



4

Infrastructure Systems

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## CHAPTER 4

# infrastructure systems

### SECTIONS

- 4.01 Introduction
- 4.02 Storm Drainage System
- 4.03 Water System
- 4.04 Sanitary Sewer System
- 4.05 Dry Utilities
- 4.06 References

## 4.01 INTRODUCTION

The purpose of infrastructure system analysis is to: 1) identify the utility providers for this corridor; 2) provide a general review of potential limitations in the currently installed systems; and 3) recommend feasibility-level improvements and associated costs. This review is based on block map information from the various utility companies, discussions with utility provider staff, and available public domain reports and records. A list of references is included at the end of this chapter.

Capacity for utility systems is determined by the type and density of development within the corridor. In the existing condition, San Pablo Avenue is primarily a business district with some medium density development up to three story buildings. It is assumed that the current utility facilities are sized to maintain service and operations at an optimal level.

For most systems, the future demands and the infrastructure system to support those demands evaluated two planning horizons, Buildout and Year 2040. The total proposed development for Year 2040 planning horizon assumes all the planned and entitled projects as well as development of high feasibility sites. The Buildout planning horizon assumes all development envisioned in the Year 2040 scenario as well as development of other underutilized

parcels which maybe developed after 2040. The Building horizon is evaluated as some infrastructure improvements need to take account long term needs beyond 2040. A limited discussion of the ability of the utility systems to support future opportunities for development within the San Pablo Corridor is provided. Existing drainage system deficiencies known from other utility study documents are noted. Correction of these deficiencies is part of the City's ongoing capital improvement program. Analyses of upstream and downstream requirements from the San Pablo corridor are not part of the analysis. The needs for additional information and investigation, to better confirm conclusions, are also discussed.

## 4.02 STORM DRAINAGE SYSTEM

### 4.02.01 GENERAL

The storm drainage system within San Pablo Avenue is owned and maintained by the City of Richmond and by the City of El Cerrito. State Route 123 roadway (including curb and gutter) from the Alameda/ Contra Costa County line in the south to Cutting Blvd in the north is owned by Caltrans but the City of El Cerrito owns and maintains the sidewalks and the drainage system. Between Cutting Blvd and the City limit with Richmond in the north, the City of El Cerrito owns and maintains the roadway, the sidewalks and the drainage system. The pipelines collecting runoff from this area discharge to Baxter Creek and Cerrito Creek. Based upon the *Caltrans Highway Design Manual, Chapter 830, Table 831.3*, the system was most likely designed to handle the design event of the 10-year storm. This assumption is based upon the low roadway speed and the urbanized nature of the roadway. For roadway speed design, local standards were most likely used.

Based upon the review of aerial photography, the existing condition of San Pablo Avenue and the surrounding parcels is highly developed. There is little open, unpaved area. The study area consists of significant impervious surfaces including buildings, roadways, parking lots, sidewalks, and walkways.

The drainage systems within the area are subject to the standards of the cities, the Contra Costa Clean Water Program (CCCWP), and Caltrans Stormwater Quality requirements.

### 4.02.02 SUPPLY AND CAPACITY

The 1999 City of El Cerrito Storm Drain Master Plan (SDMP) noted certain storm drain deficiencies within the San Pablo Specific Plan corridor and ranked deficiencies by priority for improvements. Highest priority was 1 and lowest priority was 30. The SDMP listed a deficiency with the existing 54 lineal feet (LF) and 71 LF 16-inch x 25-inch storm drain (site number 8) at intersection of Potrero Avenue and San Pablo Avenue, and categorized this as priority 14. The SDMP listed a deficiency with the existing 360 LF 48-inch storm drain (site number 11) along San Pablo Avenue between Moeser Lane and Plumas Avenue and categorized this as priority 6. The SDMP listed a deficiency with the existing 150 LF 24-inch storm drain (site number 15) along San Pablo Avenue, between Fresno Avenue and Columbia Avenue, and categorized this as priority 16. Lastly, the SDMP listed a deficiency with the existing 480 LF 30-inch

storm drain (site number 17) along San Pablo Avenue, between Central Avenue and Fairmont Avenue and categorizes this as priority 15. City staff has also noted some localized flooding on Kearney Street and San Pablo Avenue near Fairmount Avenue. Improvements to address these deficiencies are part of the City's ongoing capital improvement program.

Based upon runoff patterns discussed below, the system appears to collect runoff from the residential areas east of San Pablo Avenue. This runoff is then conveyed via pipes to San Francisco Bay. Complete data are not available. However, Baxter Creek crosses San Pablo Avenue just south of MacDonald Avenue. Additional information concerning pipes collecting runoff within the City of El Cerrito was not available for this study.

