

## **Appendix F**

### **Sanitary Sewer Capacity Evaluation**

---

*3625 Peterson Way Office Project  
Environmental Impact Report*

**City of Santa Clara**

---

# Technical Memorandum



**Subject:** Sanitary Sewer Capacity Evaluation for Proposed Development at 3625 Peterson Way (APN: 216-30-049)

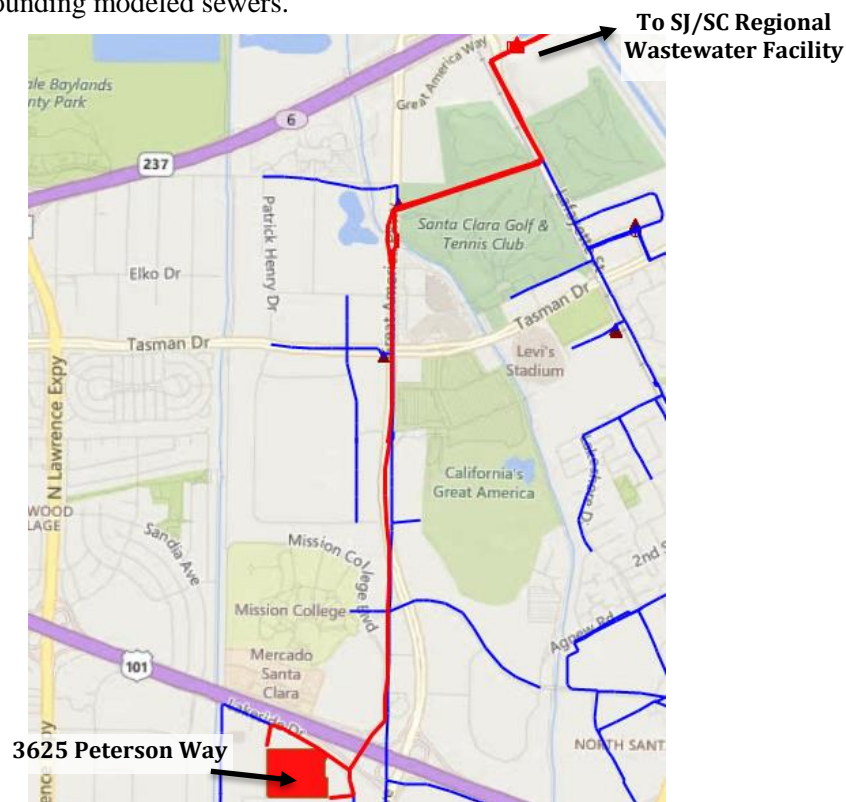
**Prepared for:** Evelyn Liang, City of Santa Clara

**Prepared by:** Cathy Greenman, P.E. California License No. C66157

**Date:** April 4, 2018

At the request of the City of Santa Clara (City), Woodard & Curran evaluated potential sanitary sewer capacity impacts of the proposed project at 3625 Peterson Way using the City's sanitary sewer hydraulic model. This technical memorandum (TM) summarizes the approach, model input, and results of the analysis. The proposed development redevelops the parcel with assessor's parcel number (APN) 216-30-049, located at the corner of Peterson Way and Tannery Way.

Flow from the development would enter the City's sanitary sewer system at manholes S72-09 and S73-13 into existing 12-inch pipes. From S72-09, flow drains northward in an existing 12-inch pipe to the 30-inch pipe running eastward along Lakeside Drive. From S73-13, flow drains eastward in an existing 12-inch pipe to the 21-inch pipe running northward along Lakeside Drive. The existing 30-inch and 21-inch pipes on Lakeside Drive come together and discharge to a single 30-inch pipe at manhole S73-07 immediately before crossing Highway 101. From there, the flow continues generally northward to the Rabello and Northside pump stations via the two parallel trunk sewer lines on Great America Parkway. **Figure 1** shows the sewer lines that are affected by the flow from this development (affected lines in red), and **Figure 2** shows the site and surrounding modeled sewers.



