

Schaaf & Wheeler
CONSULTING CIVIL ENGINEERS

1171 Homestead Road, Suite 255
Santa Clara, California 95050
408-246-4848

February 9, 2021

Ms. Arminta Jensen, PE, PLS, LEED AP
Executive Vice President
Ruggeri-Jensen-Azar
8055 Camino Arroyo
Gilroy, California 95020

Subject: Impact of Proposed Site Fill on Regulatory Flood Hazards at SouthPoint in Gilroy

Dear Arminta:

This letter documents our evaluation of existing regulatory flood hazards in the vicinity of the SouthPoint area in Gilroy, loosely bound by Leavesley Road to the north, Llagas Creek to the east, Gilman Road to the south, and U.S. Highway 101 to the west. We have also performed an impact analysis for the placement of fill to construct improvements at the development site (Site), based on a Site plan further developed by Kimley-Horn. I am under contract to you, however, so this letter is addressed to you.

The City of Gilroy serves as the Floodplain Administrator and would typically administer the regulatory floodplain based on the Flood Insurance Rate Map (FIRM) for Santa Clara County, California effective May 18, 2009. The effective FIRM shows that part of the Site is located within a Special Flood Hazard Area, Zone AE with 100-year Base Flood Elevations (BFEs) that range from 192 feet NAVD to 197 feet NAVD. There is an adjacent Floodway, but this is to the east of the Site property line.

Figure 1 shows the effective FIRM in the vicinity of SouthPoint, with site boundaries superimposed. The analyses that produced this effective mapping date to the 1970s, however, and no longer represent the best available flood hazard mapping.

Schaaf & Wheeler, under my responsible charge, completed a comprehensive flood risk study for the Santa Clara Valley Water District (Valley Water) as part of its Upper Llagas Flood Protection Project, which is currently under construction. This study evaluated both existing and post-project 100-year flood hazards throughout the entire Llagas Creek watershed, including tributaries, from the watershed divides (e.g. Cochrane Road in Morgan Hill), to the Pacheco Pass bridge (California Highway 152). These flood studies, which include the area of interest, were completed in concert with Valley Water and have been reviewed and accepted by the Federal Emergency Management Agency (FEMA), which issued a Conditional Letter of Map Revision (CLOMR) for the entire study area on October 19, 2016.



Figure 1: Effective Flood Insurance Rate Map for Site

Mapping changes shown on the CLOMR are tied to project completion, which remains uncertain. Phase 1 of the project is under construction, and Phase 2 design is nearing completion, but I am not aware of the funding status. Pre-project (existing) regulatory flood hazards have also changed compared to the effective Flood Insurance Rate Map (FIRM) for Santa Clara County, due to improvements in analytic methods, better topographic information than previously available, and a longer period of hydrologic record. However, Valley Water has no plans to pursue a Physical Map Revision (PMR) that would show the best available flood hazard information through FEMA, partly due to a lack of FEMA funding for such a map change while a significant flood control project is under construction that would further change the mapping.

Nonetheless, this effort represents the best information available to floodplain administrators and provides a realistic flood hazard appraisal that the effective FIRM does not, with the basis for much of the FIRM dating to work done in the late 1970s.

Best Available 100-year Flood Hazards in Southpoint Area

Based on the referenced work completed in 2016, the Southpoint area should be mapped as within a moderate flood hazard area, labeled Zone X (shaded), rather than in a Special Flood Hazard Area. This means the depth of 100-year (one percent annual chance) flooding is less than one foot on average. Figure 2 shows approximate site boundaries superimposed on the CLOMR work map, noting that project completion (Llagas Road in Morgan Hill to Buena Vista Avenue north of Gilroy will not change flood hazards in this area.



Figure 2: Best Available Flood Hazard Mapping

More recent analyses indicate that the depth and extent of flooding near the Site are generally less than as shown on the effective FIRM. Furthermore, the hydrologic and hydraulic models used to produce the results shown in Figure 2 can also be used to evaluate the potential impact of placing fill within those areas of the Site shown as within a moderate flood hazard area.

Basis of Flood Impact Analysis

While moderate, the remaining flood hazards can be fully mitigated by placing fill within the site as needed to raise improvements above the 100-year floodplain. The basis of evaluating grading impacts to the existing floodplain shown in Figure 2 is a detailed study completed by Schaaf & Wheeler for Valley Water.

Flood discharges are based on work completed by the United States Army Corps of Engineers. Base flood elevations are determined using a combination of detailed HEC-RAS hydraulic models for creeks and tributaries, and a two-dimensional floodplain analysis for overbank flows using FLO-2D.

