

CHINO BASIN WATERMASTER
Case No. RCV 51010
Chino Basin Municipal Water District v. The City of Chino

PROOF OF SERVICE

I declare that:

I am employed in the County of San Bernardino, California. I am over the age of 18 years and not a party to the within action. My business address is Chino Basin Watermaster, 9641 San Bernardino Road, Rancho Cucamonga, California 91730; telephone (909) 484-3888.

On August 9, 2005 I served the following:

TRANSMITTAL OF STATUS REPORTS 12, 13, 14 AND FINAL COPY OF 27TH ANNUAL REPORT

BY MAIL: in said cause, by placing a true copy thereof enclosed with postage thereon fully prepaid, for delivery by United States Postal Service mail at Rancho Cucamonga, California, addresses as follows:

See attached service list:
Mailing List 1

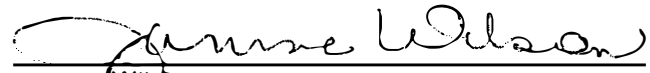
BY PERSONAL SERVICE: I caused such envelope to be delivered by hand to the addressee

BY FACSIMILE: I transmitted said document by fax transmission from (909) 484-3890 to the fax number(s) indicated. The transmission was reported as complete on the transmission report, which was properly issued by the transmitting fax machine.

BY ELECTRONIC MAIL: I transmitted notice of availability of electronic documents by electronic transmission to the email address indicated. The transmission was reported as complete on the transmission report, which was properly issued by the transmitting electronic mail device.

I declare under penalty of perjury under the laws of the State of California that the above is true and correct.

Executed on August 9, 2005 in Rancho Cucamonga, California.



JANINE WILSON
Chino Basin Watermaster

RICHARD ANDERSON
1365 W FOOTHILL BLVD
SUITE 1
UPLAND, CA 91786

RODNEY BAKER
COUNSEL FOR EGGWEST &
JOHNSON
PO BOX 438
COULTERVILLE, CA 95311-0438

PATRICK BAUER
ARROWHEAD WATER COMPANY
5772 JURUPA RD
ONTARIO, CA 91761-3672

BOB BEST
NAT'L RESOURCE CONS SVCS
25864 BUSINESS CENTER DR K
REDLANDS, CA 92374

BRUCE CASH
UNITED WATER MGMT CO INC
1905 BUSINESS CENTER DR
SUITE 100
SAN BERNARDINO, CA 92408

STEVE CORTNER
VULCAN MATERIALS COMPANY
PO BOX 39756
LOS ANGELES, CA 90039

DAVID B COSGROVE
RUTAN & TUCKER
611 ANTON BLVD
SUITE 1400
COSTA MESA, CA 92626

PAUL HOFER
11248 S TURNER AVE
ONTARIO, CA 91761

JOE DELGADO
BOYS REPUBLIC
3493 GRAND AVENUE
CHINO HILLS, CA 91709

GLEN DURRINGTON
5512 FRANCIS ST
CHINO, CA 91710

DICK DYKSTRA
10129 SCHAEFER
ONTARIO, CA 91761-7973

RALPH FRANK
755 LAKEFIELD RD #E
WESTLAKE VILLAGE, CA 91361

CARL FREEMAN
L.D KING
2151 CONVENTION CENTRE WAY
ONTARIO, CA 91764

PAUL DEUTSCH
GEOMATRIX CONSULTANTS, INC.
2444 MAIN ST., SUITE 215
FRESNO, CA 93721

JIM GALLAGHER
SOUTHERN CALIFORNIA WATER CO
2143 CONVENTION CENTER WAY
SUITE 110
ONTARIO, CA 91764

DON GALLEANO
4220 WINEVILLE RD
MIRA LOMA, CA 91752-1412

PETER HETTINGA
14244 ANON CT
CHINO, CA 91710

PETE HALL
PO BOX 519
TWIN PEAKS, CA 92391

LISA HAMILTON
GE/MGR ENV REMEDIATION PRGM
640 FREEDOM BUSINESS CTR
KING OF PRUSSIA, PA 19406

CARL HAUGE
SWRCB
PO BOX 942836
SACRAMENTO, CA 94236-0001

SUSAN TRAGER
LAW OFFICES OF SUSAN M. TRAGER
19712 MACARTHUR BLVD
SUITE 120
IRVINE, CA 92612

JOEL KUPERBERG
OCWD GENERAL COUNSEL
RUTAN & TUCKER, LLP
611 ANTON BLVD., 14TH FLOOR
COSTA MESA, CA 92626-1931

ANNESLEY IGNATIUS
COUNTY OF SAN BERNARDINO FCD
825 E 3RD ST
SAN BERNARDINO, CA 92415-0835

W. C. "BILL" KRUGER
CITY OF CHINO HILLS
2001 GRAND AVE
CHINO HILLS, CA 91709

SHARON JOYCE
STATE OF CA CDC
1515 S STREET, ROOM 314-F
SACRAMENTO, CA 95814

BOB THOMPSON
CONSULTANT TO SENATOR SOTO
822 N EUCLID AVE, SUITE A
ONTARIO, CA 91762

KRONICK ET AL
KRONICK MOSKOVITZ TIEDEMANN
& GIRARD
400 CAPITOL MALL, 27TH FLOOR
SACRAMENTO, CA 95814-4417

RONALD LA BRUCHERIE
12953 S BAKER AVE
ONTARIO, CA 91761-7903

MARILYN LEVIN
300 S SPRING ST
11TH FLOOR N TOWER
LOS ANGELES, CA 90013-1232

CARLOS LOZANO
STATE OF CA YTS
15180 S EUCLID
CHINO, CA 91710

ALAN MARKS
COUNSEL – COUNTY OF SAN
BERNARDINO
157 W 5TH STREET
SAN BERNARDINO, CA 92415

SANDY OLSON
WALNUT VALLEY WATER DISTRICT
271 BREA CANYON RD
WALNUT, CA 91789

BOB KUHN
669 HUNTERS TRAIL
GLENORA, CA 91740

ROBB QUINCY
CITY OF UPLAND
PO BOX 460
UPLAND, CA 91786

RICK REES
GEOMATRIX
2450 EAST RINCON STREET
CORONA, CA 92879

ROBERT REITER
SAN BERNARDINO VALLEY MWD
PO BOX 5906
SAN BERNARDINO, CA 92412-5906

LES RICHTER
CALIFORNIA SPEEDWAY
PO BOX 9300
FONTANA, CA 92334-9300

DAVID RINGEL
MONTGOMERY WATSON
PO BOX 7009
PASADENA, CA 91109-7009

AL LOPEZ
CBWM BOARD MEMBER
PO BOX 1773
CORONA, CA 92878

DAVID SCRIVEN
KRIEGER & STEWART
ENGINEERING
3602 UNIVERSITY AVE
RIVERSIDE, CA 92501

SENATOR NELL SOTO
STATE CAPITOL
ROOM NO 4066
SACRAMENTO, CA 95814

BILL STAFFORD
MARYGOLD MUTUAL WATER CO
9725 ALDER ST
BLOOMINGTON, CA 92316-1637

DAVID STARNES
MOBILE COMMUNITY MGMT CO
1801 E EDINGER AVE, SUITE 230
SANTA ANA, CA 92705

CRAIG STEWART
GEOMATRIX CONSULTANTS INC
510 SUPERIOR AVE, SUITE 200
NEWPORT BEACH, CA 92663

ROBERT BOWCOCK
INTEGRATED RESOURCES MGMNT
405 N. INDIAN HILL BLVD
CLAREMONT, CA 91711-4724

CHRIS SWANBERG
DEPT OF CORRECTIONS – LEGAL
AFFAIRS DIVISION
PO BOX 942883
SACRAMENTO, CA 94283-0001

SWRCB
PO BOX 2000
SACRAMENTO, CA 95809-2000

MICHAEL THIES
SPACE CENTER MIRA LOMA INC
3401 S ETIWANDA AVE, BLDG 503
MIRA LOMA, CA 91752-1126

JOHN THORNTON
PSOMAS AND ASSOCIATES
3187 RED HILL AVE, SUITE 250
COSTA MESA, CA 92626

R. E. THRASH III
PRAXAIR
5705 AIRPORT DR
ONTARIO, CA 91761

GEOFFREY VANDEN HEUVEL
CBWM BOARD MEMBER
7551 KIMBALL AVE
CHINO, CA 91710

SYBRAND VANDER DUSSEN
10573 EDISON AVE
ONTARIO, CA 91761

SYP VANDER DUSSEN
14380 EUCLID
CHINO, CA 91710

JOHN ANDERSON
CBWM BOARD MEMBER
12475 CEDAR AVENUE
CHINO, CA 91710

STEVE ARBELBIDE
417 PONDEROSA TR
CALIMESA, CA 92320

VIC BARRION
11559 PEMBROOKE
LOMA LINDA, CA 92354

ERIC WANG
SUNKIST GROWERS
760 E SUNKIST ST
ONTARIO, CA 91761

ROBERT NEUFELD
CBWM BOARD CHAIRMAN
14111 SAN GABRIEL CT
RANCHO CUCAMONGA, CA 91739

PAUL HAMRICK
JURUPA COMMUNITY SVCS DIST
11201 HARREL ST
MIRA LOMA, CA 91752

Distribution List Name: Committee List 1- Court Filings, Water Transactions

Members:

Andy Malone	amalone@wildermuthenvironmental.com
Anne Schneider	ajs@eslawfirm.com
April Woodruff	awoodruff@ieua.org
Arnold Rodriguez	jarodriguez@sarwc.com
Art Kidman	akidman@mkblawyers.com
Barbara Swanson	Barbara_Swanson@yahoo.com
Bill Kruger	citycouncil@chinohills.org
Bill Rice	brice@rb8.swrcb.ca.gov
Bill Stafford	bills@goldcom.com
Bill Thompson	bthompson@ci.norco.ca.us
Bob Feenstra	feenstra@milkproducers.org
Bob Kuhn	bgkuhn@aol.com
Bonnie Tazza	bonniet@cvwdwater.com
Boyd Hill	bhill@mkblawyers.com
Brenda Fowler	balee@fontanawater.com
Brian Hess	bhess@niagarawater.com
Butch Araiza	butcharaiza@mindspring.com
Carole McGreevy	cmcgreevy@jcsd.us
Charles Moorrees	cmoorrees@sawaterco.com
Chris Swanberg	chris.swanberg@corr.ca.gov
Cindy LaCamera	clacamera@mwdh2o.com
Craig Stewart	cstewart@geomatrix.com
Curtis Aaron	caaron@fontana.org
Dan Arrighi	darrighi@sgvwater.com
Dan Hostetler	dghostetler@csupomona.edu
Dan McKinney	dmckinney@rhlaw.com
Daniel Cozad	dcozad@sawpa.org
Dave Argo	argodg@bv.com
Dave Crosley	DCrosley@cityofchino.org
Dave Hill	dhill@ieua.org
Dave Schroeder	cbwcd.email@verizon.net
David B. Anderson	danders@water.ca.gov
David DeJesus	davidcicgm@aol.com
David Ringel	david.ringel@mwhglobal.com
Diane Sanchez	dianes@water.ca.gov
Don Galleano	donald@galleanowinery.com
Duffy Blau	Duffy954@aol.com
Eric Garner	elgarner@bbklaw.com
Frank Brommenschenkel	frank.brommen@verizon.net
Fred Fudacz	ffudacz@nossaman.com
Fred Lantz	flantz@ci.burbank.ca.us
Garth Morgan	gmorgan@ieua.org
Gene Koopman	GTKoopman@aol.com
Gerard Thibeault	gthibeault@rb8.swrcb.ca.gov
Gerry Black	gjblack@FontanaWater.com
Glen Whritenour	gwhritenour@reliantenergy.com
Gordon P. Treweek	GTreweek@CBWM.ORG
Grace Cabrera	grace_cabrera@ci.pomona.ca.us
Henry Pepper	henry_pepper@ci.pomona.ca.us
James Jenkins	cnomgr@airports.sbcounty.gov
James P. Morris	jpmorris@bbklaw.com
Janine Wilson	Janine@CBWM.ORG
Jarlath Oley	joley@mwdh2o.com
Jean Cihigoyenette	Jean_CGC@hotmail.com
jeeinc@aol.com	jeeinc@aol.com
Jeffrey L. Pierson	jpierson@unitexcorp.com
Jerry King	jking@psomas.com
Jess Senecal	JessSenecal@lagerlof.com
Jill Willis	jwillis@bbklaw.com
Jim Bryson	jtbryson@fontanawater.com
Jim Hill	jhill@cityofchino.org
Jim Markman	jmarkman@rwglaw.com
Jim Taylor	jim_taylor@ci.pomona.ca.us

Jim@city-attorney.com
jimmy@city-attorney.com

Joe Graziano
Joe P LeClaire

Joe Scalmanini

Joel Moskowitz (joel@moskowitzhq.com)

John Anderson

John Hayball

John Huitsing

John Rossi

John Schatz

John Vega

Judy Schurr

Julie Saba

Kathy Kunysz

Kathy Tiegs

Ken Jeske

Ken Kules

Kimberly Arce

Lisa Hamilton

Mark Hensley

Martin Zvirbulis

Robert W Bowcock

Jim@city-attorney.com

jimmy@city-attorney.com

jgraz4077@aol.com

jleclaire@wildermuthenvironmental.com

jschal@lsce.com

joel@moskowitzhq.com

janderson@ieua.org

john.hayball@sce.com

johnh@milkproducers.org

jrossi@wmwd.com

jschatz13@cox.net

johnv@cvwdwater.com

jschurr@earthlink.net

jsaba@ieua.org

kkunysz@mwdh2o.com

ktiegs@ieua.org

kjeske@ci.ontario.ca.us

kkules@mwdh2o.com

KArce@HatchParent.com

Lisa.Hamilton@corporate.ge.com

mhensley@localgovlaw.com

martinz@cvwdwater.com

bbowcock@irmwater.com

Distribution List Name: Committee List 2 - Court Filings, Water Transactions

Members:

Marilyn Levin	marilyn.levin@doj.ca.gov
Mark Kinsey	mkinsey@mvwd.org
Mark Ward	mark_ward@ameron-intl.com
Mark Wildermuth	mwildermuth@wildermuthenvironmental.com
Martha Davis	mdavis@ieua.org
Martin Rauch	martin@rauchcc.com
Michael Fife	Mfife@hatchparent.com
Michelle Staples	mstaples@jdplaw.com
Mike Del Santo	mike_delsanto@catellus.com
Mike Maestas	mmaestas@chinohills.org
Mike McGraw	mjmcmgraw@FontanaWater.com
Mike Thies	mthies@spacecenterinc.com
Mohamed El-Amamy	melamamy@ci.ontario.ca.us
Nathan deBoom	nathan@milkproducers.org
Pam Wilson	pwilson@hatchparent.com
Paul Hamrick	weslie@jcsd.us
Paul Hofer	farmwatchtoo@aol.com
Paula Molter	PMolter@CBWM.ORG
Pete Hall	richard.okeefe@corr.ca.gov
Peter Von Haam	peter.vonhaam@doj.ca.gov
Phil Krause	pkrause@parks.sbcounty.gov
Phil Rosentrater	prosentrater@wmwd.com
Raul Garibay	raul_garibay@ci.pomona.ca.us
Richard Atwater	Atwater@ieua.org
Rick Hansen	rhansen@tvmwd.com
Rick Rees	rrees@geomatrix.com
Rita Kurth	ritak@cvwdwater.com
Robert DeLoach	robertd@cvwdwater.com
Robert Dougherty	RED@covcrowe.com
Robert Neufeld	N78098@aol.com
Robert Neufeld	robertn@cvwdwater.com
Robert Rauch	robert.rauchcc@verizon.net
Robert W Bowcock	bbowcock@irmwater.com
Robert W. Nicholson	rwnicholson@sgvwater.com
Ron Craig	RonC@rbf.com
Ron Small	ron.small@dgs.ca.gov
Sandy Lopez	slopez@ci.ontario.ca.us
Scott Burton	sburton@ci.ontario.ca.us
Sharon Joyce	SJoyce@executive.corr.ca.gov
Stacy MacBeth (smacbeth@jcsd.us)	smacbeth@jcsd.us
Steve Arbelbide	sarbelbide@californiasteel.com
Steve Kennedy	skennedy@bbmblaw.com
Steven Lee	slee@rhlaw.com
Tej Pahwa	tpahwa@dtsc.ca.gov
Terry Catlin	tcatlin@verizon.net
Timothy Ryan	tjryan@sgvwater.com
Tom Bunn	TomBunn@Lagerlof.com
Tom Love	TLove@ieua.org
Tom McPeters	THMcP@aol.com
Tracy Tracy	ttracy@mvwd.org
Virginia Grebbien	vgrebbien@ocwd.com
Wayne Davison	ciwcpm@earthlink.net
William J. Brunick	bbrunick@bbmblaw.com
WM Admin Staff	

1 Scott S. Slater (State Bar No. 117317)
Michael T. Fife (State Bar No. 203025)
2 **Hatch & Parent, A Law Corporation**
21 East Carrillo Street
3 Santa Barbara, CA 93101
(805) 963-7000
4 (805) 965-4333

5 **Attorneys For**
CHINO BASIN WATERMASTER

6
7
8 **SUPERIOR COURT OF THE STATE OF CALIFORNIA**
9 **FOR THE COUNTY OF SAN BERNARDINO**

10 CHINO BASIN MUNICIPAL DISTRICT

11 Plaintiff,

12 vs.

