# City Of Merced Wastewater Collection System Master Plan

# DRAFT ENVIRONMENTAL IMPACT REPORT

## CHAPTER 2.0 PROJECT DESCRIPTION

September 2020


*Prepared for:*
**City of Merced**
678 W 18th Street
Merced, CA 95340

*Prepared by:*
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# 2.0 PROJECT DESCRIPTION

The City of Merced (City) is located within California's Central Valley (Figure 2.1-1). The City's wastewater collection (sewer) and treatment system, which serves a population of approximately 87,600 people, includes more than 400 miles of gravity sewers, forcemains (pressurized sewer lines), and pump/lift stations (used in association with the pressurized system) that collect and transport wastewater generated by residential, commercial, and industrial uses throughout the City limits to the City's Wastewater Treatment and Reclamation Facility (WWTRF) in the southwest corner of the City (at 1961 Gove Road, Merced, California 95341). The City's existing sewer trunk system can be categorized into two major geographical service areas, North Merced and Central/South Merced, which are separated largely by Bear Creek, which runs east to west through the City (Figure 2.1-2).

## 2.1 2017 WCSMP PLANNING PROCESS

### 2.1.1 Overview

The City's Vision 2030 General Plan (2030 General Plan) discusses City growth that may occur by the year 2030. Much of that growth requires construction of new infrastructure that is to be funded by the private development projects that would need public services provided by the City. As a part of the infrastructure planning associated with accommodating this growth, the City prepared a Wastewater Collection System Master Plan (2017 WCSMP) that set forth a strategy to meet the long-term sewer system needs of the 2030 General Plan (City of Merced 2017). Key infrastructure needs relevant to the 2017 WCSMP included the wastewater collection system itself; wastewater treatment, disposal, and reuse facilities; and various potable and non-potable water needs for the growing areas of the City. The 2017 WCSMP focused on the wastewater collection system needs and planning. However, wastewater collection system planning is driven by the following: 1) where the wastewater is generated (i.e., collected from), 2) where it is conveyed to receive treatment, and 3) subsequent disposal or reuse of the treated wastewater, which is termed "effluent" (City of Merced 2017).

**Reasonable build-out** considers not just the growth envisioned by the City in the 2030 General Plan, but the long-term growth and wastewater flow estimates based on development density within the SUDP/SOI.

Because wastewater collection systems are designed to have an effective service life of more than 50 years and can be expected to be in service up to 75 or 100 years, such systems are designed and constructed based on best professional judgement of wastewater collection system needs under reasonable build-out conditions, not just City growth envisioned in the 2030 General Plan (which has a 20-year planning horizon). The City's wastewater collection system is to be designed and constructed to serve reasonable build-out of the 2030 General Plan Specific Urban Development Plan/Sphere of Influence (SUDP/SOI). The SUDP/SOI and 2017 WCSMP Service Areas are depicted on Figure 2.1-2.

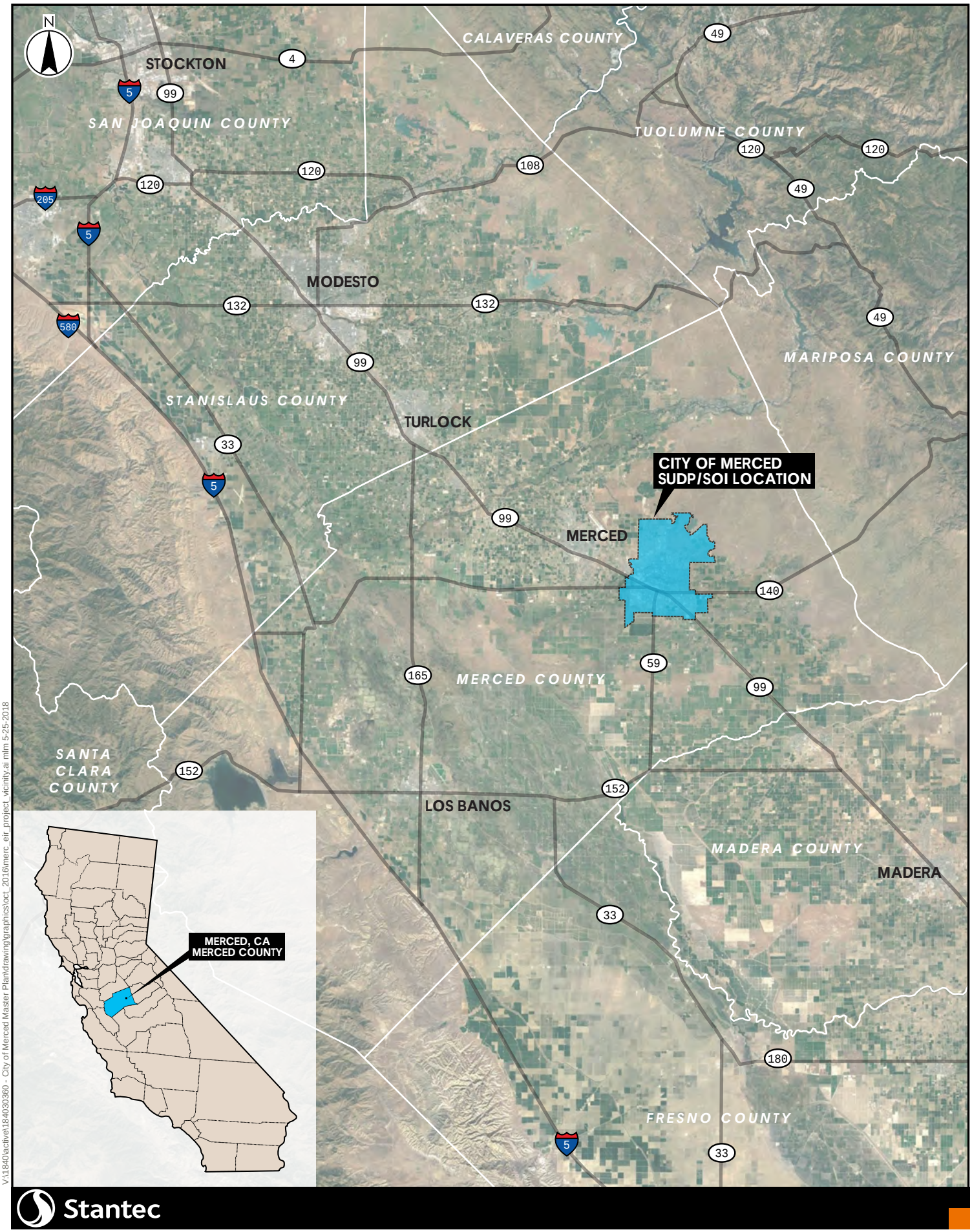


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Figure 2.1-1
Wastewater Collection System Master Plan Program Vicinity
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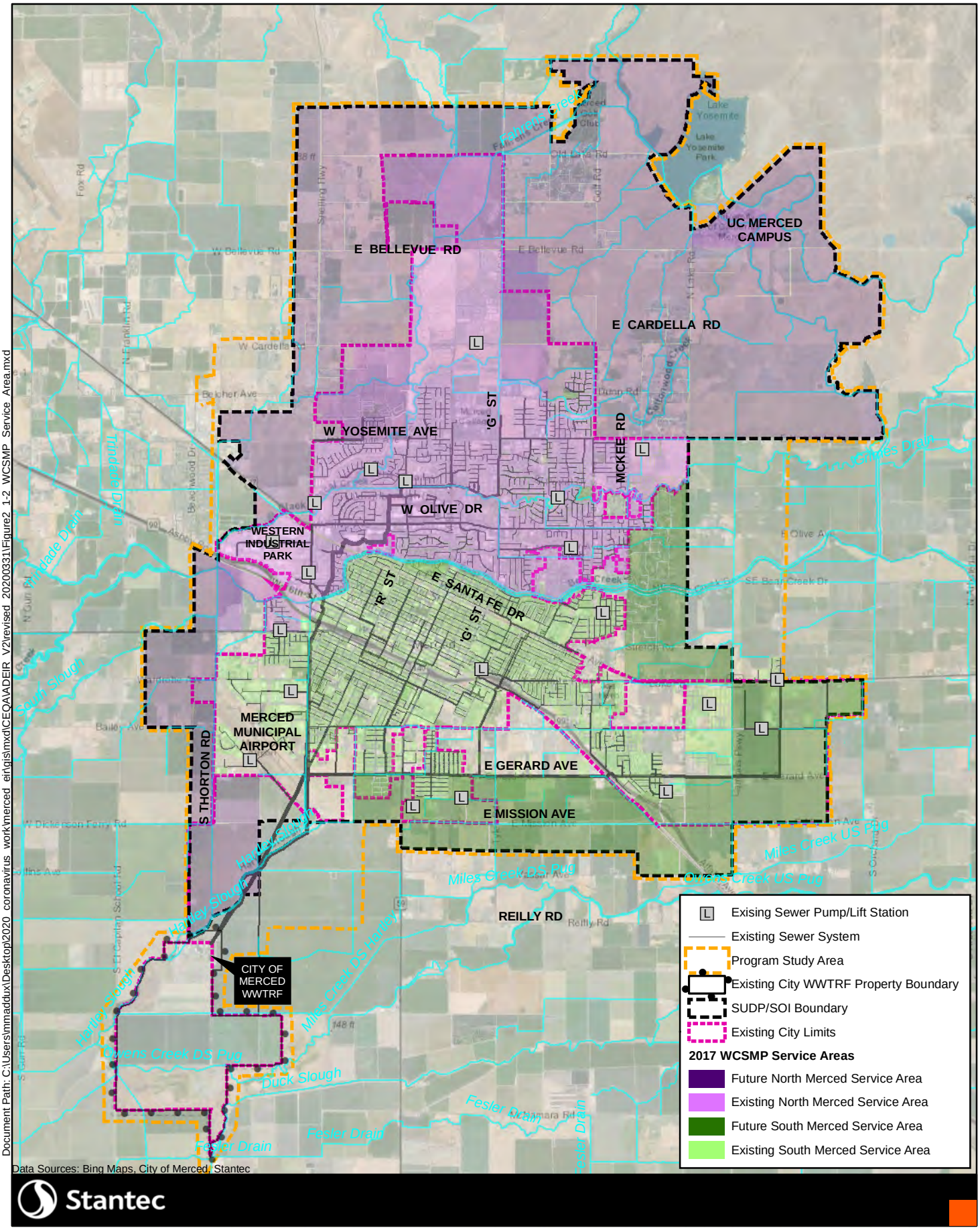


Figure 2.1-2
2017 WCSMP Service Area
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The SUDP/SOI was established in the 2030 General Plan and encompasses the unincorporated areas surrounding the current City limits in which the City anticipates growth to occur (City of Merced 2012). Reasonable build-out conditions are City growth and wastewater flow estimates based on development density assumptions outlined in Section 5.0 of the 2017 WCSMP (which can be found on the City's webpage at https://www.cityofmerced.org/Home/ShowDocument?id=8632). Application of maximum densities on all properties within the 2030 General Plan SUDP/SOI could result in higher flow estimates than those estimated in the 2017 WCSMP. Also, planning for maximum densities is unrealistic for a city like Merced (versus "land-locked" cities like San Francisco where new development is forced to be more compact and vertical due to lack of vacant land). Consequently, the 2017 WCSMP based reasonable build-out estimates of the City using current development trends and professional engineering standards.

Since collection system sewer lines, particularly large trunk sewers, are often located within roadways, the 2017 WCSMP identified locations for trunk sewers to be consistent with the 2030 General Plan Circulation Plan. Trunk sewers require deep excavations and are most cost-effectively installed prior to or concurrent with construction of major roadway and other surface improvements. Replacing sewers or putting in parallel sewers after the fact is disruptive to the public and very expensive. Thus, the 2017 WCSMP proposes to size the trunk sewers for reasonable build-out conditions rather than phased expansions based on more near-term demand.

Because wastewater collection systems require gravity flow and/or pump stations to transport effluent to wastewater treatment plant sites and related effluent disposal/reuse facilities, these plant sites and effluent facilities were evaluated conceptually within the 2017 WCSMP for function/viability under reasonable build-out flow conditions. Like collection systems, wastewater treatment plants are master-planned to serve reasonable build-out, but construction of these facilities can be more cost effective if phased in over time. When properly sited, treatment plants have generous buffers to limit exposure of commercial and residential land uses to objectionable odors, noise, and visual impacts associated with their operation. Additionally, construction activities occurring on treatment plant sites do not typically involve significant traffic disruptions like those associated with construction of trunk sewers and typically result in less exposure of the general public to noise and other potential impacts. So, treatment plants must be planned to allow for generous buffers and to allow for construction of capacity expansions at these plants to be phased to keep pace with population growth and take advantage of advances in treatment process technology and consideration of regulatory requirements. Therefore, the 2017 WCSMP considered expansions of the WWTRF to occur over time as the need develops.

### 2.1.2 Existing Collection System Assessment

To develop the recommended plan under "reasonable build-out," the City modeled different scenarios within their existing wastewater collection system to identify system deficiencies and develop a recommended plan. The City developed three scenarios for evaluation (described in more detail in Sections 6.0 and 7.0 of the 2017 WCSMP) to identify areas where the existing wastewater collection system had remaining capacity or was at capacity or over capacity. These are as follows:

- **Existing system conditions** – This scenario simulated the capacity within the existing trunk sewer system using only existing connections producing wastewater flow. The existing

wastewater collection system and service area sewer service needs were presented in Figure 6-1 and Section 5.0, respectively, of the 2017 WCSMP. Results of this simulation are shown on Figure 2.1-3.

- **Interim system conditions** – This scenario incorporated the existing conditions simulation but was expanded to include previously approved (i.e., 'entitled') users that are not yet connected to the system but are anticipated to be connected at some date in the future as defined by City staff (i.e., tentative subdivision maps and other entitlements that have been approved and are still active, etc.). This simulation excluded any new trunk sewers. This interim condition scenario was modelled to identify deficiencies in and any remaining capacity in the existing trunk sewer system if all areas identified in Figure 6-2 of the 2017 WCSMP were to be developed. Results of this simulation are presented in Section 7.2.3 of the 2017 WCSMP report.

- **SUDP/SOI "build-out" conditions** – This scenario modeled conditions under reasonable build-out of the 2030 General Plan conditions, including build-out of the University of California (UC) Merced campus, the adjacent Campus Community, and areas within the SUDP/SOI currently on septic sanitary systems. New pipes (including their sizes and slopes) for future trunk sewers and pump stations were identified to serve the entire SUDP/SOI. **Figure 6-3** of the 2017 WCSMP illustrates the extent of the build-out service area used for this simulation.

Based on the results of the modeling for the existing collection system illustrated on Figure 2.1-3, the 2017 WCSMP identified the most significant deficiencies in the major trunk sewers were those along Canal Street and R Street for South Merced (Section 7.2.1 of the 2017 WCSMP) and those along W Olive Avenue and Highway 59 trunk sewers in North Merced (Section 7.2.2 of the 2017 WCSMP). Section 7.3.1 of the 2017 WCSMP, recommended that these deficiencies be addressed to maintain the functionality of the existing system. These deficiencies have subsequently been addressed under previous environmental approvals and are not considered within this Environmental Impact Report (EIR).

Despite improvements to the existing system of trunk sewers at key locations, modeling results for interim and build-out conditions identified system deficiencies that would be too costly and/or too disruptive to City traffic circulation to upsize or construct parallel sewer interceptors (Sections 6.5.3 and 7.3.2 of the 2017 WCSMP). As a result, the 2017 WCSMP recommended new trunk sewers to accommodate and effectively serve reasonable build-out of the SUPD/SOI.

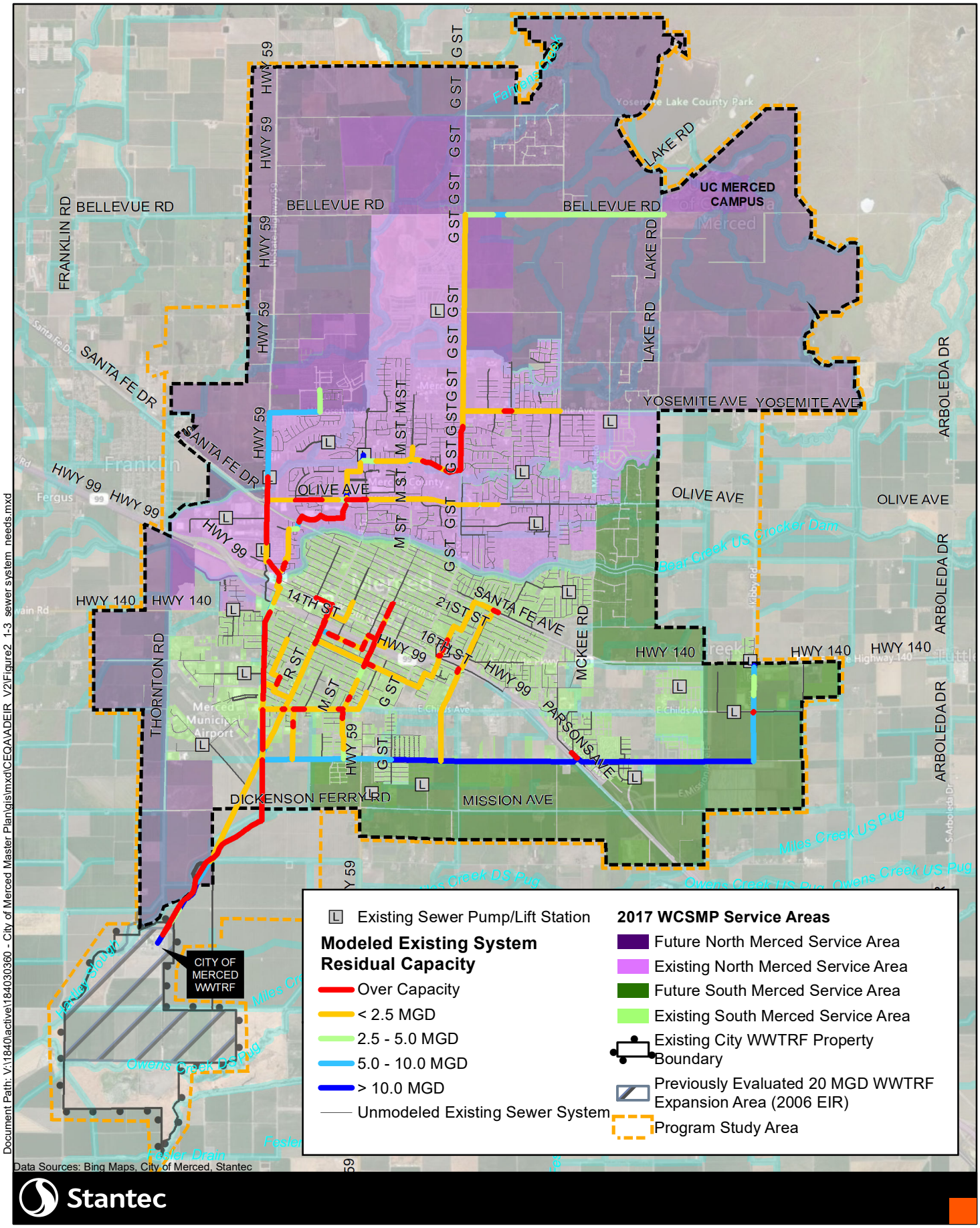


Figure 2.1-3
2017 WCSMP Sewer System Needs
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## 2.2 PURPOSE AND OBJECTIVES

The purpose of the 2017 WCSMP was to strategically and comprehensively plan development of the wastewater infrastructure necessary to support reasonable build-out of the SUDP/SOI and meet these long-term projected needs. Specific objectives to meet the purpose of the 2017 WCSMP include the following:

1. Construct and maintain safe and reliable facilities.
2. Meet long-term sewer service collection system needs by constructing the components of the collection system in stages, as needed.
3. Achieve lower overall life-cycle cost and maintain relatively low costs for sewer service considering upfront costs and anticipated operation and maintenance costs over the coming decades.
4. Maintain high water quality and wastewater treatment standards.
5. Reduce or maintain relatively low operational costs and energy demand by selecting gravity systems where feasible.
6. Maintain consistency with the Merced Vision 2030 General Plan.
7. Plan collection system infrastructure that meets reasonable build-out conditions of 35 million gallons per day (Mgal/d).
8. Minimize land use and environmental impacts.
9. Adhere to federal and state policies and regulations in support of regionalization, reclamation, recycling, and conservation for wastewater treatment plants (such as Central Valley Regional Water Quality Control Board [CVRWQCB] Resolution Number R5-2009-0028) (CVRWQCB 2009).
10. Use the existing publicly owned property, roadways, and rights-of-way (ROWs) to the extent feasible.