### 4.02.03 RUNOFF PATTERNS

The general drainage direction of the watershed is from northeast to southwest. Drainage on San Pablo Avenue is collected in gutters along the face of existing concrete curbs. The gutters convey runoff flow to inlets along the edges of the roadway. The inlets discharge to underground pipes which then flow to Baxter Creek and Cerrito Creek, within the project limits. These underground pipes are assumed to connect to pipes within cross streets to the north and south.

Project limits are located within the Baxter Creek and Cerrito Creek watersheds. Baxter Creek is located near the northerly limits of the study, just south of MacDonald Avenue. Within the project limits, Baxter Creek is mainly a constructed earth channel. Downstream of the project, Baxter Creek is almost exclusively underground until discharge to Stege Marsh and the San Francisco Bay.

Within the project limits, North Fork Cerrito Creek is underground. Just downstream of the project, North Fork Cerrito Creek discharges to Cerrito Creek, which is almost exclusively a constructed or natural earth channel until discharge to Albany Flats and the San Francisco Bay.

The existence of 100-year floodplains was explored via Federal Emergency Management Agency (FEMA) flood mapping information. Per *FEMA FIRM Community Panel Number 0600350020 C*, there is not a 100-year floodplain between the northerly limits of the project and the railroad crossing just south of MacDonald Avenue. Per *FEMA FIRM Community Panel Number 0650270003 B*, the remaining study area is not within a 100-year floodplain.

#### 4.02.04 RATIO OF PERVIOUS TO IMPERVIOUS AREA

The assessment of the amount of impervious surface is based upon review of aerial photography and approximations of this visual assessment.

The study area is highly developed and impervious. The existing condition includes a paved roadway with a minimum of four lanes of traffic. At intersections, the roadway widens to accommodate varying numbers of turning lanes. Additional roadway width also accommodates parallel parking.

The existing medians vary between being raised and at-grade. Raised medians are landscaped with grass and trees and hardscaped with cobbles and concrete. New raised medians were installed at the south part between Central Avenue and Carlson Boulevard.

The parcels surrounding San Pablo Avenue are highly developed. Up to 90 percent of the existing parcels tend to include impervious surfaces such as buildings, parking lots, and sidewalks. Approximately 10 percent of the parcels have a landscape buffer. These buffers tend to be a maximum of 10 feet wide. Along approximately 25 percent of the length of the study, the sidewalks contain street trees. These trees tend to be located within tree well insets in the sidewalk.

#### 4.02.05 DESIGN CONSIDERATIONS

There are three storm drainage requirements with which the project must comply:

- A. Collection and conveyance of the 10-year storm event.
- B. Compliance with hydromodification management.
- C. Compliance with storm water quality regulations.

Currently the San Pablo Avenue area is covered under the California Regional Water Quality Control Board, San Francisco Bay region, *Municipal Regional Stormwater NPDES Permit (MRP) Order R2-2009-0074, NPDES Permit No. CAS612008*. The Permit was adopted October 14, 2009 and revised November 28, 2011. All new projects in this plan are covered under this permit including new development, redevelopment, industrial and commercial sites. Under the current version of the 303(d) List of Impacted Water Bodies, Baxter creek and Cerrito creek are listed under the TMDL required list. This list cites various creeks and water bodies as well as pollutants of concern.

During the 10-year storm event, the project must collect roadway runoff efficiently. This collection will prevent impacts to the walking public and provide a safer environment for traffic.

To comply with generally accepted standards as well as City standards, the project may require additional inlets and connecting pipelines at traffic calming bulb-outs and upstream of mid-block crosswalks. Because of the highly-developed nature of the project and the requirement for compliance with hydromodification management within the County, it is assumed that there will be no need for trunk pipe size increases. However, during design it would be cost-effective to rehabilitate or replace existing pipelines in poor condition. Pipelines can be inspected via CCTV to verify condition. Modifications to curbs, gutters, medians, and crossing locations may necessitate the replacement of existing storm drain inlets and connecting pipelines. These modifications may also require the addition of manholes at junction points to facilitate maintenance.

Hydromodification Management (HM) is the management of storm water, "such that post-project stormwater discharge rates and durations match pre-project discharge rates and durations from 10% of the pre-project 2-year peak flow up to the pre-project 10-year peak flow." [2] Typically, if a project creates or replaces more than one acre of impervious surface, it is subject to hydromodification management requirements. However, if the project does not increase the impervious surface to levels greater than the existing condition, hydromodification management is not required. In the case of the Specific Plan, the proposed roadway curb-to-curb width is anticipated to be equal to existing conditions.

In addition, the existing area is highly developed with very small amounts of remaining pervious surfaces. The validity of the assumption that the impervious surface will not increase will need to be verified when more defined site plans are developed.

