Dist-County-Route: 04-SCl-101, 04-SCl-85
Post Mile Limits: 16.0/52.55 (US 101), 23.0/24.1 (SR 85)
Project Type: Express Lanes – Conversion and Widening
Project ID (or EA): EA 04- 2G7100
Program Identification: TBD
Phase: ☐ PID ☒ PA/ED ☐ PS&E

Regional Water Quality Control Board(s): San Francisco Bay (2) and Central Coast (3)

Is the Project required to consider Treatment BMPs? Yes ☒ No ☐
If yes, can Treatment BMPs be incorporated into the project? Yes ☒ No ☐
If No, a Technical Data Report must be submitted to the RWQCB at least 30 days prior to the projects RTL date. List RTL Date: _____

Total Disturbed Soil Area: 720 acres Risk Level: 2 and 3
Estimated: Construction Start Date: Winter 2014 Construction Completion Date: Winter 2016
Notification of Construction (NOC) Date to be submitted: TBD

Erosivity Waiver	Yes ☐	Date: _____	No ☒
Notification of ADL reuse (if Yes, provide date)	Yes ☒	Date: TBD	No ☐
Separate Dewatering Permit (if yes, permit number)	Yes ☒	Permit # TBD	No ☐

This Report has been prepared under the direction of the following Licensed Person. The Licensed Person attests to the technical information contained herein and the date upon which recommendations, conclusions, and decisions are based. Professional Engineer or Landscape Architect stamp required at PS&E.

Analette Ochoa, P.E., Registered Project Engineer — 11/14/12 Date

I have reviewed the stormwater quality design issues and find this report to be complete, current and accurate:

Nick Saleh, Project Manager — 11/15/2012 Date

Robert Braga, Designated Maintenance Representative — 11/20/12 Date

David Yam, Designated Landscape Architect Representative — 11/28/12 Date

[Stamp Required for PS&E only)

Norman Gonsalves, District/Regional Design SW Coordinator or Designee — 12/07/2012 Date

DATE: December 2012

Project ID (or EA): EA -04-2G7100

NO.	CRITERIA	YES ✓	NO ✓	SUPPLEMENTAL INFORMATION FOR EVALUATION
1.	Begin Project Evaluation regarding requirement for consideration of Treatment BMPs	✓		See Figure 4-1, Project Evaluation Process for Consideration of Permanent Treatment BMPs. Go to 2
2.	Is this an emergency project?		✓	If **Yes**, go to 10. If **No**, continue to 3.
3.	Have TMDLs or other Pollution Control Requirements been established for surface waters within the project limits? Information provided in the water quality assessment or equivalent document.	✓		If **Yes**, contact the District/Regional NPDES Coordinator to discuss the Department's obligations under the TMDL (if Applicable) or Pollution Control Requirements, go to 9 or 4. _____ *(Dist./Reg. SW Coordinator initials)* If **No**, continue to 4.
4.	Is the project located within an area of a local MS4 Permittee?	✓		If **Yes**. *(Santa Clara Phase 1 and Gilroy, Morgan Hill, Santa Clara phase 11)*, go to 5. If **No**, document in SWDR go to 5.
5.	Is the project directly or indirectly discharging to surface waters?	✓		If **Yes**, continue to 6. If **No**, go to 10.
6.	Is it a new facility or major reconstruction?	✓		If **Yes**, continue to 8. If **No**, go to 7.
7.	Will there be a change in line/grade or hydraulic capacity?	✓		If **Yes**, continue to 8. If **No**, go to 10.
8.	Does the project result in a net increase of one acre or more of new impervious surface?	✓		If **Yes**, continue to 9. If **No**, go to 10. *TBD* _____ *(Net Increase New Impervious Surface)*
9.	Project is required to consider approved Treatment BMPs.	✓	See Sections 2.4 and either Section 5.5or 6.5 for BMP Evaluation and Selection Process. Complete Checklist T-1 in this Appendix E.	
10.	Project is not required to consider Treatment BMPs. _____ *(Dist./Reg. Design SW Coord. Initials* _____*(Project Engineer Initials)* _____ *(Date)*		Document for Project Files by completing this form, and attaching it to the SWDR.	

1 *See Figure 4-1, Project Evaluation Process for Consideration of Permanent Treatment BMPs*

STORM WATER DATA INFORMATION

1. Project Description

The proposed United States Highway 101 (US 101) Express Lanes Project (project) is in Santa Clara County, California. Santa Clara Valley Transportation Authority (VTA), in cooperation with the California Department of Transportation (Caltrans), proposes to convert the existing High-Occupancy Vehicle (HOV) lanes along the US 101 to High-Occupancy Toll (HOT) lanes (hereafter known as express lanes) and add a second express lane in each direction on northbound and southbound US 101 within the overall project limits of East Dunne Avenue interchange in Morgan Hill to the Santa Clara/San Mateo County line just north of the Oregon Expressway/Embarcadero Road interchange in Palo Alto. The express lanes will allow HOVs and eligible clean air vehicles to continue to use the lanes for free and eligible single-occupant vehicles (SOVs) to pay a toll. The project will also convert the US 101/State Route (SR) 85 HOV direct connectors in Mountain View to express lane connectors and restripe the northern 1.1 mile of SR 85 to introduce a buffer separating the mixed-flow lanes from the express lane and connecting the SR 85 express lanes to the US 101 express lanes. See Figure 1 for a project Vicinity Map and Project Location Map. The project length is 36.55 miles on US 101 and 1.1 miles on SR 85, for a total of 37.65 miles.

Existing Facilities

US 101 in Santa Clara County is a 52.55-mile long freeway that connects Gilroy to Palo Alto. US 101 passes through Gilroy, Morgan Hill, San Jose, Santa Clara, Sunnyvale, Mountain View and Palo Alto. US 101 intersects SR 85 in San Jose and in Mountain View, I-280/I-680, I-880, SR 87, and SR 237. US 101 typically has 4 lanes in each direction, including 3 mixed-flow lanes and 1 HOV lane with auxiliary lanes in some locations.

Proposed Project

Two alternatives are proposed: the Build Alternative and the No Build Alternative.

The project consists of converting the existing HOV lane along both northbound and southbound US 101 into an express lane and widening the freeway to add a second express lane for the majority of the corridor. The project also proposes to build new express lanes in the northbound direction between East Dunne Avenue and the existing HOV lane at Cochrane Road, and in the southbound direction between Burnett Avenue and Cochrane Road.

With these changes, there would be two express lanes on US 101 extending from approximately the Cochrane Road interchange in Morgan Hill to just south of the Oregon Expressway/ Embarcadero Road interchange in Palo Alto in the northbound direction, and from just south of the Oregon Expressway/Embarcadero Road interchange to just south of the Burnett Avenue overcrossing in the southbound direction.

Build Alternative

The addition of the second express lane will involve a combination of inside and outside widening. The majority of the inside widening will occur within the US 101 segments south of the SR 85/US 101 interchange in southern Santa Clara County where a wide unpaved median exists. The project proposes to widen and pave the median to accommodate the additional lanes. The outside widening will occur in the remainder of the corridor to accommodate the additional lanes where needed.

The express lanes facility would be separated from the adjacent mixed-flow lanes by a striped buffer. The buffer zone, delineated with solid stripes, will have designated openings to provide access into and out of the express lanes facility. The express lanes would allow HOVs to continue to use the lanes without cost and eligible single-occupant vehicles (SOVs) to pay a toll.

The project proposes to construct and operate the express lane system with some non-standard cross sectional elements which will minimize the need for new right-of-way (ROW) and structure reconstruction. The proposed project maximizes the use of the existing pavement cross section with a combination of inside and outside widening to create the additional pavement needed to accommodate the second express lane.

Right of Way

It is anticipated that the project will require limited ROW and Temporary Construction Easements (TCE). ROW activities are currently being coordinated based on the approval of design exceptions. Utility relocations are anticipated to accommodate the outside widening.

Construction Activities

In the section between the southern project limit and the SR 85 interchange in southern San Jose, where the median width varies between 46 and 86 feet, pavement widening would be constructed in the median to accommodate the dual express lane facility. A retaining wall in the median is required to accommodate the inside widening where a split profile exists between northbound and southbound US 101.

A dual express lane facility is proposed for the majority of the corridor, with the exception of short segments near the SR 85 express lane connectors where a single express lane is proposed. A single express lane is proposed between the SR 85 Interchange and the Blossom Hill Road Interchange in San Jose, and between the Mathilda Avenue interchange and the SR 85 interchange in Mountain View. Outside widening is proposed to accommodate dual express lanes between the Blossom Hill Road interchange and the Mathilda Avenue interchange.

Bridge widening will be required at a number of grade separations and undercrossings, as well as modifications to existing overcrossing abutments, which can be found in Table 1 and Table 2. This project does not propose widening of creek bridges.

Table 1. Proposed Bridge Widening

Bridge No.	Post Mile	Bridge Name	Type of Work
37-344	21.25	Coyote Creek Golf Drive UC	Widen Bridge (Inside)
37-404	21.55	Utility Facility UC (Golf Course)	Widen Bridge (Inside)
37-347	27.01	Bernal Rd UC	Widen Bridge (Inside)
37-108	29.72	Coyote Rd UC	Widen Bridge (Inside and Outside)
37-409	31	Yerba Buena Rd UC	Widen Bridge (Inside and Outside)

Source: URS Corporation

Table 2. Proposed Modification to Bridge Abutments

Bridge No.	Post Mile	Bridge Name	Type of Work
37-668	33.03	Tully Rd OC	Modify Abutments
37-222	35.46	San Antonio St OC	Modify Abutments
37-48	35.76	Santa Clara St OC	Modify Abutments
37-123	36.12	Julian/McKee OC	Modify Abutments
37-115	37.99	North San Jose UP	Modify SB Abutment
37-118	38.09	10th Street OC	Modify SB Abutment
37-403R	39.90	Route 87/101 SEP	Modify SB Abutment
37-183G	39.91	Jct 87/101 SEP	Modify SB Abutment
37-390	42.73	Bowers Ave OC	Modify SB Abutment
37-152	43.85	Lawrence Expwy OC	Modify Abutments

Source: URS Corporation

The piles for the overhead signs would be up to 6 feet in diameter and extend to approximately 30 feet below ground surface. The piles for the tolling devices would be up to 2.5 feet in diameter and would extend to approximately 10 feet below ground surface. Some Traffic Operations Systems (TOS) equipment such as traffic monitoring stations, Closed Circuit Televisions, cabinets, and controllers would be installed along the outside edge of pavement within the existing ROW.

Trenching would be conducted along the outside edge of pavement for installation of conduits. The depth of trenching would be 3 to 5 feet below the roadway surface. Conduits would be either jacked across the freeway or constructed by open-cut trench to the median where needed to provide power and communication feeds to the new overhead signage and tolling equipment.

During construction, some lane and ramp closures would be required, but full freeway closures are not expected.

Biofiltration swales are proposed to provide storm water treatment for impervious areas that would be added or reworked as part of the project. These swales would be installed within the existing ROW.

US 101/SR 85 Direct Connectors

At the south end of the project in southern San Jose, both the northbound and southbound HOV direct connectors from SR 85 to US 101 will be converted to express lane connectors by the SR 85 Express Lanes Project, allowing SOVs with valid FasTrak devices to use the direct connectors.

At the north end of the project in Mountain View, the US 101 Express Lanes Project will convert the existing HOV connectors to express lane connectors and will extend the buffer striping onto SR 85 to connect to the buffer constructed by the SR 85 Express Lanes Project (EA #04-4A7900). The combination of SR 85 and US 101 Express Lanes projects will provide a complete express lane system on both freeways that includes the direct connectors.

No Build Alternative

The No Build Alternative assumes no modifications would be made to the current US 101 corridor, including the continuous access HOV lane, other than routine maintenance and rehabilitation of the facility and any currently planned and programmed projects within the area.

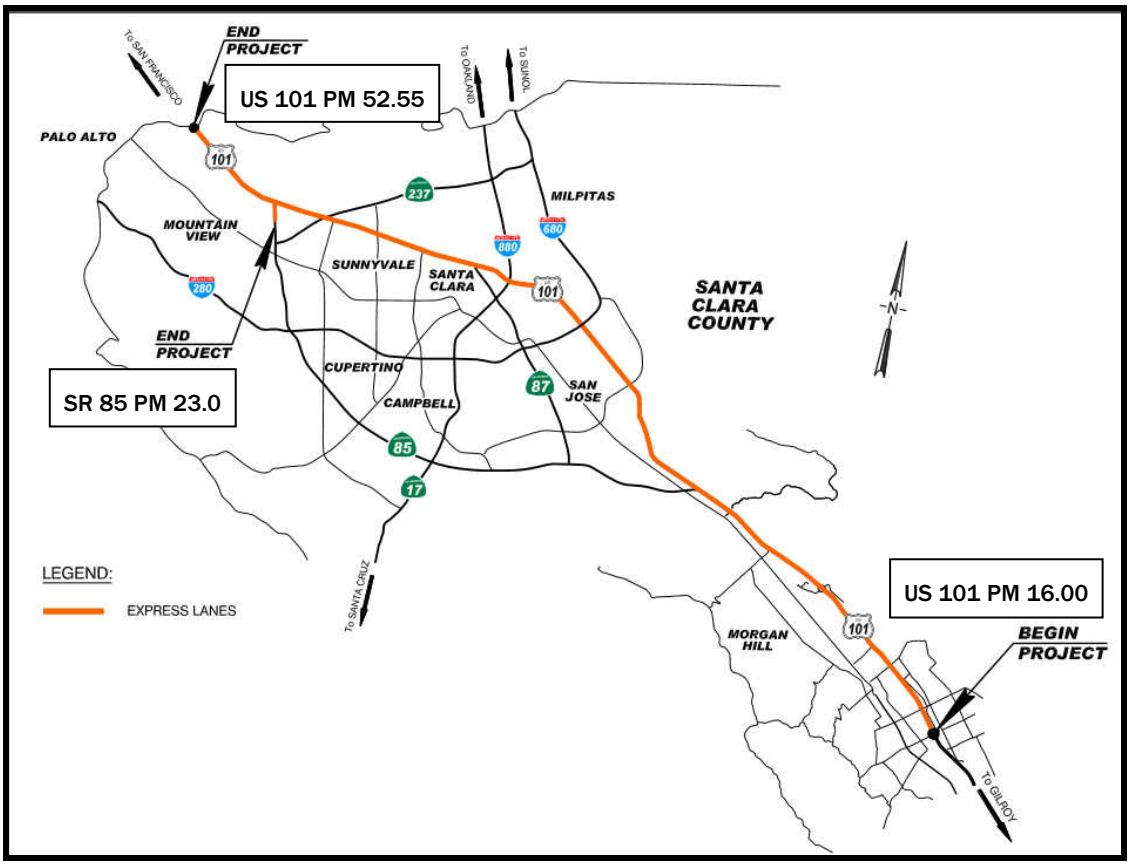
This Storm Water Data Report (SWDR) only discusses the Build Alternative.

Disturbed Soil Area (DSA) and Impervious Areas

The total Disturbed Soil Area (DSA) was calculated to be approximately 720 acres. The existing impervious area was approximately 640 acres. The project's net added impervious area and reworked impervious area were calculated to be 43.54 acres and 79.58 acres, respectively. Refer to Table 4 for a list of net added and reworked impervious areas by receiving water bodies.

The majority of the project is covered under the Santa Clara County Phase I Municipal Separate Storm Sewer System (MS4) under the Municipal Regional Permit. However,

areas south of Cochrane Road are covered under the Gilroy, Morgan Hill and Santa Clara combined Phase II MS4.



