

**California Regional Water Quality Control Board
Santa Ana Region**

January 21, 2011

ITEM: 11

SUBJECT: **Best Management Practices Strategic Plan for Selenium in the Newport Bay Watershed**

This will be an oral presentation.

Regional Board staff have been working with other members of the Nitrogen and Selenium Management Program Working Group to consider selenium Total Maximum Daily Loads (TMDLs), selenium site-specific objectives, and comprehensive management plans for both selenium and nitrogen in the Newport Bay watershed.

Board staff will review the Best Management Practices (BMP) Strategic Plan prepared by the Working Group and submitted in conformance with permit requirements and requirements specified in Time Schedule Orders No. R8-2009-0069 and R8-2009-0070. The Executive Summary of the Plan is attached. The Board will be asked to direct the Executive Officer to consider approval of the Plan, modified if and as necessary based on comments received from Board staff and interested parties.

A BMP Strategic Plan is expected to be a central component of the implementation plan for Total Maximum Daily Loads (TMDLs) and site-specific objectives for selenium for the Newport Bay watershed. The TMDL BMP Strategic Plan will be reviewed and revised over time, if and as necessary, and will be implemented by responsible parties upon approval by the Regional Board or the Board's Executive Officer, as the Board determines appropriate.

Time Schedule Order R8-2009-0069 BMP Strategic Plan

Newport Bay Watershed



January 1, 2011

County of Orange, Cities of Costa Mesa, Irvine, Laguna Hills, Laguna Woods,
Lake Forest, Newport Beach, Orange, Santa Ana, Tustin, the Irvine Ranch Water
District, Irvine Company and Lennar



EXECUTIVE SUMMARY

This Best Management Practice (BMP) Strategic Plan is submitted in response to Time Schedule Order (TSO) No. R8-2009-0069 and Order No. 2009-0030 (NPDES No. CAS 618030) (MS4 Permit) by the County of Orange, the Cities of Costa Mesa, Irvine, Laguna Hills, Laguna Woods, Lake Forest, Newport Beach, Orange, Santa Ana, Tustin, the Irvine Ranch Water District, Irvine Company and Lennar. The plan is the result of a multiple year process by the Nitrogen and Selenium Management Program (NSMP) Working Group to implement the NSMP Work Plan and serves as an approach for the stakeholders of the NSMP to assist in achieving nitrogen and selenium water quality objectives in the Newport Bay watershed under the TSO. The purpose and vision of the BMP Strategic Plan were developed by the parties submitting it, in collaboration with the members of the NSMP Working Group, which provided guidance for its structure and identified its objectives and content.

The Newport Bay watershed is a 152 square mile watershed in central Orange County, California. Surface waters of the Newport Bay watershed have been determined by the Santa Ana Regional Water Quality Control Board (Regional Board) to be impaired with nitrogen and selenium. Mobilization and transport of selenium from geologic formations to groundwater, and agricultural land uses and associated fertilizer use have led to elevated concentrations of nitrogen in groundwater in the Newport Bay watershed. Selenium and nitrogen are present in Newport Bay watershed surface waters primarily as a result of groundwater discharges and seepage.

In 2002, the USEPA adopted a Total Maximum Daily Load (TMDL) for selenium in the Newport Bay watershed. This TMDL used the California Toxics Rule concentration of 5 µg/L for selenium in the freshwater portions of the Newport Bay watershed, and established waste load and load allocations based on this objective.

In 2004, the Regional Board adopted Order No. R8-2004-0021 (amended in 2009 by Order No. R8-2009-0041), (the "General Dewatering Permit"), an NPDES permit specific to the Newport Bay watershed, for regulating short-term groundwater-related discharges with specific focus on nitrogen and selenium. The General Dewatering Permit provided that dischargers could meet their obligations with respect to the selenium limitations from the USEPA TMDL, by participation in the NSMP Working Group. Task 2 of the NSMP Work Plan, developed by the NSMP Working Group, includes the development and evaluation of nitrogen and selenium BMPs and treatment technologies with the ultimate goal of developing a BMP plan to meet nitrogen and selenium water quality objectives.



On December 10, 2009, the Regional Board adopted TSO No. R8-2009-0069, which provides a time schedule for compliance with the effluent limitations set forth in the General Dewatering Permit. The TSO required completion of certain activities by permittees under Order R8-2004-0021, including submission of this BMP Strategic Plan by January 1, 2011. The TSO requires that the BMP Strategic Plan identify "Early Action Tasks" to be completed within five years of TSO adoption and identify "candidate source and/or treatment controls believed important to meet operative TMDL targets," among other elements. Submission of the BMP Strategic Plan for Regional Board approval and implementation of the Early Action Tasks within the timeframes specified by the TSO and the Plan itself constitute compliance with the TSO.

In 2009, the Regional Board adopted the MS4 Permit Order No. 2009-0030 (NPDES No. CAS 618030). The MS4 Permit sets forth effluent limitations for selenium, which are derived from the EPA TMDL selenium waste load allocations set forth in MS4 Permit Section XVIII.B.4, Table 3, as well as effluent limitations for nitrogen set forth in MS4 Permit Section XVIII.D.2, Tables 10 and 11. Section XVIII.E.2 of the MS4 Permit allows for a BMP-based approach to be used to achieve the effluent limitations derived from waste load allocations set forth in the MS4 Permit. Submission of the BMP Strategic Plan for Regional Board approval and implementation of the Early Action Tasks within the timeframes specified by the TSO and the Plan itself constitute implementation of a BMP-based approach to controlling selenium and nitrogen in compliance with the currently applicable MS4 Permit selenium and nitrogen effluent limitations.

