MUNICIPAL WATER DISTRICT OF ORANGE COUNTY

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April 5, 2012 VIA EMAIL

State Water Resources Control Board
Ocean Unit, Division of Water Quality
Attn: Ms Joanna Jensen
1001 I Street, 15th Floor
Sacramento, CA 95814

Comment Letter – Desalination Facilities and Brine Disposal
CEQA Public Scoping - Proposed Amendments to the Ocean Plan

The Municipal Water District of Orange County (MWDOC) appreciates this opportunity to provide comments on the March 2012 "Notice of California Environmental Quality Act (CEQA) Public Scoping Meeting for Amendments to the Water Quality Control Plans for Ocean Waters and Enclosed Bays and Estuaries to Address Desalination Facilities and Brine Disposal".

Background

MWDOC is the third largest member agency of the Metropolitan Water District of Southern California and wholesales on average nearly 200,000 acre-feet per year of imported water to 28 retail water providers in Orange County. MWDOC provides regional water supply management planning encompassing water use efficiency programs, water emergency response organization management, water supply reliability planning, and facilitates development of regional and sub-regional water supply projects.

In Orange County, water agencies have been leaders in water use efficiency programs; groundwater protection, development and management; water reclamation/reuse research and recycling projects; impaired and brackish groundwater recovery; water supply reliability and integrated planning; and return flow water quality management and treatment.

Over the past several years, MWDOC has been managing and directing the South Orange Coastal Ocean Desalination (SOCOD) Project feasibility investigation and project development work with five participating agencies – South Coast Water District, Moulton Niguel Water District, Laguna Beach County Water District, City of San Clemente and the City of San Juan Capistrano.

Since 2004, the SOCOD Project (formerly Dana Point Ocean Desalination Project) has been investigating the feasibility of a subsurface Test Slant Well

beach intake to produce feedwater supply for the project. We are currently in our Phase 3 Extended Pumping and Pilot Plant Test.

This feasibility work also includes development of a surface water and groundwater flow model for the San Juan Creek Watershed in coordination with the San Juan Basin Authority groundwater management planning work. A more focused groundwater and solute transport model will also be developed for the offshore marine aquifer and coastal seasonal lagoon area situated at the mouth of the channelized San Juan Creek to assess project capacity and drawdown impacts on the seasonal lagoon and upstream brackish groundwater recovery projects.

For brine disposal, the SOCOD Project intends to co-dispose the concentrated ocean water brine with municipal wastewater through the San Juan Creek Ocean Outfall, a facility owned and operated by the South Orange County Wastewater Authority.

The ocean desalination feasibility investigation will be concluded this fall with submittal of draft/final reports to the grant agencies (CDWR, USEPA and USBR).

Foundational Ocean Plan Amendment Documents

The subject notice provides information of "Document Availability" and "Submission of CEQA Scoping Comments". Documents which were available for our review were:

- Notice and Informational Document (March 2012),
- Brine Management Expert Panel Workshop documents (December 8/9, 2012)
- Impingement and Entrainment (IM&E) Expert Panel Final Report (March 14, 2012).

Documents that have not yet been released are the Final Report from the Brine Management Expert Panel and the Granite Canyon Laboratory Salinity Toxicity Study. These two reports will form the basis for the brine disposal amendment provisions.

Without these two reports, we are unable to provide specific CEQA scoping comments because we don't know what the Brine Disposal Expert Panel and Granite Canyon Toxicity Study will recommend for brine disposal and salinity toxicity, respectively. Due to the unavailability of this critical information, MWDOC requests that the State Water Board provide an additional opportunity to identify CEQA scoping alternatives when the final reports become available and before the issuance of the DSED by the State Water Board.

Scoping Comments

We provide comments to address the potential range of actions, alternatives, mitigation measures and potential significant environmental effects that should be analyzed in the Draft Substitute Environmental Document for intakes and brine disposal.

Recognize the Emerging Role of Ocean Desalination in Improving Water Supply Reliability. Water Code section 13241 requires assessment of specified factors when adopting a (narrative) water quality objective (salinity) as proposed for this Amendment. The specified factors include future beneficial uses of water, water quality conditions, economic considerations and the implicit need for development of new, reliable water supply sources for California.