Figure 3 shows the detailed results of the pre-project (existing conditions) floodplain analysis near the area of interest. Flood depths on the site range from zero to one foot in the 100-year runoff event. Gray shading represents depths to one-half foot; orange from one-half to less than one foot. As an existing condition, this mapping is not contingent upon project construction.

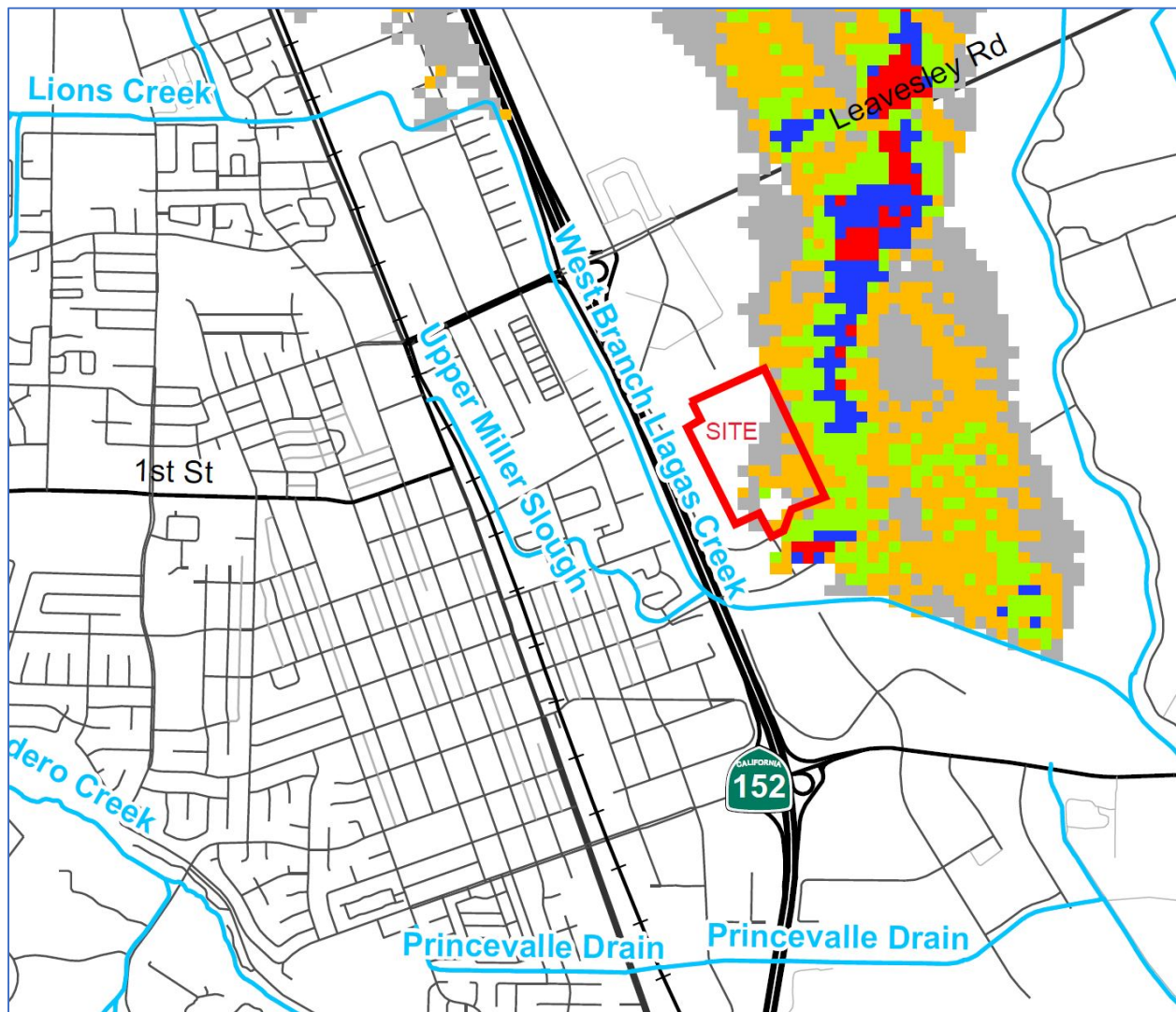


Figure 3: Overbank Model Results for Existing Conditions in Site Vicinity

The basic methodology for flood impact analysis is to quantify the existing floodplain using the model shown in Figure 3. Based on those modeled base flood elevations, Site grading is proposed to elevate improvements above the base flood elevations. Proposed improvements are then modeled, changing no other hydraulic parameters. The difference between the proposed water surface elevations and existing condition water surface elevations is the floodplain impact.

