
INTRODUCTION

1.1 AUTHORIZATION

The West Basin Municipal Water District (West Basin) has retained Carollo Engineers P.C. (Carollo) to prepare this Capital Implementation Master Plan (CIMP) for the Recycled Water Systems. This chapter presents a description of the background, purpose, scope of work, report organization, and project team responsible for the preparation of this CIMP. A list of references used in preparing this report is also included in Appendix A.

1.2 BACKGROUND

Faced with a declining groundwater table and over-reliance on water from the West Coast Groundwater Basin in the 1940s, water authorities recommended the establishment of a municipal water district. In 1947, voters approved their recommendation and the West Basin Municipal Water District was formed. A year later, West Basin became a member agency of Metropolitan Water District of Southern California (MWDSC), a 37-member agency that provides the region with imported water. In the early 1990s West Basin added recycled water to its portfolio, and today, West Basin is active in water conservation, and ocean-water desalination development to create more reliable local sources of drinking water for its customers.

West Basin is a public agency that provides drinking and recycled water to its customers within its 185-square mile service area, shown in Figure 1.1. West Basin's mission is "To provide a safe and reliable supply of high quality water to the communities we serve." It is the sixth largest water district in California, serving a population of approximately one million. In 2007, West Basin's customers consumed approximately 220,000 acre-feet of imported water, which equals over 196 million gallons per day (mgd). West Basin purchases imported water from MWDSC and wholesales the imported water to 18 cities in southwest Los Angeles County. West Basin also provides recycled water to cities and private companies for landscape irrigation and industrial usage. West Basin is a recognized leader in the production of recycled water; and its conservation and education programs are fundamental elements of its diverse water portfolio.

In 2007, West Basin recycled water users consumed over 32,200 acre-feet of recycled water, which equals nearly 29 mgd. Recycled water customers include oil refineries, other industrial facilities, commercial buildings, golf courses, parks, school districts, Caltrans, and the Water Replenishment District of Southern California (WRD). West Basin receives secondary effluent from City of Los Angeles's Hyperion Wastewater Treatment Plant (HWWTP) and produces five different water quality types of recycled water, also referred to as designer water, at four water treatment facilities. West Basin distributes the product water through different networks of conveyance systems to its customers.

1.3 PURPOSE

The purpose of this master plan is to assess current facilities and customers, and prioritize future capital projects to meet the expected needs and establish reliable recycled water supply for the existing and new recycled water customers through year 2020, as an interim milestone, and ultimately through 2030.

The CIMP considers variables that potentially impact the capital projects, including:

