

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

STAFF REPORT FOR REGULAR MEETING OF JUNE 3, 2009
Prepared May 21, 2009

ITEM NUMBER: 3

SUBJECT: Vision, Goals, and Actions

The Central Coast Regional Water Quality Control Board has a Vision of Healthy Watersheds. That Vision seems very simple: the epitome of common sense. However, a healthy watershed has many aspects:

Healthy Watersheds function well ecologically and are sustainable; support healthy, diverse aquatic habitat; have healthy riparian areas and corridors; and have near natural levels of sediment transport and near natural levels and quality of groundwater. A Healthy Watershed sustains these characteristics through measures that ensure the dynamics that provide these healthy factors and functions are protected. Healthy sustainable watersheds have more vegetative cover and canopy, less energy use for imported water, fewer greenhouse gas emissions, and a lesser carbon footprint than unhealthy watersheds. Our goal of Healthy Watersheds is compatible, supportive, and in coordination with the larger issue (beyond water quality) of Sustainability and the State's Global Warming Solutions Act. Our region's sustainability depends on healthy watersheds.

How do we attain this Vision?

We have established three measurable goals that, if achieved, will ensure Healthy Watersheds. These three goals are to attain healthy aquatic habitat, sustainably managed land, and clean groundwater within all our watersheds. We have been aligning all our work, and have established cross organizational teams, to achieve these goals. Common to all these goals is field assessment, and we have a cross organization team specifically focused on measuring the effectiveness of our actions. The Vision Goal Teams are coordinating with the Vision Assessment Team to measure effectiveness in two ways, tangible outcomes and performance. To measure the tangible outcomes of our work, we have selected "key parameters" which measure the changes to the environment such as physical, chemical and biological conditions in water (e.g., nitrate concentrations) and on land (e.g., riparian vegetation). As we develop performance measures, we will continue to test the initial key parameters selected and add additional ones as we learn more about the best indicators of the tangible outcomes for which we are striving.

To measure our performance and link our actions to tangible outcomes, we are also developing "operational measures" which measure the results, impacts or benefits of our work. For example, we can mark progress towards achieving tangible outcomes (e.g., reduced toxicity in surface waters) if we can show 1) that we have changed our regulatory requirements (e.g., mandated implementation of and reporting on management practices for irrigated agriculture), and 2) that the regulated community is complying with the new regulatory requirements (e.g., tracking and mapping locations and types of management practices implemented based on reports submitted and field inspections). Operational measures include measuring both actions by staff and the Board to establish new requirements for land managers and dischargers (or to

influence stakeholders), and behavioral changes by land managers, dischargers and stakeholders that indicate compliance or response. Basing our organization on performance and tangible progress toward measurable goals that will provide and ensure healthy watersheds is consistent with the State Board's recently updated Water Board Strategic Plan.

State Water Resources Control Board - Performance Based Organization

For example, the Strategic Plan (pg 2): "Most of the actions in the Update will be implemented in a watershed framework, which stakeholders identified as the most effective approach to manage and protect the State's water resources. Healthy watersheds, or drainage basins, that provide clean and plentiful surface water and groundwater, and support healthy riparian and wetland habitat, are essential to support the State's resources and economic future. A watershed approach is focused on hydrology, recognizes the degree to which groundwater and surface water bodies are connected physically, recognizes the linkages between water quantity and water quality, and requires a comprehensive, long-term approach to water resources management that takes system interactions into account."

Pg 4): "Crafting performance measures is difficult, but is already well underway. For example, our water quality enforcement team has already developed performance measures that will be refined over time. This Update continues the transition of Water Boards to becoming a performance-based organization where clear objectives, specific measurable goals, and targets for improved performance are established."

The Water Boards have been working on performance and operational measures and will be publishing the first report card of performance this summer. These measures are categorized in four tiers. These tiers allow us to relate our internal operations and the work products that we produce to the environmental results of those efforts. Proposed definitions for the tiers are:

TIER I: Activities and resources

These measures include the actions, activities, processes, strategies, organization of resources, resources available over time and skills needed and available to efficiently conduct and implement the mission of the Water Boards.

TIER II: Products and actions (outputs, regulatory response)

Tier II measures are the final products produced as a direct result of Water Board activities. Examples include inspections conducted, policies adopted, permits issued, enforcement actions taken, etc. These measures also include direct efforts towards restoration of the environment including the collection and analysis of information to identify problems and their causes. Measures in this tier can also assess the opportunity for public involvement as a result of Water Board actions.