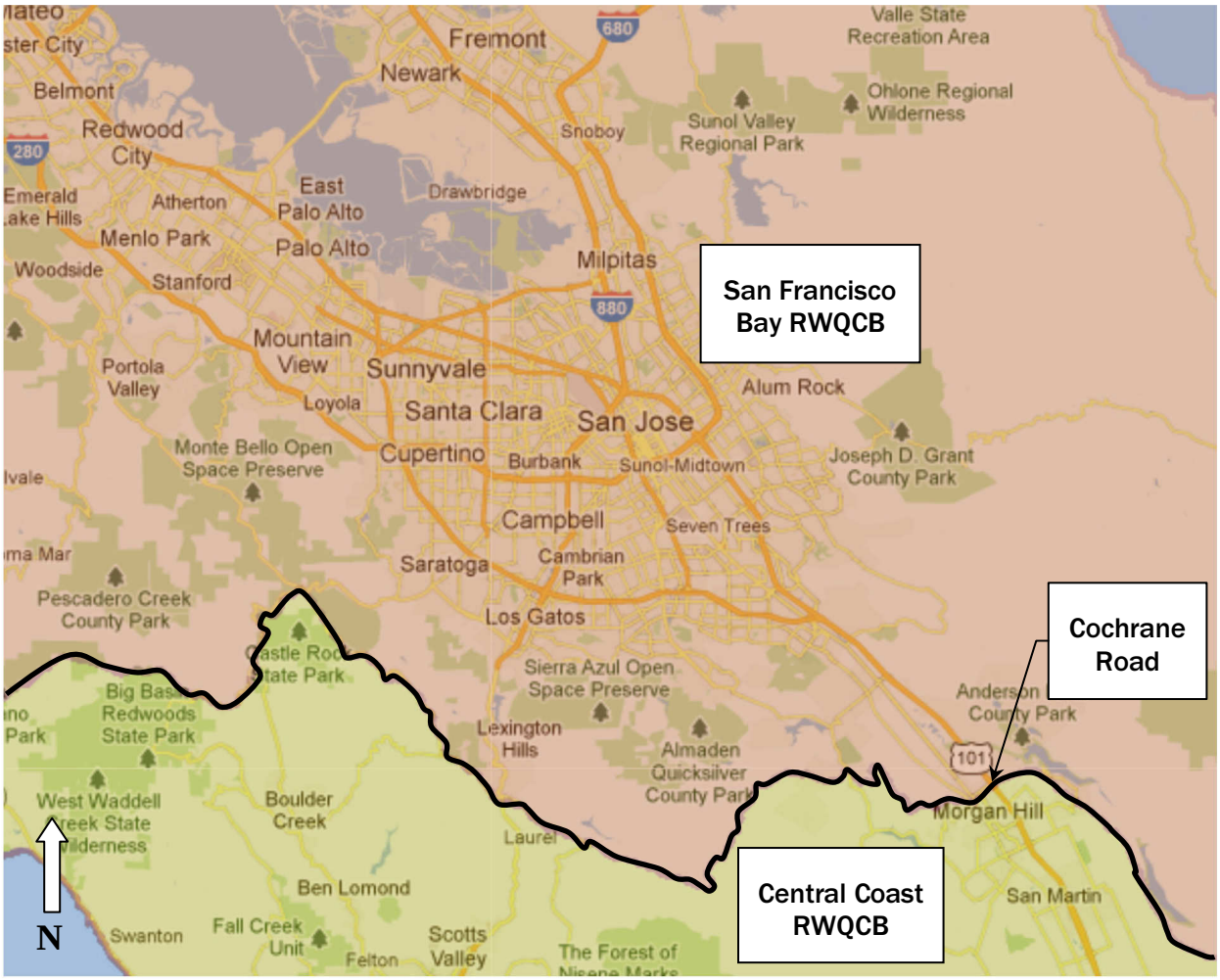
NO SCALE

Source: URS Corporation

Figure 1. Project Location and Vicinity

2. Site Data and Storm Water Quality Design Issues (refer to Checklists SW-1, SW-2, and SW-3)

The project is located within both the San Francisco Bay Regional Water Quality Control Board (SFBRWQCB) and the Central Coast Regional Water Quality Control Board (CCRWQCB) jurisdictions. The boundary between SFBRWQCB and CCRWQCB on US 101 is Cochrane Road (Figure 2).



Source: State Water Resources Control Board Map

Figure 2. Boundary between San Francisco Bay and Central Coast RWQCBs

Hydrologic Units

The Water Quality Planning Tool was utilized to identify the hydrologic units within the project limits, shown in Table 3.

Table 3. Hydrologic Units within the Project Area

US 101 PM	Hydrologic Unit	Hydrologic Area	Hydrologic Sub-area
16.0 - 17.0	Pajaro River	South Santa Clara	305.30
18.0 - 26.0, 31.0 - 40.0	Santa Clara	Coyote Creek	205.30
27.0 - 30	Santa Clara	Guadalupe River	205.40
41.0 – 52.55	Santa Clara	Palo Alto	205.50

Source: Caltrans/Sacramento State Office of Water Programs

Receiving Water Bodies

Based on a review of available information from the U.S. Geological Survey and the Federal Emergency Management Agency, a total of 13 receiving water bodies have been identified for the project. From south to north, these waterways are: Llagas Creek, Coyote Creek, Upper Silver Creek, Lower Silver Creek, Guadalupe River, San Tomas Aquino Creek, Calabazas Creek, Sunnyvale East Channel, Sunnyvale West Channel, Stevens Creek, Permanente Creek, Adobe Creek and Matadero Creek.

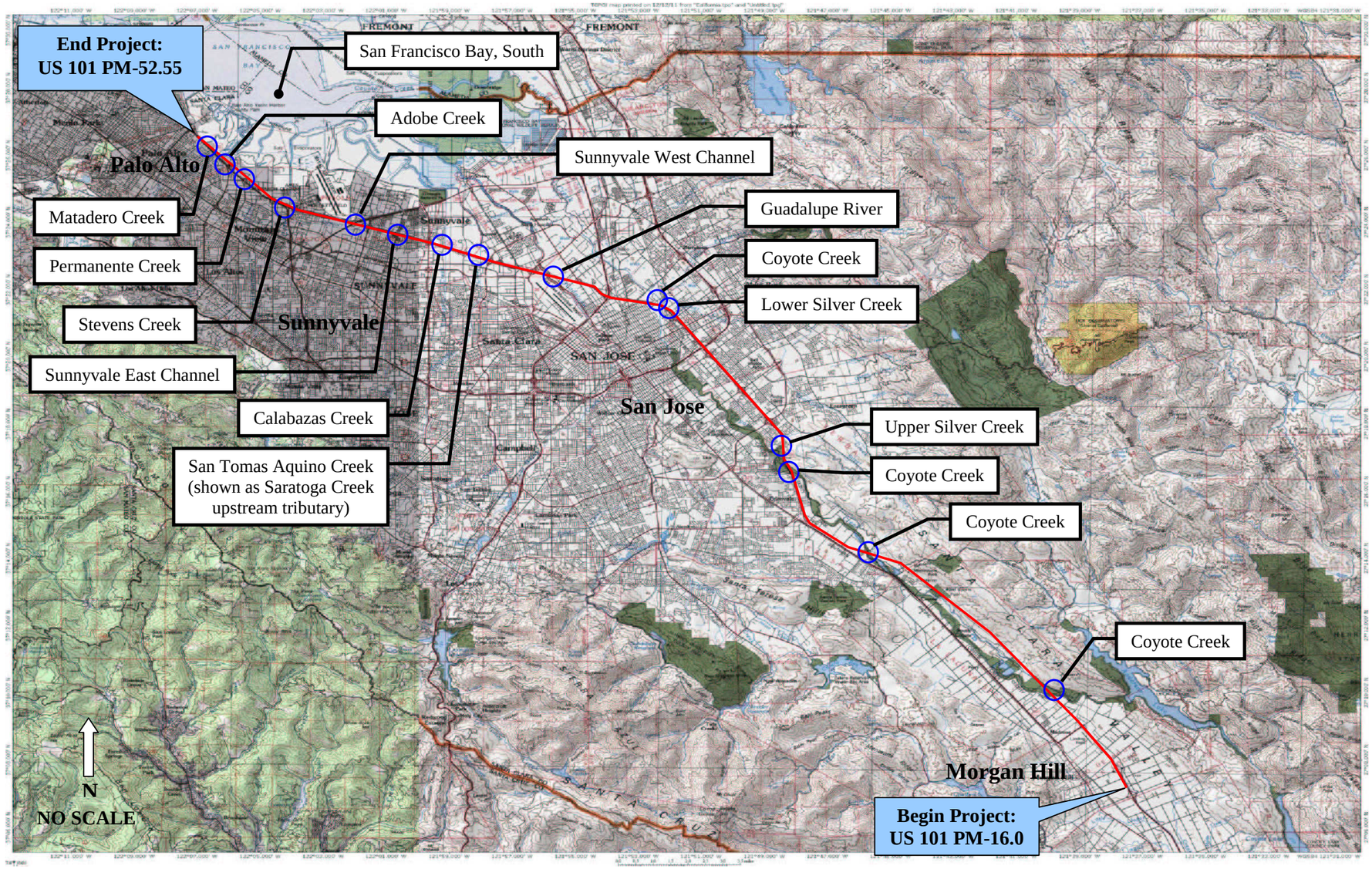
The southernmost portion of the project, from Dunne Avenue to Cochrane Road, is within the CCRWQCB. Flow from this area drains into Madrone Channel, which flows south toward Llagas Creek and eventually into the Pacific Ocean. The Llagas Creek crossing at US 101 is outside of the project limits.

The remaining 12 receiving water bodies cross US 101 within the project limits. Coyote Creek crosses US 101 four times, at approximately PM 20.6, 28.3, 31.3 and 38.13. All receiving water bodies within the project limits ultimately discharge to San Francisco Bay, South, which is located approximately 1.7 miles east of the northern project limit. Historically, Saratoga Creek and San Tomas Aquino Creek were two separate creeks; however, in recent years these creeks have merged, and now the creek is simply known as San Tomas Aquino Creek. Figure 3 shows the creek and channel crossings and the approximate locations where they cross the project. Table 4 shows the corresponding US 101 post miles of the creek and channel crossings.

Table 4. Added and Reworked Impervious Area by Receiving Water Bodies

Receiving Water Body	US 101 Post Mile	Added Impervious Area (acre)	Reworked Impervious Area (acre)
Llagas Creek (south of project)	R 10.63	3.33	1.43
Coyote Creek	R 19.21	30.26	17.73
Coyote Creek	R 26.47, R 26.60	-	-
Coyote Creek	29.83	0.71	8.71
Upper Silver Creek	N/A	0.08	1.40
Lower Silver Creek	36.37	1.56	13.69
Coyote Creek	36.69	0.39	6.95
Guadalupe River	40.19	1.41	14.74
San Tomas Aquino Creek	42.45	2.39	5.12
Calabazas Creek	43.32	2.11	5.10
Sunnyvale East Channel	N/A	1.09	2.59
Sunnyvale West Channel	N/A	0.11	1.17
Stevens Creek	48.04	0.10	0.95
Permanente Creek	N/A	-	-
Adobe Creek	50.66	-	-
Matadero Creek	51.37	-	-
Total		43.54	79.58
Total Added and Reworked Impervious Area		123.12	

Source: URS Corporation



Source: USGS

Figure 3. Creek and Channel Crossings in Project Vicinity

Clean Water Act 303(d) List

The receiving water bodies of the project listed on the State Water Resources Control Board (SWRCB) 2010 Integrated Report (Clean Water Act Section 303[d] List / 305[b] Report) are Llagas Creek, Coyote Creek, Lower Silver Creek (listed as Silver Creek), Guadalupe River, San Tomas Aquino Creek, Calabazas Creek, Stevens Creek, Permanente Creek, Matadero Creek, and the ultimate receiving water body San Francisco Bay, South. All other receiving water bodies are not listed on the 303(d) list. Table 5 shows the waterways listed on the 303(d) list and the pollutant, source, and proposed or approved total maximum daily load (TMDL) date for each of these receiving water bodies.

Table 5. Receiving Water Bodies on the 2010 303(d) List

Water Body	Pollutant	Potential Sources	TMDL Date
Llagas Creek (below Chesbro Reservoir) (CCRWQCB)	Chloride	Nonpoint Source Point Source	2021
	Chlorpyrifos	Agriculture Source Unknown	2021
	Electrical Conductivity	Source Unknown	2021
	Escherichia coli (E. coli)	Source Unknown	2011
	Fecal Coliform	Natural Sources Nonpoint Source Pasture Grazing-Riparian and/or Upland	2011
	Low Dissolved Oxygen	Agricultural Return Flows Habitat Modification Irrigated Crop Production Municipal Point Sources	2021
	Nutrients	Agricultural Return Flows Agriculture Agriculture-irrigation tailwater Agriculture-storm runoff Habitat Modification Irrigated Crop Production Municipal Point Sources Nonpoint Source Pasture Grazing-Riparian and/or Upland Unknown Point Source Urban Runoff/Storm Sewers	2006 (Approved)
	Sediment/Siltation	Agriculture Habitat Modification Hydromodification	2007 (Approved)

Table 5. Receiving Water Bodies on the 2010 303(d) list (continued)

Water Body	Pollutant	Potential Sources	TMDL Date
Llagas Creek (below Chesbro Reservoir) (CCRWQCB)	Sodium	Nonpoint Source Source Unknown	2021
	Total Dissolved Solids	Nonpoint Source Point Source	2021
	Turbidity	Source Unknown	2021
Coyote Creek (Santa Clara County) (SFBRWQCB)	Diazinon	Urban Runoff/Storm Sewers	2007 (Approved)
	Trash	Illegal Dumping Urban Runoff/Storm Sewers	2021
Silver Creek (SFBRWQCB)	Trash	Illegal Dumping Urban Runoff/Storm Sewers	2021
Guadalupe River (SFBRWQCB)	Diazinon	Urban Runoff/Storm Sewers	2007 (Approved)
	Mercury	Mine Tailings	2008
	Trash	Illegal Dumping Urban Runoff/Storm Sewers	2021
San Tomas Aquino Creek (shown as Saratoga Creek upstream tributary) (SFBRWQCB)	Diazinon	Urban Runoff/Storm Sewers	2007 (Approved)
	Trash	Illegal Dumping Urban Runoff/Storm Sewers	2021
Calabazas Creek (SFBRWQCB)	Diazinon	Urban Runoff/Storm Sewers	2007 (Approved)
Stevens Creek (SFBRWQCB)	Diazinon	Urban Runoff/Storm Sewers	2007 (Approved)
	Temperature, water	Channelization Habitat Modification Removal of Riparian Vegetation	2021
	Toxicity	Source Unknown	2019
	Trash	Illegal Dumping Urban Runoff/Storm Sewers	2021

Table 5. Receiving Water Bodies on the 2010 303(d) list (continued)

Water Body	Pollutant	Potential Sources	TMDL Date
Permanente Creek (SFBRWQCB)	Diazinon	Urban Runoff/Storm Sewers	2007 (Approved)
	Selenium, Total	Source Unknown	2021
	Toxicity	Source Unknown	2021
	Trash	Illegal Dumping Urban Runoff/Storm Sewers	2021
Matadero Creek (SFBRWQCB)	Diazinon	Urban Runoff/Storm Sewers	2007 (Approved)
	Trash	Illegal Dumping Urban Runoff/Storm Sewers	2021
San Francisco Bay, South (SFBRWQCB)	Chlordane	Nonpoint Source	2013
	DDT (dichlorodiphenyltrichorethane)	Nonpoint Source	2013
	Dieldrin	Nonpoint Source	2013
	Dioxin compounds (including 2, 3, 7, 8 – TCDD)	Atmospheric Deposition	2019
	Furan Compounds	Atmospheric deposition	2019
	Invasive Species	Ballast Water	2019
	Mercury	Atmospheric Deposition Industrial Point Source Municipal Point Source Natural Source Nonpoint Source Resource Extraction	2008
	PCBs (Polychlorinated biphenyls)	Unknown Nonpoint Source	2008
	PCBs (Polychlorinated biphenyls) (dioxin-like)	Unknown Nonpoint Source	2008
	Selenium	Domestic Use of Ground Water	2019

Source: 2010 SWRCB California 303(d) list

Beneficial Uses

The CCRWQCB does not list any beneficial uses for the water bodies within the project limits. The CCRWQCB Plan lists beneficial uses for Llagas Creek, and the SFBRWQCB Basin Plan lists beneficial uses for Coyote Creek, Calabazas Creek, Stevens Creek,

Permanente Creek, Matadero Creek, and San Francisco Bay, South. Table 6 summarizes the beneficial uses for these water bodies.

Table 6. Beneficial Uses for Receiving Water Bodies

Water Body	Beneficial Uses															
	AGR	FRSH	GWR	IND	COMM	SHELL	COLD	EST	MIGR	RARE	SPWN	WARM	WILD	REC-1	REC-2	NAV
Llagas Creek (CCRWQCB)	E		E	E	E		E		E	E	E	E	E	E	E	
Coyote Creek (SFBRWQCB)			E				E		E	E	E	E	E	P	E	
Calabazas Creek (SFBRWQCB)	E	E	E				E					E	E	E	E	
Stevens Creek (SFBRWQCB)		E					E		E		P	E	E	E	E	
Permanente Creek (SFBRWQCB)							E				E		E	E	E	
Matadero Creek (SFBRWQCB)							E		E		E	E	E	E	E	
San Francisco Bay, South (SFBRWQCB)				E	E	E		E	E	E	P		E	E	E	E

Source: San Francisco Basin Plan and Central Coast Basin Plan

Notes:

AGR – Agricultural Supply
FRSH – Freshwater Replenishment
GWR – Groundwater Recharge
IND – Industrial Service Supply
COMM – Ocean, Commercial, and Sport Fishing
SHELL – Shellfish Harvesting
COLD – Cold Freshwater Habitat
EST – Estuarine Habitat
MIGR – Fish Migration
RARE – Preservation of Rare and Endangered Species
SPWN – Fish Spawning
WARM – Warm Freshwater Habitat
WILD – Wildlife Habitat
REC-1 – Water Contact Recreation
REC-2 – Non-contact Water Recreation
NAV – Navigation

E – Existing Beneficial Uses
P – Potential Beneficial Uses

CWA Section 401 Water Quality Certification

There is no bridge widening or work planned within creek channels. A freshwater wetland exists at the downstream end of several unnamed streams that pass beneath US 101 in culverts at the southern end of the project between San Jose and Morgan Hill. Wetlands

located within the project area will be preserved during construction with the use of Environmentally Sensitive Area (ESA) fencing.

