VTA'S BART SILICON VALLEY— PHASE II EXTENSION PROJECT LOCATION HYDRAULIC STUDY

PREPARED FOR:

Santa Clara Valley Transportation Authority U.S. Department of Transportation Federal Transit Administration





PREPARED BY:

WRECO 1000 Broadway, Suite 415 Oakland, CA 94607

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The Santa Clara Valley Transportation Authority's (VTA) Bay Area Rapid Transit (BART) Silicon Valley—Phase II Extension Project (Phase II Project) would consist of an approximately 6-mile extension of the BART system from the terminus of VTA's BART Silicon Valley Berryessa Extension Project (Phase I Project) in San Jose to Santa Clara (Figure 1). The Phase I Project is currently under construction and scheduled to be operational in late 2017 or early 2018. The Phase II extension would descend into approximately 5-mile-long subway tunnels, continue through downtown San Jose, and terminate at grade near the Santa Clara Caltrain Station (Figure 2). There are two construction methods proposed for the 5-mile-long tunnel portion of the BART extension the Twin-Bore and Single-Bore Options—between the East and West Tunnel Portals. Under the Twin-Bore Option, two twin-bore tunnels would be excavated with one track in each. Under the Single-Bore Option, one large-diameter tunnel bore would be excavated, which would contain both the northbound and southbound tracks. Four passenger stations are proposed, and service for the Phase II Project would start in 2025, assuming funding is available. VTA is also proposing Transit-Oriented Joint Development (TOJD) at the four proposed stations and at two mid-tunnel ventilation structure locations.

The purpose of this study is to analyze potential impacts of the Project to Federal Emergency Management Agency (FEMA) floodplains. In accordance with the environmental documentation requirements, the primary purpose of this location hydraulic study is to define the limits of floodplain encroachment by the proposed Project and complete the detailed analysis as required by U.S. Department of Transportation (USDOT) Order 5650.2 Floodplain Management and Protection and Federal Standards in Executive Order 13690 which amends "Executive Order 11988, Floodplain Management," for the BART stations. The Federal Highway Administration (FHWA) defines a significant encroachment, as any direct support of likely base floodplain development that would involve one or more of the following construction or flood-related impacts: (1) significant potential for interruption or termination of a transportation facility that is needed for emergency vehicles or provides a community's only evacuation route; (2) a significant risk with change in land use, fill inside the floodplain, or change in water surface elevation; or (3) a significant adverse impact on the natural and beneficial floodplain values.

Four major waterways cross the Phase II alignment within the Project area: Lower Silver Creek, Coyote Creek, Guadalupe River, and Los Gatos Creek (east to west).

The 1 percent annual chance of exceedance floodplains (also referred to as base floodplains) within the Project limits was identified using the FEMA Flood Insurance Rate Maps (FIRMs). The FIRMs further categorize these areas into different Special Flood Hazard Areas (SFHA); and zones AE, AO, A, AH, D, X (shaded) and X (unshaded) were all found within the Phase II Project limits. Zone AE represents areas with a 1 percent chance of flooding determined by detailed methods. Base Flood Elevations (BFEs) derived from

detailed hydraulic analyses are shown in this zone. Zone AO represents areas with a 1 percent chance of shallow flooding, with specified flood depths of 1 to 3 feet. Zone A represents areas with a 1 percent annual chance of flooding, where the floodplain has been analyzed by approximate methods based on historic information, existing hydrologic analyses, available data, and field observations, and base flood elevations have not been determined. Zone AH represents areas with a 1 percent annual chance of shallow flooding, usually in the form of a pond, with specified flood depths of 1 to 3 feet. BFEs derived from detailed hydraulic analyses are shown in this zone.

There are also portions of the proposed Phase II Project within Zone D and Zone X (Shaded) and Zone X (unshaded). The Zone D designation is used for areas where there are possible but undetermined flood hazards, as no analysis of flood hazards has been conducted. By the FEMA definition, Zone D is not considered an SFHA. Zone X (unshaded) includes areas of minimal flooding having an elevation higher than the 0.2 percent annual chance flood event. Zone X (shaded) includes areas impacted by the 0.2 percent annual chance flood.

Most of the Phase II track alignment is underground. It passes approximately 25 feet below the Lower Silver Creek bed for the Twin-Bore Option and approximately 30 feet below the creek bed for the Single-Bore option. At Coyote Creek, the Twin-Bore Option alignment would pass approximately 20 feet beneath the creek bed, and the Single-Bore Option would be approximately 55 feet beneath the creek bed. For the Twin-Bore Option, the alignment would pass 40 feet below the riverbed of the Guadalupe River and a retaining wall west of the river, and over 20 feet below the creek bed of Los Gatos Creek. For the Single-Bore Option, the alignment would pass 50 feet below the riverbed of the Guadalupe River, the retaining wall, and the creek bed of Los Gatos Creek. The track alignments would not encroach onto any base floodplains because they are is either not within any base floodplain areas or are underground. No impacts are expected, and, therefore, mitigation measures will not be required.

The proposed Phase II Project is not considered to be a "significant encroachment" because it would not result in considerable probability of loss to human life; it would not contribute to the future damage associated with the encroachment that could be substantial in cost and extent, and would not create a notable adverse impact. The Phase II Project would not significantly impact the natural and beneficial floodplain values because the Project area has non-existent or limited undisturbed wildlife, and no open space or other natural values. The Project would not support the development of a base floodplain because the Project area within the base floodplain is currently developed. The risk associated with the proposed Project would be low because the Project would result in minimal impacted area in the base floodplain. Potential avoidance and minimization measures are discussed in this report. There are also several Flood Protection Projects under construction in Lower Silver Creek and Guadalupe River that will eliminate base floodplains. The overall impact as a result of the proposed Project would be less than significant, and mitigation measures will not be required. A summary of the floodplain impacts as a result of the Project are shown in Table S-1.

Table S-1. Summary of Floodplain Impacts

Project Option	Flood Hazard Zone	Impervious Area per Feature (ac)	Total Impervious Area (ac)	Added Impervious Area (ac)	Existing Building to be Removed (ac)	Impacts	Watershed	Watershed Drainage Area (ac)	Increase Area to Watershed (%)	Notes
	AE/ AE (Floodplain)	4.29		-	0.00	Minimal	Coyote Creek	158,080	N/A	
Mabury Road CSA	AH	20.96	25.25	-	3.74	Minimal				
Alum Rock CSA	A/AH/AO	0.71		-	0.00	Minimal	Lower Silver Creek	28,160	0.01%	Note 2
Alum Rock Station	AH/AO	9.25	9.96	2.54	2.77	Fill				
Downtown San Jose Station East Option	D	0.77		0.10	0.00	No Impact		92,160	0.05%	
Downtown San Jose Station West Option	D	0.40		0.03	0.16	No Impact	Guadalupe River			Note 3
Newhall Maintenance Facilities	D/ X(Shaded)	43.86	48.62	41.86	0.00	No Impact				
Santa Clara Station	X(Shaded)	3.59		0.46	3.42	No Impact				
Diridon Station North Option	D	0.85		Negligible	0.21	No Impact	Los Gatos Creek	35,072	N/A	
Diridon Station South Option	D	3.47	3.47	Negligible	0.21	No Impact				
VTA Planned Develop	ments						<u> </u>			
AlumRock	AH/AO	5.09	5.09	0.77	1.07	Fill	Lower Silver Creek	28,160	0.00%	Note 2
Santa Clara and 13th Street Vent Structure	D	1.15		0.11	0.13	No Impact		92,160	0.00%	Note 3
Downtown San Jose Station East Option	D	3.17		0.11	1.23	No Impact				
Downtown San Jose Station West Option	D	0.35	9.93	0.10	0.16	No Impact	Guadalupe River			
Stockton Avenue Vent Structure	D	1.731		Negligible	0.34	No Impact				
Santa Clara Station	X(Shaded)	3.53		0.11	0.00	No Impact	:			
Diridon North Option	D	2.24		Negligible	0.45	No Impact	Los Gatos Creek	35,072	N/A	
Diridon South Option	D	2.24	2.24	Negligible	0.45	No Impact				
Notes: 1. Largest of the three prop		-								
2. Improvements to Lower S						uld result in cl	nanges to the F	IRM.		
Improvements to Guadal	upe River by the	USACE and SC	CVWD could re	sult in change	s to the FIRM					

Contents

		Page
Summary	1	
Chapter 1 Pro	ject Description	1-1
1.1	Alignment and Station Features by City	1-1
1.1.1	City of San Jose	1-1
1.1.2	City of Santa Clara	1-7
1.2	VTA's Transit-Oriented Joint Development (CEQA Only)	1-8
Chapter 2 Affe	ected Environment	2-1
2.1	Creek, Stream and River Crossings	2-1
2.2	Floodplain Information	2-3
2.2.1	Floodplain of Coyote Creek	2-5
2.2.2	Floodplain of Lower Silver Creek and Coyote Creek	2-5
2.2.3	Floodplain of Guadalupe River and Los Gatos Creek	2-6
2.2.4	Floodplain near the Diridon Station	2-7
2.2.5	Floodplain near the Santa Clara Station, Newhall Maintenance Facility	2-7
Chapter 3 Imp	oacts Analysis And Mitigation Measures	3-1
3.1	Regulatory Framework	3-1
3.1.1	Federal Requirements	3-1
3.1.2	State Requirements	3-1
3.1.3	Local Requirements	3-2
3.1.4	Project Requirements	3-2
3.2	Criteria and Objectives	3-2
3.2.1	Significance Criteria	3-2
3.2.2	Floodplain Encroachment Criteria	3-2
3.2.3	Floodplain Impacts Analysis Objectives	3-3
3.3	Floodplain Impacts Evaluation	3-4
3.3.1	Natural and Beneficial Floodplain Values	3-4
3.3.2	Direct/Indirect Support for Development in the Floodplain	3-4
3.3.3	Risk Associated with the Proposed Project	3-4
3.3.4	Sea Level Rise	3-9
3.4	Summary and Conclusion	3-10
Chapter 4 List	of Preparers	4-1
Chapter 5 Ref	erences	5-1
5.1	Printed References	5-1
Appendix A F	lood Insurance Rate Maps	

Appendix B Summary Floodplain Encroachment Report

Appendix C Location Hydraulic Study Forms

Appendix D Proposed Staging Areas

Tables and Figures

Table		Page
S-1	Summary of Floodplain Impacts	•
1	Summary of Proposed TOJD	
2	Waterway Crossing Information	2-3
3	Floodplain Information	
4	Summary of Base Floodplain Impacts	
Figure	e	Page
		D
_		•
1	VTA's BART Silicon Valley – Phase II Location Map	
2	Project Map (with Options)	
3	Waterway Crossing within Project limits	2-3
4	Floodplain Map, Part 1 of 4	2-8
5	Floodplain Map, Part 2 of 4	
6	F100dp1a111 Map, Part 2 01 4	
	Floodplain Map, Part 2 of 4	

The Phase II Project consists of an approximately 6-mile extension of the BART system from the terminus of VTA's BART Silicon Valley—Berryessa Extension Project (Phase I) from San Jose to Santa Clara (see Figure 1). Phase I is currently under construction and scheduled to be operational in late 2017. The Phase II Project would include approximately 5 miles of subway tunnel from Berryessa Station, continuing through downtown San Jose, and terminating at grade near the Santa Clara Caltrain Station (see Figure 2). In addition, four passenger stations are proposed. Passenger service on the Phase II Project is scheduled to begin in 2025/2026.

There are two construction methods proposed for the five-mile-long tunnel portion of the BART extension—the Twin-Bore and Single-Bore Options—between the East and West Tunnel Portals. Under the Twin-Bore Option, two twin-bore tunnels would be excavated with one track in each. Each tunnel bore would have an outer diameter of approximately 20 feet. The depth of the tunnel would be between 10 and 75 feet below ground surface. The crown, or top, of the tunnel of the Twin-Bore Option would be, on average, 40 feet below the surface. Under the Single-Bore Option, one large-diameter tunnel bore would be excavated which would contain both northbound and southbound tracks. The tunnel bore would have an outer diameter of approximately 45 feet. The crown, or top, of the tunnel of the Single-Bore Option would be, on average, 70 feet below the surface.

1.1 Alignment and Station Features by City

1.1.1 City of San Jose

1.1.1.1 Connection to Phase I Berryessa Extension

The BART extension would begin where the Phase I tail tracks end. The at-grade Phase I tail tracks would be partially removed to allow for construction of the bored tunnels, East Tunnel Portal, and supporting facilities.

The alignment would transition from a retained-fill configuration east of U.S. 101 and south of Mabury Road near the end of the Phase I alignment into a retained-cut configuration and enter the East Tunnel Portal just north of Las Plumas Avenue.

South of the portal, the alignment would pass beneath North Marburg Way, then approximately 25 feet below the creek bed of Lower Silver Creek for the Twin-Bore Option, or approximately 30 feet for the Single-Bore Option, just to the east of U.S. 101, then curve under U.S. 101 south of the McKee Road overpass, and enter Alum Rock/28th Street Station.

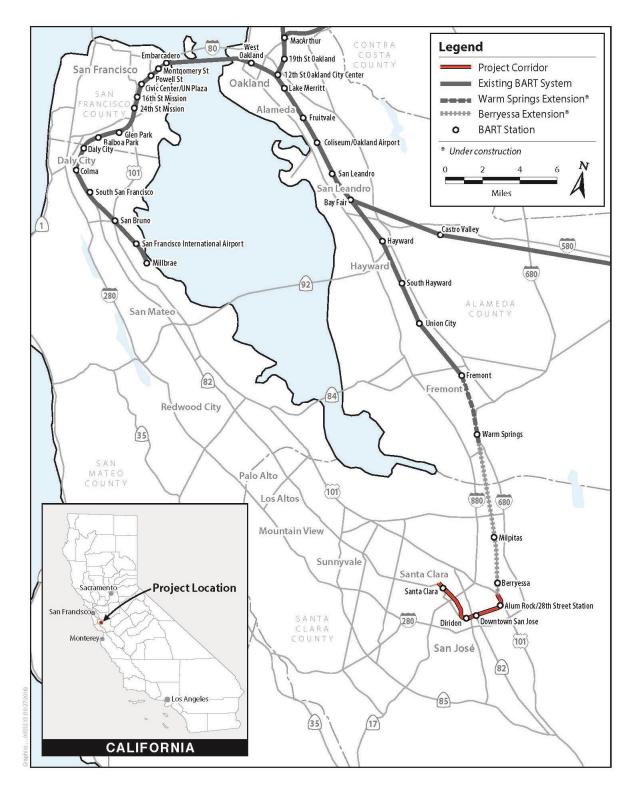


Figure 1. VTA's BART Silicon Valley - Phase II Location Map

Santa Clara Valley Transportation Authority

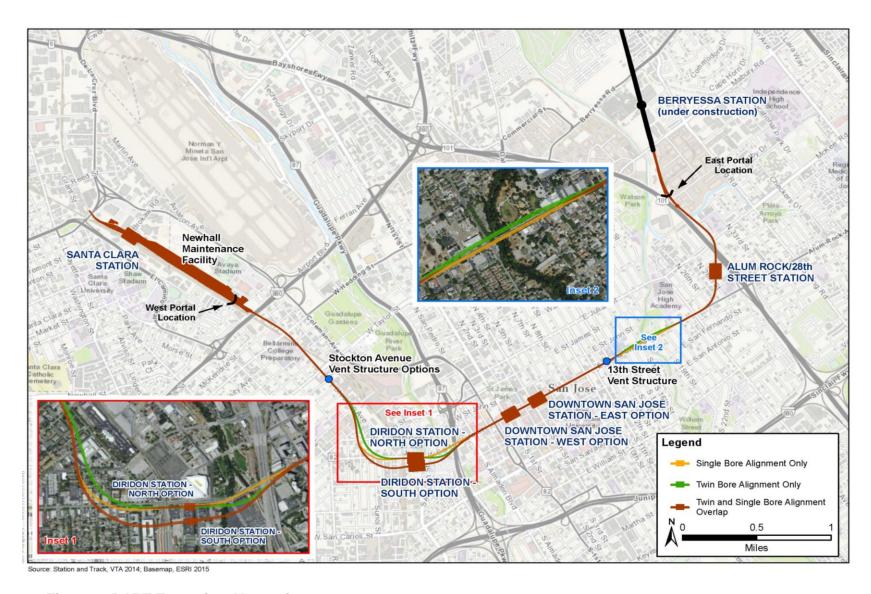


Figure 2. BART Extension Alternative

Chapter 1. Project Description

1.1.1.2 Alum Rock/28th Street Station

Alum Rock/28th Street Station would be located between U.S. 101 and North 28th Street and between McKee Road and Santa Clara Street. The station would be underground with street-level entrance portals with elevators, escalators, and stairs covered by canopy structures. In general, each station would have a minimum of two entrances. A parking structure of up to seven levels would accommodate BART park-and-ride demand with 1,200 parking spaces. The station would include systems facilities both above and below ground.

From Alum Rock/28th Street Station, the alignment would curve under North 28th Street, North 27th Street, and North 26th Street before aligning under Santa Clara Street. The alignment would continue under the Santa Clara Street right-of-way (ROW) until the alignment approaches Coyote Creek.

1.1.1.3 Tunnel Alignment near Coyote Creek

For the Twin-Bore Option, the alignment would transition north of Santa Clara Street beginning just west of 22nd Street and pass approximately 20 feet beneath the creek bed of Coyote Creek to the north of Santa Clara Street and avoid the Coyote Creek/Santa Clara Street bridge foundations. The alignment would transition back into the Santa Clara Street ROW near 13th Street, west of Coyote Creek. However, for the Single-Bore Option, the alignment would continue directly under Santa Clara Street and pass approximately 55 feet beneath the creek bed of Coyote Creek and approximately 20 feet below the existing bridge foundations.

1.1.1.4 13th Street Ventilation Structure

A systems facility site would be located at the northwest corner of Santa Clara and 13th Streets. This site would include a tunnel ventilation structure, which would be an aboveground structure with an associated ventilation shaft.

1.1.1.5 Downtown San Jose Station

There are two station location options for the Downtown San Jose Station: the Downtown San Jose Station East Option and the Downtown San Jose Station West Option, as described in detail below. The alignment for this area would be the same irrespective of the station option.

