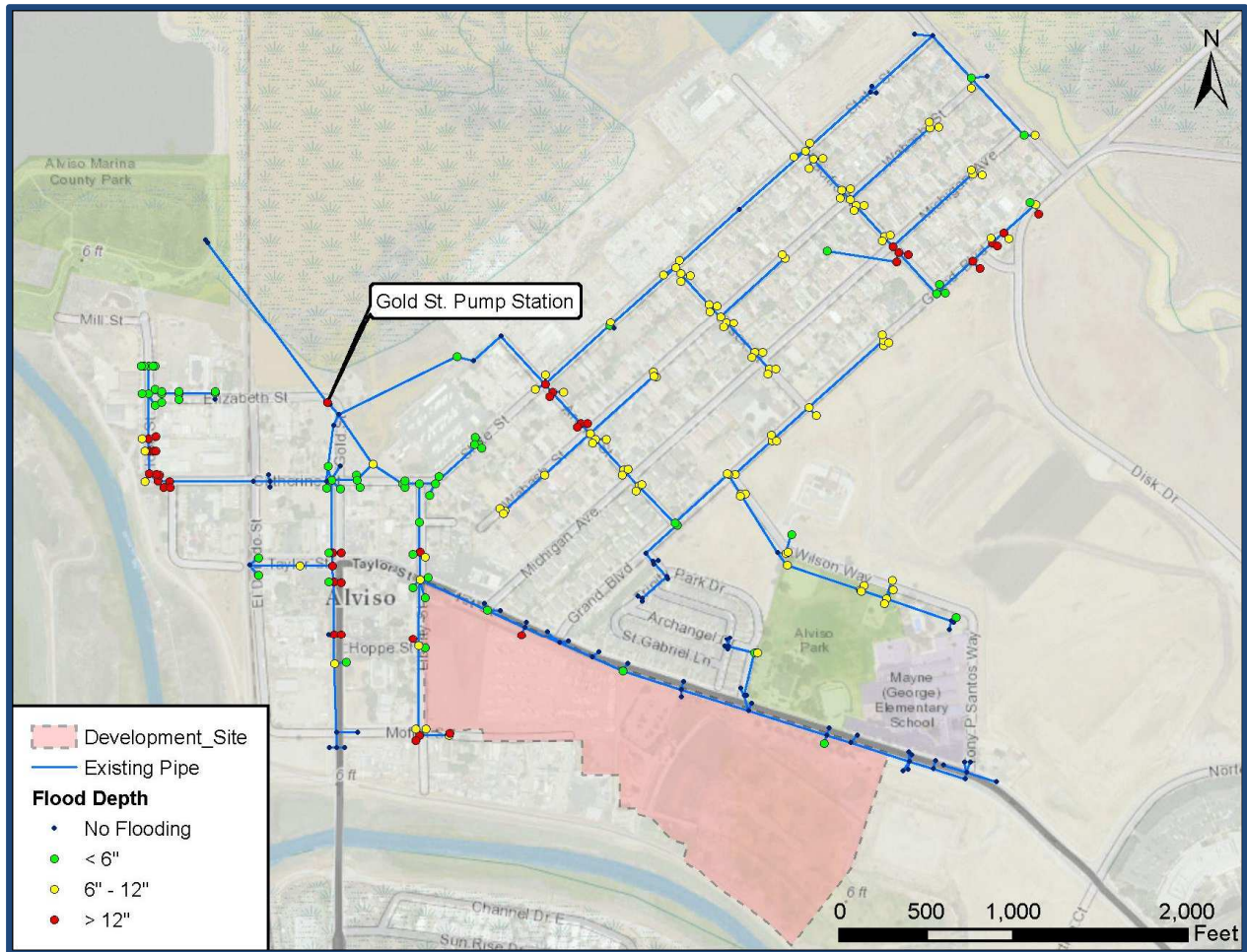


**Appendix G:**  
**Storm Drain Impact Analysis**



**Existing Conditions**

The existing Alviso land use condition model, including the Cisco 6 site in its developed condition, has been used to determine the capacity of the existing storm drain system with no developed contribution from the Topgolf site. While part of the site is currently paved over, a portion is undeveloped open space, and the majority of the site is Pin High Golf Course. Runoff from the site is currently received by storm drains on Liberty Street and North First Street. Storm drain model results for the Alviso system for a 10-year storm event are shown in Figure 1.