Permanent post-construction Best Management Practices (BMPs) are required. The MRP, in effect since December 1, 2011, mandates a low impact development (LID) approach and went into effect December 1, 2011. LID treatment measures are: rainwater harvesting and re-use, infiltration, evapotranspiration, or bio-treatment. All projects shall follow the Contra Costa Clean Water Program *Stormwater C.3 Guidebook* (current edition- February 15, 2012). Special Projects defined in *Table 4-14 (Contra Costa Clean Water Program – 6th edition)* may use non LID treatment systems such as tree boxes or vault-based high-flow rate media filters meeting the minimum criteria per the C.3 website.

BMPs must be incorporated to accommodate the runoff from impervious surfaces in compliance with the NPDES Permit. This need can be achieved through the use of low impact development (LID) features as well as various BMPs. LID features reduce the impervious surfaces. These features include pervious pavements, landscape features, and green roofs. Parking stalls and plaza areas along San Pablo Avenue may be able to utilize pervious asphalt, pervious concrete, or permeable pavers. Medians may be landscaped to increase permeability. Landscaped open space will contribute to reductions in impervious surfaces.

Given the existing level of urbanization and the proposed plans for the areas adjacent to San Pablo Avenue, BMPs should fit the project character and account for potential constraints. Bioretention planter areas may be used to treat roadway runoff. Flow-through planter boxes may be used to treat roof runoff. During design, the *Stormwater C.3 Guidebook* should be referenced for acceptable BMPs, design considerations, design criteria, and operation and maintenance information. In addition to the *C.3 Guidebook*, the project should also determine if drainage will discharge to a water body impacted by specific pollutants. The *2008 303(d) List of Impacted Water Bodies (303(d) List)* has been prepared and issued by the Regional Board. Baxter Creek and Cerrito Creek have been added to the *303(d) List* as TMDL required list. The *Municipal Regional Permit (MRP)* provides more detailed information concerning this subject.

#### 4.02.06 RECOMMENDED IMPROVEMENTS

The recommended improvements cited relate to the right-of-way limits of San Pablo Avenue. The parcels to be developed into mixed use, office, residential, and commercial sites must accommodate their own storm drainage, hydromodification, and storm water quality improvements for each parcel. Regional facilities may be desirable to accommodate some developments or to reduce operation and maintenance responsibilities.

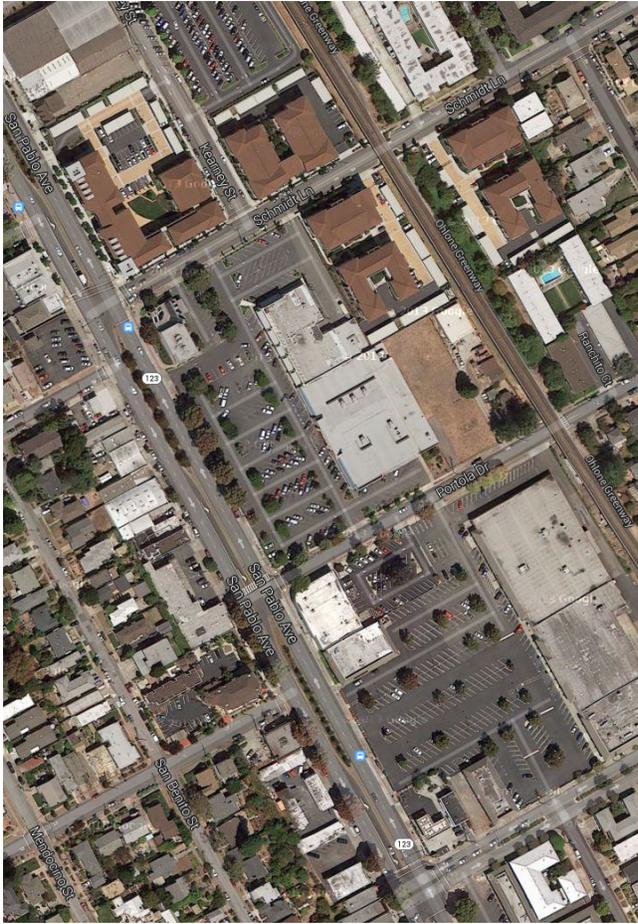
According to proposed Complete Streets streetscape designs, San Pablo Ave will mostly maintain existing curb edge and stormwater flowline. In the uptown area the sidewalks will be widened away from the road. Those additional impervious areas will have to be treated for water quality along the sidewalk.

Improvements related to 10-year storm event include those items recommended to provide collection and conveyance for a designated design event. The improvements are not required to address additional

flows since the proposed streetscape design maintains existing runoff conditions. Deficiencies along the San Pablo Avenue have been addressed in the City's CIP plan. Storm drain improvements are recommended because streets may be repaved as part of the infill development projects, providing an opportunity to maintain the current system and bring it up to current standards. In addition, modifications to the existing storm drain system may be required with the proposed construction of landscaped bulb-outs at intersections.