13 CITY OF CHINO, ET AL.

14 Defendant.

Case No. RCV 51010

[Assigned for All Purposes to the Honorable
MICHAEL GUNN]

**TRANSMITTAL OF STATUS REPORTS
12, 13, 14 AND FINAL COPY OF 27TH
ANNUAL REPORT**

Hearing Date: TBD
Time: TBD

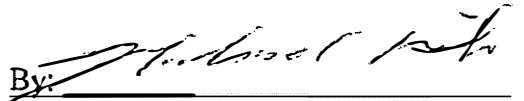
15
16
17
18 **STATUS REPORT TRANSMITTAL**

19 Attached to this pleading as Exhibits A, B, and C, are Status Reports 12, 13, and 14 which
20 have been completed pursuant to the OBMP Reporting schedule established by the Court in its
21 September 28, 2000 Order and as augmented by voluntary action of Watermaster in October 2002.
22 Watermaster respectfully requests the Court to receive and file these Status Reports. Watermaster
23 anticipates that hearings will be scheduled on other matters in the next few months, and will
24 schedule this request for hearing in conjunction with these other matters.
25
26
27
28

1 **ANNUAL REPORT TRANSMITTAL**

2 Attached to this pleading as Exhibit D is a final copy of Watermaster's 27th Annual Report. A
3 final copy of this Annual Report has been previously transmitted to the Court pursuant to the
4 Judgment, but a final copy of the bound version has not been transmitted. Watermaster respectfully
5 requests the Court to receive and file this bound version of the 27th Annual Report. As with the status
6 reports described above, Watermaster will schedule a hearing on this request in conjunction with
7 other matters soon to come before the Court.
8

9
10 Dated: August 5, 2005

11 By: 
12 HATCH & PARENT
13 Scott S. Slater
14 Michael T. Fife
15 Attorneys for Chino Basin Watermaster
16
17
18
19
20
21
22
23
24
25
26
27
28

HATCH AND PARENT
21 East Carrillo Street
Santa Barbara, CA 93101

EXHIBIT

“A”

Chino Basin Watermaster Status Report No. 12

(Covering June 2004 through August 2004)



September 2004



OPTIMUM BASIN MANAGEMENT PROGRAM

In its Order of September 28, 2000, extending the term of the nine-member Watermaster Board, the Court ordered Watermaster to provide semiannual reports regarding the progress of OBMP implementation. In Status Report Number 4, filed with the Court on September 30, 2002, Watermaster notified the Court that Watermaster intended to provide quarterly status reports because of the rapid pace of OBMP implementation. By a subsequent Order of October 17, 2002, the Court added additional reporting items to the quarterly status report.

This Status Report Number 12 is filed pursuant to this revised schedule and reports on the period from June 1, 2004 to August 31, 2004.

PROGRAM ELEMENT 1 – DEVELOP AND IMPLEMENT COMPREHENSIVE MONITORING PROGRAM

Groundwater-Level Monitoring

BACK-
GROUND

Watermaster has three active groundwater-level monitoring programs operating in the Chino Basin – a semiannual basin-wide program; an intensive key well monitoring program associated with the Chino I / II Desalter well fields and the Hydraulic Control Monitoring Program (HCMP); and an intensive piezometric monitoring program associated with land subsidence and ground fissuring (see Land Surface Monitoring below) in Management Zone 1 (MZ1).

THIS
PERIOD

For the semiannual program, Watermaster staff manually measures water levels in approximately 340 agricultural wells twice per year. In conjunction with the semiannual program, Watermaster staff manually measures water levels at about 112 key wells in the southern portion of the Basin and around the Chino I / II Desalter well fields once per month. During this reporting period, Watermaster staff installed pressure transducers/data loggers in 10 of these key wells to automatically record water levels once every 15 minutes. For the MZ-1 program, Watermaster consultants collect groundwater level data at 35 wells in the southern portion of MZ1. Data are collected manually at MZ1 wells once every two months, and automatically once every 15 minutes using a pressure transducer/data logger installed at each well.

These Watermaster 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 maintained at Watermaster's office.

TO
COME

During fiscal year 2004/05, Watermaster staff will expand the use of pressure transducers/data loggers. Watermaster staff will purchase and install about 20 additional pressure transducers/data loggers at key wells and at selected wells in the northern portions of Chino Basin where highly-detailed groundwater level data are scarce.



Groundwater-Quality Monitoring

BACK-
GROUND

Prioritizing Wells to Serve Multiple Purposes. The private wells chosen for the 2004-05 water quality monitoring program are located primarily between Interstate 60 and the Santa Ana River (SAR).

Water Quality Analyses

- All groundwater samples are analyzed for general mineral and general physical parameters
- Wells within or near the two volatile organic compound (VOC) plumes south of the Ontario and Chino Airports are being analyzed for VOCs, in addition to the general minerals and general physical parameters.
- All private wells in the key well program are being analyzed for perchlorate because of its widespread occurrence in the 1999-2001 sampling program, and the concerns expressed by appropriators faced with expensive ion exchange treatment costs for perchlorate-contaminated wells.

Sampling Program of Selected Private Wells. Watermaster developed its streamlined, key-well water quality monitoring program in which approximately 114 private "key wells" are sampled bi-annually (i.e. once every two years) in the southern portion of Chino Basin. Therefore, approximately 57 wells will be sampled on an annual basis. The steps taken in determining the key wells were:

- The basin was divided into a grid, with each cell being 2000 square meters (m²).
- For each grid cell, the average TDS and NO₃ values were calculated (using the last five years of available data).
- The water quality data of each individual well were examined. Wells most closely matching the average constituent concentrations were chosen as representative. One to two wells in each grid square were retained (the wells not chosen in the key well program, but still matching these criteria, are the alternate wells for each grid cell). Preference was given to wells with the following characteristics:
 - Known construction;
 - Choice as a groundwater level key well;
 - Likelihood of surviving the regional land development
- Basin-wide TDS and NO₃ arithmetic averages were recalculated using just the key wells and compared to the total basin arithmetic averages. New maps were made representing the water quality conditions of the key wells and qualitatively compared to the original basin maps.

Watermaster has developed a comprehensive water quality program whereby water quality data from other sources are routinely collected, quality-control checked and loaded into Watermaster's database. Data sources included:

- Appropriators



- Department of Health Services (DHS) – these data are currently downloaded from DHS annually
- Department of Toxic Substance Control (DTSC) for the Stringfellow Acid Pits
- Regional Water Quality Control Board (RWQCB) for water quality data associated with sites under Cleanup and Abatement Orders (CAO).

THIS PERIOD

Watermaster is working closely with the Appropriative Pool members and their state-certified contract laboratories in order to obtain water quality data as an electronic data deliverable (EDD). These data would be transmitted either directly from the laboratory or from the Appropriators, after their QA/QC check of the laboratory data. The EDDs will enhance the quality and timeliness of the Watermaster's database.

TO COME

With respect to the recharge of recycled water, Watermaster and IEUA are planning to construct a number of monitoring wells at recharge basins to monitor the influence of recharge on groundwater levels in general, and to monitor the water quality resulting from the recharge of supplemental and storm waters. At least one monitoring well will be installed downgradient of each recharge facility that receives recycled water. The construction schedule will be included in subsequent status reports.

Groundwater-Production Monitoring

BACK-GROUND

Monitoring of Agricultural Production Wells. Initially production monitoring involved the installation of meters on wells operated by members of the Agricultural Pool. As of the end June 2004, Watermaster counted about 489 active agricultural wells and equipped 393 of these wells with operating meters. The other 96 wells have or will become inactive within 18-24 months because of urban development in the south Chino area.

ON GOING

All Producing Wells Are Monitored Quarterly. Watermaster staff reads the newly installed and/or rehabilitated meters on the agricultural wells quarterly. A "water duty" method is used to estimate production at agricultural wells that do not have meters.

TO COME

Need For Water Use/Disposal Form To Be Reviewed. The OBMP Implementation Plan includes a provision that requires the agricultural producers to submit a water use/disposal form describing the sources of water used by each producer and how that water is disposed of after each use. Filling out the water use and disposal form and reporting the results have not been implemented. Watermaster will initiate discussions of the need for this form with the Water Quality Committee

Surface-Water Monitoring

BACK-GROUND

Measure Water Quality and Water Levels In Recharge Basins. Watermaster conducts a surface water monitoring program to characterize the water quality of water in recharge basins and the water levels in some of these basins. The purpose of this program is to estimate the volume and quality of recharge. This information will be used in subsequent years to estimate the safe yield of the Basin and for other management purposes.

ON GOING

Currently, Watermaster monitors the water quality in 20 basins: Upland, Declez, Etiwanda Spreading Grounds, Victoria, Hickory, Lower Day Banana, Ely 1, Ely 3, Wineville, San Sevaine 1, San Sevaine 5, Turner 1, Princeton, Montclair 1, Montclair 2, Montclair 3, Montclair 4, Brooks, and Grove. Generally, the water quality samples are taken after storm events, i.e., during the



period from November 1 through March 30; however, monitoring of nuisance flows also occurs. Each basin is usually sampled three to five times each year. In fiscal year 2004-05 the sampling rate will increase substantially for basins that are scheduled to receive recycled water.

THIS PERIOD Watermaster staff sampled the nuisance water captured in Grove Basin on June 22, July 20, and August 24, 2004.

BACK-GROUND **Surface Water Monitoring for Santa Ana River Began In June 2003.** One of the goals of the OBMP is to maximize Chino Basin yield. A key component in maximizing yield is to minimize groundwater discharge into the SAR. Watermaster developed a surface water monitoring program for the SAR that, in conjunction with Watermaster groundwater monitoring programs, is used to characterize those reaches of the SAR that are gaining water from the Basin, and to determine if significant discharge of Chino Basin groundwater to the SAR is occurring. A conceptual monitoring plan involving IEUA, OCWD, the RWQCB, and Watermaster was finalized. These agencies determined that the conceptual monitoring plan was adequate and developed a detailed work plan to implement a surface water and groundwater monitoring program. The work plan was completed in June 2003, and year-round water quality sampling and flow monitoring in the SAR have begun.

ON GOING Watermaster now measures the SAR flow and selected water quality parameters as key elements of the HCMP. Watermaster collects water quality samples and measures flow at four Santa Ana River stations (Van Buren, Etiwanda, Hamner, and River Road) plus another eight locations on tributaries, year round on a bi-weekly basis. In addition, Watermaster obtains discharge data from permanent USGS and OCWD stream gauge locations on the SAR and its tributaries. Discharge and water quality data from publicly owned treatment works (POTWs) that discharge to the SAR in this reach are obtained from the POTWs.

Land-Surface Monitoring

BACK-GROUND **Multifaceted Approach.** Watermaster staff developed a multifaceted land surface monitoring program to develop data for a long-term management plan for land subsidence in Management Zone 1 (MZ1). The monitoring program consists of three main elements:

1. An aquifer system monitoring facility is located in the southern portion of MZ1, an area that has experienced concentrated and differential land subsidence and ground fissuring. A major component of the aquifer system monitoring facility is a cluster of multiple depth piezometers that measure water level and pressure changes at 11 different depths. Another major component is a dual borehole extensometer that measures deformation within the aquifer system at deep and shallow levels. Together, the two components correlate the hydraulic and mechanical responses of the aquifer system to different aquifer stresses, such as pumping at wells.
2. Synthetic aperture radar interferometry (InSAR) measures land surface deformation across the entire Chino Basin using remote sensing techniques.
3. Benchmark surveys along selected profiles of the Chino Basin. The benchmark surveys (1) establish a datum from which to measure future land surface deformation, (2) "ground-truth" the InSAR data, (3) allow determination of historical subsidence at any



historical benchmarks that can be recovered, and (4) evaluate the effectiveness of the long-term management plan

Depth Specific Data. Permanent transducers and data logging equipment are recording depth specific groundwater level data at the Ayala Park piezometers. Transducers also are recording groundwater level data at wells owned by the cities of Chino and Chino Hills and the California Institution for Men (CIM). These transducers record groundwater levels at all wells once every 15 minutes, and also record "on/off" pumping cycles at the active production wells.

ON
GOING

Deep Aquifer-System Stress Test.

Controlled aquifer-system stress (pumping) tests in October 2003 and April 2004 provided piezometric response data that revealed a potential groundwater barrier within the sediments below about 300 ft-bgs, as evidenced by a lack of water level response in CH-18 (east of the fissure zone) due to pumping at CH-19 (west of fissure zone). Image-well analysis of pumping-test responses indicates that this barrier approximately coincides with the location of the historic zone of ground fissuring. This spatial coincidence suggests a cause-and-effect relationship between the barrier, the steep gradient of subsidence across the barrier as indicated by InSAR, ground level surveys and the ground fissuring.

BACK-
GROUND

Starting on September 1, 2004, Watermaster will begin a controlled deep aquifer-system stress test. In summary, the test calls for constant discharge from three wells owned by the City of Chino Hills (CH-1B, CH-15B, and CH-19), while most other wells in the area remain off. These wells have similar perforated intervals from about 300-1,100 ft-bgs and primarily influence water levels in the deep portions of the aquifer system – deeper than about 300 ft-bgs. The pumping test is planned to end on October 31, 2004 {Note: CH-17 was also planned to pump during the test, but mechanical problems at this well preclude pumping}

TO
COME

The primary objective of this test is to transition the deformation of aquifer-system sediments from elastic compression to inelastic compaction. If accomplished, it will provide "threshold" piezometric heads at the extensometer location that should not be approached in the future if permanent (inelastic) compaction within the aquifer-system is to be avoided. In doing so, it will define a key parameter required for estimating the maximum elastic storage capacity of the confined aquifer system. When inelastic compaction is clearly identified, through analysis of stress-strain diagrams (see discussion below), the pumping test will stop.

Other objectives of the stress test are to (1) constrain estimates of key aquifer-system parameters that could be used in later modeling efforts, (2) confirm and elucidate the existence of a groundwater barrier within the sediments below about 300 ft-bgs, and (3) provide data for a proposed injection test at CH-1B.