**Figure 1: Existing 10-year Capacity of Alviso System**

**Developed Conditions**

Runoff parameters for the developed site have been modified from the existing land use condition model to determine the effect any additional runoff generated from the site will have on the storm drain system. The proposed site is approximately 90% impervious area. Runoff from the developed site is routed in the model to the main line on N. First Street at three locations corresponding roughly to the proposed driveway locations. Pre- and post-development runoff hydrographs from the TopGolf development site are shown in Figure 2; the maximum runoff from the existing site is 24 cubic feet per second (cfs) and the maximum runoff from the developed site is 33 cfs. Results from the developed condition model are shown in Figure 3.

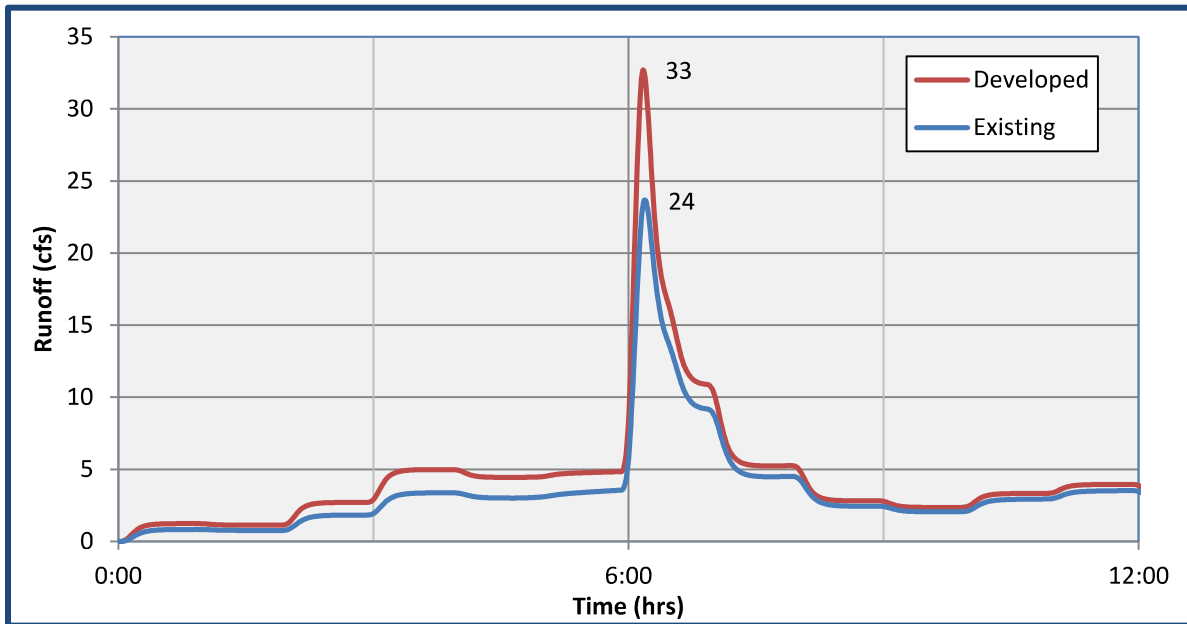


Figure 2: Pre- and Post-Development Runoff Hydrographs from Topgolf Site

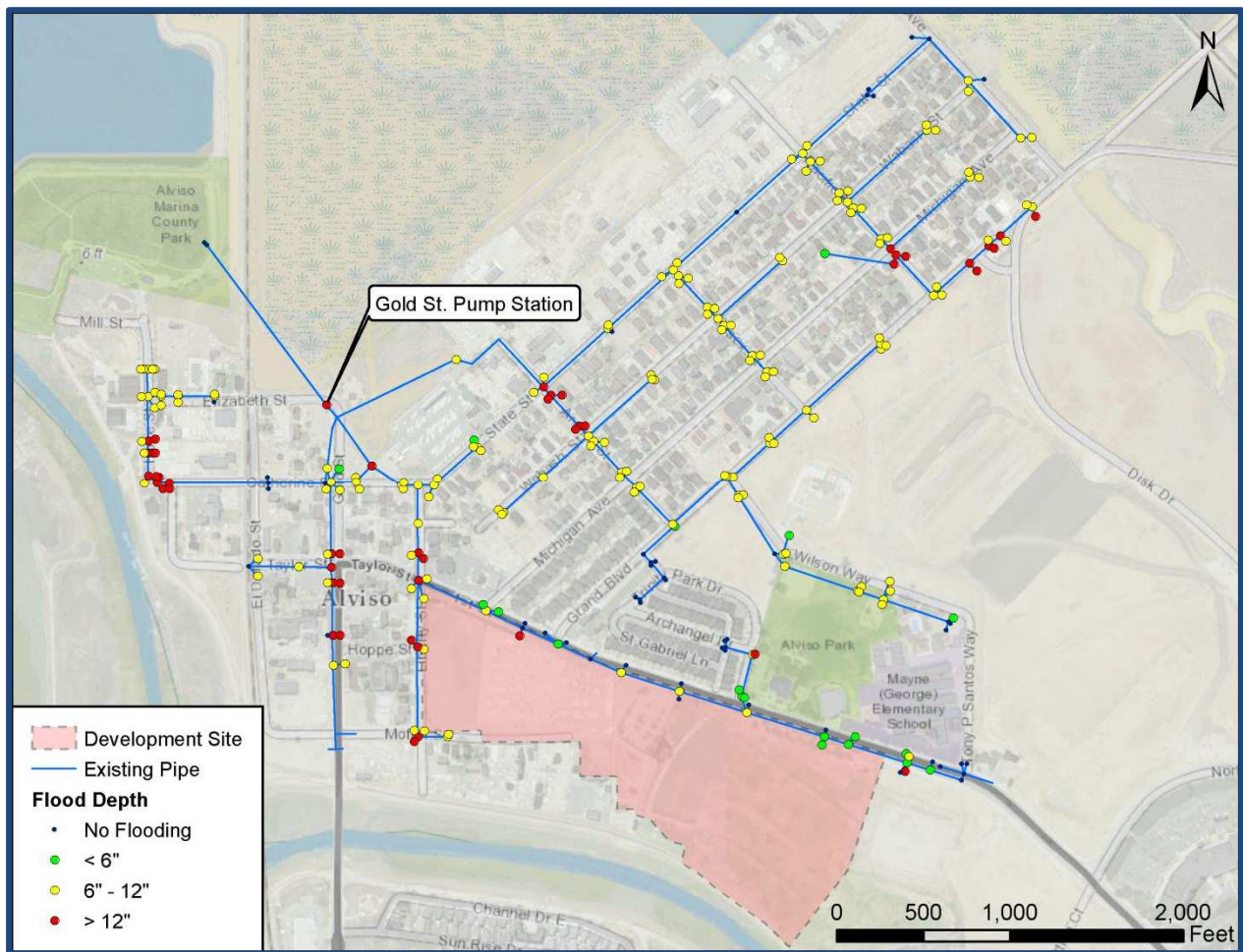
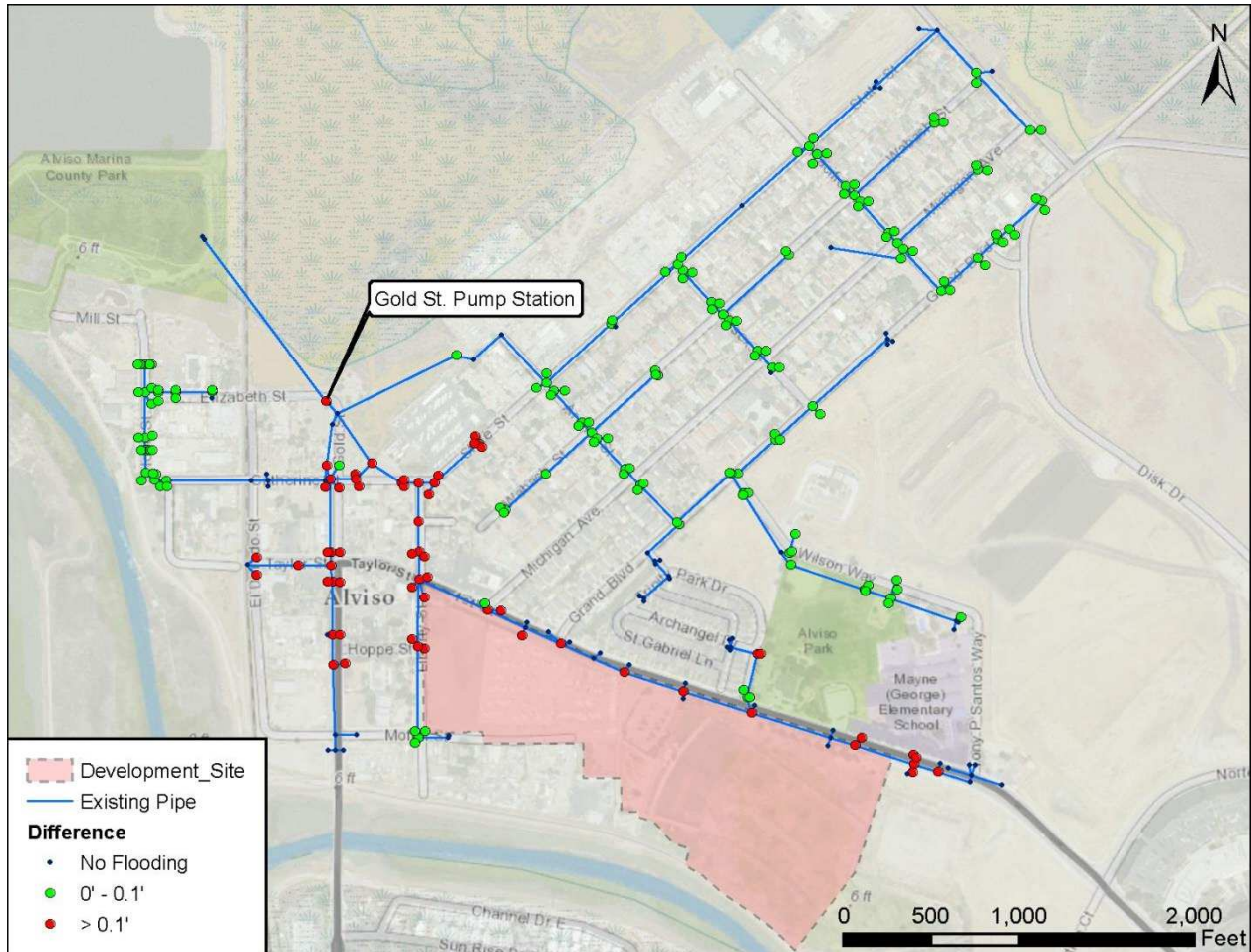