## 2.3 PROPOSED PROGRAM

### 2.3.1 Program Overview

The 2017 WCSMP set forth a 'roadmap' for wastewater collection services, referred to in this EIR as the 'Program'. The proposed Program, identified as Alternative Plan A in the 2017 WCSMP, describes the City's preferred approach for building the wastewater collection system infrastructure needed to serve 2030 General Plan growth projections and City forecasts of reasonable build-out conditions. The proposed Program was selected for its ability to best meet the long-range sewer system conveyance needs of the City. These needs were determined by the Program's use of the more reliable gravity sewers where feasible, which require no energy to operate and no moving parts (i.e., pump stations) thus limiting the life-cycle and energy costs associated with operation of the system.

The '**Program**' considers implementation of 'Plan A' of the 2017 WCSMP. It includes implementation of the plan as well as development of Projects identified within the 2017 WCSMP and the EIR Project Description.

The Program proposes the City's collection system take all municipal wastewater to the City's existing 12 Mgal/d capacity WWTRF. The existing WWTRF would be expanded, as needed in 4 to 5 Mgal/d

increments, to handle 2030 General Plan flows, referred to as WWTRF Expansion Projects in this EIR. The effluent disposal and reuse facilities at the WWTRF are believed to have sufficient land and disposal potential to serve reasonable build-out design flow estimates of 34 to 35 Mgal/d, if and when needed.

The Program proposes main trunk sewer locations consistent with the 2030 General Plan Circulation Element to serve anticipated growth in North and South Merced. These sewers would maintain gravity flows where feasible. Where infeasible, forcemain sewers and pump/lift stations would be used. Specifically, two trunk sewer projects—the Northern Trunk Sewer Project and the Southern Trunk Sewer Project—have been identified as the first steps to supporting the construction of the 2017 WCSMP. These projects are sized to accommodate the reasonable build-out of the SUDP/SOI and would be required prior to further development within North Merced or South Merced, respectively. These trunk sewers would serve as the key routes for wastewater to be delivered to the WWTRF and as interceptors for the new smaller collector sewers. Collectively, the Northern Trunk Sewer Project, Southern Trunk Sewer Project, and WWTRF Expansion Projects are referred to collectively as the 'proposed Projects' within this EIR. The proposed Program and specific Projects are illustrated on Figure 2.3-1. Construction characteristics for the Program and proposed Projects are described in more detail in Section 2.4.

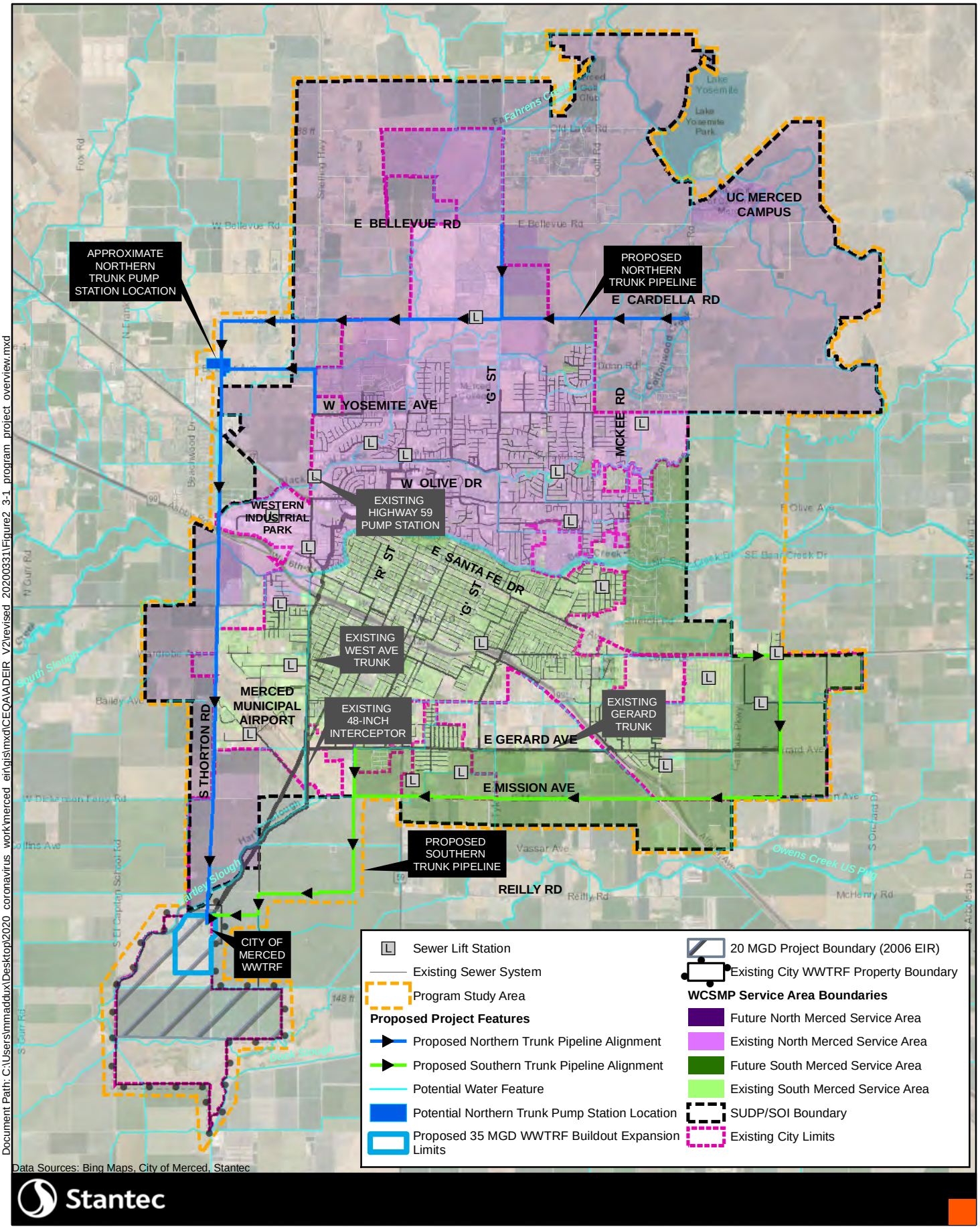
### 2.3.2 Program Components

The Program can generally be categorized into the following types of activities: existing collection system upgrades, new trunk sewer infrastructure, new localized collector infrastructure, existing WWTRF expansion, increased WWTRF effluent disposal, and operations and maintenance (O&M). Each type of activity includes a characterization of the projects identified within that category required to reach reasonable build-out. Known project-level descriptions were provided, where possible, as indicated in Table 2.3-1.

**Table 2.3-1: Program Components**

| WCSMP Program Category | Identified Projects[1] | Future Activities[2] |
|---|---|---|
| **New Trunk Sewer Infrastructure** | ✓ | ✓ |
| Northern Trunk Sewer | ✓ | |
| Southern Trunk Sewer | ✓ | |
| Program-Level Trunk Sewer Projects | | ✓ |
| **New Localized Collector Infrastructure** | | ✓ |
| **WWTRF Expansion** | ✓ | ✓ |
| Existing WWTRF Expansion | ✓ | ✓ |
| Increased WWTRF Effluent Disposal | ✓ | ✓ |
| **Operations and Maintenance** | | ✓ |

Notes:
[1] Projects to be analyzed at a specific project footprint level.
[2] Projects categories and types analyzed programmatically.

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Data Sources: Bing Maps, City of Merced, Stantec

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Figure 2.3-1
Program and Proposed Projects Overview
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The following sections provide descriptions of the categories listed in Table 2.3-1.

### 2.3.2.1 New Trunk Sewer Infrastructure

A **trunk sewer** is a pipeline that receives wastewater from many tributary branches and sewer lines and serves as an outlet for a large territory or is used to feed an intercepting sewer.

Key new trunk sewers that would serve as the "backbone" of the City's collection system are needed to meet the future wastewater collection services demands estimated within the SUDP/SOI As shown on Figure 2.3-2, up to 18 miles of new trunk sewer pipeline would be placed within existing or planned roadways, consistent with the 2030 General Plan's Circulation Element. The backbone trunk sewers would be designed to be co-located in existing or planned roads or ROWs. This backbone infrastructure can be categorized into two sections, a trunk system to serve development in the North Merced Service Area and a trunk system to serve development in South Merced Service Area.

The 2017 WCSMP breaks down the required new sewer improvements as shown in Table 2.3-2. This table identifies the name, location, size, length and the type of activities associated with each trunk feature. These new sewer pipelines can be classified into two proposed Projects, the Northern Trunk Sewer Project and Southern Trunk Sewer Project, and are proposed to serve each service area, respectively. Specific alignments are shown on Figure 2.3-1 above and Figure 2.3-2 below.

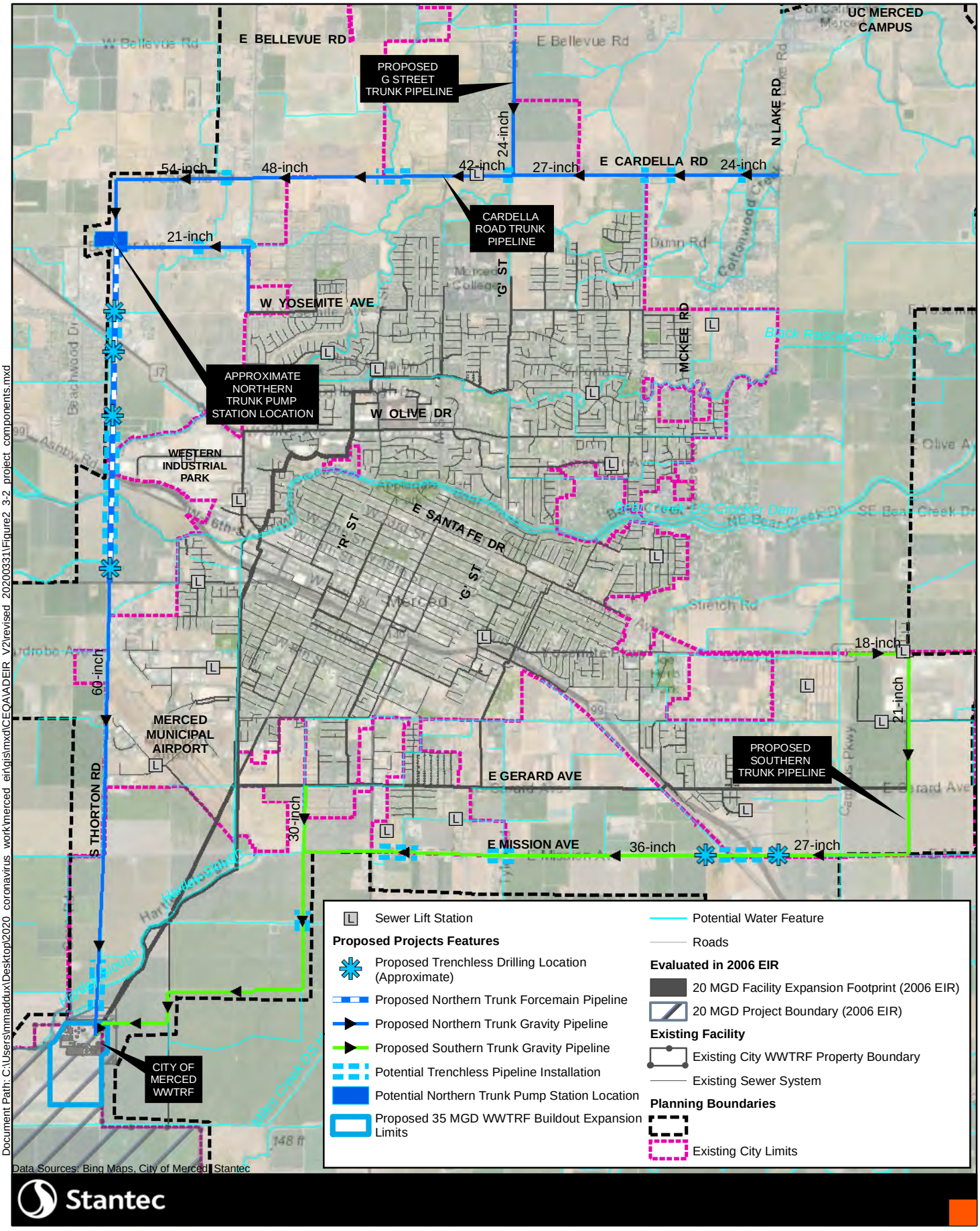


Figure 2.3-2
Proposed New Trunk Sewer Infrastructure Project Components
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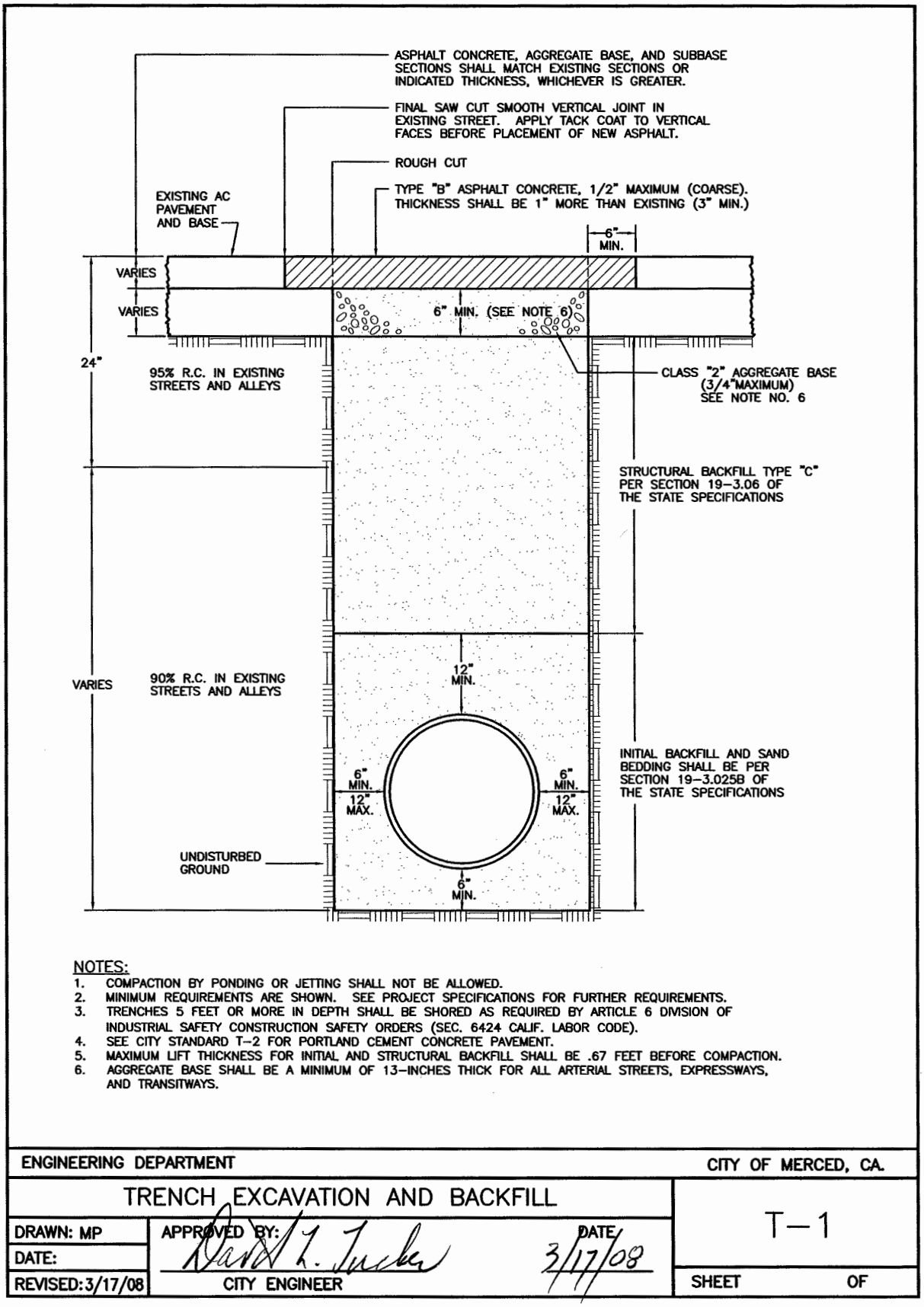
## Table 2.3-2: Proposed New Trunk Sewer Pipelines

| Trunk Feature Name | Location | Pipe Diameter | Approximate Length | Pipeline Type | Common Activities Associated with Component |
|---|---|---|---|---|---|
| **Northern Trunk Sewer Project** | | | | | |
| Cardella Road Trunk | Cardella Road from Lake Road to Gardner Avenue | 24-inch | 1 mile | Gravity | • Pipeline placement (site preparation, trenching, and dewatering)<br>• Grading and compaction<br>• Odor control facilities<br>• Air blow-off and air release valves<br>• Pump station<br>• Creek/Canal trenchless under crossing(s)<br>• Rail undercrossing(s)<br>• Sewer connections<br>• Testing/start-up |
| | Cardella Road from Gardner Avenue to G Street | 27-inch | 1 mile | Gravity | |
| | Cardella Road from G Street to Kansas Street | 42-inch | 1.4 mile | Gravity | |
| | Cardella Road from Kansas Street to Highway 59 | 48-inch | 0.5 mile | Gravity | |
| Belcher Avenue Trunk | Flow Diversion from Highway 59 Pump Station to Proposed Pump Station (S. Belcher Avenue) | 21-inch | 1.3 miles | Gravity | |
| Bellevue Road Trunk | Bellevue Road from Fahrens Creek west to new 27-inch sewer | 24-inch | 0.7 mile | Gravity | |
| | Bellevue Road to Cardella Road | 27-inch | 1 mile | Gravity | |
| Thornton Road Trunk | Thornton Road from Cardella Road to proposed Pump Station | 54-inch | 1.2 mile | Gravity | |
| | Cross-country from Proposed Pump Station to Thornton Road at McSwain Road (SR 140) | Parallel 24-inch and 36-inch | 2.3 mile | Forcemain | |
| | Thornton Road from McSwain Road (SR 140) to WWTRF | 60-inch | 3.3 mile | Gravity | |
| G Street Trunk | G Street from Bellevue Road to Cardella Road | 24-inch | 1 mile | Gravity | |
| **Southern Trunk Sewer Project** | | | | | |
| Kibby Road Trunk | End of Baker Drive to Kibby Road | 18-inch | 0.4 mile | Gravity | • Pipeline placement (site preparation, trenching, and<br>• Grading and compaction dewatering)<br>• Odor control facilities<br>• Air blow-off and air release valves |
| | Kibby Road to SR 140 to Mission Avenue | 21-inch | 1.5 mile | Gravity | |
| Mission Avenue Trunk | Mission Avenue from Kibby Road to Miles Road | 27-inch | 1.4 mile | Gravity | |
| Mission Avenue Trunk | Mission Avenue from Miles Road to approximately 0.5 mile west of Highway 59 | 36-inch | 3.2 mile | Gravity | |

| Trunk Feature Name | Location | Pipe Diameter | Approximate Length | Pipeline Type | Common Activities Associated with Component |
|---|---|---|---|---|---|
| Dickenson Ferry Road Trunk | Dickenson Ferry Road to WWTRF | 36-inch | 2.8 mile | Gravity | Continued from previous page:.<br>• Creek/Canal undercrossing(s)<br>• Rail undercrossing(s)<br>• Sewer connections<br>• Testing/start-up |
| | | **Total** | 22.9 miles | | |