TIER III: Discharger compliance (intermediate/behavioral outcomes, pressures)

Tier III measures reflect the change in the environmental pressures (problems) as a result of Water Board activities (how effective are we?). Measures in this group allow us to evaluate how dischargers respond to our regulatory requirements to control the amount of pollutants being discharged, such as changes in discharges quantities, compliance with permit conditions, etc.

TIER IV: Environmental outcomes (state, conditions)

Measures in this group collect information about the environmental conditions addressed through Water Board activities and reflect the ultimate end result of those activities. Measures in

this group include changes in ambient conditions, health, ecology, and beneficial uses. These are the tangible results that drive all of our work.

An Example of Prioritization and Performance Measurement

As a performance-based organization, our goal is to achieve healthy watersheds through effective and efficient use of our staff resources. While sufficient water quality protection and cleanup work exists to keep Water Board staff busy, we achieve effectiveness by identifying and acting on our highest water quality priorities. Examples of our prioritization efforts come from the Groundwater Section, where over the last twelve months, each of the section's four programs (Underground Storage Tanks, Site Cleanup Program, Department of Defense, and Landfills) has used prioritization criteria to identify the cleanup/landfill sites that pose the greatest risk to water quality. Given the nearly 1500 cleanup sites within the Groundwater Section, we need to use prioritization criteria to understand which sites to push harder on. These criteria are focused primarily on reducing risk (human, ecological, and water quality), although we also consider relative ease to achieving site closure – the concept of low hanging fruit – as a criteria, understanding that fewer sites to work on allows staff to better focus on the remaining high priority sites. Informed by the prioritization efforts, program staff adjusts their time allocation, spending more time on the identified high priority sites to move these sites through characterization and cleanup, to closure. We also view prioritization as dynamic, as we reduce risk at high priority sites, or as we acquire new sites, we have to re-evaluate our priorities.

As an organization, we must also evaluate our effectiveness in restoring healthy watershed function, which includes measuring reduction in water quality risk for our prioritized sites. As an example of this, the Underground Storage Tank (UST) program evaluates program performance through a variety of measures. For the UST program, site closure reflects completion of all cleanup activities and is a Tier IV measure as discussed above, because it defines the water quality outcome. To date, UST staff has closed 23 sites during this fiscal year (ending June 30, 2009); we use twenty closures as our numeric target. We also measure the number of new cases we find and know that we are closing approximately four sites for every new tank site that we find, indicating that we are moving in the right direction with a significant positive trend. For this fiscal year we have six new UST cases.

Measuring the number of site closures per year is powerful because it reflects us successfully completing our job, and we can assess our performance year over year, but closure typically takes between five and fifteen years to achieve for UST sites, occasionally more. Using closure as our only performance measure, we would know nothing with respect to our progress on reducing risk at our highest priority sites. Additionally, we have found that we need to develop more sensitive or shorter-term measures to assess our effectiveness as we implement new strategies to accelerate priority cases. The GeoTracker database, used by all groundwater staff to record and monitor progress on their sites, holds both site-specific, groundwater quality data (e.g., concentrations for compounds such as benzene and MTBE) and other site and vicinity information (e.g., distance to municipal wells, other nearby potential sources, Central Coast Region case priority rank, etc.). We are currently building measures, in the form of database queries, to assess decreases in critical constituent concentrations (e.g., benzene, MTBE) for high priority sites, defined by our internal prioritization and distance to municipal and domestic wells. We are also developing queries to measure the rate at which priority cases move from discovery, through each project phase (e.g., site characterization, remediation, verification monitoring, etc.).

Drawing lessons from the examples provided by the UST program, to measure performance we must have a data management system that is integrated with staff case work and incorporates

water quality data, as well as other less direct measures of progress. These less direct measures that we draw from the data must also be linked to the water quality outcomes.

Central Coast Region Vision

Our Regional Vision, Measureable Goals and Objectives provide a clear framework for how we conduct business and achieve measurable results in water quality improvement. This Vision structures our work towards our highest water quality priorities and more strategically aligns us with current and future challenges and opportunities in water quality, as well as the direction of the State Board as outlined above.

This work includes more comprehensive watershed assessment (as the Board saw at the May Board meeting a year ago regarding toxicity from agriculture and urban runoff), more comprehensive regulations to address critical issues, and defining measures to gauge our effectiveness over time.