The station would consist of boarding platform levels and systems facilities aboveground and within the tunnel beneath Santa Clara Street, as well as entrances at street level. In general, each station would have a minimum of two entrances. Elevators, escalators, and stairs that provide pedestrian access to the mezzanine would be at station portal entrances. Escalators and stairs would be covered by canopy structures. The station would not have dedicated park-and-ride facilities. Under either Downtown San Jose Station Option, streetscape improvements, guided by San Jose's Master Streetscape Plan, would be provided along Santa Clara Street to create a pedestrian corridor. For the East Option, streetscape improvements

would be between 7th and 1st Streets; for the West Option, streetscape improvements would be between 4th and Market Streets.

Downtown San Jose Station East Option

The alignment would continue beneath Santa Clara Street to the Downtown San Jose Station East Option. Under the Twin-Bore Option, crossover tracks would be located east of the Downtown San Jose Station between 7th and 5th Streets (within the cut-and-cover box). Under the Single-Bore Option, the crossover tracks would be located east of the station between 9th and 5th Streets.

Downtown San Jose Station West Option

The alignment would continue beneath Santa Clara Street to the Downtown San Jose Station West Option. Crossover tracks for the Twin-Bore Option would be located east of the Downtown San Jose Station between 2nd and 4th Streets (within the cut-and-cover box). Under the Single-Bore Option, the crossover tracks would be located east of the station between 7th and 2nd Streets.

1.1.1.6 Tunnel Alignment into Diridon Station

There are two station location options at Diridon Station: the Diridon Station South Option and the Diridon Station North Option, as described in detail below. The alignment into Diridon Station varies between the North and South Options and between the Twin-Bore and Single-Bore Tunnel Options as described below.

Tunnel Alignment into Diridon Station South Option

The alignment would continue beneath Santa Clara Street from the Downtown San Jose Station and shift south beginning just west of South Alamaden Boulevard to pass between the SR 87 bridge foundations. For the Twin-Bore Option, the alignment would pass 40 feet below the riverbed of the Guadalupe River and a retaining wall west of the river, and over 20 feet below the creekbed of Los Gatos Creek. For the Single-Bore Option, the alignment would pass 50 feet below the riverbed of the Guadalupe River, the retaining wall, and the creekbed of Los Gatos Creek. After passing under Los Gatos Creek, the alignment for both options would enter the Diridon Station between Los Gatos Creek and Autumn Street.

Tunnel Alignment east of Diridon Station North Option

Under the Twin-Bore Option, the alignment would continue beneath Santa Clara Street from the Downtown San Jose Station and shift south beginning just west of South Almaden Boulevard to pass between the SR 87 bridge foundations. The alignment would then pass 45 feet below the riverbed of the Guadalupe River and a retaining wall, then veer back north to a location just south of and adjacent to Santa Clara Street. The alignment passes 25 feet below the creekbed of Los Gatos Creek. After passing under Los Gatos Creek, the alignment would enter Diridon Station under Autumn Street and directly south of Santa Clara Street.

The Diridon Station North Option is closer to Santa Clara Street in comparison to the South Option.

Under the Single-Bore Option, the alignment would continue beneath Santa Clara Street, continue 50 feet below the riverbed of the Guadalupe River and 50 feet below the creekbed of Los Gatos Creek. After passing under Los Gatos Creek, the alignment would shift north and enter Diridon Station between Autumn and Montgomery Streets, directly south of Santa Clara Street. The Diridon Station North Option is closer to Santa Clara Street in comparison to the South Option.

1.1.1.7 Diridon Station

There are two station location options for the Diridon Station: the Diridon Station South Option and the Diridon Station North Option. The alignment varies by station location. Diridon Station would be generally located between Los Gatos Creek to the east, the San Jose Diridon Caltrain Station to the west, Santa Clara Street to the north, and West San Fernando Street to the south. The South Option would be located midway between Santa Clara Street and Stover Street. The North Option would be located adjacent to, and just south of, Santa Clara Street.

The station would consist of a boarding platform level, a mezzanine level, and entrances at street-level portals. The station would have a minimum of two entrances. Entrances would have elevators, escalators, and stairs covered by canopy structures. Systems facilities would be located aboveground and underground at each end of the station.

An existing VTA bus transit center would be reconfigured for better access and circulation to accommodate projected bus and shuttle transfers to and from the BART station. Kiss-and-ride facilities would be located along Cahill Street. No park-and-ride parking would be provided at this station.

Tunnel Alignment West of Diridon Station North Option

For the South Option, west of the station, the alignment for both the Twin-Bore and Single-Bore Options would continue beneath the Diridon Caltrain Station train tracks and White Street. The alignment would then turn towards the north, crossing under The Alameda at Cleaves Avenue and under West Julian Street at Morrison Avenue before aligning under Stockton Avenue.

Under the Diridon Station North Option and Twin-Bore Option, west of the station, the alignment would continue beneath the Diridon Caltrain Station train tracks and White Street. The alignment would then turn towards the north, crossing under The Alameda at Wilson Avenue and under West Julian Street at Cleaves Street before aligning under Stockton Avenue.

Under the Diridon Station North Option and Single-Bore Option, west of the station, the alignment would continue under White and Bush Streets south of The Alameda. The

alignment would then turn towards the north, crossing under The Alameda at Sunol Street and under West Julian Street at Morrison Avenue before aligning under Stockton Avenue.

1.1.1.8 Tunnel Alignment along Stockton Avenue

Around Pershing Avenue, all of the options—the Twin-Bore and Single-Bore Options and the Diridon Station South and North Options—converge back onto the same alignment under Stockton Avenue.

1.1.1.9 Stockton Avenue Ventilation Structure

On the east side of Stockton Avenue between Schiele Avenue and West Taylor Street, there are three alternate locations for a systems facility site that would house a tunnel ventilation structure, which would be an aboveground structure with an associated ventilation shaft.

1.1.1.10 Tunnel Alignment near I-880

The alignment would continue north and cross under the Caltrain tracks and Hedding Street. The alignment would continue on the east side of the Caltrain tracks and cross under Interstate (I-) 880 before ascending and exiting the West Tunnel Portal near Newhall Street.

1.1.2 City of Santa Clara

The BART Extension Alternative in Santa Clara would consist of the Newhall Maintenance Facility, system facilities, storage tracks for approximately 200 BART revenue vehicles (passenger cars), the Santa Clara Station, and tail track. The San Jose/Santa Clara boundary is located approximately midway through the Newhall Maintenance Facility.

1.1.2.1 Newhall Maintenance Facility

The Newhall Maintenance Facility would begin north of the West Tunnel Portal at Newhall Street in San Jose and extend to Brokaw Road near the Santa Clara Station in Santa Clara. A single tail track would extend north from the Santa Clara Station and cross under the De La Cruz Boulevard overpass and terminate on the north side of the overpass. The maintenance facility would serve two purposes: (1) general maintenance, running repairs, and storage of up to 200 BART revenue vehicles and (2) general maintenance of non-revenue vehicles. The facility would also include maintenance and engineering offices and a yard control tower. Several buildings and numerous transfer and storage tracks would be constructed.

1.1.2.2 Santa Clara Station

The closest streets to the Santa Clara Station would be El Camino Real to the southwest, De La Cruz Boulevard to the northwest, and Coleman Avenue to the northeast near the intersection of Brokaw Road. The station would be at grade, centered at the west end of Brokaw Road, and would contain an at-grade boarding platform with a mezzanine one level

below. Access to the mezzanine would be provided via elevators, escalators, and stairs covered by canopy structures. An approximately 240-foot-long pedestrian tunnel would connect from the mezzanine level of the BART station to the Santa Clara Caltrain plaza, and an approximately 175-foot-long pedestrian tunnel would connect from the mezzanine level to a new BART plaza near Brokaw Road. Kiss-and-ride, bus, and shuttle loading areas would be provided on Brokaw Road.

A parking structure of up to five levels would be located north of Brokaw Road and east of the Caltrain tracks within the station area and would accommodate 500 BART park-and-ride parking spaces in addition to public facilities on the site.

An approximately 150-foot-high radio tower and an associated equipment shelter would be located within the systems site.

1.2 VTA's Transit-Oriented Joint Development (CEQA Only)

VTA is proposing to construct Transit-Oriented Joint Development (TOJD) with office, retail, and residential land uses at the four BART stations (Alum Rock/28th Street, Downtown San Jose, Diridon, and Santa Clara), which offers the benefit of encouraging transit ridership. VTA is also proposing to construct TOJD at two mid-tunnel ventilation structure locations (the northwest corner of Santa Clara and 13th Streets and east of Stockton Avenue south of Taylor Street). VTA's primary objective for the proposed TOJD is to encourage transit ridership and support land use development patterns that make the most efficient and feasible use of existing infrastructure and public services while promoting a sense of community as envisioned by the San Jose and Santa Clara General Plans and relevant adopted specific plans. Estimates for VTA's TOJD at the station sites and at the mid-tunnel ventilation structure locations are provided below and are based on current San Jose and Santa Clara general plans, approved area plans, the existing groundwater table constraints, and market conditions.

Table 1 summarizes the land uses at each proposed TOJD location. The number of parking spaces is based on meeting the Cities of San Jose and Santa Clara parking requirements.

Table 1. Summary of Proposed TOJD

Location	Residential (dwelling units)	Retail (square feet)	Office (square feet)	Parking (spaces)
Alum Rock/28 th Street Station	275	20,000	500,000	2,150
Santa Clara and 13 th Streets Ventilation Structure	N/A	13,000	N/A	N/A
Downtown San Jose Station – East Option (at 3 sites)	N/A	160,000	303,000	1,398
Downtown San Jose Station – West Option	N/A	10,000	35,000	128
Diridon Station South Option	N/A	72,000	640,000	400
Diridon Station North Option	N/A	72,000	640,000	400
Stockton Ventilation Structure	N/A	15,000	N/A	N/A
Santa Clara Station	220	30,000	500,000	2,200

2.1 Creek, Stream and River Crossings

The proposed track alignment would cross four water bodies: Lower Silver Creek, Coyote Creek, Los Gatos Creek, and Guadalupe River (Figure 3). Lower Silver Creek, Los Gatos Creek, and Guadalupe River are the receiving water bodies for the proposed stations. All these creeks within the Project limits are currently maintained by the Santa Clara Valley Water District. The waterway information is discussed in the following section and summarized in Table 2.

2.1.1 Lower Silver Creek

Lower Silver Creek is one of the tributaries that drain to Coyote Creek. The Lower Silver Creek watershed drains approximately 44 square miles (28,160 acres). Lower Silver Creek originates near Silver Road and flows northerly to the Lake Cunningham area, then flows in a northwesterly direction to its confluence with Coyote Creek in the City of San Jose. The tributaries of Lower Silver Creek include, from south to north, Norwood Creek, Ruby Creek, Flint Creek, South Babb Creek, North Babb Creek, and Miguelita Creek.

The lowland areas within the Lower Silver Creek Watershed are predominantly urban. The upland areas are devoted to uses from rangelands to wildlife habitat and are largely located outside of the City of San Jose and in unincorporated areas of Santa Clara County. The Project track alignment will pass beneath Lower Silver Creek approximately at Station 581+00 of Line S1, just northeast of the US 101/Lower Silver Creek crossing.

2.1.2 Coyote Creek

The Coyote Creek watershed is the largest watershed in the Santa Clara Basin. It drains approximately 247 square miles (158,080 acres) from the Diablo Range on the east side of the basin. Coyote Creek originates from the mountains northeast of the City of Morgan Hill, flows northwest for 42 miles, and then into Lower San Francisco Bay. At the base of the Diablo Range, Coyote Creek is impounded by two dams, which form Coyote Reservoir and Anderson Reservoir.

Coyote Creek runs through unincorporated agricultural and rapidly urbanizing land between the cities of Morgan Hill and San Jose. It then runs through the urbanized area in the City of San Jose and the lower edge of Milpitas before reaching the Lower South San Francisco Bay.

The Project track alignment will pass beneath Coyote Creek approximately at Station 644+00 of Line S1. The track alignment will be to the north of East Santa Clara Street at this creek crossing to avoid the Coyote Creek/East Santa Clara Street bridge foundations.

2.1.3 Guadalupe River

The Guadalupe River watershed drains approximately 144 square miles (92,160 acres). It originates from the eastern Santa Cruz Mountains near the summit of Loma Prieta. The Guadalupe River actually begins on the valley floor at the confluence of Alamitos Creek and Guadalupe Creek just downstream of Coleman Road in San Jose. It flows north for approximately 14 miles and discharges into the Lower South San Francisco Bay via Alviso Slough. It runs through the town of Los Gatos and the cities of San Jose, Campbell, and Santa Clara. The major tributaries are Ross Creek, Canoas Creek, and Los Gatos Creek. Six major reservoirs are in the Guadalupe River watershed: Calero Reservoir on Calero Creek, Guadalupe Reservoir on Guadalupe Creek, Almaden Reservoir on Alamitos Creek, Vasona Reservoir, Lexington Reservoir, and Lake Elsman on Los Gatos Creek.

The upper watershed is composed predominantly of heavily forested areas with pockets of low-density development. As the creek runs through the alluvial foothills, residential density gradually increases to high density in the lower watershed. Commercial development is concentrated along major streets, and industrial development is concentrated closer to the bay, mostly downstream of the El Camino Real crossing. The Project track alignment will pass beneath Guadalupe River approximately at Station 725+50 of Line S1 just west of State Route (SR) 87 and south of Santa Clara Street.

2.1.4 Los Gatos Creek

Los Gatos Creek originates in the Santa Cruz Mountains at an elevation of up to 3,483 feet and follows SR 17 as it winds through the mountains. The lower portions of the creek pass through Los Gatos, Campbell, and San Jose. Upstream of the SR 85 northbound on-ramp crossing, it flows primarily in a natural channel, although downstream some portions have been straightened. Downstream of SR 85, it continues to parallel SR 17 until it outfalls into Guadalupe River in downtown San Jose.

The watershed area of Los Gatos Creek is approximately 54.8 square miles (35,072 acres) at the SR 85 crossing. Overall, the Los Gatos Creek watershed is 26 percent urbanized. The remaining 74 percent consists primarily of open space, but also includes small areas of vacant land, golf courses, and mines (Tetra Tech 2006). Most of the open space is upstream of the SR 85 crossing, so this area is less developed than the watershed as a whole. There are many water bodies in the Los Gatos Creek watershed, including Lake Elsman, Lexington Reservoir, and Vasona Reservoir, all of which are upstream of the SR 85 crossing.

The Project track alignment will pass beneath Los Gatos Creek approximately at Station 732+25 of Line S1.

Table 2. Waterway Crossing Information

Approximate Creek		Drainage	1% Flood Discharge ^a			
Crossing Station	Waterway	(square miles)	(acres)	(cubic feet per second)		
581+00	Lower Silver Creek	44	28,160	2,670		
644+00	Coyote Creek	247	158,080	12,500		
725+50	Guadalupe River	144	92.160	10,000		
732+25	Los Gatos Creek	54.8	35,072	7,980		
^a Federal Emergency Management Agency – Santa Clara County Flood Insurance Study						



Source: Google Earth & WRECO

Figure 3. Waterway Crossing within the Project Limits

2.2 Floodplain Information

Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRMs) were used to identify the 1 percent annual chance of exceedance event (also referred as base

floodplain) within the Project limits. The FIRMs further categorize these areas into different Special Flood Hazard Areas (SFHA); and zones AE, AO, A, AH, D, X (shaded) and X (unshaded) were all found within the Phase II Project limits. Zone AE represent areas with a 1 percent chance of flooding determined by detailed methods. Base Flood Elevations (BFEs) derived from detailed hydraulic analyses are shown in this zone. Zone AO represents areas with a 1 percent chance of shallow flooding (usually sheet flow on sloping terrain), with specified flood depths of 1 to 3 feet. Average flood depths derived from detailed hydraulic analyses are shown on this zone. Zone A represents areas with a 1 percent annual chance of flooding, where the floodplain has been analyzed by approximate methods based on historic information, existing hydrologic analyses, available data, and field observations, and base flood elevations have not been determined. Zone AH represents areas with a 1 percent annual chance of shallow flooding, usually in the form of a pond, with specified flood depths of 1 to 3 feet. BFEs derived from detailed hydraulic analyses are shown in this zone. These areas will be discussed in detail in the following sections.

There are also portions of the proposed Phase II Project within Zone D, Zone X (Shaded), and Zone X (unshaded). The Zone D designation is used for areas where there are possible but undetermined flood hazards, as no analysis of flood hazards has been conducted. By the FEMA definition Zone D is not considered a Special Flood Hazard Area (SFHA). Zone X (unshaded) includes areas of minimal flooding having an elevation higher than the 0.2 percent annual chance of flood event. Zone X (shaded) includes areas impacted by the 0.2 percent annual chance of flood.

The Flood Insurance Study (FIS) for Santa Clara County, California, and Incorporated Areas (2009) was used to obtain existing floodplain information within the Project area to supplement the data provided by the FIRMs. The FIS provides hydrologic information and explains the methods of analysis used to generate the floodplains shown on the FIRMs. The FIS also includes profiles of the floodplain elevations.

An overview of the floodplain maps is shown in Figure 4 through Figure 7, and the FIRMs can be found in Appendix A. Table 3 summarizes the hydrologic and hydraulic and base floodplain information.

Table 3. Floodplain Information

Approximate Floodplain Station	Flood Source	FIRM Number	Flood Hazard Zone	100-year Flood Depth (feet)	100-year Water Surface Elevation (feet)	
555+00	Coyote Creek	06085C0251J 06085C0232H	AE			
555+00	Coyote Creek	06085C0251J	AE (Floodplain)	1	82–83	
565+00	Lower Silver Creek	06085C0251J	АН		87	
581+00	Lower Silver Creek	06085C0251J	A			
605+00	Lower Silver Creek/Coyote Creek	06085C0251J	AH/AO	1	89	
725+00	Guadalupe River	06085C0234H	A			
732+50	Los Gatos Creek	06085C0234H	A			
745+00	N/A	06085C0234H	AO	1		
880+00	N/A	06085C0234H 06085C0227H	AH/A		63–66	
Based on information shown on FIRMs.						

2.2.1 Floodplain of Coyote Creek

According to FIRM 06085C0232H, the Mabury Road Construction Staging Areas (CSA) west of US 101 is entirely within the base floodplain. The CSA is within Zone AE, with a 1 percent annual chance flood water surface elevation (WSE) of 82-83 feet (Figure 4).

