

2005

Urban Water Management Plan Chino Basin Desalter Authority

Board of Directors

Ed Graham
Ken Jeske
Glenn Duncan
Paul Hamrick
J. Arnold Rodriguez
Harvey Sullivan
John Anderson

Prepared by

Inland Empire Utilities Agency

Richard Atwater, CEO
Martha Davis, Executive Manager – Policy Development
Planning and Water Resources Department
Gary Hackney, Manager
Garth Morgan
David Hill
Ron Pitman
Barbara Kruells

And

Jurupa Community Services District

Carole McGreevy, General Manager and Secretary of the CDA
Wendy Lesile
Jan Zirwas

December 2005

PREFACE

The Chino Basin Desalter Authority (CDA) is pleased to present this 2005 Urban Water Management Plan (UWMP). The CDA is a Joint Exercise of Powers Agency formed between Jurupa Community Services District, the Santa Ana River Water Company, the Cities of Chino, Chino Hills, Norco and Ontario and the Inland Empire Utilities Agency (IEUA).

The CDA purifies brackish groundwater extracted from the lower Chino Basin with the Chino 1 and 2 Desalter Facilities. The UWMP 2005 is a public statement of the goals, objectives and strategies needed to maintain a reliable water supply for our service area. It is intended to be consistent with and to support the implementation of the Chino Basin Watermaster's Optimum Management Program, commonly called the "OBMP Peace Agreement".

The UWMP 2005 lays out a vision for water management over the next twenty years. For the short term, defined as the next five years (2005 – 2010), the UWMP 2005 provides a specific implementation program. But as the horizon broadens further into the future, a greater range of options and opportunities become possible. Therefore the plan is less specific for the year 2025.

The preparation of this UWMP was primarily done by IEUA staff. However, the Metropolitan Water District of Southern California, Chino Basin Watermaster and all of the retail water agencies within the service area contributed to the technical documentation. This was a "team effort" and we thank all who helped to prepare this 2005 Urban Water Management Plan.

Executive Summary

The Chino Desalter Authority (CDA) 2005 Urban Water Management Plan (UWMP) was prepared by the staff of the Inland Empire Utilities Agency in cooperation with the staffs of member agencies of the CDA. This is the first UWMP for the CDA since it was formed on September 25, 2001. CDA is a Joint Exercise of Powers Agency formed between the Jurupa Community Services District, the Santa Ana River Water Company, the Cities of Chino, Chino Hills, Norco and Ontario and the Inland Empire Utilities Agency (IEUA). The CDA purifies brackish groundwater extracted from the lower Chino Basin with the Chino 1 and 2 Desalter facilities and distributes the drinking water to member agencies. The Chino 1 Desalter commenced operation in 2001 and was expanded in 2005. The Chino 2 Desalter was recently constructed and will become operational in 2006.

Each of the six retail members of the CDA has contractual commitments to purchase water produced by the CDA. These commitments total 24,600 acre-feet per year (AFY). Voting rights of each agency are proportional to their commitment to purchase potable water recovered from groundwater by the CDA facilities.

The population in the member agency service areas totals about 420,000 and the population of this area is expected to grow to over 600,000 people in the next twenty years. The climate of the service area is classified as semi-arid desert.

In June 2000, the Optimum Basin Management Program (OBMP) was adopted by the Chino Basin Watermaster (CBWM) and approved by the Superior Court to address water quality problems within the Chino groundwater basin and to increase and improve the water supply available from this source. The OBMP identifies groundwater recovery in the southern portion of the basin as a way to improve basin water supplies.

Groundwater in the southern portion of the Chino Basin is high in salts and nitrates. The "Maximum Benefit" Plan for managing the Chino Groundwater Basin was approved by the SARWQCB in February, 2004 as part of the Santa Ana River Basin Plan update. It provided that "hydraulic control" and groundwater quality improvement projects could be implemented to prevent degradation of downstream Santa Ana River flows into Orange County. The lower Chino Basin area was identified as the area needing recovery and treatment of brackish groundwater with the intent to control and manage outflow of groundwater high in salts and nitrates from the Chino Basin into the Santa Ana River.

The CDA owns and operates two groundwater treatment desalination systems known as Chino Basin 1 and 2 Desalters. Both of these facilities include

groundwater extraction wells, pumps and pipelines that provide water to advanced treatment facilities that include processes for pretreatment, filtration, air stripping of volatile organic compounds, ion exchange for removal of nitrates, and reverse osmosis for removal of salts. This treated water is then blended and disinfected to produce high quality drinking water that is delivered to its member agencies by a system of pipelines, pumps and reservoirs.