Notes:
SR = State Route
WWTRF = Wastewater Treatment and Reclamation Facility

Much of the City's existing sewer system uses gravity flow sewers, and the proposed Program was thereby designed with the intent to continue the use of such a system. Where gravity sewers are infeasible, pressure flow sewers (also known as forcemains) and lift stations would be used to transport pressurized sewage from low points back into a gravity-fed system. Where the trunk sewers require crossing non-City-owned properties' ROWs, negotiations would be required; however, the Projects would be sited to be on the edge of existing properties. These trunk sewers would be below ground ranging with maximum depths of approximately 30 feet, and the associated pump station would be anticipated to have an approximate maximum depth of 40 feet. A standard cross section of the City's typical pipeline design is shown on Figure 2.3-3. For the purposes of this analysis throughout this EIR, a 100-foot wide construction disturbance corridor was assumed around all proposed pipeline alignments to accommodate uncertainties or realignment of design; however, a more realistic footprint of approximately 10- to 20-foot width is anticipated.




NOTES:

1. COMPACTION BY PONDING OR JETTING SHALL NOT BE ALLOWED.
2. MINIMUM REQUIREMENTS ARE SHOWN. SEE PROJECT SPECIFICATIONS FOR FURTHER REQUIREMENTS.
3. TRENCHES 5 FEET OR MORE IN DEPTH SHALL BE SHORED AS REQUIRED BY ARTICLE 6 DIVISION OF INDUSTRIAL SAFETY CONSTRUCTION SAFETY ORDERS (SEC. 6424 CALIF. LABOR CODE).
4. SEE CITY STANDARD T-2 FOR PORTLAND CEMENT CONCRETE PAVEMENT.
5. MAXIMUM LIFT THICKNESS FOR INITIAL AND STRUCTURAL BACKFILL SHALL BE .67 FEET BEFORE COMPACTION.
6. AGGREGATE BASE SHALL BE A MINIMUM OF 13-INCHES THICK FOR ALL ARTERIAL STREETS, EXPRESSWAYS, AND TRANSITWAYS.

| ENGINEERING DEPARTMENT | | CITY OF MERCED, CA. |
|---|---|---|
| TRENCH EXCAVATION AND BACKFILL | | T-1 |
| DRAWN: MP | APPROVED BY: David L. Tucker | DATE 3/17/08 |
| DATE: | CITY ENGINEER | SHEET OF |
| REVISED: 3/17/08 | | |





Figure 2.3-3
Typical Pipeline Cross-Section
City of Merced - Draft Environmental Impact Report

## Northern Trunk Sewer Project

The Northern Trunk Sewer Project is composed of three components: the Northern Trunk Sewer Gravity Pipeline (designated as “Gravity” in Table 2.3-2), the Northern Trunk Sewer Forcemain Pipeline (designated as “Forcemain” in Table 2.3-2), and the Northern Trunk Pump Station. These three components are made up of five trunk sewer pipelines. The Northern Trunk Sewer Project would construct approximately 11 miles of pipeline ranging from 21 to 60 inches in diameter (Table 2.3-2) to serve the North Merced service area. The Northern Trunk Sewer Project would be partially gravity fed (the Northern Trunk Sewer Gravity Pipeline) and partially pressurized (the Northern Trunk Forcemain Pipeline) requiring an approximately 33 Mgal/d flow capacity pump station (the Northern Trunk Pump Station) near the intersection of W Cardella Road and Thornton Road as denoted on Figure 2.3-4. The Northern Trunk would generally follow W Cardella Road/E Cardella Road and Thornton Road east-west then north-south until reaching the WWTRF as illustrated on Figure 2.3-4.

The new Northern Trunk Sewer would be gravity sewer pipeline along the existing and proposed portions of Cardella Road and the northern segment of Thornton Road. The new pump station, the Northern Trunk Sewer Pump Station, sited near the intersection of W Cardella Road and Thornton Road, would be constructed to assist flows as the pipeline runs south to the WWTRF under Santa Fe Drive, State Route (SR) 140, and the railroad tracks. From the Northern Trunk Sewer Pump Station to south of the railroad tracks near SR 140, the Northern Trunk Sewer Project would be pressurized with a forcemain to accommodate changes in elevation. South of SR 140 gravity flows would return for the remainder of the pipeline until it reaches the WWTRF.

The Northern Trunk Sewer system would also require new trunk sewer pipes that would connect to Bellevue Avenue and G Street as demand warrants as shown in Table 2.3-2. Above-ground features associated with the new Northern Trunk Sewer Project would be limited to the new Northern Trunk Sewer Pump Station (an approximately 2,000 square foot above-ground structure illustrated on Figure 2.3-4D below) and associated control boxes, air-blow off, and air release valves, which would all have small, inconspicuous footprints of a few square feet and architectural finishes that match the surrounding area. The Northern Trunk Sewer Pump Station would be sized for approximately 33 Mgal/d of flow and would require backup power generation, grid power connections, and mechanical and chemical equipment to operate. The Northern Trunk Sewer Pump Station would be installed adjoining to the sewer trunk at a depth around 40 feet. Excavations associated with construction of the pump station are anticipated to require depths of up to 50 feet subsurface. Engineering studies are needed prior to identification and selection of a specific design; however, it can generally be assumed the pumps would be submerged subsurface pumping wastewater flows up to the elevation of the forcemain.

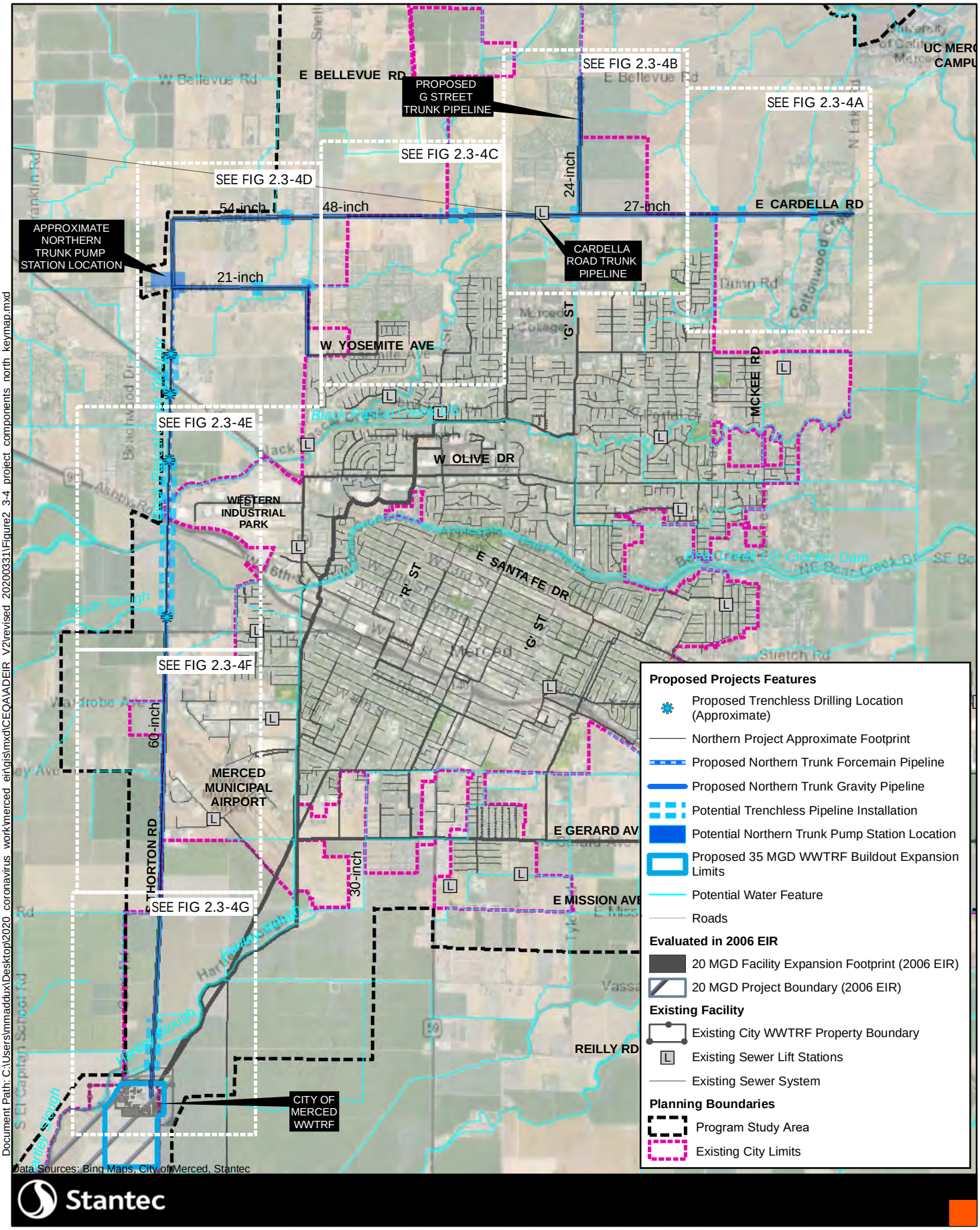



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Figure 2.3-4
Proposed Northern Trunk Sewer Project Components Key Map
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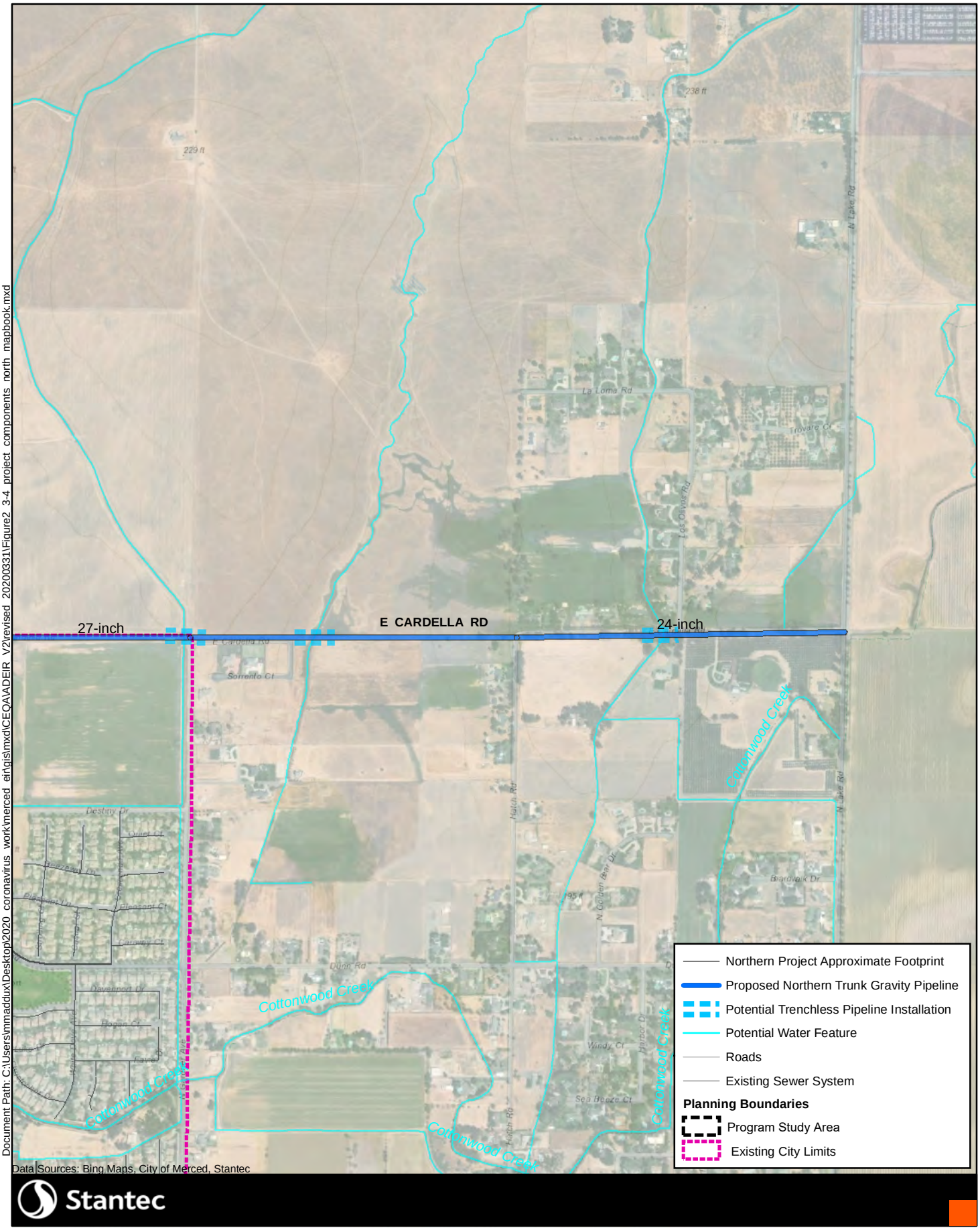


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Figure 2.3-4A
Proposed Northern Trunk Sewer Project Components
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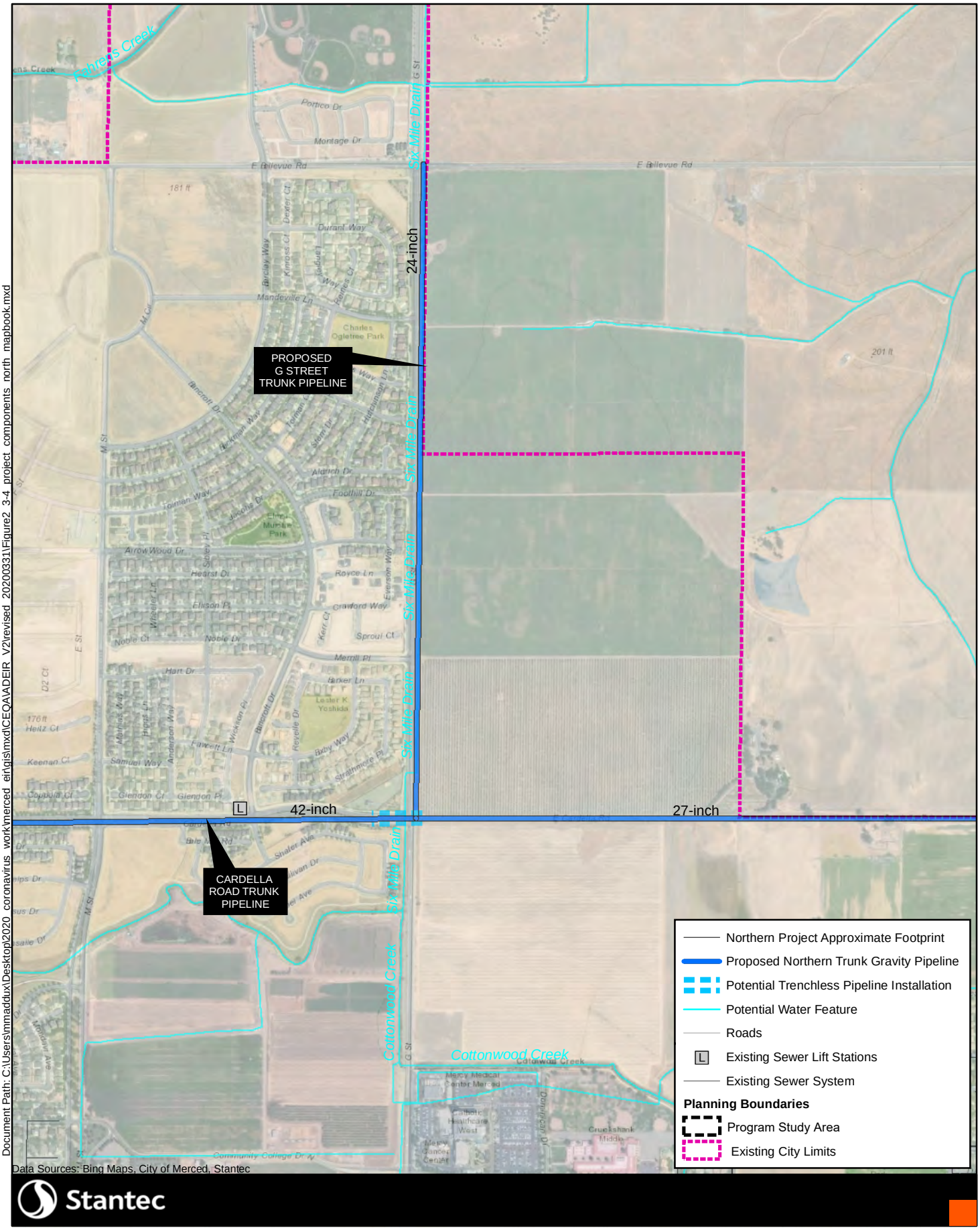