A long segment of the proposed widening (about 12 miles) is parallel to and in the vicinity of Coyote Creek (within the City of Morgan Hill and Silver Creek Valley Road). Several natural waterways are crossing and passing beneath US 101 and draining into Coyote Creek within this segment. 401 Certification would be required for the project, because of the impacts of the widening to the streams and nearby wetlands.

Local Agency Requirements/Concerns

The creeks crossing the project alignment are within the jurisdiction of the Santa Clara Valley Water District (SCVWD), a local government agency that provides water resource management within the project limits. The project is in Santa Clara County, which is subject to a Municipal Regional Stormwater Permit (MRP) for discharging stormwater to San Francisco Bay and tributary creeks. The agencies in Santa Clara County have formed a countywide program known as the Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP) (Program), which has its own National Pollutant Discharge Elimination System (NPDES) permit requirements for local projects outside of Caltrans' ROW.

The project is located within the jurisdiction of the SCVURPPP Program, which is a member agency covered under the MRP. The Program has an approved hydromodification management plan (HMP). The SFBRWQCB's *Memorandum of California Department of Transportation Post-Construction Stormwater and Hydromodification Standards* (July 2008) requests Caltrans to comply with the SFBRWQCB Municipal Regional Stormwater NPDES Permit. According to the *Santa Clara HM Map* (November 2010) of the MRP, from the Santa Clara/San Mateo County line to the Yerba Buena Road interchange in San Jose, the project is either draining to hardened channel and/or tidal areas, or within catchments and subwatersheds that are greater than or equal to 65% impervious; therefore, the project is exempt from hydromodification requirements. From the Yerba Buena Road interchange to the SFBRWQCB limits, the project will be susceptible to hydromodification. Per the HMP, because the project results in a net increase of 80 acres of impervious area, the project will be subject to the HMP for potential hydromodification effects.

The CCRWQCB is currently developing hydromodification criteria. It is anticipated that these criteria will be approved prior to or during the design phase of this project. Therefore, hydromodification mitigation requirements will be applicable to waterways within the CCRWQCB. The southernmost portion of the project is within the CCRWQCB and drains towards Llagas Creek, which is located to the south of the project.

The boundary between the San Francisco Bay and the CCRWQCB is Cochrane Road. Refer to Figure 2 for a map of the Regional Board boundaries. A hydromodification evaluation and mitigation efforts for the project will be developed during the Plans, Specifications & Estimates (PS&E) phase.

In addition to the temporary construction site best management practices (BMPs) listed in Section 6 of this report and the general BMPs listed in the Natural Environment Study (NES) (URS 2012), the Santa Clara Valley Habitat Conservation Plan/Natural Community Conservation Plan (HCP/NCCP; CSC 2010) has additional BMP requirements that the project may have to adhere to.

Climate

The climate at the project area is considered to be Mediterranean semi-arid with dry summers and mild winters. San Jose is approximately the halfway point between the beginning and the end of the project; therefore, the climate information is based on San Jose. The average annual rainfall in San Jose is approximately 15 inches/year. The average daily high temperature during the summer is 84.3°F, and the average daily low in the winter is 41.0°F (URS 2011).

The Caltrans *Statewide Storm Water Management* Plan identifies the project as being within an area where there is an increased probability for rain events to occur between October 15 and April 15, with the most precipitation occurring between November and March.

Topography

The topography of the project area is relatively flat (URS 2011). The profile along the project varies from depressed sections as much as 20 feet below surrounding development to embankments as high as 34 feet (URS 2011).

Soil Characteristics

The Preliminary Geotechnical Report for the project was completed by URS in December 2011. A general description of the soils in the project area is given in the quote below:

> "...the relatively level project alignment is underlain predominantly by thick, unconsolidated, interbedded alluvial and fluvial deposits of clay, silt, sand and gravel. The alluvial deposits were derived from a wide range of rock types that comprise the Franciscan Group, which is the principal bedrock geologic unit exposed in the nearby part of the Santa Cruz Mountains west of the alignment. Bay Mud deposits are also present at the northern end of the alignment along US 101 in the vicinity of Charleston Slough. Bedrock is exposed near the surface in the southeastern portion of the project along US 101. In areas where the bedrock is not exposed, it is covered with alluvium that varies from approximately 20 to 150 feet thick."

For a more detailed description of the soils, refer to the Preliminary Geotechnical Report.

The Natural Resources Conservation Service Web Soil Survey (WSS) was utilized to determine the hydrologic soil groups within the project limits. The WSS shows the soils

within the vicinity of the project as being predominantly clay or clay loam, within hydrologic soil groups C and D.

Hazardous Waste Material

According to the project's Initial Site Assessment (ISA) (URS 2012), 13 potential hazardous materials sites have been identified within the study area but outside the project area. Further detailed studies to determine the levels of contamination and efforts to mitigate or avoid these hazardous waste materials will be specified during the PS&E phase. Table 7 lists all the locations within the study area that were identified as containing hazardous materials on site.

If hazardous waste levels are above allowable concentrations, then coordination with the Department Stormwater Coordination and the Hazardous Waste Branch will be required. This coordination will ensure runoff during construction and placement of infiltration type treatment BMPs will not further impact downstream water bodies or the groundwater.

Table 7. Hazardous Materials Sites

Site No.	Owner or Occupant	Address	Hazardous Material
1	East Charleston Business Park	2513 East Charleston Road, Mountain View, CA 94043	TCE and other halogenated VOCs.
2	CTS Printex Corporation	Plymouth and Colony Streets, Mountain View, CA 94043	Acid waste water containing copper, lead, and organic wastes containing trichloroethane (TCA), TCE and other solvents
3	Teledyne Semiconductors Inc.	1300 Terra Bella Ave, Mountain View, CA 94043	The site has used a variety of toxic chemicals, primarily chlorinated organic solvents which contaminate ground water.
	Spectra-Physics Inc.	1250 W Middlefield Road, Mountain View, CA 94042	TCE, TCA, and 1,2-DCE
4	Caltrans Maintenance Yard	Old Middlefield Way at southbound US 101 on-ramp	
5	Former Moffett Field Naval Air Station	Moffett Field, Mountain View, CA 94035	Variety of toxic chemicals, primarily chlorinated organic solvents
6	Vacant	870 Leong Drive, Mountain View, CA 94043	Potential COCs: Other Chlorinated Hydrocarbons, TCE.
7	Intel Corporation/Fairchild Semiconductor/Memory and High Speed Logic/NEC Electronics America Inc.	365 Middlefield Road/313 Fairchild Drive, Mountain View, CA	VOCs (TCE, DCE, and vinyl chloride) have been detected in soil
8	National Semiconductor	2900 Semiconductor Drive, Santa Clara, CA 95051	Monitoring wells on the site are contaminated with vinyl chloride, TCE, 1,1-DCE resulting from LUSTs.
9	Hellwig Family Limited	1301 Laurelwood Road, Santa Clara, CA 95054	Potential COC: Diesel, Fuel Oxygenates, Gasoline, MTBE
10	DTG Operations Inc.	2251 Airport Boulevard, San Jose, CA 95131	Potential COC: Gasoline, Other Petroleum
11	Action Forklift	1441 Terminal Avenue, San Jose, CA 95112	Presence of a wide range of hydrocarbon compounds
12	Safety Kleen Corporation	1147 10th Street, San Jose, CA 95112	Potential COC: Solvents.
13	PG&E Substation	Intersection of Metcalf Road and US 101	Large natural gas plant

Source: URS Corporation

Aerially Deposited Lead (ADL)

The project's ISA (URS 2012) determined that the exposed soil in the immediate vicinity of US 101 is likely contaminated with ADL. Limited soil excavation is planned, and investigation of the soil for ADL is also recommended where unpaved areas will be disturbed. More detailed information will be provided during the PS&E phase.

Groundwater Information

The project extends through various groundwater sub-basins, based on the San Francisco and Central Coast Basin Plans. Table 8 shows a list of the sub-basins and the corresponding beneficial values. According to the project's ISA, groundwater in the northern portion of the study area is under the influence of either incursion of San Francisco Bay waters or tidal pressure effects. Groundwater has been detected at depths averaging between 2 and 6 feet bgs in Mountain View at the northern end of the study area, to depths of up to 10 and 20 feet bgs near Morgan Hill at the southern end of the study area. The project's ISA assumed that regional groundwater within the project area generally flows toward the Bay, while local groundwater flow may be subject to local variations, tidal influence, and temporary changes (URS 2012).

Table 8. Groundwater Beneficial Uses

Groundwater Basin Name	Groundwater Sub-Basin	Basin Number	Beneficial Uses			
			MUN	PROC	IND	AGR
Santa Clara Valley (SFBRWQCB)	San Mateo Plain	2 – 9.03	E	E	E	P
Santa Clara Valley (SFBRWQCB)	Santa Clara	2 – 9.02	E	E	E	E
Gilroy – Hollister Valley (CCRWQCB)	Llagas Area	3 – 3.01	E		E	E

Source: San Francisco and Central Coast Basin Plans

Notes:
MUN—Municipal and domestic water supply
IND—Industrial service water supply
PROC—Industrial process water supply
AGR—Agricultural water supply

E—Existing Beneficial Uses
P—Potential Beneficial Uses

The project does not propose to widen bridges over creeks or construct walls or conduct deep excavation in creeks; therefore, dewatering will not be anticipated at the creek locations. However, based on the preliminary geotechnical information, construction dewatering would be anticipated at some locations due to excavation for the construction of the new retaining wall footings or for bridge footings of other bridges to be widened

where shallow groundwater depths (where groundwater is about 3 to 10 feet bgs) are anticipated. More detailed information about the potential dewatering locations can be obtained from the Preliminary Geotechnical Report (URS 2012). A dewatering plan will be required as part of the Contractor's SWPPP. Water quality sampling and analysis will be required prior to any discharge into the drainage system or downstream receiving water bodies.

Erosion Potential

The following summarizes the erosion potential along the project alignment as described in the project's Preliminary Geotechnical Report by URS.

- A majority of the southernmost project between Dunne Avenue and Metcalf Road has a concrete barrier wall located in the US 101 median; the ground surface on the west side of the median typically is well-vegetated, whereas the east side is typically paved. Because the proposed express lanes are planned adjacent to the median, only a slight change of rate of erosion is expected from this project.

- Along most of US 101 between Metcalf Road and Embarcadero Road (except near Hellyer Avenue), the roadway surface is close to original grade. Only a few retaining walls were required and are mostly at interchanges. Because the proposed express lanes are planned in the median and shoulders, only a slight change of rate of erosion is expected from this project.

- A large cut was made through a hillside near Hellyer Avenue; there was erosion of this sloped face during the latter 1990s and subsequent successful remediation. It will be prudent to minimize excavation and disturbance in this hillside during future construction.

- Along most of US 101 between Alum Rock Avenue and De La Cruz Boulevard, the roadway is located in deep cuts (20 feet or deeper) retained by concrete retaining walls. A sloped soil toe was frequently observed at the base of the retaining walls; however, there are no apparent signs of erosion observed on these sloped soil toes. The median is paved with concrete barrier for a majority of the stretch, and there is double thrie beam barrier for some short segments. Because the cut faces are mostly supported by reinforced concrete walls, no change in erosion rates are expected for this project.

- The northernmost portion of the project between De La Cruz Boulevard and Embarcadero Road has relatively flat topography with leveled northbound and southbound roadways. Consequently, areas of cut and fill are small.

Risk Assessment

This project is subject to the "NPDES General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities," (NPDES Number CAS000002), or CGP. The sediment risk factor is determined from the product of the

rainfall runoff erosivity factor (R), the soil erodibility factor (K), and the length-slope factor (LS). The R factors were determined from the United States Environmental Protection Agency's "Rainfall Erosivity Factor Calculator for Small Construction Sites," and the K and LS factors were determined from a GIS map on the SWRCB website. Due to the length of the project and multiple receiving water bodies, individual R, K and LS factors were determined for each planning watershed along US 101 within the project limits. Table 9 lists the planning watersheds and risk factors used to determine the risk levels for the project. If the product of the R, K and LS factors is less than 15, then the sediment risk is low; if the product is between 15 and 75, then the sediment risk is medium; and if the product is above 75, then the sediment risk is high.

The receiving water risk can be classified as low or high. The receiving water risk was first determined from the Caltrans "CGP Info" GIS mapping system. The receiving water risks were then confirmed by examining whether the project's receiving water bodies were on the 303(d) List for sedimentation/siltation and/or had the beneficial uses of Cold Freshwater Habitat (COLD), Spawning, Reproduction, and/or Early Development (SPWN) and Migration of Aquatic Organisms (MIGR) (Table 6).

Llagas, Coyote and Matadero creeks have the combined existing beneficial uses of COLD, SPWN and MIGR, and therefore are classified as having a high receiving water risk. The remaining water bodies are classified as having a low receiving water risk because they do not have these beneficial uses and are not on the 303(d) List as being impaired for sediment.

Table 9. Risk Assessment by Planning Watershed

Planning Watershed	R	K	LS	R x K x LS	Sediment Risk	Receiving Water Risk	Risk Level
Llagas Creek (CCRWQCB)	136.57	0.20	0.68	18.57	Medium	High	2
Coyote Creek (SFBRWQCB)	139.98	0.20	5.42	151.74	High	High	3
Miguelita Creek (Silver Creek) (SFBRWQCB)	139.98	0.20	0.69	19.32	Medium	Low	2
Upper Silver Creek (SFBRWQCB)	136.57	0.32	0.68	29.72	Medium	Low	2
Guadalupe River (SFBRWQCB)	153.64	0.37	0.68	38.66	Medium	Low	2
San Tomas Aquino Creek (SFBRWQCB)	157.05	0.32	0.36	18.09	Medium	Low	2
Calabazas Creek (SFBRWQCB)	157.05	0.32	0.36	18.09	Medium	Low	2

Table 9. Risk Assessment by Planning Watershed (continued)

Planning Watershed	R	K	LS	R x K x LS	Sediment Risk	Receiving Water Risk	Risk Level
Sunnyvale West Channel (SFBRWQCB)	157.05	0.32	0.36	18.09	Medium	Low	2
Sunnyvale East Channel (SFBRWQCB)	157.05	0.32	0.36	18.09	Medium	Low	2
Stevens Creek (SFBRWQCB)	150.22	0.32	0.36	17.31	Medium	Low	2
Permanente Creek (SFBRWQCB)	149.39	0.32	0.36	17.21	Medium	Low	2
Adobe Creek (SFBRWQCB)	149.39	0.32	0.36	17.21	Medium	Low	2
Matadero Creek (SFBRWQCB)	149.39	0.32	0.68	32.51	Medium	High	2

Based on the combined sediment and receiving water risk, this project has two risk levels. The project is Risk Level 3 for areas draining to Coyote Creek because it has both high sediment and high receiving water risk. Llagas, Silver, Upper Silver, San Tomas Aquino, Calabazas, Stevens, Permanente, Adobe, and Matadero creeks, Guadalupe River, and Sunnyvale East and West channels are classified as Risk Level 2.

The project risk level(s) will be further evaluated and verified during the PS&E phase.

Measures for Avoiding or Reducing Potential Stormwater Impacts

Measures will be employed to prevent any construction material from entering the receiving water bodies. There is no anticipated work in creeks and waterways. Maintenance vehicle pullouts will be considered for the project, and side slopes will be specified to be as flat as possible, for easy maintenance. Actual side slopes and grading will be determined during the PS&E phase. Concentrated flows will be collected into stabilized drains and channels.

As of December 2011, there are projects in design or in construction that will construct treatment BMPs within the project limits. These BMPs will be avoided during construction, if possible, and will be identified on the plans to be developed during the PS&E phase. Existing BMPs will be replaced if disturbed.

3. Regional Water Quality Control Board Agreements

There are no negotiated understandings and/or agreements with the SFBRWQCB or the CCRWQCB at this time. Communication with the SFBRWQCB and the CCRWQCB will be coordinated through the Regional Storm Water Coordinator. No bridge widening or work within creek channels is proposed, so a 401 water quality certification is not anticipated for this project. As long as no work, temporary or permanent, occurs within a creek, channel or wetland, the project should not require a Section 404 permit from the U.S. Army Corps of Engineers, and consequently a 401 water quality certification will also not be needed. Any necessary permits or agreements with jurisdictional agencies will be discussed in later phases of the project SWDR.

4. Proposed Design Pollution Prevention BMPs to be used on the project.

Downstream Effects Related to Potentially Increased Flow, Checklist DPP-1, Parts 1 and 2

The project will result in a total of 123.12 acres of net added impervious surface area and reworked impervious area. Additional impervious areas may increase the volume and velocity of the stormwater discharge. With an increase in impervious area, there will also be an increase in the volume of downstream flow from the roadway. In order to prevent downstream erosion, various measures such as sediment control or design pollution prevention BMPs will be implemented to mitigate potential velocity increases, stabilize slopes, and minimize erosion potential. General hydromodification evaluation and potential mitigation are discussed in the project's Water Quality Study (WRECO 2012).