Existing Condition Floodplain

A further modeling step is taken to replace the Santa Clara County LiDAR topography used to generate model results shown in Figure 3 with the detailed survey data gathered by RJA in the vicinity of the Site, georeferenced the topography, and repeat the modeling. This step provides a direct basis for comparison after Site improvements are completed, to properly assess floodplain impact. These results are presented in Figure 4 (100-year flood depths) and Figure 5 (Base Flood Elevations).

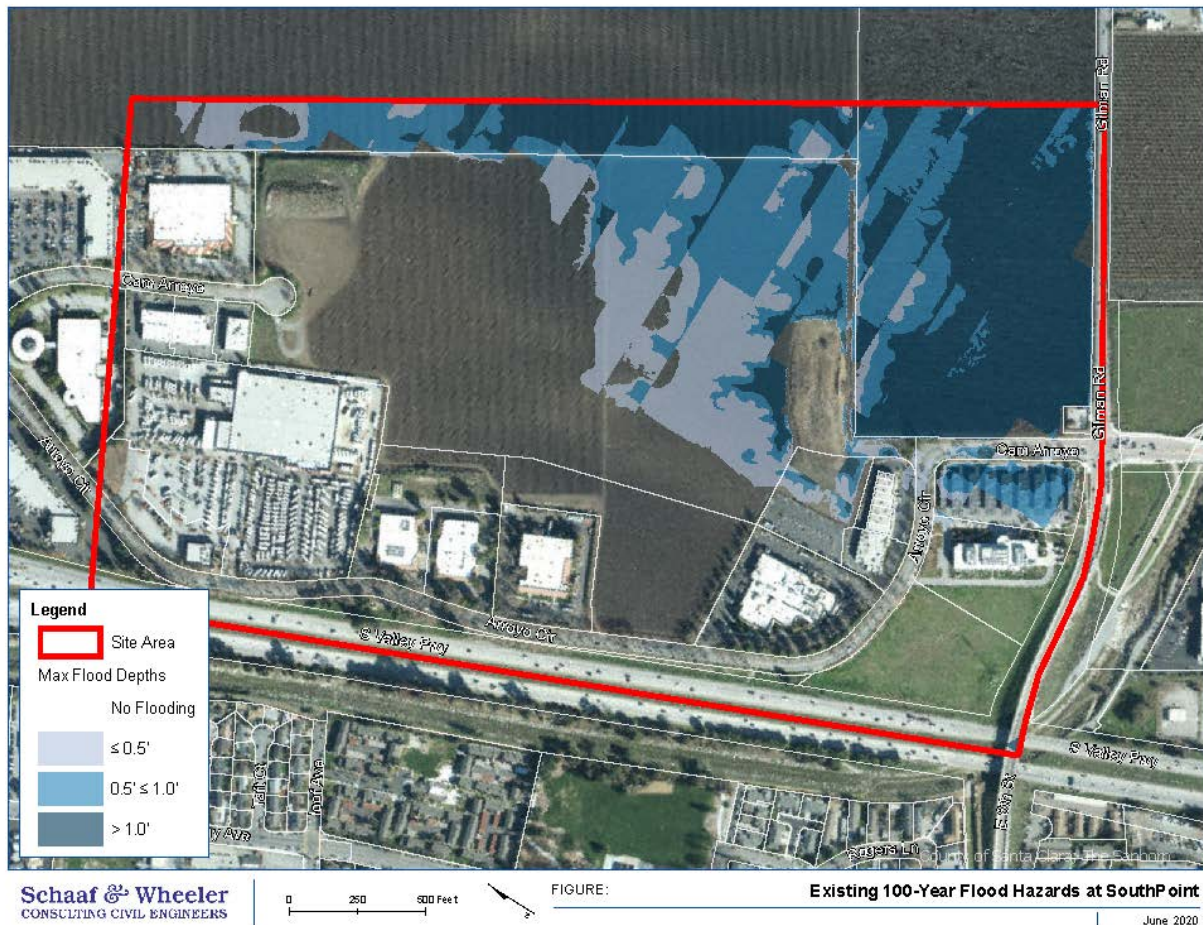


Figure 4: Existing 100-year Flood Depths at Site

Flood depths (Figure 4) generally increase to the east and south of the site, due primarily to existing site topography. Base flood elevations in the vicinity are largely controlled by flow over Gilman Road, which acts somewhat as a hydraulic control. There appears to be a slight topographic depression immediately north of Gilman Road, which results in locally deeper flooding at the southeast corner of the Site.