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Figure 2.3-4B
Proposed Northern Trunk Sewer Project Components
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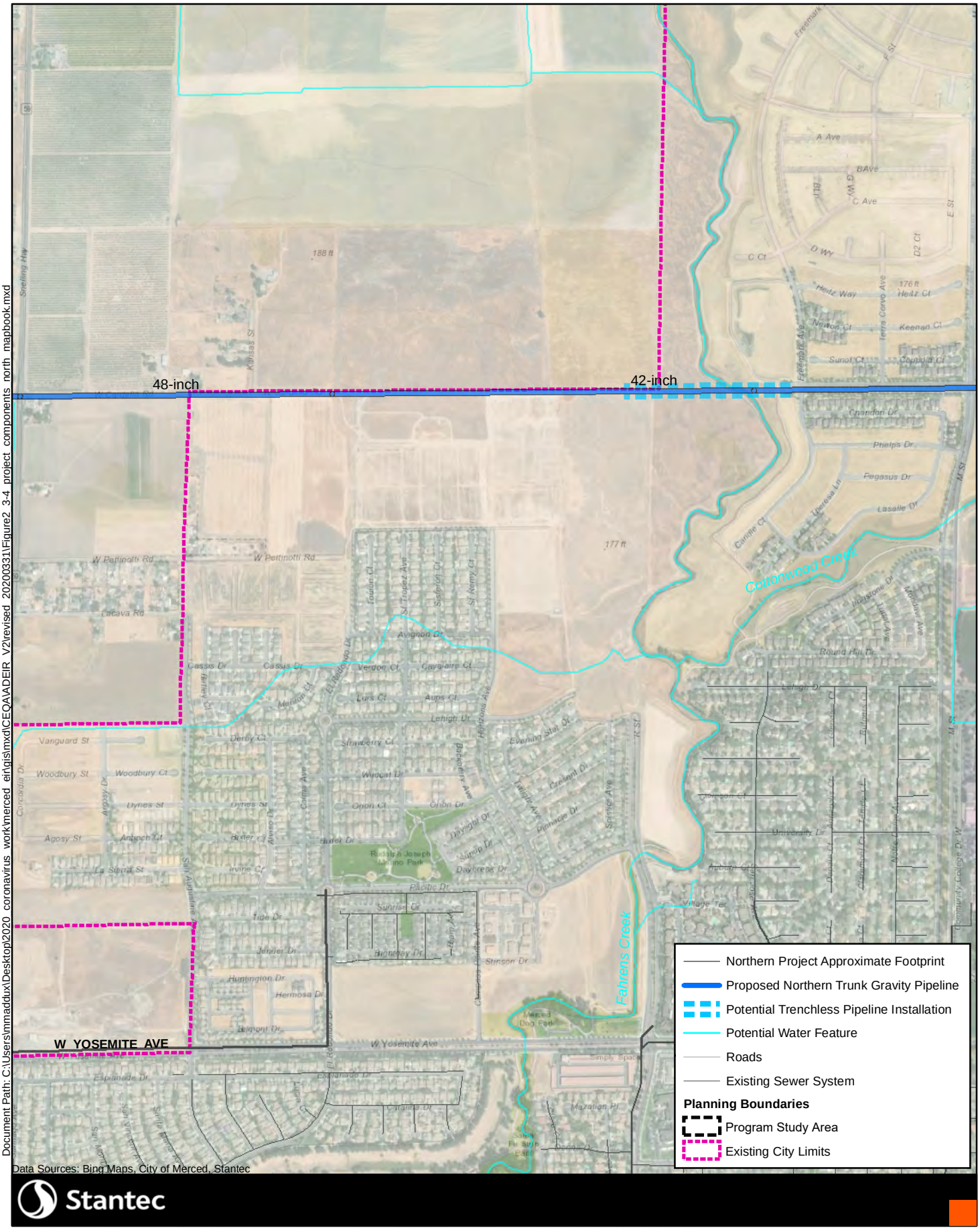


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Figure 2.3-4C
Proposed Northern Trunk Sewer Project Components
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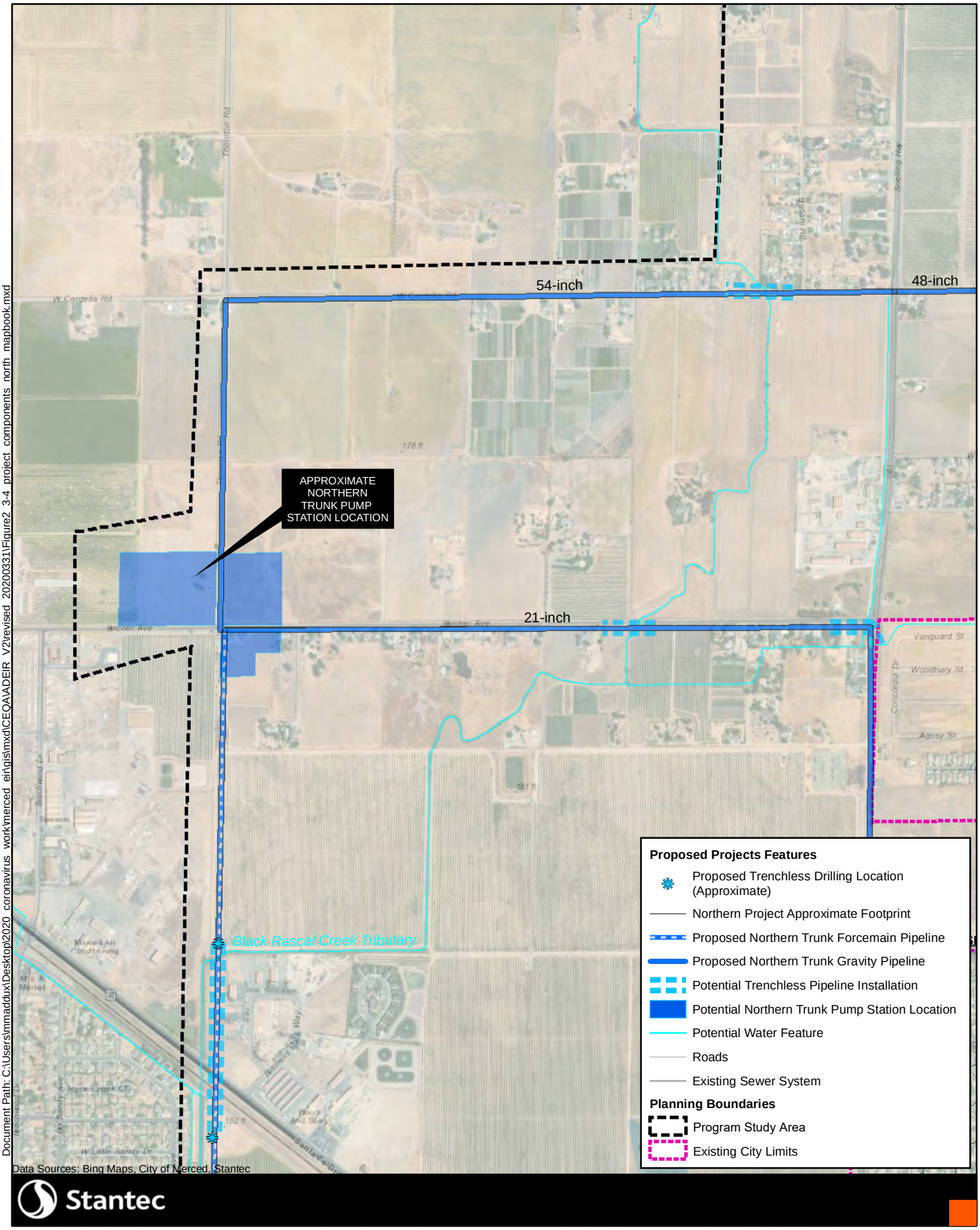


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Figure 2.3-4D
Proposed Northern Trunk Sewer Project Components
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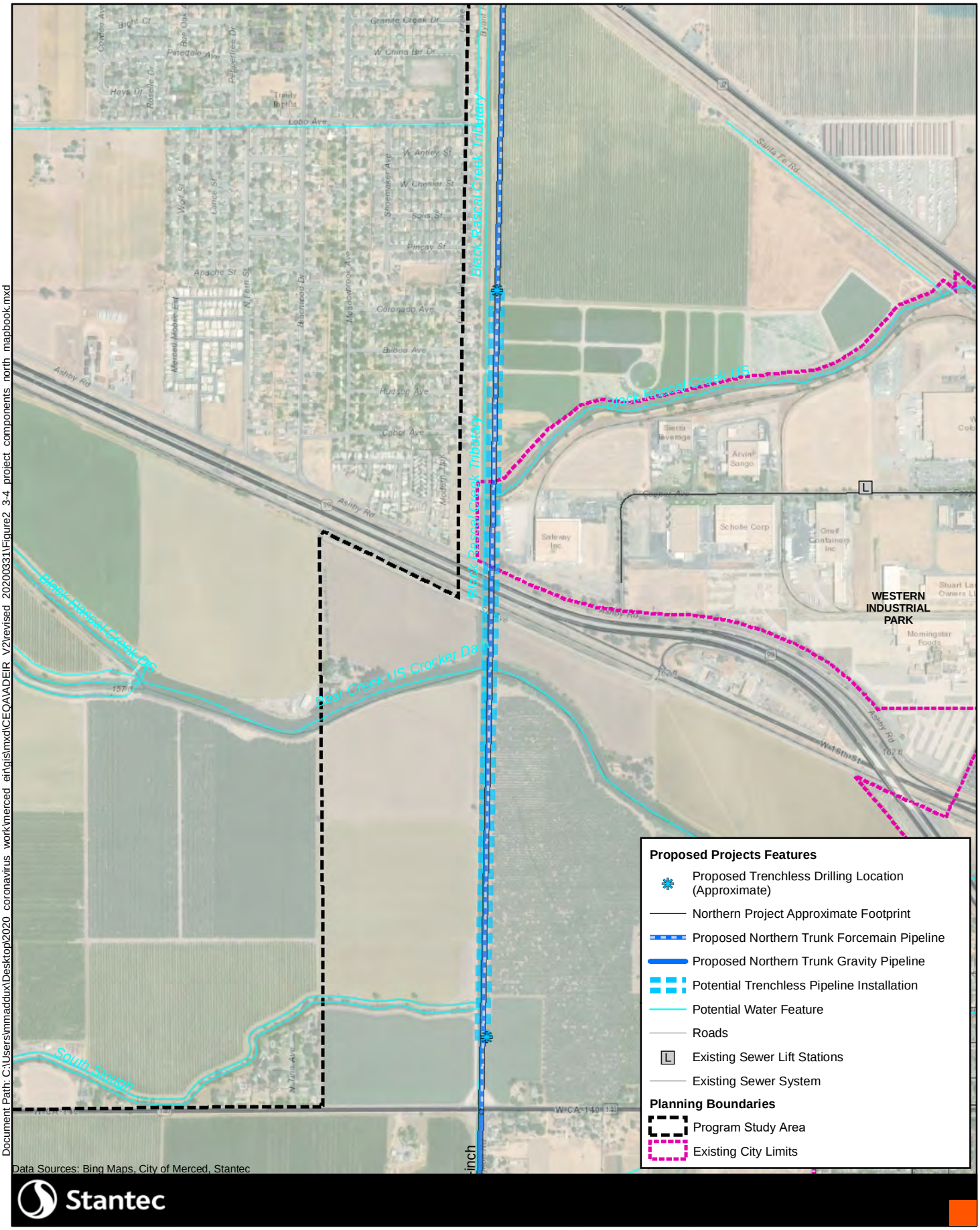


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Figure 2.3-4E
Proposed Northern Trunk Sewer Project Components
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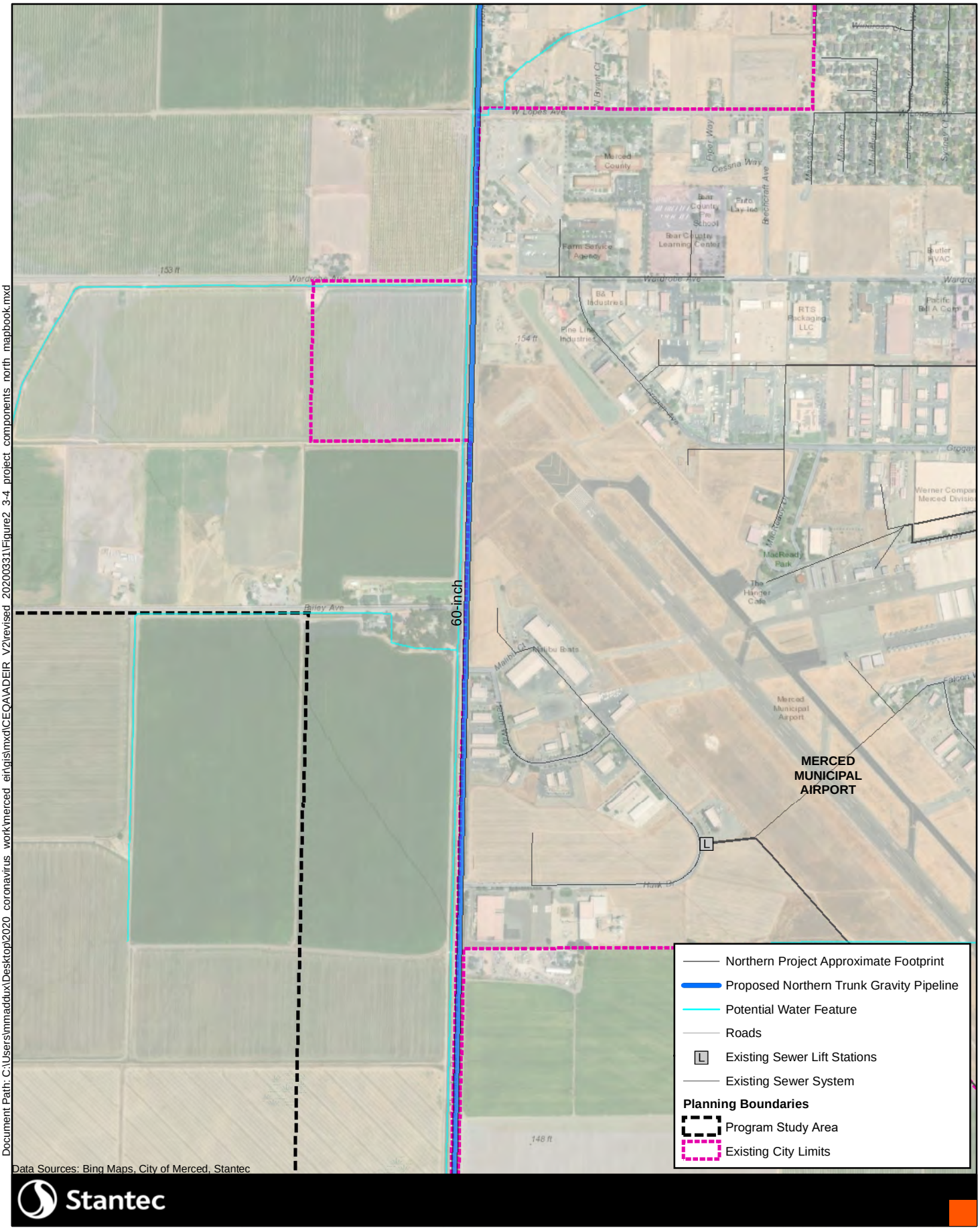


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Figure 2.3-4F
Proposed Northern Trunk Sewer Project Components
City of Merced - Draft Environmental Impact Report

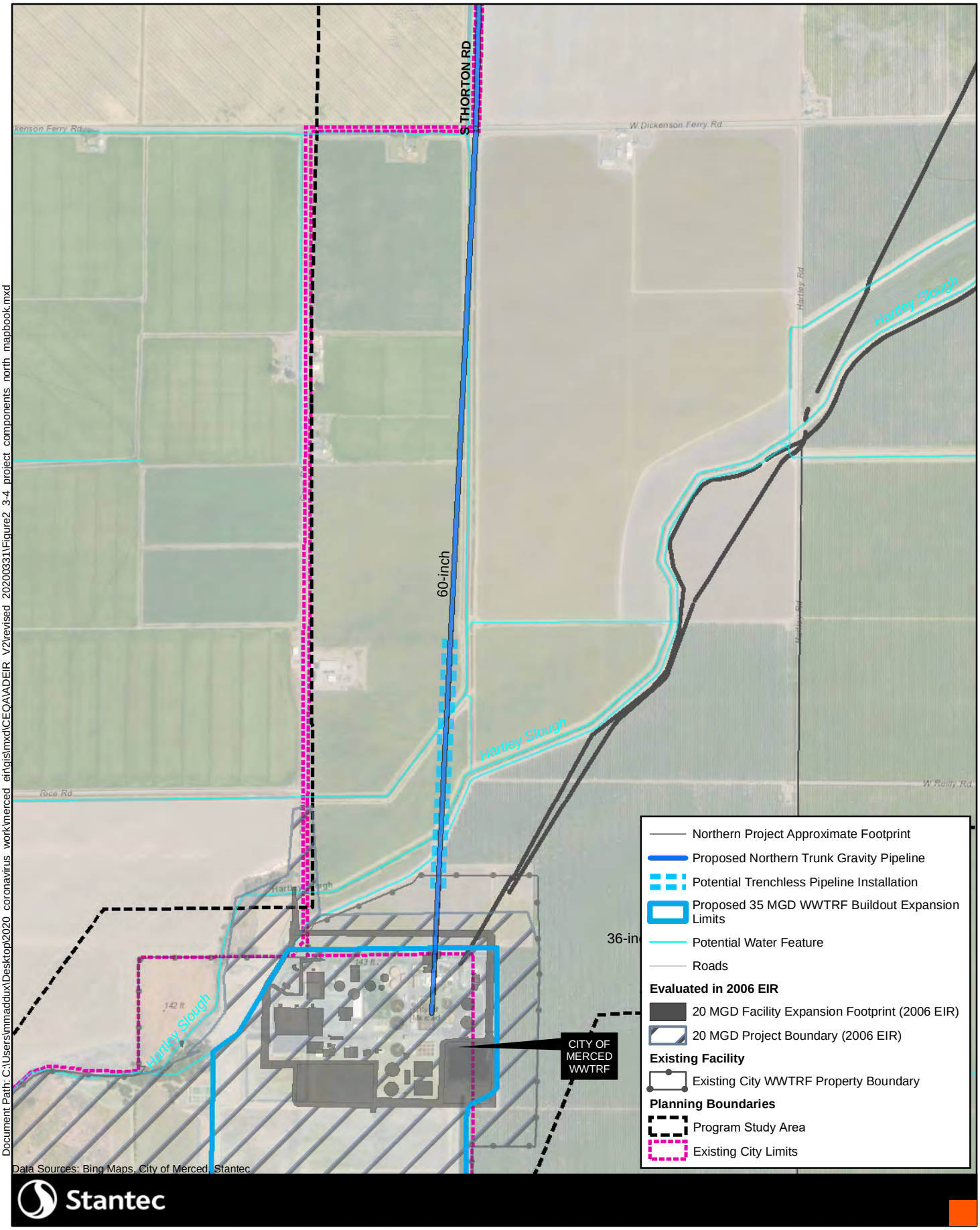



Figure 2.3-4G
Proposed Northern Trunk Sewer Project Components
City of Merced - Draft Environmental Impact Report

### Southern Trunk Sewer Project

The Southern Trunk Sewer Project is composed of one gravity component made up of four trunk sewer pipelines that would make up approximately 10 miles of pipeline ranging from 18 to 36 inches in diameter (Table 2.3-2) serving the Southern Merced service area. The Southern Trunk Sewer Project would be gravity fed and would generally follow along E Mission Avenue/W Dickenson Ferry Road, Yosemite Parkway, and Kibby Road until reaching the WWTRF.