Figure 3: Alviso System 10-year Capacity with Developed Topgolf Site.



The Alviso system in general lacks capacity for runoff from existing conditions. Additional runoff generated by the developed site causes an increase in flooding greater than a tenth of a foot, industry standard threshold for determining significant impact, at 60 nodes along Gold Street, Liberty Street, and N. First Street. Increases in flooding are shown in Figure 4.

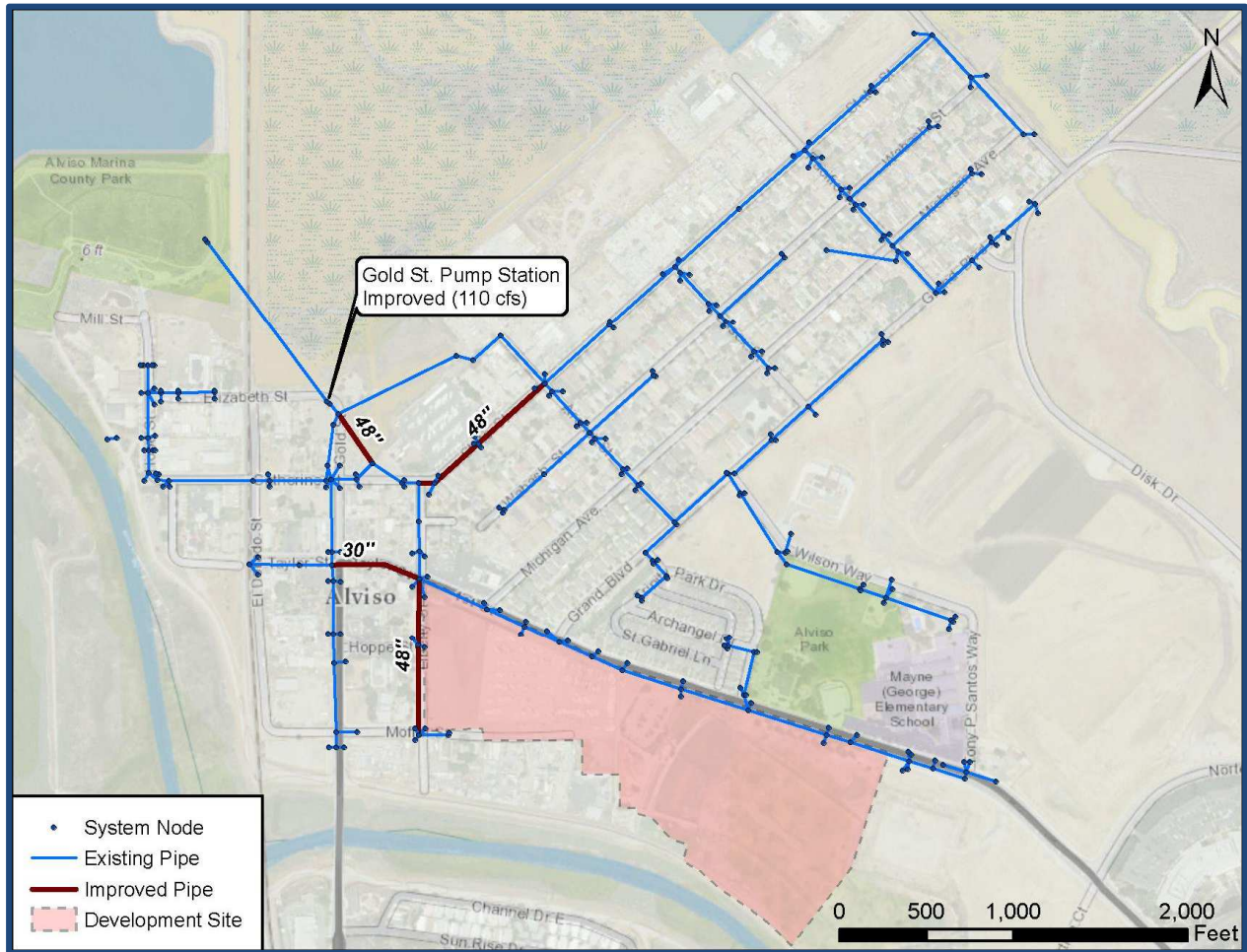


**Figure 4: Increase in Alviso 10-year Flooding Depth Resulting from Addition of Developed Site.**

In order to estimate the maximum amount of runoff the Topgolf site can release to the existing Alviso system without causing a significant increase in flooding, a constant flow was incrementally added to the system on N. First Street until the flood depth at any point in the system increased by more than a tenth of a foot. This increase in depth occurs with a discharge of 2 cfs or more, indicating that if the Alviso system is not improved, the on-site Topgolf storm drain system should be designed to release a maximum flow of 26 cfs.