During the deep aquifer system stress test of October 2003, drawdown was not great enough to cause clearly-defined inelastic compaction. It is hoped that by pumping CH-19, CH-15B, and CH-1B at full capacity, that piezometric heads in the deep aquifer system will drawdown further than during the pumping test of October 2003 (~150 ft at PA-7), and cause the onset of inelastic compaction.



With regard to CH-1B, groundwater pumped from this well has relatively high concentrations of arsenic that do not permit pumping this well directly into Chino Hills' distribution system. Yet it is imperative that this well participate in the stress test in an attempt to transition the aquifer-system deformation to inelastic compaction. Watermaster and Chino Hills have jointly funded the connection of CH-1B (and CH-15B) to the storm drain system through a "flush line" discharge pipe, which will allow the pumping of CH-1B during the test. However, the pH of water pumped from CH-1B is above 8.5, which is the limit imposed by the Regional Board for discharge to aquatic waters. Watermaster is working on a physical solution to reduce pH of the pumped groundwater and a monitoring plan to satisfy the Regional Board's permitting requirements.

Deep piezometer rehabilitation. During the summer drawdown in the 2003 it became evident that some degree of intercommunication was developing among the piezometers in the deep cluster (PB) at Ayala Park, and that the deepest piezometer, **PB-1**, and perhaps others, were also intermittently communicating with the much higher heads in the shallow aquifer system. The leakage apparently was occurring through faulty joints in the two-inch PVC casings, although actual breaks in the casings may also exist. Evidence suggests that many of the problems may have resulted from defects in the casing of PB-1 that allowed leakage directly into the gravel envelopes around the screened intervals of shallower piezometers. To the extent that this is true, repair of PB-1 could solve most of the problems.

BACK-
GROUND

Rehabilitation of the PB piezometers was conducted during June/July 2004, using a "well-in-a-well" construction technique. This involved filling the screened interval (5 to 20 ft) of the piezometer casing with coarse, highly permeable sand, which is then topped with about 10 ft of graded medium to very fine sand and silt to form a filter cap of very low permeability. A 1-inch inner pipe, the well within the well, is jetted through the filter cap in an attempt to communicate with the original gravel envelope and surrounding formation. Before final jetting down into position, the inner pipe, temporarily set about 20 ft above the screen, allows water standing in the 2-inch casing to be displaced to the surface while a sealing bentonite grout was pumped down the annulus between the 2-inch casing and the inner pipe.

THIS
PERIOD

This technique was tested and refined by experimenting in PB-6, the shallowest of the deep piezometer cluster. Based on the results at PB-6, Watermaster attempted to rehabilitate PB-1 using similar methodologies.

Preliminary evaluation of piezometric data from all piezometers in PB indicates that the rehabilitation procedures were at least partially successful. In particular, PB-2 and PB-4 appear so far to be producing reasonable and accurate data. However, a comprehensive analysis of the rehabilitation results can not be completed until the end of the current drawdown season (end of October 2004).

TO
COME

A comprehensive analysis of the rehabilitation results at PB will commence at the end of the current drawdown season (end of October). Further rehabilitation, if needed, will be recommended at the conclusion of the analysis, along with a detailed description of rehabilitation procedures.

BACK-
GROUND

InSAR. The objective of this task is to characterize ground surface deformation in Chino Basin using Synthetic Aperture Radar Interferometry (InSAR). This analysis will be performed for a



historical period (1992-2003) and on an on-going basis thereafter. The advantage of InSAR is that it provides a continuous representation of land surface deformation. These data are planned to be used to: (1) characterize the time history of land surface deformation in greater spatial and temporal detail than can be accomplished from the available historical ground level survey data, (2) calibrate computer simulation models of subsidence and groundwater flow, and (3) assist in the evaluation of the effectiveness of the long term management plan.

THIS
PERIOD

Vexcel Corporation of Boulder, Colorado – a company that specializes in remote sensing and radar technologies conducted a “proof of concept” study of historical synthetic aperture radar data that was acquired over the MZ-1 area. The objective of this study was to generate cumulative displacement maps over relatively short time steps (April to November 1993). The MZ-1 Technical Group deemed the study successful, and approved follow-up study by Vexcel to perform a comprehensive analysis of all historical synthetic aperture radar data (1992-2003) to characterize in detail the time history of subsidence in MZ-1

TO
COME

Vexcel has submitted a cost estimate of \$200,000 to complete the comprehensive analysis of all historical synthetic aperture radar data (1992-2003) to characterize in detail the time history of subsidence in MZ-1. Watermaster has budgeted the above amount for InSAR analysis in its fiscal year 2004/05 budget. A contract will be executed between Watermaster and Vexcel to complete the work by the first quarter of calendar 2005. Part of the contract will include the presentation of the analysis results by Vexcel staff to the MZ-1 Technical Committee

Benchmark Surveys. The Interim Monitoring Program (IMP) work plan called for the deep extensometer, which is anchored in sedimentary bedrock at about 1,400 ft bgs, to be used as the “starting benchmark” for all survey loops. To accomplish this, a Class-A benchmark was constructed outside the extensometer building to serve as the practical (*i.e.* actual) starting benchmark. To link this benchmark to the deep extensometer pipe, each survey event is begun by referencing the benchmark to a marked spot on one of the piers that supports the extensometer instrument platform. These piers and the instrument platform represent a stable ground surface datum that is used to measure relative vertical displacement between the ground surface and the deep extensometer pipe (recorded every 15 minutes). The vertical displacement recorded at the deep extensometer between survey events, in addition to any vertical displacement measured between the starting benchmark and the pier, is then used to calculate the elevation at the starting benchmark outside the extensometer building. Then, relative vertical displacement between benchmarks is measured across the entire work to obtain current elevations. These comprehensive surveys are planned to be repeated annually during spring season of highest regional water levels.

A key element of the MZ-1 benchmark network is the array of closely spaced benchmarks that have been established across the historic fissure zone in the immediate vicinity of the Ayala Park extensometers (Ayala Park array). At this array, located along Edison and Eucalyptus Avenues, the IMP work plan calls for the semiannual measuring of both vertical and horizontal displacements. These horizontal and vertical displacements are expected to define two-dimensional profiles of land surface deformation that can be related to the vertical distribution of aquifer system compaction and expansion that is being recorded continuously at the extensometers. These surveys are repeated semi-annually during the late spring and early fall periods of highest and lowest water levels – in an attempt to monitor fissure movement that may be associated with elastic and/or inelastic aquifer deformation.



THIS
PERIOD

In late April 2004, AE performed the annual survey event across the entire network of benchmark monuments, including the measurements of horizontal displacements at the Ayala Park Array of monuments. The results of the ground level surveys to date were presented to the MZ-1 Technical Committee at its July 21, 2004 meeting. Also at this meeting, the project manager from AE made a presentation to describe survey methodologies, accuracy, results, and challenges, as well as answered questions

The vertical displacement at monuments that occurred from April 2003 to April 2004 was presented. Comparing monument elevations over the April to April time period should reveal the inelastic component of compaction, if any, that may be occurring in the region. The assumption here is that in April 2004 water levels in the region have recovered to the April 2003 levels, thus the measured vertical displacement does not include the elastic component of the aquifer system deformation. Water levels measured as part of the IMP (in the vicinity of Ayala Park) support this assumption. The monuments near Ayala Park showed little to no subsidence over this time period. However, the monuments located in the northern portions of the surveyed area consistently showed subsidence of the land surface (on average about 0.04 feet). Maximum subsidence of about 0.08 feet was recorded at monuments located along Philadelphia Street between Pipeline and Ramona Avenues. Water level data have not yet been collected or analyzed as part of the IMP in these northern portions of the survey area that seemingly are experiencing inelastic subsidence.

The subsidence that occurred in the area over the October 1993 to December 1995 period was measured by InSAR. The subsidence indicated by InSAR data has been interpreted as primarily permanent subsidence caused by inelastic aquifer system compaction. If so, the survey data are indicating that the distribution of inelastic compaction in 2003-04 is significantly different compared to that of the early 1990's. In particular, maximum subsidence of about 1 foot in 1993-95 was measured in the vicinity of Ayala Park by InSAR, whereas in 2003-04 the survey data are indicating minimal subsidence, if any, in this same area

The horizontal displacement at monuments of the Ayala Park Array that occurred from April 2003 to November 2003 and November 2003 to April 2004, respectively was determined through distance measurements between adjacent monuments, and is based on the assumption that the southeastern monument was stable over the period of measurement. The measurements indicate the elastic nature of the land surface displacement over the course of the pumping and recovery seasons, as well as the apparent presence of a groundwater barrier within the deep aquifer system.

Groundwater production and water level data show that pumping of wells perforated within the deep aquifer system (>300 ft-bgs) causes water level drawdowns in the deep aquifer system on the order of 150 feet. However, these large drawdowns do not propagate east of the fissure zone. During the pumping season of 2003 (April to November) vertical displacement of the land surface (*i.e.* subsidence) was generally greater on the west side of the fissure zone where water level drawdown was greatest. During the recovery season of 2003-04 (November to April) vertical displacement of the land surface (*i.e.* rebound) was again greater on the west side of the fissure zone where water level recovery was greatest

In other words, the groundwater barrier in the deep aquifer system aligned with the fissure zone causes greater water level fluctuations on the west side of the barrier where the pumping is concentrated. These greater water level fluctuations on the west of the barrier, in turn cause



greater deformation of the aquifer-system matrix which, in turn, causes greater vertical land surface deformation on the west side of the barrier. The InSAR data corroborate the existence of the groundwater barrier by showing maximum subsidence west of the barrier (0.2ft) and virtually no subsidence east of the barrier during the course of one pumping season (April-1993 to September 1993).

In addition, the pattern of horizontal displacement of benchmarks over the pumping and recovery seasons, likely reflects, in part, the differential compaction of the aquifer system across the fissure zone. The horizontal movements of benchmarks in the vicinity of the fissure zone merit further monitoring using the same surveying methods for at least one additional year.

The next survey of the Ayala Park array of monuments is planned for October 2004. The timing of this survey will coincide with the time just prior to the cessation of the controlled pumping test planned for September/October 2004. As such, this survey will measure both vertical and horizontal displacements between monuments during a time of maximum water level drawdown (stress) within the aquifer system. The October 2004 survey data can then be compared to the April 2004 survey data (maximum water level recovery in the aquifer system), in an effort to monitor fissure movement, if any, that may be associated with elastic and/or inelastic aquifer-system deformation.

TO
COME

Well Construction, Abandonment, and Destruction Monitoring

Watermaster staff monitors the condition of wells on a regular basis. Wells that may be improperly abandoned/destroyed are reported to Riverside and San Bernardino Counties as they are discovered.

BACK-
GROUND

Watermaster staff inspected 150 suspect wells during a 2002-03 field inspection and determined that 113 of these wells were properly abandoned and 37 wells will require some modification to meet the standard for a properly abandoned well. A well repair/abandonment program was prepared and approved by Watermaster. Watermaster continues to develop a wellhead protection program and makes recommendations on closure of abandoned wells. Ongoing land development will require continued well abandonment activity by Watermaster.

PROGRAM ELEMENT 2 – DEVELOP AND IMPLEMENT COMPREHENSIVE RECHARGE PROGRAM

A centerpiece of the OBMP is enhancement of the Basin recharge capacity, so that high quality storm water and available recycled water can be retained in the Basin.

Recharge Facilities Improvement Project (Seven Bid Packages)

Bid Package No. 1—Reconfiguration of Banana, College Heights, Lower Day, RP3 and Turner Basins

Bid Package No. 1, which included major earthwork at Banana, College Heights, Lower Day, RP-3, and Turner Basins, was awarded to LTE Excavating on March 24, 2003. Work was scheduled for completion by November 15, 2003, but was delayed while awaiting delivery of sluice gates and their actuator assemblies. These items were received and installed; and the bid package was accepted on May 12, 2004

COMPLETED



Bid Package No. 2 – Basin Improvements (3 ea), Drop Inlets (3 ea), and Rubber Dams (4 ea)

COMPLETED Bid Package No. 2 consisted of construction of the drop inlet structures for Brooks Street Basin, Turner Basin; and Victoria Basin; rubber dams for College Heights/Upland Basins, Turner No. 1 Basin, Lower Day Basin, and RP-3 Basin; and various improvements at Declez Basin, Ely Basins, and 8th Street Basins. This package was awarded to Banshee Construction with work beginning on July 16, 2003. Work on this contract was scheduled to be completed by March 15, 2004; however, rain delays slowed completion of excavation and soil cement berms. All the work on this bid package was accepted on August 18, 2004.

Bid Package No. 3 – Jurupa Basin to RP-3 Force Main

THIS PERIOD Bid Package No. 3 involves construction of approximately 11,000 linear feet of 36-inch CML&C force main between Jurupa Basin and RP-3 Basin. The force main will be used to convey storm water, imported water, and recycled water between the pump station at Jurupa Basin and the RP-3 Basins. This package was awarded to W. A. Rasic Construction Company with work beginning on August 6, 2003. The Contractor has completed 93% of the force main, and has provided a "substantially complete" estimate of mid September 2004.

Bid Package No. 4 – Jurupa Basin to RP-3 Pump Station

THIS PERIOD Bid Package No. 4 consists of construction of the Jurupa Pump Station, 100 feet of 48-inch pipeline, and 400 feet of 36 inch, CML&C steel force main. The package was awarded to LT Engineering with work beginning on February 19, 2004. The Contractor anticipates a construction period of 8 months with substantial completion in November 2004.

Bid Package No. 5 – SCADA System

THIS PERIOD This bid package includes the SCADA system and electrical improvements at all the basins. The 100 % design was submitted, reviewed, and sent out for bid in January 2004. The package was awarded to Denboer Engineering with construction beginning in March 2004. The contractor is now 65% complete, with substantial completion in December 2004.

Bid Package No. 6 – MWD Turnouts

THIS PERIOD This bid package covers the construction of three new MWD turnouts: CB-11TB and CB-15T on the Rialto Pipeline, and CB-18T on the Etiwanda Intertie near San Sevaine Channel. This package was awarded to Griffith Construction with work beginning on February 4, 2004. The contractor is now 84% completion, with substantial completion in September 2004.

Bid Package No. 7 – Priority, Funding and Scope of Misc. Projects

THIS PERIOD This bid package will complete miscellaneous projects not included in the previous bid packages. Among the projects included in this bid package are:

- Habitat Mitigation Area at RP-3



- Upland Basin Improvements
- Victoria Basin Improvements
- Hickory Rubber Dam, Pump Station and Force Main
- SCADA module

This package was bid and awarded to Brutoco Engineering & Construction on July 21, 2004. The construction is estimated to take five months, with substantial completion in December 2004.

THIS
PERIOD

Groundwater Recharge Coordinating Committee (GRCC)

The GRCC meets monthly to monitor and coordinate the Recharge Facilities Improvement Project, focusing on design issues, construction management, and operations manuals. Watermaster's FY2004-05 budget provides \$413,000 for current operation and maintenance activities.

In addition to design review, the GRCC has initiated work on individual operations procedures for all the recharge basins, as well as obtaining regulatory agency approvals and permits.

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

These program elements focus on the shift of production in the southern end of the Basin away from agricultural uses and toward urban uses. Without the OBMP, this land use conversion would result in a decrease in production in the southern end of the Basin, ultimately leading to rising water levels. If groundwater levels in the southern end of the Basin rise too high, then water may "spill" out of the Basin into the Santa Ana River. Such uncontrolled spillage caps the overall Safe Yield of the Basin. The Basin can be managed to avoid this possibility.

