

1.0 Introduction

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This Sanitary Sewer Collection Master Plan provides long range planning of the wastewater collection system facilities for the Fountain Sanitation District (FSD) to manage the anticipated growth through build-out of the service area. The population projections and future land use for this Master Plan are coordinated with the City of Fountain's Water Master Plan. This study incorporated population and land use projections as presented in November 2002 report City of Fountain Population, Housing, Employment and Employer Projections Years 2001 – 2010, by Crowley's Consulting.

This study is driven by a significant increase in population in the last decade and the concern for adequate facilities to best serve the District through planning year 2020 and beyond. The plan focuses on evaluating the service area needs for interceptors, and pumping facilities for the wastewater collection system. Both present and future service area configurations were evaluated.

Spatially distributed population projections were developed for the 2010, 2020, and build-out planning year scenarios and incorporated in each of the system evaluations. Service area boundaries were reviewed and assessed to identify those areas to be included in future collection scenarios.

The wastewater collection system was evaluated using an initial temporary flow monitoring program from September 12, 2001 to January 7, 2002, plus a second program from July 15 to September 3, 2002. Key flow parameters for dry weather flow were determined from the flow monitoring data. Due to lack of rain, wet weather flow parameters for infiltration and inflow were selected from experience. Projected peak wet weather flows were used for capacity assessments in the Hydra hydraulic model.

The calibrated model for the wastewater collection system was used to perform the planning year evaluations. The results of these evaluations served as the basis for identifying major capital improvement programs (CIP) to meet FSD's anticipated wastewater flows resulting from population growth and development through the years 2010 and build-out.

1.2 Scope of Study

This study was governed by the Scope and Basic Services, which was designed to complete a review of historical data for the estimation of wastewater demand and future collection system needs through the design years. Existing collection system data was collected to complete an existing inventory for evaluation of existing service and as a basis for projecting future needs. A hydraulic model was built on selected existing elements. The hydraulic model provided sizing information for proposed collection system extensions. The scope of this study includes:

- ?? Task 1 – Project Management
- ?? Task 2 – Existing Information Review including;
 - Collect and review Background Data
 - Conduct Interviews With District Staff
- ?? Task 3 – System Flow Evaluation
 - Flow and Rainfall Monitoring
 - Flow and Rainfall Data Analysis
 - Develop Future flow Projections
- ?? Task 4 – Evaluate Wastewater System
 - Develop Limited Inventory Database
 - Calibrate Model
 - Analyze existing Collection System
 - Analyze Future Collection System
- ?? Task 5 – Develop Preliminary Capital Improvements Plan (CIP), Maps, and Report
 - Develop Preliminary Capital Improvements Plan and Maps
 - Prepare Report

1.3 Study Area

The Study Area for this report represents the area where FSD plans to provide wastewater collection services. Figure 1-1 illustrates the Study Area boundary, the City of Fountain, and the U.S. Bureau of the Census year 2000 census tract and census block boundaries. As shown on Figure 1, the FSD covers most, but not all, of the current City of Fountain. The total land area enclosed by the Study Area boundary is estimated to be 11,487 acres, or 18 square miles.

The north Study Area boundaries are established by agreements with adjacent utilities. The east Study Area boundary follows a ridge line, beyond which gravity flow to the FSD Wastewater Treatment Plant would not be available. Fort Carson bounds the Study Area on the west.

The FSD service area includes two natural drainage basins, approximately divided by a line extending from north to south along approximately Reed Street and Fountain Mesa Road. The FSD Wastewater Treatment Plant is located at Santa Fe Avenue just east of where Fountain Creek leaves the Study Area. Fountain Creek flows from north to south along the west side of the Study Area, generally between Interstate Highway 25 and U.S. Highway 85. Jimmy Camp Creek flows from northeast to southwest, from near the northeast boundary of the Study Area to about one-half mile north of the Plant where it joins with Fountain Creek.

1.4 Previous Reports

A review of the existing information included:

- ?? City of Fountain Water Master Plan, Black & Veatch, December 2002
- ?? City of Fountain Population Forecast 2001 – 2010, November 2001 (subsequently updated November 2002)
- ?? City of Fountain Comprehensive Development Plan, Community Matters, Inc., October 1999
- ?? Predesign Engineering Study For Jimmy Camp Creek Outfall Sewer System, GMS, Inc., August 1996

INSERT FIGURE 1-1 STUDY AREA

1.5 Abbreviations

Abbreviations used in this report are as follows:

ADDF	Average daily dry weather flow
ADF	Average annual daily flow
cfs	Cubic feet per second
CIP	Capital Improvement Plan
du	Dwelling unit
empl.	Employee
fps	Feet per second
ft	Feet
ft/day	Feet per day
FSD	Fountain Sanitation District
gcd	Gallons per capita per day
gpac	Gallons per acre per day
GIS	Geographical Information System
gpm	Gallons per minute
hp	Horsepower
in	Inch
ICI	Institutional Commercial Industrial
I/I	Infiltration/Inflow
LS	Lift Station
mgal	Million Gallons
mg/L	Milligram per Liter
mgd	Million gallons per day
Min	minutes
MMAD	Maximum Month Average Day
PDF	Peak Dry Weather Flow
psi	Pounds per square inch
PWWF	Peak Wet Weather Flow
SCADA	Supervisory Control And Data Acquisition
TDH	Total Dynamic Head
WWP	Wastewater Production
WWTP	Wastewater Treatment Plant