**System Improvements**

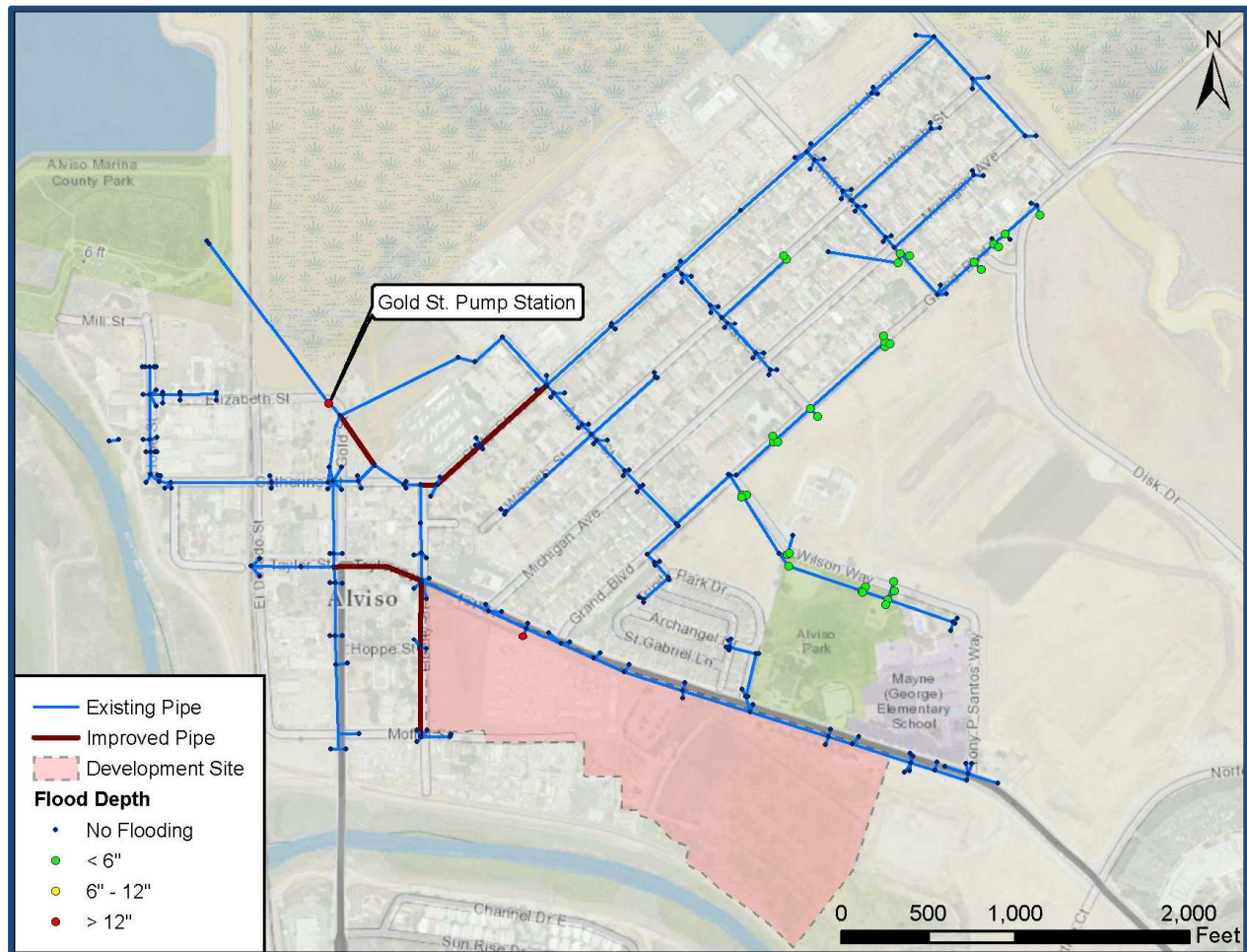
Multiple capital improvement projects (CIPs) are recommended for the Alviso area in the North San Jose SDMP. The suggested projects from the SDMP are shown in Figure 5, and include upsizing approximately 2,100 feet of existing pipe and increasing the capacity of the existing Gold Street Pump Station which will have a new 48 inch force main in Catherine Street which will discharge to the Guadalupe River.



**Figure 5: Alviso System SDMP Improvement Projects.**

In order to analyze whether these CIPs will provide sufficient capacity for additional runoff generated by the Topgolf development to be discharged to the Alviso system, the development catchment parameters were added to the near-term land use condition with CIPs model. Results from this analysis are shown in Figure 6. If recommended CIP projects are implemented, the improved system will handle the increase in runoff from the Topgolf development with no need for on-site detention.