Continuing advancements and development of desalination technology provides increased opportunities to improve local water supply reliability. Work has been ongoing for several years in the development of feasible brackish and ocean water desalination supply projects. These efforts have been gaining recognition over the past several years in statewide, regional and local agency planning documents. These include the State Desalination Task Force report, the California State Water Plan, the Metropolitan Water District of Southern California's Integrated Resources Plan, and in sub-regional plans for our service area (2010 MWDOC Urban Water Management Plan and the 2004 MWDOC South Orange County Water Reliability Study, Phase 2 System Reliability Plan).

Avoid Overly Restrictive Regulation. In considering the selection of the preferred alternative/implementation provisions for intakes and brine disposal the Ocean Plan Amendment needs to recognize that overly stringent regulations can result in excessive costs to ocean desalination with the possibility of only gaining small incremental environmental benefit. Care should be taken to avoid overly restrictive regulations as they may inadvertently make this drought proof, local potable supply option cost-prohibitive. Similarly, the selected alternative should allow for flexibility in implementation, in recognition of the site-specific factors that may need to be considered in development of designs for desalination facilities.

The environmental evaluation needs to account not only for the direct impacts but also for the indirect or offsetting impacts by the development of ocean desalination projects. For example, offsetting impacts can be an equal reduction in imported water supply plus the improved local supply reliability benefit provided by ocean desalination under an extreme drought or emergency supply outage of the imported delivery system. These benefits include not only public health and welfare protections but also the economic value of having a more reliable water supply.

Ocean Water Intakes. The type of intake that can be used for withdrawing ocean water is site specific and is dependent on the necessary size of the ocean desalination project. There are various types of conventional open, modified and screened intake systems that have been used worldwide. Their impact on the ocean environment is a function of the local site, intake depth and measures employed to control and/or mitigate impacts.

Subsurface intakes methods may include seabed infiltration galleries and various types of wells that draw ocean water from the overlying ocean indirectly through sands/gravels. These methods may have capacity limitations due to site hydrogeology, ocean floor conditions, and other factors, and usually will require significant investigation to determine their feasibility and impacts.

The SOCOD Project has been conducting a phased investigation into the feasibility of using slant beach wells to provide a cost-effective means to produce filtered ocean water and to avoid marine impacts. We investigated several types of intakes options for this site and decided in 2004 to explore the use of a subsurface well type system.

A Phase 1 hydrogeology investigation was conducted in 2004/05 with onshore boreholes and monitoring well completions. Promising hydrogeology led to our Phase 2 investigation with design and construction of the first of its kind, a fully buried 350-foot Test Slant Well which is located on Doheny State Beach. This well extends at an angle of 23 degrees from horizontal 250 feet out under the ocean into a productive alluvial formation.

At the March 8, 2012 Moss Landing IM&E Expert Panel Workshop, I provided to you for your information and for inclusion into this record our Phase 1 and 2 reports (CDs) on hydrogeology, slant well design, aquifer pumping test and preliminary groundwater modeling analysis.

Since June 2010 we have been conducting our Phase 3 Extended Pumping and Pilot Plant Test and plan to conclude the actual testing work in early May 2012. Data analysis and report preparation would follow. Our current schedule calls for the completion of the Phase 3 draft reports this fall; we would then submit those reports for your information and for inclusion into the record. The Phase 2 and 3 work has been funded through local funds and grants from CDWR, USEPA and USBR.

All intake systems will have various levels and types of impacts. Employing a subsurface slant wellfield for feedwater supply for the SOCOD Project would avoid marine impacts. A study was conducted as part of the California Fish and Game Commission Marine Life Protection Act process that provided the analysis that showed that the SOCOD Project would result in no impingement or entrainment of marine organisms on the ocean floor. This report was previously emailed to you on March 5, 2012 along with other project information for your information and for inclusion into this record.

As part of our investigation work, we are developing a comprehensive surface water and groundwater model to evaluate drawdown impacts and mitigation approaches from the full scale wellfield on upstream groundwater recovery desalter wells and on San Juan Creek and its seasonal coastal lagoon.