2.2.2 Floodplain of Lower Silver Creek and Coyote Creek

According to FIRM 06085C0251J, several areas at the vicinity of the alignment crossing for the Alum Rock/28th Street Station are within the base floodplain. The area northeast of the US 101/Lower Silver Creek crossing is defined as being within Zone AH, with a 1 percent annual chance flood WSE of 87 feet. The area within the Lower Silver Creek Channel is defined as being within Zone A (Figure 4).

The area southwest of Lower Silver Creek is a large floodplain of Lower Silver Creek and Coyote Creek, according to FIRM 06085C0251J. This floodplain covers both sides of US 101 (including the traveled way in both directions), and extends to Interstate (I-) 280 to the south. The FIRM designates the northern part of this large floodplain (north of Alum Rock Avenue) as Zone AH with a 1 percent annual chance flood WSE of 89 feet, which covers the Alum Rock/28th Street Station area. The FIRM designates the southern part of this large floodplain (south of Alum Rock Avenue) as Zone AO with a 1 percent annual chance flood depth of 1 foot.

The Santa Clara Valley Water District (SCVWD), in cooperation with the Natural Resources Conservation Service and the Guadalupe Coyote Resource Conservation District, proposed an approximately 4.4-mile-long section of Lower Silver Creek between its confluence with Coyote Creek and Lake Cunningham to provide flood protection from a 1 percent annual chance event. The construction for Reach 1 through Reach 3 of this six-reach flood control project was completed in 2006. A Hydrologic Engineering Centers River Analysis System (HEC-RAS) model was developed by the SCVWD in 2003 for the "improvement in progress" condition of Lower Silver Creek between Coyote Creek and I-680. The model results indicated that the 100-year discharge in Lower Silver Creek is contained within the creek channel (Earth Tech 2003). Therefore, the area northeast of the US 101/Lower Silver Creek crossing is no longer within a floodplain. However, the area south of the Lower Silver Creek remains within the base floodplain because this area is within the commingled floodplain of both Lower Silver Creek and Coyote Creek. Upon completion of all six reaches and Lake Cunningham, SCVWD and the City of San Jose will be able to demonstrate to FEMA that all homes and businesses subject to the 1 percent annual chance flood from Lower Silver Creek have been protected. Work on Reaches 4 through 6 is ongoing and according to SCVWD will run through December 2017.

2.2.3 Floodplain of Guadalupe River and Los Gatos Creek

According to FIRM 06085C0234H, the areas within the channel of Guadalupe River and Los Gatos Creek near the Project are designated as Zone A. The FIRM also indicates that the 1 percent annual chance flood discharge is contained in the channel for both Guadalupe River and Los Gatos Creek. There are also areas designated as Zones D and X (Shaded) (Figure 6).

The U.S. Army Corps of Engineers (USACE) and the SCVWD completed the Guadalupe River Park and Flood Protection Project in 2004. The Project also incorporates park elements and trails developed by the San Jose Redevelopment Agency and the City of San Jose from I-880 south to I-280. Two additional projects along the Upper and Lower Guadalupe integrate flood protection, public access, and environmental restoration from Almaden Valley to Alviso. The Lower Guadalupe project was completed in 2004, and the Upper Guadalupe project is still under construction.

The Guadalupe River's natural channel directly upstream of the confluence with Los Gatos Creek has a capacity of 7,000 cubic feet per second (cfs), roughly the flow of a 10-year flood event. By modifying the channel, replacing bridges, protecting against erosion, and building a bypass box culvert to handle high flows, the capacity of the channel was improved to handle 14,600 cfs upstream of the confluence with Los Gatos Creek and 17,000 cfs downstream of the confluence. The additional capacity was designed to protect the area from a 1 percent annual chance flood event. The Downtown Project is the second project in a string of three projects along the river, starting at San Francisco Bay and moving upstream (south) to where the river meets Blossom Hill Road in south San Jose. The projects are being built in stages, so that the downstream projects are complete before the upstream projects.

The Lower Guadalupe Project improves the capacity of the river from the San Francisco Bay to I-880, and was completed in December 2004. Now the channel is able to safely pass the 1 percent annual chance flood flow from the Downtown Project. Similarly, with the Downtown Project complete, in the future the river will successfully handle the flows from the Upper Guadalupe Project, which will modify the channel from I-280 to Blossom Hill Road and is now in the engineering and design stages. With the proper permits and with funding from the federal government, the projected completion date for the Upper Guadalupe Project is December 2016 (Guadalupe River Park Conservancy).

2.2.4 Floodplain near the Diridon Station

According to FIRM 06085C0234H, a small area designated as Zone AO exists at the intersection of West Santa Clara Street and Stockton Avenue at the vicinity of the Diridon Station in the City of San Jose, with a 1 percent annual chance shallow flooding depth of 1 foot. This area is not connected to any other larger floodplain, and so the floodplain may be just due to the insufficient capacity of the local drainage systems. The rest of the area is designated as Zone D (Figure 6).

2.2.5 Floodplain near the Santa Clara Station, Newhall Maintenance Facility

According to FIRMs 06085C0227H and 06085C0231H, the areas west of the Caltrain tracks, bounded by I-880 to the south and El Camino Real to the north, are within the base floodplain. Some of these areas are designated as Zone A, and others are designated as Zone AH, with the 1 percent annual chance WSE ranging from 63 feet to 66 feet (Figure 7). There are also areas designated as Zone D and Zone X (Shaded). Flooding in this area is primarily due to overland flow. The exact quantity is not known; however, the watershed area draining to the area is approximately 4 square miles.

Santa Clara Valley Transportation Authority

Chapter 2. Affected Environment

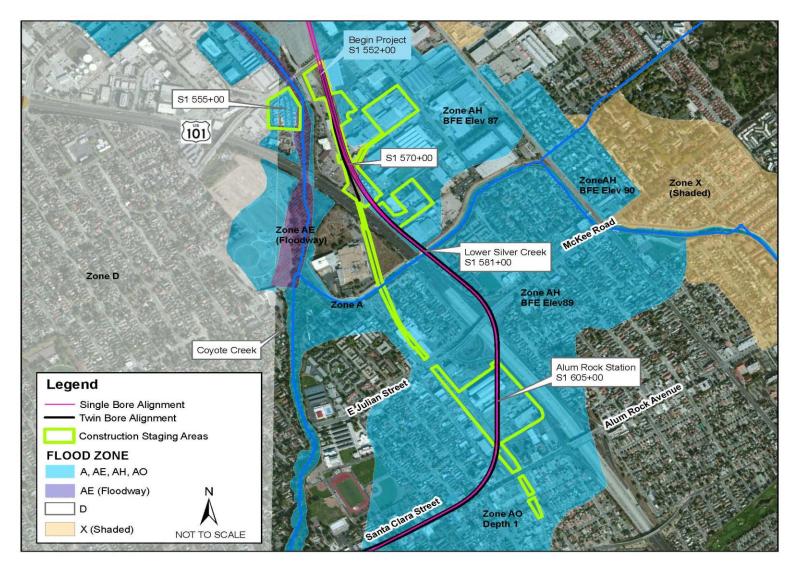


Figure 4. Floodplain Map, Part 1 of 4

Santa Clara Valley Transportation Authority Chapter 2. Affected Environment

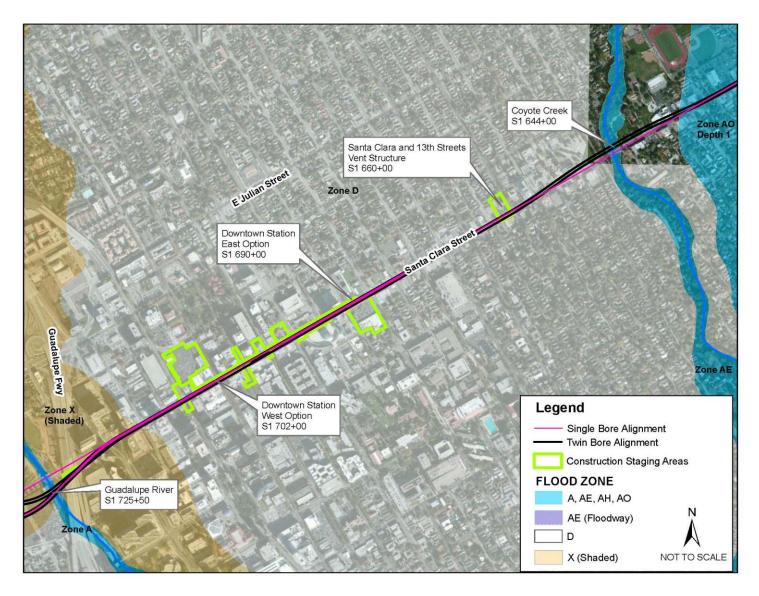


Figure 5. Floodplain Map, Part 2 of 4

Santa Clara Valley Transportation Authority

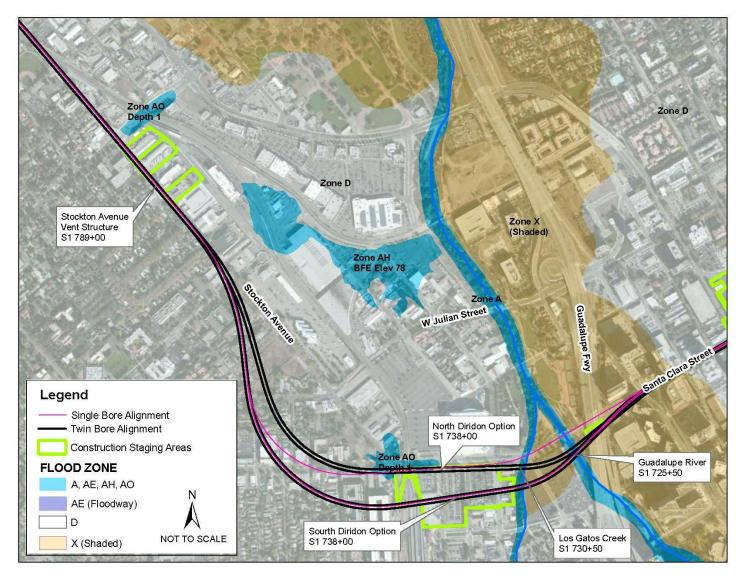


Figure 6. Floodplain Map, Part 3 of 4

Santa Clara Valley Transportation Authority Chapter 2. Affected Environment

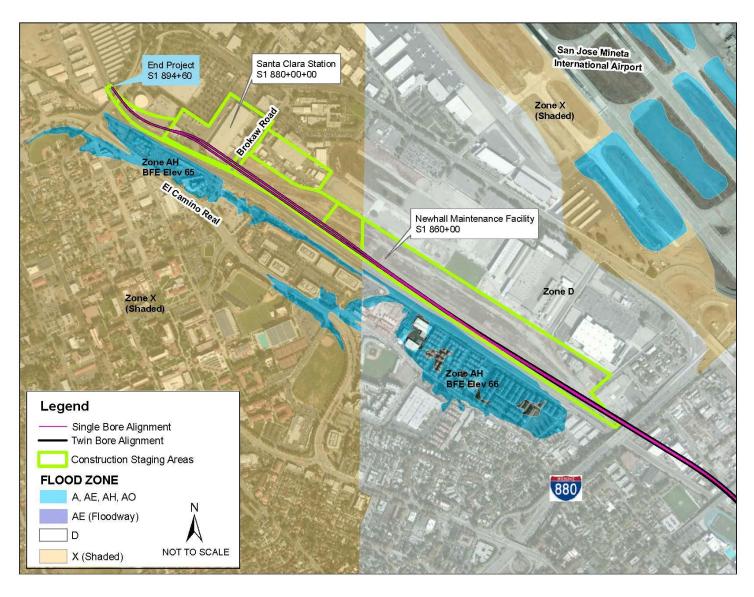


Figure 7. Floodplain Map, Part 4 of 4

Impacts Analysis and Mitigation Measures

3.1 Regulatory Framework

The Federal Transit Administration (FTA) is the lead federal agency and VTA is the lead local agency for the preparation of the environmental documentation for the proposed Project.

3.1.1 Federal Requirements

Executive Order 13690, which amends Executive Order 11988, Floodplain Management, directs all federal agencies to avoid conducting, allowing, or supporting construction in the base floodplain. The executive order also directs federal agencies to take action to reduce the risk of flood loss; minimize the impact of floods on human safety, health, and welfare; and restore and preserve the natural and beneficial values served by the floodplain. The floodplain elevation and flood hazard area should be the result of using climate-informed science. Freeboard for non-critical actions should be 2 feet above the BFE and 3 feet for critical actions, and the areas subject to flooding by the 0.2 percent annual chance flood should be evaluated. U.S. DOT Order 5650.2, Floodplain Management and Protection, prescribes the policies and procedures for implementing the executive order. Agencies are required to make a finding that there is no practicable alternative to the project before taking action that would encroach on a base floodplain.

Pursuant to the Executive Order for federal facilities, VTA finds that: (1) A transportation facility such as the Phase II Extension Project, which starts at the end of the Phase I Berryessa Extension alignment, crosses east San Jose to US 101 in a north-south direction, crosses central San Jose in an east-west direction through subway tunnels, and terminates at grade at the Santa Clara Station, cannot avoid crossing floodplains, and there is no practicable alternative to the alignment located in the floodplains; (2) the proposed action would include all practicable measures to reduce the risk of flood loss and minimize the impacts of floods on human safety, health, and welfare; and (3) construction the Phase II Project alignment and associated facilities would comply with applicable federal, state, and local ordinances for flood control and drainage. Summary Floodplain Encroachment Reports and Location Hydraulic Study Forms can be found in Appendix B and C, respectively.

3.1.2 State Requirements

The California Environmental Quality Act (CEQA) Guidelines, Appendix G, provides a checklist of questions to identify significant environmental impacts. Agencies are required to consider whether significant impacts related to floodplains would occur due to either of the following.

- Placement of structures in the 1 percent annual chance of exceedance flood hazard zone.
- Exposure of people or structures to significant risk of loss associated with flooding.

3.1.3 Local Requirements

The Project would take place within the jurisdiction of the cities of San Jose and Santa Clara, and would comply with local ordinances for flood control and drainage. Other agencies that have discretionary authority over the Project or aspects of the Project related to flood control are considered "responsible agencies," which would include but not be limited to the following.

- SCVWD
- Departments of public works of the cities of San Jose and Santa Clara
- USACE
- BART

3.1.4 Project Requirements

According to the *BART Facility Standards* (2011), BART facilities must be designed to withstand 10 percent annual storm events and specific facilities must be designed to withstand the 1 and 0.2 percent annual storm events. Critical facilities such as traction power substations, gap breaker stations, train control and communication buildings, and vent shaft openings must be set above the 0.2 percent annual storm event. The retained cut sections, retained fill sections, station entrances, and access points should have a freeboard of 6 inches to 1 foot above the BFE. Where the locations of critical facilities are not above the 0.2 percent flood elevations, the facilities would be raised above the 0.2 percent floodplain level.

3.2 Criteria and Objectives

3.2.1 Significance Criteria

Based on the CEQA Appendix G guidelines, floodplain impacts would be considered significant if the Project would place structures in the base floodplain hazard zone or expose people or structures to significant risk of loss associated with flooding.

3.2.2 Floodplain Encroachment Criteria

An encroachment is defined as an action within the limits of the base floodplain. U.S. DOT Order 5650.2 defines a "significant encroachment" as an encroachment that results in one or more of the following construction or flood-related impacts.

1. A considerable probability of loss of human life.

- 2. Likely future damage associated with the encroachment that could be substantially in cost or extent, including interruption of service on or loss of a vital transportation facility.
- 3. A notable adverse impact on natural and beneficial floodplain values.

The Order defines "natural and beneficial floodplain values" as those that include but are not limited to the natural moderation of floods, water quality maintenance, groundwater recharge, fish, wildlife, plants, open space, natural beauty, scientific study, outdoor recreation, agriculture, aquaculture, and forestry.

Order 5650.2 requires that FIRMs (or if unavailable, flood hazard boundary maps) be consulted to determine base floodplain limits and delineate the proposed project encroachments. If a proposed project is located within a floodplain, FTA requires that a detailed analysis according to Order 5650.2 be included in the environmental document which addresses: (1) any risk to, or resulting from, the proposed project, (2) the impacts on natural and beneficial floodplain values, and (3) the degree to which the action provides direct or indirect support for development in the floodplain. The analysis must also include sufficient discussion to permit an initial review of the adequacy of methods proposed to minimize harm and, where practical, to restore and preserve the natural and beneficial floodplain values affected by the project.

Section 17.08.370.C of the "Special Flood Hazard Area Regulations" contained in the City of San Jose Municipal Code and Santa Clara County Ordinance No. NS.1100.106 specifies that no new construction or development within an SFHA may cause an increase of more than 1 foot in the base flood WSE when combined with all other existing and anticipated development. Other local jurisdictions adhere to the same criterion. Based on these local requirements, floodplain impacts would also be considered significant if the Project encroachments would result in increases in the base flood elevations of approximately 1 foot or greater.

3.2.3 Floodplain Impacts Analysis Objectives

In accordance with the environmental documentation requirements, the primary objective of this location hydraulic study is to define the limits of floodplain encroachment by the proposed Project and complete the detailed analysis as required by Executive Order 5650.2. The detailed analysis and discussion of the potential impacts includes the risk associated with the Project, impacts on natural and beneficial floodplain values, and direct/indirect support for development in the floodplain.

3.3 Floodplain Impacts Evaluation

3.3.1 Natural and Beneficial Floodplain Values

The proposed Project would have an insignificant impact on natural and beneficial floodplain values. The proposed Project area is currently developed or zoned for development, and has non-existent or limited undisturbed wildlife, open space, and other natural values.

3.3.2 Direct/Indirect Support for Development in the Floodplain

The proposed Project would not change the land use of the Project area. The Project would improve transportation access within the Project area. All of the Project area within the floodplain is currently developed, partially developed, or zoned for development. VTA's TOJDs are consistent with development plans for the areas. Some of the projected base floodplain development would occur regardless of the Project.

3.3.3 Risk Associated with the Proposed Project

The base floodplain impacts as a result of the Project are discussed in detail in the following sections and summarized in Table 4. The change in WSE would be minimal because there would be minimal fill in the base floodplains with the proper minimization measures. In general, the Project would not significantly change the land use in the area because it is currently developed or zoned for development.