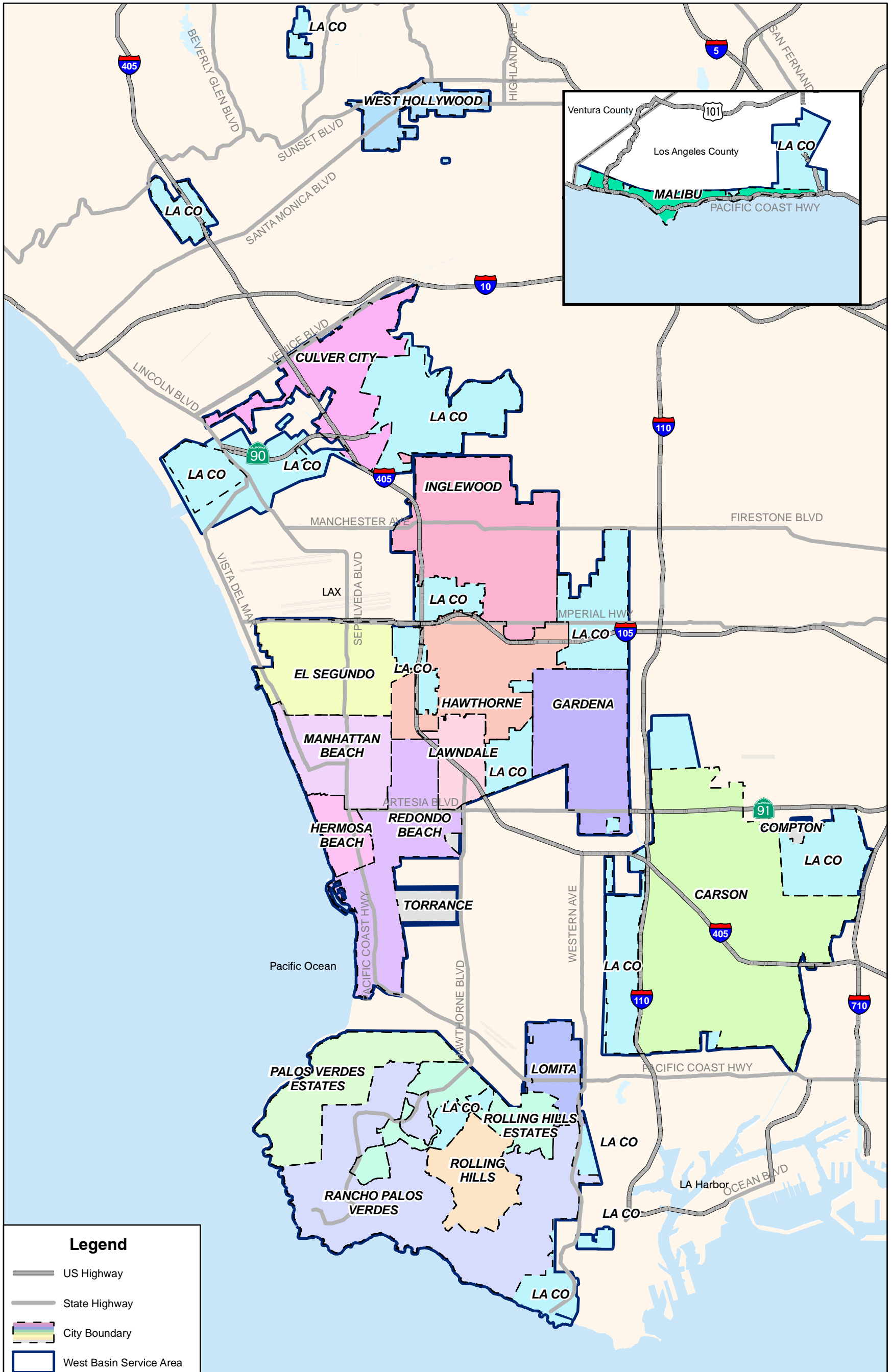
- Identification of potential customers to be served with recycled water,
- What type of quality and quantity of recycled water do customers need, and
- Overall costs of expanding, operating, and efficiently maintaining West Basin's water recycling facilities and conveyance system.

The findings of this project are not just intended for planning the capital improvements, repair, replacement, rehabilitation requirements of the systems, but also for budgeting and financing. West Basin expects to make major investments in its recycled water system during the next 20 years. To support these investments, West Basin intends to develop a long-term financial plan; forecast expenditures for future expansions, maintaining capital assets, and operation and maintenance of the recycled water system based on best available information; and set rates to enable West Basin to achieve its mission to increase recycled water supply and lessen dependency on imported water supplies in the region, while maintaining long term financial stability.

1.4 SCOPE OF WORK

The preparation of this CIMP for Recycled Water Systems included the following 17 tasks:

1. Comprehensive Data Collection and Review
2. Field Observations and Assessment
3. Recycled Water System Schematics
4. System Operation Parameters
5. Surge Study (incorporate work from others)
6. Water Quality Study (incorporate work from others)
7. Development of Hydraulic Modeling and Master Planning Criteria
8. Development of a Customer Database
9. Development of Hydraulic Models
10. Preparation of Users Manual for the Hydraulic Models
11. Hydraulic Model Calibration



Legend

- US Highway
- State Highway
- City Boundary
- West Basin Service Area



West Basin Municipal Water District
 Capital Implementation Master Plan For Recycled Water Systems

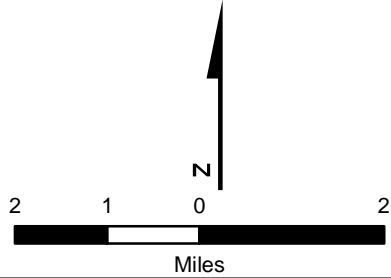


Figure 1.1
 West Basin Municipal Water District Service Area

12. Existing System Evaluation and Requirements
13. Future Phased System Development, Evaluation, and Requirements
14. Development of a Capital Improvement Plan
15. Final Report Preparation and Presentation
16. Meetings and Presentations
17. Deliverables

1.5 REPORT ORGANIZATION

The CIMP has been structured to help the reader easily locate and identify information needed regarding West Basin's recycled water system. The report contains nine chapters, followed by appendices that include supporting documentation for the information presented in the report. These appendices are included in a separate binder. The chapters are briefly described below:

Chapter 1 – Introduction. This chapter presents the goals and objectives of the CIMP.