**Figure 1: Trunk Sewers Downstream of the Proposed Project Site**

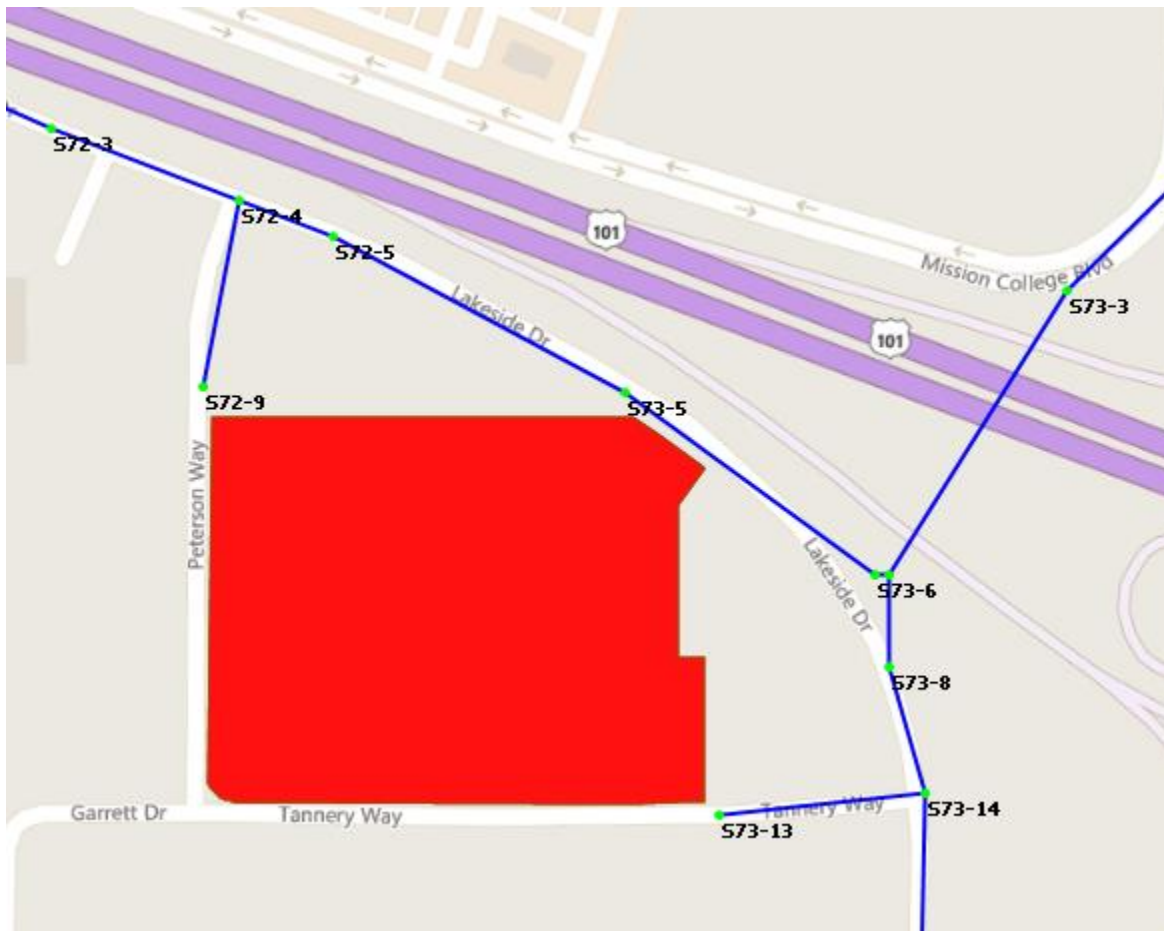


Figure 2: Modeled Sewers around Proposed Project Site

## 1 Approach

To evaluate the potential sewer capacity impact of the proposed development, the following model configurations were used:

- *Sewer network:* The City's current solution network was used. The network consists of the City's expanded trunk sewer system that was developed as part of the Sanitary Sewer Master Plan Update (2016 Master Plan). The network includes the improvements recommended by the 2016 Master Plan (P1, P2, P3, P4, P5, P6 Alternative, and E1). There are no proposed capacity improvement projects downstream of this development.

As part of this development review, the model network was extended one pipe upstream to reach the proposed discharge manhole of S72-09, plus one pipe upstream to reach the proposed discharge manhole S73-13. Pipe data for these pipes, as well as the downstream pipes on Lakeside Drive and the Highway 101 crossing, were updated based on record drawings.

- *Sanitary sewer load:* The Updated General Plan Phase 3 Loads (aka 2035 Loads) were used for this analysis. The 2035 loads were recently updated for the 2016 Master Plan, which includes updated base loads, updated development assumptions consistent with the City's 2035 General Plan, and projected loads for additional developments that were approved between 2009 (after the completion of the original 2035 Loads) and the completion of the 2016 Master Plan. The model also includes other developments that have been evaluated since completion of the 2016 Master Plan. In addition

to the wastewater flows generated within the City’s service area, the City also receives flow from the Cupertino Sanitary District (CuSD). For planning purposes, the model capped the peak wet weather flow (PWWF) discharge from CuSD at 13.8 mgd, which is the contractual maximum flow rate that CuSD is allowed to discharge into the Santa Clara system.

- *Flow Scenario:* System capacity was evaluated based on the ability of the sanitary sewer system to convey future PWWF under design storm conditions. This analysis used the same 10-year design storm that was used for the 2016 Master Plan.