3.3.3.1 Construction Staging Areas

The staging areas for the Project are shown in Appendix D. Some of these areas are within the base floodplains. These areas would only be used temporarily during the construction of the Project, and it is anticipated that they would not result in permanent impacts on the base floodplain; therefore, mitigation is not required for the staging areas.

3.3.3.2 Alum Rock/28th Street Station Option

Tunnel Alignment

The Phase II alignment would begin where the Phase I tail tracks end. Part of the Phase I at-grade tracks would be partially removed to allow for construction of the bored tunnels, east tunnel portal, and supporting facilities. The retained-cut configuration would enter the East Tunnel Portal just north of Las Plumas Avenue (STA 569+50). South of the portal, the alignment would pass approximately 25 feet below Lower Silver Creek bed (STA 581+00) for the Twin-Bore Option or approximately 30 feet below the creek bed for the Single-Bore Option and continue toward the Alum Rock/28th Street Station. The Project alignment between the Phase I connection and the Alum Rock/28th Street Station would not encroach

onto any base floodplain because it is either not within base floodplain areas, or it is underground within a bored tunnel.

The Phase II track alignment is underground until the End of the Line Maintenance Yard.

At Coyote Creek, the Twin-Bore Option alignment would pass approximately 20 feet beneath the creek bed, and the Single-Bore Option would pass approximately 55 feet beneath the creek bed. For the Twin-Bore Option, the alignment would pass 40 feet below the riverbed of the Guadalupe River and a retaining wall west of the river, and over 20 feet below the creek bed of Los Gatos Creek. For the Single-Bore Option, the alignment would pass 50 feet below the riverbed of the Guadalupe River, the retaining wall, and the creek bed of Los Gatos Creek. The track alignment would not encroach onto any base floodplains because it is either not within any base floodplain areas, or it is underground. There would be no impacts on the base floodplain; therefore, mitigation measures are not required.

Station

The Alum Rock/28th Street Station would be located between US 101 and North 28th Street and between McKee Road and Santa Clara Street. The 11-acre station campus would include an underground station and aboveground facilities, such as a parking structure, system facilities, and roadway improvements to North 28th Street.

Alum Rock Station provides ground parking along North 28th Street (Figure 4). The ground parking, the system facilities, and station entrances and roadway improvements are all located entirely with the floodplain of Coyote Creek/Lower Silver Creek and occupy a total of approximately 9.25 acres (2.09, 1.18, 0.26, and 5.72 acres, respectively). However, the Phase II Project would remove the adjacent buildings that currently occupy approximately 2.77 acres, which is also entirely within the same floodplain. The proposed station would add approximately 2.54 acres of added impervious area (AIA) to the floodplain area. The removal of structures helps with reducing/offsetting floodplain risk. In addition, it is anticipated that the roadway improvements would not significantly change the existing grade. The Alum Rock/28th Street Station would be within a Zone AH with BFE 89 feet (NAVD) and a Zone AO depth 1 (Figure 4). Station features would have a floor elevation 2–3 feet above the BFE, depending on whether the feature is deemed non-critical or critical per Executive Order 13690. Critical facilities, such as traction power substations, gap breaker stations, train control and communication buildings, and vent shaft openings, must be set above the 0.2 percent annual storm event. Minimization measures at this station would include balancing pre-fill and post-fill in the floodplain to minimize the amount of fill and to prevent flood storage from being lost. The flood flow pattern would be maintained as much as possible by incorporating and providing flow-through area in the station campus, especially in the parking areas. Storage and detention would be proposed as necessary to make up for storage lost as a result of the Project.

The area of the proposed structures within the base floodplain is insignificant compared to the overall floodplain area for Coyote Creek/Lower Silver Creek (approximately 28,160

acres). Therefore, the Project would not significantly change the base floodplain WSE at this location. There would be fill in the floodplain as a result of the Project in the Alum Rock/ 28^{th} Street Station Option; however, with minimization measures such as balancing the fill and storage capacity and providing flow-through to ensure the flood flow is maintained, no mitigation measures would be required.

Downtown San Jose Station East Option

The Downtown San Jose Station East Option would be located underground along Santa Clara Street and between 4th and 2nd Streets (Figure 5). The Downtown San Jose Station East Option would add 0.72 acre of structures such as System Facilities and Transit Plazas. The station would add 0.10 acre of AIA. The Downtown San Jose Station East Option campus would be within a Zone D where flooding is undetermined but possible; Zone D is not considered a base floodplain. The station campus would not be within any base floodplain. Therefore, there would not be any floodplain impacts as a result of the Project at this location, and mitigation is not required.

Downtown San Jose Station West Option

The Downtown San Jose Station West Option would be underground along Santa Clara Street and between 3rd and Market Streets (Figure 5). The Downtown San Jose Station West Option would add approximately 0.40 acre of structures such as System Facilities and Transit Plazas. The station would add 0.03 acre of AIA. However, the Phase II Project would remove adjacent buildings that currently occupy approximately 0.16 acre. There would be approximately 0.24 acre of additional building structures within Zone D. The Downtown San Jose West Station Option campus would be within a Zone D where flooding is undetermined but possible, and is not considered an SFHA or a base floodplain. The station campus is not located within any base floodplain. Therefore, there would not be any floodplain impacts as a result of the Project at this location, and mitigation is not required.

3.3.3.3 Diridon Station South Option

The Diridon Station South Option would be underground between Los Gatos Creek and Autumn Street (Figure 6). The Diridon Station South Option would add approximately 0.85 acre. The AIA to this station is negligible.

The station campus is not located within any base floodplain. Therefore, there would not be any floodplain impacts as a result of the Project at this location, and mitigation is not required.

3.3.3.4 Diridon Station North Option

The Diridon Station North Option would be underground under Autumn Street and directly south of Santa Clara Street. (Figure 6). The Diridon Station North Option would add approximately 1.08 acres of structures such as System Facilities and Transit Plazas (Station

entrances). However, the Phase II Project would remove adjacent buildings that currently occupy approximately 0.21 acre. The AIA to this station is negligible.

The station campus is not located within any base floodplain. Therefore, there would not be any floodplain impacts as a result of the Project at this location, and mitigation is not required.

3.3.3.5 Newhall Maintenance Facility

The Newhall Maintenance Facility would be located on the former Union Pacific Railroad (UPRR) Newhall Yard, bounded on the southeast by Newhall Street in San Jose and extending to Brokaw Road on the northwest near the intersection of Coleman Avenue. The Newhall Maintenance Facility would add approximately 2.16 acres of structures, and the AIA would be 41.86 acres, within flood Zones D and X (shaded). These areas are not considered a base floodplain (Figure 7). According to the *Silicon Valley Rapid Transit Project Hydrologic Study* prepared by HMH and HNTB (2005), critical facilities, including traction power, train control, and communications buildings, are specified to be set a minimum of 1 foot above the 0.2 percent WSE, and have an overland flood release path such that no more than 1 foot of ponding can develop. The Newhall Maintenance Facility would not be within any base floodplain. Therefore, there would not be any floodplain impacts as a result of the Project at this location, and mitigation is not required.

3.3.3.6 Santa Clara Station

Santa Clara Station would be generally bounded by El Camino Real to the southwest, De La Cruz Boulevard to the northwest, and Coleman Avenue to the northeast near the intersection of Brokaw Road.

Under the Santa Clara Station, all Project features would not be within any base floodplain (Figure 7). Santa Clara Station would add approximately 4.61 acres of structures in flood Zone X (shaded) and would add approximately 0.46 acre of AIA to the floodplain. However, the Phase II Project would remove the adjacent building that currently occupies approximately 3.42 acres, which is also entirely within the same floodplain. The station campus would not be within any base floodplain. Therefore, there would not be any floodplain impacts as a result of the Project at this location, and mitigation is not required.

3.3.3.7 Alum Rock TOJD

The Alum Rock TOJD would be located within the Alum Rock/28th Street Station campus. The development would include office space, retail, dwelling units, and the corresponding parking spaces.

The Alum Rock TOJD would provide office, retail and residential space, and parking and would be entirely with the floodplain of Coyote Creek/Lower Silver Creek; it would occupy a total of approximately 5.09 acres (1.34, 0.40, 0.58, and 2.78 acres, respectively). However, the Phase II Project would remove the adjacent buildings that currently occupy

approximately 1.07 acres, which are also entirely within the same floodplain. The Alum Rock/28th Street Station would be within a Zone AH with BFE 89 feet (NAVD) and a Zone AO depth 1 (Figure 4). The Project would add approximately 0.77 acre of AIA to the floodplain area. The same minimization measures proposed for Alum Rock/28th Street Station would be applied to the Alum Rock TOJD, including minimizing fill in the floodplain, maintaining flood storage capacity, and proposing that the floor elevation of all buildings be above the BFE of 89 feet (NAVD).

The area of the proposed structures within the base floodplain is insignificant compared to the overall floodplain area for Coyote Creek/Lower Silver Creek (approximately 28,160 acres). Therefore, the Project would not significantly change the base floodplain WSE at this location. There would be fill in the floodplain as a result of the Project in the Alum Rock/ 28th Street Station Option; however, with minimization measures such as balancing the fill and storage capacity and providing flow-through to ensure the flood flow is maintained, no mitigation measures would be required.

3.3.3.8 Santa Clara and 13th Street Ventilation Structure TOJD

The Santa Clara and 13th Street Ventilation Structure TOJD would be located at the northwest corner of Santa Clara and 13th Streets and would consist of a maximum of 0.30 acre of retail along the street frontage facing Santa Clara Street and 0.81 acre of BART vent structures. This area is entirely within Zone D. There is currently an existing 0.13-acre building on the lot that would be removed. There would be approximately 0.11 acre of AIA in the floodplain area. The Santa Clara and 13th Street Ventilation Structure would be within Zone D where flooding is undetermined but possible; Zone D is not considered a base floodplain. Therefore, there would not be any base floodplain impacts as a result of the Project at this location, and mitigation is not required.

3.3.3.9 Downtown San Jose Station East Option TOJD

The Downtown San Jose Station East Option TOJD would cover 3.17 acres. There are currently four existing building covering 1.23 acres that would be removed. There would be approximately 0.11 acre of AIA in the floodplain area. The Downtown San Jose Station East Option campus would be within a Zone D where flooding is undetermined but possible; Zone D is not considered a base floodplain. Therefore, there would not be any base floodplain impacts as a result of the Project at this location, and mitigation is not required.

3.3.3.10 Downtown San Jose Station West Option TOJD

The Downtown San Jose Station West Option TOJD would cover 0.35 acre. There are currently two existing buildings on the two proposed TOJD sites that would be removed, totaling 0.16 acre. There would be approximately 0.10 acre of AIA in the floodplain area. This area is entirely within Zone D. The Downtown San Jose Station West Option campus would be within Zone D where flooding is undetermined but possible, and is not considered

an SFHA or a base floodplain. Therefore, there would not be any base floodplain impacts as a result of the Project at this location, and mitigation is not required.

3.3.3.11 Diridon Station South Option TOJD

The Diridon Station South Option TOJD would be located within the station campus and would consist of a maximum of 2.24 acres of office space and retail space. A total of 0.45 acre of existing structures would be removed. The station campus would be within Zone D and would not be within any base floodplain. Therefore, there would not be any base floodplain impacts as a result of the Project at this location, and mitigation is not required.

3.3.3.12 Diridon Station North Option TOJD

The Diridon Station North Option TOJD would be located within the station campus and would consist of a maximum of 2.24 acres of office space and retail space. A total of 0.45 acre of existing structures would be removed. The AIA to the Diridon Station North Option TOJD would be negligible. The station campus would be within Zone D and would not be within any base floodplain. Therefore, there would not be any base floodplain impacts as a result of the Project at this location, and mitigation is not required.

3.3.3.13 Stockton Avenue Ventilation Structure TOJD

The Stockton Avenue Ventilation Structure TOJD would consist of a maximum of 0.34 acre of retail along the street frontage facing Stockton Avenue and 0.51 acre of BART ventilation structures. A total of 0.34 acre of existing structures would be removed. The AIA to the Stockton Avenue Ventilation Structure would be negligible. The building structures would be in Zone D. There would be minimal floodplain impacts as a result of the Project at this location, and mitigation is not required.

3.3.3.14 Santa Clara Station TOJD

The Santa Clara Station TOJD would be located within the station campus and would consist of a maximum of 3.53 acres of office space, retail, and parking. The AIA to Santa Clara TOJD is approximately 0.11 acre. The TOJD would be within a Zone X (shaded); this is the area within the 0.2 percent floodplain. As mentioned in Section 2.2, *Floodplain Information*, flood control improvements by others to Guadalupe River would increase the capacity of the river. There would not be any base floodplain impacts as a result of the Project at this location, and mitigation is not required.

3.3.4 Sea Level Rise

The WSE of San Francisco Bay would potentially be impacted by the future sea level rise. According to the *Preliminary Geotechnical Report* (Parikh 2015b), the elevation of the Phase II Project varies from about sea level to approximately 80 feet above sea level. The projected sea level rise for the year 2100 in San Francisco Bay is approximately 3 feet \pm 10 inches, according to *Sea-Level Rise for the Coasts of California, Oregon and Washington: Past*,

Present and Future (National Academy of Science 2012). Because the Phase II Project limits are approximately 5 miles from the San Francisco Bay, the impacts of the Phase II Project on the year 2100 sea level WSE would be minimal to insignificant.

3.4 Summary and Conclusion

The proposed Project would have an insignificant impact on natural and beneficial floodplain values. The proposed Project area is currently developed or zoned for development, and has non-existent or limited undisturbed wildlife, open space, and other natural values. The Project would not support the development of a base floodplain because the Project area within the base floodplain is currently developed. The risk associated with the proposed Project would be low because the Project would result in minimal impacted areas within the base floodplain. Therefore, the overall impact as a result of the proposed Project would be less than significant, and mitigation measures are not required.

Table 4. Summary of Base Floodplain Impacts

Project Option	Flood Hazard Zone	Impervious Area per Feature (ac)	Total Impervious Area (ac)	Added Impervious Area (ac)	Existing Building to be Removed (ac)	Impacts	Watershed	Watershed Drainage Area (ac)	Increase Area to Watershed (%)	Notes	
Mabury Road CSA	AE/ AE (Floodplain)	4.29	25.25	-	0.00	Minimal	Coyote Creek	158,080	N/A		
	AH	20.96		-	3.74	Minimal	,				
Alum Rock CSA	A/AH/AO	0.71	0.06	-	0.00	Minimal	Lower Silver	20.160	0.01%	N 2	
Alum Rock Station	AH/AO	9.25	9.96	2.54	2.77	Fill	Creek	28,160	0.01%	Note 2	
Downtown San Jose Station East Option	D	0.77		0.10	0.00	No Impact					
Downtown San Jose Station West Option	D	0.40	40.52	0.03	0.16	No Impact	Guadalupe	02.450	0.0504		
Newhall Maintenance Facilities	D/ X(Shaded)	43.86	48.62	41.86	0.00	No Impact	River	92,160	0.05%	Note 3	
Santa Clara Station	X(Shaded)	3.59		0.46	3.42	No Impact					
Diridon Station North Option	D	0.85		Negligible	0.21	No Impact	Los Gatos				
Diridon Station South Option	D	3.47	3.47	Negligible	0.21	No Impact	Creek	35,072	N/A		
VTA Planned Develop	ments		•		•		•	•			
AlumRock	AH/AO	5.09	5.09	0.77	1.07	Fill	Lower Silver Creek	28,160	0.00%	Note 2	
Santa Clara and 13th Street Vent Structure	D	1.15		0.11	0.13	No Impact					
Downtown San Jose Station East Option	D	3.17		0.11	1.23	No Impact					
Downtown San Jose Station West Option	D	0.35	9.93	0.10	0.16	No Impact	Guadalupe River	92,160	0.00%	Note 3	
Stockton Avenue Vent Structure	D	1.731		Negligible	0.34	No Impact					
Santa Clara Station	X(Shaded)	3.53		0.11	0.00	No Impact					
Diridon North Option	D	2.24	2.24	Negligible	0.45	No Impact	Los Gatos	07.070	27/1		
Diridon South Option	D	2.24	2.24	Negligible	0.45	No Impact	Creek	35,072	N/A		
2. Improvements to Lower S	Notes: 1. Largest of the three proposed lots was chosen for analysis 2. Improvements to Lower Silver Creek by SCVWD and the Natural Resources Conservation Service could result in changes to the FIRM. 3. Improvements to Guadalupe River by the USACE and SCVWD could result in changes to the FIRM										
CSA-Construction Staging		OSACE and SC	, ii D could le	san in change	o to the PHAM						