Directly tied to the threat of rising water levels in the southern area is the diminished desire of appropriators in the southern end of the Basin to pump water because of impaired water quality. The ability to compensate for the loss of agricultural production with increased appropriative production is inhibited because of these water quality concerns. Greater appropriative production in this area therefore requires water treatment, an issue addressed through the construction of desalter facilities.



The Chino I/II Desalters

BACK-
GROUND

The Chino I Desalter was originally constructed by SAWPA to provide 8.1 million gallons per day (MGD) of product water using reverse osmosis treatment. The project also included extraction wells, raw water pipeline, and product water pipelines and pump stations.

THIS
PERIOD

Chino I Expansion/Chino II Desalter. This expansion includes the construction of an additional 4.9 MGD of parallel treatment capacity (nitrate removal via ion exchange) at Chino I and 10 MGD of similar ion exchange at the Chino II Desalter. A construction contract was signed and construction is underway with completion scheduled for March 2005. Watermaster staff reviewed the proposed well construction for the new wells for Desalter II and determined that the location and construction were consistent with the OBMP Implementation Plan

ON
GOING

Chino I Desalter Other Improvements. Other facilities either under design or construction include three new extraction wells (construction completed), a raw water pipeline (construction 80% completed), a Chino Hills pump station and product water pipeline (construction 35% completed), and a volatile organic compound (VOC) treatment system (construction 35% completed) ahead of the ion exchange treatment.

ON
GOING

Chino II Desalter Other Improvements. Other facilities either under design or construction include nine new extraction wells (seven under construction, two wells completed), four raw water pipelines (two in early construction, two in design), two product water pipelines (one completed construction, one completed design), and site improvements (construction underway).

All the projects underway to expand the Chino I/II Desalters should be completed by March 2005.

PROGRAM ELEMENT 4 – DEVELOP AND IMPLEMENT COMPREHENSIVE GROUNDWATER MANAGEMENT PLAN FOR MANAGEMENT ZONE 1

Program Element 4 details the steps undertaken by Watermaster to reduce or abate subsidence and fissuring in Management Zone 1.

THIS
PERIOD

The MZ1 Technical Committee Meetings – July 21, 2004 and August 25, 2004. Committee representatives were informed of the status of the various efforts to implement the monitoring program (see Land Surface Monitoring of Program Element 1). The meetings focused on the rehabilitation of the deep piezometers, the Associated Engineers (AE) semi annual survey of the Ayala Park Array of benchmarks, the Vexcel cost estimate and schedule for the InSAR studies, and the analysis of piezometric and extensometer data.

Voluntary Forbearance. The City of Chino and the City of Chino Hills submitted certifications documenting their respective voluntary participation in forbearance of groundwater production. Through the end of June 2004, the City of Chino submitted documentation of pumping reductions of 1,718 acre-feet toward its forbearance goal of 1,500 acre-feet for 2003/2004. The City of Chino Hills submitted documentation of forbearance of 1417 acre-feet through April 2004, and a credit of 83 acre-feet for May 2004.



Agency	Forbearance through June 2004	Forbearance Goal 2003/2004
City Of Chino	1718 acre-feet	1,500 acre-feet
City Of Chino Hills	1500 acre-feet	1,500 acre-feet

TO
COME

Pending Legal Actions Regarding Subsidence. In its October 17, 2002 Order, the Court ordered Watermaster to keep the Court apprised of any legal actions that could question the Court's jurisdiction over subsidence. Watermaster is not aware at this time of any such actions. The hearing regarding the City of Chino's Paragraph 15 Motion concerning subsidence was continued by the court until September, 2005.

**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 SALT MANAGEMENT PROGRAM**

The "water quality committee" as envisioned in the OBMP Implementation Plan has been formally constituted. Since the development of the OBMP, Watermaster has worked closely with the Regional Water Quality Control Board, the Department of Toxic Substances Control, and others to define water quality challenges and to refine the water quality management criteria in the Chino Basin. Watermaster continues to review water quality conditions in the Basin and to consider future water quality management activities beyond the Chino Basin desalting program.

BACK-
GROUND

Water Quality Management. In response to the results of RWQCB and Watermaster's groundwater quality monitoring programs (Program Element 1) Watermaster has refined its water quality monitoring to focus on the following key areas:

- Watermaster is identifying and characterizing water quality anomalies, such as the VOC anomaly south of the Ontario International Airport (OIA). Status Reports on each of the anomalies were developed by Watermaster and were presented to the Water Quality Committee for their review.
- Watermaster staff receives and reviews all reports that are produced by dischargers that are conducting investigations under order by the RWQCB and the Department of Toxic Substances Control (DTSC).
- Watermaster staff is assisting the RWQCB with research, monitoring, and the crafting of investigative, and cleanup and abatement orders for potential dischargers involved with the OIA.
- Watermaster staff continues to participate in the process of developing TMDLs for Reach 3 of the Santa Ana River and other water bodies in the lower Chino



Basin. No progress has been made during the last quarter because of the State budget crisis and staffing issues at the RWQCB.

Water Quality Committee

Watermaster staff and consultants continue to update our understanding of the contaminants of concern in the various plumes, and the extent of their migration and remediation. In addition, Wildermuth Environmental continued their analysis of the environmental records search performed by EDR. This consisted of a query of state and federal databases of known users and dischargers of potentially hazardous chemicals. Watermaster is analyzing the relationship of potential sources of perchlorate with down gradient impacted production wells. On March 30, 2004, Black & Veatch delivered their "Draft Technical Memorandum --Treatment Technology Review" which analyses current and emerging treatment technologies for specific contaminants of concern in the Chino Basin; including nitrates, perchlorate, arsenic, and specific VOCs.

With respect to the VOC plume at OIA, Wildermuth Environmental completed their data gathering effort at the RWQCB and prepared five draft Letters of Notification/Cleanup and Abatement Orders for review by the RWQCB prior to their mailing to identified potential dischargers. At the Chino Airport VOC plume, Watermaster obtained permission from private well owners to release VOC water quality data to the RWQCB. Tetra Tech, a consulting engineering firm performing quarterly groundwater monitoring of the VOC plume immediately southwest of the airport property in turn obtained these data from the RWQCB to assist in their efforts to model plume movement.

Tetra Tech is under contract to the County of San Bernardino, Department of Architecture and Engineering, the owner and operator of Chino Airport, and is attempting to determine the sources of the VOC plume. Tetra Tech is currently negotiating to install five additional groundwater monitoring wells, and to perform additional soil gas surveys, in order to locate the VOC sources. Watermaster's water level and water quality monitoring programs over the last several years have resulted in a robust database that is being used by Watermaster and other stakeholders in the basin to help answer these kinds of questions.

With respect to perchlorate in MZ-3, a number of wells in the Fontana area of Chino Basin have been impacted and shut down because of relatively low levels of perchlorate (but above the State Action Level of 6 µg/l). Some parties in the basin believe that significant perchlorate sources near the Mid-Valley Landfill (Goodrich, Aerojet, Quickset, Emhart Industries, Denova Environmental, Pyro Spectacular, Rialto Ammunition Storage Point, et al.) in the Rialto-Colton basin may also be sources of perchlorate in Chino Basin. The proposed transport pathway is leakage across the Rialto-Colton Fault. Members of the WQC proposed that Watermaster perform a hydrogeologic investigation of that area to better understand cross basin transport. The investigation may be prohibitively expensive, given the complexity of the fault system and aquifer heterogeneity.

In a related study, the RWQCB has done an extensive historical perchlorate usage literature review and has produced a sizable volume of circumstantial evidence that large quantities of Chilean fertilizer may have been used for citrus in the Fontana area.

Neil Sturchio, Professor and Head of the Earth and Environmental Sciences at the University of Illinois at Chicago, has developed a technique for using stable isotope ratios of oxygen and chloride to distinguish the origin of perchlorate (man-made or Chilean fertilizer). Natural perchlorate carries a unique ¹⁸O and ³⁷Cl signature – very robust parameters that can be used to distinguish between man-made and natural sources of perchlorate. Professor Sturchio has

BACK-
GROUND

THIS
PERIOD

TO
COME



tested several samples of leachate from fertilizer nitrogen (from the Atacama Desert in Chile) and rocket fuel sources. One of the innovations that Professor Sturchio has developed is the use of a flow-through column with an bifunctional anion-exchange resin. This is required to concentrate the typically low levels of perchlorate in groundwater so that the perchlorate can be analyzed isotopically..

Watermaster intends to utilize this isotopic perchlorate analysis to determine if source of the perchlorate in groundwater MZ-3 is anthropogenic or from Chilean fertilizer..

Watermaster and Regional Board Propose TDS and Nitrogen Objectives to Promote Maximum Benefit of Waters Available to the Chino Basin

BACK-
GROUND

Watermaster staff worked with the Total Dissolved Solids (TDS)/ Nitrogen (N) Task Force to revise the sub-basin boundaries, and the TDS and N objectives for the Chino Basin to promote maximum beneficial use of waters in the Basin (as opposed to the Regional Board's current, more rigid anti-degradation based objectives). The maximum beneficial use approach will increase water supplies and lower costs over time while meeting water quality requirements. In December 2002, Watermaster proposed specific water-quality management zone boundaries, and N and TDS objectives for the Chino Basin to the RWQCB. The TDS/N Task Force and the RWQCB incorporated Watermaster recommendations in the TDS/N Basin Plan Amendment dated November 21, 2003.

The Basin Plan Amendment incorporating the sub-basin boundaries and maximum beneficial use concept was adopted by the RWQCB on January 24, 2004 (RWQCB Basin Plan Amendment, and Attachment to Resolution No. R8-2004-001). Watermaster staff immediately developed and submitted surface water and groundwater monitoring programs to the RWQCB on February 21, 2004. These monitoring programs measure the progress of CBWM and IEUA in achieving the "maximum benefit" goal for TDS/N in the Chino and Cucamonga Basins. The Basin Plan amendment was reviewed and approved by the State Water Resources Control Board (SWRCB) on September 8, 2004. It is currently under review by the Office of Administrative Law (OAL) and U.S. Environmental Protection Agency (USEPA)..

BACK-
GROUND

Cooperative Effort to Determine State of Hydraulic Control. One remaining issue regarding the Basin Plan changes was to develop a monitoring plan to evaluate the state of hydraulic control in the southern end of the Basin. Hydraulic control is one tool that can be used to maximize the safe yield of the Basin. Watermaster staff developed a monitoring program for OBMP purposes and described this effort in the Initial State of the Basin Report (October 2002). The execution of this monitoring program is included in Program Element 1. Watermaster and IEUA have collaborated with OCWD and the RWQCB to select existing wells and to site nine new multi-piezometer wells that will be used to monitor and assess the state of hydraulic control

In addition to being a core element of the OBMP, hydraulic control is a requirement of the Basin Plan Amendment. Watermaster, OCWD, and RWQCB staffs developed a conceptual monitoring program in June 2003 to assess the state of hydraulic control and to provide information to Watermaster to manage future production and recharge. The final work plan for the Hydraulic Control Monitoring Program was completed in May 2004, and implementation is now occurring. This program will change over time as new information is developed and will last for several years. The coordination and review of the hydraulic control monitoring data and the



development of management programs to maintain hydraulic control have been added to Program Elements 6 and 7.

Watermaster, IEUA, OCWD, and the Regional Board have agreed to construct nine new monitoring wells as part of the piezometric monitoring element of the HCMP. These monitoring wells are necessary because existing well locations and well construction are not sufficient to measure the extent of hydraulic control in the vicinity of the Desalter well fields and because of the loss of monitoring use of agricultural wells as these wells are destroyed in the land conversion from agricultural to urban uses. These new wells will document the creation of a regional depression in the piezometric surface, for both the shallow and deep aquifer systems, as a result of Desalter pumping. These wells will be installed during fiscal year 2004/05.

Funding for the construction of the nine monitoring wells will come from Watermaster, IEUA, and other sources. These other sources include \$250,000 from the Local Groundwater Assistance Fund, sponsored by the California Department of Water Resources (DWR) and about \$400,000 from the U.S. Bureau of Reclamation (BOR). The DWR funding will support the construction of two of the nine piezometric monitoring wells; the BOR funding will support construction of three of the nine piezometric monitoring wells.

The following tasks were performed during June-August 2004 for the nine HCMP wells:

- Continued land acquisition efforts for all wells
- Prepared various permits in support of land acquisition efforts
- Completed CEQA/NEPA processes for all wells
- Finalized the IEUA plans and specifications for wells MW-2/-3/-5/-7/-8/-9
- Finalized the IEUA bid package for wells MW -2/-3/-5/-7/-8/-9
- Supported Bureau of Reclamation (BOR) in its preparation of plans and specifications for wells MW-1/-4/-6
- Conducted the pre-bid meeting and site walk for all wells with drilling contractors in conjunction with IEUA/CBWM/BOR on August 5, 2004. IEUA and BOR provided separate bid packages to drilling contractors.

The following tasks are projected to be performed during September-November 2004 for the 9 HCMP wells:

- IEUA and BOR to award separate contracts to drilling contractor(s)
- IEUA to submit and negotiate finalized site acquisition offers to well site landowners
- Prepare and submit well construction permits and fees
- Begin construction of wells in November

THIS
PERIOD

TO
COME



Salt Budget Tool To Establish TDS Objectives

COMPLETED Watermaster has developed a salt budget tool to estimate the current and future salt loads to the Basin and the salt benefits of the OBMP. This tool was used to establish TDS objectives for the northern part of the Basin based on maximum beneficial use of water available to the region. These projections were based on the water supply plan in the Implementation Plan and include alternative recycled water and State Project water recharge scenarios. Watermaster consultants prepared a letter report (February 20, 2004) describing the salt budget and the Chino Basin Maximum Benefit Commitment. The commitments require Watermaster and IEUA to take specific actions triggered by ambient water quality and other time-certain conditions. An implementation schedule is specified, with the RWQCB responsible for overseeing compliance.

PROGRAM ELEMENT 8 – DEVELOP AND IMPLEMENT GROUNDWATER STORAGE MANAGEMENT PROGRAM; AND

PROGRAM ELEMENT 9 – DEVELOP AND IMPLEMENT STORAGE AND RECOVERY PROGRAM

This section summarizes the work accomplished to date and the work planned over the next few months for the Chino Basin Dry Year Yield (DYY) and Storage and Recovery Programs. The DYY Program is a conjunctive use program between the Metropolitan Water District of Southern California (MWDSC) and several Basin appropriators, which would develop a maximum of 100,000 acre-feet of storage. These Programs also explore the potential for using up to 500,000 acre-feet of storage capacity.

BACK-GROUND **Completed Preliminary Design Report.** The first draft of the DYY Preliminary Design Report was completed in July 2003 and submitted to Watermaster. The DYY Program documentation is organized into four volumes: Volumes I and II, prepared by Black & Veatch, comprise the Preliminary Design Report (PDR). Volume I describes the background information and design objectives of the Program, while Volume II describes the facilities to be designed to help the agencies meet their shift obligation. Volume III presents the groundwater modeling report developed by Wildermuth Environmental, Inc., and Volume IV contains the CEQA Findings of Consistency environmental documentation prepared by Tom Dodson and Associates.

ON GOING **DYY Shift Obligation.** Participants in the DYY Program will be required to reduce (shift) their imported water usage by a predetermined amount during a dry year. Each participating agency will have a specific shift obligation that, when added together, will provide MWDSC with 33,000 acre-feet of dry year yield. The shift obligations were determined through meetings and correspondence among IEUA, Watermaster, Black & Veatch, and representatives from each participating agency.

