Optimum Basin Management Program

Status Report 2008-1: January to June 2008

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Introduction

This status report covers the period January 1, 2008 through June 30, 2008. The bulk of this report describes the activities that occurred and status of the work conducted for each program element of the Optimum Basin Management Program (OBMP). However, there are additional significant efforts that occurred during the reporting period, which are listed below.

In compliance with the Superior Court's "Order Concerning Motion for Approval of Peace II Documents," dated December 21, 2007, Conditions Subsequent Numbers 1-6 were filed with the Court as follows:

- Condition Subsequent 1, a brief to explain the amendments to Judgment Paragraph 8 and Judgment Exhibit "G," was filed on February 1, 2008.
- Condition Subsequent 2, a corrected initial schedule to replace Resolution No. 07-05 Attachment "E," together with an explanation of the corrections made, was filed on February 1, 2008.
- Condition Subsequent 3, a new Hydraulic Control technical report that addressed all factors included in the Special Referee's Final Report and Recommendations (including a technical analysis of the projected decline in safe yield, and a definition and analysis of "new equilibrium" issues), was filed on March 3, 2008.
- Condition Subsequent 4, the status of CEQA documentation, compliance, and requirements, and assurances to the Court that Watermaster's approval and participation in any project that is a "project" for CEQA purposes has been or will be subject to all appropriate CEQA review, was filed on April 1, 2008.
- Condition Subsequent 5, a detailed outline of the scope and content of its first Recharge Master Plan update, was filed on June 30, 2008.
- Condition Subsequent 6, the development of standards and criteria by which the RWQCB will determine that hydraulic control is achieved and maintained, was filed on June 30, 2008.

In addition, the following court hearings and orders occurred during the reporting period:

- January 10, 2008: Notice of Change of Firm Name [from Hatch & Parent to Brownstein Hyatt Farber Schreck].
- February 14, 2008: Stipulation to Continue Defendant City of Chino's Motion Under Paragraph 15.
- April 11, 2008: Response to Watermaster's Compliance with Conditions Subsequent Numbers Three and Four of the Court's December 21, 2007 Order; Request for Additional Time to Evaluate Watermaster's Compliance with Condition Subsequent Number Three; and Withdrawal of Monte Vista Water District's Joinder to Watermaster's Motion for Approval of Peace II Documents; AND Declaration of Mark Kinsey; AND Motion Requesting Approval of Intervention of the Riboli Family/San Antonio Winery and Fuji Natural Foods, Inc.
- April 17, 2008: Comments of Special Referee on Watermaster Compliance with December 21, 2007 Order Conditions 1 through 4.
- April 25, 2008: Watermaster's Response to Comments of Special Referee on Watermaster Compliance with December 21, 2007 Order Conditions 1 through 4.
- April 29, 2008: Cucamonga Valley Water District's Joinder to Watermaster's Response to Comments of Special Referee on Watermaster Compliance with December 21, 2007 Order Conditions 1 through 4.
- May 2, 2008: Joint Response of Western Municipal Water District and Inland Empire Utilities Agency and Joinder to Chino Basin Watermaster's Response to Watermaster Compliance with December 21, 2007 Order Conditions 1 through 4; AND Declaration of Tom Dodson in Support of Joint Response of Western Municipal Water District and Inland Empire Utilities Agency and Joinder to Chino Basin Watermaster's Response to Watermaster Compliance with December 21, 2007 Order Conditions 1 through 4.
- June 30, 2008: Cucamonga Valley Water District's Notice of Motion and Motion to Discontinue the Appointment of the Special Referee.

Program Element 1: Develop and Implement a Comprehensive Monitoring Program

Groundwater Level Monitoring

Watermaster has three active groundwater level monitoring programs operating in the Chino Basin: 1) A semiannual basin-wide well monitoring program, 2) A key well monitoring program associated with the Chino I/II Desalter Well Fields and the Hydraulic Control Monitoring Program (HCMP), and 3) A piezometric monitoring program associated with land subsidence and ground fissuring in Management Zone 1 (MZ-1). The frequency of groundwater level monitoring varies with each program, depending on the needs of the data analyst. These groundwater level monitoring programs also rely on municipal producers, other government agencies, and private entities to supply their groundwater level measurements on a cooperative basis. Watermaster digitizes all these measurements and combines them into a relational database for general usage. During this period, Watermaster purchased and installed pressure transducers/data loggers at key wells; principally in the northern portions of Chino Basin where more detailed groundwater level data are needed.