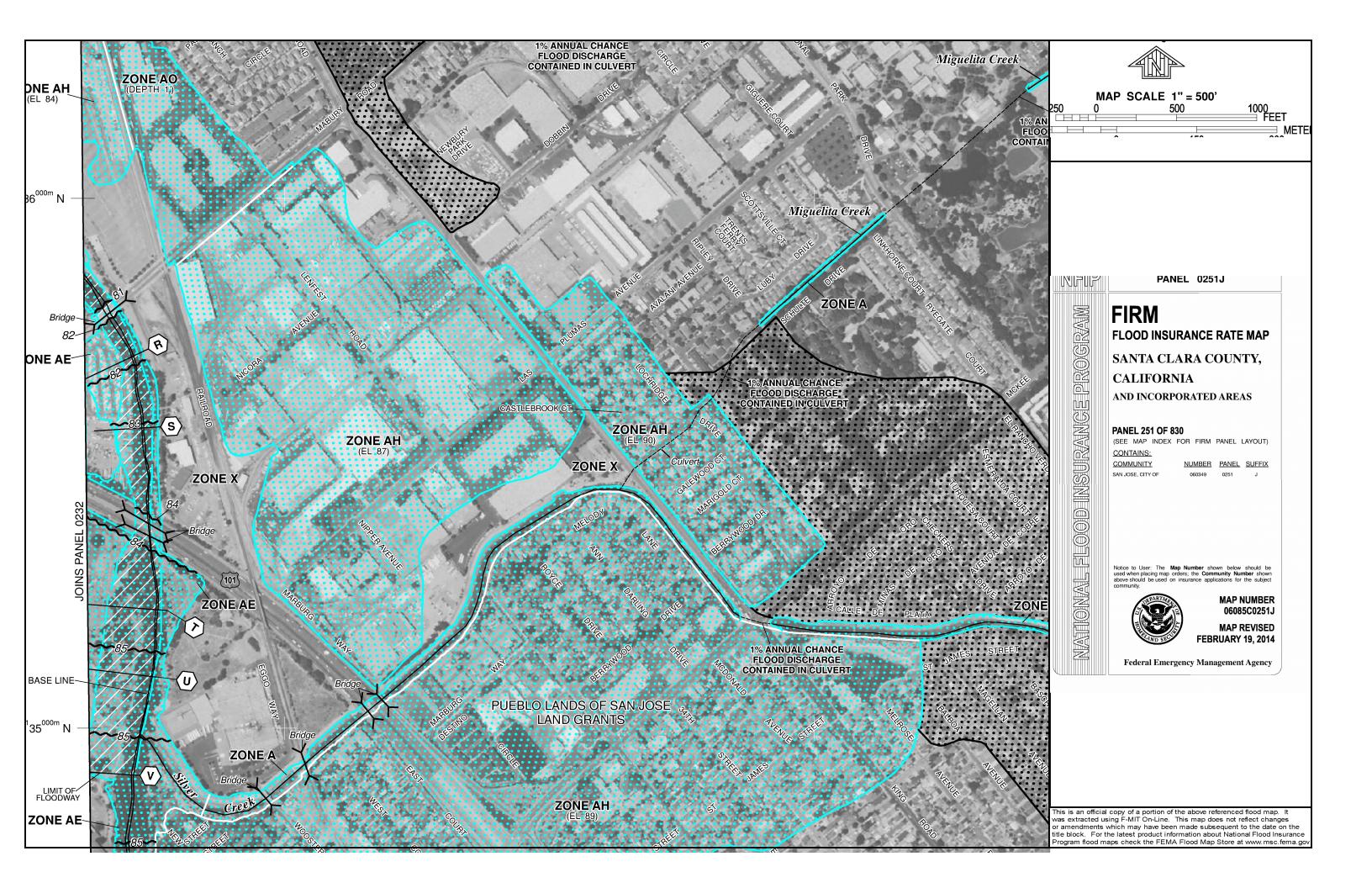
Chapter 4 List of Preparers

Analette Ochoa, P.E. – WRECO Erica Cruz, P.E. – WRECO

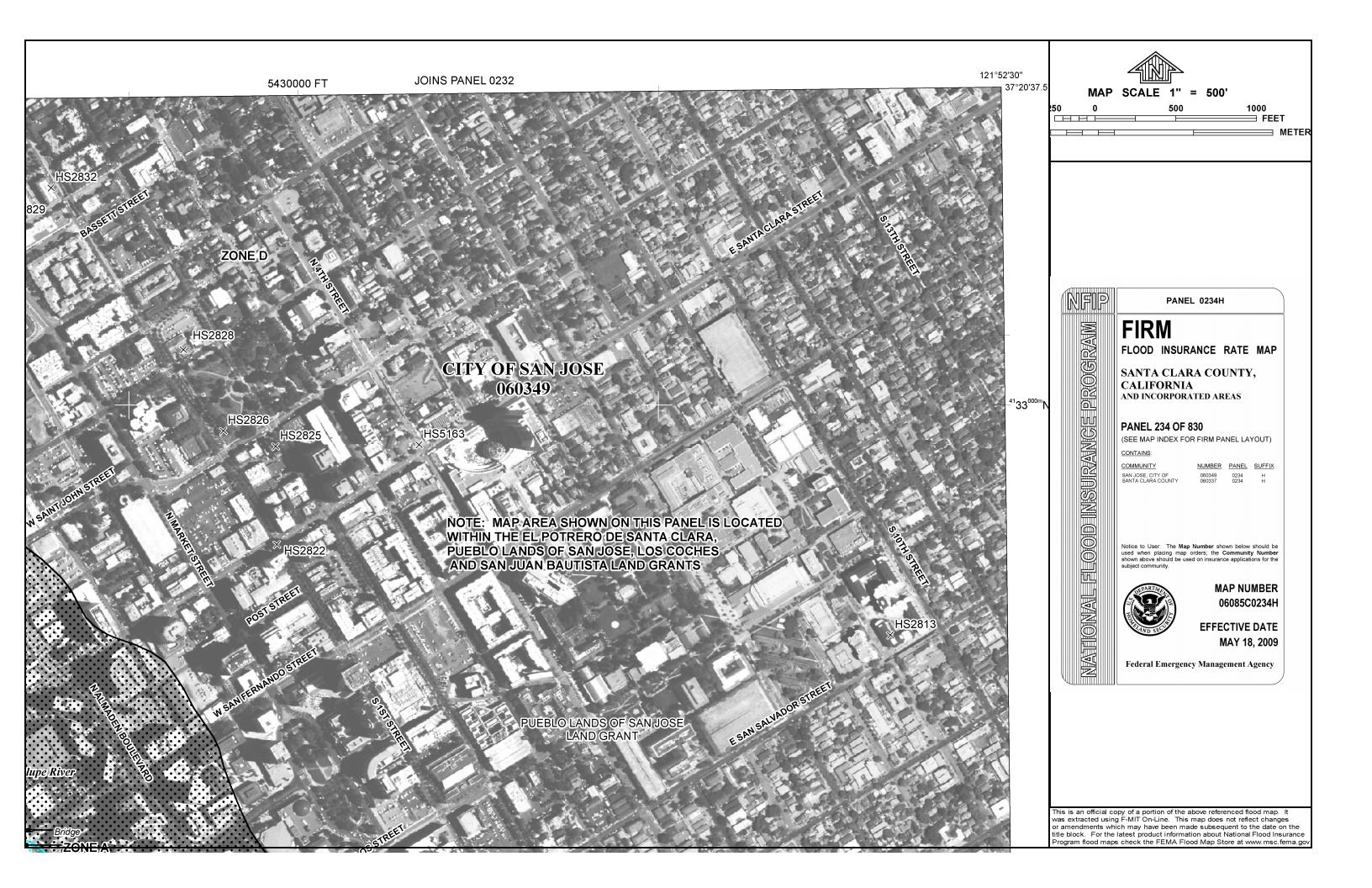
5.1 Printed References

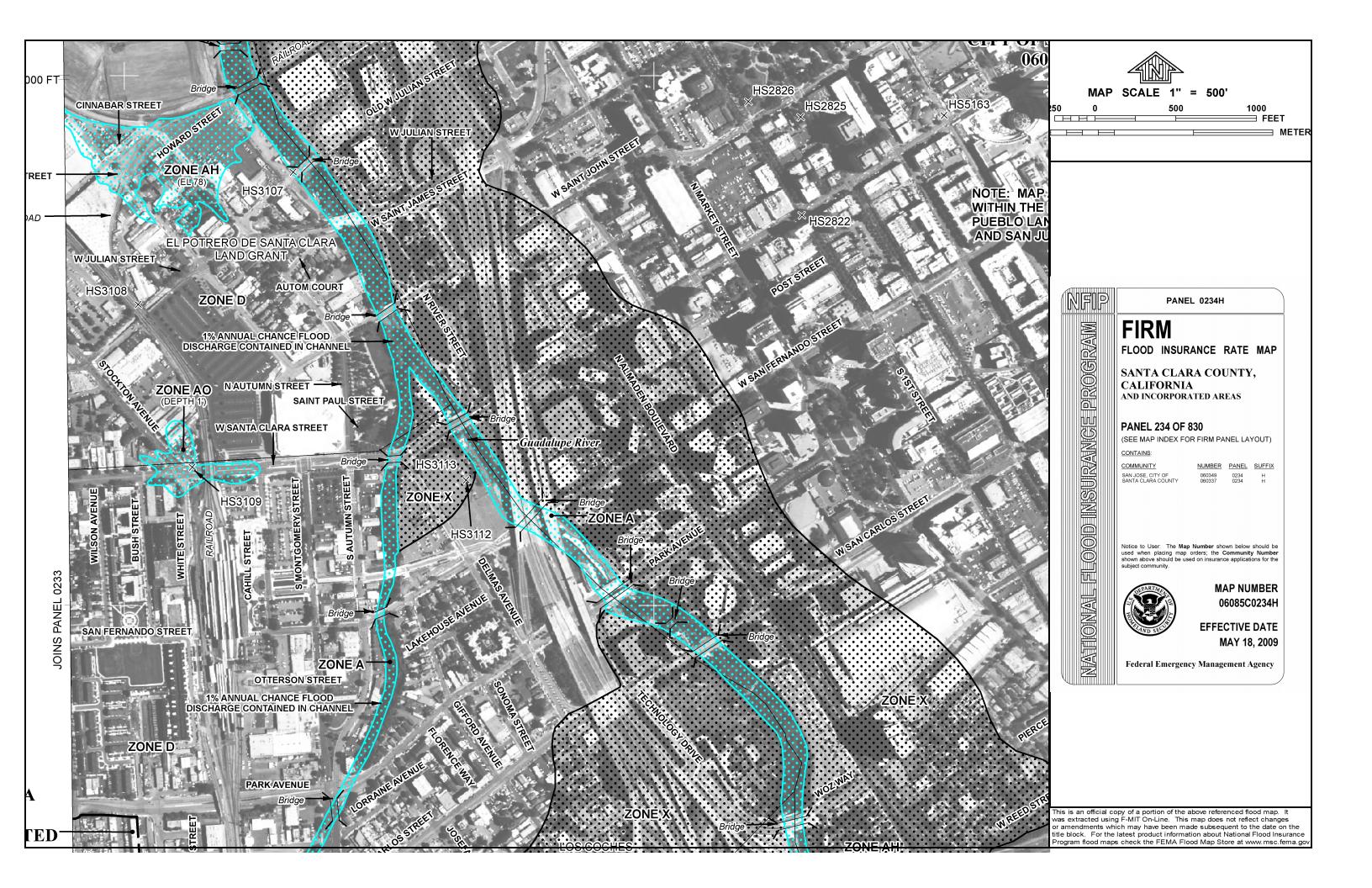
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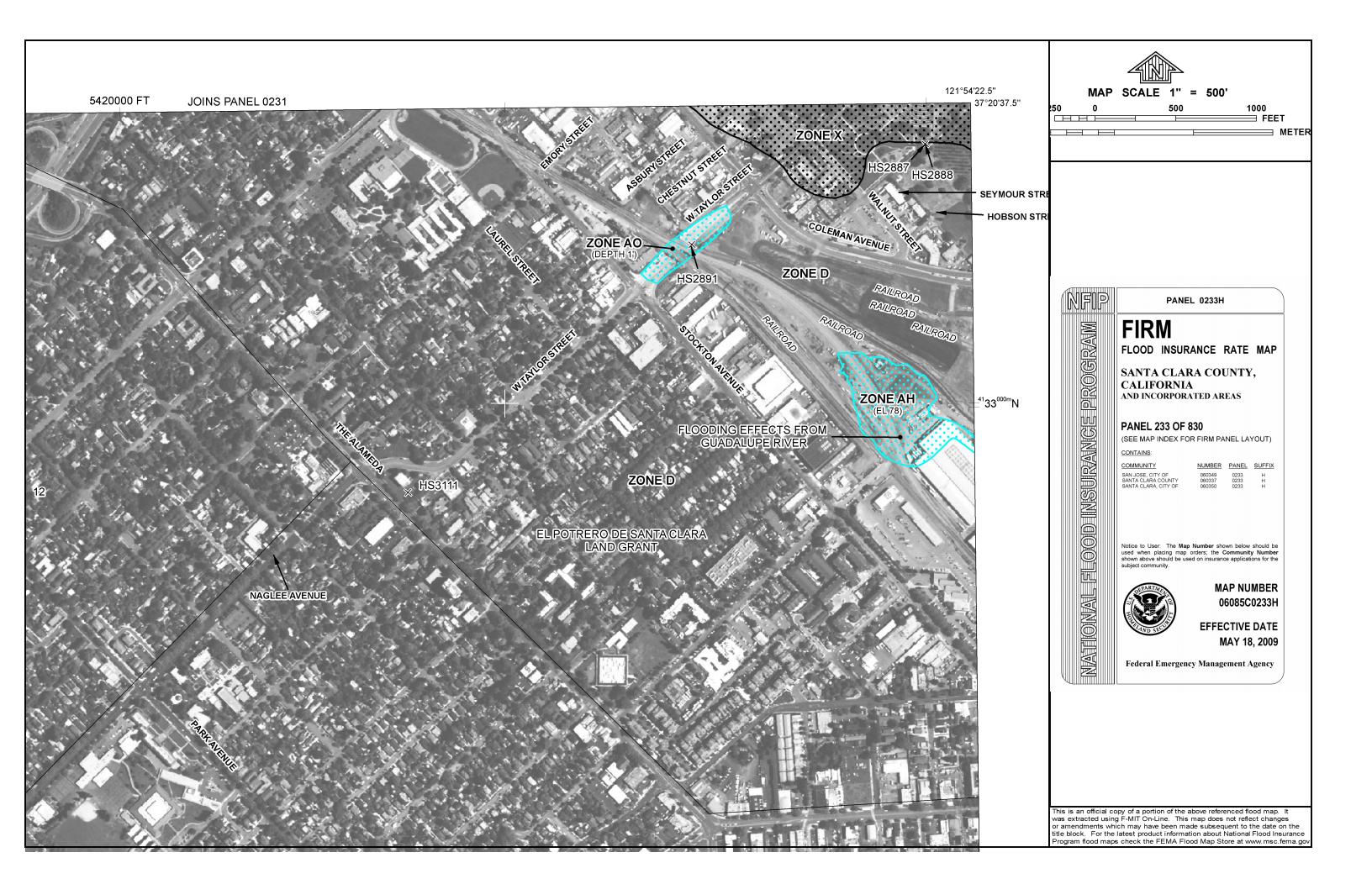
Appendix A Flood Insurance Rate Maps

