W0#16-074

DEXTER WILSON ENGINEERING, INC.

WATER • WASTEWATER • RECYCLED WATER

CONSULTING ENGINEERS

Plan Check # 2

2234 FARADAY AVENUE • CARLSBAD, CA 92008 • (760) 438-4422

8/7/2018
APPROVED
MBATES
-No comments.

PRELIMINARY
SEWER SYSTEM EVALUATION
FOR
TRACT NO. 37305
IN LAKE ELSINORE
W.O. No. 16-074

July 2018

Prepared For:
K & A Engineering
357 North Sheridan, Suite 117
Corona, CA 92880

Prepared by:
Dexter Wilson Engineering, Inc.
2234 Faraday Avenue
Carlsbad, CA 92008

Job No. 544-045

TABLE OF CONTENTS

LIST OF TABLES

PAGE NO.

LIST OF FIGURES

CHAPTER 1

INTRODUCTION

This report provides a sewer system analysis for the Lake Elsinore Tract No. 37305 project. This report will provide information concerning projected sewer flows, existing facilities, and recommended facilities associated with serving this project.

PROJECT OVERVIEW

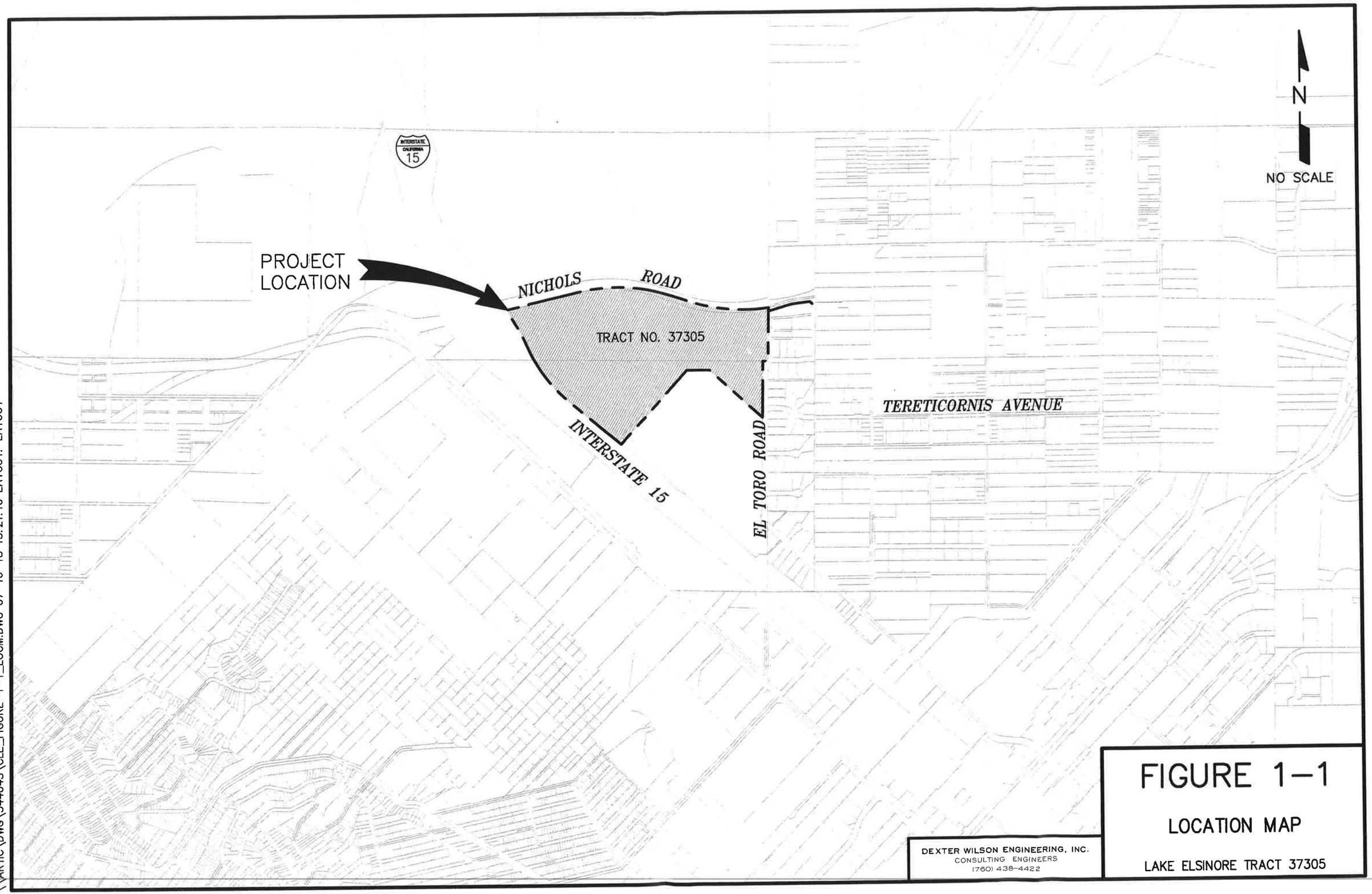
The Tract No. 37305 project is located in the City of Lake Elsinore. Nichols Road borders the project to the north and the project is located just east of Interstate 15 and west of El Toro Road. The Temescal Canyon High School is located just to the south of the project. Sewer service for the project area is provided by the Elsinore Valley Municipal Water District (EVMWD). Figure 1-1 presents a location map for the project.