Groundwater Quality Monitoring

During this reporting period no additional private wells were sampled. (All of the key wells were sampled during the previous reporting period.) Watermaster continued a comprehensive data collection program whereby water quality data from other sources are routinely collected, QA/QC'd, and loaded into Watermaster's database. These sources include the appropriators, DTSC, RWQCB, USGS, the Counties, and other cooperators.

Watermaster and the Inland Empire Utilities Agency (IEUA) are working closely with the Appropriative Pool members and their state-certified laboratories to obtain water quality data as an electronic data deliverable (EDD), which can be entered directly into Watermaster's relational database.

Groundwater-Production Monitoring

All active wells (except for minimum user wells) are now metered. Watermaster reads the agricultural production data from the meters on a quarterly basis and enters these data into Watermaster's relational database.

Surface Water Monitoring

Water Quality and Quantity in Recharge Basins. Watermaster measures the quantity and quality of storm and supplemental water entering the recharge basins. Pressure transducers or staff gauges are used to measure water levels during recharge operations. In addition to these quantity measurements, imported water quality values for State Water Project water are obtained from the Metropolitan Water District of Southern California (MWDSC) and recycled water quality values for the RP-1 and RP-4 treatment plant effluents are obtained from IEUA. Watermaster monitors the storm water quality in the eight major channels (San Antonio, West Cucamonga, Cucamonga, Deer Creek, Day Creek, San Sevaine, West Fontana, and DeClez) usually after each major storm event. Combining the measured flow data with the respective water qualities enables the calculation of the blended water quality in each recharge basin, the "new yield" to the Chino Basin, and the adequate dilution of recycled water.

Surface Water Monitoring in Santa Ana River (SAR). Watermaster measures the discharge of the river and selected water quality parameters to determine those reaches of the SAR that are gaining flow from Chino Basin and/or, conversely, those reaches that are losing flow into the Chino Basin. These bi-weekly flow and water quality measurements are combined with discharge data from permanent USGS and Orange County Water District (OCWD) stream gauges and discharge data from publicly owned treatment works (POTWs). These data are used along with groundwater modeling to assess the extent of hydraulic control.

HCMP Annual Report

In January 2004, the RWQCB amended the Water Quality Control Plan (Basin Plan) for the Santa Ana River Basin to incorporate an updated total dissolved solids (TDS) and nitrogen (N) management plan. The Basin Plan Amendment includes both "antidegradation" and "maximum benefit" objectives for TDS and nitrate-nitrogen for the Chino and Cucamonga groundwater management zones. The application of the "maximum benefit" objectives relies on Watermaster and IEUA's implementation of a specific program of projects and requirements, which are an integral part of the OBMP. On April 15, 2005, the RWQCB adopted resolution R8-2005-0064; thus approving the Surface Water

Monitoring Program and Groundwater Monitoring Program in support of maximum benefit commitments in the Chino and Cucamonga Basins.

Pursuant to the Basin Plan Amendment and the Watermaster/IEUA permit to recharge recycled water, Watermaster and IEUA have conducted groundwater and surface water monitoring programs. During this reporting period Watermaster measured 711 manual water levels at private wells throughout the Chino Basin, conducted two quarterly downloads at the 130 wells containing pressure transducers, and collected 70 groundwater quality samples, and 221 surface water quality samples. Quarterly Surface Water Monitoring Program reports that summarize data collection efforts were submitted to the RWQCB in January and April of 2008. An annual HCMP report for 2007 was submitted to the RWQCB in April 2008.

