

Principles and Procedures of the Seaside Basin Monitoring and Management Plan

Introduction

This document sets forth the criteria that will guide the Watermaster in creating the Seaside Basin Monitoring and Management Plan. It also establishes a procedure for dealing with seawater intrusion, should the same occur, during the time the Watermaster is developing its plan of action to deal with such an eventuality.

Plan Criteria

Within sixty days of entry of the Judgment by the Court, the Watermaster will submit for the Court's approval a Monitoring and Management Plan containing details for implementation of the following actions:

- a. *Exploratory borehole drilling program.* About four exploratory boreholes shall be drilled along the shoreline and the northern boundary of the Basin to depths ranging from 500 to 1500 feet, the depth being controlled by the depth of the Monterey formations. Lithologic samples shall be collected and classified for every one foot of drilling. A full suite of geophysical logs shall be collected. The data collected as part of this program shall be compared to other well data in the Seaside Basin to further refine the hydrogeologic conceptual model in the areas between the production wells and saline groundwater.
- b. *Geophysical surveys.* Geophysical surveys shall be performed along the shoreline and the northern boundary of the Basin, intersecting the test borehole locations. The results of the geophysical surveys shall be calibrated against the test borehole data. The borehole data and the surveys shall be analyzed to characterize the near shore hydrology and to locate and design new monitoring wells.
- c. *New monitoring wells.* About four to six monitoring well clusters shall be drilled and installed along the shoreline and the northern boundary of the Basin. Each cluster shall consist of at least four to five wells to provide a detailed vertical characterization of head and water quality through the aquifer system. The Watermaster shall coordinate the placement of the wells with MPWMD, which already has some monitoring wells in place with plans to drill more, to avoid duplication of effort and cost inefficiencies.

- d. *Design and implementation of a piezometric and water quality monitoring program.* Pressure transducers and ionic probes (EC and Cl) shall be installed in each well at each cluster. These probes will record water levels and water quality on a frequent interval (every 15 minutes for water levels, and every day for water quality). Where possible, similar probes will be installed in the pumping wells to record water levels and on/off cycles. Grab samples will be obtained periodically to true up the ionic probes. These data will be analyzed to assess the state of seawater intrusion, reveal groundwater barriers within the aquifer system, and more accurately estimate aquifer system parameters.
- e. *Development and implementation of a management program.* The objectives of the management program will be to optimize pumping, halt seawater intrusion, and return the Basin to equilibrium through implementation of conservation methods; replacement of water drawdown by substitution of reclaimed water, where appropriate; infusion of imported water into the aquifer; and utilization of controlled pumping schedules through analysis of real-time monitoring.

The management program will include periodic review of monitoring information and the use of this review to guide near-term and long-term groundwater pumping. If seawater is detected by the MPWMD monitoring wells currently in place, or by pumping wells, or by the monitoring well system contemplated by this document, the Watermaster shall follow the procedures developed pursuant to the mandate of the following paragraph. If it is detected before such procedures are in place, the Watermaster shall follow the procedure set forth in the *Interim Contingency Procedure to Contain Seawater Intrusion*, infra.

Within one year after entry of the Judgment by the Court, the Watermaster will: (a) develop improved estimates of the natural and secondary recharge within the Seaside Basin; (b) develop and implement a program for collecting groundwater production, water use, and land use data for the Seaside Basin and appropriate adjacent areas; (c) develop a suitable groundwater model of the Seaside Basin and appropriate adjacent areas; (d) develop a plan of action to be implemented to avoid various adverse effects in the Basin, including seawater intrusion; and (e) develop a plan of action to contain seawater intrusion, should it occur. The plan of action to avoid adverse effects in the Basin shall include a timeline for the importation of Non-Native water for spreading or injection into the Basin, and for acquisition of recycled water in lieu of Native Water production, and shall outline concrete steps to be taken to secure both Non-Native Water and recycled water.

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Interim Contingency Procedure to Contain Seawater Intrusion

If Seawater intrusion is detected in the Basin during the development of the Watermaster's Management Plan, the following contingency plan will be set in motion to prevent seawater from contaminating larger portions of the Basin:

- a. *Detection in a coastal monitoring well.* If seawater intrusion is detected in a coastal monitoring well, it is imperative that pumping stresses be reduced so that seawater is not pulled inland to producing wells. To accomplish this, all wells that produce from the intruded aquifer that are within one-half mile of the affected monitoring well will reduce their production to the equivalent of one-half their previous five-year pumping average. Monitoring of groundwater levels within the one-half mile radius of the affected well will be increased to determine if groundwater gradients following reductions in pumping have been modified sufficiently to prevent further seawater intrusion. This increase in monitoring effort will include installing at least one new monitoring well as a sentinel between the affected monitoring well and the nearest down-gradient active production well. After six months of reduced pumping, the threat of further seawater intrusion will be re-evaluated. If there continues to be a groundwater gradient that would pull the detected seawater toward producing wells, the pumping wells within one-half mile of the affected monitoring well will further reduce pumping to one-third of their previous five-year pumping average. After another six months of monitoring, the direction of groundwater gradients will again be evaluated. If there continues to be a groundwater gradient that would pull the detected seawater towards producing wells, then the wells with reduced pumping will discontinue pumping. If, after the initial discovery of intrusion, seawater is encountered in an additional monitoring well, pumping reductions will be required for nearby producing wells in the same manner as for the first intruded monitoring well.
- b. *Detection in a production well.* If seawater intrusion is encountered in a production well, that well will discontinue pumping. In addition, all wells that produce from the intruded aquifer that are within one-half mile of the affected well will reduce their production to the equivalent of one-half of their previous five-year pumping average. The sequence of threat evaluation, subsequent pumping reductions, and installation of new monitoring wells will be the same as for that in subparagraph a.

If the implementation of the procedures set forth above causes a production well to reduce its pumping or to cease pumping altogether, all reasonable efforts must be undertaken by the Watermaster to insure that lost production will be replaced by redistributing pumping, further conservation efforts on the part of all parties, or provision of replacement water from other sources.