The assumptions for drainage system improvements are as follows:

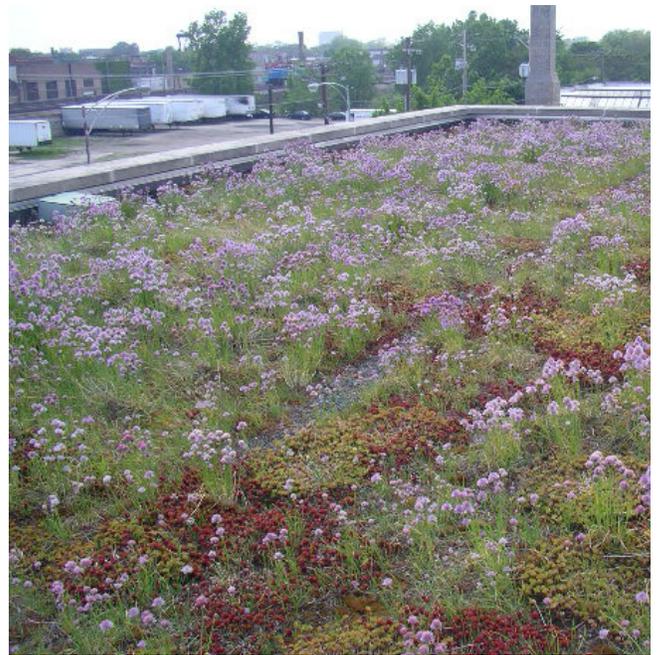
- A. Project length is approximately 2.7 miles (14,200 feet).
- B. Assume two existing inlets every 500 feet (Replacement of 60 inlets)
- C. Assume addition of two new inlets at each midblock crossing with associated piping and junction structures.
  - 1. 13 new manholes
  - 2. 26 new inlets
- D. Assume 10 percent of existing pipe is in poor condition (offset joints, broken pipe, etc).
  - 1. Rehabilitate or replace 1,400 feet of 36-inch pipe
  - 2. Rehabilitate or replace ten manholes
- E. Improvements related to HM program include those items required to comply with the program by the CCCWP. It does not appear that the project will increase impervious surface or discharge. Therefore, no HM improvements are anticipated at this time. The existing system is a paved area discharging to inlets, which discharge to pipelines.
- F. Improvements related to storm water quality are those items required to comply with Section C.3 of the NPDES Permit. For the purposes of this Study, storm water quality compliance is limited to those improvements related to San Pablo Avenue not the adjacent parcels, which are required to treat storm water runoff on a project by project basis. Road resurfacing and sidewalk repair/replacement are excluded from C.3 requirements if the replacement is within the existing impervious area footprint. The administrative draft of the San Pablo Specific Plan streetscape design maintains existing road runoff patterns and does not include



Infrastructure Figure 01. Impermeable surfaces are widespread in the study area



Infrastructure Figure 02. Award winning low impact streetscape improvements along San Pablo Ave



Infrastructure Figure 03. Green roof is a good stormwater best management practice.



Infrastructure Figure 04. Low impact development features may serve as community amenities.



Infrastructure Figure 05. Permeable paving, used for the parking spaces at right, is an example of LID

road widening. The proposed streetscape plan describes future widening of the existing sidewalks in the uptown area. Any increase in impervious area as a result of widening would be required to be treated for water quality along the sidewalk.

## 4.03 WATER SYSTEM

### 4.03.01 EXISTING CONDITIONS

Water service to San Pablo Avenue is supplied by the East Bay Municipal Utility District (EBMUD). The Pardee Reservoir (supplied by the Mokelumne River Basin system) is the main source of water for EBMUD.

Based upon utility block maps obtained from EBMUD, the general pipe size within San Pablo Avenue (from north to south) ranges from 12-inch on the right side of the street (from Knott Avenue to Potrero Avenue) to 8-inch on the right side of the street (from Potrero Avenue to Fairmount Avenue). Similarly, on the left side of the street, pipe sizes range between 4-inch and 6-inch (from MacDonald Avenue to Cutting Boulevard) to 8-inch (from Cutting Boulevard to Fairmount Avenue).

The San Pablo Avenue corridor is served by two separate pressure zones: 1) GIAa (elevation 355) at the north from Nevin Avenue to Ohio Street, and 2) GOA (elevation 202) from Ohio Street in the north to the boundary of the City of Albany. San Pablo Avenue elevation ranges from 50 ft in the north to 40 ft in the south.