Slope/Surface Protection Systems, Checklist DPP-1, Parts 1 and 3

Areas of cut and fill are required throughout the project to satisfy the proposed project geometry. Cut and fill areas for the project will be developed during the PS&E phase and shown on the contract plans.

The project would propose side slopes steeper than 4:1 and the construction of retaining walls. Permanent erosion control measures will be applied on disturbed slopes that will remain unpaved, and linear barriers will be placed on slopes to prevent erosion. These BMP types and locations will be detailed during the PS&E phase.

Concentrated Flow Conveyance Systems, Checklist DPP-1, Parts 1 and 4

Concentrated flow conveyance systems, such as ditches, berms, swales, overside drains, flared end sections, outlet protection and velocity dissipation devices will be considered for this project. Dikes will be required in areas where slopes will be too steep to allow for sheet flow and will route runoff to existing and proposed drainage inlets. Outlet protection and velocity dissipation BMPs will be placed at all outlets of drainage systems that discharge into earth-lined ditches/basins. The existing roadway drainage features will either be modified to fit with new drainage systems or be removed and replaced by new systems. The change in drainage will result in changes in the interception of surface runoff. The drainage facilities will be developed during the PS&E phase.

Preservation of Existing Vegetation, Checklist DPP-1, Parts 1 and 5

Vegetation to remain in place will be delineated in the design phase plans and protected with temporary fencing during construction.

Wetlands within the project limits will be preserved during construction with the use of ESA fencing.

5. Proposed Permanent Treatment BMPs to be used on the Project

Treatment BMP Strategy, Checklist T-1

Infiltration or retention devices are the preferred treatment alternatives for Caltrans per the Project Planning and Design Guide (PPDG); however, infiltration devices are anticipated to be infeasible for the majority of the project area due to the HSG C and D soils, which are slow to drain. Based on the locations recommended by the project biologist and the observed topography adjacent to the project area, the project team has identified potential stormwater treatment locations for biofiltration devices (Table 10). Plans of these potential BMP locations can be found in the Supplemental Attachment of this report. Feasibility of the BMP locations and the treatment areas will be further evaluated during the PS&E phase.

Table 10. Potential Treatment BMP Locations and Treated Areas

No.	Side	Beg Station	End Station	BMP Type	BMP Size (ac)	Treated Impervious Area (ac)
1	Rt	62+90	68+20	Biofiltration Device	0.23	0.91
2	Rt	70+20	73+35	Biofiltration Device	0.14	0.64
3	Rt	102+85	139+60	Biofiltration Device	1.41	5.78
4	Rt	216+80	229+70	Biofiltration Device	0.57	2.38
5	Lt	217+20	230+80	Biofiltration Device	0.59	2.57
6	Lt	235+70	268+00	Biofiltration Device	1.85	6.37
7	Lt	340+60	347+10	Biofiltration Device	0.33	1.20
8	Rt	349+15	353+40	Biofiltration Device	0.19	1.03
9	Rt	548+50	550+50	Biofiltration Device	0.10	2.50
10	Lt	548+50	550+50	Biofiltration Device	0.07	1.55
11	Lt	553+10	592+00	Biofiltration Device	1.44	7.86
12	Lt	634+30	635+80	Biofiltration Device	0.08	1.21
13	Rt	636+80	638+85	Biofiltration Device	0.11	1.00
14	Rt	676+45	700+20	Biofiltration Device	2.02	5.00
15	Rt	707+75	717+85	Biofiltration Device	0.42	1.90
16	Rt	727+60	733+00	Biofiltration Device	0.23	1.08
17	Rt	768+60	772+40	Biofiltration Device	0.32	6.81
18	Lt	770+10	773+35	Biofiltration Device	0.31	7.79
19	Rt	818+30	819+95	Biofiltration Device	0.16	3.68
20	Lt	828+00	829+65	Biofiltration Device	0.08	1.80
21	Rt	1019+50	1034+90	Biofiltration Device	1.04	3.88
22	Rt	1068+00	1070+50	Biofiltration Device	0.20	4.01
23	Lt	1069+00	1072+50	Biofiltration Device	0.39	9.48
24	Rt	1081+00	1084+00	Biofiltration Device	0.33	3.66

Table 10. Potential Treatment BMP Locations and Treated Areas (continued)

No.	Side	Beg Station	End Station	BMP Type	BMP Size (ac)	Treated Impervious Area (ac)
25	Lt	1138+70	1140+30	Biofiltration Device	0.11	2.67
26	Rt	1336+95	1340+50	Biofiltration Device	0.14	3.38
27	Lt	1342+65	1344+30	Biofiltration Device	0.11	2.74
28	Rt	1384+50	1387+05	Biofiltration Device	0.26	6.41
29	Lt	1445+80	1448+50	Biofiltration Device	0.10	0.68
30	Rt	1446+10	1448+50	Biofiltration Device	0.08	0.54
31	Rt	1454+00	1455+75	Biofiltration Device	0.06	0.50
32	Lt	1454+10	1456+15	Biofiltration Device	0.07	0.49
33	Lt	1463+35	1464+40	Biofiltration Device	0.04	1.00
34	Rt	1463+60	1464+70	Biofiltration Device	0.05	1.23
35	Rt	1467+00	1481+30	Biofiltration Device	0.69	3.03
36	Rt	1482+40	1488+30	Biofiltration Device	0.20	1.08
37	Lt	1488+30	1490+10	Biofiltration Device	0.15	3.40
38	Rt	1545+75	1547+85	Biofiltration Device	0.15	3.75
39	Lt	1552+80	1554+45	Biofiltration Device	0.13	3.25
40	Lt	1596+95	1598+60	Biofiltration Device	0.14	3.25
41	Rt	1598+50	1600+70	Biofiltration Device	0.15	3.00
42	Rt	1642+15	1643+90	Biofiltration Device	0.13	3.25
43	Lt	1649+75	1652+60	Biofiltration Device	0.10	0.48
44	Lt	1666+70	1668+65	Biofiltration Device	0.16	4.00
45	Rt	1672+40	1675+55	Biofiltration Device	0.21	4.77
46	Lt	1759+05	1760+60	Biofiltration Device	0.11	2.75
47	Lt	1766+40	1767+95	Biofiltration Device	0.11	2.30
48	Lt	1850+30	1851+65	Biofiltration Device	0.09	2.25
49	Lt	1885+60	1886+70	Biofiltration Device	0.08	1.05
50	Rt	1895+35	1897+05	Biofiltration Device	0.10	0.33
					Total Potential Treated Impervious Area	**145.67**

6. Proposed Temporary Construction Site BMPs to be used on Project

This project has been identified as Risk Levels 2 and 3. The risk levels will be confirmed as detailed information on the project geometry and schedule become available during the PS&E phase. This section presents the temporary construction site BMP strategy to be considered for this project to meet both current Caltrans criteria and the requirements presented in the CGP.

Storm Water Pollution Prevention Plan

A Storm Water Pollution Prevention Plan (SWPPP) must be prepared by the Contractor and approved by the Caltrans Resident Engineer prior to the start of construction. The SWPPP includes the development of a Construction Site Monitoring Program that presents procedures and methods related to the visual monitoring and sampling and analysis plans for non-visible pollutants, sediment and turbidity, and pH. Risk Level 2 projects are required to prepare rain event action plans prior to an anticipated rain event; perform stormwater sampling at all discharge locations during a qualifying rain event; comply with numeric action levels; and prepare annual reports detailing BMP and sampling efforts. Risk Level 3 projects are subject to potential bioassessment if the tributary DSA to Coyote Creek is greater than 30 acres and if the creeks are wadeable.

Construction Site BMP Strategy

The construction work for this project is anticipated to cover approximately two years. Whenever possible, the scheduling of earth-disturbing construction activities should not be made during anticipated rain events. To mitigate any potential runoff or run-on within the project area, construction site BMPs should be installed prior to the start of construction or as early as feasibly possible during construction.

DSAs will be protected in accordance with the project's pollution control measures. Measures that are to be considered for this project will be detailed during the PS&E phase. The construction site BMP strategy for this project shall consist of the following:

- Soil Stabilization Measures
- Sediment Control Measures
- Tracking Control
- Non-stormwater Management Measures
- General Construction Site Management
- Stormwater Sampling and Analysis

Soil stabilization and sediment control include placing linear sediment barriers such as silt fence at the toe of all excavation and embankment slopes. Contour grading of slopes shall include surface roughening by walking the slopes with tracked equipment. Immediately thereafter, slope interruption devices such as fiber rolls shall be installed, and soil stabilizer

shall be hydraulically applied. Wherever possible, early implementation of permanent erosion control seeding or landscape planting shall be performed.

Storm drain inlet protection will be deployed throughout the project.

Because construction dewatering is anticipated due to the excavation to the groundwater level for the construction of the new retaining wall footings or bridge footings of other bridges to be widened, BMPs such as temporary desilting basins or tanks shall be used to provide water pollution control. For any contaminated groundwater, the water may be collected and off-hauled to the local sanitary sewer, or an active treatment systems may be required to treat the water prior to discharge. More detailed information will be considered during the design phase of the project.

There are areas adjacent to creeks that will be designated as ESAs and protected with temporary high visibility fencing. Construction within the creek channels is not anticipated; therefore temporary stream crossings, clear water diversions, and dewatering within the channels are not required.

There is potential for wind erosion. Off-site tracking of sediment shall be limited by placing stabilized construction entrances in combination with regular street sweeping and vacuuming. Stabilized construction roadways shall be used to provide access for construction activities. Locations of these tracking control BMPs will be considered during the PS&E phase.

Various waste management, materials handling, and other housekeeping BMPs shall be used throughout the duration of the project. Stockpiles of various kinds are anticipated and shall be maintained with the appropriate BMPs.

7. Maintenance BMPs (Drain Inlet Stenciling)

Drain inlet markers are not currently anticipated to be required for this project because all work is located along the US 101 mainline and ramps where pedestrian or bike access is prohibited. Other types of maintenance BMPs, including placement of maintenance vehicle pullouts, will be considered during the PS&E phase and coordinated with the Caltrans Maintenance Area Manager.

Required Attachments

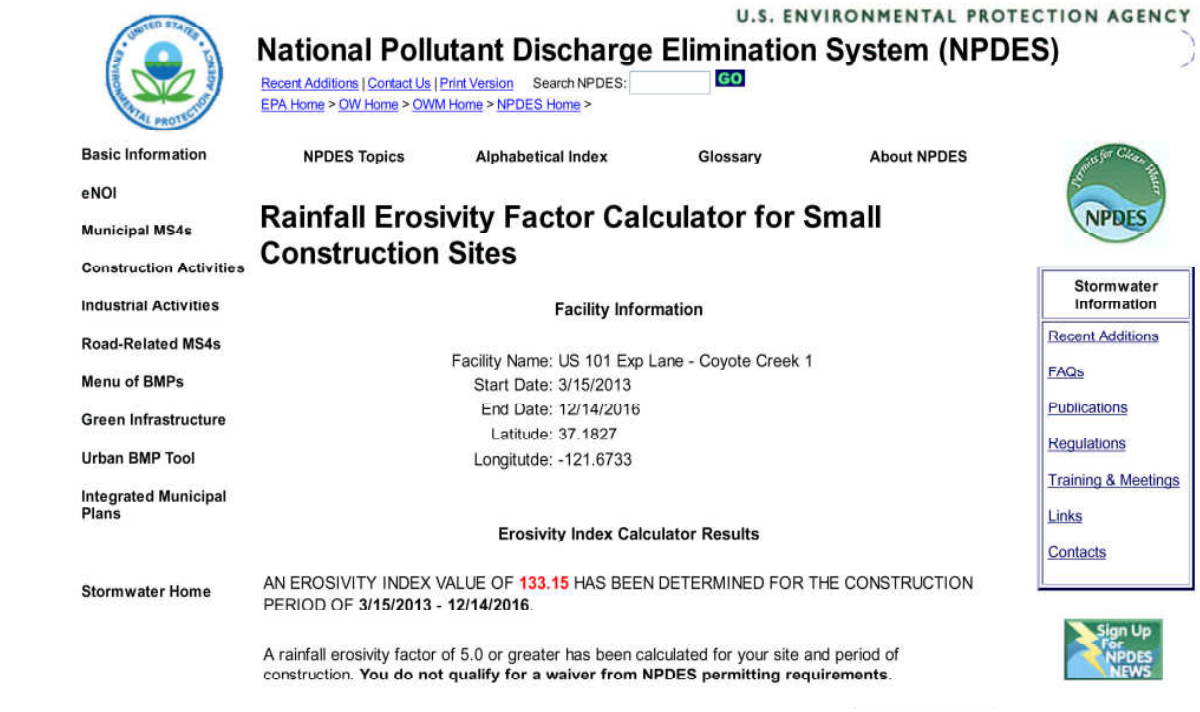
- Vicinity Map (See Figure 1)
- Evaluation Documentation Form (EDF)
- Risk Level Determination Documentation

DATE: August 2012

Project ID (or EA): 04-2G7100

NO.	CRITERIA	YES ✓	NO ✓	SUPPLEMENTAL INFORMATION FOR EVALUATION
1.	Begin Project Evaluation regarding requirement for consideration of Treatment BMPs	✓		See Figure 4-1, Project Evaluation Process for Consideration of Permanent Treatment BMPs. Go to 2
2.	Is this an emergency project?		✓	If **Yes**, go to 10. If **No**, continue to 3.
3.	Have TMDLs or other Pollution Control Requirements been established for surface waters within the project limits? Information provided in the water quality assessment or equivalent document.	✓		If **Yes**, contact the District/Regional NPDES Coordinator to discuss the Department's obligations under the TMDL (if Applicable) or Pollution Control Requirements, go to 9 or 4. _____ *(Dist./Reg. SW Coordinator initials)* If **No**, continue to 4.
4.	Is the project located within an area of a local MS4 Permittee?	✓		If **Yes**. *(Santa Clara Phase 1 and Gilroy, Morgan Hill, Santa Clara Phase II)*, go to 5. If **No**, document in SWDR go to 5.
5.	Is the project directly or indirectly discharging to surface waters?	✓		If **Yes**, continue to 6. If **No**, go to 10.
6.	Is it a new facility or major reconstruction?	✓		If **Yes**, continue to 8. If **No**, go to 7.
7.	Will there be a change in line/grade or hydraulic capacity?	TBD		If **Yes**, continue to 8. If **No**, go to 10.
8.	Does the project result in a net increase or rework of one acre or more of new impervious surface?	✓		If **Yes**, continue to 9. If **No**, go to 10. *Impervious Area TBD*
9.	Project is required to consider approved Treatment BMPs.	✓	See Sections 2.4 and either Section 5.5 or 6.5 for BMP Evaluation and Selection Process. Complete Checklist T-1 in this Appendix E.	
10.	Project is not required to consider Treatment BMPs. _____*(Dist./Reg. Design SW Coord. Initials)* _____*(Project Engineer Initials)* _____ *(Date)*		Document for Project Files by completing this form, and attaching it to the SWDR.	

See Figure 4-1, Project Evaluation Process for Consideration of Permanent Treatment BMPs



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Rainfall Erosivity Factor Calculator for Small Construction Sites

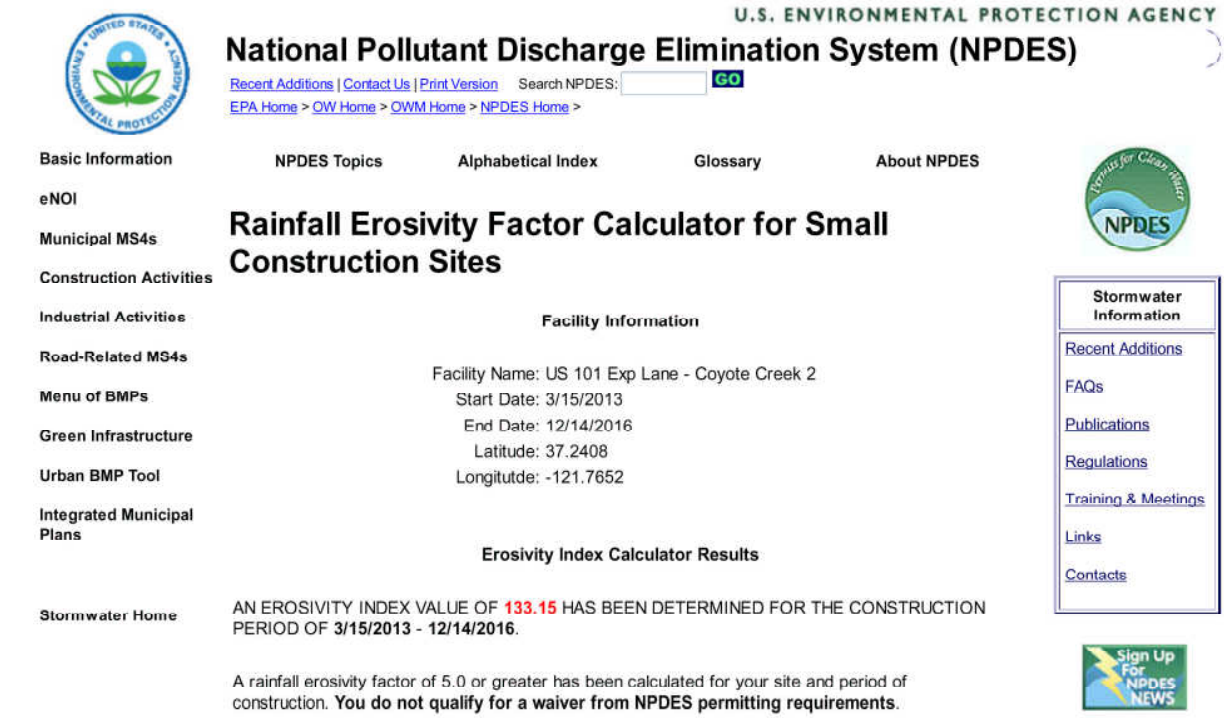
Facility Information

Facility Name: US 101 Exp Lane - Coyote Creek 1
Start Date: 3/15/2013
End Date: 12/14/2016
Latitude: 37.1827
Longitutde: -121.6733

Erosivity Index Calculator Results

AN EROSIVITY INDEX VALUE OF 133.15 HAS BEEN DETERMINED FOR THE CONSTRUCTION PERIOD OF **3/15/2013 - 12/14/2016**.