Our Teams are defining important actions and measures. All of our staff are contributing to these efforts and are incorporating actions identified by the teams into their daily work. For example, staff in the Agricultural Program evaluates compliance with the Conditional Waiver of Waste Discharge Requirements for Irrigated Agriculture by considering reporting and monitoring information submitted by growers, along with water quality data for nitrate and toxicity in streams, pesticide use information *and* results of inspections. This is the first time we have used Geographic Information System tools to link site and area land uses to water quality data from monitoring programs. Also, Storm Water Program staff is incorporating low impact development, hydromodification control, and long-term watershed protection requirements into municipal storm water management programs. More broadly, our Vision Teams are developing amendments to our Water Quality Control Plan (Basin Plan) to strengthen or establish watershed, wetland, riparian area, and groundwater recharge protections.

Case in Point – Nitrate

One of the constituents mentioned above is nitrate. We have extensive nitrate problems in many areas of our region's watersheds, both in surface and groundwater. Many individual well users are not provided the protections enjoyed by users of small community well systems and larger systems that are regulated (prompting testing and corrective actions) by health agencies. These individual users could be considered to suffer from environmental injustice. We are attacking the problem through septic tank, ag, and to some degree stormwater regulation and follow-up, as well through our assessment efforts and via grants. Even in our site cleanup program, we recently provided notification to 72 well users in southern Santa Clara County due to excessive nitrate results from Olin's groundwater monitoring program (Olin included nitrate testing in a recent round of required perchlorate testing).

Here are some examples of aligning our programs to make progress on this common problem of high nitrates, with several sources, throughout our region. To put these actions into context of the State Board's performance measures, most of these efforts are Tier I and II regulatory efforts, which are designed to cause Tier III practice changes in the field, which will lead to Tier IV environmental outcomes – water quality improvements.

Vision Assessment

(Karen Worcester 805/549-3333)

Nitrate Assessment in Surface Water

The Central Coast Basin Plan includes nitrate numeric objective of 10 mg/L as N, both in surface and in ground water, to protect drinking water for municipal and domestic use. Aquatic life and recreational uses are protected from excessive nitrate through two narrative objectives:

1. Biostimulatory objective- "waters shall not contain biostimulatory substances in concentrations that promote aquatic growths to the extent that such growths cause nuisance or adversely affect beneficial uses."
2. Toxicity objective- "All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in, human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, toxicity bioassays of appropriate duration, or other appropriate methods as specified by the Regional Board.

Survival of aquatic life in surface waters subjected to a waste discharge or other controllable water quality conditions, shall not be less than that for the same water body in areas unaffected by the waste discharge or, when necessary, for other control water that is consistent with the requirements for "experimental water" as described in Standard Methods for the Examination of Water and Wastewater, latest edition. As a minimum, compliance with this objective shall be evaluated with a 96-hour bioassay.

In addition, effluent limits based upon acute bioassays of effluents will be prescribed where appropriate, additional numerical receiving water objectives for specific toxicants will be established as sufficient data become available, and source control of toxic substances is encouraged."

Excessive nutrient concentrations stimulate algal growth, which can create nuisance conditions for water use and for recreation, but perhaps more importantly, can remove oxygen from water creating conditions unsuitable for aquatic life. Some algal blooms are also toxic to aquatic life, wildlife, and even humans. Waters that contain excessive algal growth are characterized by wide swings in dissolved oxygen concentrations, typically dropping below concentrations set to protect for aquatic life at night, and often rising above fully saturated levels during mid-day. Staff at the Central Coast Water Board and State Water Resources Control Board have studied local data and conditions, and commissioned studies by experts to develop methodologies and determine safe nitrate levels to interpret the narrative Biostimulatory objective.

Staff has reviewed several studies indicating that nitrate is toxic to freshwater invertebrates, fishes and amphibians. Nitrate is directly toxic to sensitive aquatic organisms because of its detrimental effect on the oxygen carrying capacity in blood. Nitrate converts oxygen-carrying pigments to forms that are incapable of carrying oxygen. Staff is evaluating the results of these studies to determine what levels of nitrate are considered safe to interpret the narrative Toxicity objective. The acceptable levels of nitrate reported in the literature range from 2 mg/L as N to greater than 10 mg/L as N. In a recent survey of the literature, Camargo suggested that a maximum nitrate concentration of 2 mg NO₃-N/l would be appropriate for protecting the most sensitive freshwater species. (J. A. Camargo, A. Alonso and A. Salamanca, 2005. Nitrate toxicity to aquatic animals: a review with new data for freshwater invertebrates. Chemosphere. Volume 58(9): 1255-1267.)