The Southern Trunk Sewer Project would follow E Mission Avenue/W Dickenson Ferry Road from the eastern limits of SUDP/SOI to west of SR 59 where the pipeline is anticipated to turn south and then west again to reach the WWTRF. Figure 2.3-5 illustrates the alignments of these new trunk sewers, and Table 2.3-2 outlines the specific locations and sizing of pipelines that would be required for reasonable build-out within the SUDP/SOI.

Above-ground features associated with the new Southern Trunk Sewer Project would be limited to the associated control boxes and air-blow off and air release valves that would all have small, inconspicuous footprints of a few square feet and architectural finishes that match the surrounding area. It is not anticipated that a new pump station would be required for the Southern Trunk Sewer Project at this time.

### Program-Level Trunk Sewer Projects

Under the Program, it is anticipated that additional shorter trunk sewer pipelines would be required to serve the needs of reasonable build-out and private development within the SUDP/SOI. Sizing and locations of these pipelines would be determined as development occurs. However, size would be limited by the sizing of the entire wastewater collection system, which would generally constrain pipe sizes to less than 30 inches in diameter and a mile or less in length. Where feasible, trunk sewers would be gravity fed; however, pressurized forcemains may be required. Forcemains would be accompanied by pump/lift stations. These pump stations are anticipated to require smaller footprints than the Northern Trunk Pump Station and are not anticipated to have a footprint greater than 2,000 square feet. It is anticipated that power would be available adjacent to any required pump stations. These pipelines would be planned within roadways and utility ROWs in future developments and pump/lift stations would be located immediately adjacent to the roadway on City ROWs. These trunk sewers would generally be located in the future service areas as shown on Figure 2.3-1.

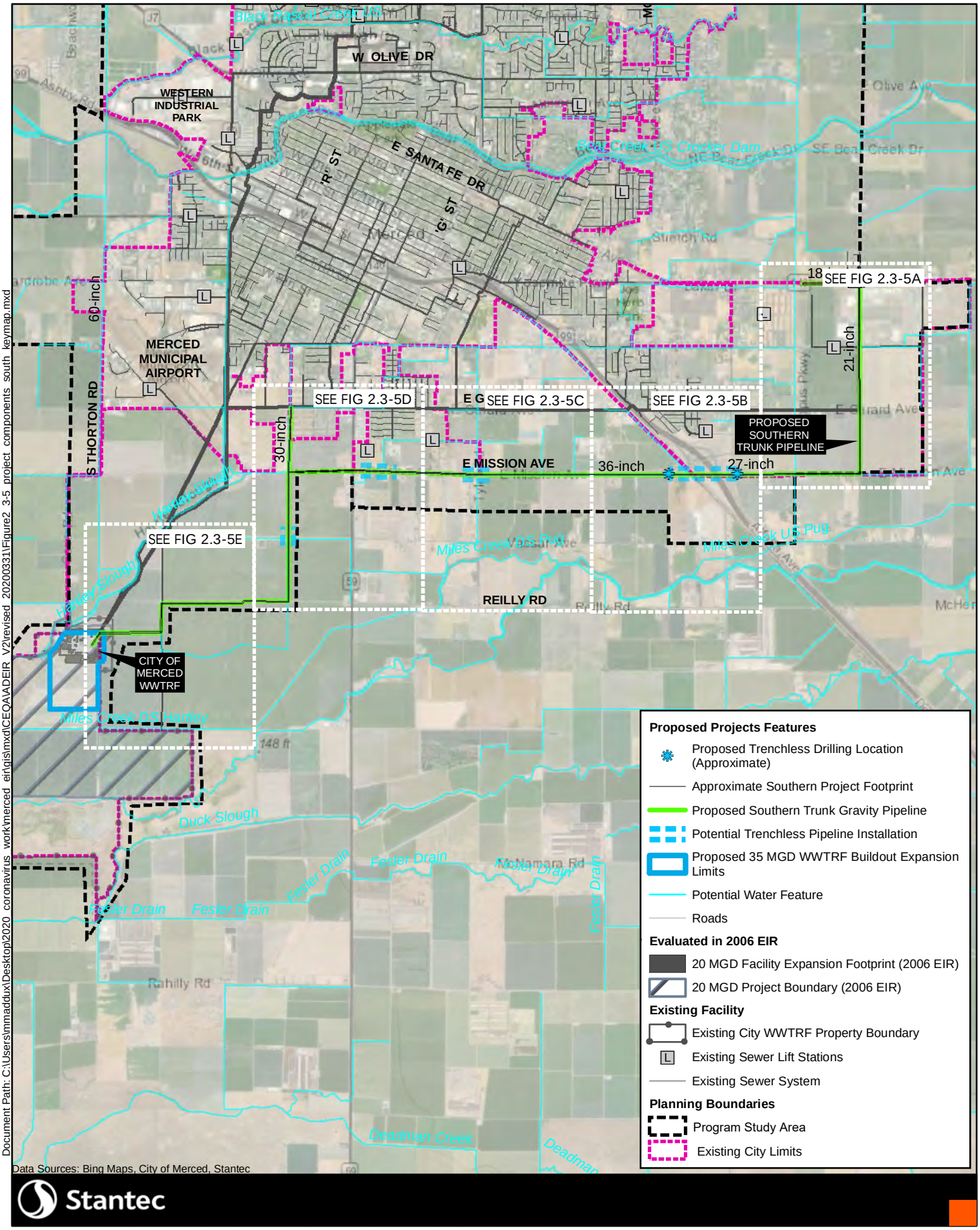
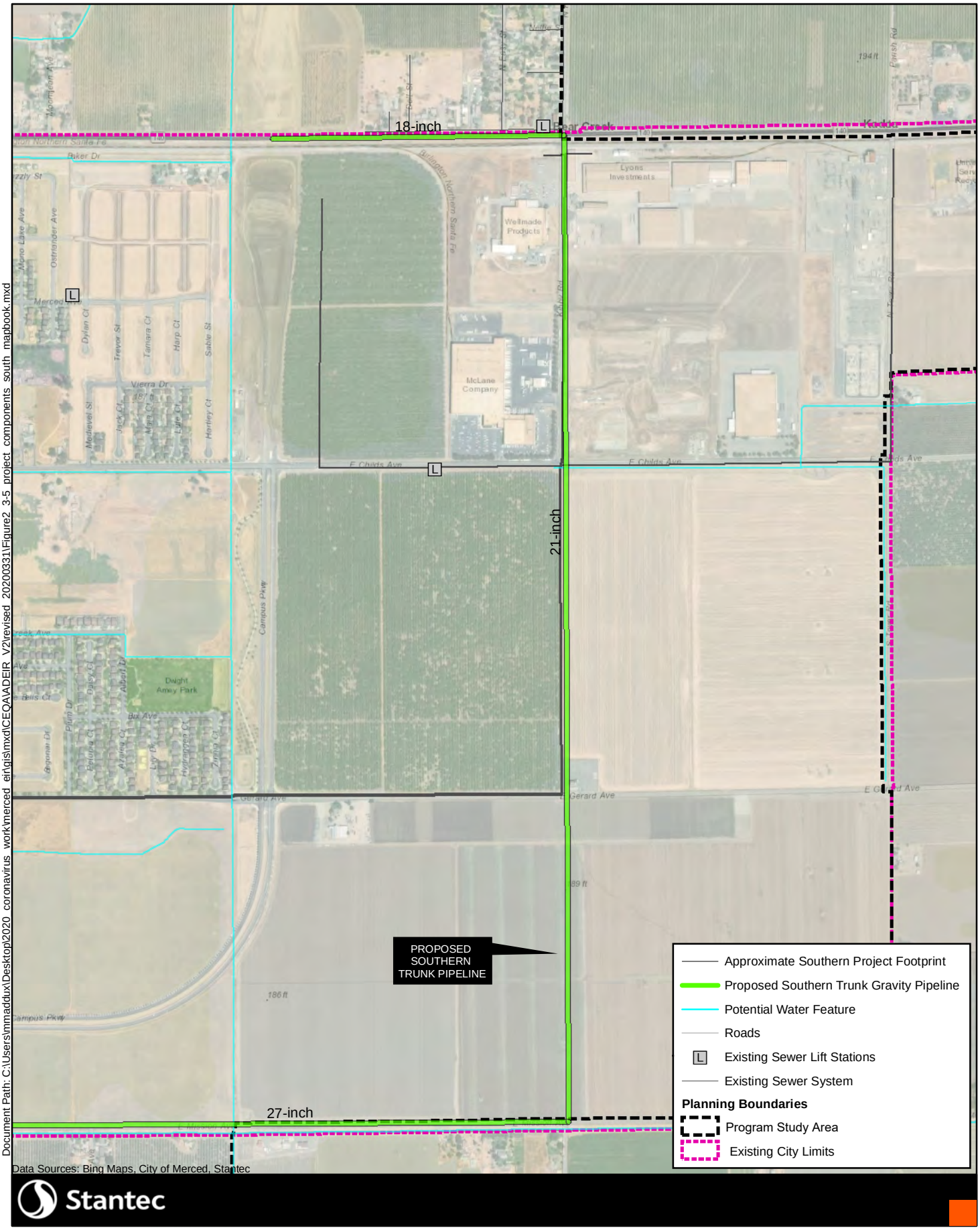



Figure 2.3-5
Proposed Southern Trunk Sewer Project Components Key Map
City of Merced - Draft Environmental Impact Report




0 0.2 0.4 Miles

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Figure 2.3-5A
Proposed Southern Trunk Sewer Project Components
City of Merced - Draft Environmental Impact Report

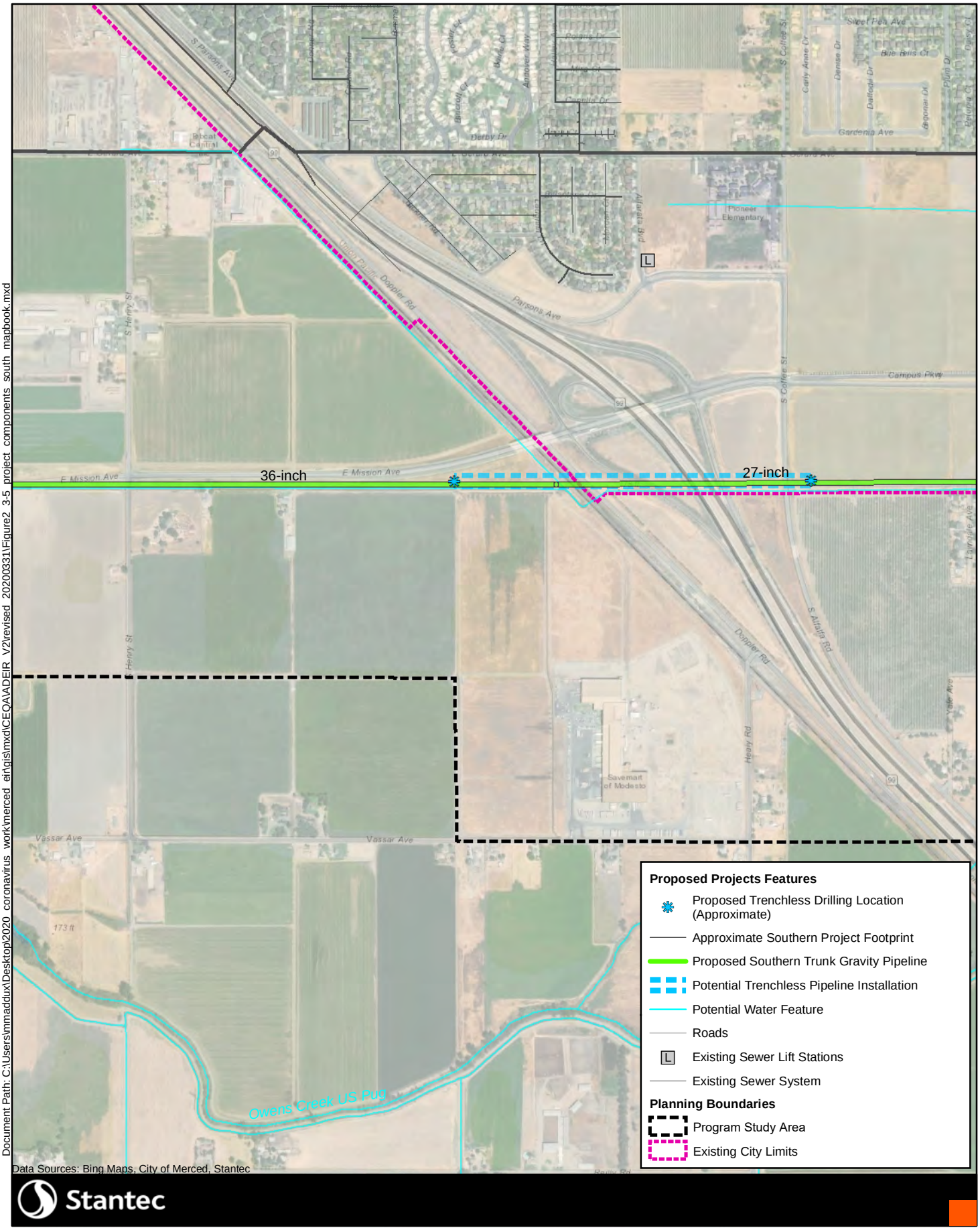


Figure 2.3-5B
Proposed Southern Trunk Sewer Project Components
City of Merced - Draft Environmental Impact Report

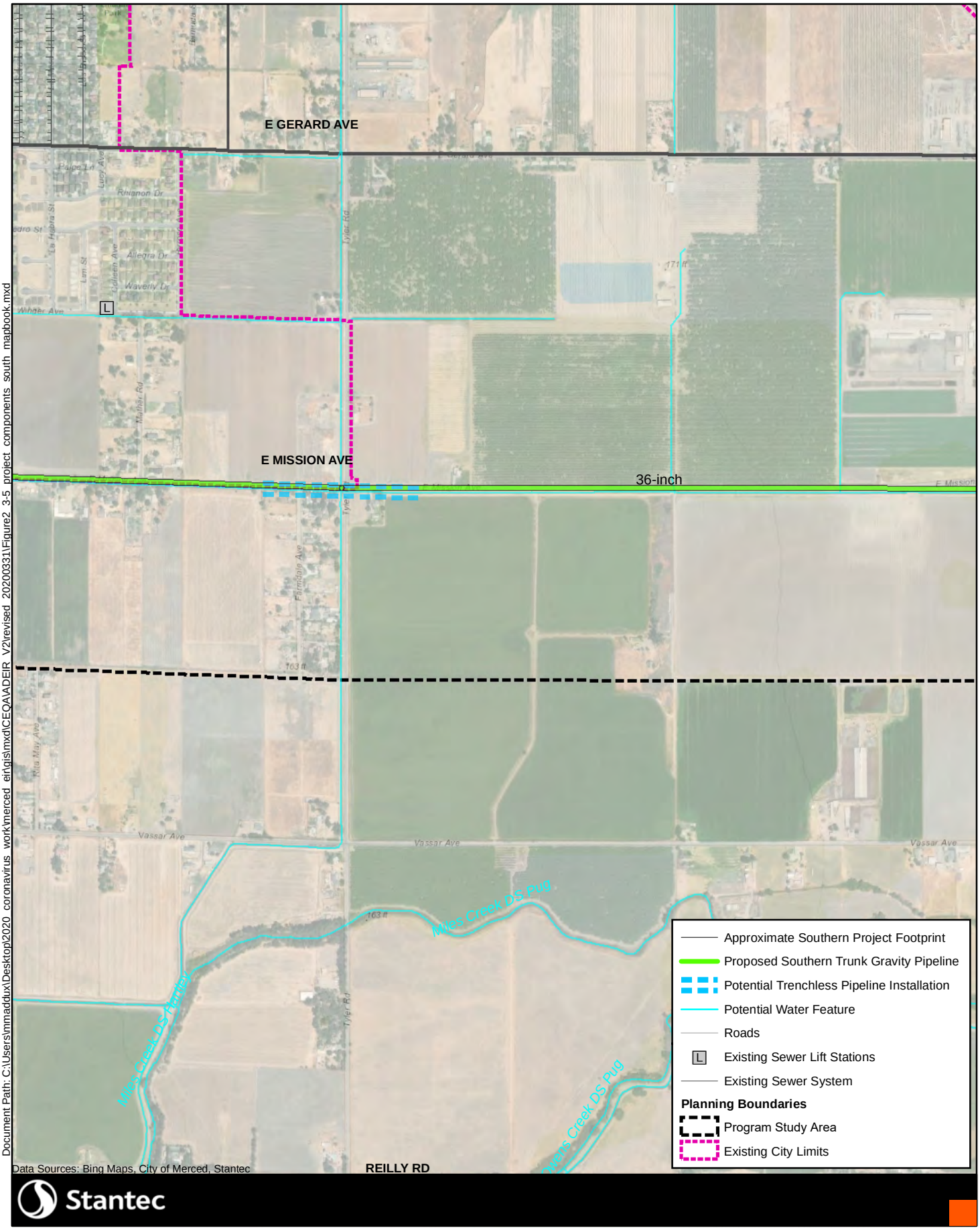


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Figure 2.3-5C
Proposed Southern Trunk Sewer Project Components
City of Merced - Draft Environmental Impact Report