Base flood elevations (Figure 5) are not that different from those shown on the effective FIRM, ranging from 191 feet to 197 feet NAVD compared to 192 feet to 197 feet NAVD.

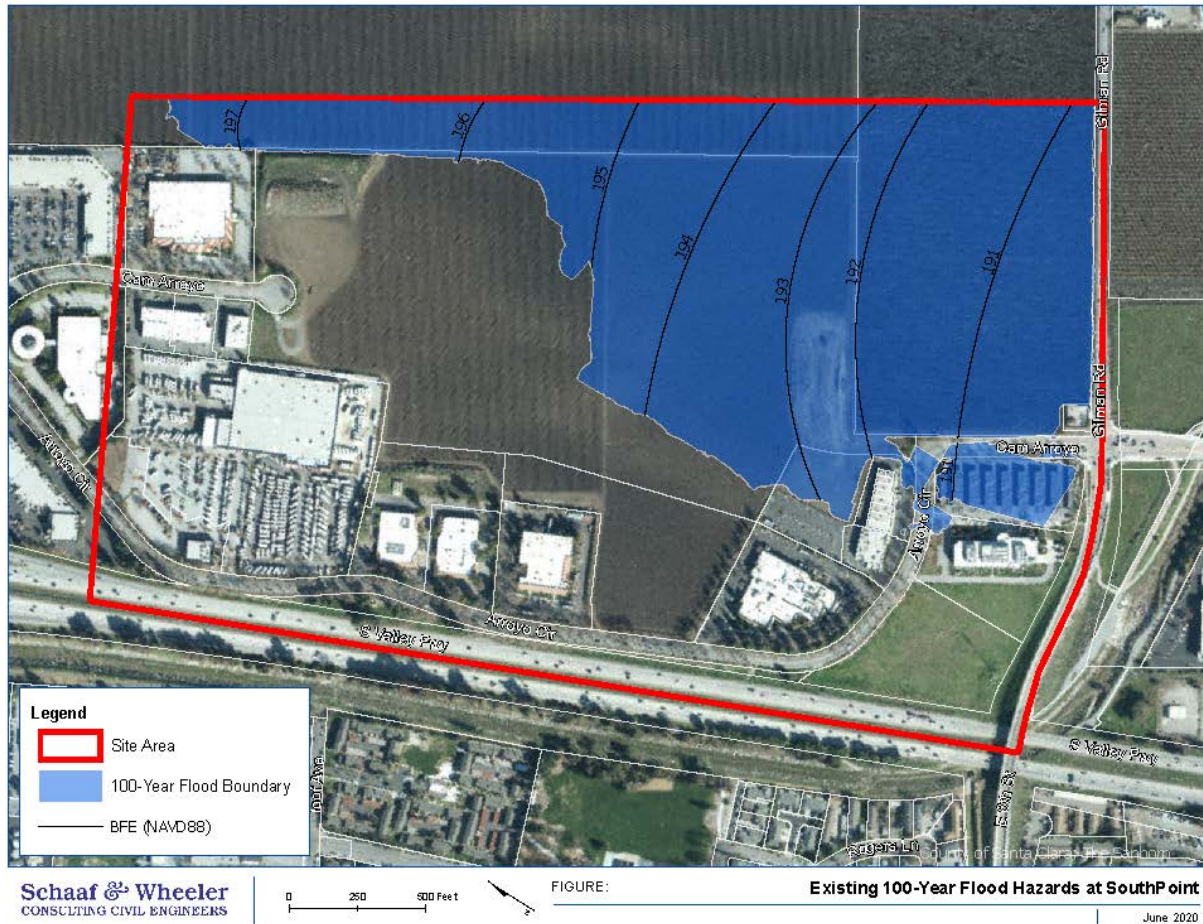


Figure 5: Existing Base Flood Elevations at Site

Site Improvements and Floodplain Impacts

A high-level site plan is shown as Figure 6. Kimley-Horn provided Schaaf & Wheeler with a more detailed grading plan for evaluation. The major buildings and other improvements within the grading plan are labeled as the “Development Footprint.” The working assumption for impact analysis is that within the Development Footprint, flood flows are completely blocked. This is a conservative assumption that effectively means vertical “glass walls” could be constructed at Development Footprint, and anything can be done inside the Development Footprint without affecting the results shown.

Figure 7 shows 100-year flood depths with the Site blockage described. Figure 8 shows post-fill base flood elevations. Comparisons of post-fill 100-year flood depths to existing flood depths can be confusing, noting that the creation of storage features increases depth while the placement of fill decreases depth. More importantly, Figure 9 compares post-fill 100-year water surface elevations to existing condition water surface elevations, representing the impact of conceptual fill placement on the adjacent floodplain.