Numeric Nitrate Evaluation Guideline for Aquatic Life Protection based on the Biostimulatory Objective - Every two years, the U.S. EPA requires that States assess water quality under Sections 303(d) and 305(b) of the Clean Water Act. This is the process that determines whether or not a water body should be placed on the 303(d) List of Impaired Water Bodies. The 2008 Integrated Report will be presented to the Central Coast Water Board for approval at its July meeting. In developing the 2008 report, staff used a new approach to evaluate the narrative criterion for protection of aquatic life against excessive biostimulation. In the absence of a numeric nitrate criterion, staff used a modeling approach developed for the State Water Resources Control Board by expert consultants called the California Nutrient Numeric Endpoint (NNE) technical approach (Creager, et al., 2006) to support interpretation of the narrative objective.

The California NNE technical approach utilizes predicted benthic algae biomass and chlorophyll a concentrations as “response variables”, and defines “Risk Categories” for these response variables that can serve as preliminary numeric targets. These numeric targets are set at a conservative level to account for uncertainty and to be applicable throughout California. These numeric targets can serve as the basis for numeric objectives. The California NNE provides a modeling tool that predicts in-stream benthic algal density, chlorophyll a concentrations, and oxygen deficit associated with algal growth.

Staff identified a set of reference data associated with sites monitored by the Water Board's Central Coast Ambient Monitoring Program. These sites all met Basin Plan oxygen objectives and showed no other signs of biostimulation (including algal cover, water column chlorophyll, and oxygen supersaturation). These sites rarely or never had nitrate concentrations that exceeded 1.0 mg/L-N. Staff used the NNE modeling tool to evaluate all CCAMP data, and determined that at 1.0 mg/L, the predicted oxygen deficit was 1.25. The reference data set had predicted oxygen deficits that virtually never exceeded this value. Staff determined that at 1.0 mg/L nitrate-N, the risk for biostimulation is relatively low, and that above this concentration, sites begin to show various indications of excessive nutrient enrichment. Staff used 1.0 mg/L as an Evaluation Guideline in the Integrated Report to evaluate priority areas, and supported decisions with other evidence of biostimulation.

Using all data compiled for the Integrated Report, 110 water bodies of the total 235 (53%) evaluated in the Region are found to exceed the aquatic life guideline value on average, and 46 (20%) are found to exceed the much higher drinking water standard of 10 mg/L. It is clear that nitrate is a widespread and serious surface water problem in the Central Coast.

The first Goal of the Central Coast Vision project relates to healthy aquatic habitat. The Healthy Aquatic Habitat team has defined several key parameters associated with healthy habitat; one of these parameters is “biostimulation”. Nitrate is an important component of this parameter. At the June offsite Board meeting, staff will provide more detailed information on nitrate contamination and biostimulatory risk in our Region's surface waters.

Nitrate Assessment in Groundwater

Groundwater is a very important resource in the Central Coast, accounting for 83% of the agricultural and urban use in the Region. The third Goal of our Central Coast Vision requires that we assess what percent of our groundwater is clean, and that we track trends in groundwater that is not. The Groundwater team has defined exceedance of the Maximum

Contaminant Level (10 mg/L) for nitrate as one of its key parameters for evaluation of this goal. A 2003 report by the Department of Water Resources (Bulletin 118) determined that 83% of public supply wells in the Region were free of contaminants (using data from 1994 through 2000). This only represents public supply wells, not the thousands of private wells throughout our Region, many of which are contaminated with nitrate (we are investigating the magnitude of this problem now). Of the 17% of public supply wells that were not clean, 55% of those wells were contaminated by nitrate, meaning they exceeded the drinking water standard. This reference shows nitrate to be the single most important contaminant of drinking water in our Region.

Staff has compiled data from 1980 through 2008 from the Groundwater Ambient Monitoring and Assessment (GAMA) program and the Department of Public Health. This dataset represents the water quality of wells used as drinking water sources for public water systems with 15 or more connections. We will provide maps and summaries of this information by groundwater basin at the June offsite Board meeting. This will identify basins that are meeting the goal of 80% clean from the standpoint of nitrate contamination, measured as % of public supply wells. It should be noted that public supply wells are only a good measure of the “used” drinking water resource. Other wells that tap into groundwater for other purposes may have very different water quality.

Agricultural Regulatory Program
(Angela Schroeter 805/542-4644)

Watershed Implementation Strategy

We are aligning the Central Coast Water Board Agricultural Regulatory (Ag) Program with our Vision for Healthy Watersheds. We are maximizing our effectiveness by identifying and prioritizing actions that address the most significant agricultural water quality problems we face in the Central Coast Region, including pollutants in agricultural tailwater, nitrate in groundwater from fertilizer, surface water toxicity resulting from pesticides, degradation of aquatic habitat, surface water nutrients from fertilizer, and sediment discharge (Table 1).