### 4.03.02 RECOMMENDED IMPROVEMENTS

The following water design criteria are used to develop conceptual improvements for both Buildout and Year 2040 planning horizons:

- A. For residential areas, a demand factor of 80 gallons per day per person and a factor of three persons per unit are assumed.
- B. For commercial areas, a usage factor of 0.13 gallons per day per sq ft has been used.
- C. For the pipe sizing, an assumed maximum day factor of 2 is used; a peak hour factor of 3 is also assumed.
- D. Fire flows are based on maximum building area, type of building, and if a sprinkler system is required.

E. Per 2010 California Fire Code Appendix BB, assumed type V building construction, maximum fire area is 55,000 sq ft reduced by 50% under the assumption that the building is provided with an approved automatic fire sprinkler system. An additional 500 gallons per minute (gpm) will be used for fire sprinkler for a total maximum fire demand of 3,625 gpm.

F. Total water demand will include the maximum daily usage demand in addition to the fire flow required.

G. Proposed development is expected to consist of buildings ranging in height from 55 to 65 feet. To support the plumbing of these buildings and to provide the required fire flows, the water system with the higher pressure (GIAa, elevation 355) will need to be used.

H. Master Plan level modeling of the existing distribution system will be required. This modeling effort is needed to determine if the existing system can provide the additional demands. Computer simulations were not conducted as part of this report.

I. For the purposes of the Specific Plan, the assumption is that the existing high pressure 36 inch pipeline along Key Boulevard, Liberty Street, and Elm Street (four blocks north of San Pablo Avenue) will be adequate. It is assumed that this high pressure pipeline will be used to supply the additional demands and will feed the development with new mains to San Pablo Avenue. In addition, EBMUD plans to construct a new 36-inch transmission main along San Pablo Avenue starting in 2021 that would connect to existing mains at Nevin Avenue in Richmond and Central Avenue in El Cerrito. The proposed 36-inch transmission main is part of EBMUD's West of Hills Northern Pipelines project.

J. The water system is a looped system.

*Infrastructure Table 01. Buildout Planning Horizon: Additional Water Demands and Associated Distribution System Improvements and Infrastructure Table 02. Year 2040 Development: Additional Water Demands and Associated Distribution System Improvements present the proposed commercial floor area, residential units, water demands, improvements required, and the costs associated with these improvements. The costs include pipe construction only. Pump stations and general system upgrades are excluded from this cost.*

### INFRASTRUCTURE TABLE 01. BUILDOUT PLANNING HORIZON: ADDITIONAL WATER DEMANDS AND ASSOCIATED DISTRIBUTION SYSTEM IMPROVEMENTS

Location Along San Pablo Avenue	Proposed Commercial (Sq Ft)	Proposed Residential Units	Total Water Demand, Max Day (gpm)	Fire Demand (gpm)	Total Water Demand, Max Day + Fire (gpm)	Pipe Size (in)	Length (ft)	Rounded Cost (\$)
Knott Ave to Potrero Ave <sup>a</sup>	168,000	900	330	3,625	3,955	12	3,120	1,600,000
Kearney and Schmidt <sup>b</sup>	0	200	67	1,500	1,567	8	1,000	400,000
Manila Ave to Santa Cruz Ave <sup>c</sup>	164,712	408	166	3,625	3,791	12	2,750	1,400,000
Santa Cruz Ave to Fairmount Ave <sup>d</sup>	244,400	812	315	3,625	3,940	12	4,700	2,400,000
Creekside Project <sup>e</sup>	0	128	43	3,625	3,668	12	3,360	1,700,000
5620 Central Ave Project <sup>f</sup>	0	170	57	3,625	3,682	12	1,570	800,000
<b>Total</b>								<b>8,300,000</b>

a: Length includes 660 LF along Cutting Boulevard to serve opportunity sites.

b: Length extends along Kearney St (Manila to Schmidt) and Schmidt (Kearney to San Pablo).

c: Improvements excluded for Ohlone Gardens project. EBMUD did not require upgrades to existing system.

d: Length extends along Fairmount Avenue to serve proposed opportunity sites.

e: Extend 12-inch main along San Pablo Ave, south of Fairmount Ave. Looped water main through existing shopping center with connections at Fairmount Ave and San Pablo Ave.

f: Length extends along Central Ave from Pierce St to Carlson Blvd.