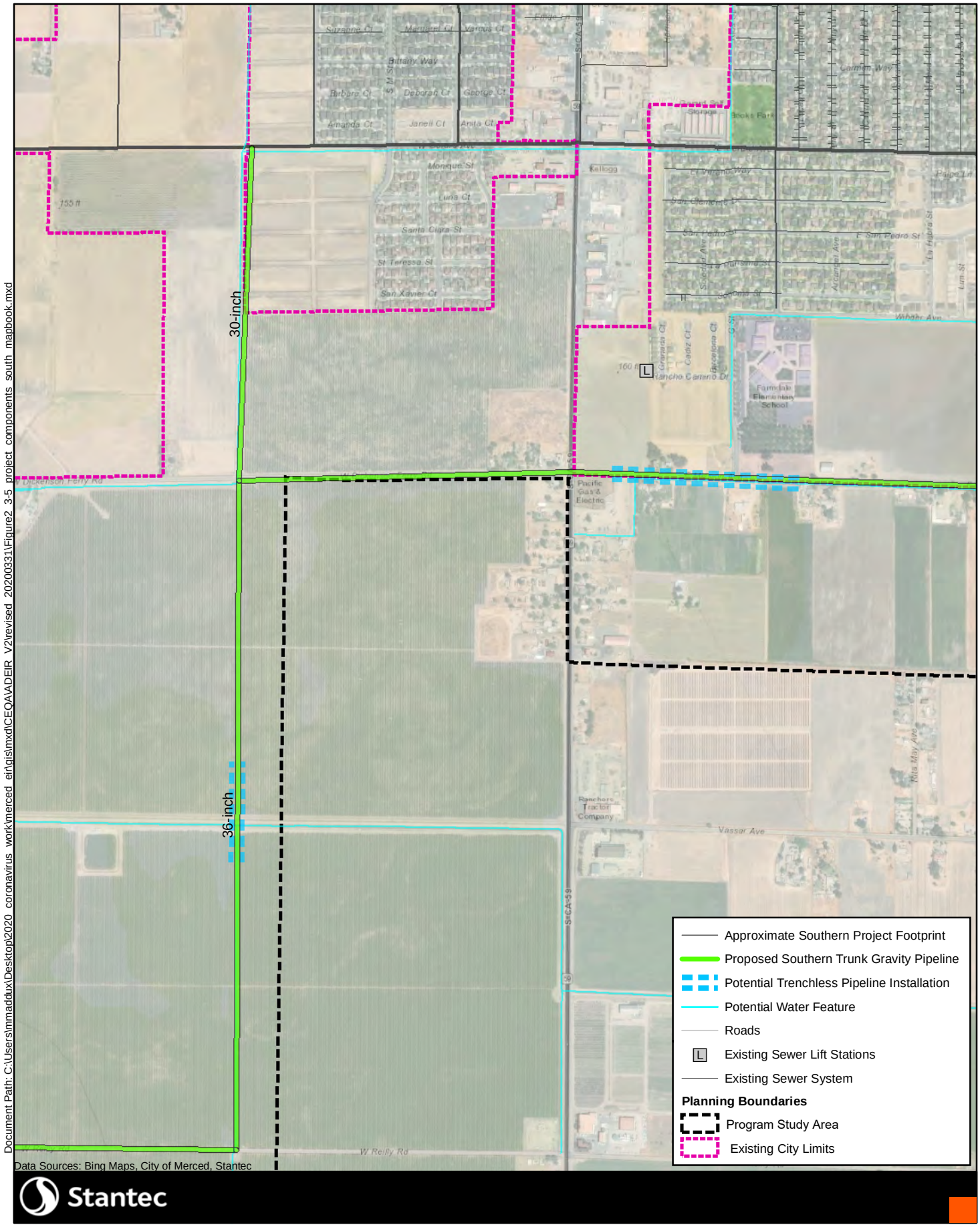


Figure 2.3-5D
Proposed Southern Trunk Sewer Project Components
City of Merced - Draft Environmental Impact Report

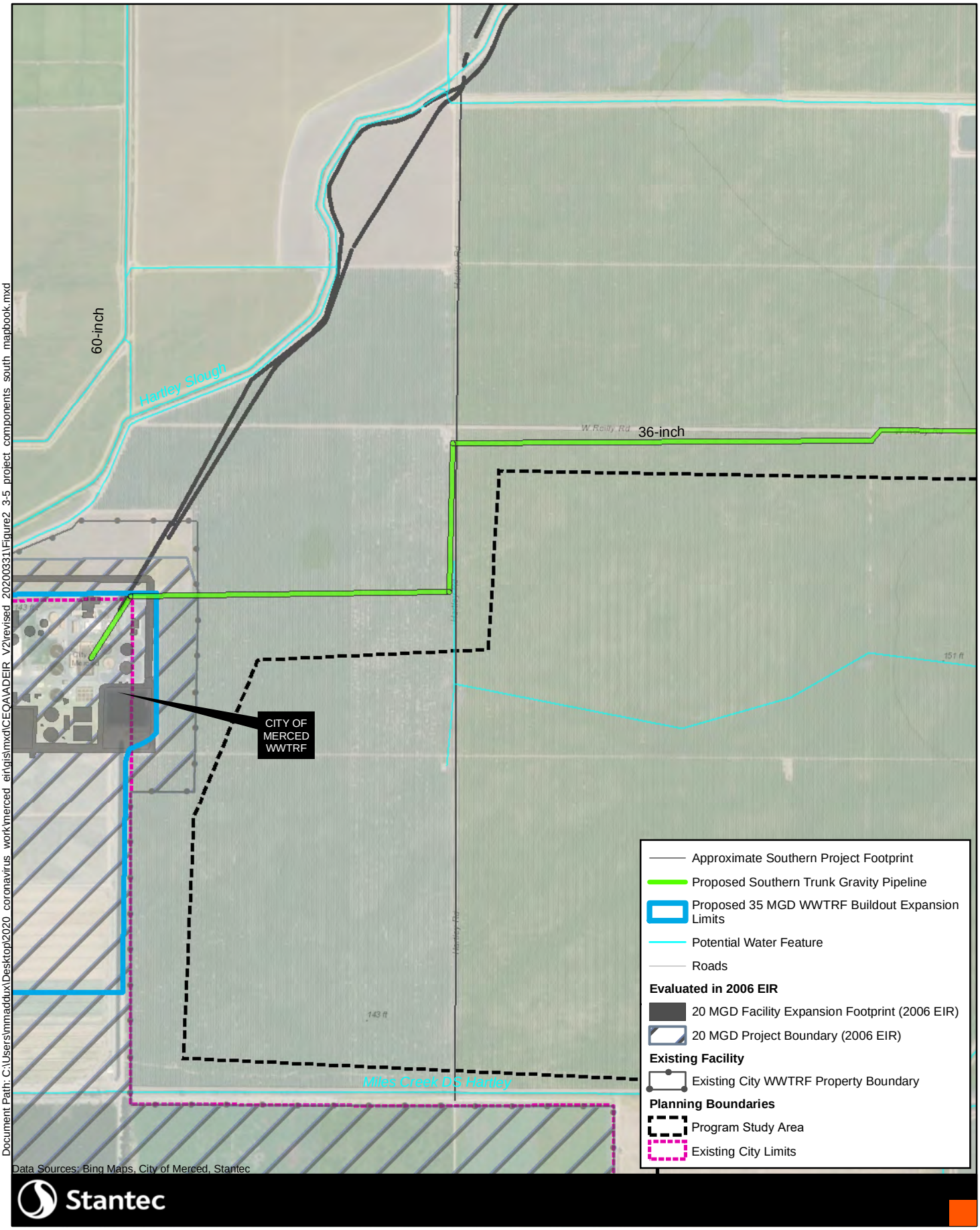


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Figure 2.3-5E
Proposed Southern Trunk Sewer Project Components
City of Merced - Draft Environmental Impact Report

### 2.3.2.2 Program-Level New Localized Collector Infrastructure

A **collector sewer** is a pipeline used to convey wastewater from smaller tributaries feeding a larger trunk line as the sewage flows toward the wastewater treatment plant.

The 2017 WCSMP identifies the need for new localized collector infrastructure to provide residential, commercial, and industrial (etc.) sewer connections to transport the flow to the main trunk sewers. As development occurs within the SUDP/SOI, localized collector infrastructure would be developed to serve these future connections and to connect them to the proposed trunk sewers. These collector lines would be planned and developed as specific developments within the SUDP/SOI are proposed (i.e., future entitlements occur). While a project-specific level of detail is not available for these Projects, typical conditions for the collector system can generally be characterized as requiring trenches with a maximum 30-foot depth and a work corridor of up to 50 feet.

The collectors are programmatically analyzed in this document but would require evaluation as a part of specific development plans. Infrastructure needs may include new pipelines, smaller pump stations (anticipated maximum footprint of 100 by 100 foot building), and associated appurtenances (such as control panels, blow-off and air release valves, and backup generators similar to those described for the Trunk Sewer Projects) that would connect the current and planned wastewater collection systems as growth occurs within the SUDP/SOI. Generally, these future developments are anticipated in the areas of North Merced near the UC Merced Campus and in southeastern Merced as illustrated by the future service areas of North and South Merced within the SUDP/SOI shown on Figure 2.3-1.

The 2017 WCSMP in conjunction with the 2030 General Plan and community specific plans have developed growth projections and corresponding wastewater flow estimates for these undeveloped or unconnected areas of the SUDP/SOI as described in Section 5.0 of the 2017 WCSMP. A total of 106,132 equivalent dwelling units were estimated to be connected to the wastewater collection system under reasonable build-out conditions as shown in Table 5-5 of the 2017 WCSMP. Specific pipeline sizes, lengths, and locations have yet to be determined but would be smaller than the trunk sewers that they feed into and would be placed within current or planned roadways for areas where development proposals are submitted and wastewater collection system needs are more clearly defined. While it is difficult to estimate particular development sizes, it is estimated that there would be anywhere from 500 to 5,000 collector pipelines varying in length from a few hundred feet to a few miles to serve the undeveloped areas within the SUDP/SOI at reasonable build-out conditions.

### 2.3.2.3 Existing Wastewater Treatment and Reclamation Facility Expansion Projects

**Tertiary treatment** involves a series of additional steps after secondary treatment to further reduce organics, turbidity, nitrogen, phosphorus, metals, and pathogens.

**Title 22 regulations** govern the discharge and use of treated and recycled wastewater under the 1969 Porter-Cologne Water Quality Control Act and the SWRCB's Water Recycling Policy.

The City's existing 12 Mgal/d WWTRF currently collects and treats the wastewater that it receives from the City's existing wastewater collection system. The WWTRF provides disinfected tertiary treatment that meets Title 22 treatment requirements for "effluent" discharged from the WWTRF. Effluent, or treated wastewater, is either applied on the WWTRF property or discharged into Hartley Slough, which is a tributary of the San Joaquin River.

Although the WWTRF is currently permitted to treat 12 Mgal/d of flows, the City has already approved an expansion to 20 Mgal/d (as evaluated within the City of Merced 2006 Wastewater Treatment Plant Expansion EIR [State Clearinghouse {SCH} No. 2005101135]). The limits and features of the previous approvals are shown on Figure 2.3-5. As a part of the 2017 WCSMP, treatment expansion options were evaluated to the level of detail needed to support reasonable build-out of the collection system. The 2017 WSCMP identifies that reasonable build-out requires 35 Mgal/d. Therefore, this EIR analyzes the incremental increases to take the WWTRF from 20 to 35 Mgal/d in 4 to 5 Mgal/d projects as needed.

Unlike the collection system that requires advanced planning for a 50- to 75-year horizon, treatment capacity is relatively easily added on in an incremental fashion as demand warrants. Expansion of the WWTRF from 20 to 35 Mgal/d is evaluated in 4 to 5 Mgal/d expansion increments because the expansion of the WWTRF would occur as demand warrants (i.e., in 4 to 5 Mgal/d increases), rather than all at once (i.e., a 15 Mgal/d increase). WWTRFs are typically designed in a fashion that allows for the processes in the treatment train to be expanded without much interruption to the existing treatment process. At the WWTRF, these expansions have historically been done in 4 to 5 Mgal/d increments which are anticipated to continue if the growth rate within the SUDP/SOI stays consistent with historic conditions until reasonable build-out is reached. If growth rates were to increase, demand would subsequently increase, and the plant could be expanded in larger intervals. This flexibility in increasing capacity only as needed is a cost savings measure to ensure that expensive unnecessary projects are not undertaken.

To reach reasonable build-out, the WWTRF expansion would expand the WWTRF footprint to the south immediately adjacent to the existing WWTRF. The expansion is anticipated to require a similar amount of space for siting facilities to those facilities currently in use at the WWTRF, which would essentially triple the existing 12 Mgal/d facility footprint requiring approximately 133 additional acres immediately to the south of the existing facility to accommodate the full expansion as shown on Figure 2.3-5 would be needed to develop the WWTRF to reasonable build-out capacity. The exact configuration and processes of these improvements and ultimate capacity would be determined as growth and development occurs in accordance with the latest design standards, treatment technologies, and permit requirements; however, the treatment components, footprints, and processes can be reasonably estimated with enough specificity to provide a project-specific level of detail.

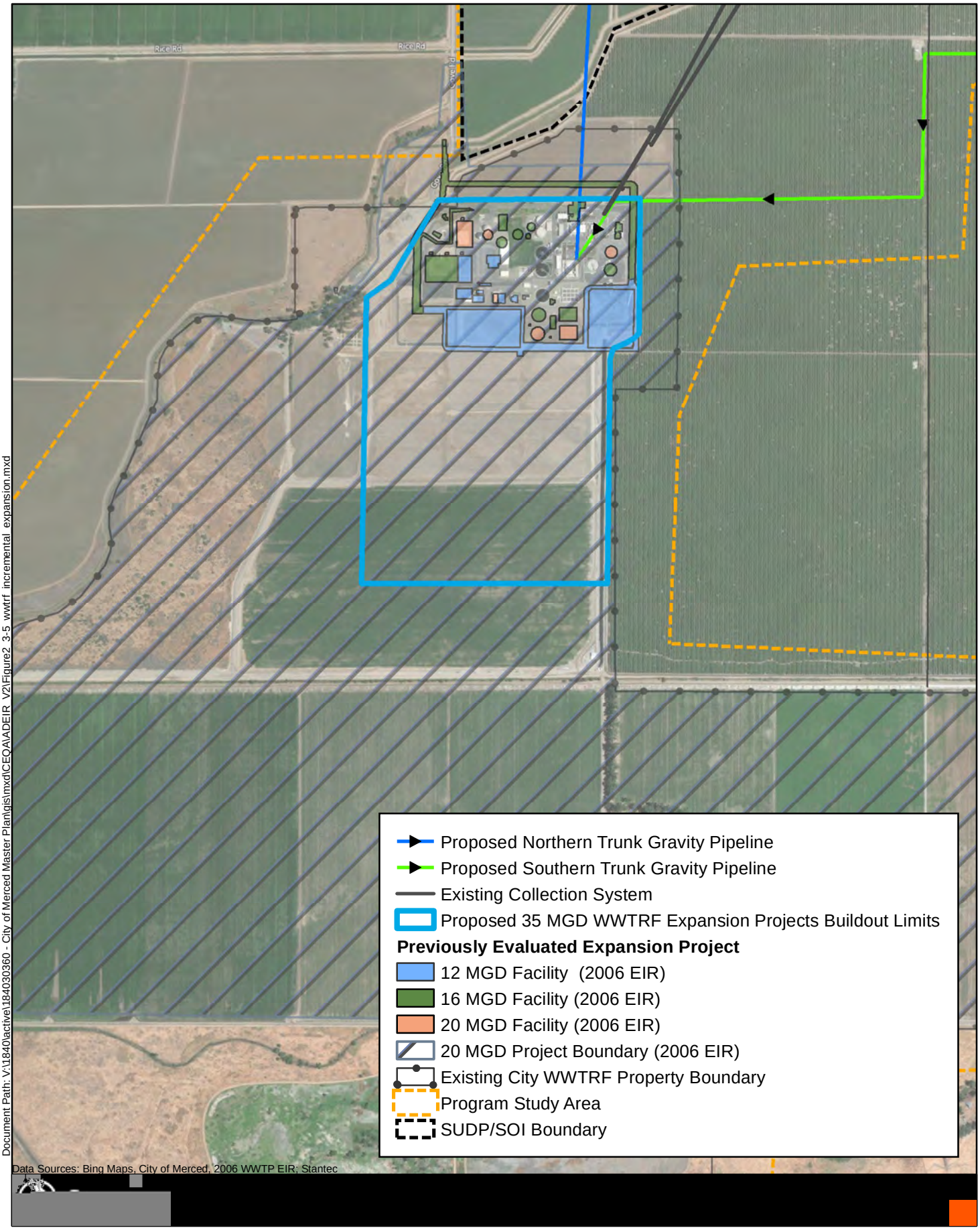



Figure 2.3-6
WWTRF Expansion Projects
City of Merced - Draft Environmental Impact Report

The WWTRF is sited on a large parcel of land with plenty of room for expansion of the current facilities. Increased wastewater flows would continue to be treated to a tertiary level and disinfected prior to disposal. The treatment processes and project details for how reasonable build-out at the WWTRF would be met are described below. Descriptions and assumptions are based on similar projects and typical wastewater treatment plant expansions. Incremental increases to the wastewater treatment facilities would be completed by expanding the WWTRF footprint to the south much like the expansion from 12 to 20 Mgal/d described in the City's 2006 EIR. The City is concurrently conducting engineering studies and preparing plans to provide reliable wastewater treatment capacity that is capable of serving planned future wastewater loads and that will meet National Pollution Discharge Elimination System (NPDES) and Waste Discharge Requirements (WDRs) (CVRWQCB WDRs Order No. R5-2014-0096 and NPDES No. CA0079219 ). The City is in the process of renewing the NPDES permit and WDRs, which are expected to have more stringent WDRs even if the improvements associated with development of the Program are not implemented.

## Existing Wastewater Treatment Reclamation Facility Expansion

Specific improvements to the WWTRF would include increased treatment capacity and additional effluent equalization storage capacity and have the potential to incorporate newer wastewater treatment technologies. Anticipated equipment and processes associated with each phase of treatment include the following:

- **Headworks and primary treatment facilities improvements** – Headworks and treatment facilities are the portion of the WWTRF where wastewater is initially received and undergoes primary treatment at the plant. With the increase in capacity, facilities would need to be expanded to accommodate increased flows. Required improvements anticipated would include additional pumps at the influent pump station, additional screen and grit basin at the headworks facilities, an increase in the total capacity of the equalization basins, and improvements to the primary clarifiers.