DEVELOPMENT PLAN

The Tract No. 37305 project encompasses a total of approximately 74 acres. The proposed land use development plan includes single-family residential totaling 168 units, a commercial site, a park site, and open space areas.

PURPOSE OF STUDY

The Tract No. 37305 project is located within the Elsinore Valley Municipal Water District for sewer service. The purpose of this report is to establish the onsite sewer facilities that will be required for the development of the Tract No. 37305 project. The impact of the project on the existing offsite sewer system will be evaluated by the District.



\\ARTIC\DWG\544045\CLE_FIGURE-1-1_LOCM.DWG 07-16-18 13:21:10 LAYOUT: LAYOUT

DEXTER WILSON ENGINEERING, INC.
CONSULTING ENGINEERS
(760) 438-4422

FIGURE 1-1

LOCATION MAP

LAKE ELSINORE TRACT 37305

RELATED STUDIES

MWH prepared the District's August 2016 Sewer System Master Plan. This document provides a District wide analysis of existing and future proposed sewer conveyance facilities. Relevant information from this document on regional facilities in the vicinity of Tract No. 37305 is provided in Chapter 5 of this report.

CHAPTER 2

DESIGN CRITERIA

This chapter presents the design criteria used to evaluate recommended sewer system improvements for the Tract No. 37305 project. The criteria utilized in this study are in accordance with the District's July 2017 Design Standards. The design criteria are used for evaluating the design and sizing of proposed improvements to accommodate development in the study area.

SEWER SYSTEM

Sewer Generation Factors and Peaking Factors

Table 2-1 presents wastewater duty factors per EVMWD's Standards Volume 1 (2017) Section 2.04.A used in projecting sewer flows for the project. To convert average dry weather flows (ADWF) to peak dry weather flow (PDWF) a factor of 3.0 is used for collector sewer lines up to 18-inch in diameter.

TABLE 2-1
RECOMMENDED WASTEWATER DUTY FACTORS

Land Use Category	Wastewater Duty Factor
Single Family Residential (4-6 Du/Ac)	780 gpd/ac
Commercial	810 gpd/ac
Parks	0 gpd/ac[1]

[1]No restroom facilities are proposed at the park site.

Gravity Sewer Lines

Sewer pipe shall be 8-inch minimum and are to be designed with slopes that provide minimum velocities of 2.0 feet per second and maximum velocities of 10.0 feet per second during peak flows. A roughness coefficient, or manning's "n" value, shall be 0.013 in evaluating flow through gravity sewers.

Lift Stations and Force Mains

Sewer lift stations shall be designed in accordance with the latest version of EVMWD Standards (Volume II). Some of the requirements of these standards include a redundant submersible pump, minimum 6.0 foot diameter wet well, discharge check valves and plug valves, backup power via a diesel generator and automatic transfer switch, electrical and control equipment in a building, provisions for odor control, and radio telemetry. Prior to final engineering design plans for a sewer lift station, a preliminary design report (PDR) is required to be prepared for review and approval by EVMWD. The PDR presents the sizing and selection of major equipment items and provides the preliminary site and building layouts.

Force mains are designed to maintain minimum velocities to prevent the deposition of solids and maximum velocities to prevent pipe scouring. EVMWD Standards require a minimum velocity of 2.5 feet per second under normal operating conditions and a minimum velocity of 4.0 feet per second with all pumps running. Maximum force main velocity shall be 7.0 feet per second. Odor control measures will be evaluated at the lift station site and at the force main discharge manhole. The PDR for the lift station will need to evaluate odor control measures.

CHAPTER 3

PROJECTED SEWER FLOWS

This chapter provides the projected sewer flows for the Tract 37305 project. Table 3-1 presents the projected sewer flows for Tract 37305. Using a peaking factor of 3.0, the estimated PDWF from the project is 119,772 gpd.