The eight participating agencies are as follows:



• City of Chino	• Monte Vista Water District (MVWD)
• City of Chino Hills	• City of Ontario
• Cucamonga Valley Water District (CVWD)	• City of Pomona
	• City of Upland
• Jurupa Community Services District (JCSD)	

Facility Requirements and Site Selection. A preliminary screening of potential sites identified the most feasible locations for the DYY Program facilities. The information was presented to the agencies and a final selection was made. The Program facilities consist of five new ion exchange (IX) facilities, expansion of two existing IX facilities, construction of seven new non-water quality impaired wells, and two new perchlorate wellhead treatment facilities. The new wellhead IX facilities would contribute approximately 18,000 acre-feet of dry year yield, while the new well facilities would contribute approximately 15,000 acre-feet of additional yield. The total capital cost for the facilities is estimated to be \$38 million. MWDSC will contribute approximately \$27 million. The Groundwater Storage Program Funding Agreement between MWDSC, IEUA, Three Valleys Municipal Water District (TVMWD), and Watermaster was signed in July 2003.

ON
GOING

Final Design of PDR Facilities. The designs for the facilities outlined in the PDR are either under way, completed, or will commence shortly. All design documents are scheduled to be completed by September 2004.

BACK-
GROUND

Final Approval of DYY Storage Account Pursuant to Article X of Watermaster's Rules and Regulations, IEUA submitted an Application to enter into a Storage and Recovery Program Storage Agreement. This Application was approved unanimously by all Pools and received unanimous approval from the Advisory Committee and Board on October 23, 2003. Watermaster and IEUA developed a storage agreement pursuant to the Application and processed that agreement through the Watermaster approval process in March 2004. The agreement was submitted to the Court for approval. Prior to Court approval, MWDSC is utilizing its existing Trust Storage Account with the intention of transferring its water stored in the Trust Account into the DYY account upon approval of the Storage Agreement.

BACK-
GROUND

Groundwater Modeling. The Chino Basin groundwater model was completed and the draft modeling report was submitted to Watermaster in July 2003. In addition to evaluating the effects of the DYY program on the Basin, the model was used to:

- Develop draft future replenishment and wet water recharge criteria based on requirements described in the Section 7.1b of the Watermaster Rules and Regulations regarding the balance of recharge and discharge. (See Wildermuth, Analysis of Supplemental Water Recharge Pursuant to the Peace Agreement. To be filed with the Court.)
- Evaluate the cumulative effects of transfers among the Parties as described in Section 9.3 of the Watermaster Rules and Regulations. (See Wildermuth, Evaluation of the Cumulative Effects of Transfers Pursuant to the Peace Agreement. To be filed with the Court)



- Describe pumping patterns in Management Zone 1 that will not reduce piezometric levels below current conditions.

These management criteria were incorporated into the DYY program. The results of this work were presented to the Pool Committees, Advisory Committee, and the Watermaster Board in June and August 2003, and the final report was submitted in September 2003.

BACK-
GROUND

Engineering Review and Determination of the Operational Storage Requirement and Safe Storage. The Operational Storage Requirement was defined in the Peace Agreement as part of the storage in the Chino Basin "necessary to maintain the safe yield" of the Basin (Peace Agreement, Exhibit B – Implementation Plan, page 37). Safe storage is the maximum storage in the Basin that can occur without significant water quality and high groundwater related problems. The draft results of this work were presented to the Pool Committees, Advisory Committee, and the Watermaster Board in August 2003.

ON-
GOING

Other Uses of the Groundwater Model in the OBMP Implementation. The groundwater model is currently being used to investigate alternative management strategies including reduced storage in the eastern part of the basin, expanded storage and recovery programs, and assessing hydraulic control with various appropriator proposed pumping alternatives in the southern Chino Basin. A draft report documenting the modeling effort and related investigations will be submitted to Watermaster during the next reporting period.

CONCLUSION

THIS
PERIOD

This has been an active reporting period for Watermaster, with major activities on a number of issues:

- Construction on Bid Packages 1 and 2 of the Recharge Facilities Improvement Project was accepted, and construction on Bid Packages 3-7 is progressing on schedule. Demonstration projects for recharge in College Heights, Montclair and Brooks Basins were undertaken.
- The groundwater level and quality monitoring programs have been reorganized to better support new initiatives, such as MZ1, HCMP, Nitrogen Loss, and Desalter Expansion. Selected wells are being equipped with automatic measuring and recording devices to continually collect water level data at wells at frequent intervals. Field sampling and laboratory analyses used in FY 2003/04 have transitioned to the new monitoring program.
- Planning and design of nine new HCMP monitoring wells was completed.
- Updated status reports were developed for Chino Basin plumes at Kaiser, GE Flat Iron, GE Test Cell, OIA and Chino Airport. An initial evaluation of potential perchlorate sources and plumes was undertaken based on an EDR database.
- Data from the Ayala Park Extensometer indicated that deformation within the aquifer system sediments has been primarily elastic compression and expansion during the 2003 pumping season and the FY2003/04 recovery season. Additional test protocols are being developed for FY2004-05.



- Following the resignation of John Rossi, the former Watermaster CEO, an extensive search was undertaken and Kenneth R. Manning was offered the position of new Watermaster CEO.

EXHIBIT

“B”

Chino Basin Watermaster Status Report No. 13

(Covering September 2004 through December 2004)



January 2005



OPTIMUM BASIN MANAGEMENT PROGRAM

In its Order of September 28, 2000, extending the term of the nine-member Watermaster Board, the Court ordered Watermaster to provide semiannual reports regarding the progress of OBMP implementation. In Status Report Number 4, filed with the Court on September 30, 2002, Watermaster notified the Court that Watermaster intended to provide quarterly status reports because of the rapid pace of OBMP implementation. By a subsequent Order of October 17, 2002, the Court added additional reporting items to the quarterly status report. An additional month (December 2004) was added to Status Report No. 13 so that the Watermaster reporting schedule aligns with traditional practice.

This Status Report Number 13 is filed pursuant to this revised schedule and reports on the period from September 1, 2004 to December 31, 2004.

PROGRAM ELEMENT 1 – DEVELOP AND IMPLEMENT COMPREHENSIVE MONITORING PROGRAM

Groundwater-Level Monitoring

BACK-
GROUND

Watermaster has three active groundwater-level monitoring programs operating in the Chino Basin – a semiannual basin-wide program; an intensive key well monitoring program associated with the Chino I / II Desalter well fields and the Hydraulic Control Monitoring Program (HCMP); and an intensive piezometric monitoring program associated with land subsidence and ground fissuring (see Land Surface Monitoring below) in Management Zone 1 (MZ1).

THIS
PERIOD

For the semiannual program, Watermaster staff manually measures water levels in approximately 345 agricultural wells twice per year. In conjunction with the semiannual program, Watermaster staff manually measures water levels at about 107 key wells in the southern portion of the Basin and around the Chino I / II Desalter well fields once per month. Pressure transducers/data loggers are installed in 19 of these key wells to automatically record water levels once every 15 minutes. For the MZ-1 program, Watermaster consultants collect groundwater level data at 35 wells in the southern portion of MZ1. Data are collected manually at MZ1 wells once every two months, and automatically once every 15 minutes using a pressure transducer/data logger installed at each well.

These Watermaster 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 maintained at Watermaster's office.

TO
COME

During fiscal year 2004/05, Watermaster staff will expand the use of pressure transducers/data loggers. Watermaster staff will purchase and install about 15-18 additional pressure transducers/data loggers at HCMP wells that are currently being drilled. During fiscal year 2005/06, Watermaster staff will purchase and install about 20 additional pressure



transducers/data loggers at key wells and at selected wells in the northern portions of Chino Basin where highly-detailed groundwater level data are scarce.

Groundwater-Quality Monitoring

Prioritizing Wells to Serve Multiple Purposes. The private wells chosen for the 2004-05 water quality monitoring program are located primarily between Interstate 60 and the Santa Ana River (SAR).

BACK-
GROUND

Water Quality Analyses

- All groundwater samples are analyzed for general mineral and general physical parameters.
- Wells within or near the two volatile organic compound (VOC) plumes south of the Ontario and Chino Airports are being analyzed for VOCs, in addition to the general mineral and general physical parameters.
- All private wells in the key well program are being analyzed for perchlorate because of its widespread occurrence in the 1999-2001 sampling program, and the concerns expressed by appropriators faced with expensive ion exchange treatment costs for perchlorate-contaminated wells.

Sampling Program of Selected Private Wells. Watermaster developed its streamlined, key-well water quality monitoring program in which approximately 114 private "key wells" are sampled bi-annually (i.e. once every two years) in the southern portion of Chino Basin. Therefore, approximately 57 wells will be sampled on an annual basis. The steps taken in determining the key wells were:

- The basin was divided into a grid, with each grid cell being 2000 square meters (m²).
- For each grid cell, the average TDS and NO₃ values were calculated (using the last five years of available data).
- The water quality data of each individual well were examined. Wells most closely matching the average constituent concentrations were chosen as representative. One to two wells in each grid square were retained (the wells not chosen in the key well program, but still matching these criteria, are the alternate wells for each grid cell). Preference was given to wells with the following characteristics:
 - Known construction;
 - Choice as a groundwater level key well;
 - Likelihood of surviving regional land development.
- Basin-wide TDS and NO₃ arithmetic averages were recalculated using just the key wells and compared to the total basin arithmetic averages. New maps were made representing the water quality conditions of the key wells and qualitatively compared to the original basin maps.



Watermaster continues a comprehensive water quality program whereby water quality data from other sources are routinely collected, quality-control checked and loaded into Watermaster's database. Data sources included:

- Appropriators
- Department of Health Services (DHS) – these data are currently downloaded from DHS annually
- Department of Toxic Substance Control (DTSC) for the Stringfellow Acid Pits
- Regional Water Quality Control Board (RWQCB) for water quality data associated with sites under Cleanup and Abatement Orders (CAO).

THIS PERIOD
Watermaster is working closely with the Appropriative Pool members and their state-certified contract laboratories in order to obtain water quality data as an electronic data deliverable (EDD). These data are transmitted either directly from the laboratory or from the Appropriators, after their QA/QC check of the laboratory data. The EDDs will enhance the quality and timeliness of the Watermaster's database.

TO COME
With respect to the recharge of recycled water, Watermaster and IEUA are designing a number of monitoring wells at recharge basins to monitor the influence of recharge on groundwater levels in general, and to monitor the water quality resulting from the recharge of supplemental and storm waters. At least one monitoring well will be installed downgradient of each recharge facility that receives recycled water. The construction schedule will be included in subsequent status reports.

Groundwater-Production Monitoring

BACK - GROUND
Monitoring of Agricultural Production Wells. Initially production monitoring involved the installation of meters on wells operated by members of the Agricultural Pool. As of the end December 2004, Watermaster counted about 482 active agricultural wells and equipped 349 of these wells with operating meters. The other 133 wells have or will become inactive within 18-24 months because of urban development in the south Chino area or have inoperable meters.

ON GOING
All Producing Wells Are Monitored Quarterly. Watermaster staff reads the newly installed and/or rehabilitated meters on the agricultural wells quarterly. A "water duty" method is used to estimate production at agricultural wells that do not have meters

TO COME
Need For Water Use/Disposal Form To Be Reviewed. The OBMP Implementation Plan includes a provision that requires the agricultural producers to submit a water use/disposal form describing the sources of water used by each producer and how that water is disposed of after each use. Filling out the water use and disposal form and reporting the results have not been implemented. Watermaster will initiate discussions of the need for this form with the Water Quality Committee

Surface-Water Monitoring

BACK - GROUND
Measure Water Quality and Water Levels In Recharge Basins. Watermaster conducts a surface water monitoring program to characterize the water quality of water in recharge basins and the water levels in some of these basins. The purpose of this program is to estimate the volume and quality of recharge. This information will be used in subsequent years to estimate the safe yield of the Basin and for other management purposes.



ON
GOING

Currently, Watermaster monitors the water quality in 20 basins: Upland, Declez, Etiwanda Spreading Grounds, Victoria, Hickory, Lower Day, Banana, Ely 1, Ely 3, Wineville, San Sevaine 1, San Sevaine 5, Turner 1, Princeton, Montclair 1, Montclair 2, Montclair 3, Montclair 4, Brooks, and Grove. Generally, the water quality samples are taken after storm events, i.e., during the period from November 1 through March 30; however, monitoring of nuisance flows also occurs. Each basin is usually sampled three to five times each year. In fiscal year 2005-06 the sampling rate will increase substantially for basins that are scheduled to receive recycled water

THIS
PERIOD

Watermaster staff sampled the storm water captured on the following dates in the named basins:

- 10/22/04 - Montclair 1-4;
- 10/25/04 - Lower Day, Ely 1-3, San Sevaine, and Turner 1;
- 10/26/04 - DeClez, Banana, Wineville, San Sevaine 5;
- 10/28/04 - DeClez, Wineville, Turner 1, 8th Street;
- 10/29/04 - San Sevaine 5, Brooks, Grove; and
- 11/30/04 - Victoria and Grove.

BACK-
GROUND

Surface Water Monitoring for Santa Ana River Began In June 2003. One of the goals of the OBMP is to maximize Chino Basin yield. A key component in maximizing yield is to minimize groundwater discharge into the SAR. Watermaster developed a surface water monitoring program for the SAR that, in conjunction with Watermaster groundwater monitoring programs, is used to characterize those reaches of the SAR that are gaining water from the Basin, and to determine if significant discharge of Chino Basin groundwater to the SAR is occurring. A conceptual monitoring plan involving IEUA, OCWD, the RWQCB, and Watermaster was finalized. These agencies determined that the conceptual monitoring plan was adequate and developed a detailed work plan to implement a surface water and groundwater monitoring program. The work plan was completed in June 2003, and year-round water quality sampling and flow monitoring in the SAR have begun.

ON
GOING

Watermaster now measures the SAR flow and selected water quality parameters as key elements of the HCMP. Watermaster collects water quality samples and measures flow at four Santa Ana River stations (Van Buren, Etiwanda, Hamner, and River Road) plus another eight locations on tributaries, year round on a bi-weekly basis. In addition, Watermaster obtains discharge data from permanent USGS and OCWD stream gauge locations on the SAR and its tributaries. Discharge and water quality data from publicly owned treatment works (POTWs) that discharge to the SAR in this reach are obtained from the POTWs.

Land-Surface Monitoring

BACK-
GROUND

Multifaceted Approach. Watermaster staff developed a multifaceted land surface monitoring program to develop data for a long-term management plan for land subsidence in Management Zone 1 (MZ1). The monitoring program consists of three main elements:



1. An aquifer system monitoring facility is located in the southern portion of MZ1, an area that has experienced concentrated and differential land subsidence and ground fissuring. A major component of the aquifer system monitoring facility is a cluster of multiple depth piezometers that measure water level and pressure changes at 11 different depths. Another major component is a dual borehole extensometer that measures deformation within the aquifer system at deep and shallow levels. Together, the two components correlate the hydraulic and mechanical responses of the aquifer system to different aquifer stresses, such as pumping at wells.
2. Synthetic aperture radar interferometry (InSAR) measures land surface deformation across the entire Chino Basin using remote sensing techniques.
3. Benchmark surveys along selected profiles of the Chino Basin. The benchmark surveys (1) establish a datum from which to measure future land surface deformation, (2) "ground-truth" the InSAR data, (3) allow determination of historical subsidence at any historical benchmarks that can be recovered, and (4) evaluate the effectiveness of the long-term management plan.

Depth Specific Data. Permanent transducers and data logging equipment are recording depth specific groundwater level data at the Ayala Park piezometers. Transducers also are recording groundwater level data at wells owned by the cities of Chino and Chino Hills and the California Institution for Men (CIM). These transducers record groundwater levels at all wells once every 15 minutes, and also record "on/off" pumping cycles at the active production wells.

ON
GOING

Deep Aquifer-System Stress Test.