### INFRASTRUCTURE TABLE 02. YEAR 2040 DEVELOPMENT: ADDITIONAL WATER DEMANDS AND ASSOCIATED DISTRIBUTION SYSTEM IMPROVEMENTS

Location Along San Pablo Avenue	Proposed Commercial (Sq Ft)	Proposed Residential Units	Total Water Demand, Max Day (gpm)	Fire Demand (gpm)	Total Water Demand, Max Day + Fire (gpm)	Pipe Size (in)	Length (ft)	Rounded Cost (\$)
Knott Ave to Potrero Ave <sup>a</sup>	92,000	680	243	3,625	3,868	12	3,120	1,600,000
Manila Ave to Santa Cruz Ave <sup>b</sup>	47,712	198	75	3,625	3,700	12	2,750	1,400,000
Santa Cruz Ave to Fairmount Ave <sup>c</sup>	103,400	530	195	3,625	3,820	12	4,700	2,400,000
Creekside Project <sup>d</sup>	0	128	43	3,625	3,668	12	3,360	1,700,000
5620 Central Ave Project <sup>e</sup>	0	170	57	3,625	3,682	12	1,570	800,000
<b>Total</b>								<b>7,900,000</b>

a: Length includes 660 LF along Cutting Boulevard to serve opportunity sites.

b: Improvements excluded for Ohlone Gardens project. EBMUD did not require upgrades to existing system.

c: Length extends along Fairmount Avenue to serve proposed opportunity sites.

d: Extend 12-inch main along San Pablo Ave, south of Fairmount Ave. Looped water main through existing shopping center with connections at Fairmount Ave and San Pablo Ave.

e: Length extends along Central Ave from Pierce St to Carlson Blvd.

Both planning horizons take into account planned and entitled projects including Creekside, 5620 Central Ave, and Eden Housing. According to the Ohlone Gardens project utilities design engineer (Luk and Associates), an upgrade to the existing water system to serve fire flow demands was not required by EBMUD. Thus, improvements to serve the Ohlone Gardens project are excluded.

## 4.04 SANITARY SEWER SYSTEM

### 4.04.01 EXISTING CONDITIONS

Sewage within the San Pablo Avenue corridor is managed by the Stege Sanitary District (SSD). SSD provides sewer service to businesses along San Pablo Avenue in the City of El Cerrito and has about 13,000 connections.

SSD operates and maintains 148 miles of sanitary sewer over a total area of 5.3 square miles. SSD also operates two pumping stations. Wastewater collected in the SSD system flows to the EBMUD Special District #1 Interceptor Sewer. Sewage is then conveyed to the EBMUD Wastewater Treatment Facility in Oakland.

Based upon utility block maps obtained from SSD, pipelines are located on the westerly (southbound lanes) and the easterly (northbound lanes) side of median along San Pablo Avenue.

A review of the block maps indicates that the existing sewer is split into segments along San Pablo Avenue and discharged to larger diameter collector mains that extend along cross streets. From north to south, the general routing of flows is westerly as summarized below:

- A. A 10-inch collector main along Cutting Boulevard collects flows along San Pablo Avenue between Knott Avenue and Cutting Boulevard
- B. A 12-inch collector main along Potrero Avenue collects flows along San Pablo Avenue between Cutting Boulevard and Potrero Avenue and flows from Hill Boulevard and Blake Street
- C. An 18-inch collector main along Potrero Avenue collects flows along San Pablo Avenue between Potrero Avenue and Schmidt Lane
- D. An 18-inch collector main along Huntington Avenue collects flows along San Pablo Avenue between Schmidt Lane and Waldo Avenue (properties on east side of San Pablo Avenue)
- E. An 8-inch collector main along Central Avenue collects flows along San Pablo Avenue between El Dorado Street and Central Avenue (properties on west side of San Pablo Avenue)
- F. An 18-inch collector main just south of Fairmount Avenue collects flows along San Pablo Avenue between Waldo Avenue and Fairmount Avenue (properties on east side of the San Pablo Avenue) and between Central Avenue and Fairmount Avenue (properties on west side of San Pablo Avenue)

Prior to construction, Stege Sanitary District requires completion of sanitary sewer capacity studies for proposed projects with 10 or more residential units, 10,000 square feet or more of office or commercial facility, 1,000 square foot or more of restaurant, and Laundromats or industrial facilities. SSD requires flow monitoring of the existing system to be conducted as part of the capacity study. In December 2013, a sewer capacity study was completed for the Eden Housing project. The Eden Housing capacity study concluded that based on SSD's design criterion, the existing 6-inch sewer main that extends along San Pablo Avenue from Carlos Avenue to Manila Avenue is undersized for estimated peak wet weather flows. The study recommended upsizing segments of the existing sewer main from 6-inch to either 8-inch, 10-inch or 12-inch depending on the existing pipe slope and estimated peak wet weather flow. The study presented an estimated cost of \$266,604 for replacement of the existing 1,340 lineal feet of sewer main.

### 4.04.02 RECOMMENDED IMPROVEMENTS

Design criteria are summarized below.