TABLE 3-1
TRACT NO. 37305
PROJECTED SEWER FLOWS

Description	Quantity	Wastewater Duty Factor	Total ADWF, (gpd)
SF Residential	168 Units/36.2 Ac	780 gpd/Ac	28,236
Commercial	14.43 Ac	810 gpd/Ac	11,688
Park	6.49 Ac	0 gpd/Ac	0
TOTAL			**39,924**

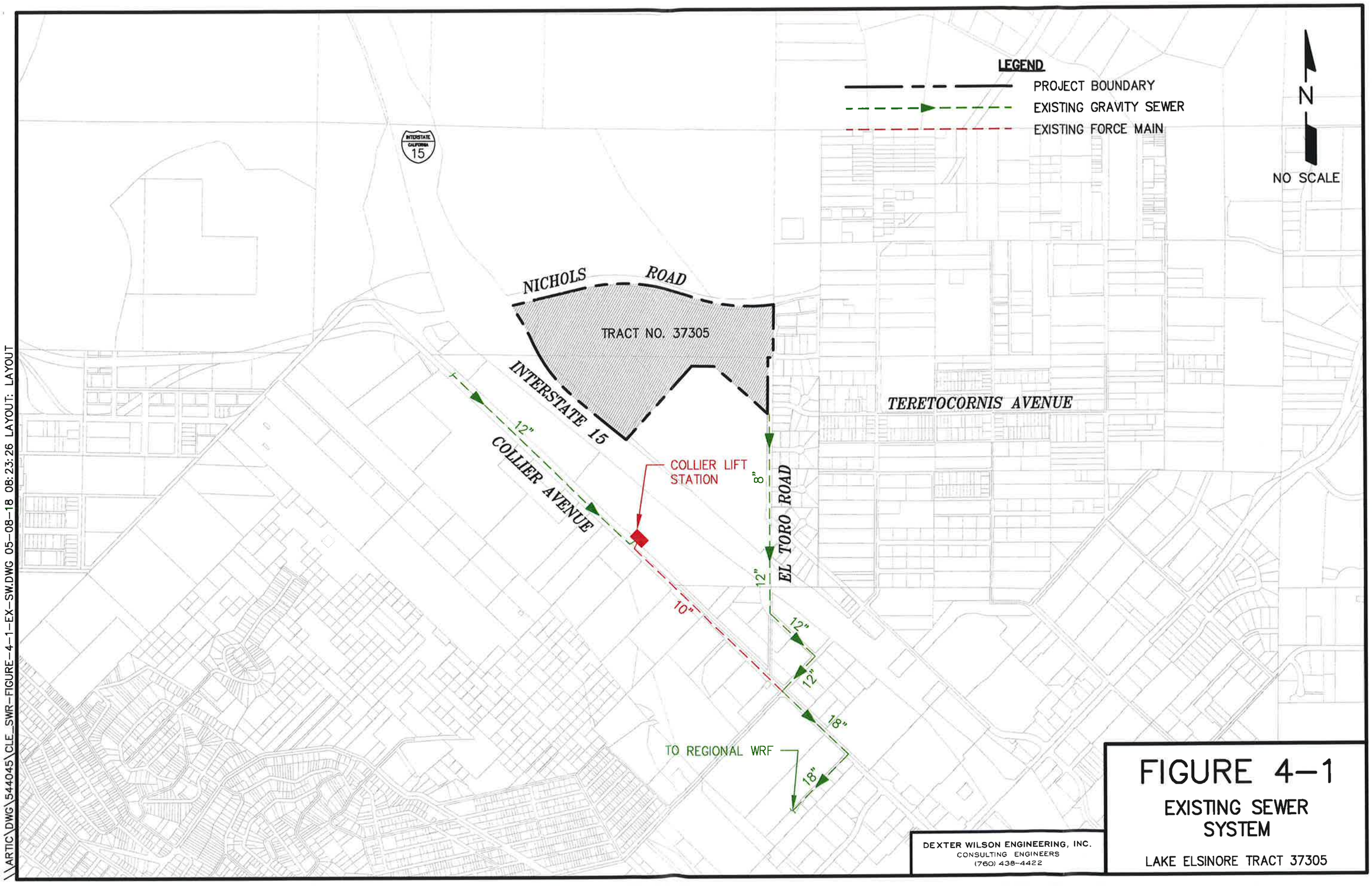
CHAPTER 4

EXISTING SEWER FACILITIES

The existing sewer facilities in the vicinity of the project are located to the south and west of the project. Figure 4-1 presents a map showing the boundaries of the project and the existing regional sewer facilities in the vicinity of the project.

All sewage generated from the Tract No. 37305 project will be conveyed to the EVMWD Regional Water Reclamation Facility (WRF) for the treatment and disposal. To the west of the project, there is an existing gravity sewer line, lift station, and force main in Collier Avenue that conveys flow south to a trunk sewer system upstream of the Regional WRF. The Collier Avenue Lift Station has a capacity of 800 gpm and conveys flow through a 10-inch force main.