A rainfall erosivity factor of 5.0 or greater has been calculated for your site and period of construction. **You do not qualify for a waiver from NPDES permitting requirements**.



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Rainfall Erosivity Factor Calculator for Small Construction Sites

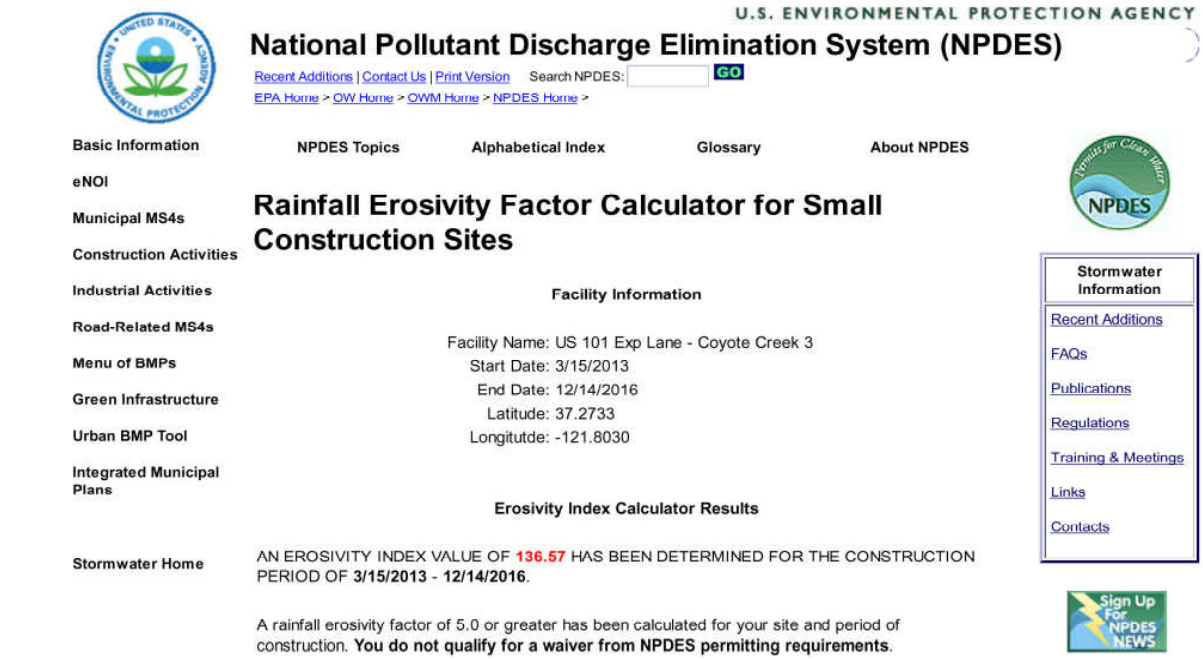
Facility Information

Facility Name: US 101 Exp Lane - Coyote Creek 2
Start Date: 3/15/2013
End Date: 12/14/2016
Latitude: 37.2408
Longitutde: -121.7652

Erosivity Index Calculator Results

AN EROSIVITY INDEX VALUE OF 133.15 HAS BEEN DETERMINED FOR THE CONSTRUCTION PERIOD OF **3/15/2013 - 12/14/2016**.

A rainfall erosivity factor of 5.0 or greater has been calculated for your site and period of construction. **You do not qualify for a waiver from NPDES permitting requirements**.



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Rainfall Erosivity Factor Calculator for Small Construction Sites

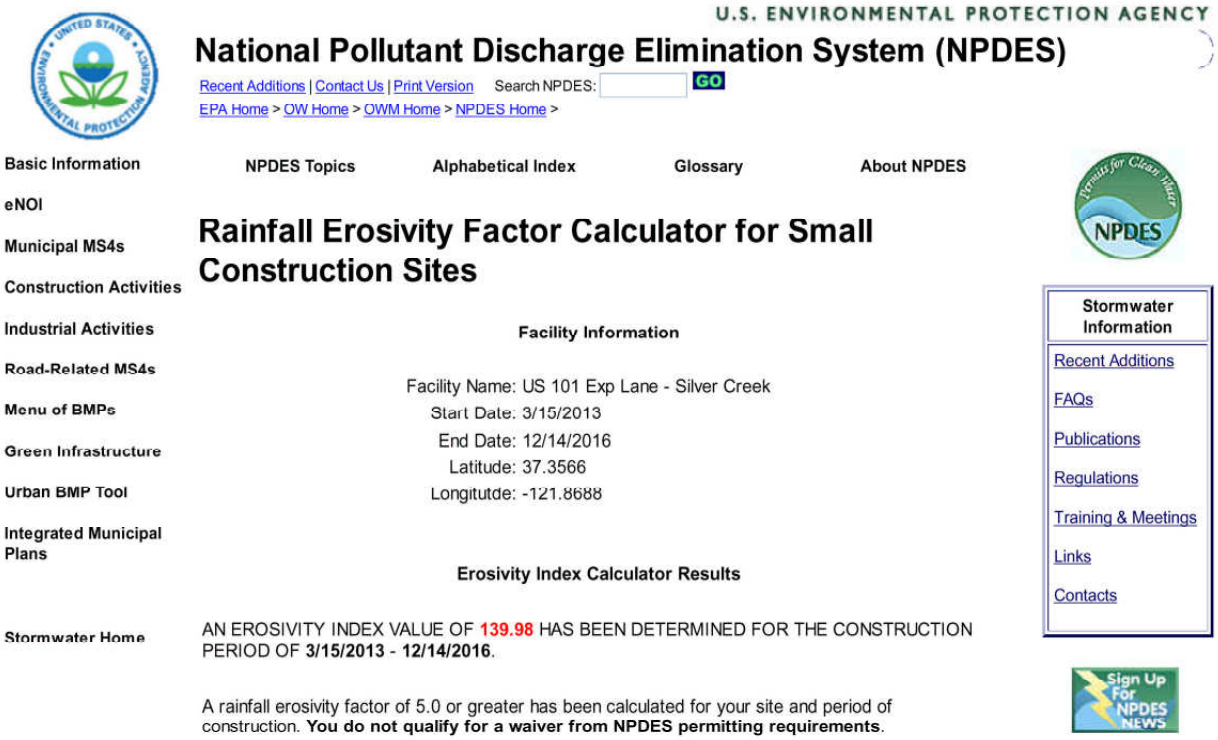
Facility Information

Facility Name: US 101 Exp Lane - Coyote Creek 3
Start Date: 3/15/2013
End Date: 12/14/2016
Latitude: 37.2733
Longitutde: -121.8030

Erosivity Index Calculator Results

AN EROSIVITY INDEX VALUE OF **136.57** HAS BEEN DETERMINED FOR THE CONSTRUCTION PERIOD OF **3/15/2013 - 12/14/2016**.

A rainfall erosivity factor of 5.0 or greater has been calculated for your site and period of construction. **You do not qualify for a waiver from NPDES permitting requirements**.



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Rainfall Erosivity Factor Calculator for Small Construction Sites

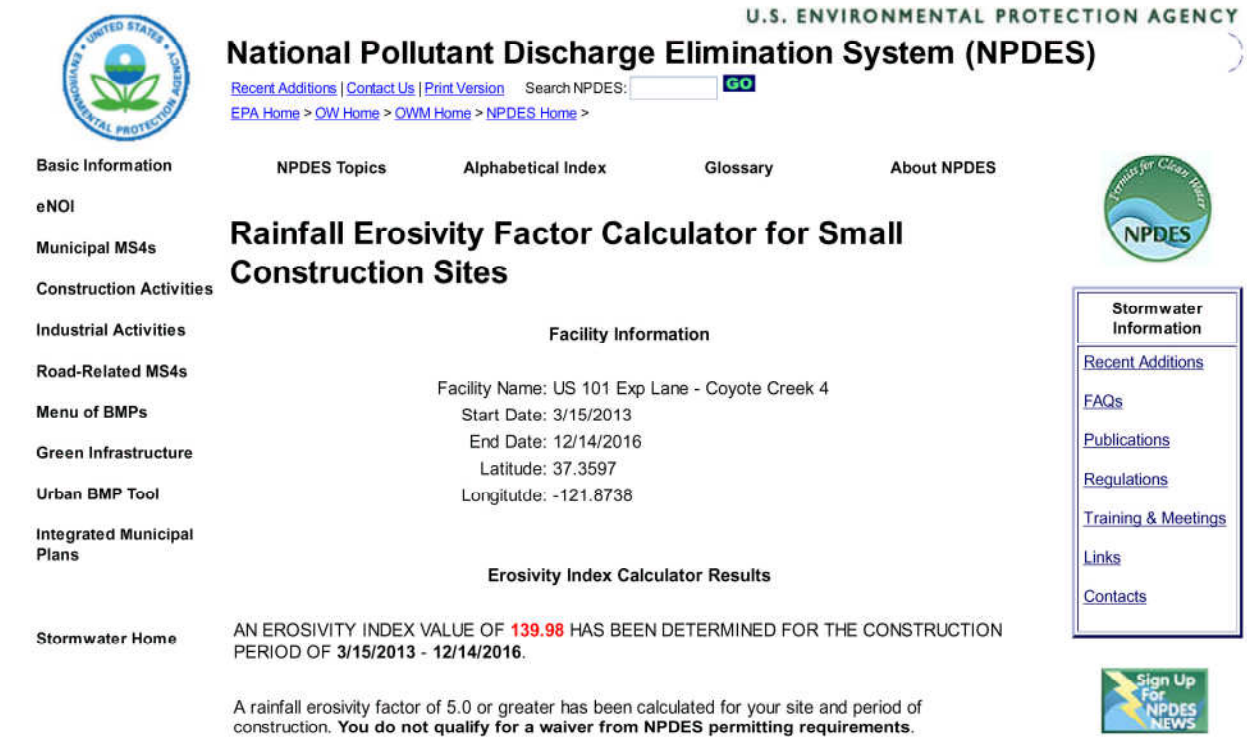
Facility Information

Facility Name: US 101 Exp Lane - Silver Creek
Start Date: 3/15/2013
End Date: 12/14/2016
Latitude: 37.3566
Longitutde: -121.8688

Erosivity Index Calculator Results

AN EROSIVITY INDEX VALUE OF **139.98** HAS BEEN DETERMINED FOR THE CONSTRUCTION PERIOD OF **3/15/2013 - 12/14/2016**.

A rainfall erosivity factor of 5.0 or greater has been calculated for your site and period of construction. **You do not qualify for a waiver from NPDES permitting requirements**.



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Rainfall Erosivity Factor Calculator for Small Construction Sites

Facility Information

Facility Name: US 101 Exp Lane - Coyote Creek 4
Start Date: 3/15/2013
End Date: 12/14/2016
Latitude: 37.3597
Longitude: -121.8738

Erosivity Index Calculator Results

AN EROSIVITY INDEX VALUE OF 139.98 HAS BEEN DETERMINED FOR THE CONSTRUCTION PERIOD OF 3/15/2013 - 12/14/2016.

A rainfall erosivity factor of 5.0 or greater has been calculated for your site and period of construction. **You do not qualify for a waiver from NPDES permitting requirements.**

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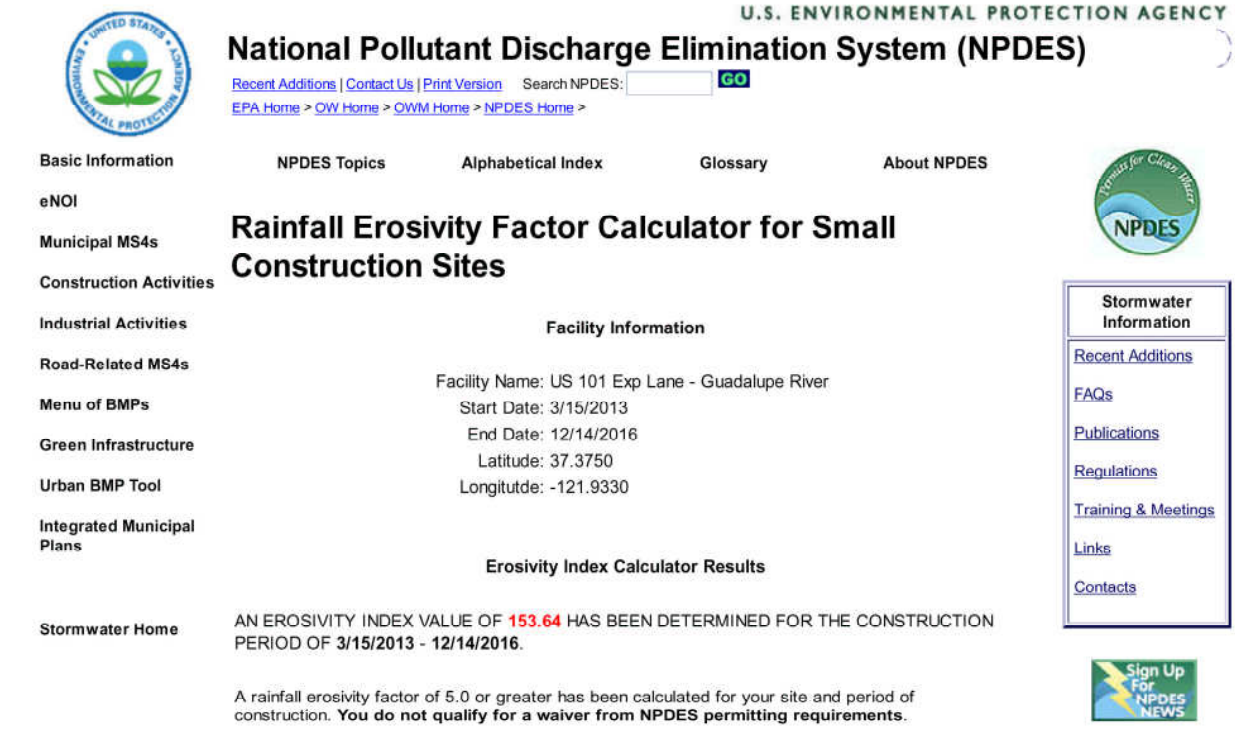

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Facility Information

Facility Name: US 101 Exp Lane - Guadalupe River
Start Date: 3/15/2013
End Date: 12/14/2016
Latitude: 37.3750
Longitude: -121.9330

Erosivity Index Calculator Results

AN EROSIVITY INDEX VALUE OF 153.64 HAS BEEN DETERMINED FOR THE CONSTRUCTION PERIOD OF 3/15/2013 - 12/14/2016.

