



West Basin Municipal Water District

**CAPITAL IMPLEMENTATION MASTER PLAN  
FOR RECYCLED WATER SYSTEMS**

**FINAL REPORT**

June 2009



**WEST BASIN MUNICIPAL WATER DISTRICT**

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## LIST OF ABBREVIATIONS

<b>Abbreviation</b>	<b>Description</b>
AACE	Association for the Advancement of Cost Engineering
AAD	average annual demand
ADD	average day demand
af	acre-feet
afy	acre feet per year
AOP	advanced oxidation processes
aSAR	adjusted sodium adsorption ratio
B	barrier
Carollo	Carollo Engineers, a Professional Corporation
CBOD	carbonaceous biochemical oxygen demand
CC	construction cost
CC+C	construction cost plus contingency
CCTV	closed circuit television
CIMIS	California Irrigation Management Information System
CIMP	Capital Implementation Master Plan
CIP	Capital Improvement Program
Cl	chloride
CMF	Continuous Microfiltration
CMLC	cement mortar lined and coated
CNF	Chevron Nitrification Facility
CRWRF	Carson Regional Water Recycling Treatment Facility
CSUDH	California State University Dominguez Hills
CT value	the product of total chlorine residual and modal contact time measured at the same point
DCS	distributed control system
DIP	ductile iron pipe
EC	electrical conductivity
ELWRF	Edward C. Little Water Reclamation Facility
EMWRF	ExxonMobil Water Recycling Facility
ENR	Engineering and News Record
EPS	extended period simulation
ET	evapotranspiration
FM	force main
fps	feet per second
frp	fiber reinforced plastic
ft	feet
ft/kft	foot per 1,000 feet
FY	fiscal year
GIS	Geographic Information Systems

**LIST OF ABBREVIATIONS (continued)**

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<b>Abbreviation</b>	<b>Description</b>
gpd/ac	gallons per day per acre
gpm	gallons per minute
HCO <sub>3</sub>	bicarbonate
HDPE	high-density polyethylene
HP	horsepower
HPBF	high pressure boiler feed
HSEFM	Hyperion Secondary Effluent Force Main
HSEPS	Hyperion Secondary Effluent Pump Station
HWWT	Hyperion Wastewater Treatment Plant
IIMM	International Infrastructure Management Manual, Edition 2006
IN	industrial
IR	irrigation
JWPCP	Joint Water Pollution Control Plant
K <sub>d</sub>	density factor
K <sub>mc</sub>	microclimate factor
K <sub>s</sub>	species factor
LACDPW	Los Angeles County Department of Public Works
LACSD	Los Angeles County Sanitation District
LADWP	Los Angeles Department of Water and Power
LF	leaching fraction
LPBF	low pressure boiler feed
MCL	maximum contaminant level
MDD	Maximum Day Demand
MF	Microfiltration
MFP	Mobile Facility Plant
Mg	magnesium
MG	million gallons
mg/L	milligrams per liter.
mgd	million gallons per day
MinDD	minimum day demands
MMD	maximum month demand
MPN	most probable number
MU	mixed use
MWD	Metropolitan Water District of Southern California
N	total nitrogen
Na	sodium
NH <sub>3</sub>	ammonia
NO <sub>3</sub>	nitrate
NPDES	National Pollutant Discharge Elimination System



**LIST OF ABBREVIATIONS (continued)**

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<b>Abbreviation</b>	<b>Description</b>
O&M	Operations and Maintenance
OD	outer diameter
PS	pump station
psi	pounds per square inch
PVC	polyvinyl chloride
RO	reverse osmosis
RPM	revolutions per minute
SAR	sodium absorption ratio
SCADA	supervisory control and data acquisition
SDR	Standard Dimension Ratio
SE	secondary effluent
sf	square feet
TDS	total dissolved solids
TOC	total organic carbon
UV	ultraviolet
WBMWD	West Basin Municipal Water District
WDF	water demand factor
West Basin	West Basin Municipal Water District
WSPG	Water Surface Pressure Gradient (software package)

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### ES.1 PROJECT BACKGROUND

The West Basin Municipal Water District's (West Basin) service area encompasses approximately 185 square miles in southwest Los Angeles County. The West Basin service area, shown on Figure ES.1, includes 17 cities and unincorporated areas of Los Angeles County, and serves a population of about one million.

As of 2007, West Basin wholesaled approximately 220,000 acre-feet per year (afy) or 196 million gallons per day (mgd) of imported potable water to its customers within the service area. In addition, West Basin served about 31,861 afy or 28 mgd of recycled water to over 200 customer sites within the service area for landscape irrigation, industrial applications, and seawater intrusion barrier applications.

West Basin is planning to expand its recycled water system to continue offsetting potable water demands in its service area and improve overall water supply reliability by reducing dependency on less reliable imported water supplies.

Major capital investments are required to expand and maintain West Basin's recycled water system to meet expected needs and establish reliable recycled water supply for existing and new recycled water customers through year 2030. To define and prioritize the capital improvement projects needed to achieve this goal, West Basin retained Carollo Engineers (Carollo) and team members AKM Consulting Engineers, SPI Technologies, and E.W. Moon, to develop this Capital Implementation Master Plan (CIMP) for recycled water systems.

In addition, West Basin is currently preparing its long-term financial plan that includes a forecast of expenditures for future expansions, repair, replacement, and rehabilitation requirements, and operation and maintenance of the overall recycled water system required to serve approximately 70,000 acre-ft/yr of recycled water by year 2020. This CIMP and the long term financial plan will provide a roadmap for West Basin to achieve its mission of providing reliable water supplies to its customers and the southern California region, increasing recycled water usage and lessening dependency on imported water supplies.