- A. Sewer generation at the build out phase is based on 95 percent of indoor water demand projection. (average dry weather flow)
- B. Peaking factor of two times average dry weather flow to determine peak dry weather flow and a factor of four times the peak dry weather flow to determine the peak wet weather flow. (SSD Sanitary Sewer Capacity Study Criteria requires wet weather flow be calculated as 400% of peak dry weather flow in lieu of wet weather monitoring data.)
- C. At this stage no modeling has been performed for the existing system to evaluate the capacity under the new loads.

Improvements are proposed for San Pablo Avenue area and not for downstream systems.

D. Master Plan level modeling of the existing sewer system will be required. This effort will assist in determining the effects of this project on the existing infrastructure as well as required improvements. Computer simulations were not conducted as part of this report.

*Infrastructure Table 03. Year 2040 Planning Horizon: Projected Additional Sanitary Sewer Flows and Collection System Improvements and Infrastructure Table 04. Buildout Planning Horizon: Projected Additional Sanitary Sewer Flows and Collection System Improvements* present the additional sewer flows that will be generated by the additional commercial and residential areas. The pipes shown in the table are sized to serve only the additional development area. Modeling of the sewer system will

**INFRASTRUCTURE TABLE 03. YEAR 2040 PLANNING HORIZON: PROJECTED ADDITIONAL SANITARY SEWER FLOWS AND COLLECTION SYSTEM IMPROVEMENTS**

Location Along San Pablo Avenue	Proposed Commercial (sq ft)	Potential Residential Units	Total PWWF (gpm)	Pipe size (in)	Length (ft)	Rounded Cost (\$)
San Pablo, Knott Ave to Potrero Ave <sup>a</sup>	92,000	680	924	12	3,120	1,300,000
Eden Housing <sup>b</sup>	3,062	63	82	--	--	267,000
Ohlone Gardens <sup>c</sup>	4,650	57	75	--	--	0
San Pablo, Burlingame Ave to Huntington Ave	40,000	78	126	8	1,540	600,000
San Pablo, Avila Ave to Central Ave <sup>d</sup>	26,400	60	94	8	500	200,000
Fairmount Ave, Richmond St to San Pablo <sup>e</sup>	77,000	470	648	10	1,300	600,000
San Mateo St, south of Central Ave <sup>f</sup>	0	170	215	8	400	200,000
Creekside project <sup>g</sup>	0	128	162	6	1,700	600,000
<b>Total</b>						<b>3,767,000</b>

*a: Length includes 660 LF along Cutting Boulevard to serve opportunity sites.*

*b: Cost based on December 2013 Sewer Capacity Study recommended improvements to address existing deficiencies.*

*c: Per December 2013 sewer capacity study, improvements not required to serve Ohlone Gardens project.*

*d: Serves McNevin planned/entitled project. Improvements to serve site "J" are not anticipated. It is assumed that the existing sewer main can accommodate projected additional PWWF of 10 gpm from the project site.*

*e: Length consists of 1300 LF along Fairmount from Richmond St west to San Pablo Ave to serve proposed opportunity sites.*

*f: Serves planned/entitled 5620 Central Avenue project.*

*g: Length consists of 1700 LF to serve planned/entitled Creekside project.*

**INFRASTRUCTURE TABLE 04. BUILDOUT PLANNING HORIZON: PROJECTED ADDITIONAL SANITARY SEWER FLOWS AND COLLECTION SYSTEM IMPROVEMENTS**

Location Along San Pablo Avenue	Proposed Commercial (sq ft)	Potential Residential Units	Total PWWF (gpm)	Pipe size (in)	Length (ft)	Rounded Cost (\$)
San Pablo, Knott Ave to Potrero Ave <sup>a</sup>	168,000	900	1,255	15	3,120	1,500,000
Eden Housing <sup>b</sup>	3,062	63	82	--	--	267,000
Ohlone Gardens <sup>c</sup>	4,650	57	75	--	--	0
San Pablo, Burlingame Ave to Huntington Ave	0	200	253	8	800	300,000
San Pablo, Ayila Ave to Central Ave <sup>d</sup>	286,400	462	782	12	5,400	2,300,000
Fairmount Ave, Richmond St to San Pablo <sup>e</sup>	115,000	638	887	12	1,300	600,000
San Mateo St, south of Central Ave <sup>f</sup>	0	170	215	8	400	200,000
Creekside project <sup>g</sup>	0	128	162	8	1,700	600,000
<b>Total</b>						<b>5,767,000</b>

*a: Length includes 660 LF along Cutting Boulevard to serve opportunity sites.*

*b: Cost based on December 2013 Sewer Capacity Study recommended improvements to address existing deficiencies.*

*c: Per December 2013 sewer capacity study, improvements not required to serve Ohlone Gardens project.*

*d: Serves McNevin planned/entitled project. Improvements to serve site "J" are not anticipated. It is assumed that the existing sewer main can accommodate projected additional PWWF of 10 gpm from the project site.*