Chino Basin Groundwater Recharge Program

IEUA, Watermaster, Chino Basin Water Conservation District, and the San Bernardino County Flood Control District jointly sponsor the Chino Basin Groundwater Recharge Program. This is a comprehensive water supply program to enhance water supply reliability and improve the groundwater quality in local drinking water wells throughout the Chino Groundwater Basin by increasing the recharge of storm water, imported water, and recycled water. The recharge program is regulated under RWQCB Order No. R8-2007-0039 and Monitoring and Reporting Program No. R8-2007-0039.

Recharge Activities. On-going recycled water recharge occurred in the Hickory Basin during this reporting period, and a six month recycled water test recharge program concluded at the 7th and 8th Street basins in early 2008.

Monitoring Activities. Watermaster and IEUA collect weekly and bi-weekly water quality samples from basins that are actively recharging recycled water and from lysimeters installed within those basins. During this reporting period, approximately 218 basin and lysimeter samples were collected. Monitoring wells located downgradient of the recharge basins were sampled every two weeks during the reporting period for a total of about 62 samples.

Construction Activities. Lysimeters and monitoring wells associated with the 7th and 8th Street Basins were installed in the first half of fiscal year (FY) 2007/08. There have been no further construction activities since that time.

Reporting. Watermaster and IEUA completed the following required reports concerning the recharge program during the reporting period:

- 4Q07 Quarterly Report, submitted to the RWQCB – February 2008
- 1Q08 Quarterly Report, submitted to the RWQCB – May 2008
- 2007 Annual Report, submitted to the RWQCB – May 2008
- Brooks Basin Tracer Test Protocols Using Recycling Water, submitted to CDPH – June 2008

Land Surface Monitoring

Watermaster developed a multifaceted land surface monitoring program to develop data for a long-term management plan for land subsidence in Management Zone 1 (MZ-1). The monitoring program consisted of three main elements:

- An aquifer system monitoring facility consisting of multiple depth piezometers and a dual bore extensometer.
- The application of synthetic aperture radar interferometry (InSAR) to measure historical land surface deformation.
- Benchmark surveys to measure land surface deformation, "ground truth" the InSAR data, and evaluate effectiveness of the long term management plan.

In February 2006, Watermaster submitted the MZ-1 Summary Report, which contained Guidance Criteria to minimize subsidence and fissuring. The Guidance Criteria included a listing of Managed Wells and their owners subject to the criteria, a map of the so-called Managed Area, an initial threshold water level (Guidance Level) of 245 feet below the top of the PA-7 well casing, and a plan for ongoing monitoring and notification. The MZ-1 Summary Report and the Guidance Criteria were adopted by the Watermaster Board in May 2006. The Guidance Criteria formed the basis for the MZ-1 Plan, which was approved by Watermaster in October 2007. The Court approved the MZ-1 Plan in November 2007 and ordered its implementation.

During this reporting period, Watermaster began implementation of the MZ-1 Plan, which includes:

- Continuing the scope and frequency of monitoring that was implemented during the IMP within the Managed Area.
- Expanded monitoring of the aquifer system and land subsidence in other areas of MZ-1 and Chino Basin where the IMP indicated concern for future subsidence and ground fissuring.
- Detailed monitoring of horizontal strain across the historical fissure zone.
- Further evaluation of the potential contribution of pumping in the central and northern portions of MZ-1 on groundwater conditions in the central and southern portions of MZ-1.
- Additional testing and monitoring to refine the Guidance Criteria.
- Development of alternative pumping plans for the MZ-1 producers that are impacted by the MZ-1 Plan.
- Construction and testing of a lower-cost extensometer facility at Ayala Park.
- Evaluation and comparison of ground-level surveying and InSAR, and recommendation for future monitoring by both techniques.
- An ASR (aquifer injection and recovery) feasibility study at a production well owned by the City of Chino Hills within the Managed Area.

The continued and expanded monitoring elements of the MZ-1 Plan (first and second bullets above) are currently being implemented. The scopes of work and cost estimates for the remaining elements of the plan (last seven bullets) were developed by the MZ-1 Technical Committee during this reporting period and recommended for implementation in 2008 and beyond. These recommendations and supporting documentation were forwarded to Watermaster and were approved and included in the FY 2008/09 budget.