Concentrated brine from the reverse osmosis process is discharged to the Santa Ana River Interceptor (SARI) line as non-reclaimable water (NRW) and is conveyed to the Orange County Sanitation District (OCSD) for treatment and ultimate disposal in the Pacific Ocean. Brine disposal will export over 20,000 tons per year of salt out of the Chino Basin.

The main benefits of the CDA are:

1. A reliable, local source of drinking water is produced by desalination;
2. Improved water supply reliability through enhanced local supplies and less dependency on MWD imported supplies;
3. Salt and nitrates are removed from the groundwater basin to clean up the Chino Basin; and,
4. Hydraulic control of groundwater is enhanced by the location of groundwater extraction wells. This helps prevent groundwater that is high in salinity and nitrates from "spilling over" the Chino Basin southern barrier into the Santa Ana River.

Through the interconnected pipeline delivery system with the retail water agencies, the CDA has the capability of transferring "surplus" water produced by the Desalters and to assist member agencies during emergency outages of other supplies. In cases of emergency and water shortages, the Chino Desalters will serve as a stable and reliable potable water source in the Basin.

The retail members of the CDA have other sources of water (ground, surface, recycled and imported water) in addition to the recovered groundwater produced by the CDA. The cities of Chino, Chino Hills, and Ontario are located in San Bernardino County and are entirely within the boundaries of the IEUA. The Jurupa Community Services District (JCSD), the Santa Ana River Water Company (SARWC), and the City of Norco are within the Western Municipal Water District (WMWD), located in Riverside County. Both IEUA and WMWD are members of the Metropolitan Water District of Southern California (MWD) with responsibility to provide wholesale imported water to the retail agencies within their respective service areas.

TABLE OF CONTENTS

CHAPTER 1 INTRODUCTION

1.1 CHINO BASIN DESALTER AUTHORITY	1-1
1.2 URBAN WATER MANAGEMENT PLANNING ACT	1-5
1.3 DWR GUIDANCE.....	1-5
1.4 REGIONAL WATER AGENCY COORDINATION	1-5
1.5 CITY AND COUNTY NOTIFICATION OF CHANGES TO THE UWMP	1-6
1.6 CDA COORDINATION WITH LOCAL AGENCIES	1-6
1.7 STRATEGIC OBJECTIVE FOR GROUNDWATER MANAGEMENT.....	1-6

CHAPTER 2 POPULATION AND WATER USE

2.1 CURRENT POPULATION.....	2-1
2.2 CONVERSION OF AGRICULTURAL USE TO URBAN USE	2-1

CHAPTER 3 WATER SUPPLIES

3.1 CHINO GROUNDWATER BASIN	3-1
3.2 AVAILABLE GROUNDWATER SUPPLY	3-1
3.3 GROUNDWATER QUALITY IN THE LOWER CHINO BASIN.....	3-2
Total Dissolved Solids (TDS).....	3-2
Nitrates.....	3-2
Volatile Organic Chemicals (VOCs).....	3-3
3.4 CHINO BASIN DESALTER AUTHORITY FACILITIES & OPERATION	3-3
Initial Implementation	3-4
Chino 1 Desalter – Current Operations.....	3-4
Chino I Expansion	3-5
Chino 1 Desalter Extraction Wells	3-6
Chino 2 Desalter	3-6