## 2 Model Input

The development was added to the model as an individual subcatchment with the following settings, based on the sewer model run request received March 1, 2018:

- *Sanitary Sewer Loads:* The development consists of two proposed Office/R&D buildings of 336,000 square feet (sf) each that will replace all existing buildings. One of the two buildings is proposed to connect to manhole S72-09, and the other building is proposed to connect to manhole S73-13. The development is estimated to discharge a total of 100,800 gpd, split equally between the two proposed buildings. This flow will replace 40,236 gpd as estimated for this parcel for the Master Plan 2035 model.

**Table 1: Sewer Load Estimates for the Development**

Proposed Usage <sup>(1)</sup>	Discharge Manhole	Building Square Footage <sup>(1)</sup>	Unit Flow <sup>(2)</sup>	Estimated Sewer Flow (gpd)
Low Intensity Office/R&D	S72-09	336,000	0.15 gpd/sf	50,400
Low Intensity Office/R&D	S73-13	336,000	0.15 gpd/sf	50,400
<b>Total Flow</b>				<b>100,800</b>

**Notes:**

1. Land use and values were obtained from the sewer model run request received March 1, 2018.
2. Unit flow factor per the City’s 2016 Sanitary Sewer Capacity Assessment (Table 2-1).

- *Diurnal Profile:* A commercial diurnal curve was applied to the estimated flows.
- *Rainfall Event:* The rainfall event used was the same 10-year design event used for the 2016 Master Plan Update.
- *RDI/I Parameters:* The RDI/I parameters used were the calibrated parameters from the 2016 Master Plan. This means that RDI/I response is assumed to neither increase nor decrease with the development.

## 3 Model Results

Hydraulic profiles and predicted PWWF under future (2035) conditions in the sewers downstream of the development were reviewed.

**Without the development:** The model predicts the 12-inch pipe from manhole S72-9 to Lakeside Drive to be 26% full (in terms of the flow depth to pipe diameter ratio, or d/D), and the downstream 30-inch pipe on Lakeside Drive to be 72% to 84% full.

The model predicts the 12-inch pipe from manhole S73-13 to Lakeside Drive to be 35% full, and the downstream 21-inch pipe on Lakeside Drive to be about 47% to 80% full.

The two Lakeside Drive trunks discharge to a single 30-inch pipe at manhole S73-7. This pipe becomes the “West” trunk of the parallel pipes running along Great America Parkway. From manhole S73-7 to Old Glory Lane, the model predicts this trunk to be about 65% to 86% full. Continuing downstream, the “West”

trunk surcharges slightly (approximately 4 inches above the pipe crown) around Tasman Drive. Farther downstream, from the San Tomas Aquino Creek crossing continuing to Rabello Pump Station the model predicts the pipe (now a 33-inch to 42-inch pipe), to be from 62% to about 95% full. The portion of the “East” trunk that may receive a small amount of flow from the development is predicted to be about 60% to about 90% full.

***With the development:*** The model predicts the 12-inch pipe from manhole S72-9 to Lakeside Drive to be 29% full, with a 30% increase in the PWWF compared to without the development. The model predicts the downstream 30-inch pipe on Lakeside Drive to be 72% to 85% full, with less than a 1% increase in PWWF.

The model predicts the 12-inch pipe from manhole S73-13 to Lakeside Drive to be 38% full, with a 17% increase in the PWWF compared to without the development. The model predicts the downstream 21-inch pipe on Lakeside Drive to be 48% to 81% full, with less than a 3% increase in PWWF.

Downstream of manhole S73-7, where the two Lakeside Drive trunks discharge to the single 30-inch pipe, there is a negligible impact to the d/D. From manhole S73-7 to Old Glory Lane, the model predicts this trunk to be about 65% to 86% full. Continuing downstream, the “West” trunk surcharges slightly (approximately 4 inches above the pipe crown) around Tasman Drive. Farther downstream, from the San Tomas Aquino Creek crossing continuing to Rabello Pump Station the model predicts the pipe (now a 33-inch to 42-inch pipe), to be from 62% to about 95% full. The portion of the “East” trunk that may receive a small amount of flow from the development is predicted to be about 60% to about 90% full. **Therefore, no capacity improvement is needed** to serve the proposed development at 3625 Peterson Way.

This development also contributes flow to the Northside and Rabello pump stations. The development increases flow to the pump stations by less than 0.04 mgd (combined), and therefore does not significantly change the projected pump station inflows. It should be noted, however, that the combined model-predicted future PWWF to the pump stations slightly exceeds their estimated firm capacities (capacity with the largest pump out of service). Although this exceedance does not warrant expanding pump station capacity at this time, the City may wish to consider planning for future pump station capacity improvements as additional developments are proposed.