In June 2008, the City of Chino Hills was awarded grant funding from DWR's Local Groundwater Assistance Fund for $214,000 for the ASR feasibility study (last bullet above). This grant funding could be raised to $250,000 by the DWR. Watermaster composed the grant application, and the grant funds will offset Watermaster's expenditures for the ASR feasibility study.

Program Element 2: Develop and Implement a Comprehensive Recharge Program

Construction on the Chino Basin Facilities Improvement Project (CBFIP) Phase I was completed by December 31, 2005 at a cost of $38M; 50-percent from a SWRCB Proposition 13 Grant, and 25-percent each from Watermaster and IEUA. A CBFIP Phase II list of projects was developed by Watermaster and IEUA, including monitoring wells, lysimeters, recycled water connections, SCADA system expansions, three MWDSC turnouts, and berm heightening and hardening. At a cost of approximately $10.5M, these Phase II facilities will be financed through a 50-percent Grant from DWR and 25-percent each from Watermaster and IEUA.

In FY 2005/06, the CBFIP Phase I facilities were able to recharge approximately 49,000 AF of storm and supplemental water. With the completion of the Phase II facilities by December 31, 2008, the total recharge capacity will be about 96,000 AF. By the start of FY 2009/10, most of the basins will be able to operate on a 12 months-per-year basis with combinations of storm, imported, and recycled water, with occasional downtime for silt and organic growth removal. Operations and basin planning are coordinated through the Groundwater Recharge Coordinating Committee (GRCC), which met quarterly during this reporting period.

Because of the drought and Delta water quality, water supply, and environmental issues, MWDSC has been unable to provide replenishment water to southern California since May 1, 2007. This greatly restricts Watermaster's ability to recharge recycled water, since the California Department of Public Health requires that one part of diluent water (imported or storm water) be blended with each part of recycled water. For this reporting period, just under 8,500 AF of storm and recycled water have been recharged.

Preparation of the Recharge Master Plan update in underway, in satisfaction of Condition Subsequent No. 5. On March 28, 2008, the initial meeting of the group occurred. A detailed outline of the scope and content of the Recharge Master Plan update was filed with the Court for approval on June 30, 2008. Progress reports on the completion of the updated plan are to be submitted on January 1, 2009 and July 1, 2009, with the final updated Recharge Master Plan due to the Court by July 1, 2010. The Recharge Master Plan update will be the primary focus of the upcoming Strategic Planning Conference, to be held in late September 2008.

Program Element 3: Develop and Implement Water Supply Plan for the Impaired Areas of the Basin; and

Program Element 5: Develop and Implement Regional Supplemental Water Program

Construction of the Chino I Desalter Expansion and the Chino II Desalter facilities was completed in February 2006. As currently configured, the Chino I Desalter provides 2.6 MGD of treated (air stripping for VOC removal) water from Wells Nos. 1-4, 4.9 MGD of treated (ion exchange for nitrate removal) water from Well Nos. 5-15, and 6.7 MGD of treated (reverse osmosis for nitrate and TDS removal) water from Wells Nos. 5-15 for a total of 14.2 MGD (15,900 AFY). The Chino II Desalter provides 4.0 MGD of ion exchange treated water and 6.0 MGD of reverse osmosis treated water from eight additional wells for a total of 10.0 MGD (11,200 AFY).

Negotiations are currently underway between the Chino Desalter Authority and Western Municipal Water District to allow WMWD to join the CDA and to expand the Chino II Desalter by 10.5 MGD (11,800 AFY). Raw water will be drawn from existing CDA II wells, and possible additional new wells if needed. In addition, a new Chino Creek Well Field, required for hydraulic control, will provide additional raw water to the Chino I Desalter, enabling existing Well Nos. 13, 14, and 15 to shift production to the expanded Chino II Desalter facility if needed.

Program Element 4: Develop and Implement a Comprehensive Groundwater Management Plan for Management Zone 1 and Management Zone 3

MZ-1 Management Plan

Because of the historical occurrence of pumping-induced land subsidence and ground fissuring in southwestern Chino Basin (southern MZ-1), the OBMP called for the development and implementation of an interim management plan for MZ-1 that would:

- Minimize subsidence and fissuring in the short-term,
- Collect information necessary to understand the extent, rate, and mechanisms of subsidence and fissuring, and
- Formulate a management plan to reduce to tolerable levels or abate future subsidence and fissuring.