Figure 6: Conceptual Site Plan



Figure 7: Post-Fill Flood Depths at Site

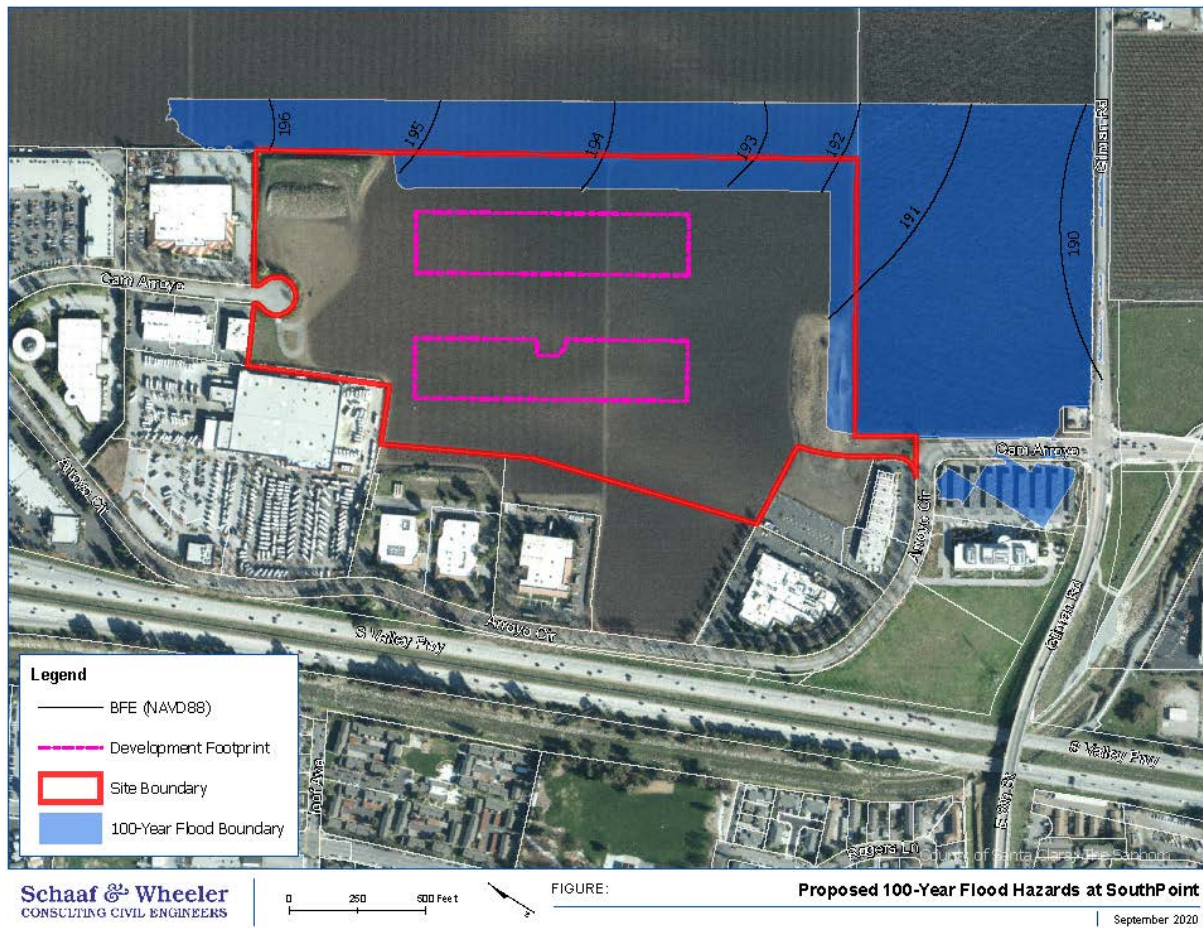


Figure 8: Post-Fill Base Flood Elevations at Site



Figure 9: Floodplain Impacts with Fill Placement

Fill placement decreases flood depths within the Development Footprint itself by default and casts a small “hydraulic shadow” to the south since the limited flood flows at the fringe of the floodplain are blocked. Increases in base flood elevations are limited to 0.1 foot just east of the Development Footprint. This increase meets the 0.1-foot threshold that has been established by the City of Gilroy, County of Santa Clara, and Santa Clara Valley Water District as a significant increase, but its extent off the Site is very limited.

I trust this information proves useful. Please feel free to call me with specific questions.

Sincerely,
Schaaf & Wheeler

Charles D. Anderson

Charles D. Anderson, PE
President