CHAPTER 4 WATER CONSERVATION PROGRAM

4.1 OVERVIEW 4-1

4.2 VALUE OF CONSERVATION 4-2

4.3 CONSERVATION OPPORTUNITIES 4-3

4.4 CONSERVATION PROGRAMS TO DATE 4-4

 Implementing the BMPs 4-4

 Inland Empire Utilities Agency 4-5

 City of Chino 4-5

 City of Chino Hills 4-5

 City of Ontario 4-6

 Western Municipal Water District 4-6

 City of Norco 4-6

 Jurupa Community Services District 4-7

 Santa Ana River Water Company 4-7

4.5 CONSERVATION PROGRAMS 2005-2025 4-7

CHAPTER 5 RECYCLED WATER PROGRAM

5.1 OVERVIEW 5-1

5.2 IEUA’s REGIONAL RECYCLED WATER PROGRAM 5-1

5.3 RECHARGE OF RECYCLED WATER IN THE CHINO BASIN 5-1

5.4 IEUA’s HISTORICAL RECYCLED WATER DISTRIBUTION SYSTEM 5-2

5.5 GRANT FOR GROUNDWATER REPLENISHMENT FACILITIES 5-2

5.6 IEUA RECYCLED WATER DISTRIBUTION 5-3

CHAPTER 6 GROUNDWATER MANAGEMENT PROGRAMS

6.1 CHINO BASIN GROUNDWATER MANAGEMENT 6-1

 1978 Chino Basin Judgment 6-1

 Optimum Basin Management Plan (OBMP) 6-1

 Peace Agreement 6-2

6.2 MAXIMUM BENEFIT 6-3

6.3 HYDRAULIC CONTROL 6-3

 Hydraulic Control Wells – Chino 1 Desalter and Expansion 6-4

 Hydraulic Control Wells – Chino 2 Desalter 6-4

 Hydraulic Control Monitoring Wells 6-4

CHAPTER 7 ALTERNATIVE WATER SUPPLIES

7.1 WATER SYSTEM INTERCONNECTIONS.....7-1
Interagency Transfer of Water7-1
The CDA Interconnections and transfers.....7-1

7.2 ALTERNATIVE WATER SUPPLIES.....7-2
Treated Potable Water Sources7-2
Groundwater7-2
Recycled Water in Chino Basin7-2

CHAPTER 8 WATER SHORTAGE CONTINGENCY PLAN

8.1 MUTUAL AID AGREEMENT – REGIONAL AGENCIES.....8-1

8.2 PLANNING FOR A CATASTROPHE – Desalter Water Serves as a Backup.....8-1

8.3 DRY YEAR YIELD8-1

CHAPTER 9 WATER QUALITY IMPACTS ON RELIABILITY

9.1 GROUNDWATER QUALITY IN CHINO BASIN.....9-1
Total Dissolved Solids (TDS).....9-3
Nitrate-Nitrogen (NO₃-N)9-4
Other Constituents of Concern9-5
VOC's9-5
Tetrachloroethene and Trichloroethene.....9-5
Dichloroethene and *cis*-1, 2-Dichloroethene.....9-6
1,2,3-Trichloropropane9-6
Aluminum, Arsenic, Fluoride, Iron and Manganese9-7
Aluminum and Iron9-7
Arsenic9-7
Fluoride9-8
Manganese9-8
Perchlorate9-9
Additional Constituents.....9-9

9.2 POINT SOURCES OF CONCERN9-10
Chino Airport9-10
VOC Anomaly – South of the Ontario Airport9-12

9.3 CURRENT STATE OF GROUNDWATER QUALITY IN CHINO BASIN9-12

9.4 IMPACT OF WATER QUALITY ON RELIABILITY9-12

CHAPTER 10 WATER SERVICE RELIABILITY10-1

LIST OF FIGURES

Figure 1-1 IEUA and WMWD Boundaries Relative to the Chino Groundwater Basin.....	1-4
Figure 1-2 Service Areas of CDA Entities.....	1-5
Figure 2-1 Agricultural Conversion Area	2-3
Figure 3-1 Existing CDA Extraction Wells	3-8
Figure 3-2 Chino 1 and 2 Desalter System Facilities	3-9
Figure 4-1 Estimated Reduction in Imported Water and Cost Savings with Conservation	4-2
Figure 5-1 Recycled Water Distribution Lines and Regional Plants	5-3
Figure 6-1 Hydraulic Control Monitoring Wells	6-5
Figure 9-1 Groundwater Wells with Water Quality Date	9-13
Figure 9-2 Total Dissolved Solids in Groundwater	9-14
Figure 9-3 Nitrate in Groundwater	9-15
Figure 9-4 Tetrachloroethene in Groundwater	9-16
Figure 9-5 Trichloroethene in Groundwater	9-17
Figure 9-6 1,1-Dichloroethene in Groundwater	9-18
Figure 9-7 cis-1,2-Dichloroethene in Groundwater	9-19
Figure 9-8 1,2,3-Trichloropropane in Groundwater	9-20
Figure 9-9 Aluminum in Groundwater	9-21
Figure 9-10 Iron in Groundwater	9-22
Figure 9-11 Arsenic in Groundwater	9-23
Figure 9-12 Manganese in Groundwater	9-24
Figure 9-13 Perchlorate in Groundwater	9-25
Figure 9-14 VOC Plumes in the Chino Basin	9-26