- **Secondary treatment improvements** – Secondary treatment is a treatment process where wastewater undergoes physical phase separation to remove settleable solids and a biological process to remove dissolved and suspended organic compounds. Secondary treatment facilities improvements required for expansion of the WWTRF are anticipated to include expansion of the aeration basin; a splitter box, blower building and blowers; secondary clarifiers; and Return Activated Sludge/Waste Activated Sludge pump stations. However, more efficient treatment technologies, such as a membrane bioreactor facility, may be used in lieu of the traditional secondary treatment facilities. If different technologies are identified during engineering studies, they would be implemented within similar footprints and be consistent with the NPDES discharge permit.

- **Tertiary treatment improvements** – Tertiary treatment is the final cleaning process that improves wastewater quality before it is reused, recycled, or discharged into the environment. Tertiary treatment improvements associated with the upgrades to the existing WWTRF are anticipated to include an upsized tertiary pump station, rapid mix and flocculation basins, and tertiary disc filters , but could also include alternate treatment technologies such as membrane bioreactor treatment trains, as well. These improvements would require new structures. Tertiary treatment upgrades would

be required to produce acceptable quality tertiary effluent consistent with California Department of Health Services "Title 22" pathogen-free reuse criteria.

- **Disinfection system improvements** – The existing WWTRF uses an ultraviolet (UV) disinfection system, which is a physical process that instantaneously neutralizes microorganisms as they pass by UV lamps submerged in the effluent. This UV disinfection system would need to be expanded incrementally by adding an additional UV disinfection facility to accommodate flows up to 35 Mgal/d.

- **Miscellaneous structures improvements** – Miscellaneous structure improvements associated with the upgrades to the existing WWTRF would include improvements and/or upsizing to the operations/lab/admin building, generator building, chemical storage facility, chemical building, plant water pump station, stormwater pump station, and stormwater detention basin. Additional lighting or electrical components could also be required for the upgrades to the WWTRF in order to accommodate the upgrades to the facility. New concrete and gravel pathways would also likely be required for access to any new structures. Alternative energy sources such as solar or use of methane-powered electric generators could potentially be used or implemented as a part of the Program.

- **Biosolids handling facilities improvements** – Improvements to the biosolids handling facilities would be required including, upgrades to the dissolved air flotation thickeners (DAFTs) digester control building, primary digesters, solids holding tank, gas holding system, waste gas flare, biosolids dewatering building, active solar dryers, centrate equalization tank, and centrate pump station. Additional biosolids thickening with an expanded dissolved air flotation thickener, expanded anaerobic digestion facilities, expanded centrifuge dewatering, and expanded drying and stabilization to Class A or B quality biosolids using active solar dryers (or equivalent) would also be required.

  The active solar dryers would be used to dry, stabilize, and temporarily store biosolids prior to land application or offsite hauling. Currently, at 12 Mgal/d, the WWTRF produces an average of 14,800 pounds per day (lbs/day) of biosolids, which is currently applied to the 580 acres of City owned agricultural land at the WWTRF facility where crop rotation is used to balance the chemical levels of the applied soils and regulated by the CVRWQCB Permit No. 97-034.

  At the planned 20 Mgal/d capacity increase, it is estimated that the WWTRF would produce approximately 24,600 lbs/day of biosolids which are anticipated to also be land applied on the WWTRF site (which otherwise would result in approximately 214 haul trips per year). At the 35 Mgal/d buildout, the WWTRF would produce an estimated 43,050 lbs/day total of biosolids (an addition of 28,250 lbs/day increase from current 12 Mgal/d). It is anticipated that the total solids generated would be accommodated on the WWTRF site; however, future conditions, such as permit stipulations, land application chemistry, and other factors, may dictate additional land for disposal or alternate disposal methods. In the event that additional land is required, it is anticipated that an existing City property would be available for discharge and subject to WDR permit amendments. Currently, the City anticipates that land may be available at a City property along Thornton Road. If onsite or nearby City property disposal is not available, it is conservatively estimated that approximately 621 haul trips per

year (approximately two trips a day) would be required to haul all biosolids generated to an approved disposal facility.

As described, the additional biosolids associated with the increased capacity could be applied to additional agricultural areas within 2 miles of the WWTRF or trucked to the Synagro Central Valley Compost Facility (approximately 22 miles from the WWTRF). Any application of these biosolids to offsite areas would be in compliance with the Merced County biosolids disposal ordinance, WDRs, and 40 Code of Federal Regulations part 503. For purposes of this analysis, it is assumed that there would be a total of 621 truck trips offsite (to the Synagro Facility) per year under a worst-case scenario; however, the City would likely continue to land-apply the biosolids where feasible.

### Effluent Disposal Facilities

During the 2017 WCSMP planning process, the City considered a range of options for disposal and reuse of effluent resulting from the City's treatment process, ultimately concluding that centralized treatment, reuse through agricultural irrigation, habitat enhancement, and discharge to Hartley Slough (similar to the existing permitted effluent management practices) was preferred. This approach capitalizes on existing City assets, requires limited new infrastructure, has lower life cycle costs, consistent with the principal of maximizing the use of gravity systems, and minimizes energy costs as further described within Section 8.0 of the 2017 WCSMP.

While the City needs to maintain flexibility in wastewater collection and effluent discharge, the City explored an option with Merced irrigation District (MID) to allow for effluent discharges to supplement MID flows in South Merced near the WWTRF while MID would provide irrigation water deliveries in North Merced to offset any potential groundwater depletion. The City has reached an agreement with MID on how increased effluent flows from the WWTRF would be utilized. This supplemental effluent from the WWTRF would allow for recharging of the areas groundwater resources and would also allow for irrigated parks and other City landscaping, rather than using groundwater sources and would accomplish a similar outcome to developing a recycled water system without the associated costs and greater footprint.

Improvements to the outfall structure and irrigation system improvements would be required for the WWTRF expansion. The upgrades to the WWTRF would continue to discharge to Hartley Slough (which flows to Owens Creek and later flows to the Eastside Canal) and would also continue to convey treated effluent to the Merced Wildlife Management Area south of the WWTRF. Expansion of the existing 54-inch pipeline and outfall structure would be required in order to allow for additional capacity associated with reasonable build-out. Effluent discharge into Hartley Slough would continue to achieve an effluent quality (measured at the point of discharge, before mixing with receiving waters occurs) of 10 milligrams per liter (mg/L) biological oxygen demand, 10 mg/L total dissolved solids, and 10 mg/L nitrate consistent with permitting requirements. Effluent disposal options are dependent on flows, treatment standards, and permit requirements. Among other factors specific discharge details would be determined as development and expansion occur.

#### 2.3.2.4 Operations and Maintenance

The Program also warrants the considerations of O&M of these new and upgraded facilities once construction is complete. Placement of Program facilities would require routine inspections, maintenance, repair, and ongoing minor improvements associated with keeping the system in working order. It is anticipated that this maintenance would be performed by City staff and would not generate a substantial increase in trips or vehicle miles traveled since this infrastructure would be added into the current responsibility of maintaining existing infrastructure.

As discussed in the 2017 WCSMP, the ongoing O&M of both the existing and new infrastructure would be required to ensure that the system remains in sound working order. Pipeline, pump station, and WWTRF operation would require regular cleaning maintenance of the valves, odor control devices, and associated WWTRF features. The frequency of these O&M activities would depend upon the water quality, and cleaning of the pipelines and pump stations would occur often enough to maintain desirable pumping efficiencies. Operational access to existing and new pipelines would occur within the public sewer easement and from existing access points. Access to the WWTRF would occur along the existing roadways and within the footprint of the WWTRF.

## 2.4 CONSTRUCTION CHARACTERISTICS

### 2.4.1 Proposed Activities

Implementation of the Program and proposed Projects can generally be categorized into pipeline-related activities and stationary site building activities. The Program and specific Projects themselves are described in Section 2.3; however, to avoid redundancy, these pipeline and building/site activities require similar types of typical construction and phases that are representative of activities under the Program (unless otherwise noted). Key construction activities include site preparation and grading, pipeline and/or facility construction, dewatering, dust control, testing and start-up, and grading and site restoration. Specific equipment and construction assumptions for the proposed Projects were prepared to support this Project Description and the Air Quality analysis in this EIR. These assumptions and Project details are enumerated and are included in Appendix B, Air Quality and Greenhouse Gas Assumptions Memorandum of this document. Typical activities and construction requirements associated with each stage of construction are described below.

#### 2.4.1.1 Mobilization, Site Preparation, and Grading

Construction activities would be mobilized as needed for each individual project. Mobilization would include arrival of crews and equipment onsite. Site preparation and grading would vary based on the underlying site conditions: Paved areas would require removal of existing asphalt, whereas unpaved areas would require minimal vegetation removal through clearing and grubbing. The stationary site would require grading and leveling to prepare the site for building and structure construction. Import base material may be required to facilitate leveling. Preparations would be made for entry and exit holes for trenchless crossings under the railroad(s), stream(s), and highway facilities. Water application on disturbed unpaved areas during construction for dust control would be required pursuant to Regulation

VII, Fugitive Dust Prohibitions (CARB 2019), which requires the application of approximately 2,000 gallons of water per acre of exposed soil.

#### 2.4.1.2 Pipeline and/or Facility Construction

##### Pipelines: Trenching, Excavation, and Placement

Pipeline placement is expected to occur at an average rate of 250 to 300 feet of pipeline per day within the roadway segments, with some sections requiring longer, more intensive construction durations and other sections occurring at a more rapid sequence. Generally, pipeline installation would involve site preparation and grading, preparation of the pipe, staging of the pipe adjacent to the trench alignment, digging and shoring the trench, placing the pipe in the trench, backfill and compaction in accordance with design and roadway specifications, revegetation or paving, and installation of appurtenances such as air and vacuum release valves or blow-off valves.

Where possible, the pipelines would be placed within the roadway or City ROW to minimize impacts to undisturbed and agriculture lands. Placement of the pipeline would consist of open-cut trenching and selected trenchless pipe installation. It is anticipated that trench widths would range from 3 to 15 feet in width to accommodate the trunk sewers, but in some select instances may reach widths up to 20 feet (to accommodate pipe intersections, dissipaters, valves, joints, etc.). Depths of trenching are anticipated to generally be less than 10 feet deep, with maximum depths of 40 to 50 feet when required to cross existing utilities or to minimize high points and associated additional air valve installations. Exact trench widths and depths would vary depending on soil conditions and would be determined during final design stages. Trenches would be backfilled at the end of each workday or would be temporarily closed by covering with steel trench plates if the site cannot be secured by other safety measures such as fencing. Construction equipment needed for pipeline installations generally includes backhoes, excavators, dump trucks, cranes, shoring equipment, steam rollers, and plate compactors. Based on preliminary desktop review and previous work within the City, it is not expected that any blasting would be required for the Project other than minor spot blasting if shallow rock is encountered.

A trenchless piping installation methodology (i.e., horizontal directional drilling [HDD], jack and bore, or microtunneling) would be used to avoid conflicts with potentially jurisdictional waters, MID canals, railroad ROWs (Union Pacific Railroad [UPRR] and Burlington Northern Santa Fe [BNSF]), and highway ROWs SR 99, SR 140, and SR 59). These technologies are less invasive and would allow construction to proceed under a particular feature with minimal disturbance. Each of these trenchless technologies differ slightly in methodology for how the pipeline is installed. HDD or directional boring is a minimal impact trenchless method of installing underground utilities such as pipe in a relatively shallow arc or radius along a prescribed underground path using a surface-launched drilling rig (Figure 2.4-1). Jack and boring is a method that drills a hole underground horizontally between two points (below-grade pits) without disturbing the surface between sending and receiving pits (Figure 2.4-2). Microtunneling is a digging process that uses a remote-controlled microtunnel boring machine (MTBM) combined with the pipe jack-and-bore method to directly install pipes underground in a single pass (Figure 2.4-3). The technology for trenchless tunneling and technologies would be selected during the design process based on cost, minimizing disturbance impact, and other factors. For impact analysis purpose, it is assumed that drill pits

on both sides of the trenchless section would be needed during construction. The maximum depth of these pits would be approximately 40 feet. These methods would require a specialized drilling construction crew, drill equipment, settlement basins, etc.

**Figure 2.4-1: Trenchless: Representative Horizontal Directional Drilling Process**

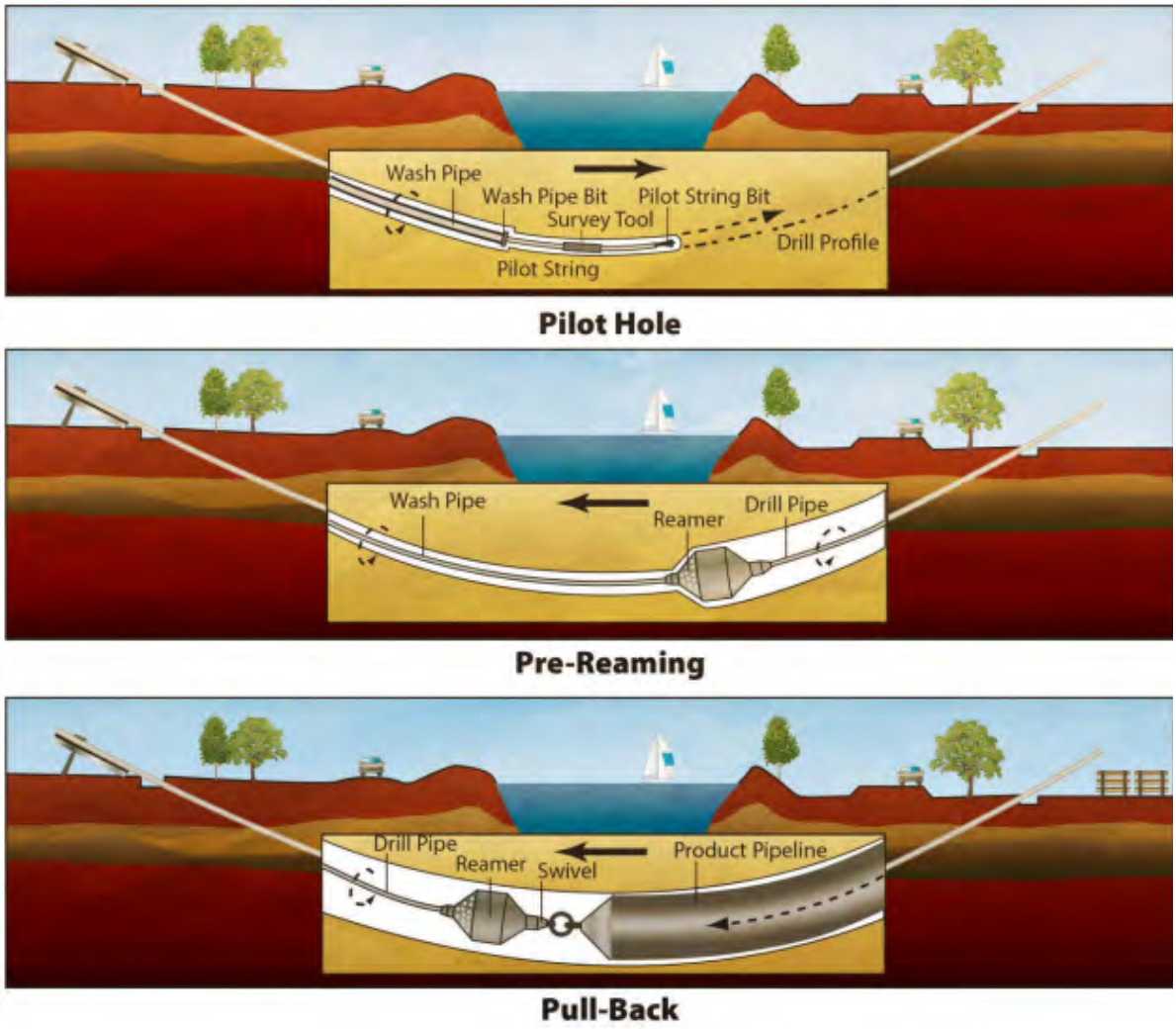


**Figure 2.4-2: Trenchless: Representative Microtunneling Process**

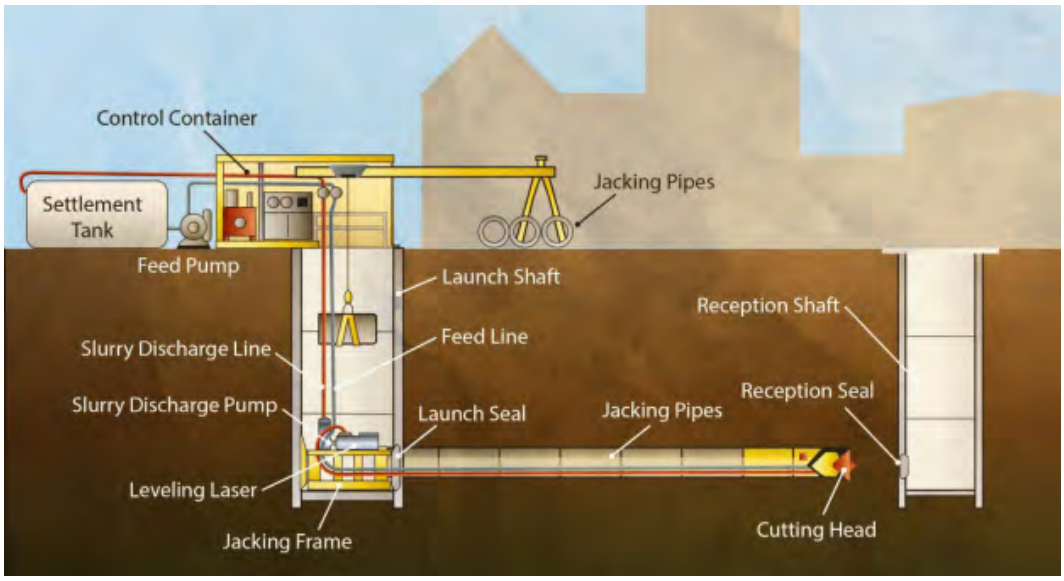
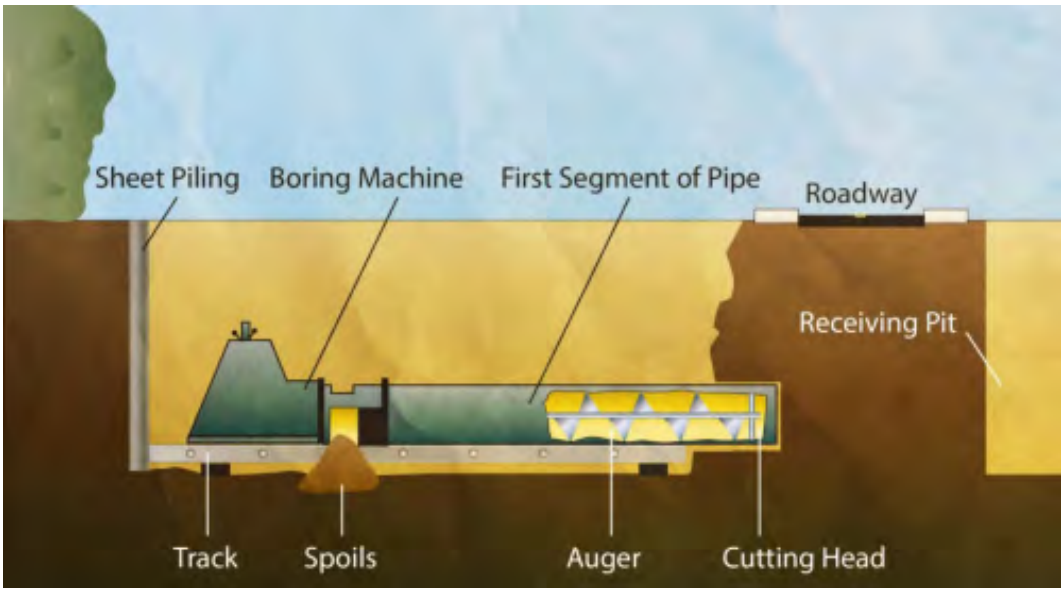



**Figure 2.4-3: Trenchless: Representative Jack and Bore Process**




## Pump Station: Excavation and Construction

The pump station(s) would be housed in single-story building(s) that would include features such as a pump room, an electric control room, and a room for disinfection facilities. The exterior of the pump station(s) would-be built in accordance with standard construction methods for roofed masonry buildings and would be designed to blend with the surrounding landscape. The Northern Trunk Sewer Pump

Station, which would be the largest pump station associated with the 2017 WCSMP, is conservatively anticipated to be housed in a 2,000 square foot building on a site that could be up to 2-acres in size depending on City acquisition of property, in Northwest Merced near the intersection of Thornton Road and W Cardella Road. It is anticipated that a depth of 40-50 feet would be required for construction of the pumps and connection with the collection system. Smaller pump stations required for collectors or infrastructure would have much smaller footprints of approximately 100 by 100 feet.