From 2001-2005, Watermaster developed, coordinated, and conducted an Interim Monitoring Program (IMP) under the guidance of the MZ-1 Technical Committee, which is composed of representatives from all major MZ-1 producers and their technical consultants. The IMP was an aquifer-system and land subsidence investigation focused in the southwestern region of MZ-1 that would support the development of a long-term management plan to minimize and abate subsidence and fissuring (MZ-1 Plan). The IMP involved the construction of highly-sophisticated monitoring facilities, such as deep borehole extensometers and piezometers, the monitoring of land surface displacements through traditional ground-level surveys and remote-sensing techniques, the detailed monitoring of the aquifer system with water-level-recording transducers installed at an array of production and monitoring wells, and the purposeful stressing of the aquifer system through multiple controlled pumping tests.

The investigation methods, results, and conclusions are described in detail in the MZ-1 Summary Report, dated February 2006. The investigation provided enough information for Watermaster to develop Guidance Criteria for the MZ-1 producers in the investigation area that, if followed, would minimize the potential for subsidence and fissuring during the completion of the MZ-1 Plan. The MZ-1 Summary Report and the Guidance Criteria were adopted by the Watermaster Board in May 2006. The Guidance Criteria formed the basis for the MZ-1 Plan, which was approved by Watermaster in October 2007. The Court approved the MZ-1 Plan in November 2007 and ordered its implementation.

MZ-3 Monitoring Program

The former Kaiser plume has been incorporated into an overall monitoring program for the MZ-3 area. The MZ-3 monitoring program is also assessing the groundwater quality impairment from total dissolved solids (TDS), nitrate, and perchlorate. The perchlorate may have originated from the Mid-Valley Landfill (in Rialto Basin, across the Rialto-Colton fault) or it may be a non-point source that resulted from the historical application of Chilean fertilizer. Two rounds of quarterly samples (February and May 2008) have been collected from the two new monitoring wells constructed in 2007. Results from the entire monitoring program for MZ-3 will be presented in the final report, to be completed by December 2008.

Program Element 6: Develop and Implement Cooperative Programs with the Regional Water Quality Control Board, Santa Ana Region (Regional Board) and Other Agencies to Improve Basin Management; and

Program Element 7: Develop and Implement a Salt Management Program

A Water Quality Committee meeting was held on February 12, 2008 to discuss the status of the investigations of the three major water quality plumes (Chino Airport, Ontario Airport, and Stringfellow Hazardous Waste site) in the Basin and provide an update on the MZ-3 monitoring program. Following are the major technical accomplishments and activities for Program Elements 6 and 7 for the reporting period:

Ontario International Airport. Watermaster coordinated with Lynne Preslo at EcoGeo and Roy Marroquin at GeoTrans, Inc. regarding the drilling schedule for the OIA monitoring wells and Watermaster technical input on well design. Watermaster prepared for and attended a meeting with GeoTrans on March 7, 2008 to discuss drilling coordination and also attended a site walk with GeoTrans on April 17, 2008 at OIA MW-3. Watermaster reviewed and approved the well designs for OIA MW-1 and OIA MW-3. Watermaster reviewed a letter from Northrop describing their historical operations at the Ontario International Airport.

Chino Airport. Watermaster prepared for and attended a meeting at the City of Ontario on May 22, 2008. The meeting was attended by the staff of Watermaster and the City of Ontario, as well as Watermaster consultants and the consultants to the County of San Bernardino Department of Airports. The purpose of the meeting was to inform the County's consultant about the direction that the Chino Desalter Authority (CDA) and Watermaster were taking concerning the proposed alignment of the Chino Creek Desalter Well Field and the schedule. Watermaster reviewed the Chino Airport "Offsite Well Installation Work Plan" and the quarterly report.