Controlled aquifer-system stress (pumping) tests in October 2003 and April 2004 provided piezometric response data that revealed a potential groundwater barrier within the sediments below about 300 ft-bgs, as evidenced by a lack of water level response in CH-18 (east of the fissure zone) due to pumping at CH-19 (west of fissure zone). Image-well analysis of pumping-test responses indicates that this barrier approximately coincides with the location of the historic zone of ground fissuring. This spatial coincidence suggests a cause-and-effect relationship between the barrier, the steep gradient of subsidence across the barrier as indicated by InSAR, ground level surveys and the ground fissuring.

BACK-
GROUND

Starting on September 1, 2004, Watermaster began a controlled deep aquifer-system stress test. In summary, the test provided constant discharge from two wells owned by the City of Chino Hills (CH-15B and CH-19); while most other wells in the area remain off. These wells have similar perforated intervals from about 300-1,100 ft-bgs and primarily influence water levels in the deep portions of the aquifer system – deeper than about 300 ft-bgs. The pumping test ended on October 6, 2004 {Note: CH-1B was also planned to pump during the test, but high ph levels at this well precluded pumping}

THIS
PERIOD

The primary objective of this test was to transition the deformation of aquifer-system sediments from elastic compression to inelastic compaction. It will provide "threshold" piezometric heads at the extensometer location that should not be approached in the future if permanent (inelastic) compaction within the aquifer-system is to be avoided. It defines a key parameter required for estimating the maximum elastic storage capacity of the confined aquifer system. When inelastic



compaction was clearly identified, through analysis of stress-strain diagrams (see discussion below), the pumping test ceased

Other objectives of the stress test were to (1) estimate key aquifer-system parameters that could be used in later modeling efforts, (2) confirm and elucidate the existence of a groundwater barrier within the sediments below about 300 ft-bgs, and (3) provide data for a proposed injection test at CH-1B.

With regard to CH-15B, groundwater pumped from this well has relatively high concentrations of arsenic that do not permit pumping this well directly into Chino Hills' distribution system. Yet it was imperative that this well participate in the stress test in an attempt to transition the aquifer-system deformation to inelastic compaction. Watermaster and Chino Hills jointly funded the connection of CH-15B to the storm drain system through a "flush line" discharge pipe, which allowed the pumping of CH-15B during the test.

Deep piezometer rehabilitation. During the summer drawdown in the 2003 it became evident that some degree of intercommunication was developing among the piezometers in the deep cluster (PB) at Ayala Park, and that the deepest piezometer, **PB-1**, and perhaps others, were also intermittently communicating with the much higher heads in the shallow aquifer system. The leakage apparently was occurring through faulty joints in the two-inch PVC casings, although actual breaks in the casings may also exist. Evidence suggests that many of the problems may have resulted from defects in the casing of PB-1 that allowed leakage directly into the gravel envelopes around the screened intervals of shallower piezometers. To the extent that this is true, repair of PB-1 could solve most of the problems.

BACK-
GROUND

Rehabilitation of the PB piezometers was conducted during June/July 2004, using a "well-in-a-well" construction technique. This involved filling the screened interval (5 to 20 ft) of the piezometer casing with coarse, highly permeable sand, which is then topped with about 10 ft of graded medium to very fine sand and silt to form a filter cap of very low permeability. A 1-inch inner pipe, the well within the well, is jetted through the filter cap in an attempt to communicate with the original gravel envelope and surrounding formation. Before final jetting down into position, the inner pipe, temporarily set about 20 ft above the screen, allows water standing in the 2-inch casing to be displaced to the surface while a sealing bentonite grout was pumped down the annulus between the 2-inch casing and the inner pipe.

This technique was tested and refined by experimenting in PB-6, the shallowest of the deep piezometer cluster. Based on the results at PB-6, Watermaster attempted to rehabilitate PB-1 using similar methodologies.

Preliminary evaluation of piezometric data from all piezometers in PB indicates that the rehabilitation procedures were at least partially successful. In particular, PB-2 and PB-4 appear so far to be producing reasonable and accurate data. A comprehensive analysis of the rehabilitation results at PB will commence at the end of the current drawdown season October 2004. Further rehabilitation, if needed, will be recommended at the conclusion of the analysis, along with a detailed description of rehabilitation procedures.

THIS
PERIOD

InSAR. The objective of this task is to characterize ground surface deformation in Chino Basin using Synthetic Aperture Radar Interferometry (InSAR). This analysis will be performed for a

BACK-
GROUND



historical period (1992-2003) and on an on-going basis thereafter. The advantage of InSAR is that it provides a continuous representation of land surface deformation. These data are used to: (1) characterize the time history of land surface deformation in greater spatial and temporal detail than can be accomplished from the available historical ground level survey data, (2) calibrate computer simulation models of subsidence and groundwater flow, and (3) assist in the evaluation of the effectiveness of the long term management plan.

Vexcel Corporation of Boulder, Colorado – a company that specializes in remote sensing and radar technologies conducted a "proof of concept" study of historical synthetic aperture radar data that was acquired over the MZ-1 area. The objective of this study was to generate cumulative displacement maps over relatively short time steps (April to November 1993). The MZ-1 Technical Group deemed the study successful, and approved follow-up study by Vexcel to perform a comprehensive analysis of all historical synthetic aperture radar data (1992-2003) to characterize in detail the time history of subsidence in MZ-1.

Vexcel submitted a cost estimate of \$200,000 to complete the comprehensive analysis of all historical synthetic aperture radar data (1992-2003) to characterize in detail the time history of subsidence in MZ-1. Watermaster budgeted the above amount for InSAR analysis in its fiscal year 2004/05 budget. A contract was executed between Watermaster and Vexcel to complete the work by the first quarter of calendar 2005. Part of the contract includes the presentation of the analysis results by Vexcel staff to the MZ-1 Technical Committee in March 2005.

Benchmark Surveys. The Interim Monitoring Program (IMP) work plan called for the deep extensometer, which is anchored in sedimentary bedrock at about 1,400 ft bgs, to be used as the "starting benchmark" for all survey loops. To accomplish this, a Class-A benchmark was constructed outside the extensometer building to serve as the practical (*i.e.* actual) starting benchmark. To link this benchmark to the deep extensometer pipe, each survey event is begun by referencing the benchmark to a marked spot on one of the piers that supports the extensometer instrument platform. These piers and the instrument platform represent a stable ground surface datum that is used to measure relative vertical displacement between the ground surface and the deep extensometer pipe (recorded every 15 minutes). The vertical displacement recorded at the deep extensometer between survey events, in addition to any vertical displacement measured between the starting benchmark and the pier, is then used to calculate the elevation at the starting benchmark outside the extensometer building. Then, relative vertical displacement between benchmarks is measured across the entire work to obtain current elevations. These comprehensive surveys are planned to be repeated annually during spring season of highest regional water levels.

A key element of the MZ-1 benchmark network is the array of closely spaced benchmarks that have been established across the historic fissure zone in the immediate vicinity of the Ayala Park extensometers (Ayala Park array). At this array, located along Edison and Eucalyptus Avenues, the IMP work plan calls for the semiannual measuring of both vertical and horizontal displacements. These horizontal and vertical displacements are expected to define two-dimensional profiles of land surface deformation that can be related to the vertical distribution of aquifer system compaction and expansion that is being recorded continuously at the extensometers. These surveys are repeated semi-annually during the late spring and early fall periods of highest and lowest water levels – in an attempt to monitor fissure movement that may be associated with elastic and/or inelastic aquifer deformation.

THIS
PERIOD

BACK-
GROUND



In late April 2004, AE performed the annual survey event across the entire network of benchmark monuments, including the measurements of horizontal displacements at the Ayala Park Array of monuments. The results of the ground level surveys to date were presented to the MZ-1 Technical Committee at its July 21, 2004 meeting. Also at this meeting, the project manager from AE made a presentation to describe survey methodologies, accuracy, results, and challenges, as well as answered questions.

The vertical displacement at monuments that occurred from April 2003 to April 2004 was presented. Comparing monument elevations over the April to April time period should reveal the inelastic component of compaction, if any, that may be occurring in the region. The assumption here is that in April 2004 water levels in the region have recovered to the April 2003 levels, thus the measured vertical displacement does not include the elastic component of the aquifer system deformation. Water levels measured as part of the IMP (in the vicinity of Ayala Park) support this assumption. The monuments near Ayala Park showed little to no subsidence over this time period. However, the monuments located in the northern portions of the surveyed area consistently showed subsidence of the land surface (on average about 0.04 feet). Maximum subsidence of about 0.08 feet was recorded at monuments located along Philadelphia Street between Pipeline and Ramona Avenues. Water level data have not yet been collected or analyzed as part of the IMP in these northern portions of the survey area that seemingly are experiencing inelastic subsidence.

The subsidence that occurred in the area over the October 1993 to December 1995 period was measured by InSAR. The subsidence indicated by InSAR data has been interpreted as primarily permanent subsidence caused by inelastic aquifer system compaction. If so, the survey data are indicating that the distribution of inelastic compaction in 2003-04 is significantly different compared to that of the early 1990's. In particular, maximum subsidence of about 1 foot in 1993-95 was measured in the vicinity of Ayala Park by InSAR, whereas in 2003-04 the survey data are indicating minimal subsidence, if any, in this same area.

The horizontal displacements at monuments of the Ayala Park Array that occurred from April 2003 to November 2003 and November 2003 to April 2004, respectively were determined through distance measurements between adjacent monuments, and are based on the assumption that the southeastern monument was stable over the period of measurement. The measurements indicate the elastic nature of the land surface displacement over the course of the pumping and recovery seasons, as well as the apparent presence of a groundwater barrier within the deep aquifer system.

Groundwater production and water level data show that pumping of wells perforated within the deep aquifer system (>300 ft-bgs) causes water level drawdowns in the deep aquifer system on the order of 150 feet. However, these large drawdowns do not propagate east of the fissure zone. During the pumping season of 2003 (April to November) vertical displacement of the land surface (*i.e.* subsidence) was generally greater on the west side of the fissure zone where water level drawdown was greatest. During the recovery season of 2003-04 (November to April) vertical displacement of the land surface (*i.e.* rebound) was again greater on the west side of the fissure zone where water level recovery was greatest.

In other words, the groundwater barrier in the deep aquifer system aligned with the fissure zone causes greater water level fluctuations on the west side of the barrier where the pumping is concentrated. These greater water level fluctuations on the west of the barrier, in turn cause



greater deformation of the aquifer-system matrix which, in turn, causes greater vertical land surface deformation on the west side of the barrier. The InSAR data corroborate the existence of the groundwater barrier by showing maximum subsidence west of the barrier (0.2ft) and virtually no subsidence east of the barrier during the course of one pumping season (April-1993 to September 1993).

In addition, the pattern of horizontal displacement of benchmarks over the pumping and recovery seasons, likely reflects, in part, the differential compaction of the aquifer system across the fissure zone. The horizontal movements of benchmarks in the vicinity of the fissure zone merit further monitoring using the same surveying methods for at least one additional year. The next survey of the Ayala Park array of monuments is planned for April 2005.

Aquifer-System Modeling. The objectives of aquifer-system modeling in MZ-1 are:

- To evaluate fluid withdrawal as the mechanism of historical land subsidence (forensic tool)
- To predict the effects of potential basin management practices on groundwater levels and land subsidence (forecasting tool)

BACK-
GROUND

In other words, if a model can be constructed that simulates past drawdown and associated land subsidence, then the model represents an additional line of evidence that fluid withdrawal was the mechanism of historical and land subsidence. In addition, the model can be used to predict future drawdown and associated land subsidence that would result from potential basin management practices.

Three distinct modeling efforts will take place in sequence:

1. Inverse analytical modeling. This type of modeling will use groundwater level and production data collected as part of the aquifer-system stress testing (pumping tests) that were conducted in 2003 and 2004. The objectives are to determine the hydraulic and mechanical parameters of the aquifer-system and reveal XY-anisotropy. The results will be used in subsequent numerical modeling efforts.
2. One-dimensional compaction modeling. This type of modeling will use groundwater level and aquifer-system deformation data collected at the Ayala Park Extensometer facility. The objective is to determine the aquitard properties in the vicinity of Ayala Park. Areal extrapolation of aquitard properties will be based on geology and InSAR data, and the results will be used in the three-dimensional numerical modeling efforts (below).
3. Three-dimensional groundwater flow and subsidence modeling. This type of modeling will use groundwater level and production data at all wells in the area, and historical land subsidence data from ground level surveys and InSAR. Again, this model will serve as a forensic and forecasting tool for MZ-1.

TO
COME



Development of Long-Term Management Plan. The objective of the long-term management plan is to minimize or abate permanent land subsidence and ground fissuring in MZ-1. The modeling efforts described above will be key to the development and evaluation of this plan.

The OBMP implementation plan called for the development of the long-term management plan for MZ-1 by June 2005. Because the modeling efforts will not be completed by June 2005, the long-term management plan will not be completed by June 2005. The Special Referee has been notified, and has indicated that the IMP progress and current activities are sufficient to warrant a delay in the development of the long-term management plan for MZ-1. A workshop will be scheduled for the second quarter of 2005 to update the Special Referee on IMP progress.

Well Construction, Abandonment, and Destruction Monitoring

BACK-GROUND

Watermaster staff monitors the condition of wells on a regular basis. Wells that may be improperly abandoned/destroyed are reported to Riverside and San Bernardino Counties as they are discovered.

Watermaster staff inspected 150 suspect wells during a 2002-03 field inspection and determined that 113 of these wells were properly abandoned and 37 wells will require some modification to meet the standard for a properly abandoned well. A well repair/abandonment program was prepared and approved by Watermaster. Watermaster continues to develop a wellhead protection program and makes recommendations on closure of abandoned wells. Ongoing land development will require continued well abandonment activity by Watermaster.

**PROGRAM ELEMENT 2 –
DEVELOP AND IMPLEMENT COMPREHENSIVE RECHARGE PROGRAM**

A centerpiece of the OBMP is enhancement of the Basin recharge capacity, so that high quality storm water and available recycled water can be retained in the Basin.

Recharge Facilities Improvement Project (Seven Bid Packages)

Bid Package No. 1—Reconfiguration of Banana, College Heights, Lower Day, RP3 and Turner Basins

COMPLETED

Bid Package No. 1, which included major earthwork at Banana, College Heights, Lower Day, RP-3, and Turner Basins, was awarded to LTE Excavating on March 24, 2003. Work was scheduled for completion by November 15, 2003, but was delayed while awaiting delivery of sluice gates and their actuator assemblies. These items were received and installed; and the bid package was accepted on May 12, 2004

Bid Package No. 2 – Basin Improvements (3 ea), Drop Inlets (3 ea), and Rubber Dams (4 ea)

COMPLETED

Bid Package No. 2 consisted of construction of the drop inlet structures for Brooks Street Basin, Turner Basin; and Victoria Basin; rubber dams for College Heights/Upland Basins, Turner No. 1 Basin, Lower Day Basin, and RP-3 Basin; and various improvements at Declez Basin, Ely Basins, and 8th Street Basins. This package was awarded to Banshee Construction with work



beginning on July 16, 2003. Work on this contract was scheduled to be completed by March 15, 2004, however, rain delays slowed completion of excavation and soil cement berms. All the work on this bid package was accepted on August 18, 2004

Bid Package No. 3 – Jurupa Basin to RP-3 Force Main

THIS PERIOD Bid Package No. 3 involves construction of approximately 11,000 linear feet of 36-inch CML&C force main between Jurupa Basin and RP-3 Basin. The force main will be used to convey storm water, imported water, and recycled water between the pump station at Jurupa Basin and the RP-3 Basins. This package was awarded to W. A. Rasic Construction Company with work beginning on August 6, 2003. The contractor has completed 99% of the work, rendering the project "substantially complete" on November 30, 2004.

