has the potential to play a key role in protecting and restoring water quality from specific pollutants. These two treatment systems are among the first of their kind in the region, and we need evidence of their performance effectiveness. Accordingly, the project includes monitoring for water quality, flow, and load calculations. Researchers at UC Santa Cruz will perform water quality monitoring associated with the nutrients and sediment, and that work is already funded. Researchers at UC Davis and UC Santa Cruz will perform monitoring for toxicity and pesticides, and funds are requested from the PGE monitoring fund (see proposal two, page four).

Regional Board staff support the implementation of vegetated treatment systems for several reasons. First, more so than any other management practice, vegetated treatment systems have the capacity to solve several water quality problems simultaneously. There are 40 impaired water listings in northern Monterey County, 29 identifying agriculture as a potential source. Many of these listings are for nutrients, pesticides and sediment, all of which can be treated by the vegetated treatment systems. Second, practices such as nutrient management plans or sediment basins greatly improve water quality, but in the lower Salinas, these actions alone are unlikely to restore certain beneficial uses such as the support of fisheries or sensitive wildlife because fine sediment and soluble constituents will continue to leave the farm. Therefore, source control via containment and treatment of pollutants on farms must be accompanied with other

treatment practices in order to fully prevent pollution. Finally, since these systems will be installed within existing drainage canals and ditches, they do not occupy valuable productive acreage. This increases the likelihood of growers adopting the management practice.

Stream Channel Stabilization and Sediment Basin

The RCD's proposed stream channel stabilization site is a 1000-foot long section of a tributary to the Reclamation Canal, and the parcel immediately upstream from this reach. The sediment basin will have a capacity of at least three acre-feet and will be located above the tributary reach.

This pair of projects will mitigate the impacts of accelerated stormwater runoff in the watershed. Substantial increases in impervious surfaces have occurred in the project watershed during the past ten years. The two principal land use changes associated with this problem are increases in urban development, and the increase in strawberry cultivation and the associated use of polyethylene sheeting (plastic mulch) over approximately half the farm land area. The accelerated runoff has destabilized the creek bed and banks, causing down cutting and widening. Over the past ten years, the eight to ten foot wide creek bed has dropped by two to five feet along the entire 1000 foot reach. This channel bed drop has caused several large bank failures, and approximately 1500 cubic yards of material has been mobilized from this site and transported downstream. The flood flows can no longer access the flood plain, which causes both increased flooding down stream, and reduces the ability of the stream to expend energy during floods in a non-erosive manner.

The proposed projects will stabilize the channel and reconnect it with the floodplain. The proposed solution is to establish a sediment basin upstream. During peak flows, water will overflow into this area and be detained for a period of hours to days. This will reduce the peak flow and stream power downstream, thereby helping to stabilize the down cutting

reach. The channel will be stabilized with a series of rock rip-rap stabilization structures. The quantity of rock will be minimized to avoid undesirable environmental impacts. Bank protection will be accomplished by armoring the toes of unstable slopes using reliable and environmentally sensitive biotechnical methods, such as rock riprap with willow log crib walls. The banks and floodplain areas will be revegetated using native trees, shrubs and grasses.

The stream channel stabilization and sediment basin projects are designed to reduce channel erosion and downstream impacts from the deposition of sediment and associated contaminants. The Reclamation Canal is a known source of several sediment-bound contaminants (e.g. DDT and its metabolites, dieldrin, chlordane) and projects like this prevent their release into our waterways.

Proposal Two: Assessing the Effectiveness of Vegetated Treatment Systems to Reduce Toxicity

The Monterey RCD, in collaboration with UC Davis Department of Environmental Toxicology, requests \$136,379 to perform part of the water quality sampling associated with evaluating the vegetated treatment systems mentioned above. The proposed monitoring activities will test the hypothesis that vegetated treatment systems can reduce water column toxicity.

The Monterey RCD is collaborating with local growers to convert agricultural drainage ditches into treatment wetlands, which should remove nutrients, sediments and pesticides, as described in the first proposal. As part of this effort, water quality monitoring for nutrient and sediment loads will be conducted by UC Santa Cruz, and paid for through EPA 319(h) funding. The last remaining piece of this effort is understanding vegetated treatment systems effects on water column and sediment toxicity.