Ag Program staff is addressing priority agricultural water quality issues, on a watershed basis, using a focused and systematic approach in close coordination with other Water Board programs and efforts. The Ag Program watershed implementation strategy identifies our plan to achieve tangible agricultural water quality improvement and sustainable land management, including resource allocation, goals, timeframe and specific measures to assess progress and make program adjustments at the watershed scale.

The Ag Program watershed implementation strategy concentrates efforts in our most impaired watersheds by assigning lead Ag Program staff to the Pajaro River, Salinas River, and Santa Maria watersheds, as well as other areas of the Central Coast region. The responsibility of Ag Program staff is to achieve and demonstrate tangible agricultural water quality improvement in a specific watershed, through the development and implementation of an efficient and effective watershed implementation strategy. Each staff person will identify and implement the actions of Water Board staff, driven by our desired outcome for water quality improvement, sustainable land management, and relying on our regulatory tools to achieve those outcomes. The strategy takes into consideration the potential roles of our external stakeholders, but is not overly reliant on external actions. Timeframe to launch individual watershed implementation strategies for the

Pajaro River, Salinas River, and Santa Maria Watersheds is December 2009. Progress will be reported in quarterly Ag Program "State of the Watershed" summaries.

Agricultural Water Quality Operational Measures

In coordination with the Vision Assessment, Sustainable Land Management, Healthy Aquatic Habitat, and Clean Groundwater Vision Teams, Ag Program staff has prioritized operational measures to track our progress towards addressing the most significant agricultural water quality problems, allowing us to make timely implementation adjustments to maximize our effectiveness (Table 2). These agricultural water quality operational measures will be included in the quarterly Ag Program "State of the Watershed" summaries.

Progress Towards Addressing Nitrate Pollution from Irrigated Agriculture

Four of our eight priority agricultural water quality operational measures address the severe nitrate problem resulting from agricultural land uses: tailwater elimination, tailwater treatment, irrigation efficiency practice implementation, and nutrient management practice implementation. Ag Program staff will consider these measures in watershed implementation strategies and include priority actions that will result in a reduction in surface water and groundwater nitrate impairment over time. Such actions may include:

- Focused outreach in areas of severe nitrate impairment in surface water or groundwater to ensure clear understanding of water quality condition and requirements (of the Irrigated Ag Order);
- Coordinating with technical agencies to support effective implementation of tailwater elimination/treatment, irrigation efficiency, and nutrient management practices that will result in water quality improvement;
- Coordinating with private industry and fertilizer applicators to improve precision application and minimize fertilizer losses during application;
- Coordinating with state and local agencies to maximize compliance and use of resources available to growers;
- Referrals to technical agencies and appropriate follow-up;
- Focused inspections in areas of groundwater and surface water nitrate impairment (for compliance with the Ag Order);
- Individual and watershed monitoring to assess sources and verify compliance (with the Irrigated Ag Order);
- Requiring nutrient management strategies to ensure that fertilizers are applied to keep nutrients in the plant root zone (including nutrient budgeting), eliminate fertilizer losses to surface water, treat or capture excess nutrients, and avoid leaching to groundwater;
- Requiring fertigation controls on groundwater wells to avoid groundwater contamination;
- Progressive enforcement in areas where landowners/growers are not demonstrating progress towards addressing nitrate impairment (not complying with the Irrigated Ag Order);

Table 1. Agricultural Water Quality Priorities

Priority Problems	Priority Goals
1. Pollutants in agricultural tailwater	↓ Polluted Tailwater
2. Nitrates in groundwater from fertilizer	↓ Nitrates in groundwater
3. Surface water toxicity from pesticides	↓ Toxicity in surface water
4. Lack of aquatic habitat / habitat degradation	↑ Aquatic habitat quantity and health
5. Surface water nutrients from fertilizer	↓ Nutrients in surface water
6. Sediment Discharge	↓ Sediment discharge