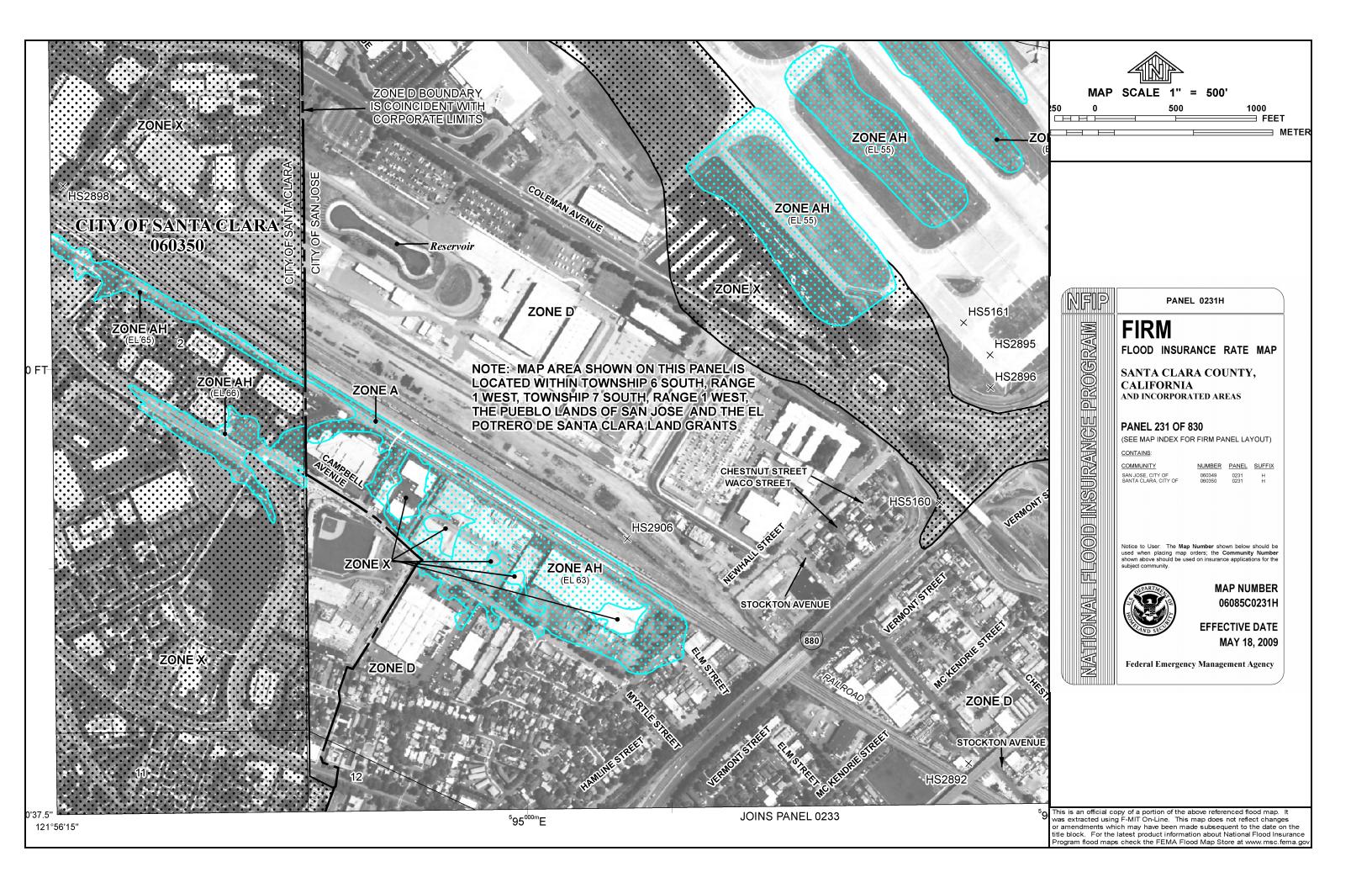


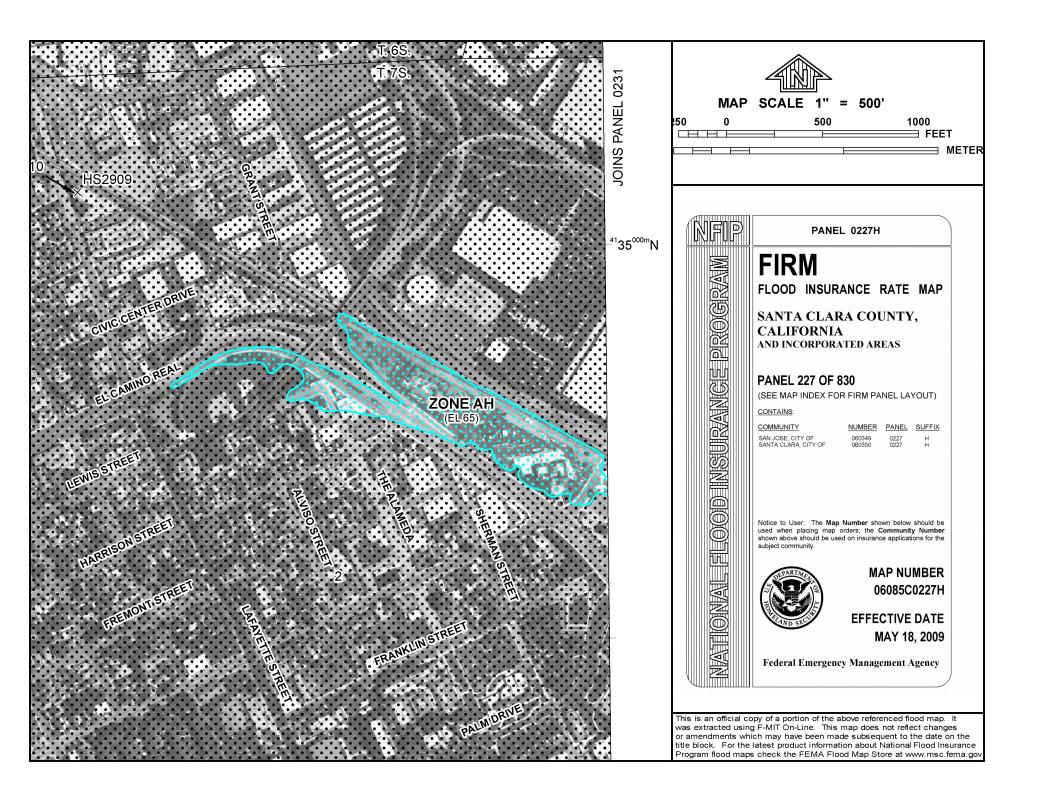












Appendix B Summary Floodplain Encroachment Report

SUMMARY FLOODPLAIN ENCROACHMENT REPORT Alum Rock Station and Joint development

	<u>4</u>						
Fed	eral-Aid Project Number	(Local Assistance)		N/A			
Pro	eral-Aid Project Number ect No.:N/A	Br	idge No	N/A			
Lin	its: Between 28th Street	and 101 and E St Jan	mes St and 5	Wounds Lane.			
Flo	odplain Description: Acco	ording to FIRM 060850	C0251J, a large	e comingled floo	dplain of	Lower Silver	Creek and
	ote Creek covers both sides						
	of this large floodplain (nor						
	ch covers the Alum Rock St						
	k Avenue) as Zone AO with						
	oximately 4.4 mile long sec				1th Coyot	e Creek and I	<u> ake</u>
Cun	ningham to provide flood p	rotection from a 1% ar	inual chance e	<u>vent.</u>			
					N	lo Yes	
1.	Is the proposed action a	longitudinal encroac	hment of the	base floodplain			
2.	Are the risks associated	_		-	$\overline{\lambda}$	<u> </u>	
	significant?	1	1	1	_		
3.	Will the proposed action	support probable in	compatible fl	oodplain	X	K	
	development?	11 1	1	1	_		
4.	Are there any significant	t impacts on natural	and beneficia	l floodplain va	lues?	<u></u>	
5.	Routine construction pro				$= \frac{\overline{\lambda}}{\lambda}$	<u> </u>	
	floodplain. Are there any						
	impacts or restore and pr						
	yes, explain.			•			
6.	Does the proposed action	n constitute a signifi	cant floodpla	in encroachmei	nt as X	K	
	defined in 23 CFR, Sect	ion 650.105(q).	•				
7.	Are Location Hydraulic	Studies that docume	nt the above	answers on file	? If _	X	
	not explain.						
	•						
PRE	PARED BY:						
-	1.4 D : . E :		Date				
Loc	al Agency Project Engineer						
			Date				
Eric	a Cruz - Local Agency / Co						

SUMMARY FLOODPLAIN ENCROACHMENT REPORT Downtown San Jose East Option Station and Joint Development

Dist4Co <u>SCl</u> Rte <u>N/A</u> P.N	/I1	<u>N/A</u>
Federal-Aid Project Number (Local Assistance) N/A		
Project No.: <u>N/A</u> Bridge No. <u>N/A</u>		<u> </u>
Limits: Santa Clara Street between 4th and 6th Street.		
Floodplain Description: <u>According to FIRM 06085C0234H</u> , the <u>Downtown San Jose Eas</u> Zone D. Zone D is a floodplain where flooding is undetermined but possible; Zone l		
floodplain. The Downtown Project is the second project in a string of three projects		•
starting at San Francisco Bay and moving upstream (south) to where the river meets	_	_
San Jose. The projects are being built in stages, so that the downstream projects are		
upstream projects. The Lower Guadalupe Project improves the capacity of the river	_	
880, and was completed in December 2004. Now the channel is able to safely pass t		
flow from the Downtown Project. Similarly, with the Downtown Project complete,		
flows from the Upper Guadalupe Project, which will modify the channel from High		
Road and is now in the engineering and design stages. With the proper permits and		
federal government, the projected completion date for the Upper Guadalupe Project		_
	No	Yes
1. Is the proposed action a longitudinal encroachment of the base floodplain?	<u>X</u> _	
2. Are the risks associated with the implementation of the proposed action	<u>X</u> _	
significant?		
3. Will the proposed action support probable incompatible floodplain development?	<u>X</u> _	
4. Are there any significant impacts on natural and beneficial floodplain values?	<u>X</u> <u>X</u>	
5. Routine construction procedures are required to minimize impacts on the	<u>X_</u>	
floodplain. Are there any special mitigation measures necessary to minimize impacts or restore and preserve natural and beneficial floodplain values? If		
yes, explain.		
6. Does the proposed action constitute a significant floodplain encroachment as	<u>X_</u>	
defined in 23 CFR, Section 650.105(q).		
7. Are Location Hydraulic Studies that document the above answers on file? If		<u>X</u> _
not explain.		
PREPARED BY:		
Date		
Local Agency Project Engineer		
200m. I gener i roject Engineer		
Date		

Erica Cruz - Local Agency / Consulting Hydraulic Engineer

SUMMARY FLOODPLAIN ENCROACHMENT REPORT Downtown San Jose West Option Station and Joint Development

			Co			N/A	P.M	•	N/A	-
			mber (Local Assist			N/A				_
Pro	ject No.:		N/A	Brid	dge No	N/A	<u>\</u>			
Lim	nits: Along S	Santa C	lara Street bety	ween 2nd and	1 4th Streets.					
Zon floc	e D. Zone Dodplain. The) is a flo Downto	: According to I odplain where own Project is	the second pr	<u>indetermined</u> roject in a str	but possible ing of three	e; Zone D projects a	is no long t	t considere	ed a base upe River,
star	ting at San F	rancisc	o Bay and mo	ving upstrean	n (south) to v	where the riv	er meets	Bloss	om Hill Ro	ad in south
San	Jose. The p	rojects a	are being built	in stages, so	that the dow	nstream proj	ects are c	omple	ete before t	he
ups	tream projec	ts. The	Lower Guada	lupe Project	improves the	capacity of	the river	from t	the Bay to 1	— Highway
_			d in December		-				•	
		_	vn Project. Sin				•			
			uadalupe Proj	•		•	-		•	
			engineering a							
			projected con						_	
	8		<u> </u>	<u></u>		<u> </u>				
								No	Yes	
1.	Is the prop	osed act	tion a longitud	inal encroach	ment of the	base floodpla	ain?			
2.		ks assoc	tiated with the					<u>X</u> <u>X</u>		
3.	_	oposed	action support	probable inc	ompatible flo	oodplain		<u>X_</u>		
4.			ificant impacts	s on natural a	nd heneficial	floodplain v	zalues?	<u>X_</u>		
5.			on procedures					<u>X</u> _		
٥.			ere any special	-		-		<u> </u>		
			and preserve n							
	yes, explai		and preserve i	iaturar and oc		apiain varue.	3. H			
6.			action constit	ute a cionific	ant floodplai	n encroachm	ent ac	<u>X_</u>		
0.			, Section 650.		ani mooupiai	ii encroaciiii	ieni as	Λ_		
7.			raulic Studies	· •	ut the cheve o	maryara on fi	109 If		v	
7.	not explain	-	laune Studies	mai documen	it tile above a	uisweis on 11	ne: n		<u>X_</u>	
	not emplain									
PRE	PARED BY	<i>Y</i> :								
				1	Date					
Loc	al Agency Pr	oiect En	gineer	<i>L</i>	<u></u>					
Loc	ar rigority in	oject Em	5							
				I	Date					
Eric	a Cruz - Loca	al Agenc	y / Consulting I	Hydraulic Eng	ineer					

SUMMARY FLOODPLAIN ENCROACHMENT REPORT Diridon Station North Option and Joint Development

		Co						
Fed	eral-Aid Project	Number (Local Assis	stance)]	N/A			
Pro	ject No.:	<u>N/A</u>	Brid	lge No	N/A			
		tion North Option	n would be loc	cated undergr	ound under A	<u>lutumn Str</u>	eet and dire	ctly south of
<u>San</u>	ta Clara Street.							
inte	rsection of W San	ion: According to ta Clara Street and nce shallow flooding	Stockton Aven	ue at the vicin	ity of the Diric	lon Station	in the City of	San Jose,
						No	o Yes	
1.	Is the proposed	action a longitud	linal encroach	ment of the b	ase floodplai			
2.		ssociated with the				X		
3.	_	sed action suppor	t probable inco	ompatible flo	odplain	X		
	development?	• •	-	-	•	·	_	
4.	•	ignificant impact						
5.		uction procedures						
	-	there any special ore and preserve	_		•			
	yes, explain.	1			•			
6.	Does the propo	sed action constitution 650.	_	ant floodplair	n encroachmen	nt as X		
7.		Iydraulic Studies		t the above a	nswers on file	? If	_ X_	
	not explain.							
PRE	PARED BY:							
			L)ate				
Loc	al Agency Project	Engineer						
			<i>D</i>) ate				
Fric	a Cruz - Local Ac	rency / Consulting						

SUMMARY FLOODPLAIN ENCROACHMENT REPORT Diridon Station South Option and Joint Development

Dist	<u>4</u> l-Aid Project Numbe	_Co	<u>SCl</u>	Rte	N/A	P.M	•	N/A	
Federa	I-Aid Project Number	r (Local Assistat	nce)	<u> </u>	N/A				-
Project	No.:N/A	<u> </u>	Bridge	No	<u>N/A</u>				
Limits: Street.	Diridon Station Sou	ath Option	would be locate	d undergr	ound betwee	n Los G	atos C	Creek and A	<u>utumn</u>
intersec	lain Description: Acc tion of W Santa Clara % annual chance shall	Street and S	tockton Avenue a	t the vicin	ity of the Diri	don Stati	on in t	he City of Sa	ın Jose,
<u>D.</u>									
							No	Vac	
1 Io	the muoneed estion	a lanaitudir	al an ana a ahma	ot of the h	osa flaadelai	m 9	No v	Yes	
	the proposed action a	_				ın?	<u>X</u> <u>X</u>		
sig	re the risks associated gnificant?		1	1	_		Δ_		
	ill the proposed action	n support p	probable incomp	oatible flo	odplain		<u>X_</u>		
	evelopment?								
	re there any significa						<u>X</u> <u>X</u>		
	outine construction p						<u>X</u> _		
	oodplain. Are there ar	• 1	_		•				
	npacts or restore and	preserve na	tural and benefi	cial flood	plain values'	? If			
-	es, explain.								
	oes the proposed acti			floodplain	encroachme	ent as	<u>X_</u>		
	efined in 23 CFR, Sec				21.1	2.72			
	re Location Hydrauli	c Studies th	at document the	e above ar	nswers on file	e? If		<u>X_</u>	
nc	ot explain.								
PREPA	RED BY:								
			Date						
Local A	agency Project Enginee								
			D .						
Erica C	ruz - Local Agency / C	onsulting H							

SUMMARY FLOODPLAIN ENCROACHMENT REPORT End-of-the-Line Yard and Shops Facility

	<u>4</u> C				_ P.M	_N/A	
Fed	eral-Aid Project Number (1	Local Assistance)		<u>N/A</u>			
Pro	ect No.:N/A_	Bri	dge No	N/A			
	its: The Yard and Shops I						
	extend to Brokaw Road no			-			
	n the Santa Clara Station a	nd cross under the D	<u>e La Cruz E</u>	<u> Boulevard overpa</u>	ass and tern	ninate on the	<u>north</u>
side	of the overpass.						
	odplain Description: Accor						
	nded by I-880 to the south, an						
<u>desi</u>	gnated as Zone A, and others	are designated as Zor	ie AH, with I	% annual chance	WSE rangii	ig from 63 ft to	66 It.
					No	Yes	
1.	Is the proposed action a le	ongitudinal encroach	ment of the	base floodplain			
2.	Are the risks associated v				$\frac{X}{X}$		
	significant?	The same same same same same same same sam	1011 01 1110 p	opos cu ucu on	<u></u>		
3.	Will the proposed action	support probable inc	ompatible f	loodplain	<u>X</u> _		
	development?	F F					
4.	Are there any significant	impacts on natural a	nd beneficia	ıl floodplain valu	ies? X		
5.	Routine construction prod	-		*	ies? $\frac{X}{X}$		
	floodplain. Are there any			-			
	impacts or restore and pre			•			
	yes, explain.						
6.	Does the proposed action	constitute a signific	ant floodpla	in encroachment	as X_		
	defined in 23 CFR, Section	_	1				
7.	Are Location Hydraulic S	` . *	it the above	answers on file?	If	<u>X_</u>	
	not explain.						
	1						
PRE	PARED BY:						
		1	Date				
Loc	al Agency Project Engineer						
		7	Data				
Eric	a Cruz - Local Agency / Con						
1110	a craz Local rigolog / Coll	saming 11, draunc Ling	111001				

Appendix C Location Hydraulic Study Forms

LOCATION HYDRAULIC STUDY FORM Alum Rock Station and Joint development

	4			Rte	N/A	_P.M	N/A	_EA:	N/A
Federal-Aid Pro	ject Nun	1ber:	N/A						<u></u>
Floodplain Desc	cription:								
According to FI	RM 0608	35C0251H.	a large comi	ngled floodpla	in of Lov	ver Silve	er Creek	and Cov	yote Creek covers both
									of this large floodplain
						_		•	covers the Alum Rock
									k Avenue) as Zone AO
									imately 4.4 mile long
						_			to provide flood
									s 6-reach flood control
-						_			003 for the "improvement
in progress" con	dition of	Lower Sil	ver Creek bet	ween Coyote	Creek and	d I-680.	The mo	del resu	Its indicated that the 1%
annual chance fl				•					
Therefore, the an	rea north	east of the	US 101/Lowe	er Silver Creek	crossing	g is no lo	nger wi	thin a flo	oodplain. However, the
area south of the	e Lower S	Silver Cree	k remains wit	hin the base fl	oodplain	because	this are	a is with	nin the commingled
floodplain of bo	th Lower	Silver Cre	ek and Coyo	e Creek. Upo	n comple	etion of a	all 6 reac	ches and	Lake Cunningham,
SCVWD and the	e city of	San Jose w	ill be able to	demonstrate to	FEMA	that all h	omes ar	nd busine	esses subject to the 1%
annual chance fl	lood fron	n Lower Si	lver Creek ha	ve been protec	ted. Wor	k on Re	aches 4-	6 are on	-going and according to
SCVWD will ru	n throug	h Decembe	<u>er 2017.</u>						
1.5	c D	1							
_	_								inimize floodplain impacts)
									lities would be above
	_				ing unit	structure	s propos	sed for th	he joint development
would also be w	ithin the	AH and A	<u>O floodplains</u>	<u>.</u>					
2. ADT:	Current_	N/.	<u>A</u>	Projec	ted	N/A	_		
3. Hydraulic Da	ta:	Base Flood	Q100=	N/A cfs					
J				The flood of record	, if greater t	han 0100:			
		Q = N/2		•		:	N/A		
				N/A cfs			N/A		
A METE		**				T TEG			
Are NFIP maps	and stud	ies availab	le?			YES	_		
4. Is the highway	y locatio	n alternativ	e within a reg	ulatory floody	vay?				
	•		•	•	NO	N/A	YES_		
									_
5. Attach map w	ith flood	l limits outl	ined showing	all buildings	or other i	mprovei	nents w	ithin the	base floodplain.
•		ackwater d	_						•
		Residences				NO	X	YES	
	B.	Other Bldg	s?			NO	X	YES	
		Crops?				NO	X	YES	
			d beneficial F	loodplain valu	es?	NO	X	YES	
	al flood-pla	in values" shal	l include but are ne	ot limited to fish, wi	ldlife, plants	, open spac	e, natural i		entific study, outdoor recreation,
6. Type of Traff	ic:								
		genev supr	oly or evacuat	ion route?		NO	X	YES	
			cle access?	ion route:		NO	X	YES	
			ur available?			NO		YES YES	X
		ol bus or m				NO	X	YES_	
	D. DUID	or ous or III	an route:			110	/1	_ 110	

7. Estimated duration of traffic interruption for 100-year event hours: N/A

LOCATION HYDRAULIC STUDY FORM cont. Alum Rock Station and Joint development

Dist.	4				N/A				
Federa	al-Aid Project Nu	umber:		N/A					
EA	N/A				Bridge No		N/A		
8. Esti	mated value of (A.	Q100 flood dama Roadway	•	any) – m N/A		vel.			
	В	Property Total	\$ \$	N/A N/A					
9.	Assessment of	Level of Risk	Mode	X rate					
For Halterna		, during design	phase, ac	dditional	l Design Study	Risk An	alysis may be	e necessary	y to determine design
PREP	PARED BY:								
Signat I certify form is a	that I have conducted o	a Location Hydraulic .						n items numbe	ers 3, 4, 5, 8, and 9 of this
Erica	Cruz - Local Age	ency/Consulting	Hydrau	 lic Engir	Date neer				
	re any longitudin opment?	al encroachment			roachment, or _YES		ort of incomp	oatible Flo	odplain
If yes,	provide evaluati	ion and discussion	on of pra	ecticabili	ity of alternativ	ves in acc	ordance with	23 CFR 6	550.113
	nation developed t files.	to comply with	the Fede	eral requ	irement for th	e Locatio	n Hydraulic S	Study shal	l be retained in the
	that item numbers 1, 2 endations of said repor		ion Hydrau	ılic Study F	Form are accurate a	nd will ensur	e that Final PS&I	E reflects the in	nformation and
					Date				
Local	Agency Project	Engineer (local as.	sistance pro	ojects)					