LIST OF APPENDICES

- A. CDA Joint Exercise of Powers Agreement
- B. Letters of Notification of Preparation to Local Agencies
- C. CDA Board Resolution Adopting UWMP 2005
- D. Chino Groundwater Basin Judgment
- E. Chino Basin Optimum Basin Management Plan
- F. Chino Basin, State of the Basin Report
- G. Peace Agreement
- H. Santa Ana River Basin Plan Update
- I. Mutual Aid Agreements
- J. IEUA 2005 UWMP (text only)

ACRONYMS AND ABBREVIATIONS

Act	Urban Water Management Planning Act
AF	acre feet
AFY	acre feet per year
Agency	Inland Empire Utilities Agency
ASR	Aquifer Storage & Recovery Program
BMP	Best Management Practice
CALFED	California State and Federal Agencies
CBFIP	Chino Basin Facilities Improvement Project
CBWCD	Chino Basin Water Conservation District
CBWM	Chino Basin Watermaster
CCWRP	Carbon Canyon Water Recycling Plant
CCR	California Code of Regulations
CDA	Chino Basin Desalter Authority
CEQA	California Environmental Quality Act
CII	Commercial/Industrial/Institutional
CIM	California Institution for Men
CIP	Capital Improvement Plan
Corps	U.S. Army Corps of Engineers
CRA	Colorado River Aqueduct
CUWA	California Urban Water Agencies
CUWCC	California Urban Water Conservation Council
CVP	Central Valley Project
CVWD	Cucamonga Valley Water District
DBCP	1,2-Dibromo-3-Chloropropane
DCE	Dichloroethene
DHS	California Department of Health Services
DMM	Demand Management Measures
DWR	California Department of Water Resources
DYY	Dry Year Yield
EPA	Environmental Protection Agency
GCPD	Gallons Per Capita Daily
GIES	Garden In Every School Program
HECW	High Efficiency Clothes Washer
HET	High Efficiency Toilet (1 Gallon per Flush)
IID	Imperial Irrigation District
IEUA	Inland Empire Utilities Agency
IRP	Integrated Resources Planning
IWP	Integrated Watershed Plan
IX	Ion Exchange
LAA	Los Angeles Aqueduct
LEED	Leadership in Energy & Environmental Design

LPP	Local Projects Program
LRP	Local Resources Program
M&I	Municipal and Industrial
MCL	Maximum Contaminant Level
MGD	Million Gallons per Day
Mg/L	Milligrams per Liter
MOU	Memorandum of Understanding
MTBE	Methyl Tertiary Butyl Ether
MVWD	Monte Vista Water District
MWD	Metropolitan Water District of Southern California
MZ	Management Zone
NDMA	N-nitrosodimethylamine
NEPA	National Environmental Policy Act
NTC	National Theatre for Children
NRW Line	Non-Recoverable Waste Line
O&M	Operations and Maintenance
OBMP	Optimum Basin Management Plan
PBMZ	Prado Basin Management Zone
PCE	Tetrachloroethene
RO	Reverse Osmosis
RP	Regional Treatment Plant
RTS	Readiness-To-Serve
RWIP	2005 Recycled Water Implementation Plan
RWQCB	Regional Water Quality Control Board
SARI Line	Santa Ana Regional Interceptor
SARWQCB	Santa Ana Regional Water Quality Control Board
SAV-A-BUC	MWD's CII Rebate Program
SAWPA	Santa Ana Watershed Project Authority
SB	Senate Bill
SCAG	Southern California Association of Governments
SNWA	Southern Nevada Water Authority
SWP	State Water Project
SWRCB	State Water Resources Control Board
TCE	Trichloroethene
TCP	Trichloropropane
TDS	Total Dissolved Solids
Title 22	California Title 22 Drinking Water Standards
TMDL	Total Maximum Daily Load
TOC	Total Organic Carbon
TVMWD	Three Valleys Municipal Water District
TYCIP	Ten-Year Capital Improvement Plan
µg/L	Microgram per Liter
ULFT	Ultra-Low Flush Toilet (1.6 Gallons per Flush)
USEPA	United States Environmental Protection Agency
UWMP	Urban Water Management Plan
VOC	Volatile Organic Compounds

Watermaster
WEWAC
WFA
WRP
WSDM

Chino Basin Watermaster
Water Education Water Awareness Committee
Water Facilities Authority
Water Recycling Plant
Water Surplus and Drought Management