A rainfall erosivity factor of 5.0 or greater has been calculated for your site and period of construction. **You do not qualify for a waiver from NPDES permitting requirements.**

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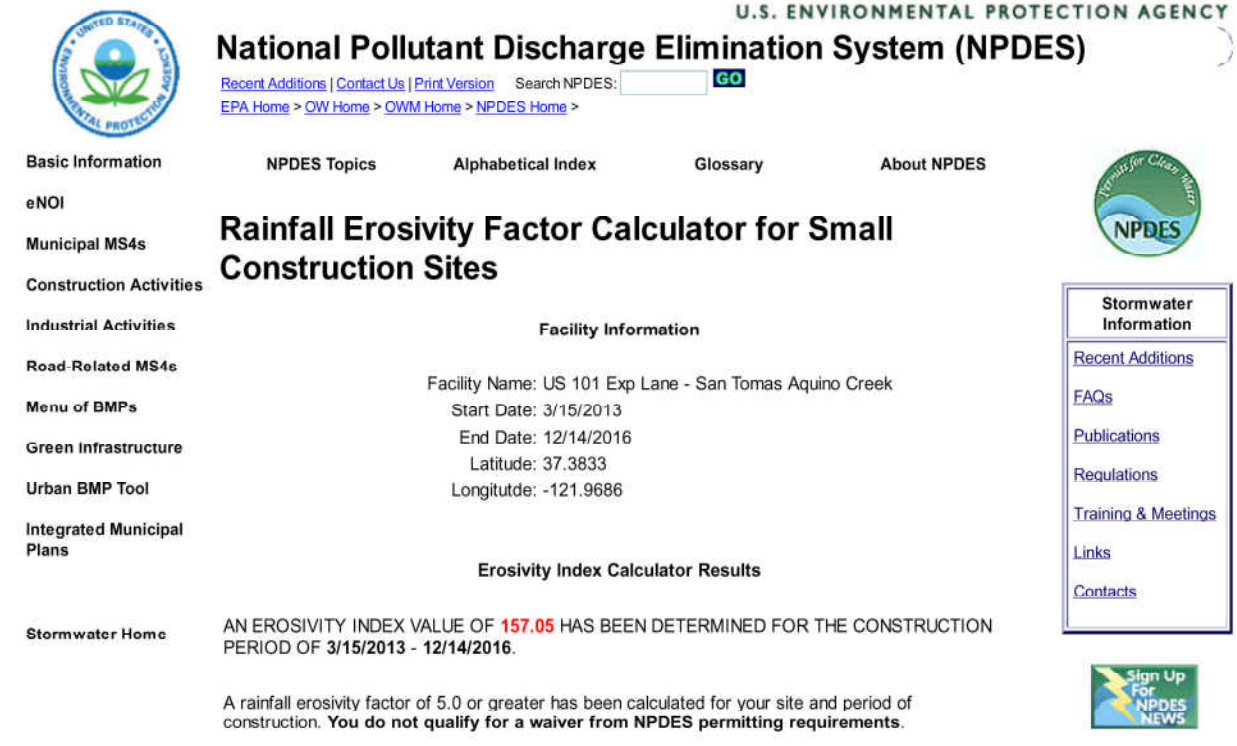

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Rainfall Erosivity Factor Calculator for Small Construction Sites

Facility Information

Facility Name: US 101 Exp Lane - San Tomas Aquino Creek
Start Date: 3/15/2013
End Date: 12/14/2016
Latitude: 37.3833
Longitutde: -121.9686

Erosivity Index Calculator Results

AN EROSIVITY INDEX VALUE OF 157.05 HAS BEEN DETERMINED FOR THE CONSTRUCTION PERIOD OF **3/15/2013 - 12/14/2016**.

A rainfall erosivity factor of 5.0 or greater has been calculated for your site and period of construction. **You do not qualify for a waiver from NPDES permitting requirements**.

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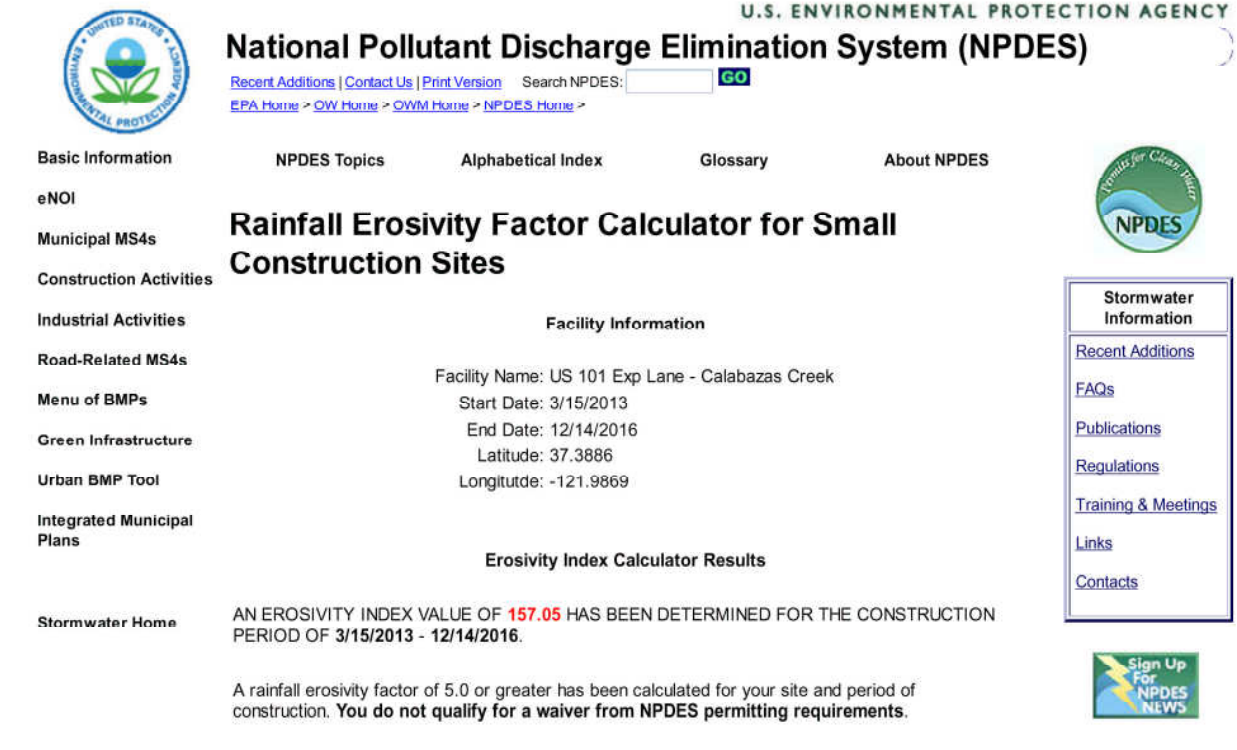

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Rainfall Erosivity Factor Calculator for Small Construction Sites

Facility Information

Facility Name: US 101 Exp Lane - Calabazas Creek
Start Date: 3/15/2013
End Date: 12/14/2016
Latitude: 37.3886
Longitutde: -121.9869

Erosivity Index Calculator Results

AN EROSIVITY INDEX VALUE OF 157.05 HAS BEEN DETERMINED FOR THE CONSTRUCTION PERIOD OF **3/15/2013 - 12/14/2016**.

A rainfall erosivity factor of 5.0 or greater has been calculated for your site and period of construction. **You do not qualify for a waiver from NPDES permitting requirements**.

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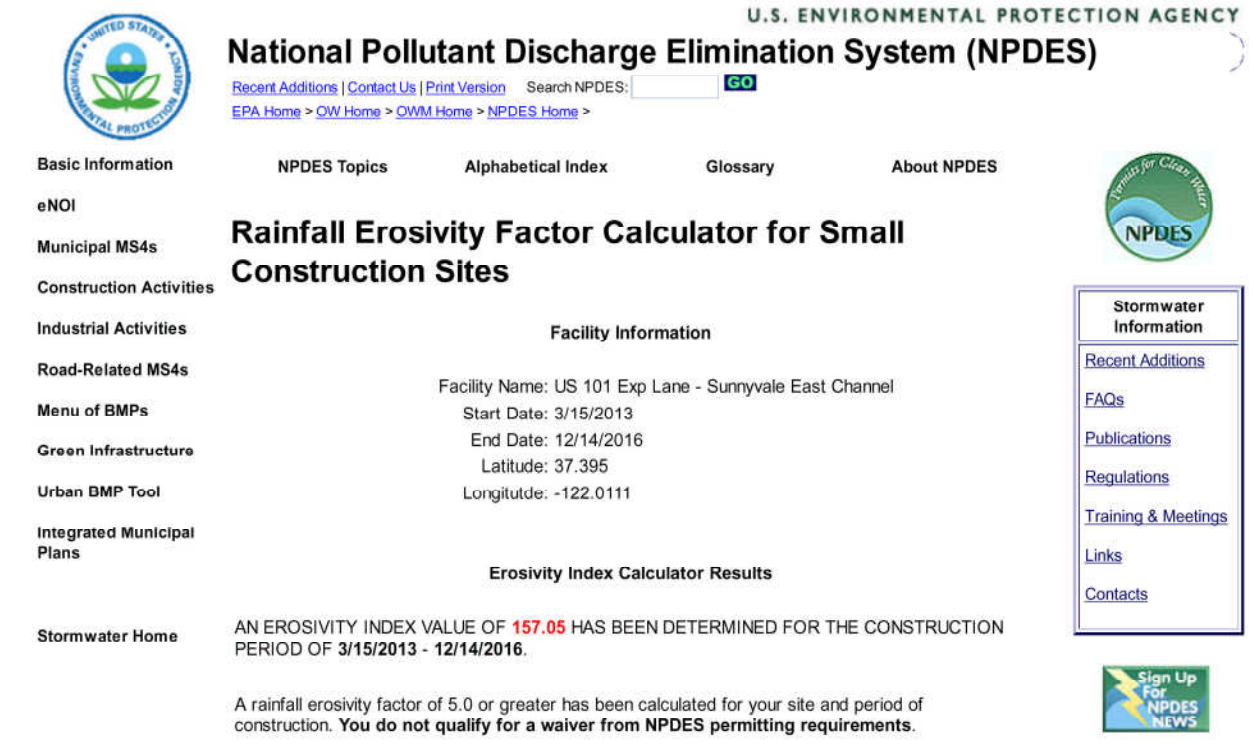

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Rainfall Erosivity Factor Calculator for Small Construction Sites

Facility Information

Facility Name: US 101 Exp Lane - Sunnyvale East Channel
Start Date: 3/15/2013
End Date: 12/14/2016
Latitude: 37.395
Longitude: -122.0111

Erosivity Index Calculator Results

AN EROSIVITY INDEX VALUE OF 157.05 HAS BEEN DETERMINED FOR THE CONSTRUCTION PERIOD OF 3/15/2013 - 12/14/2016.

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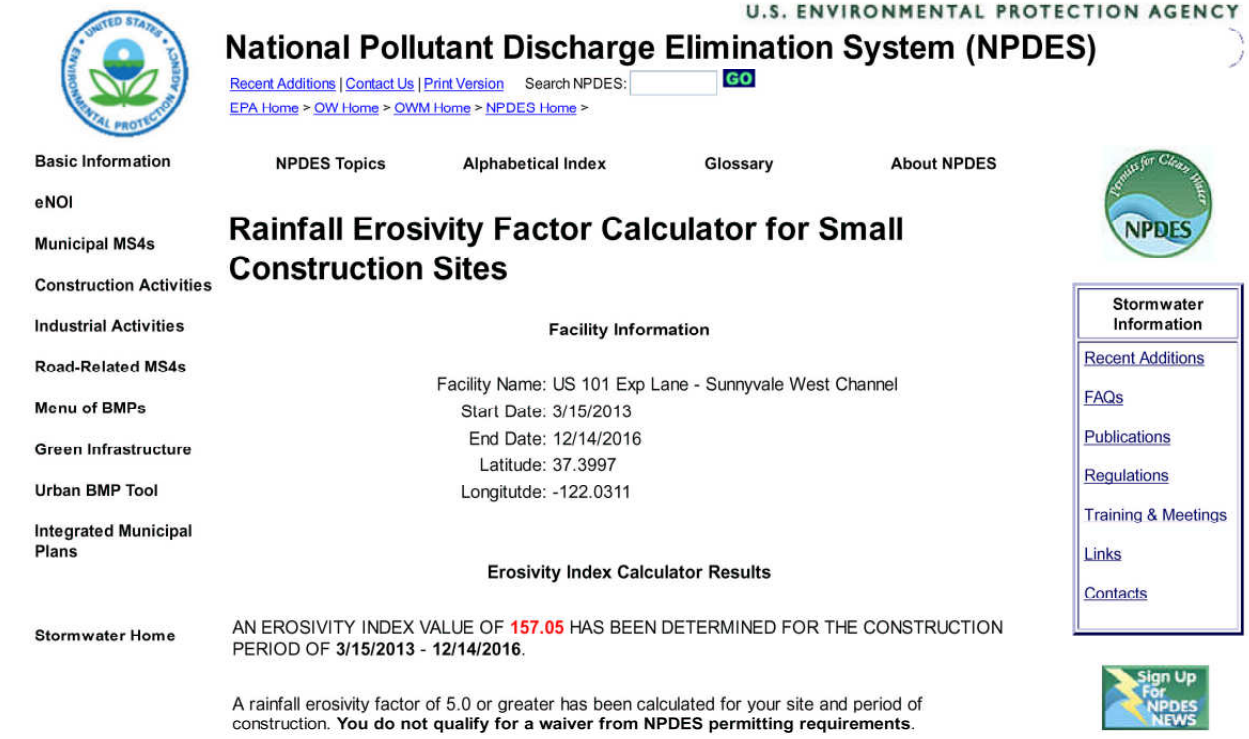

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Rainfall Erosivity Factor Calculator for Small Construction Sites

Facility Information

Facility Name: US 101 Exp Lane - Sunnyvale West Channel
Start Date: 3/15/2013
End Date: 12/14/2016
Latitude: 37.3997
Longitude: -122.0311

Erosivity Index Calculator Results

AN EROSIVITY INDEX VALUE OF 157.05 HAS BEEN DETERMINED FOR THE CONSTRUCTION PERIOD OF 3/15/2013 - 12/14/2016.

A rainfall erosivity factor of 5.0 or greater has been calculated for your site and period of construction. **You do not qualify for a waiver from NPDES permitting requirements**.

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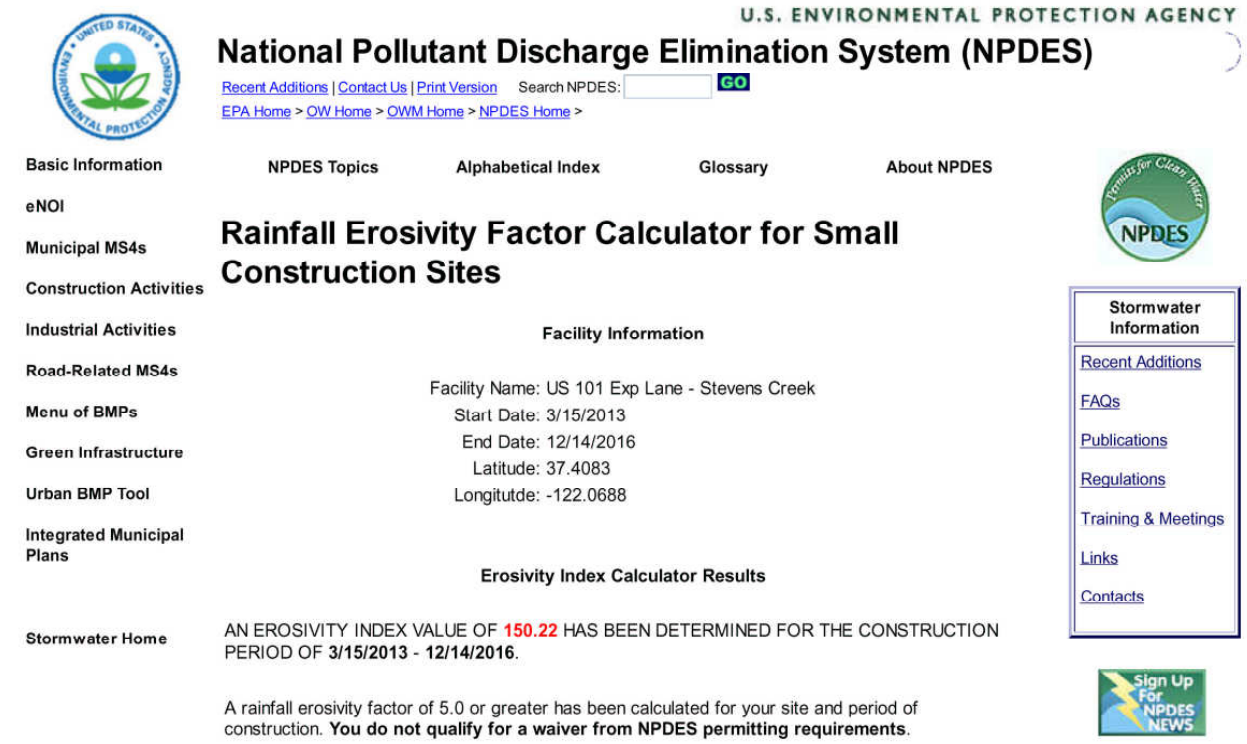

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Rainfall Erosivity Factor Calculator for Small Construction Sites

Facility Information

Facility Name: US 101 Exp Lane - Stevens Creek
Start Date: 3/15/2013
End Date: 12/14/2016
Latitude: 37.4083
Longitutde: -122.0688

Erosivity Index Calculator Results

AN EROSIVITY INDEX VALUE OF 150.22 HAS BEEN DETERMINED FOR THE CONSTRUCTION PERIOD OF 3/15/2013 - 12/14/2016.