*e: Length consists of 1300 LF along Fairmount from Richmond St west to San Pablo Ave to serve proposed opportunity sites.*

*f: Serves planned/entitled 5620 Central Avenue project.*

*g: Length consists of 1700 LF to serve planned/entitled Creekside project.*

be required to determine the impact of the additional flows resulting from the proposed building areas on the downstream system. Both planning horizons take into account planned and entitled projects including Ohlone Gardens, Creekside, 5620 Central Ave, and Eden Housing. A December 2013 sewer capacity study completed for the Ohlone Gardens project concluded that the existing sewer main along Portola Drive adjacent to the project site, and the existing sewer main along San Pablo (at Waldo Avenue) have sufficient capacity to serve the proposed Ohlone Gardens project. Therefore, improvements to serve the project are not anticipated.

#### 4.05 DRY UTILITIES

Dry utilities within the San Pablo Specific Plan corridor include Pacific Gas and Electric (PG&E), Comcast (cable and communication lines) and AT&T (telecommunications).

##### 4.05.01 PG&E GAS LINE LOCATION

Upon examination of utility block maps obtained from PG&E, the general gas pipeline size within San Pablo (from north to south) is as follows:

- A. Left side of the street:
  - 1. 3-inches to 2-inches from Ohio Street to Knott Avenue
  - 2. 8-inches from Cutting Avenue to Manila and from Schmidt to Fairmount
  - 3. 10-inches from Manila to Schmidt Avenue
- B. Right side of the street:
  - 1. 8-inches from MacDonald Avenue to Cutting Avenue
  - 2. 2-inches from Hill to Potrero Avenue and from Madison to Moeser
  - 3. 3-inches from Potrero Avenue to Madison Avenue and from Moeser to Huntington
  - 4. From Huntington through Central Avenue, the lines vary between 2-inch and 3-inch

There appear to be no large diameter gas pipelines crossing San Pablo Avenue. Per the mapping information, all crossing gas pipelines are either 2-inch or 3-inch lines.

##### 4.05.02 PG&E ELECTRIC LINE LOCATION

In general, it appears from the PG&E electric block maps that electric service is underground through the limits of the San Pablo Specific Plan area (opportunity sites located between Knott Avenue at the north and Fairmont Avenue at the south end of the project).

There are locations where underground and overhead lines cross San Pablo Avenue. These locations are as follows:

- A. 4-inch underground electric at Conlon Avenue.
- B. 4-inch underground electric at Knott Boulevard.
- C. 115KV UG crossing at Cutting Boulevard.
- D. 6-inch underground electric at Hill Avenue.
- E. Two 6-inch underground electric and one 4-inch underground electric at Alameda.
- F. One 6-inch vacant underground electric and one 4-inch vacant underground electric at Manila.
- G. A three-wire overhead line at Manila.
- H. Two 6-inch underground electric lines at Portola.
- I. Six-wire and four-wire overhead lines at Columbia to Eureka Avenue.
- J. 4-inch underground electric at Central Avenue.

##### 4.05.03 CABLE, INTERNET, AND TELECOM ACCESS

Access to cable, internet, and telecom service lines are within the adjacent streets/properties along San Pablo Avenue. There are no major service lines locations within the Specific Plan Area.

## 4.06 REFERENCES

1. El Cerrito General Plan, August 1999.
2. Aerial Mapping, Google Maps, 2013.
3. Opportunity Sites Map, San Pablo Avenue Specific Plan, MIG, October 23, 2013.
4. Contra Costa County Watershed Atlas, Contra Costa County Community Development Department, January 2004.
5. Flood Insurance Rate Map, Community Panel 0600350020 C, City of Richmond, CA Federal Emergency Management Agency (FEMA), September 7, 2001.
6. Flood Insurance Rate Map, Community Panel 0650270003B C, City of El Cerrito, CA Federal Emergency Management Agency (FEMA), June 1, 1977.
7. San Pablo Avenue Specific Plan Existing Conditions Analysis, MIG, October 2007.
8. EBMUD block maps
9. Stege Sanitary District sewer map (PDF)
10. Stege Sanitary District Sanitary Sewer Capacity Study Criteria
11. City of Richmond GIS data for sewer and storm systems.
12. 2010 California Fire Code
13. PG&E block maps
14. Comcast Block maps
15. City of El Cerrito, Storm Drain Master Plan, March 1999.
16. V & A Consulting Engineers, Sanitary Sewer Flow Monitoring and Capacity Analysis for Ohlone Gardens, 6495 Portola Drive, El Cerrito, December 2013.
17. E2 Consulting Engineers, Sewer Capacity Study for Senior Citizen Housing Project Memorandum, May 2, 2013.