Table 2. Agricultural Water Quality Operational Measures

No.	Priority Goal						Measure	Target
	1	2	3	4	5	6		
1	X	X	X	X	X	X	<p>Agricultural Sustainability</p> <p>Measure 1: Number of acres certified sustainable (e.g. CCVT-SIP, Organic), reported by watershed;</p>	Increasing Trend
2	X		X		X	X	<p>Tailwater Elimination</p> <p>Measure 2: Volume of tailwater produced by watershed;</p>	Reducing Trend
3	X		X	X	X	X	<p>Tailwater Treatment</p> <p>Measure 3A: Number of acres/Volume where tailwater is effectively captured and/or treated, reported by watershed;</p> <p>Measure 3B: Number of Regional Board requirements (inspections or enforcement actions) to implement tailwater treatment practices in areas with high volumes of tailwater and severe water quality impairment, reported by watershed;</p>	<p>3A. 80% of all acres enrolled – measured annually or 80% of volume of tailwater produced.</p> <p>3B. Increasing Trend</p>
4	X	X	X		X	X	<p>Irrigation Efficiency Practice Implementation</p> <p>Measure 4A: Number of acres effectively implementing irrigation efficiency practices, reported by watershed;</p> <p>Measure 4B: Number of Regional Board requirements (inspections or enforcement actions) to implement irrigation efficiency practices in areas with high volumes of tailwater and severe water quality impairment, reported by watershed;</p>	<p>4A. 80% of all acres enrolled – measured annually.</p> <p>4B. Increasing Trend</p>

5	X	X		X	X		<p>Nutrient Management Practice Implementation</p> <p>Measure 5A. Number of acres effectively implementing nutrient management plans including budgeting practices, reported by watershed;</p> <p>Measure 5B. Number of Regional Board requirements (inspections or enforcement actions) to implement nutrient management practices (including nutrient budgeting) in groundwater recharge areas, areas with domestic well use, and areas with severe nitrate impairment, reported by watershed.</p>	<p>5A. 80% of all acres enrolled, measured annually.</p> <p>5B. Increasing Trend</p>
6	X		X				<p>Pesticide Risk Reduction</p> <p>Measure 6A. Pounds of high risk pesticides applied by watershed.</p> <p>Measure 6B. Number of acres effectively implementing IPM practices, reported by watershed;</p> <p>Measure 6C. Number of Regional Board requirements (inspections or enforcement actions) to implement IPM practices in areas with severe toxicity, reported by watershed;</p>	<p>6A. Decreasing Trend</p> <p>6B. Increasing Trend</p> <p>6C. Increasing Trend</p>
7				X			<p>Aquatic Habitat Protection</p> <p>Measure 7. Square feet of aquatic habitat existing on agricultural lands, reported by watershed;</p>	<p>Increasing trend</p>

Addressing Nitrate Pollution Through Municipal Stormwater Permitting

Our municipal stormwater permitting program requires both source reduction and elimination of urban pollutant discharges, including nitrates. Source reduction requirements include public education and outreach regarding fertilizer and pesticide use in the urban environment and reductions in chemical use at municipal facilities. Illicit discharge detection and elimination programs, which include new ordinances prohibiting non-stormwater discharges to stormdrains, also hold potential to reduce discharges of nitrate and other urban pollutants of concern.

Addressing Surface Water Nitrate Pollution Through Total Maximum Daily Loads (TMDLs)

The numeric water quality objective identified our Basin Plan for nitrate is 10 mg/L as nitrogen. This water quality objective is protective for drinking water, but is not protective for aquatic life. Therefore, our Basin Plan also identifies narrative objectives that nitrate concentration must be controlled to support other beneficial uses. For example, the narrative biostimulatory substances objective states that substances discharged to surface waters cannot result in aquatic plant growth, e.g. algae, to the extent that these growths negatively impact beneficial uses. Excessive aquatic plant growths can negatively impact aquatic life.

Narrative objectives must be expressed numerically when we address nutrient-related pollution. Numeric interpretation of the biostimulation narrative objective can be challenging; environmental responses to nitrate loading in surface waters depend on several environmental factors, and the correct combination of these factors that is protective to water quality is not static. TMDL program staff across the state have historically experienced this challenge as they moved forward with nitrate TMDLs protective of all beneficial uses, not just municipal and domestic supply. Consequently, USEPA contracted with Tetra Tech to develop a modeling tool that staff could use to develop nutrient numeric endpoint (NNE) targets protective of aquatic life. TMDL program staff in the Central Coast Region first utilized the NNE tool to develop a TMDL nitrate target for the Chorro Creek Nutrient TMDL; the nitrate target for this TMDL is 1.5 mg/L as nitrate, and was approved by USEPA in July 2007.

