Section 1

Introduction

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This report presents the findings for Task 3 of the Cambria Community Services District's (CCSD's) update to its Water Master Plan. Task 3 is focused on the potable water distribution system and related needs to improve fire-fighting delivery and storage. The Task 3 scope of work also includes conceptual planning for a future recycled water distribution system, which is addressed as a separate report. The following summarizes the planning study background, objectives, scope of services, and conduct of the potable water distribution system study.

1.1 Background

The water system now owned and operated by CCSD was originally constructed and operated by the J.D. Campbell Water Company, and subsequently the Cambria Development Company. The facilities were deeded to the Cambria County Water District which was formed in 1959. The CCSD was formed in 1976, and includes public services for the community's water and sewer service, fire protection, refuse collection and disposal, and a portion of street lighting. Since the District was formed, virtually all of the water system distribution piping, service lines, storage and pumping facilities have been replaced (except the Pine Knolls tanks, constructed in 1962). Underground piping rehabilitation was completed in 1989, and storage tank upgrading completed in 1995.

CCSD began its current Water Master Plan Update with the solicitation of engineering proposals in 1998. Subsequent fees proposed however, were outside available funding levels and a Methyl-tert-butyl-ether (MtBE) contamination plume was discovered in 2000, causing CCSD to reallocate resources to an emergency well project. As a result, CCSD has elected a phased Water Master Planning update process as shown in Table 1-1.

TABLE 1-1
SUMMARY OF DISTRICT WATER MASTER PLANNING TASKS

Task No.	Task	Description	Status
1	Land Use & Build-out Analysis	Analysis of future water needs based on detailed mapping of water facilities, lots, land use, & geographic features.	Mapping completed and being used to support Task 3.
2	Water Supply & Availability Analysis	Assessed existing groundwater supplies and impact of future water commitments. Developed water supply & demand model.	Report completed on December 8, 2000.
3	Water & Recycled Distribution Systems	Detailed computer modeling of water distribution system to analyze fire-fighting needs. Conceptual recycled water distribution system for outdoor irrigation.	Subject of current report and separate Recycled Water Report.

Task No.	Task	Description	Status
4	Water Resources Plan	Analysis of long-term supply options, including desalination, Nacimiento reservoir water, dams, and related alternatives.	Final report edits received during June 2004.
5	Financing Study	Analysis and recommendations for financing of long-term supply options.	Not started to date.
6	Habitat Conservation Plan	Habitat Conservation Planning (HCP) was envisioned as part of the original request for proposals. HCPs are required if a project could result in the "incidental take" of a threatened species.	To date, it is not known whether recommendations of Task 4 will require the development of a Habitat Conservation Plan (HCP).

The Task 3 work summarized in this report focuses on development of a detailed hydraulic model that was used to analyze distribution system pipelines, tank storage, and pumping stations. Various fire-fighting scenarios were simulated within a computer model to estimate pipeline flows and system pressures in order to identify distribution system upgrade needs. CCSD's service area includes existing homes with minimal spacing between structures with combustible exteriors, high vegetative fuel loads between structures, and a long wild land fire interface. Concerns over fire vulnerability of the area led to analyses of multiple simultaneous structure fires. The multiple fire approach was based upon discussions with CCSD's Fire Chief and review of information obtained from CCSD's independent fire prevention consultant, as well as the 2000 Uniform Fire Code (UFC). Research also included a review of the 2000 International Fire Code Institute's Urban-Wild land Interface Code.

An analysis of long-term water supply options is not part of this Task 3 report. This work has concluded and was submitted separately as part of the Water Resource Plan (Task 4) of CCSD's Water Master Plan Update.

1.2 Objectives

The primary objective of this evaluation is to provide CCSD with phased capital improvement projects for which the District may consider for budgeting and implementation. Capital improvements will emphasize issues of storage and water quality, especially related to CCSD's Leimert and Pine Knolls tanks and provide a calibrated distribution system model to be used as a comprehensive planning tool for future evaluation of necessary improvements to the water system.

This report documents the creation, development, calibration, and application of the water system model to identify prioritized system improvements. The model was used to analyze the CCSD water system with consented levels of fire protection, recommend upgrades to the existing water distribution system, improve current operations, and recommend facility improvements. To achieve these objectives, CCSD authorized Kennedy/Jenks Consultants to

develop a hydraulic system model to evaluate CCSD's water and recycled water systems under an Agreement for Engineering Services dated October 25, 2001.

1.3 Scope of Services

To accomplish these objectives, the following scope of services were developed:

- Develop Design and Unit Cost Criteria
- Modeling and Analysis of Water and Recycled Water Systems (evaluation of Recycled Water in a separate report)
- Develop Water Demand Criteria and Demand Projection

1.4 Conduct of the Study

The information developed in this study is based on information provided by CCSD, discussions with CCSD staff, input from other related studies, and office analysis. Initial phases of the study were concerned with the collection and review of information related to existing CCSD facilities and operations so that system models could be developed. A commercially-available modeling program (H_20NET) was utilized in the analysis.

Subsequent phases were concerned with the evaluation of historical water demand data which form the basis for demand patterns, current and future demand projections, and recent Board directives which impact these future projections and the allocation of future demands across the hydraulic model. Fire flow criteria and agreed-upon levels of fire protection were provided by CCSD. Based on the model, water demand projections, and fire flow criteria, CCSD's existing and future water systems were evaluated and facility improvements were recommended. The estimated capital cost of the recommended improvements and implementation plan are presented.

The next three sections of this report discuss the study area and existing potable water system, the development of projected water demands and the implementation of the hydraulic model analysis. The last three sections discuss model results, recommended improvements and the proposed phasing plan.