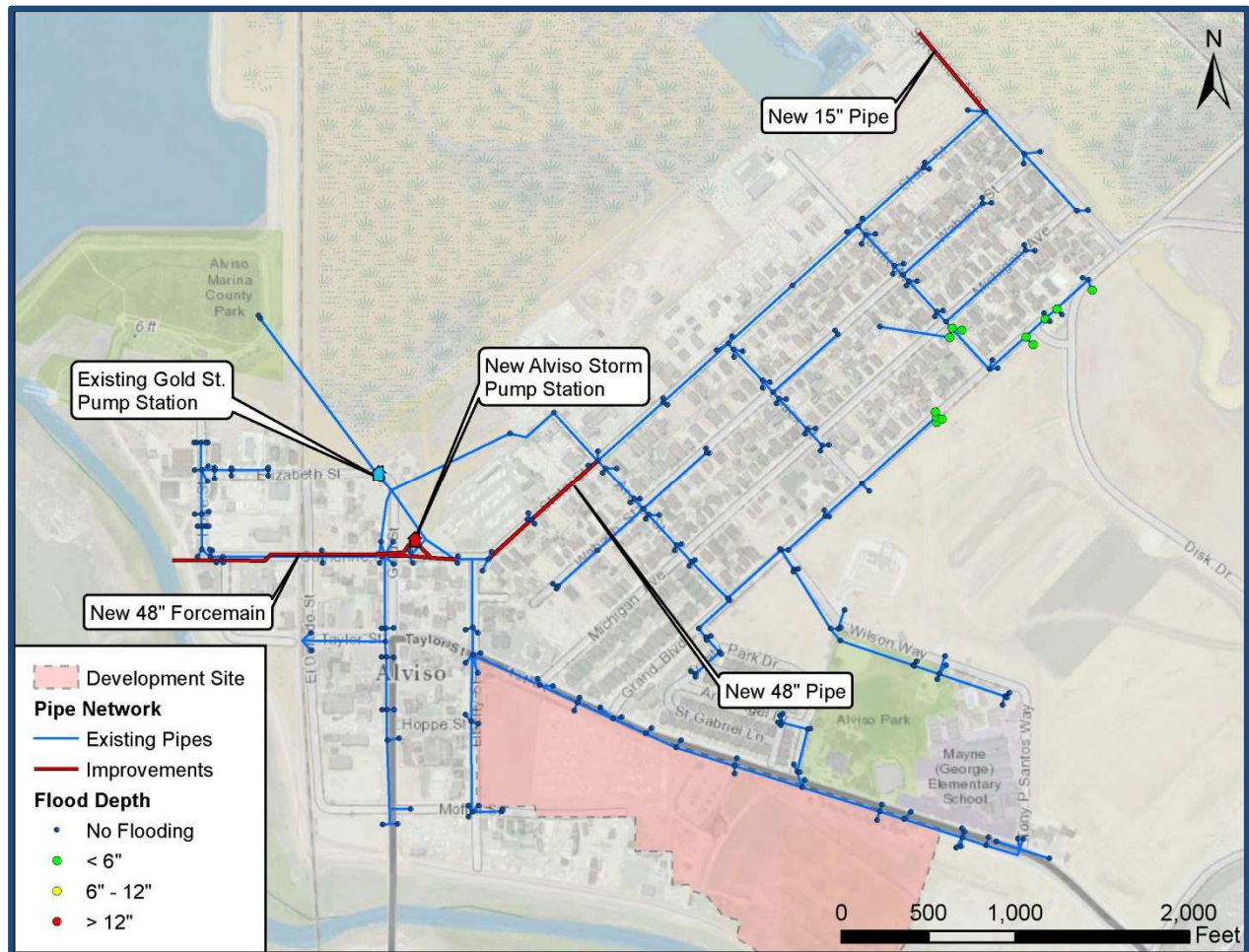




**Figure 6: Alviso System 10-year Capacity with Topgolf Development, Near-Term Land Use Condition, and SDMP CIPs.**

Two Alviso system improvement projects are financed and currently in the design phase: The “Alviso Storm Pump Station” project and the “Alviso Storm Sewer Improvements B” project. The pump station project consists of the construction of a 110 cfs pump station at the intersection of Catherine Street at Gold Street and a 40 inch force main in Catherine Street which discharges to the Guadalupe River. The existing Gold Street Pump Station remains in place. The storm sewer improvements consist of upsizing pipe in Catherine Street and Spreckles Aveune.

In order to determine whether these improvements add sufficient capacity to the Alviso system to handle the increase in runoff from the developed Topgolf site, they were input into the existing system with near-term land use MIKE URBAN model based on current design documents. The location of the improvements and results of the analysis are shown in Figure 7. If the financed CIP projects are implemented, the improved system will handle the increase in runoff from the Topgolf development with no need for on-site detention.



**Figure 7: Financed Improvements and Developed Model Results**

**Conclusion**

Development of the Topgolf site will cause peak runoff from the site to increase from 24 cfs to 33 cfs. Offsetting the impacts of development without constructing the CIPs recommended in the North San Jose SDMP or currently financed system improvements will require site design measures that either keep the post-development discharge to the Alviso system at or below 26 cfs, or offset timing such that no increase in flooding occurs. These site design measures will require additional analysis.

If the CIPs recommended in the North San Jose SDMP are constructed, the improved system will handle the increase in runoff from the developed site with no on-site detention required. The financed improvements currently in the design phase are also sufficient for the system to handle the increase in runoff.