Many NSMP Work Plan tasks have affected and contributed to the development of the BMP Strategic Plan. Approval of a site-specific objective (SSO) for selenium in the Newport Bay watershed (NSMP Work Plan Task 5) may have the greatest effect on the BMP Strategic Plan. The Regional Board is currently developing a selenium TMDL for the Newport Bay watershed that will incorporate the SSO for selenium which is expected to be adopted in 2011. Upon adoption, the SSO may affect the location, quantity, and type of BMPs identified in the BMP Strategic Plan. Because the Regional Board TMDL for selenium has not yet been adopted, the BMP Strategic Plan will need to be revised to address the final requirements of the TMDL.

This BMP Strategic Plan acknowledges that BMPs to treat selenium are not yet proven technologies and that better understanding of selenium sources in the Newport Bay watershed is needed, along with information to be developed regarding cost-effective treatment technologies and the SSOs necessary to protect beneficial uses in the watershed. This BMP Strategic Plan, therefore, anticipates a phased approach that incorporates time for information to be developed as well as adaptive management principles. The BMP Strategic Plan has three phases:



Early Action Tasks, Phase I Evaluation and Optimization, and conditional Phase II – Candidate Implementation Alternatives.

The BMP Strategic Plan does not currently include a comprehensive selenium reduction strategy for Big Canyon Wash. It is envisioned that certain data gathering and characterization work for Big Canyon Wash will occur as Early Action Tasks. Based on that work, as a part of Phase I, the BMP Strategic Plan will likely be updated to include an approach to address selenium in Big Canyon Wash similar to the approach contemplated for selenium in San Diego Creek. During the Early Action Items and Phase I of the BMP Strategic Plan, field investigations, water balance investigations, and BMP testing will provide information relevant to the Big Canyon Wash sub-watershed. This information, in addition to on-going characterization work by Regional Board staff, will inform an approach that may be developed for Big Canyon Wash in subsequent iterations of this BMP Strategic Plan.

Early Action Tasks include:

- tasks that are anticipated for completion by December 2014 and focus on measurable reductions within the Newport Bay watershed and an increased understanding of groundwater/surface water interaction;
- if funding is secured, implementation of the Cienega ABMet® Treatment Facility (Cienega Facility) pursuant to the schedule, funding plan and work plan prepared by IRWD. The project is designed to remove approximately 126 pounds per year of selenium and 79,000 pounds per year of nitrogen upon initial implementation as an Early Action Task. Depending upon implementation of Phase 1 Cienega optimization activities, an additional 125 pounds of selenium per year or more may be achieved, depending on the scope of the Phase I activities;
- further characterization of Big Canyon Wash selenium levels and sources;
- assessment of the water balance relating to groundwater in the Newport Bay watershed and an evaluation of the interactions between groundwater and surface water; and
- effectiveness monitoring for the Cienega Facility;

Phase I Tasks include:

- projects that will commence after Office of Administrative Law adoption of the Regional Board revised Selenium TMDL and be completed over a period of seven (7) years;
- an evaluation of the feasibility of diversion of surface waters to the sanitary sewer system and identification of candidate locations;
- strategy development for the Big Canyon Wash sub-watershed;



- if funding is secured, a groundwater pump/capture and treatment system to augment the Cienega Facility; and
- Adaptive management revisions to further refine Phase II candidate implementation alternatives.

Phase II, if implemented, is envisioned to include candidate implementation alternatives for BMPs and controls identified in Phase I. Phase II activities will be dependent upon the results of Phase I and other conditions, but are anticipated to include one of three alternatives for full-scale implementation in the Newport Bay watershed. Phase II candidate alternatives are presented in this BMP Strategic Plan both for the California Toxics Rule (CTR) selenium criterion of 5 ppb (i.e., based upon the USEPA TMDL) and for the water column selenium target calculated from the SSO and the Regional Board TMDL, which are currently in development. If implemented, Phase II activities are anticipated to last eight (8) years.

The cost to implement the Cienega Facility (Early Action Task 1) is anticipated to be up to \$22 million. The range of costs for implementing the remaining Early Action Tasks is currently estimated to be approximately \$183,232 - \$203,232. The range of costs to implement Phase I tasks is approximately \$132,000 - \$4,015,900. The range of costs for implementing Phase II of the BMP Strategic Plan are preliminary and for informational purposes only. These costs will be revised following evaluation of selenium concentrations in the Newport Bay watershed after Cienega Facility implementation, following Phase I evaluations of technology effectiveness, and depending upon the applicable regulatory requirements at the time. Phase II implementation is also dependent upon the availability of funding and resources.

At this time, it is unknown whether the Phase I and II activities will need to be implemented, whether they are economically justified, whether funding will be available and/or whether the regulatory framework at the time would require that they be implemented. The revised selenium TMDL for Newport Bay watershed is still in draft form and has many unresolved issues. As such nothing in this BMP Strategic Plan should be interpreted as a commitment to fund and implement any of the Phase I and II measures described here, and all such measures remain subject to agreement, funding and revision.