Bid Package No. 4 – Jurupa Basin to RP-3 Pump Station

THIS PERIOD Bid Package No. 4 consists of construction of the Jurupa Pump Station, 100 feet of 48-inch pipeline, and 400 feet of 36 inch, CML&C steel force main. The package was awarded to LT Engineering with work beginning on February 19, 2004. The contractor has completed 85% of the work, with "substantial completion" estimated by February 1, 2005.

Bid Package No. 5 – SCADA System

THIS PERIOD This bid package includes the SCADA system and electrical improvements at all the basins. The 100 % design was submitted, reviewed, and sent out for bid in January 2004. The package was awarded to Denboer Engineering with construction beginning in March 2004. The contractor is now 90% complete, with substantial completion in February 2005

Bid Package No. 6 – MWD Turnouts

THIS PERIOD This bid package covers the construction of three new MWD turnouts: CB-11TB and CB-15T on the Rialto Pipeline, and CB-18T on the Etiwanda Intertie near San Sevaine Channel. This package was awarded to Griffith Construction with work beginning on February 4, 2004. The contractor is now 95% completion, with substantial completion in January 2005

Bid Package No. 7 – Priority, Funding and Scope of Misc. Projects

THIS PERIOD This bid package will complete miscellaneous projects not included in the previous bid packages. Among the projects included in this bid package are:

- Habitat Mitigation Area at RP-3
- Upland Basin Improvements
- Victoria Basin Improvements
- Hickory Rubber Dam, Pump Station and Force Main
- Grove Basin SCADA Improvements



This package was bid and awarded to Brutoco Engineering & Construction on July 21, 2004. The construction was estimated to take five months, but rain delays have extended the project 60 days. The package should be "substantially complete" in February 2005.

THIS
PERIOD

Groundwater Recharge Coordinating Committee (GRCC)

The GRCC meets monthly to monitor and coordinate the Recharge Facilities Improvement Project, focusing on design issues, construction management, and operations manuals. Watermaster's FY2004-05 budget provides \$413,000 for current operation and maintenance activities.

In addition to design review, the GRCC has prepared draft operations procedures for all the recharge basins, as well as obtained regulatory agency approvals and permits.

Watermaster has been performing "demonstration" recharge of imported and storm water in the basins as they are completed. These demonstration project have been valuable in pointing out shortcomings in the design and construction of the recharge facilities. During this quarter, Watermaster captured 4,600 AF of "new yield" stormwater in the completed basins.

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

These program elements focus on the shift of production in the southern end of the Basin away from agricultural uses and toward urban uses. Without the OBMP, this land use conversion would result in a decrease in production in the southern end of the Basin, ultimately leading to rising water levels. If groundwater levels in the southern end of the Basin rise too high, then water may "spill" out of the Basin into the Santa Ana River. Such uncontrolled spillage caps the overall Safe Yield of the Basin. The Basin can be managed to avoid this possibility.

Directly tied to the threat of rising water levels in the southern area is the diminished desire of appropriators to pump water because of impaired water quality. The ability to balance the loss of agricultural production with increased appropriative production is inhibited because of these water quality concerns. Greater appropriative production in this area therefore requires water treatment, an issue addressed through the construction of desalter facilities.

The Chino I/II Desalters

The Chino I Desalter was originally constructed by SAWPA to provide 8.1 million gallons per day (MGD) of product water using reverse osmosis treatment. The project also included extraction wells, raw water pipeline, and product water pipelines and pump stations.

BACK-
GROUND



THIS PERIOD

Chino I Expansion/Chino II Desalter. This expansion includes the construction of an additional 4.9 MGD of parallel treatment capacity (nitrate removal via ion exchange) at Chino I and 10 MGD of similar ion exchange at the Chino II Desalter. A construction contract was signed and construction is underway with completion scheduled for March 2005. Watermaster staff reviewed the proposed well construction for the new wells for Desalter II and determined that the location and construction were consistent with the OBMP Implementation Plan

ON GOING

Chino I Desalter Other Improvements Other facilities either under design or construction include three new extraction wells (construction completed), a raw water pipeline (construction completed), a Chino Hills pump station and product water pipeline (construction 70% completed), and a volatile organic compound (VOC) treatment system (construction 55% completed) ahead of the ion exchange treatment.

ON GOING

Chino II Desalter Other Improvements. Other facilities either under design or construction include nine new extraction wells (seven under construction, two wells completed), three raw water pipeline packages (one in early construction, two in design), two product water pipelines (one completed construction, one completed design), and site improvements (construction 55% completed)

All the projects underway to expand the Chino I/II Desalters should be completed by March 2005. Application has been made for Prop. 50 funds (\$1,600,000) to add 8 mgd of ion exchange capacity to the Chino II Desalter.

PROGRAM ELEMENT 4 – DEVELOP AND IMPLEMENT COMPREHENSIVE GROUNDWATER MANAGEMENT PLAN FOR MANAGEMENT ZONE 1

Program Element 4 details the steps undertaken by Watermaster to reduce or abate subsidence and fissuring in Management Zone 1.

THIS PERIOD

The MZ1 Technical Committee Meeting – December 8, 2004. Committee representatives were informed of the status of the various efforts to implement the monitoring program (see Land Surface Monitoring of Program Element 1). The meeting focused on the pumping test results, the Associated Engineers (AE) semi annual survey of the Ayala Park Array of benchmarks, the progress on the Vexcel InSAR studies, and the analysis of piezometric and extensometer data.

Voluntary Forbearance. The City of Chino and the City of Chino Hills submitted certifications documenting their respective voluntary participation in forbearance of groundwater production. Through the end of November 2004, the City of Chino submitted documentation of pumping reductions of 482.5 acre-feet toward its forbearance goal of 1,500 acre-feet for 2004/2005. The City of Chino Hills submitted documentation of forbearance of 500 acre-feet through December 2004.



Agency	Forbearance through December 2004	Forbearance Goal 2004/2005
City Of Chino	482.5 acre-feet	1,500 acre-feet
City Of Chino Hills	500.0 acre-feet	1,500 acre-feet

TO
COME

Pending Legal Actions Regarding Subsidence. In its October 17, 2002 Order, the Court ordered Watermaster to keep the Court apprised of any legal actions that could question the Court's jurisdiction over subsidence. Watermaster is not aware at this time of any such actions. The hearing regarding the City of Chino's Paragraph 15 Motion concerning subsidence was continued by the court until September, 2005.

**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 SALT MANAGEMENT PROGRAM**

The "water quality committee" as envisioned in the OBMP Implementation Plan has been formally constituted. Since the development of the OBMP, Watermaster has worked closely with the Regional Water Quality Control Board, the Department of Toxic Substances Control, and others to define water quality challenges and to refine the water quality management criteria in the Chino Basin. Watermaster continues to review water quality conditions in the Basin and to consider future water quality management activities beyond the Chino Basin desalting program.

BACK-
GROUND

Water Quality Management. In response to the results of RWQCB and Watermaster's groundwater quality monitoring programs (Program Element 1) Watermaster has refined its water quality monitoring to focus on the following key areas:

- Watermaster is identifying and characterizing water quality anomalies, such as the VOC anomaly south of the Ontario International Airport (OIA). Status Reports on each of the anomalies were developed by Watermaster and were presented to the Water Quality Committee for their review.
- Watermaster staff receives and reviews all reports that are produced by dischargers that are conducting investigations under order by the RWQCB and the Department of Toxic Substances Control (DTSC).
- Watermaster staff assisted the RWQCB with research, monitoring, and the crafting of investigative, and cleanup and abatement orders for potential dischargers involved with the OIA.
- Watermaster staff continues to participate in the process of developing TMDLs for Reach 3 of the Santa Ana River and other water bodies in the lower Chino



Basin. No progress has been made during the last quarter because of the State budget crisis and staffing issues at the RWQCB.

Water Quality Committee

Watermaster staff and consultants continue to update our understanding of the contaminants of concern in the various plumes, and the extent of their migration and remediation. In addition, Wildermuth Environmental continued their analysis of the environmental records search performed by EDR. This consisted of a query of state and federal databases of known users and dischargers of potentially hazardous chemicals. Watermaster is analyzing the relationship of potential sources of perchlorate with down gradient impacted production wells. On March 30, 2004, Black & Veatch delivered their "Draft Technical Memorandum –Treatment Technology Review" which analyses current and emerging treatment technologies for specific contaminants of concern in the Chino Basin; including nitrates, perchlorate, arsenic, and specific VOCs.

With respect to the VOC plume at OIA, Wildermuth Environmental completed their data gathering effort at the RWQCB and prepared five draft Letters of Notification/Cleanup and Abatement Orders for review by the RWQCB prior to their mailing to identified potential dischargers. At the Chino Airport VOC plume, Watermaster obtained permission from private well owners to release VOC water quality data to the RWQCB. Tetra Tech, a consulting engineering firm performing quarterly groundwater monitoring of the VOC plume immediately southwest of the airport property in turn obtained these data from the RWQCB to assist in their efforts to model plume movement.

Tetra Tech is under contract to the County of San Bernardino, Department of Architecture and Engineering, the owner and operator of Chino Airport, and is attempting to determine the sources of the VOC plume. Tetra Tech is currently negotiating to install five additional groundwater monitoring wells, and to perform additional soil gas surveys, in order to locate the VOC sources. Watermaster's water level and water quality monitoring programs over the last several years have resulted in a robust database that is being used by Watermaster and other stakeholders in the basin to help answer these kinds of questions.

With respect to perchlorate in MZ-3, a number of wells in the Fontana area of Chino Basin have been impacted and shut down because of relatively low levels of perchlorate (but above the State Action Level of 6 µg/l). Some parties in the basin believe that significant perchlorate sources near the Mid-Valley Landfill (Goodrich, Aerojet, Quickset, Emhart Industries, Denova Environmental, Pyro Spectacular, Rialto Ammunition Storage Point, et al.) in the Rialto-Colton basin may also be sources of perchlorate in Chino Basin. The proposed transport pathway is leakage across the Rialto-Colton Fault. Members of the WQC proposed that Watermaster perform a hydrogeologic investigation of that area to better understand cross basin transport. The investigation may be prohibitively expensive, given the complexity of the fault system and aquifer heterogeneity.

In a related study, the RWQCB has done an extensive historical perchlorate usage literature review and has produced a sizable volume of circumstantial evidence that large quantities of Chilean fertilizer may have been used for citrus in the Fontana area.

Neil Sturchio, Professor and Head of the Earth and Environmental Sciences at the University of Illinois at Chicago, has developed a technique for using stable isotope ratios of oxygen and chloride to distinguish the origin of perchlorate (man-made or Chilean fertilizer). Natural perchlorate carries a unique ¹⁸O and ³⁷Cl signature – very robust parameters that can be used to distinguish between man-made and natural sources of perchlorate. Professor Sturchio has

BACK-
GROUND

TO
COME



tested several samples of leachate from fertilizer nitrogen (from the Atacama Desert in Chile) and rocket fuel sources. One of the innovations that Professor Sturchio has developed is the use of a flow-through column with an bifunctional anion-exchange resin. This is required to concentrate the typically low levels of perchlorate in groundwater so that the perchlorate can be analyzed isotopically.

Watermaster intends to utilize this isotopic perchlorate analysis to determine if source of the perchlorate in groundwater MZ-3 is anthropogenic or from Chilean fertilizer.

Watermaster and Regional Board Propose TDS and Nitrogen Objectives to Promote Maximum Benefit of Waters Available to the Chino Basin

BACK-
GROUND

Watermaster staff worked with the Total Dissolved Solids (TDS)/ Nitrogen (N) Task Force to revise the sub-basin boundaries, and the TDS and N objectives for the Chino Basin to promote maximum beneficial use of waters in the Basin (as opposed to the Regional Board's current, more rigid anti-degradation based objectives). The maximum beneficial use approach will increase water supplies and lower costs over time while meeting water quality requirements. In December 2002, Watermaster proposed specific water-quality management zone boundaries, and N and TDS objectives for the Chino Basin to the RWQCB. The TDS/N Task Force and the RWQCB incorporated Watermaster recommendations in the TDS/N Basin Plan Amendment dated November 21, 2003.

The Basin Plan Amendment incorporating the sub-basin boundaries and maximum beneficial use concept was adopted by the RWQCB on January 24, 2004 (RWQCB Basin Plan Amendment, and Attachment to Resolution No. R8-2004-001). Watermaster staff immediately developed and submitted surface water and groundwater monitoring programs to the RWQCB on February 21, 2004. These monitoring programs measure the progress of CBWM and IEUA in achieving the "maximum benefit" goal for TDS/N in the Chino and Cucamonga Basins. The Basin Plan amendment was reviewed and approved by the State Water Resources Control Board (SWRCB) on September 8, 2004. It is currently under review by the Office of Administrative Law (OAL) and U.S Environmental Protection Agency (USEPA).

BACK-
GROUND

Cooperative Effort to Determine State of Hydraulic Control. One remaining issue regarding the Basin Plan changes was to develop a monitoring plan to evaluate the state of hydraulic control in the southern end of the Basin. Hydraulic control is one tool that can be used to maximize the safe yield of the Basin. Watermaster staff developed a monitoring program for OBMP purposes and described this effort in the Initial State of the Basin Report (October 2002). The execution of this monitoring program is included in Program Element 1. Watermaster and IEUA have collaborated with OCWD and the RWQCB to select existing wells and to site nine new multi-piezometer wells that will be used to monitor and assess the state of hydraulic control.

In addition to being a core element of the OBMP, hydraulic control is a requirement of the Basin Plan Amendment. Watermaster, OCWD, and RWQCB staffs developed a conceptual monitoring program in June 2003 to assess the state of hydraulic control and to provide information to Watermaster to manage future production and recharge. The final work plan for the Hydraulic Control Monitoring Program was completed in May 2004, and implementation is now occurring. This program will change over time as new information is developed and will last for several years. The coordination and review of the hydraulic control monitoring data and the



development of management programs to maintain hydraulic control have been added to Program Elements 6 and 7

Watermaster, IEUA, OCWD, and the Regional Board have agreed to construct nine new monitoring wells as part of the piezometric monitoring element of the HCMP. These monitoring wells are necessary because existing well locations and well construction are not sufficient to measure the extent of hydraulic control in the vicinity of the Desalter well fields and because of the loss of monitoring use of agricultural wells as these wells are destroyed in the land conversion from agricultural to urban uses. These new wells will document the creation of a regional depression in the piezometric surface, for both the shallow and deep aquifer systems, as a result of Desalter pumping. These wells are being installed during fiscal year 2004/05.

Funding for the construction of the nine monitoring wells will come from Watermaster, IEUA, and other sources. These other sources include \$250,000 from the Local Groundwater Assistance Fund, sponsored by the California Department of Water Resources (DWR) and about \$400,000 from the U.S. Bureau of Reclamation (USBR). The DWR funding will support the construction of two of the nine piezometric monitoring wells; the USBR funding will support construction of three of the nine piezometric monitoring wells.

THIS
PERIOD

The following tasks were performed during September-December 2004 for the nine HCMP wells:

- Completed site acquisition efforts
- IEUA and USBR awarded separate contracts to drilling contractor
- Completed drilling, installation, and development on MW-2/-5/-8/-9

TO
COME

The following tasks are projected to be performed during January-March 2005 for the 9 HCMP wells:

- Complete drilling, installation, and development on MW-1/-3/-4/-6/-7
- Complete well heads on all wells (in coordination with property owners who are currently developing the land)
- Equip wells with water level transducers

Salt Budget Tool To Establish TDS Objectives

COMPLETED

Watermaster has developed a salt budget tool to estimate the current and future salt loads to the Basin and the salt benefits of the OBMP. This tool was used to establish TDS objectives for the northern part of the Basin based on maximum beneficial use of water available to the region. These projections were based on the water supply plan in the Implementation Plan and include alternative recycled water and State Project water recharge scenarios. Watermaster consultants prepared a letter report (February 20, 2004) describing the salt budget and the Chino Basin



Maximum Benefit Commitment. The commitments require Watermaster and IEUA to take specific actions triggered by ambient water quality and other time-certain conditions. An implementation schedule is specified, with the RWQCB responsible for overseeing compliance.