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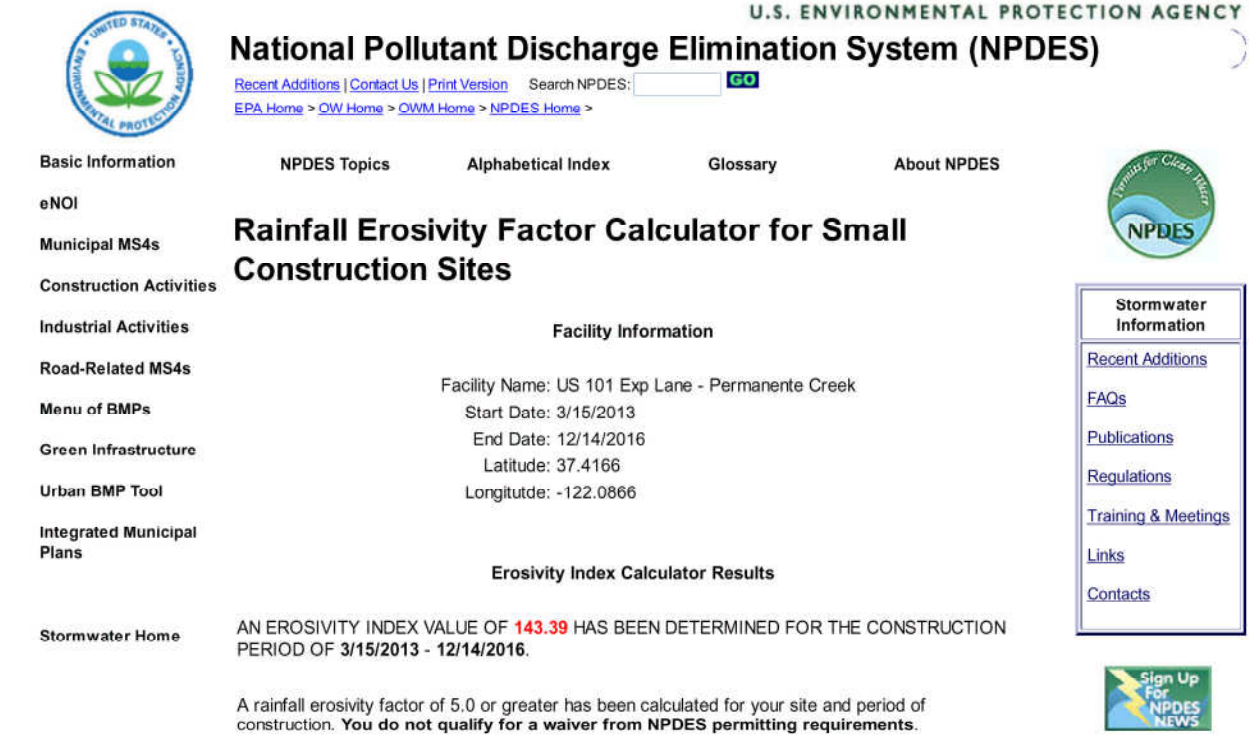

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Rainfall Erosivity Factor Calculator for Small Construction Sites

Facility Information

Facility Name: US 101 Exp Lane - Permanente Creek
Start Date: 3/15/2013
End Date: 12/14/2016
Latitude: 37.4166
Longitutde: -122.0866

Erosivity Index Calculator Results

AN EROSIVITY INDEX VALUE OF 143.39 HAS BEEN DETERMINED FOR THE CONSTRUCTION PERIOD OF 3/15/2013 - 12/14/2016.

A rainfall erosivity factor of 5.0 or greater has been calculated for your site and period of construction. **You do not qualify for a waiver from NPDES permitting requirements.**

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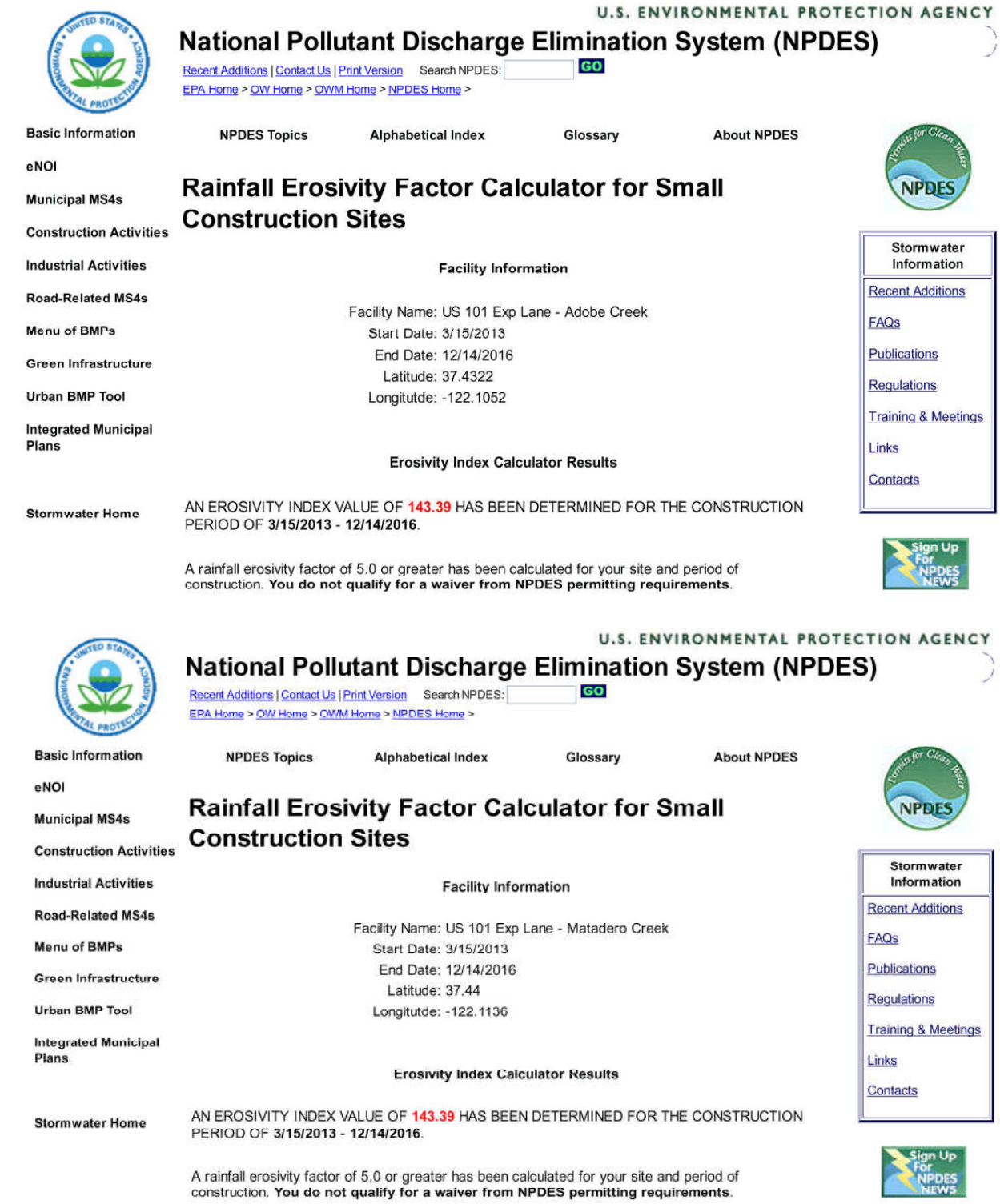

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Facility Information

Facility Name: US 101 Exp Lane - Adobe Creek
Start Date: 3/15/2013
End Date: 12/14/2016
Latitude: 37.4322
Longitutde: -122.1052

Erosivity Index Calculator Results

AN EROSIVITY INDEX VALUE OF 143.39 HAS BEEN DETERMINED FOR THE CONSTRUCTION PERIOD OF **3/15/2013 - 12/14/2016**.

A rainfall erosivity factor of 5.0 or greater has been calculated for your site and period of construction. **You do not qualify for a waiver from NPDES permitting requirements.**

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Facility Information

Facility Name: US 101 Exp Lane - Matadero Creek
Start Date: 3/15/2013
End Date: 12/14/2016
Latitude: 37.44
Longitutde: -122.1136

Erosivity Index Calculator Results

AN EROSIVITY INDEX VALUE OF 143.39 HAS BEEN DETERMINED FOR THE CONSTRUCTION PERIOD OF **3/15/2013 - 12/14/2016**.

A rainfall erosivity factor of 5.0 or greater has been calculated for your site and period of construction. **You do not qualify for a waiver from NPDES permitting requirements.**

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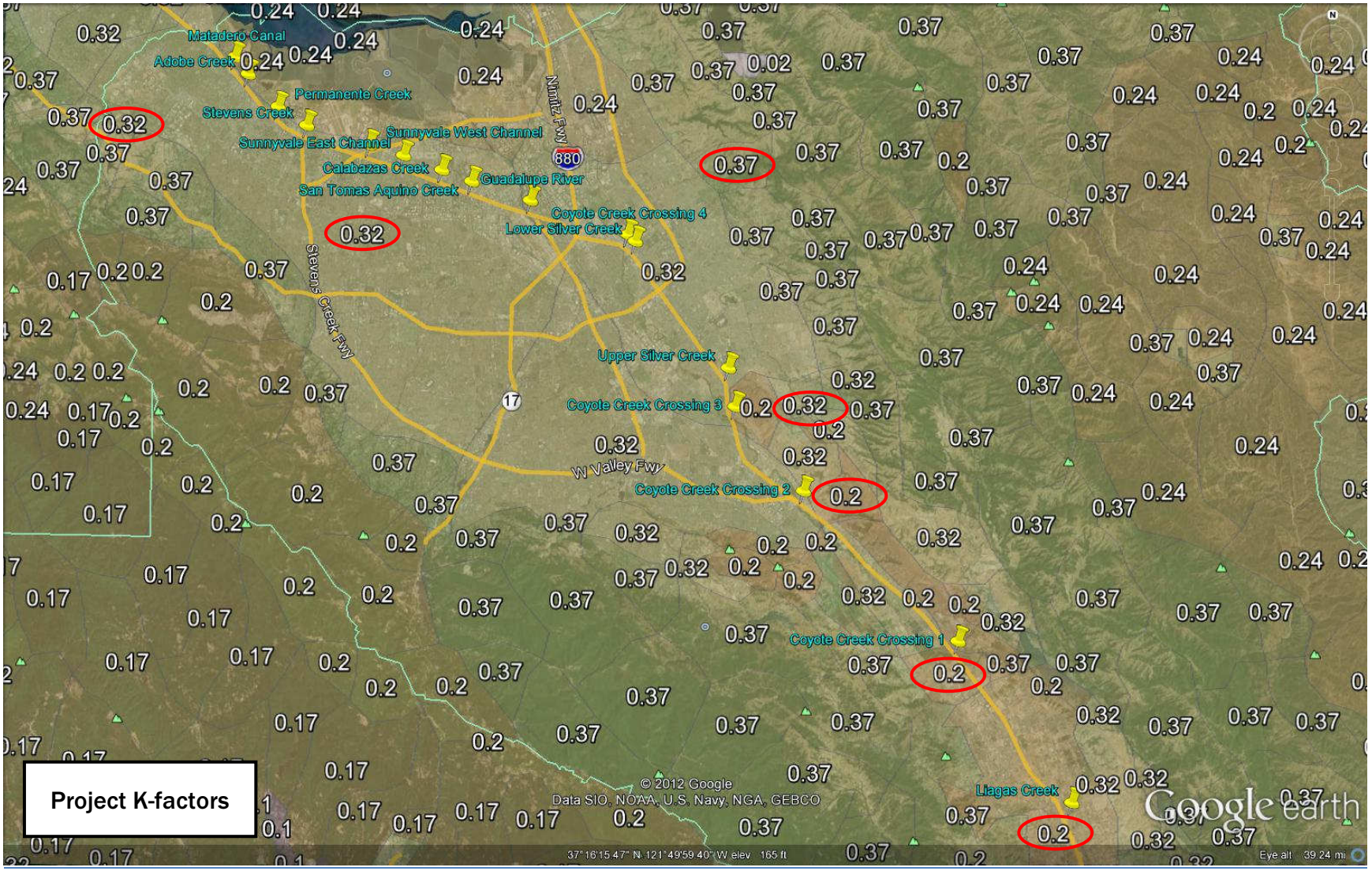
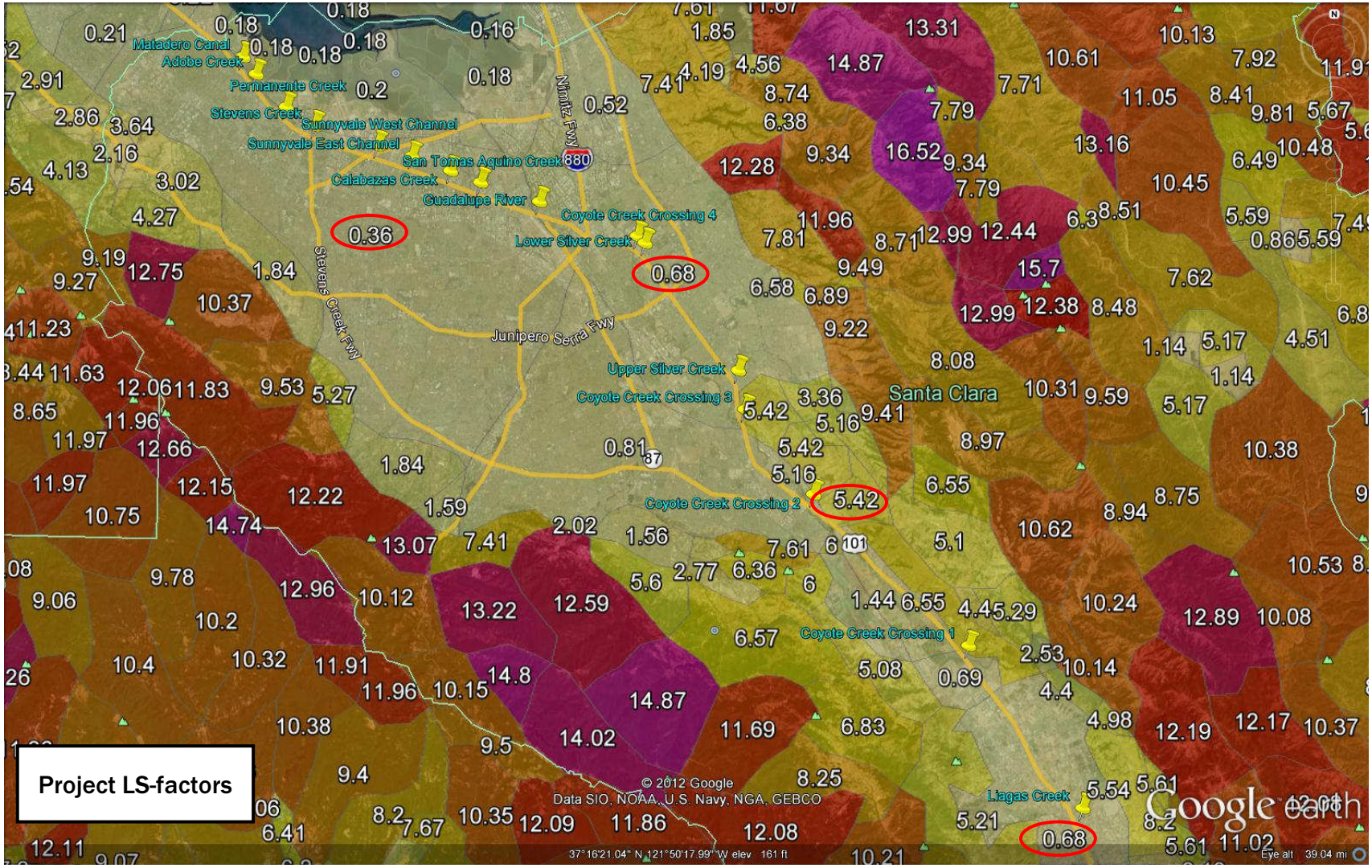
Source: US EPA < http://cfpub.epa.gov/npdes/stormwater/lew/lewcalculator.cfm>



Source: SWRCB



Source: SWRCB

Supplemental Attachments

- Storm Water BMP Cost Summary
- Checklist SW-1, Site Data Sources
- Checklist SW-2, Storm Water Quality Issues Summary
- Checklist SW-3, Measures for Avoiding or Reducing Potential Storm Water BMPs
- Checklists DPP-1, Parts 1–5 (Design Pollution Prevention BMPs)
- Checklists T-1, Parts 1 and 2 (Treatment BMPs)
- Potential Treatment BMP and Monitoring Location Maps
- NRCS Web Soil Survey

Storm Water BMP Cost Summary

Project Name:	**US 101 Express Lanes**
District:	**04**
County:	**SCl**
Route:	**101, 85**
Postmile Limits:	**16.0/52.55, 23.0/24.1**
Project ID (or EA):	**04-2G7100**

1.0 DPP BMPs

Total Construction Cost	1.00% General			
$314,330,100	**$3,143,301**	**SUBTOTAL**	$	3,143,301

2.0 Treatment BMPs

Total Construction Cost	2.00% MRP Guidance			
$314,330,100	**$6,286,602**	**SUBTOTAL**	$	6,286,602

3.0 Prepare SWPPP (or WCPC)

Total Construction Cost	Cost per Table F-6			
$314,330,100	**$26,800**	**SUBTOTAL**	$	26,800

RQM Value (if SWPPP is required): **$20,800**

4.0 Construction Site BMPs

Total Construction Cost	1.25% per Table F-3			
$314,330,100	**$3,929,126**	**SUBTOTAL**	$	3,929,126

5.0 Stormwater Monitoring

Project Risk Level	SWM Cost (PPDG Appen F)			
2 and 3	**$322,452**	**SUBTOTAL**	$	322,452

TOTAL COST FOR STORM WATER BMPs $ 13,709,000

Note: Total cost rounded up to the nearest thousands.