Construction of the pump station(s) would begin with grading and site preparation and then excavation. Once the area is excavated, the crew would install a structural foundation consisting of concrete, construct the pump house, and install the pumps and motors. The pump station(s) would be equipped with a portable emergency generator and manual transfer switches. Power to the pump station(s) would be provided through underground service to minimize the possibility of damage during fires. Excavated soils would be reused onsite (for site leveling or stockpiling for future use) to the extent feasible and otherwise disposed of offsite. Concrete would be required for construction of pump station foundations and pads.

#### WWTRF: Expansion

Similar to the construction undertaking described in the 2006 WWTRF, a 4 to 5 Mgal/d expansion would require grading, excavation and soil removal, transporting and installing equipment, and constructing process units. Excavated material would mostly remain onsite and would be used for backfilling; however, when additional material would require transport on- or offsite or when equipment is being transported to and from the WWTRF, construction traffic would use Gove Road, Dickenson Ferry Road, Thornton Road, and SRs 99 and 140 to haul these materials to the landfill or other suitable disposal location. Construction at the WWTRF would occur with periodic activity peaks, requiring brief periods of substantial effort, followed by longer periods of reduced activities.

### 2.4.1.3 Dewatering

Based on the topography and groundwater table levels throughout the City, it is anticipated that dewatering would be required during trenching and excavation activities, particularly near creek crossings where trenchless crossings would occur. Groundwater pumps would be installed as needed during the trenching and excavation stages, and groundwater would be discharged in accordance with permit conditions and statewide NPDES permit requirements (typically a low-threat discharge dewatering permit). The construction contractor would be required to develop a Construction Dewatering Management Plan to ensure compliance with regulations of the CVRWQCB, California Department of Fish and Wildlife (CDFW), and any other regulatory agency that has jurisdiction in the Program area. All flushing water (used during the testing and start-up phase) would be treated and discharged into the wastewater system.

### 2.4.1.4 Excavated Soils Handling, Testing, and Disposal

Construction would generate excavated soils, which would be used for backfilling when feasible. If excavated soils are found to be inadequate for backfill, new backfill material would be imported. All

excess excavated soils would be disposed of in accordance with applicable laws and are anticipated to be accepted at the local landfill (likely the Highway 59 Landfill).

#### 2.4.1.5 Start-up and Testing, Final Grading, and Site Restoration

Once the pipelines and facilities are constructed, a testing and start-up period would be required to check that the facilities are in proper working order, which would require water usage. Once the pipeline, pump stations, and other associated Project components are installed, the disturbed areas would be restored to pre-construction conditions in accordance with City standards. The in-road segments would be repaved, and any overland segments would be graded to match the existing topography and re-seeded with native vegetation where necessary.

### 2.4.2 Construction Schedule

Construction of the proposed Projects would generally occur as development occurs in accordance with the 2030 General Plan. As described throughout this Section, construction of the trunk sewers would be required before additional development within the Program area (SUDP/SOI) is approved, whereas expansion of the WWTRF would be done incrementally as demand warrants.

#### 2.4.2.1 Pipelines

The two proposed trunk sewer Projects would form the backbone of the wastewater collection system necessary to allow for growth. They would be the first critical pieces constructed. It is anticipated that construction on the Northern Trunk Sewer Project would occur first due to demand surrounding the UC Merced campus area; however, construction of the Southern Trunk Sewer Project could occur simultaneously. Construction is anticipated to begin as early as 2022 and is projected to occur within a 5-year period. Once initiated, it is anticipated that construction of each of the trunk sewer Projects would take approximately 18 months or 395 working days to construct the pipelines.

Other segments of the collector system constructed as part of the Program would be smaller in size and with less total construction effort than either of the two trunk sewer Projects. It is anticipated that the construction period of any given pipeline would be less than 18 months or 395 working days. While conservative estimates for air quality and other impact assessments would evaluate construction of reasonable build-out conditions happening all at once, that is highly unlikely. It is anticipated that growth within the SUDP/SOI would continue at a similar rate to that was analyzed in the 2017 WCSMP, which indicates reasonable build-out would not occur until beyond 2030 (likely, much longer in the future). For the purpose of analysis, where conservative estimates are necessary it is assumed that reasonable build-out would be reached by 2030.

#### 2.4.2.2 Pump Stations

The Northern Trunk Pump Station would be constructed at the same time as the Northern Trunk Sewer, within the same 5-year period potentially beginning as early as 2022. It is anticipated that the pump station may take closer to 18 months or approximately 365 working days to complete.

If required, construction of additional pump stations under the Program would be lesser in duration than the Northern Trunk Pump Station construction as they would likely have shorter depths and would be much smaller. Other pump station construction could be staggered and would not be anticipated to occur at the same time as another pump station. However, it is likely that new pump stations would be constructed as a part of a new pipeline project, and those construction activities would run simultaneously.

#### 2.4.2.3 WWTRF Expansions

WWTRF expansions would be completed as growth and demand warrant. It is anticipated that since the WWTRF expansion to 20 Mgal/d (as previously analyzed in the City's 2006 EIR) has not yet been constructed, that would be completed first (likely in 2022 or 2023). When construction occurs, it is anticipated that a 4 to 5 Mgal/d expansion of the WWTRF would take approximately 24 months or 474 working days to complete. Each subsequent expansion of the WWTRF would take approximately the same amount of time unless the expansions were combined, in which case, construction could be completed more quickly than back-to-back projects. This construction schedule provides flexibility in implementation of the 2017 WCSMP, with the earliest portions of the 2017 WCSMP being operational by 2024 and subsequent projects operational between 2024 and 2030 as reasonable build-out of the 2030 General Plan warrants.

#### 2.4.2.4 Other Construction Activities

Other activities under the Program could warrant as-needed construction activities to make repairs and construct ancillary infrastructure like valves or effluent disposal equipment. Construction of these facilities would be determined as plans for specific projects were set forth but are estimated for the purpose of assessment to require 3 months of construction within the period of reasonable build-out.

#### 2.4.2.5 Construction Hours

In general, construction would occur between 7:00 a.m. and 8:00 p.m., Monday through Friday; however, longer hours could occur in certain specific circumstances (i.e., when trenchless drilling operations need to be completed for stability reasons or when working in a narrow ROW). It is expected that the collection system backbone would be installed first, with associated infrastructure and smaller collectors and laterals developed as needed.

### 2.4.3 Construction Equipment and Workers

Typical construction equipment associated with pipeline construction activities includes the use of excavators, back hoes, loaders, dump trucks, water trucks, concrete trucks, and drilling and boring equipment. Mobile construction equipment used for the Project would depend on the selected contractor's planned operations, but may include the following equipment:

- Excavators
- Scrapers
- Graders
- Rollers
- Asphalt trucks
- Pickup trucks
- Air compressors
- Welding equipment
- Pumps and piping

- Generators
- Back-up lighting systems,
- Communications, and safety equipment
- Water trucks
- Vehicle maintenance truck
- Erosion control materials
- Front-end loaders
- Highway trucks
- Cranes
- Miscellaneous equipment customary to the mechanical and electrical crafts, and vehicles used to deliver equipment and materials

Construction of the Project would require workers to perform various duties and would include truck drivers, heavy equipment operators, flaggers, etc. Table 2.4-1 summarizes the number of workers needed for each construction activity.

**Table 2.4-1: Anticipated Number of Construction Workers per Project**

| Construction Stage | Anticipated Number of Workers |
|---|---|
| Site preparation/Grading | 15 |
| Pipeline and/or Facility Construction | 50 |
| Paving | 10 |
| Architectural Coating | 5 |

### 2.4.4 Construction-Related Traffic

Construction activities would require material haul trips, excavated material trips, and employee trips over the duration of the Project. Temporary construction-related road closures may entail single lane or detours where necessary. Traffic control would be necessary throughout construction activities. Traffic control would typically require five to ten workers to implement traffic control measures during active construction. Equipment required for traffic control would include changeable message signs, delineators, arrow boards, and K-Rails. The traffic plan for each project would be coordinated with the applicable jurisdictions including the City of Merced and County of Merced. Specifics of the traffic plan are discussed in greater detail in Section 3.15, Transportation.

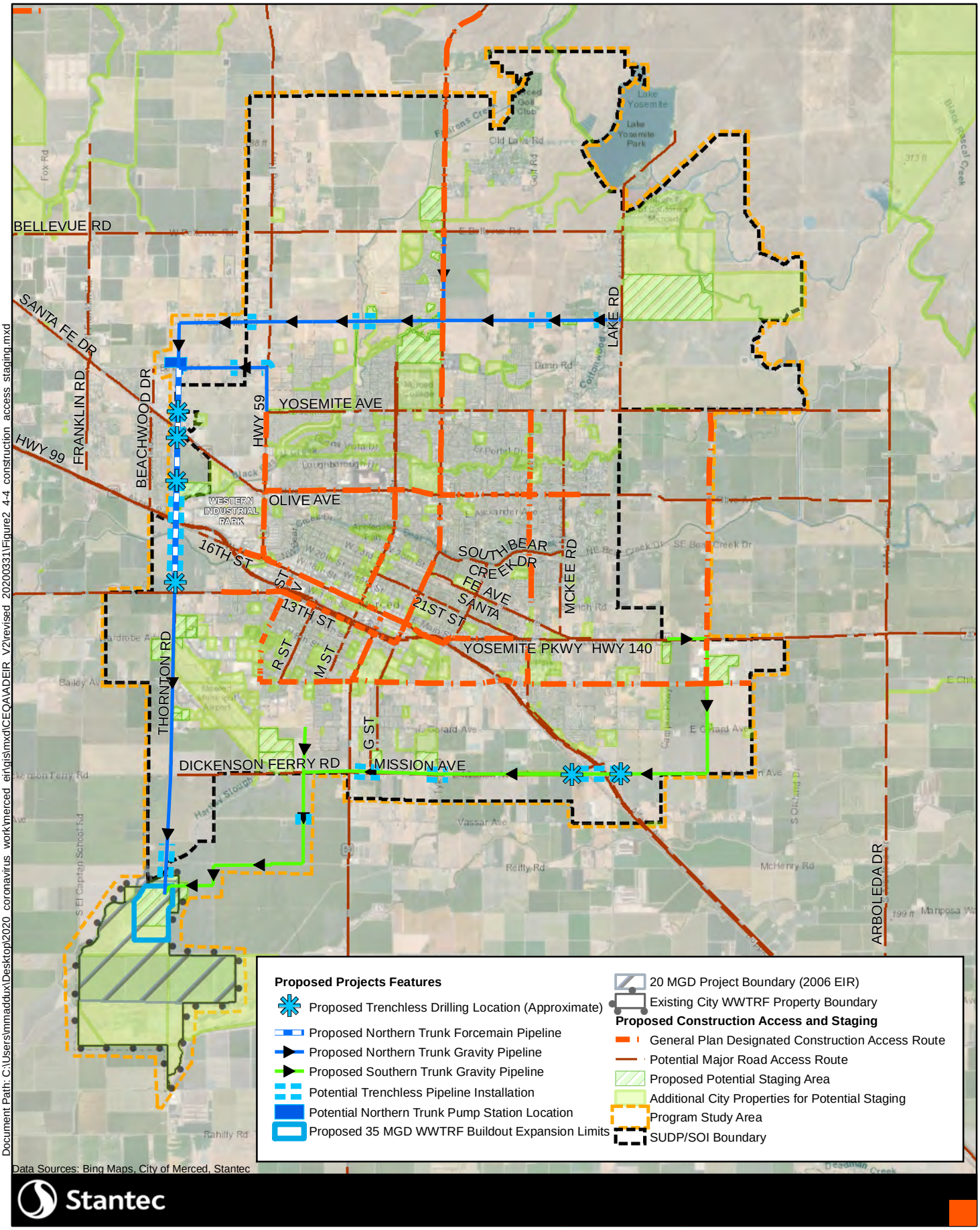



Figure 2.4-4
Construction Access and Staging Areas
City of Merced - Draft Environmental Impact Report

### 2.4.5 Proposed Access and Staging Areas

Staging and access associated with the majority of the in-road pipeline placement is anticipated to occur within or adjacent to the pipeline alignment (within the 200-foot construction buffer) and associated roadways. Additional staging areas would occur on City-owned property adjacent to the Project activities. It is anticipated that key staging areas would include the WWTRF, City property along Thornton Road across from the airport, City property within the Airport Business Park, trenchless drilling sites along the pipeline alignment, City property along Thornton Road south of the intersection of W Cardella, and City property along Dickenson's Ferry Road as shown on Figure 2.4-4. Figure 2.4-4 also shows the construction access, including potential disposal sites, and staging areas for the Project.

## 2.5 REFERENCES

California Air Resources Board (CARB). 2019. San Joaquin Valley Air Pollution Control District List of Current Rules. https://www.arb.ca.gov/drdb/sju/cur.htm. Accessed January 2019.

City of Merced. 2012. Merced Vision 2030 General Plan. https://www.cityofmerced.org/departments/development-services/planning-division/merced-vision-2030-general-plan#:~:text=The%20Merced%20Vision%202030%20General%20Plan%20was%20adopted%20on%20January,which%20can%20be%20downloaded%20below. Accessed June 2018.

_____. 2017. Wastewater Collection System Master Plan https://www.cityofmerced.org/depts/engineering_division/sewer_master_plan.asp. Accessed April 2019.

Central Valley Regional Water Quality Control Board (CVRWQCB). 2009. Resolution No.R5-2009-0028. In Support of Regionalization, Reclamation, Recycling, and Conservation for Wastewater Treatment Plants. Website: https://www.waterboards.ca.gov/centralvalley/board_decisions/adopted_orders/resolutions/r5-2009-0028.pdf. April 2009. Accessed March 2020.

## 2.6 ABBREVIATIONS

| | |
|---|---|
| BNSF | Burlington Northern Santa Fe |
| CARB | California Air Resources Board |
| CDFW | California Department of Fish and Wildlife |
| CVRWQCB | Central Valley Regional Water Quality Control Board |
| City | City of Merced |
| DAFT | dissolved air flotation thickener |
| EIR | Environmental Impact Report |
| HDD | horizontal directional drilling |
| lbs/day | pounds per day |

| | |
|---|---|
| Mgal/d | million gallons per day |
| mg/L | milligrams per liter |
| MID | Merced Irrigation District |
| MTBM | microtunnel boring machine |
| NPDES | National Pollution Discharge Elimination System |
| O&M | operations and maintenance |
| Program | "roadmap" for wastewater collection services as defined by the 2017 Wastewater Collection System Master Plan |
| Project | Specified project under the 2017 WCSMP |
| ROW | right-of-way |
| SCH | State Clearinghouse |
| SR | State Route |
| SUDP/SOI | Specific Urban Development Plan/Sphere of Influence |
| UC | University of California |
| UPRR | Union Pacific Railroad |
| UV | ultraviolet |
| WDRs | Waste Discharge Requirements |
| WWTRF | Wastewater Treatment and Reclamation Facility |
| 2017 WCSMP | 2017 Wastewater Collection System Master Plan |
| 2030 General Plan | City of Merced Vision 2030 General Plan |

## 2.7 GLOSSARY

| | |
|---|---|
| 2017 WCSMP | The 2017 Draft Wastewater Collection System Master Plan. |
| Plan A | The identified preferred option in the 2017 Draft Wastewater Collection System Master Plan (WCSMP) and the overarching "Program" in this EIR. |
| Program | Implementation of the 2017 WCSMP including the proposed Projects identified in this EIR as well as future programmatic components of the WCSMP that are being analyzed programmatically throughout this document. |
| Program Area or Program Study Area | All areas in the City's SUDP/SOI where potential wastewater collection system infrastructure would be constructed and operated, as well as additional areas of physical impact analyzed in the 2017 WCSMP and this EIR. |
| Proposed Projects | The 'proposed Project(s)' are specific projects identified under Plan A of the 2017 WCSMP that have been carried forward in this EIR in a project-specific level of detail. The proposed Projects include the following:<br>- New Trunk Sewer Infrastructure Projects:<br>o Northern Trunk Sewer Project<br>o Southern Trunk Sewer Project<br>- WWTRF Expansion Projects |
| Reasonable build-out | The projected growth and development of the City of Merced as described in the City of Merced's Merced Vision 2030 General Plan (2030 General Plan) (City of Merced 2012) used for modeling the wastewater collection system in the City's Wastewater Collection System Master Plan (2017 WCSMP). |

| | |
|---|---|
| SUDP/SOI | The Specific Urban Development Plan/Sphere of Influence. This includes the City's boundary limits as well as the ultimate growth boundary of the community over the life if the 2030 General Plan. The SUDP/SOI and the Program Area are the same. |