To the south and east of the Tract No. 37305, gravity sewer lines collect flow from development east of Interstate 15 and convey them across Interstate 15 just south of the Temescal Canyon High School. There is an 8-inch gravity sewer line in El Toro Road near the southeast corner of Tract No. 37305. This sewer conveys flow south in El Toro Road and increases to 12-inch where it crosses Interstate 15. On the west side of Interstate 15, this gravity sewer line connects to the trunk sewer line in Collier Avenue near the discharge of the Collier Avenue Lift Station force main. From this location, flow is conveyed in trunk sewers and interceptor sewers to the Regional WRF.



\\ARTIC\DWG\544045\CLE_SWR-FIGURE-4-1-EX-SW.DWG 05-08-18 08:23:26 LAYOUT: LAYOUT

DEXTER WILSON ENGINEERING, INC.
CONSULTING ENGINEERS
(760) 438-4422

FIGURE 4-1

EXISTING SEWER SYSTEM

LAKE ELSINORE TRACT 37305

CHAPTER 5

RECOMMENDED SEWER FACILITIES

This chapter presents the recommendations for sewer system improvements required to provide service to the Tract No. 37305 project.

SEWER SYSTEM ANALYSIS

The evaluation performed to determine the recommended onsite sewer system for the project consists of reviewing project topography and constraints and applying current District criteria. The Stovepipe Canyon Creek traverses the project with the majority of the development proposed north of the creek. Development south of the creek includes 34 single family residential homes and the park site. Figure 5-1 provides the proposed layout of onsite facilities for the project. An evaluation of the impact of this project on offsite facilities will be evaluated by EVMWD and is outside the scope of this study.

To avoid a potential onsite sewer lift station, the project evaluated a few alternatives for providing sewer service to the project. The first alternative considered was to get everything to El Toro Road by gravity. This requires the area north of the creek to "buck" grade and construct a gravity sewer line beneath the creek and to El Toro Road. Due to the site topography, the gravity sewer line would have to reach a depth of approximately 70 feet and was therefore considered infeasible.

The second gravity alternative considered was to sewer the portion south of the creek to El Toro Road and the portion north of the creek to Collier Avenue. To sewer to Collier Avenue would require a new gravity sewer beneath Interstate 15, and acquisition of an easement from the existing shopping center between Interstate 15 and Collier Avenue. After investigating this alternative, it was also ruled out as infeasible.

As shown on Figure 5-1, it is proposed to provide sewer service to the project by conveying all flows to the existing 8-inch sewer line in El Toro Road. The portion of the project that is south of the creek can gravity flow to El Toro Road and the portion of development north of the creek proposes an onsite sewer lift station and force main to convey flows to the south of the creek.

Conclusions

Table 5-1 summarizes the projected flows from the project that are tributary to the lift station and the flows that can gravity flow to El Toro Road. The peak flow to the proposed onsite sewer lift station would be approximately 102,630 gpd (71 gpm). To provide a velocity of 3.5 feet per second in a 4-inch force main, a station with a design capacity of 140 gpm is recommended. All onsite gravity sewers are proposed as 8-inch as shown on Figure 5-1.

A Preliminary Design Report (PDR) for the sewer lift station will be required for review and approval by EVMWD before final engineering documents can be submitted for this facility. The District will evaluate the offsite impact of sewer flows from this project and identify required offsite improvements, if any.

TABLE 5-1
WASTEWATER FLOW SUMMARY

Description	ADWF		PDWF	
	gpd	gpm	gpd	gpm
Area tributary to Onsite Sewer Lift Station	34,210	24	102,630	71
Area Tributary to El Toro Road	5,714	4	17,142	12
TOTAL	**39,924**	**28**	**119,772**	**83**

LEGEND

- PROJECT BOUNDARY
- EXISTING GRAVITY SEWER
- PROPOSED GRAVITY SEWER
- PROPOSED SEWER FORCE MAIN

NOTE: ALL PROPOSED PIPES ARE RECOMMENDED AS 8-INCH UNLESS NOTED.

N

0 300 FEET

NICHOLS RD.

COMMERCIAL SITE

PARK SITE

PROPOSED SEWER LIFT STATION

CONNECT TO EXISTING 8" SEWER LINE

8"

4"

INTERSTATE 15

INTERSTATE CALIFORNIA 15

MANZANITA DRIVE

TERETICORNIS AVE.

EL TORO RD.

FIGURE 5-1

PROPOSED SEWER FACILITIES

LAKE ELSINORE TRACT 37305

DEXTER WILSON ENGINEERING, INC.
CONSULTING ENGINEERS
(760) 438-4422