The Central Coast Ambient Monitoring (CCAMP) program staff has taken the NNE tool a significant step further. CCAMP has applied the NNE model to the hundreds of nitrate sample results from across the Central Coast Region, and then compared the predicted (modeled) environmental response to the actual environmental response, as we have observed in the field. The result was a confirmation that nitrate concentration in surface waters should not be significantly above 1.0 mg/L-N to be protective of aquatic life. Consequently, the current 303d-listing effort includes listings of impairment due to nitrate concentration exceeding 1.0 mg/L-N; this is a significant departure from the historic listing threshold of 10.0 mg/L-N. In turn, the TMDL program is moving forward with these findings and actions with TMDL development addressing protection of aquatic life, which requires lower nitrate concentration relative to protection of municipal and domestic supply.

The TMDL work plan for the 2009-2010 fiscal year includes a Watershed TMDL approach in the Santa Maria watershed. A Watershed approach to TMDL development addresses all pollutant listings in a watershed, whether the pollutants and sources are related or not. The Santa Maria watershed includes 12 listings for nitrate. Staff will move forward with TMDL development in the Santa Maria watershed with nitrate targets designed to meet the narrative biostimulatory substances objective, and therefore protection of aquatic life beneficial uses. The Watershed approach implies a holistic approach to watershed management. As a part of this approach,

TMDL program staff will coordinate with non-TMDL program staff in an effort to identify and implement synergistic solutions and holistic approaches to solving nitrate and other water quality problems in surface and groundwater. Staff will take a similar approach for the seven nitrate listings in the lower Salinas River watershed.

Core Permitting Programs

The core regulatory permitting staff has been including requirements for dischargers to prepare nutrient management plans (on a site specific-point source basis) in newly adopted waste discharge requirements. One recent example, the Pajaro Valley Water Management Agency Master Water Reclamation permit, was presented to the Water Board at the December 5, 2009 meeting. Permitting staff worked closely with Ag Regulatory Program staff to develop these requirements, which hold the users of the recycled water accountable for managing the nitrate loading from the nitrogen contained in the recycled water and that which is applied as fertilizer. Permitting staff and Ag regulation staff are looking at the Pajaro master recycling nutrient management plan requirements as a possible template for the upcoming renewal of the irrigated agriculture order.

In addition, permitting staff revised the criteria and regulatory permitting mechanisms for regulation of onsite wastewater (septic) systems. The criteria clarify siting, maintenance, and operational requirements for onsite systems, and the permitting mechanism contains a waiver of waste discharge requirements. The revised criteria also require local agencies to develop onsite system management plans and memoranda of understanding with the Water Board. The onsite system management plans will outline how the local agencies will evaluate and protect groundwater quality, specifically with regard to nitrate loading, as a result of existing and proposed septic systems.

The State Water Board adopted the Recycled Water Policy on February 3, 2009. The Policy calls for the collaborative development of regional salt and nutrient management plans for each groundwater basin/sub-basin in California by February 2014. Regional Board staff is beginning to review and compile available information and coordinate with local agencies and water and wastewater purveyors in an effort to align the pending management plans with our priorities and goals. We anticipate that the salt and nutrient management plans will be the basis for staff recommendations for revised implementation plans (via Basin Plan amendments) brought before the Central Coast Water Board for consideration some time in 2015.

Core regulatory staff is coordinating with Monterey County (both the Water Resources Agency and Environmental Health Department), California Department of Public Health (CDPH), and State Board on the early stages of a Salinas Valley nitrate study called for by Senate Bill (SB) X2 1 (Perata) signed into law on September 30, 2008. The nitrate study is intended to improve the understanding of the causes and extent of nitrate contamination within the groundwater basin and evaluate remedies to address the problem. The pretense of the study is primarily related to environmental justice issues associated with nitrate-impacted groundwater supplies. Although SB X2 1 identifies the State Board and CDPH as the lead agencies on this project, Central Coast Water Board staff is taking an active role in this project to make sure it is aligned with our priorities and goals. As part of this effort we have also been evaluating potential strategies aimed at evaluating existing and potential nitrate impacts to individual domestic wells, which appear discounted if not completely overlooked in the Senate Bill in deference to small domestic water supply systems with multiple connections. We have begun dialogue with Monterey County Department of Environmental Health staff regarding a requirement for nitrate sampling of new

domestic wells and are preparing a letter for submittal to the county health officers within the Central Coast Region requesting nitrate sampling as part of the local agency permitting requirements for new domestic wells. We have also begun working with Monterey County to share domestic well and septic system permitting and location data in addition to water and sewer service area GIS data layers to identify and evaluate potential high risk nitrate areas. Unfortunately, much of Monterey County's data are not available in a usable electronic format. Consequently, we are also evaluating potential funding mechanisms to aid the County in developing an electronic filing and tracking system that will better enable to the County to manage the well and septic system programs and make this information available to us in a useful format. We anticipate expanding this effort to the other counties within our region in the future.