Chapter 2 – Existing System. This chapter presents an overview of the components and connectivity of West Basin's distribution systems and treatment facilities.

Chapter 3 – Recycled Water Demands. This chapter provides an updated recycled water user database of existing and potential new customers, their estimated recycled water demands, user type, diurnal patterns, water quality needs, and seasonal peaking factors.

Chapter 4 – Recycled Water Supplies. This chapter provides a summary of the historical, existing, and projected recycled water supplies required to meet the future recycled water demand.

Chapter 5 – Planning and Evaluation Criteria. This chapter summarizes the criteria established for the development of the hydraulic/water quality models and for the analysis of the master plan facilities.

Chapter 6 – Model Development. This chapter describes the development and calibration of West Basin's recycled water distribution hydraulic models. As part of this project, separate hydraulic models were created to evaluate the following ten systems:

- Title 22 Distribution System
- West Coast Barrier Water System
- Hyperion Secondary Effluent Pumping System (HSEPS)
- Chevron Low Pressure Boiler Feed System
- Chevron High Pressure Boiler Feed System

- Chevron Nitrified Water System
- Carson Regional Water Recycling Facility Brine Line
- Edward C. Little Water Recycling Facility Brine Line
- bp Reverse Osmosis System
- bp Nitrified Water System

The model calibration included hydraulic calibration for all models and a water quality calibration of the Title 22 system model. This chapter also summarizes the development of the OPTIMO™ model for integrated system analysis of West Basin's conveyance and treatment systems.

Chapter 7 – Existing System Evaluation. The chapter presents results of the analyses of the existing hydraulic distribution systems and treatment systems. A summary of recommendations for the existing system is also included.

Chapter 8 – Future System Evaluation. The chapter presents results of the analyses of the future hydraulic distribution systems and treatment systems. A summary of recommendations for the future system is also included.

Chapter 9 – Capital Improvement Program. This chapter presents the Capital Improvement Program (CIP) for the West Basin recycled water treatment and distribution systems, including cost analysis and scheduling of future facility improvements. The CIP has been prepared to assist West Basin in planning and budgeting for the recycled water distribution system and treatment plant expansions, upgrades, repairs, and replacements through year 2030.

1.6 PROJECT TEAM

The primary team members that helped develop this report are listed in Table 1.1. Carollo Engineers, AKM Consulting Engineers, and Separation Processes, Inc. also wish to acknowledge and thank all West Basin staff for their support and assistance in completing this project.

**Table 1.1 Project Team
Capital Implementation Master Plan
West Basin Municipal Water District**

Team Member	Title or Project Role	Organization
Rajen Budhia	Project Manager	West Basin
Marc Serna	Engineering Manager	West Basin
Wyatt Won	Operations Manager	West Basin
Joe Walters	Recycled Water Program Manager	West Basin
Frank Fuchs	Recycled Water Project Manager	West Basin
Mark Ervin	Project Manager	United Water
Bill Brooks	Supervisor O&M Specialist	United Water
Tony Mack	Senior O&M Specialist	United Water
Ralph Valencia	Manager of Engineering	United Water
Gregg Oelker	Manager of Water Quality	United Water
Kevin Tirado	Project Engineer	United Water
Gil Crozes	Principal-in-Charge	Carollo Engineers
Inge Wiersema	Project Manager	Carollo Engineers
Brian Brenhaug	Project Engineer	Carollo Engineers
Tommy Greci	Staff Engineer	Carollo Engineers
Nitin Verma	Staff Engineer	Carollo Engineers
Jason Nikaido	Staff Engineer	Carollo Engineers
Shawn Dent	Staff Engineer	Carollo Engineers
Cari Ishida	Staff Engineer	Carollo Engineers
Zeki Kayiran	Project Manager for AKM	AKM Consulting Engineers
Diann Pay	Project Engineer	AKM Consulting Engineers
Serpil Kara	Staff Engineer	AKM Consulting Engineers
Steve Patterson	Staff Engineer	AKM Consulting Engineers
Richard Chmielewski	Project Manager for SPI	SPI Technologies
Alex Wesner	Staff Engineer	SPI Technologies
Mark Donovan	Staff Engineer	SPI Technologies
Carl McGinnis	Staff Engineer	EW Moon
Celine Kahrizi	Staff Engineer	EW Moon

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