Vegetated treatment systems with fluctuating water levels provide a variety of mechanisms for the degradation of chemical pollutants, including oxidation, reduction, hydrolysis,

photolysis, volatilization, and metabolic processes. One study showed that 95 to 98% of diazinon was removed after about 60 days of exposure to a wetland environment (Tsukano, 1986). In a more recent study by Schutlz (2004), water column toxicity was reduced by 44 to 99%, and certain pesticides reduced by 80%. We expect similar reductions in the proposed project areas. However, these treatment systems are among the first of their kind in the region, and so treatment effectiveness needs must be demonstrated, as provided through this project.

Researchers at UC Davis and UC Santa Cruz will use sensitive, standardized toxicity tests and chemical analyses to measure the effectiveness of vegetated treatment systems. Monitoring will proceed in four phases, and will evaluate both sediment and water column toxicity.

Because toxic compounds often occur in pulses through flowing waterways, *in situ* toxicity tests will be conducted in some cases so that test organisms will be continuously exposed to field conditions. *In situ* studies will be compared to conventional laboratory tests. The zooplankton *Ceriodaphnia dubia* will be used, as is common for water column toxicity testing within our agency. Containers will be retrieved from the field for measurement of *Ceriodaphnia* mortality, as well as concentrations of the pesticides diazinon and chlorpyrifos. Researchers will also measure pH, dissolved oxygen, conductivity and turbidity. Similar tests and data will be collected from reference sites, which have naturally occurring vegetation, as a comparison.

The second phase of the toxicity evaluation will consist of measuring sediment toxicity, grain size, and total organic carbon. Because sediments tend to integrate the concentrations and effects of contaminants over time, there will only be one sediment screening survey. Sediments will be tested using the sensitive and standardized 10-day growth and survival toxicity test with the amphipod *Hyaella azteca*.

In the third phase, water and sediments will be analyzed for toxicity and a suite of chemicals likely to be present in water and sediments associated with agricultural runoff. This analytical suite will include organophosphate, organochlorine, carbamate, and pyrethroid pesticides.

Finally, toxicity identification evaluations will be conducted on water and sediment samples to determine the compounds or compound classes responsible for any observed toxicity.

Monitoring the effectiveness of the vegetated treatment system to reduce toxicity is important in understanding how to properly operate these systems. This is particularly relevant in our region, since preliminary review of our Agricultural Waiver data indicates widespread and acute toxicity within the lower Salinas and Santa Maria watersheds. We need to understand the conditions that cause toxicity (e.g. which chemicals cause the problems, at what concentrations, how often etc...) to correct the problem. Toxicity analyses are expensive, which hinders monitoring and research efforts. Under the Agricultural Waiver, toxicity testing takes place twice per year, with limited funds to perform follow up monitoring. The results from this project will greatly aid our efforts to understand the causes of toxicity and the effectiveness of vegetated treatment systems.

CONCLUSION

Both proposals described here, and all projects proposed for funding via this settlement, link together as part of a larger effort to affect water quality change in the Moss Landing area. All grantees coordinate their projects, such that activities from one grant compliment activities adjacent or similar to other grants. For example, previous funds allocated for education and coordination of growers resulted in the implementation of the vegetated treatment systems and the stream channel stabilization project. This creates the vital link between teaching growers the importance of implementing pollution prevention practices, and then taking steps towards the actions necessary to implement those practices.

Finally, as part of our vision effort, we stress that healthy functioning watersheds will be achieved through proper land management (Measurable goal #3

[<http://www.waterboards.ca.gov/centralcoast/Board/Agendas/032406/Item17/documents/Item17StaffReport.pdf>]). The vegetated treatment systems and channel stabilization projects directly implement this goal by reducing the most commonly found pollutants in northern Monterey County. The monitoring for toxicity directly and indirectly aid us in this goal as well; directly by providing information about how best to optimize the treatment systems, and indirectly by describing how toxicity occurs, and thereby aiding us to determine the best suite of land management practices.

RECOMMENDATION

Staff recommends that the Water Board approve funding the proposed projects:

1. Vegetated treatment systems, stream channel stabilization and sediment basin for \$500,000
2. Assessing vegetated treatment systems effectiveness at reducing toxicity for \$136,379

ATTACHMENTS

1. PG&E fund criteria
2. Budget for vegetated treatment systems, stream channel stabilization and sediment basin projects
3. Budget for assessing vegetated treatment systems effectiveness at reducing toxicity

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