California Institute for Men. Watermaster reviewed a letter from the California Institute for Men (CIM) to the Regional Water Quality Control Board (RWQCB) requesting site closure. Watermaster prepared a response to the RWQCB stating that No Further Action was not appropriate and recommended that the monitoring program continue, but at a reduced level of effort. Groundwater elevations in key wells should be measured and maps of groundwater elevation contours should be developed by CIM annually to demonstrate that the plume continues to be contained hydraulically. Certain key monitoring wells should also be sampled for VOCs every three years to further demonstrate that the plume is not migrating off-site. Watermaster stated that it would be amenable to working with CIM in developing the new monitoring program.

Crown Coach. Watermaster reviewed documentation (including site data and maps), prepared comments, and recalculated expected salt concentrations related to their proposed in situ treatment. Watermaster coordinated with Mr. Uday Shah at the City of Ontario to obtain unit O&M costs associated with the desalter to understand the economic impacts of Crown Coach's proposed remediation. Watermaster participated in a teleconference with the RWQCB and composed a comment letter to the RWQCB. The conclusion of this letter states,

> "Watermaster recognizes that the proposed project will reduce the mass of volatile organic chemicals (VOCs) in groundwater at the site by enhancing bioremediation during the interim period while the site is being developed. We also recognize that the addition of 14 pounds of sodium chloride salt into the basin represents a de minimus impact. Watermaster would like to state, for the record, that should this project – or other projects proposed by other stakeholders – produce a significant salt load to the groundwater basin, Watermaster has the option to seek compensation to offset the considerable expense already borne by the Parties.
>
> Watermaster would also like an assurance that this site will continued to be monitored to ensure that the VOC plume does not migrate off-site and that, if the site warrants the re-installation and operation of an active remediation system, the Regional Board will enforce the current order issued to Crown Coach."

Santa Ana River Perchlorate Sampling. Watermaster compiled perchlorate data for samples collected in the Santa Ana River and its tributaries and began analyzing recent surface water samples at a lower detection limit (0.5 µg/L) to determine the presence/absence of perchlorate in surface water.

Program Element 8: Develop and Implement a Groundwater Storage Management Program; and

Program Element 9: Develop and Implement a Storage and Recovery Program

The existing Watermaster/IEUA/Metropolitan Dry Year Yield (DYY) program continued during the reporting period. The construction statuses of local facilities included in the DYY program for the participating parties are as follows:

- City of Ontario – Wellhead treatment (IX) facility: construction began in March 2008 and is anticipated to be completed by February 2009. DYY Wells: Equipping Well Nos. 44 and 52 began in March 2008 and is anticipated to be completed by January 2009.
- Cucamonga Valley Water District – Five new wells (Nos. 39-43): construction completed for Well Nos. 39-42 and Well No. 43 is anticipated to be completed in September 2008.
- City of Upland – New IX treatment facility constructed and online.
- City of Pomona – Expansion of existing IX treatment facility is complete, a permit to operate has been issued, and the facility is fully functioning.
- City of Chino Hills – The original intent to Refurbish the Pellisier well did not yield the results the City was hoping to achieve. As a result, in January 2008, the DYY grant money and shift obligation was transferred to MVWD's Well No. 32.
- Monte Vista Water District – Well No. 31: well construction completed July 2006 and well equipping is scheduled for completion in September 2008. Well No. 32 is substantially complete. Well No. 33 and treatment facility (joint MVWD/Chino project): Well construction is complete and treatment facility construction is underway, with completion scheduled for November 2008.
- Jurupa Community Services District – Expansion of the Teagarden IX facility completed and online.

Due to the current drought situation, Metropolitan ceased allowing deposits into the account on April 1, 2007. As of June 30, 2008, about 86,000 AF had been stored in the Basin in Metropolitan's DYY account, after accounting for losses. On May 1, 2008, Metropolitan called for the parties to begin withdrawing water from the DYY account in the total amount of 33,000 AF per 12-month period.

Discussions have been underway with Metropolitan since September 2007 to increase the DYY account to 150,000 AF. Feasibility studies are currently being performed by Black & Veatch and Wildermuth Environmental Inc.