PROGRAM ELEMENT 8 – DEVELOP AND IMPLEMENT GROUNDWATER STORAGE MANAGEMENT PROGRAM; AND

PROGRAM ELEMENT 9 -- DEVELOP AND IMPLEMENT STORAGE AND RECOVERY PROGRAM

This section summarizes the work accomplished to date and the work planned over the next few months for the Chino Basin Dry Year Yield (DYY) and Storage and Recovery Programs. The DYY Program is a conjunctive use program between the Metropolitan Water District of Southern California (MWDSC) and several Basin appropriators, which would develop a maximum of 100,000 acre-feet of storage. These Programs also explore the potential for using up to 500,000 acre-feet of storage capacity.

BACK-GROUND

Completed Preliminary Design Report. The first draft of the DYY Preliminary Design Report was completed in July 2003 and submitted to Watermaster. The DYY Program documentation is organized into four volumes: Volumes I and II, prepared by Black & Veatch, comprise the Preliminary Design Report (PDR). Volume I describes the background information and design objectives of the Program, while Volume II describes the facilities to be designed to help the agencies meet their shift obligation. Volume III presents the groundwater modeling report developed by Wildermuth Environmental, Inc., and Volume IV contains the CEQA Findings of Consistency environmental documentation prepared by Tom Dodson and Associates.

ON GOING

DYY Shift Obligation. Participants in the DYY Program will be required to reduce (shift) their imported water usage by a predetermined amount during a dry year. Each participating agency will have a specific shift obligation that, when added together, will provide MWDSC with 33,000 acre-feet of dry year yield. The shift obligations were determined through meetings and correspondence among IEUA, Watermaster, Black & Veatch, and representatives from each participating agency.

The eight participating agencies are as follows:

• City of Chino	• Monte Vista Water District (MVWD)
• City of Chino Hills	• City of Ontario
• Cucamonga Valley Water District (CVWD)	• City of Pomona
• Jurupa Community Services District (JCSD)	• City of Upland

Facility Requirements and Site Selection. A preliminary screening of potential sites identified the most feasible locations for the DYY Program facilities. The information was presented to the agencies and a final selection was made. The Program facilities consist of five new ion



exchange (IX) facilities, expansion of two existing IX facilities, construction of seven new non-water quality impaired wells, and two new perchlorate wellhead treatment facilities. The new wellhead IX facilities would contribute approximately 18,000 acre-feet of dry year yield, while the new well facilities would contribute approximately 15,000 acre-feet of additional yield. The total capital cost for the facilities is estimated to be \$38 million. MWDSC will contribute approximately \$27 million. The Groundwater Storage Program Funding Agreement between MWDSC, IEUA, Three Valleys Municipal Water District (TVMWD), and Watermaster was signed in July 2003.

ON
GOING

Design of PDR Facilities. While some of the designs for the facilities outlined in the PDR are underway (Upland IX design completed, MVWD ASR well design completed, Pomona JCSD Teagarden IX expansion design underway); others such as the IX designs for Chino, Chino Hills, Ontario, and CVWD have yet to be started. These later designs should be completed in 2006.

BACK-
GROUND

Final Approval of DYY Storage Account. Pursuant to Article X of Watermaster's Rules and Regulations, IEUA submitted an Application to enter into a Storage and Recovery Program Storage Agreement. This Application was approved unanimously by all Pools and received unanimous approval from the Advisory Committee and Board on October 23, 2003. Watermaster and IEUA developed a storage agreement pursuant to the Application and processed that agreement through the Watermaster approval process in March 2004. The agreement was submitted to the Court for approval. Prior to Court approval, MWDSC is utilizing its existing Trust Storage Account with the intention of transferring its water stored in the Trust Account into the DYY account upon approval of the Storage Agreement.

BACK-
GROUND

Groundwater Modeling. The Chino Basin groundwater model was completed and the draft modeling report was submitted to Watermaster in July 2003. In addition to evaluating the effects of the DYY program on the Basin, the model was used to:

- Develop draft future replenishment and wet water recharge criteria based on requirements described in the Section 7.1b of the Watermaster Rules and Regulations regarding the balance of recharge and discharge. (See Wildermuth, Analysis of Supplemental Water Recharge Pursuant to the Peace Agreement. To be filed with the Court.)
- Evaluate the cumulative effects of transfers among the Parties as described in Section 9.3 of the Watermaster Rules and Regulations. (See Wildermuth, Evaluation of the Cumulative Effects of Transfers Pursuant to the Peace Agreement. To be filed with the Court.)
- Describe pumping patterns in Management Zone 1 that will not reduce piezometric levels below current conditions.

These management criteria were incorporated into the DYY program. The results of this work were presented to the Pool Committees, Advisory Committee, and the Watermaster Board in June and August 2003, and the final report was submitted in September 2003.

BACK-
GROUND

Engineering Review and Determination of the Operational Storage Requirement and Safe Storage. The Operational Storage Requirement was defined in the Peace Agreement as part of the storage in the Chino Basin "necessary to maintain the safe yield" of the Basin (Peace



Agreement, Exhibit B – Implementation Plan, page 37). Safe storage is the maximum storage in the Basin that can occur without significant water quality and high groundwater related problems. The draft results of this work were presented to the Pool Committees, Advisory Committee, and the Watermaster Board in August 2003.

ON-
GOING

Other Uses of the Groundwater Model in the OBMP Implementation. The groundwater model is currently being used to investigate alternative management strategies including reduced storage in the eastern part of the basin, expanded storage and recovery programs, and assessing hydraulic control with various appropriator proposed pumping alternatives in the southern Chino Basin. A draft report documenting the modeling effort and related investigations will be submitted to Watermaster during the next reporting period.

CONCLUSION

THIS
PERIOD

This has been an active reporting period for Watermaster, with major activities on a number of issues:

- Construction on Bid Packages 3 is substantially complete, but construction on Bid Packages 4-7 are delayed approximately 60 days by winter rains. Demonstration projects for recharge in College Heights, Montclair, Brooks, Turner and Lower Day Basins were undertaken.
- The groundwater level and quality monitoring programs have been reorganized to better support new initiatives, such as MZ1, HCMP, Nitrogen Loss, and Desalter Expansion. Selected wells are being equipped with automatic measuring and recording devices to continually collect water level data at wells at frequent intervals. Field sampling and laboratory analyses used in FY 2003/04 have transitioned to the new monitoring program for FY 2004/2005.
- Construction of nine new HCMP monitoring wells has begun.
- Data from the Ayala Park Extensometer indicated that deformation within the aquifer system sediments has been primarily elastic compression and expansion during the 2004 pumping season. A pumping test in October 2004 is being evaluated to determine the limits of pumping the deep aquifer to provide elastic compression and expansion.
- Cleanup and Abatement Order (CAO) were prepared for five industrial firms which appear to have discharged relative organic compounds from their activities at Ontario Airport. These orders are being completed by the RWQCB.

EXHIBIT

“C”



CHINO BASIN WATERMASTER

9641 San Bernardino Road, Rancho Cucamonga, Ca 91730
Tel: 909.484.3888 Fax: 909.484.3890 www.cbwm.org

KENNETH R. MANNING
Chief Executive Officer

June 8, 2005

Anne Schneider
Ellison & Schneider
2015 H Street
Sacramento, CA 95814

Re: Status Report No 14 (Jan-Mar 2005)

Dear Ms Schneider:

Under the recently approved filing schedule, Watermaster will provide Quarterly Status Letters in April and October of each year, in lieu of the complete Quarterly Status Reports, which will continue to be provided in January and July of each year. The status letters will only report on changes to the current operating procedures during the reporting periods.

Program Element 1 – Develop and Implement Comprehensive Monitoring Program

Groundwater Level Monitoring: Watermaster staff manually measured water levels in agricultural wells, key private wells, and wells around the desalter well field. Watermaster continues to install automated pressure transducers in key wells so that water level data can be collected once every 15 minutes. These data are entered into Watermaster's database.

Groundwater Quality Monitoring. Watermaster samples and analyses groundwater samples from 15 important wells each quarter. These data are then combined with data from other producers (appropriators, DHS, RWQCB) and entered into Watermaster database. Watermaster and IEUA are constructing additional monitoring wells at recharge basins (Hickory, RP-3, DeClez, Turner, and Ely) to monitor water quality resulting from the recharge of supplemental and storm water.

Groundwater Production Monitoring: Each quarter, Watermaster reads the water production at approximately 480 active agricultural wells. The number of measurements decreases each quarter as existing agricultural land is converted into urban usage. Production is estimated at wells that do not have meters. These data are entered into Watermaster's database.

Surface Water Monitoring. Watermaster staff sampled the storm water captured in storm water retention basins on the following dates in the named basins:

June 8, 2005
Ann Schneider2

Montclair 1, 2, & 3	--	1/12/05 & 2/14/05
Montclair 4	---	1/13/05 & 2/15/05
Brooks	---	2/15/05
8 th St 1 & 2	---	2/14/05 & 2/24/05
Ely 1	---	1/05/05, 1/19/05, 2/15/05 & 3/23/05
Ely 3	---	1/14/05, 1/19/05 & 3/24/05
Turner 1	---	1/13/05 & 2/14/05
Turner 3	---	1/13/05, 1/18/05 & 2/14/05
Lower Day	---	1/14/05, 1/18/05 & 2/24/05
Victoria	---	1/18/05 & 2/24/05
San Sevaine 1	---	1/05/05
San Sevaine 5	---	1/05/05
Banana	---	1/14/05, 2/14/05 & 3/24/05
DeClez	---	1/05/05
Wineville	---	2/24/05 & 3/23/05
Grove	---	2/14/05, 3/23/05 & 3/24/05

In addition, Watermaster measured the Santa Ana River flow and water quality at four river stations and eight locations on tributaries. These data will be used in the management of the basin including the elevation of the water quality recharge, groundwater modeling investigations, and assessment of the state of hydraulic control.

Land surface subsidence: In addition to recording groundwater level data at Ayala Park piezometers, Watermaster staff analyzed and reported on the data from the fall 2004 deep aquifer stress test. The stress test provided estimates of key aquifer system parameters, confirmed the existence of a groundwater barrier 300 bgs, and provided data for a proposed injection test at Chino Hills. A contract was executed between Watermaster and Vexcel to complete a comprehensive analysis of historical (1992-2003) synthetic aperture radar data to characterize the time history of subsidence in MZ-1. Finally, the semi-annual survey data showed that pumping of wells perforated in the deep (>300' bgs) aquifer system causes greater vertical displacement of the land surface (subsidence) on the west side of the fissure zone, than on the east side.

Program Element 2 – Develop and Implement Comprehensive Recharge Program

Recharge Facilities Improvement Project: The construction status of the seven Bid Package is as follows:

BP1-Reconfiguration of Banana, College Heights, Lower Day, RP-3 and Turner Basins – completed.

BP2- Basin Improvements, Drop Inlets, and Rubber Dams – completed

BP3- Jurupa Basin to RP-3 Force Main – completed

BP4- Jurupa Basin to RP3 Pump Station – completed

BP5- SCADA System – 90% constructed, with programming and testing to be completed by June 30, 2005

BP6- MWD Turnouts – completed

BP7- Miscellaneous Projects – 90% constructed, with final punch list to be completed by April 30, 2005

IEUA/CBWM are currently designing enhancements to be added to the existing 18 recharge basins over the next 18 months.

June 8, 2005
Ann Schneider3

Groundwater Recharge:

The GRCC meets monthly to focus on facility operations and maintenance, redesign of facility shortcomings, and planning new facilities. A Second Draft Facilities Operating Procedures Manual was completed, and 14,500 AF of storm water were captured thus far in the FY2004-2005 storm season.

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

Program Element 5 – Develop and Implement Regional Supplemental Water Program

The following facilities at the Chino I Desalter Expansion are at least 90% complete: well drilling and equipping, raw water pipeline, on-site improvements, and the Chino Hills product water pipeline and pump station. The ion exchange treatment facilities are 75% complete. At the Chino II Desalter, the following facilities are at least 90% complete; six extraction wells, on-site improvements including ion exchange, and the product water pipeline and brine line. Other facilities, principally pipelines and pump stations, are scheduled to be completed in 2006.

Program Element 4 – Develop and Implement Comprehensive Groundwater Management Plan for MZ1

A meeting for the MZ1 Technical Committee, held on March 30, 2005 focused on an analysis of piezometric and extensometer data, the progress of the Vexcel InSAR studies, and the semi-annual survey of the Ayala Park Array of benchmarks.

The cities of Chino and Chino Hills submitted certifications of their forbearance of groundwater production towards their FY 2004/2005 goals of 1500 AF. Through March 2005, Chino reported forbearance of 1170.7 AF, while Chino Hills reported forbearance of 1050 AF through December 2004.

Program Element 6 – Develop and Implement Cooperative Programs with the RWQCB, SAR and Other Agencies to Improve Basin Management; and Program Element 7 – Develop and Implement Salt Management Program

At the Water Quality Committee Meeting on January 20, 2005, Watermaster presented status reports on the GE Flat Iron Remediation (pump and treat groundwater contaminated by chromium and VOCs), the GE Test Cell Remediation (proposed pump and treat groundwater contaminated by VOCs), the Chino Airport Site Assessment (quarterly water quality sampling plus installation of three additional monitoring wells), the proposed MZ3 Groundwater Contaminant Assessment (quarterly sampling of 20 groundwater monitoring wells), and the preparation of Ontario Airport Cleanup and Abatement Orders (RWQCB to issue orders to PRPs in 4th quarter, FY 2004/2005). The MZ3 and Ontario Airport issues were revisited at the Water Quality Committee Meeting on March 28, 2005, and a detailed presentation was made on possible remediation scenarios for Ontario VOC plume. The goal is to have remediation scenarios available for discussion with the PRPs subsequent to issuance of the CAOs.

During the period, Watermaster continued the drilling, installation, and development of MW 1 through MW9 in the southern portion of the Basin. These wells are important elements in a monitoring network established to determine the extent of hydraulic control. In the 4th quarter FY 2004/2005, Watermaster will complete the well heads, and equip the wells with dedicated sampling pumps and water level transducers with interested data loggers.

Program Element 8 – Develop and Implement Groundwater Storage Management Program; and Program Element 9 – Develop and Implement Storage and Recovery Program

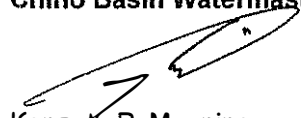
The participants in the DYY Program continue their designs of facilities specified in the Preliminary Design Report. Watermaster consultants continue to develop a groundwater model to investigate alternative management strategies including reduced storage in the eastern part of the basin, expanded

June 8, 2005
Ann Schneider4

storage and recovery programs, and hydraulic control under various pumping alternatives in the southern Chino Basin

Sincerely,

Chino Basin Watermaster

A handwritten signature in black ink, appearing to read "Kenneth R. Manning". The signature is stylized and somewhat cursive, with a large initial "K" and "M".

Kenneth R. Manning
Chief Executive Officer

GT/psm

EXHIBIT

“D”

27th ANNUAL REPORT

PREVIOUSLY DISTRIBUTED ON

JUNE 2, 2005