LOCATION HYDRAULIC STUDY FORM Downtown San Jose East Option Station and Joint Development

Dist.	4	Co	SCl	_Rte		N/A	_P.M	N/A	_EA:	N/A
Federal-Aid	l Project N	umber:	N/	A						<u> </u>
Floodplain 1	Dogarintia	n•								
•	•		the Downto	own San I	lose Fas	t ontion	ic entir	elv with	in a Zone	D. Zone D is a
						_		•		floodplain. The
-		_		-						River, starting at San
										in south San Jose. The
										e upstream projects.
								_		y 880, and was
•		-	-					-	_	ce flood flow from the
_										s the flows from the
•	•	•			•	_		,		
	_	•		•		•	•			Hill Road and is now
					_			_		federal government,
the project	ea compi	etion date for	the Opper	Guadait	ipe Pro	ject is i	Decemi	<u> </u>	<u>0.</u>	
1 Descripti	on of Pror	ocal (include any	nhysical harric	rsia concra	eta harriare	soundwa	lls atc and	l dosian ol	amante ta mir	nimize floodplain impacts)
•								-		ve within the D
		-				-				ment would also be
										ocation, and mitigation
will not be			111000	<u> </u>			01 0110	110,00		<u> </u>
***************************************	100000									
2. ADT:	Curre	ntN/A	<u> </u>		Projecto	ed	N/A			
3. Hydraulio	c Data:	Base Flood			cfs					
		WSE100=_		The flood o						
		Q = N/A			2					
		Overtoppin	g flood Q=	N/A	_cfs	WSE=	-	N/A		
Are NFIP m	naps and st	udies availabl	e?				YES			
	1							_		
4. Is the hig	hway loca	tion alternativ	e within a r	egulatory	floodwa	ay?				
						NO	N/A	_YES_		_
5. Attach m	ap with flo	ood limits outli	ned showi	ng all buil	dings or	r other i	mprove	ments w	ithin the	base floodplain.
Dot	antial O10	O boolsssssa								
rou	A.	0 backwater d Residences	_				NO	X	YES	
	В.	Other Bldgs					NO	X	YES YES	
	C.	Crops?	· ·				NO	X	YES_	
	D.	Natural and	beneficial	Floodplai	n values	s?	NO	X	YES YES	
"Natural and be										ntific study, outdoor recreation,
agriculture, aqu	aculture, fore.	stry, natural modero	ution of floods,	water quality	maintenar	ice, and gr	oundwater	recharge.		
6 Type of T	Fraffice									
6. Type of T		nergency supp	ly or avacu	ation rout	-27		NO	X	YES	
		nergency supp nergency vehic		aaon roul			NO	X	TES _YES	
		acticable detor		?			NO		YES YES	X
		hool bus or ma		•			NO	X	YES_	
	2.50								~_	
7. Estimated	d duration	of traffic inter	ruption for	100-year	event ho	ours:	N/A			

LOCATION HYDRAULIC STUDY FORM cont. Downtown San Jose East Option Station and Joint Development

Dist.	4	Co	SCl		N/A			
Federa	al-Aid Project N	umber:		N/A				
EA	N/A				Bridge No		N/A	
8. Esti		Q100 flood dama			oderate risk lev	el.		
	A .	Roadway	\$		<u> </u>			
	В	Property	\$	N/A				
		Total	\$	N/A	<u></u>			
9.	Assessment of	f Level of Risk		X rate				
For Halterna		s, during design		dditional	Design Study	Risk Anal	lysis may be ne	cessary to determine design
PREP	PARED BY:							
Signat I certify form is a	that I have conducted	a Location Hydraulic	Study consi					ns numbers 3, 4, 5, 8, and 9 of this
Erico	Cruz I ocal A a	ency/Consulting	Hydron	lie Engir	Date			
Effica	Ciuz - Locai Ag	ency/Consuming	пушаи	ne Engn	icei			
	re any longitudin opment?	nal encroachmen			roachment, or a YES		rt of incompatil	ole Floodplain
If yes,	provide evaluat	ion and discussion	on of pra	acticabili	ty of alternative	es in acco	ordance with 23	CFR 650.113
	nation developed et files.	l to comply with	the Fed	eral requ	irement for the	Location	Hydraulic Stud	ly shall be retained in the
	that item numbers 1, 2 endations of said repo		tion Hydrai	ulic Study Fo	orm are accurate and	l will ensure	that Final PS&E refl	ects the information and
					Date			
Local	Agency Project	Engineer (local as	sistance pro	oiects)				

LOCATION HYDRAULIC STUDY FORM Downtown San Jose West Option Station and Joint Development

Dist. 4 Federal-Aid Project N	Co	SC1	_Rte	N/A	P.M	N/A	EA <u>:</u>	N/A
Federal-Aid Project N	umber:	N/A	<u> </u>					
Floodplain Description		41 D	G I	***	. ,.	1	. 7	D. 7 D
According to FIRM 0				_		•		
floodplain where flo								
•							_	River, starting at San
-								d in south San Jose. The
The Lower Guadalu						-		e upstream projects. ay 880, and was
completed in Decem	ber 2004. No	ow the chan	nel is able to	o safely p	ass the	1% ann	ual chai	nce flood flow from the
Downtown Project.	Similarly, wi	th the Dow	ntown Proje	ct comple	ete, succ	essfully	y handle	es the flows from the
Upper Guadalupe Pr	oject, which	will modify	y the channe	el from Hi	ghway	280 to I	Blossom	n Hill Road and is now
in the engineering as	nd design sta	ges. With th	ne proper pe	rmits and	with fu	nding f	rom the	federal government,
the projected comple	etion date for	the Upper	Guadalupe l	Project is	Decem	ber 201	6.	
floodplain. The propo	sed retail, offi	ce and dwell	ing unit struc	ctures for tl	he joint	developr	nent wo	ove within the Zone D uld also be within the and mitigation will not
2. ADT: Curre	ntN/A	A	Proj	ected	N/A			
3. Hydraulic Data:	Base Flood	`						
			_The flood of reco					
		cfs	NT/A - C-		·			
	Overtoppin	g 1100a Q=	N/A cfs	WSE=	=	N/A	_	
Are NFIP maps and st	udies availabl	e?			YES			
4 To the high-way to so	4: a.m. a14 a.m. a4:		1-4	4				
4. Is the highway loca	tion aiternativ	e within a re	guiatory 1100	idway? NO	N/A	YES		
					1 1/11	125		_
5. Attach map with flo	ood limits outl	ined showing	g all building	s or other	improve	ments w	ithin the	base floodplain.
•		·			•			
Potential Q10	0 backwater d	amages:						
A.	Residences				NO	X	_YES_	
B.	Other Bldg	s?			NO	X	_YES_	
C.	Crops?				NO	X	_YES_	
D.			Floodplain va		NO	X	_YES_	
"Natural and beneficial flood- agriculture, aquaculture, fores							beauty, scie	entific study, outdoor recreation,
	•		· *	. 0		Ü		
6. Type of Traffic:								
	nergency supp	-	tion route?		NO	X	_YES_	
	nergency vehic				NO_	_ <u>X</u>	_ YES	
	acticable detor				NO_	37	_YES_	X
D. Sc	hool bus or ma	an route?			NO	X	YES	

LOCATION HYDRAULIC STUDY FORM cont. Downtown San Jose West Option Station and Joint Development

Dist.	4	Co						
Feder	al-Aid Project N	Number:		N/A			N/A	_
EA	N/A	<u></u>			Bridge No		N/A	_
7. Est	imated duration	of traffic interrup	ption for	100-year	event hours:	N/A	_	
8. Est	imated value of	Q100 flood dama	ages (if a	any) – mo	derate risk leve	el.		
	A.	Roadway	\$	N/A				
	В	Property	\$	N/A	_			
	_	Total	\$	N/A	- -			
9.	Assessment of	of Level of Risk		X rate				
For H altern		ts, during design		dditional I	Design Study R	Risk Ana	lysis may be necessa	ary to determine design
PREI	PARED BY:							
	ture: that I have conducted accurate.	l a Location Hydraulic .	Study consi	stent with 23	CFR 650 and that th	ne informati	on summarized in items nur	mbers 3, 4, 5, 8, and 9 of this
				I	Date			
Erica	Cruz - Local Ag	gency/Consulting						
Ic that	ro ony longitudi	nal anaroachman	t cionifi	cent enerc	and mant or ar	av cuppo	rt of incompatible F	loodplain
	opment?	nai encroacimien	_		YES	• • •	it of incompatible f	Юоцыян
If yes	, provide evalua	tion and discussion	on of pra	acticability	y of alternative	s in acco	ordance with 23 CFF	₹ 650.113
	mation develope et files.	d to comply with	the Fed	eral requii	rement for the	Location	Hydraulic Study sh	nall be retained in the
	v that item numbers 1, cendations of said repo		tion Hydrai	ulic Study For	m are accurate and	will ensure	that Final PS&E reflects th	e information and
				<i>L</i>	Date			
Local	Agency Project	Engineer (local as	sistance pro	niects)				

LOCATION HYDRAULIC STUDY FORM Diridon Station North Option and Joint Development

Dist.	4	Co Tumber:	SC1	Rte	1	V/A	_P.M	N/A	_EA:	N/A
Federal-Aid	Project N	lumber:	N/	<u>A</u>						<u> </u>
Floodplain I	Descriptio	n:								
•	•		a small are	a designate	ed as Zor	ne AO	exists a	at the int	ersection	of W Santa Clara Street
and Stockton	n Avenue	at the vicinity	of the Diric	don Station	n North (Option	in the (City of S	an Jose,	with a 1% annual chance
shallow floo	ding dept	h of 1 ft. The	rest of the st	tation and	joint dev	elopn	nent wor	uld be in	a Zone I	<u>).</u>
1 Description	n of Pron	ogg1 /: 1 1	1 . 11 .		, .	,	11			
•								_		nimize floodplain impacts) of Santa Clara Street,
										ne proposed retail, and
		ne joint develo						<i>D</i> 11000	<u> </u>	ie proposed retain, and
-		•						olain. Po	otential m	ninimization measures
	_	-	-				_			ampus is not located
			_							nual chance WSE at
west Santa	Clara Stı	eet. There w	ill minima	l floodpla	ain impa	cts as	a resul	lt of the	Project	at this location, and
mitigation v	will not b	<u>se required.</u>								
2 ADT.	C	NT/		,	D	ı	NT/A			
2. ADT:	Curre	entN/A	<u> </u>		Projected	l	N/A			
3. Hydraulic	Data:	Base Flood	O100=	N/A	cfs					
J		WSE100=_				reater ti	han Q100:			
		Q = N/A						N/A		
		Overtoppin	g flood Q=	<u>N/A</u>	cfs V	VSE=		N/A		
Ana MEID m	one and a	tudiaa availa h l	a-9				YES			
Ale INFIF III	aps and s	tudies availabl	e ?		_		IES	<u></u>		
4. Is the high	nway loca	tion alternativ	e within a r	egulatory f	floodway	?				
					ľ	1O	N/A	_YES_		_
5 A 440 a la 1111	:41- 61.	1::	المائيين ما ما المامان		1:	.41 :			ا ماه ماهاد	haaa flaadulain
3. Attacii ilia	ıp willi ile	ood illilits outi	med snown	ig an bunc	ings or c	omer i	mprove	mems w	ium me	base floodplain.
Pote	ntial Q10	0 backwater d	amages:							
	A.	Residences					NO	X	_YES_	
		Other Bldg	s?				NO	X	YES	
	C.	Crops?					NO	X	YES	
"Natural and ha	D.	Natural and					NO_	X	YES_	ntific study, outdoor recreation,
		-piain vaiues "snaii stry, natural moder							beauty, scien	шус миау, ошаоот тестешоп,
6. Type of T	raffic									
o. Type of T		nergency supp	ly or evacua	ation route	27		NO	X	YES	
		nergency vehic	-		•		NO_	X	YES_	
		acticable detoi		?			NO		YES	X
	D. Sc	hool bus or m	ail route?				NO	X	YES _	
7. Estimated	duration	of traffic inter	ruption for	100-year e	event hou	ırs:	N/A			
9 Fatimat - 1	volve of	0100 fl ~ ~ 1 1.		mv.) 1	1 ـ المحمد	r 10-1-1				
o. Esumated	value of A.	Q100 flood da Roadway	mages (11 a ¢	ny) – moa N/A	erate risk	level	l .			
	A. B	Property	φ \$	N/A						
	D	Total	\$ <u></u>	N/A						

LOCATION HYDRAULIC STUDY FORM cont. Diridon Station North Option and Joint Development

Dist.	4	Co	SC1	Rte	N/A	P.M	N/A	
Federa	ıl-Aid Project Nu	mber:		N/A				
EA	N/A	_			Bridge No		N/A	_
9.	Assessment of	I aval of Dick	Low	v				
9.	Assessment of	Level of Risk	Mode	X rate	<u> </u>			
For Hi alterna		during design [phase, ac	lditional	Design Study l	Risk Anal	ysis may be necess	sary to determine design
PREP	ARED BY:							
Signat I certify i form is a	that I have conducted a	Location Hydraulic S	Study consi.	stent with 23	3 CFR 650 and that t	he informatio	on summarized in items nu	umbers 3, 4, 5, 8, and 9 of this
Erica (Cruz - Local Age	ncy/Consulting	Hydrau	lic Engin	neer			
	e any longitudina pment?	l encroachment			roachment, or a _YES		rt of incompatible I	Floodplain
If yes,	provide evaluation	on and discussion	on of pra	cticabili	ty of alternative	es in acco	rdance with 23 CF	R 650.113
Inform projec	•	to comply with	the Fed	eral requ	irement for the	Location	Hydraulic Study sl	hall be retained in the
	that item numbers 1, 2, endations of said report		ion Hydrau	lic Study Fo	orm are accurate and	will ensure	that Final PS&E reflects t	he information and
					Date			
Local	Agency Project E	Engineer (local ass	sistance pro	iects)				

LOCATION HYDRAULIC STUDY FORM Diridon Station South Option and Joint Development

Dist.	4	Co	SC1	Rte		N/A	_P.M	N/A	_EA:	<u>N/A</u>
Federal-	Aid Project l	Number:	N	[/A						<u> </u>
Floodpla	ain Description	on:								
			a small are	ea designa	ted as Z	Zone AC	exists a	at the int	ersection	n of W Santa Clara Street
and Stoc	kton Avenue	e at the vicinity	of the Dir	idon Static	on Soutl	h Option	in the C	City of S	an Jose,	with a 1% annual chance
shallow	flooding dep	oth of 1 ft. The i	est of the	station and	l joint d	<u>levelopn</u>	nent wou	ıld be in	a Zone	<u>D.</u>
1 Descr	intion of Pro	nosal (include any	nhysical barr	iars i a concre	ota harriar	rs soundwa	lls etc and	l design ele	mants to m	inimize floodplain impacts)
	_	_								Street, but the station's
										il, and office structures
	-	ment would also					•			
					·	fill in th	e flood	olain. Po	otential r	minimization measures
may incl	lude local dra	ainage system i	mproveme	nts to deal	with th	ne small	Zone A	O. The	station o	campus is not located
within a	any base flo	odplain and th	e elevatio	ons at the	propos	ed stati	on are a	above th	ne 1% ai	nnual chance WSE at
west Sa	nta Clara St	treet. There w	ill minim	al floodpl	lain im	pacts as	a resul	t of the	Project	at this location, and
mitigati	on will not	be required.								
2 ADT	C	NT//			ъ :	. 1	NT/A			
2. ADT:	Curr	ent N/A	<u> </u>		Project	ted	N/A	_		
3. Hydra	aulic Data:	Base Flood	O100=	N/A	cfs					
- · J · · ·		WSE100=_			_	if greater t	han Q100:			
		Q = N/A						N/A		
		Overtoppin			_cfs	WSE=	: <u> </u>	N/A		
Are NFI	P maps and s	studies availabl	e?				YES	_		
4 Is the	highway loc	ation alternativ	e within a	regulatory	floodw	vav?				
i. Is the	ingiiway ioc	ation aiternativ	e within a	regulatory	1100011		N/A	YES		
5. Attacl	h map with f	lood limits outl	ined showi	ing all buil	ldings o	or other i	mprove	ments w	ithin the	base floodplain.
	Potential O1	00 backwater d	amages:							
•	A.	Residences	_				NO	X	YES	
		Other Bldgs					NO_		YES	
	C.	Crops?					NO	X	YES	
	D.	Natural and	beneficial	Floodplai	in value	es?	NO	X	YES	
		d-plain values" shall estry, natural modere							beauty, scie	entific study, outdoor recreation,
адпсините	, адиасините, јот	esiry, natural moderi	uton oj jiooas,	, water quaity	татепа	ince, ana gi	оиниманет	recharge.		
6. Type	of Traffic:									
	A. E	mergency supp	ly or evacı	uation rout	te?		NO	X	_YES_	
		mergency vehic					NO	_ <u>X</u>	_ YES	
		racticable detou		e?			NO		_YES_	X
	D. S	chool bus or ma	ail route?				NO	X	YES _	
7. Estim	ated duration	n of traffic inter	ruption for	100-year	event h	nours:	N/A			
8 Estim	ated value of	f Q100 flood da	mages (if	anv) – mo	derate r	isk level	Ī			
J. 25mm	A.	Roadway	\$	N/A	worute 1	1010				
	В	Property	\$	N/A	_					
		Total	\$	N/A	- -					