Preliminary groundwater modeling work conducted in 2007 indicated a potential yield of 30 mgd from a slant wellfield (3 clusters of 3 wells each with 7 operating and 2 on rotational standby service) constructed across the alluvial channel with about 95% (28.5 mgd) of the water produced from ocean sources and 5% (about 1.5 mgd) from the upstream brackish San Juan Creek source, which is less than the historical subsurface discharge from the aquifer to the ocean.

The use of the slant beach wellfield across the San Juan Creek alluvial channel would also help minimize seawater intrusion control because the wellfield pumping would create a pumping depression which would help to minimize inland seawater intrusion, especially during prolonged

droughts. This incidental benefit was shown in the initial groundwater modeling work and would be further evaluated with the more detailed coastal area groundwater model that is under development.

We expect that the drawdown impacts can be reasonably mitigated. The DSED should recognize that slant wells avoid impingement and entrainment impacts but may cause inland drawdown impacts that may require mitigation. The level of drawdown impact is not yet well known and requires completion of our more focused coastal groundwater model that will be developed over the summer.

As part of the planning work for the SOCOD Project, we have identified potential integrated water management opportunities that would be afforded by the planned ocean desalination facility and the existing groundwater recovery desalter facilities. These opportunities include the potential for reuse of groundwater desalter brines by the ocean desalination project as a feedwater supply and use of treated brackish groundwater for post-treatment stabilization of the ocean desalination product water. In this case, the ocean desalination project would allow better recovery of water and lower overall costs for both the groundwater desalters and the ocean desalination project.

On balance we believe the slant well approach can provide a cost-effective technology for smaller, sub-regional coastal ocean desalination projects and that it can provide additional integrated resource management benefits as noted.

In summary, the ocean plan should recognize the value in using marine aquifer extensions of coastal aquifers as a means to avoid impingement and entrainment impacts but also recognize that upstream drawdown impacts can occur that may require mitigation.

Considering all intake alternatives and based on the presentations provided by the Expert Panel on IM&E held in Moss Landing, the DSED should include an evaluation of the costs/benefits and burdens of the various intake systems, including screen choices as well as subsurface intakes, and the differences between screened intakes in differing benthic environments (e.g. sandy bottom vs rocky bottom).

Brine Disposal. We attended the brine management expert panel workshop at SCCWRP on December 8/9, 2011. Under contract to MWDOC, Dr. Susan Paulsen presented an overview of brine disposal and modeling technology.

The SOCOD Project plans to co-dispose its brine stream directly through the San Juan Creek Ocean Outfall. Co-disposal with municipal wastewater is both a cost-effective and low-impact approach and it offers several advantages where mixing capacity is available. This approach reduces public costs by making greater use of existing underutilized outfall capacity which avoids the need for construction of new infrastructure.

The environmental benefits of co-disposal include minimizing ocean construction work, reducing whole effluent toxicity due to salinity, increasing the pH of the municipal wastewater stream, and reducing the combined concentrations of conventional and trace pollutants. In some cases on-site flow equalization storage may be required to match discharges with the diurnal wastewater flows. The Ocean Plan Amendment should include provisions that support this method of co-disposal.

Co-disposal may require modifications of the ocean outfall diffusers to optimize initial dilution (e.g. to angle ports or to modify port openings). The Ocean Plan Amendment should consider such modifications, which would be determined on a site-specific basis, as part of the technology required for co-disposal.

The regulations and point of compliance needs to consider that the combined wastewater stream would not be as buoyant as a municipal wastewater outfall discharge, and thus some change in the shape and size of the zone of initial dilution may result and should be allowed, provided the resulting plume is still protective of the beneficial uses of the ocean.

Summary

We are requesting that the State Water Board to include the provided information and evaluation of the above comments in the Draft SED.

Thank you for the opportunity to provide comments for this scoping step. I would be pleased to provide further clarification, provide additional information, or answer any questions. I may be contacted at (714) 593-5003 or by email at rbell@mwdoc.com.

Sincerely,

Richard B. Bell, PE
Principal Engineer/Project Manager

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