

STATE OF CALIFORNIA
REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

STAFF SUMMARY REPORT (Naomi Feger)
MEETING DATE: January 15, 2014

ITEM: 8

SUBJECT: **Overview of Nutrient Management Strategy for San Francisco Bay** – Information Item on How We Are Addressing Nutrients in the Bay and What Is Our Current Understanding of the Condition of the Bay

DISCUSSION: This item will provide an overview of the emerging issues associated with nutrients in San Francisco Bay and how we are responding to them. Naomi Feger, the chief of the Board's Planning and TMDL Division, and Dr. David Senn, Senior Scientist at the San Francisco Bay Estuary Institute, will present a synopsis of our current understanding of nutrients in the Bay and our management strategy to avoid nutrient-caused impairments, including the development of nutrient water quality objectives and implementation alternatives.

Nationally, nutrient pollution, caused by excess nitrogen and phosphorus in the air and water, is one of America's most widespread, costly, and challenging environmental problems. Too much nitrogen and phosphorus in the environment can impact surface waters. Nutrients can cause algae to grow faster than ecosystems can handle, leading to adverse impacts to water quality, food resources, and habitats and to decreases in oxygen that fish and aquatic life need to survive.

The San Francisco Bay estuary has long been recognized as nutrient-enriched but has been resilient to the effects of nutrients. In the estuary, the abundance of phytoplankton, microalgae that form an essential component of the aquatic food chain, has historically been lower than would be expected in a nutrient-enriched system due to a number of factors, including strong tidal mixing in the Bay; high Bay turbidity, which limits light penetration; and high filtration by clams. Recent analysis of data collected by the United States Geological Survey (USGS) shows an increasing trend in phytoplankton biomass and a small decline in dissolved oxygen concentrations in many areas of the estuary, especially the South Bay. These findings give us cause to be concerned about the high loading of nutrients to the Bay. While there are multiple sources of nutrient loading to the Bay, municipal wastewater treatment plants account for about 63 percent of the annual average total nitrogen load to the Bay.

U.S. EPA has been calling on states to develop nutrient water quality criteria since the late 1990s. In 2010, we began working with the State Water Board on development of numeric nutrient objectives, referred to as numeric nutrient endpoints or NNE, for San Francisco Bay. The need for nutrient objectives and a regulatory response to the observed changes in the estuary including concerns about low productivity in Suisun Bay, lead to the development of our San Francisco Bay

Nutrient Management Strategy in 2012. The strategy calls for a collaborative effort to develop the science to support regulatory management decisions. We have been working with the San Francisco Estuary Institute, the Bay Area Clean Water Agencies (municipal wastewater treatment agencies), and other stakeholders to develop our Nutrient Management Strategy.

Our strategy is based on a transparent, collaborative regional approach to develop the science to support regulatory and management decisions. The overarching objective of the strategy is to avoid nutrient-caused impairments. Key elements include synthesis of the available scientific information and development of a science plan, development of nutrient objectives, development of a monitoring program to gather the observations necessary to support modeling of the Bay ecosystem's response to nutrients, and development of implementation strategies.

It will take several years and require a significant investment of resources to generate the scientific understanding needed to fully support management decisions. The San Francisco Estuary Institute has synthesized the available science on nutrients, has developed a conceptual model of nutrient processes in the estuary and nutrient loading estimates, and is building a collaborative nutrient science program to support our strategy. Dischargers, particularly the Bay Area Clean Water Agencies and individual municipal wastewater treatment agencies, are actively involved in supporting and coordinating scientific studies, including monitoring and modeling, as well as evaluating wastewater treatment plant performance and nutrient removal technologies. Our approach acknowledges the uncertainties in the science, yet looks to identify actions we can take today as we continue to plan for the possibilities of longer term solutions.

Information on our San Francisco Bay Nutrient Management Strategy, the development of nutrient water quality objectives, and nutrients in San Francisco Bay is available on our web site at www.waterboards.ca.gov/sanfranciscobay/water_issues/programs/planningtmdls/amendments/estuaryne.shtml.

**RECOMEN-
DATION:**

This is an information item not requiring action by the Board.