Consistent with nitrate being identified as a priority issue within our region and calls for an assessment of the sources of nitrate loading within the Salinas Valley pursuant to SB X2 1, core regulatory staff have begun to develop a tool to estimate salt and nitrogen loading to our groundwater basins from all of our waste discharge permitted facilities. Other programs and staff have also begun to discuss and develop tools to assess nitrate loading from other sources.

Given the complexity and cross program nature of nitrate issues within our region, we are in the process of developing a Nitrate Working Group comprised of various staff from different programs within our agency. The Nitrate Working Group will meet regularly to gather and discuss available information and coordinate on the development of cross program related nitrate policies and actions such as the ones identified above.

We have also realigned our priorities towards reviewing and providing comments on draft policies, guidelines, general permits, local ordinances, general plans, environmental documents, etc. in an effort to infuse them with our Vision and measurable goals. Core regulatory staff recently participated in or spearheaded comment letters regarding the following:

- 2008 Monterey County General Plan Update
- Proposition 84 Draft Criteria for Funding: Public Resources Code Section 75022 - small community infrastructure improvements for chemical and nitrate contaminants and Section 75025 - grants to protect or reduce contamination of groundwater that serves as a source of drinking water.
- Statewide General Permit for Landscape Irrigation Uses of Recycled Water
- 2009 California Water Plan Update
- AB 885 draft statewide regulations for onsite (septic) systems
- Comments to Cal Am's Coastal Water Project draft EIR (May 2009)

Future Actions

Watershed Protection Basin Plan Amendment Project

Watershed protection means preserving and protecting riparian areas, wetlands and other aquatic habitats, minimizing hydrological modification to maintain groundwater recharge and stream base flows, and controlling erosion and sedimentation; it means that municipalities and other entities with principle land use authority design, plan, and coordinate future development, including infrastructure, from the perspective of protecting critical watershed elements and functions over the long term. Watershed protection requires integration and incorporation of

multiple control measures that support healthy watersheds into all aspects of land use planning and development.

Through our municipal stormwater permitting program we require regulated municipalities to include strategies for conducting watershed-based planning that yield control measures beyond the site-specific or individual project scale. Watershed-based planning will include, for example, that land uses be restricted within areas close to streams to protect sensitive habitat, and in important groundwater recharge areas, and to prevent downstream hydrologic impacts, and will also include the design of infrastructure to achieve long term environmental sustainability.

Beyond our existing regulatory efforts, staff is working on a major Basin Plan amendment to protect healthy watersheds. This amendment will be one of the most complex, challenging, and important amendments the Water Board ever considers. The amendment will include the elements mentioned above, and it will have broad applicability across the entire organization and our many regulatory programs. We are currently defining the schedule for this major project, and will keep the Board updated on our progress.

Questions from Staff to Board Members

Has staff adequately described the scale and magnitude of the nitrate problem in groundwater and surface water, and how we are addressing the problem?

Has staff adequately described the scale and magnitude of the surface water toxicity problem, and how we are addressing the problem?

Is staff adequately describing its efforts to establish performance measures and track our tangible progress?

Does the Board have direction or ideas to discuss with staff to improve our performance?

Conclusion

Water Board staff continue to implement our organization's vision for Healthy Watersheds by aligning all our work to achieve specific tangible goals, and by establishing key measures to track our progress. There are almost eighty Water Board staff members working full time to protect Central Coast resources for future generations. The most telling measures of our ongoing evolution to a more performance based organization are the actions staff takes to achieve Healthy Watersheds. Increasingly, in our day to day work, we imagine a better future and how to achieve it, and take risks to try to different approaches to see what works. We recently heard the State Board organization described as having a culture of no risk and no surprises, low expectations, and little tangible results in terms of protecting resources. We want the opposite. We will continue to build a culture of risk taking and personal responsibility for achieving tangible results, and we will help State Board staff do the same. We will deal directly with the big, complex water quality issues facing our Region; we will not avoid these challenges with convenient, politically safe or popular decisions. We will meet these challenges directly, make significant tangible improvements, and hold ourselves accountable for doing so.

For reference, and to provide context for the work we are doing and the changes we are making, Attachment 1 is our staff report from the June 2008 Board meeting and is available here:

http://www.waterboards.ca.gov/centralcoast/board_info/agendas/2008/jun/item3/index.shtml