LOCATION HYDRAULIC STUDY FORM cont. Diridon Station and Joint Development

Dist.	4	Co	SCl	Rte.	N/A	P.M	N/A	
Federa	al-Aid Project Nu	mber:		N/A				
EA	N/A				Bridge No		N/A	•
9.	Assessment of	Level of Risk	Mode	X erate				
For Hi		during design	phase, a	dditional	Design Study	Risk Anal	ysis may be necessar	ry to determine design
PREP	PARED BY:							
		Location Hydraulic S	Study consi	istent with 2.	3 CFR 650 and that t	he informatio	on summarized in items numi	bers 3, 4, 5, 8, and 9 of this
					Date			
Erica (Cruz - Local Age	ncy/Consulting	Hydrau	lic Engir	neer			
	re any longitudina opment?	l encroachment			roachment, or a _YES		rt of incompatible Flo	oodplain
If yes,	, provide evaluation	on and discussion	on of pra	acticabili	ty of alternative	es in acco	rdance with 23 CFR	650.113
Inform projec		to comply with	the Fed	eral requ	irement for the	Location	Hydraulic Study sha	all be retained in the
	that item numbers 1, 2, endations of said report		tion Hydrai	ulic Study Fo	orm are accurate and	l will ensure	that Final PS&E reflects the	information and
					Date			
Local	Agency Project E	Engineer (local as	sistance pro					

LOCATION HYDRAULIC STUDY FORM End-of-the-Line Yard and Shops Maintenance Facility

Dist. Federal-Aid	4 D : 4 N	Co	SC1	Rte	N/A	_P.M	N/A	_EA:	N/A_	
rederal-Ald	Project Nu	ımber:	N/	'A						
Floodplain D			10.500	G000477 1						
									ounded by I-880 designated as Zor	
				nual chance W					designated as Zoi	ile A, anu
_	_								nimize floodplain impa	
	_						-		facilities, include	_
									nimum of one for lease path such	
									ntenance Facilit	
		-	-					-	Road is 85 feet	
•				•		_			se the capacity	
		•	_	•				-	SCVWD and th	e city of
				at this locat					will minimal	
1100upiaiii 1	mpacis as	a resuit or t	ne Frojeci	at tills locat	ion, and m	ingano	11 W 111 11	01 06 16	<u>quireu.</u>	
2. ADT:	Curren	ntN/A	<u> </u>	Pro	jected	N/A	_			
2 1111:-	Data	D El 1	0100	62.66 -f-						
3. Hydraulic	Data:			63-66 cfs _The flood of rec		han 0100:				
							N/A			
		Overtopping	g flood Q=	N/A cfs	WSE=		N/A	_		
Are NFIP ma	ps and stu	ıdies availabl	e?			YES				
	•						_			
4. Is the high	way locati	ion alternative	e within a r	egulatory flo	-	NT/A	YES			
					NO	N/A	_ I ES		_	
5. Attach ma	p with floo	od limits outli	ned showin	ng all building	gs or other i	mprove	ments w	ithin the	base floodplain.	
Pote	ntial O100	backwater d	amages:							
		Residences'				NO	X	_YES_		
	B.	Other Bldgs	3?			NO	X	_YES_		
	C. D.	Crops?	hanafiaial	Floodplain va	oluoc?	NO NO	X X	_YES_ YES		
	eficial flood-p	olain values" shall	include but are	not limited to fish	, wildlife, plants	, open spac	e, natural l		entific study, outdoor re	creation,
agriculture, aqua	culture, forest	ry, natural modero	ution of floods,	water quality mair	ntenance, and gr	oundwater	recharge.			
6. Type of Tr	raffic:									
		ergency supp	-	ation route?		NO	X	_YES_		
		ergency vehic cticable detou		า		NO NO	<u>X</u>	_ YES YES	X	
		ool bus or ma		•		NO	X	YES_	Λ	
	2.5011	. J. Just of Ill	5			-· ~				
7. Estimated	duration o	of traffic inter	ruption for	100-year eve	nt hours:	N/A	_			
8. Estimated	value of C)100 flood da	mages (if a	ny) – modera	ite risk level					
	A.	Roadway	\$	N/A						

В

Property

\$ N/A

	Total	\$	N/A
--	-------	----	-----

LOCATION HYDRAULIC STUDY FORM cont. End-of-the-Line Yard and Shops Maintenance Facility

Dist.	4	Co	SCl	Rte	N/A	P.M	N/A	
Federa	l-Aid Project Nu	mber:		N/A				_
EA	N/A				Bridge No		N/A	<u> </u>
9.	Assessment of	Level of Risk	Mode	X rate				
For Hi		during design [phase, ac	lditional	Design Study	Risk Ana	lysis may be necess	sary to determine design
PREP	ARED BY:							
Signatu I certify to form is ac	hat I have conducted a	Location Hydraulic S	Study consi	stent with 23	3 CFR 650 and that	the informati	on summarized in items nu	umbers 3, 4, 5, 8, and 9 of this
					Date			
Erica (Cruz - Local Age	ncy/Consulting	Hydrau	lic Engin	eer			
	e any longitudina pment?	l encroachment			oachment, or a _YES		rt of incompatible F	Floodplain
If yes,	provide evaluation	on and discussion	on of pra	eticabilit	ty of alternativ	es in acco	ordance with 23 CFI	R 650.113
Inform project		to comply with	the Fede	eral requi	irement for the	Location	ı Hydraulic Study sl	hall be retained in the
0.0	that item numbers 1, 2, ndations of said report		ion Hydrau	lic Study Fo	orm are accurate an	d will ensure	that Final PS&E reflects to	he information and
					Date			
Local	Agency Project E	Engineer (local ass	istance pro					

LOCATION HYDRAULIC STUDY FORM

Santa Clara Station and Joint Development

Dist.	4	C	0	SC1			N/A	_P.M	N/A	EA:	N/A
Federa	l-Aid Proje	ct Number	·	N/.	<u>A</u>						<u> </u>
D1 4	1 D										
•	lain Descri	•	70227H and	d 060850	C0231H	the are	ac wast o	f the C	altrain T	racks bo	ounded by I-880 to the
											lesignated as Zone A, and
	are designa										iesignated as Zone 71, and
others.	are aesigna	tea as Zon	<u> </u>	170 41111	uui viiui	100 1151	, ranging	110111 0.	<u> </u>	<u>0 11.</u>	
1. Desc	cription of l	Proposal (in	clude any phys	sical barries	rs i.e. conc	rete barrier	rs, soundwal	ls, etc. and	l design ele	ements to min	nimize floodplain impacts)
											anta Clara Station would
be abo	veground th	ne station's	structures	and syst	em faci	<u>lities wo</u>	uld be ab	ove wit	hin a Zo	one X (sh	aded). The proposed
											<u>re will minimal</u>
<u>floodp</u>	<u>lain impac</u>	ets as a res	sult of the	<u>Project</u>	at this	location	, and mi	tigatio	n will n	ot be rec	<u>quired.</u>
2. ADT	г. С	urrent	NI/Δ			Project	ted	NI/A			
2. AD I	i. C	urrent	11/71	<u> </u>		Trojec	.cu	11//			
3. Hvd	raulic Data	: Base	e Flood Q1	00=	N/A	cfs					
J			E100=				if greater th	an Q100:			
			N/A				WSE=		N/A		
		Ove	rtopping fl	ood Q=	N/A	_cfs	WSE=	-	N/A	<u> </u>	
A N.T.	TID	1 . 1	11 11 0					MEG			
Are Ni	FIP maps ar	ia studies a	ivailable?					YES	_		
4 Is th	e highway	location alt	ernative w	ithin a re	-gulator	v floody	/av?				
T. 15 th	c ingiiway	iocation an	.critative w	itiiiii a iv	Salatoi	y 1100 a w	NO	N/A	YES		
											_
5. Atta	ch map wit	h flood lim	its outlined	d showin	ig all bu	ildings c	or other in	nprove	ments w	ithin the	base floodplain.
		-	water dama	ages:						******	
	A		dences?					NO	X	YES_	
	B C		er Bldgs?					NO NO	X X	YES YES	<u></u>
	D		ural and be	naficial l	Floodal	ain value	xc?	NO	X	YES	
"Natural											ntific study, outdoor recreation,
agricultui	re, aquaculture	, forestry, natu	ral moderation	of floods, v	vater quali	ty maintena	ınce, and gro	oundwater	recharge.		
6 Type	e of Traffic										
o. Typo			cy supply o	or evacua	ation ro	ıte?		NO	X	YES_	
		-	cy vehicle		ation to			NO_	X	YES Y	
			le detour a		?			NO		YES	X
	D	. School bu	ıs or mail r	oute?				NO	X	YES _	
7. Estir	mated durat	ion of traff	fic interrup	tion for	100-yea	r event h	nours:	N/A	<u>—</u>		
0 E-41.	4 11	-£0100 (7 1 1	(:C			1				
8. Esui	mated value		100a dama dway	_	-	oderate i	isk ievei.				
	A B		•	\$	N/A N/A						
	D	Prop Tota		\$ \$	N/A						
		1012	ıı	Ψ	11/11	<u>—</u>					
9.	Assessme	nt of Level	of Risk	Low_	X						
					ate	_					
				High_							

LOCATION HYDRAULIC STUDY FORM cont. Santa Clara Station and Joint Development

Dist.		4	Co	SCl	Rte.	N/A	P.M.	N/A		
Federal	l-Aid	Project No	umber:		N/A					
EA		N/A	<u></u>			Bridge No		N/A		
For Hig	-	sk projects	s, during desig	n phase, a	dditiona	ıl Design Study l	Risk Ana	lysis may	be necessary to determine des	ign
PREPA	AREI	BY:								
Signatu I certify th form is ac	hat I hav	ve conducted (a Location Hydrau	lic Study cons	istent with 2	23 CFR 650 and that t	he informatio	on summari:	sed in items numbers 3, 4, 5, 8, and 9 of thi	s
Erica C	cruz -	Local Age	ency/Consulti	ng Hydrau	ılic Engi	neer				
Is there develop			al encroachm	-		croachment, or aYES		rt of inco	mpatible Floodplain	
If yes, j	provio	de evaluat	ion and discus	ssion of pr	acticabil	lity of alternative	es in acco	rdance v	vith 23 CFR 650.113	
Informa project		_	to comply w	th the Fed	leral requ	uirement for the	Location	Hydraul	ic Study shall be retained in the	Э
		numbers 1, 2 s of said repor		ocation Hydra	ulic Study I	Form are accurate and	l will ensure	that Final P	S&E reflects the information and	
						Date				
Local A	Agenc	y Project	Engineer (local	assistance pr	ojects)					

LOCATION HYDRAULIC STUDY FORM Santa Clara and 13th Street Vent Structure Joint Development

Dist4	Co	SCl	Rte	N/A	_P.M	N/A	_EA:	N/A_
Federal-Aid Project	Number:	N/A	_					<u> </u>
Floodplain Descripti	on:							
		the Santa Cl	ara and 13 th Str	reet Vent	t Structu	re Deve	lonment is	s entirely within a Zor
D. Zone D is a floor								v
	•							the Guadalupe Rive
	•					_		som Hill Road in so
San Jose. The proje								
		_			_	-	_	the Bay to Highway
		-						annual chance floo
flow from the Dow	ntown Project	. Similarly,	with the Dow	ntown I	Project of	comple	te, succes	ssfully handles the
flows from the Upp	•				•	_		
Road and is now in	the engineering	ng and desig	gn stages. Wit	th the pr	oper pe	rmits a	nd with f	unding from the
federal government	t, the projected	l completion	n date for the	Upper (Guadalu	pe Proj	ect is De	cember 2016.
1. Description of Pro The proposed retail, floodplain impacts	structures for th	<u>e joint devel</u>	opment would	also be v	within th	e Zone	D. There	will minimal
2. ADT: Curr	ent <u>N/A</u>	<u> </u>	Projec	cted	N/A	_		
3. Hydraulic Data:	WSE100=_ Q=N/A	cfs	N/A cfs The flood of record, N/A cfs	WSE=	han Q100: :	N/A N/A	_	
Are NFIP maps and	studies available	e?			YES			
4. Is the highway loc	ation alternative	e within a reg	gulatory floody	way? NO	N/A	_YES_		-
5. Attach map with f	lood limits outli	ned showing	g all buildings	or other i	mprove	nents w	ithin the b	pase floodplain.
Potential O1	00 backwater da	amages:						
A.	Residences'				NO	X	YES	
B.	Other Bldgs	3?			NO	X	YES	
C.	Crops?				NO	X	YES_	
D.			loodplain valu		NO	X	_YES	
"Natural and beneficial floo agriculture, aquaculture, for							beauty, scient	tific study, outdoor recreation,
6. Type of Traffic:								
	mergency supp		tion route?		NO	X	_YES	
	mergency vehic				NO	_ <u>X</u>	_ YES	
	racticable detou				NO	37	_YES	<u>X</u>
D. S	chool bus or ma	ııı route?			NO	X	_YES	
7. Estimated duration	n of traffic inter	ruption for 1	00-year event l	hours:	N/A			

LOCATION HYDRAULIC STUDY FORM cont. Santa Clara and 13th Street Vent Structure

Dist.	4	Co	SC1	Rte	N/A	P.M	N/A	
Feder	al-Aid Project N	umber:		N/A	Bridge No			
EA	N/A				Bridge No		N/A	
8. Est		Q100 flood dama	-			el.		
	A.	Roadway	\$					
	В	Property	\$	N/A				
		Total	\$ <u></u>	N/A				
9.	Assessment of	f Level of Risk		X				
			Mode	erate	<u></u>			
			High					
altern	ative.	s, during design	pnase, a	aditiona	i Design Study R	ask Ana	iysis may be ne	ecessary to determine desig
PRE	PARED BY:							
		a Location Hydraulic	Study cons	istent with 2	23 CFR 650 and that th	e informati	on summarized in ite	ems numbers 3, 4, 5, 8, and 9 of this
					Date			
Erica	Cruz - Local Ag	ency/Consulting	Hydrau	ılic Engi	neer			
	re any longitudir opment?	nal encroachment	_		roachment, or ar YES		rt of incompati	ble Floodplain
If yes	, provide evaluat	tion and discussion	on of pr	acticabil	ity of alternative	s in acco	ordance with 23	3 CFR 650.113
	mation developed ct files.	d to comply with	the Fed	leral requ	uirement for the l	Location	Hydraulic Stu	dy shall be retained in the
	y that item numbers 1, nendations of said repo		tion Hydra	ulic Study F	Form are accurate and	will ensure	that Final PS&E ref	flects the information and
					Date			
Local	Agency Project	Engineer (local as:	sistance pr	ojects)				

LOCATION HYDRAULIC STUDY FORM Stockton Avenue Vent Structure Joint Development

Dist.	4	Co	SCl Rt	e	N/A	_P.M	N/A	_EA:	N/A
Feder	al-Aid Project	Number:	N/A						<u></u>
Flood	plain Descript	ion.							
	•	06085C0233H,	the joint develo	pment wou	ld be enti	irely wit	thin Zoi	ne D.	
				•		•			
									nimize floodplain impacts)
_									tation campus is not
	-	_		mınımal fl	<u>oodplain</u>	ı ımpac	ts as a r	esult of	the Project at this
<u>iocati</u>	on, and mitig	gation will not	<u>be required.</u>						
2. AD	T: Cui	rrent N/A	<u> </u>	Projec	cted	N/A	_		
3. Hy	draulic Data:	Base Flood	Q100= N/	A cfs					
•			N/A The		, if greater ti	han Q100:			
		Q = N/A							
		Overtoppin	g flood $Q = N/$	A_cfs	WSE=		N/A		
Are N	IFIP maps and	l studies availabl	e?			YES			
4 Istl	he highway lo	cation alternativ	e within a regul	atory floody	wav?				
1. 15 0	ne ingnway 10	cation arternativ	e within a regar	atory mood		N/A	YES		
									_
5. Att	ach map with	flood limits outl	ined showing al	l buildings	or other i	mprove	ments w	ithin the	base floodplain.
	Potential (100 backwater d	amagas.						
	A.		•			NO	X	YES	
	В.	Other Bldgs				NO_	X	YES_	
	C.	Crops?	·			NO_	X	YES YES	
	D.		beneficial Floo	dplain valu	es?	NO	X	YES	
		ood-plain values" shall orestry, natural modero	include but are not li	mited to fish, wi	ldlife, plants	, open spac			ntific study, outdoor recreatio
6 Tvr	oe of Traffic:								
0. 1) }		Emergency supp	ly or evacuation	route?		NO	X	YES	
		cle access?		NO		YES_			
C. Practicable detour available?								YES	X
	D. 3	School bus or ma	ail route?			NO	X	_YES _	
7. Est	imated duratio	on of traffic inter	ruption for 100-	-year event	hours:	N/A			
0.17		CO100 M 11	(16			1			
8. Est		of Q100 flood da			risk level				
	A. B	Roadway	\$ N/	A A					
	Б	Property Total	\$ <u>N/</u> \$ N/						
		10441	Ψ	<u> </u>					
9.	Assessment	t of Level of Risl	k Low_X						
			Moderate_						
			High						

For High Risk projects, during design phase, additional Design Study Risk Analysis may be necessary to determine design alternative.

LOCATION HYDRAULIC STUDY FORM cont. Stockton Avenue Vent Structure

Dist.	4	Co	SCl	Rte	N/A	P.M	N/A	_	
Federal-Ai	d Project Nur	mber:		N/A					
EA	N/A	-		Bri	dge No		N/A		
PREPARI	ED BY:								
Signature: I certify that I form is accura		Location Hydrai	ulic Study consis	tent with 23 CFR	650 and that th	e informatio	n summarized in i	items numbers 3,	4, 5, 8, and 9 of this
				Date					
Erica Cruz	- Local Ager	cy/Consult	ing Hydraul	ic Engineer					
developme			NO	X YE	.S	_	·		
If yes, prov	vide evaluatio	n and discu	ssion of pra	cticability of	alternatives	s in acco	rdance with 2	23 CFR 650.	113
Informatio project file	•	o comply w	ith the Fede	eral requireme	ent for the I	Location	Hydraulic St	udy shall be	retained in the
0.0	tem numbers 1, 2, 0 ons of said report:	6 and 7 of this L	ocation Hydrau	lic Study Form are	e accurate and t	will ensure 1	hat Final PS&E r	eflects the inforn	nation and
				Date					
Local Age	ncy Project E	ngineer (loca	ıl assistance pro						

Appendix D Proposed Staging Areas