Checklist SW-1, Site Data Sources

Prepared by: WRECO Date: August 2012 District-Co-Route: 04-SCl-101, 04-SCl-85

PM: 16.0/52.55, 23.0/24.1 Project ID (or EA): 04-2G7100 RWQCB: San Francisco Bay (2), Central Coast (3)

Information for the following data categories should be obtained, reviewed and referenced as necessary throughout the project planning phase. Collect any available documents pertaining to the category and list them and reference your data source. For specific examples of documents within these categories, refer to Section 5.5 of this document. Example categories have been listed below; add additional categories, as needed. Summarize pertinent information in Section 2 of the SWDR.

DATA CATEGORY/SOURCES	Date
Topographic	
• United States Geological Survey. (2001). California: Seamless U.S.G.S. Topographic Maps [CDROM, Version 2.6.8, 2001, Part Number: 113-100-004]. National Geographic Holdings, Inc.	Accessed: December, 2011
Hydraulic	
• Federal Emergency Management Agency. (2009). Flood Insurance Study, Santa Clara County, California and Incorporated Areas, Volumes 1-4 (Flood Insurance Study Number 06085C0030H, 06085C0036H, 06085C0037H , 06085C0039H, 06085C0202H and 06085C0206H, 06085C0063H, 06085C0064H, 06085C0068H, 06085C0231H).	Accessed: January 2012
• Santa Clara Valley Water District. Available on website at: http://www.valleywater.org/	Accessed: January 2012
Soils	
• URS Corporation. (2011). *Draft Preliminary Geotechnical Report, US 101 Express Lanes Project, Santa Clara County, California.*	December, 2011
• US Dept. of Agriculture (USDA), Natural Resources Conservation Service (NRCS). Web Soil Survey. http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx	Accessed: December 2011
Climatic	
• URS Corporation. (2011). Preliminary Geotechnical Report US 101 Express Lanes Project, Santa Clara County, California	Accessed: December 2011
Water Quality	
• California State University (CSU) at Sacramento, Office of Water Programs. Water Quality Planning Tool. http://stormwater.water-programs.com/	Accessed: December 2011
• San Francisco Bay Regional Water Quality Control Board. Water Quality Control Plan (*Basin Plan).*	Amended December 31, 2010
• California State Water Resources Control Board (SWRCB). *2010 Integrated Report (Clean Water Act 303(d) List/305(b) Report)*	December 9, 2011
• California State Water Resources Control Board (SWRCB).	Adopted: September 2, 2009

National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities. NPDES Number CAS000002.	Amended: November 16, 2010
Other Data Categories	
• Caltrans. *Storm Water Quality Handbooks, Project Planning and Design Guide*. CTSW-RT-10-254.03.	July 2010
• Caltrans. *Storm Water Quality Handbooks, Construction Site Best Management Practices (BMPs) Manual.*	March 2003
• Caltrans. *Storm Water Quality Handbooks, Stormwater Pollution Prevention Plan (SWPPP) and Water Pollution Control Program (WPCP) Preparation Manual.* CTSW-RT-10-255.08.01.	March 2011
• Caltrans. *Project Study Report (Project Development Support) to Request Programming for Capital Outlay Support (Project Approval/Environmental Document Phase) On Route Southbound 680 between Livorna Road and 0.2 mile north of Geary Road*. EA 3A580K	May 27, 2009
• California Regional Water Quality Control Board San Francisco Bay Region. *Municipal Regional Stormwater NPDES Permit*. Order R2-2009-0074 NPDES Permit No. CAS612008	October 14, 2009
• URS Corporation. (2012). *Draft Initial Site Assessment, US 101 Express Lanes Project, Santa Clara County, California.*	July, 2012
• URS Corporation. (2012). *Draft Preliminary Geotechnical Report, US 101 Express Lanes Project, Santa Clara County, California.*	July, 2012
• URS Corporation. (2012). *Preliminary Environmental Analysis Report, US 101 Express Lanes Project, Santa Clara County, California.*	July, 2012
• U.S. EPA Rainfall Erosivity Factor Calculator for Small Construction Sites <http://cfpub.epa.gov/npdes/stormwater/lew/lewcalculator.cfm >	Accessed: December 2011

Checklist SW-2, Storm Water Quality Issues Summary

Prepared by: WRECO Date: August 2012 District-Co-Route: 04-SCl-101, 04-SCl-85

PM: 16.0/52.55, 23.0/24.1 Project ID (or EA): 04-2G7100 RWQCB: San Francisco Bay (2), Central Coast (3)

The following questions provide a guide to collecting critical information relevant to project stormwater quality issues. Complete responses to applicable questions, consulting other Caltrans functional units (Environmental, Landscape Architecture, Maintenance, etc.) and the District/Regional Storm Water Coordinator as necessary. Summarize pertinent responses in Section 2 of the SWDR.

1. Determine the receiving waters that may be affected by the project throughout the project life cycle (i.e., construction, maintenance and operation).	☒ Complete	☐ NA
2. For the project limits, list the 303(d) impaired receiving water bodies and their constituents of concern.	☒ Complete	☐ NA
3. Determine if there are any municipal or domestic water supply reservoirs or groundwater percolation facilities within the project limits. Consider appropriate spill contamination and spill prevention control measures for these new areas.	☐ Complete	☒ NA
4. Determine the RWQCB special requirements, including TMDLs, etc.	☒ Complete	☐ NA
5. Determine regulatory agencies seasonal construction and construction exclusion dates or restrictions required by federal, state, or local agencies.	☒ Complete	☐ NA
6. Determine if a 401 certification will be required.	☐ Complete	☒ NA
7. List rainy season dates.	☒ Complete	☐ NA
8. Determine the general climate of the project area. Identify annual rainfall and rainfall intensity curves.	☒ Complete	☐ NA
9. If considering Treatment BMPs, determine the soil classification, permeability, erodibility, and depth to groundwater.	☒ Complete	☐ NA
10. Determine contaminated soils within the project area.	☒ Complete	☐ NA
11. Determine the total disturbed soil area of the project.	☒ Complete	☐ NA
12. Describe the topography of the project site.	☒ Complete	☐ NA
13. List any areas outside of the Caltrans right-of-way that will be included in the project (e.g. contractor's staging yard, work from barges, easements for staging, etc.).	☐ Complete	☒ NA
14. Determine if additional right-of-way acquisition or easements and right-of-entry will be required for design, construction and maintenance of BMPs. If so, how much?	☐ Complete	☒ NA
15. Determine if a right-of-way certification is required.	☒ Complete	☐ NA
16. Determine the estimated unit costs for right-of-way should it be needed for Treatment BMPs, stabilized conveyance systems, lay-back slopes, or interception ditches.	☐ Complete	☒ NA
17. Determine if project area has any slope stabilization concerns.	☒ Complete	☐ NA
18. Describe the local land use within the project area and adjacent areas.	☒ Complete	☐ NA
19. Evaluate the presence of dry weather flow.	☐ Complete	☒ NA

Checklist SW-3, Measures for Avoiding or Reducing Potential Storm Water Impacts

Prepared by: WRECO Date: August 2012 District-Co-Route: : 04-SCl-101, 04-SCl-85

PM: 16.0/52.55, 23.0/24.1 Project ID (or EA): 04-2G7100 RWQCB: San Francisco Bay (2), Central Coast (3)

The PE must confer with other functional units, such as Landscape Architecture, Hydraulics, Environmental, Materials, Construction and Maintenance, as needed to assess these issues. Summarize pertinent responses in Section 2 of the SWDR.

Options for avoiding or reducing potential impacts during project planning include the following:

1.	Can the project be relocated or realigned to avoid/reduce impacts to receiving waters or to increase the preservation of critical (or problematic) areas such as floodplains, steep slopes, wetlands, and areas with erosive or unstable soil conditions?	☐Yes	☒No	☐NA
2.	Can structures and bridges be designed or located to reduce work in live streams and minimize construction impacts?	☐Yes	☐No	☒NA
3.	Can any of the following methods be utilized to minimize erosion from slopes:			
	a. Disturbing existing slopes only when necessary?	☒Yes	☐No	☐NA
	b. Minimizing cut and fill areas to reduce slope lengths?	☒Yes	☐No	☐NA
	c. Incorporating retaining walls to reduce steepness of slopes or to shorten slopes?	☒Yes	☐No	☐NA
	d. Acquiring right-of-way easements (such as grading easements) to reduce steepness of slopes?	☐Yes	☐No	☒NA
	e. Avoiding soils or formations that will be particularly difficult to re-stabilize?	☒Yes	☐No	☐NA
	f. Providing cut and fill slopes flat enough to allow re-vegetation and limit erosion to pre-construction rates?	☒Yes	☐No	☐NA
	g. Providing benches or terraces on high cut and fill slopes to reduce concentration of flows?	☐Yes	☐No	☒NA
	h. Rounding and shaping slopes to reduce concentrated flow?	☒Yes	☐No	☐NA
	i. Collecting concentrated flows in stabilized drains and channels?	☒Yes	☐No	☐NA
4.	Does the project design allow for the ease of maintaining all BMPs?	☒Yes	☐No	
5.	Can the project be scheduled or phased to minimize soil-disturbing work during the rainy season?	☒Yes	☐No	
6.	Can permanent storm water pollution controls such as paved slopes, vegetated slopes, basins, and conveyance systems be installed early in the construction process to provide additional protection and to possibly utilize them in addressing construction storm water impacts?	☒Yes	☐No	☐NA

Design Pollution Prevention BMPs

Checklist DPP-1, Part 1

Prepared by: WRECO Date: August 2012 District-Co-Route: 04-SCl-101, 04-SCl-85

PM: 16.0/52.55, 23.0/24.1 Project ID (or EA): 04-2G7100 RWQCB: San Francisco Bay (2), Central Coast (3)

Consideration of Design Pollution Prevention BMPs

Note: Checklist to be completed during PS&E.

Consideration of Downstream Effects Related to Potentially Increased Flow [to streams or channels]

Will project increase velocity or volume of downstream flow?	☒Yes	☐No	☐NA
Will the project discharge to unlined channels?	☒Yes	☐No	☐NA
Will project increase potential sediment load of downstream flow?	☒Yes	☐No	☐NA
Will project encroach, cross, realign, or cause other hydraulic changes to a stream that may affect downstream channel stability?	☒Yes	☐No	☐NA

If Yes was answered to any of the above questions, consider ***Downstream Effects Related to Potentially Increased Flow***, complete the DPP-1, Part 2 checklist.

Slope/Surface Protection Systems

Will project create new slopes or modify existing slopes?	☒Yes	☐No	☐NA

If Yes was answered to the above question, consider ***Slope/Surface Protection Systems***, complete the DPP-1, Part 3 checklist.

Concentrated Flow Conveyance Systems

Will the project create or modify ditches, dikes, berms, or swales?	☒Yes	☐No	☐NA
Will project create new slopes or modify existing slopes?	☒Yes	☐No	☐NA
Will it be necessary to direct or intercept surface runoff?	☒Yes	☐No	☐NA
Will cross drains be modified?	☒Yes	☐No	☐NA

If Yes was answered to any of the above questions, consider ***Concentrated Flow Conveyance Systems***; complete the DPP-1, Part 4 checklist.

Preservation of Existing Vegetation

It is the goal of the Storm Water Program to maximize the protection of desirable existing vegetation to provide erosion and sediment control benefits on all projects. ☒Complete

Consider ***Preservation of Existing Vegetation***, complete the DPP-1, Part 5 checklist.

Design Pollution Prevention BMPs

Checklist DPP-1, Part 2

Prepared by: WRECO Date: August 2012 District-Co-Route: 04-SCl-101, 04-SCl-85

PM: 16.0/52.55, 23.0/24.1 Project ID (or EA): 04-2G7100 RWQCB: San Francisco Bay (2), Central Coast (3)

Downstream Effects Related to Potentially Increased Flow

Note: Checklist to be completed during PS&E.

1.	Review total paved area and reduce to the maximum extent practicable.	☐ Complete
2.	Review channel lining materials and design for stream bank erosion control.	☒ Complete
	(a) See Chapters 860 and 870 of the HDM.	☒ Complete
	(b) Consider channel erosion control measures within the project limits as well as downstream. Consider scour velocity.	☒ Complete
3.	Include, where appropriate, energy dissipation devices at culvert outlets.	☐ Complete
4.	Ensure all transitions between culvert outlets/headwalls/wingwalls and channels are smooth to reduce turbulence and scour.	☐ Complete
5.	Include, if appropriate, peak flow attenuation basins or devices to reduce peak discharges.	☐ Complete

Design Pollution Prevention BMPs

Checklist DPP-1, Part 3

Prepared by: WRECO Date: August 2012 District-Co-Route: 04-SCl-101, 04-SCl-85

PM: 16.0/52.55, 23.0/24.1 Project ID (or EA): 04-2G7100 RWQCB: San Francisco Bay (2), Central Coast (3)

Slope / Surface Protection Systems

Note: Checklist to be completed during PS&E.

1. What are the proposed areas of cut and fill? (attach plan or map) ☐ Complete
2. Were benches or terraces provided on high cut and fill slopes to reduce concentration of flows? ☐ Yes ☒ No
3. Were slopes rounded and/or shaped to reduce concentrated flow? ☒ Yes ☐ No
4. Were concentrated flows collected in stabilized drains or channels? ☒ Yes ☐ No
5. Are new or disturbed slopes > 4:1 horizontal:vertical (h:v)? ☒ Yes ☐ No

   If Yes, District Landscape Architect must prepare or approve an erosion control plan, at the District's discretion.
6. Are new or disturbed slopes > 2:1 (h:v)? ☒ Yes ☐ No

   If Yes, Geotechnical Services must prepare a Geotechnical Design Report, and the District Landscape Architect should prepare or approve an erosion control plan. Concurrence must be obtained from the District Maintenance Storm Water Coordinator for slopes steeper than 2:1 (h:v).

Estimate the net new impervious area that will result from this project. ☐ Complete

VEGETATED SURFACES

1. Identify existing vegetation. ☐ Complete
2. Evaluate site to determine soil types, appropriate vegetation and planting strategies. ☒ Complete
3. How long will it take for permanent vegetation to establish? ☐ Complete
4. Minimize overland and concentrated flow depths and velocities. ☒ Complete

HARD SURFACES

1. Are hard surfaces required? ☒ Yes ☐ No

   If Yes, document purpose (safety, maintenance, soil stabilization, etc.), types, and general locations of the installations. ☒ Complete

Review appropriate SSPs for Vegetated Surface and Hard Surface Protection Systems. ☐ Complete

Design Pollution Prevention BMPs

Checklist DPP-1, Part 4

Prepared by: WRECO Date: August 2012 District-Co-Route: 04-SCl-101, 04-SCl-85

PM: 16.0/52.55, 23.0/24.1 Project ID (or EA): 04-2G7100 RWQCB: San Francisco Bay (2), Central Coast (3)

Concentrated Flow Conveyance Systems

Note: Checklist to be completed during PS&E.

Ditches, Berms, Dikes and Swales

1. Consider Ditches, Berms, Dikes, and Swales as per Topics 813, 834.3, and 835, and Chapter 860 of the HDM. ☒Complete
2. Evaluate risks due to erosion, overtopping, flow backups or washout. ☒Complete
3. Consider outlet protection where localized scour is anticipated. ☒Complete
4. Examine the site for run-on from off-site sources. ☒Complete
5. Consider channel lining when velocities exceed scour velocity for soil. ☒Complete

Overside Drains

1. Consider downdrains, as per Index 834.4 of the HDM. ☒Complete
2. Consider paved spillways for side slopes flatter than 4:1 h:v. ☒Complete

Flared Culvert End Sections

1. Consider flared end sections on culvert inlets and outlets as per Chapter 827 of the HDM. ☒Complete

Outlet Protection/Velocity Dissipation Devices

1. Consider outlet protection/velocity dissipation devices at outlets, including cross drains, as per Chapters 827 and 870 of the HDM. ☒Complete

Review appropriate SSPs for Concentrated Flow Conveyance Systems. ☐Complete

Design Pollution Prevention BMPs

Checklist DPP-1, Part 5

Prepared by: WRECO Date: August 2012 District-Co-Route: 04-SCl-101, 04-SCl-85

PM: 16.0/52.55, 23.0/24.1 Project ID (or EA): 04-2G7100 RWQCB: San Francisco Bay (2), Central Coast (3)

Preservation of Existing Vegetation

Note: Checklist to be completed during PS&E.

1.	Review Preservation of Property, Standard Specifications 16.1.01 and 16-1.02 (Clearing and Grubbing) to reduce clearing and grubbing and maximize preservation of existing vegetation.	☒ Complete
2.	Has all vegetation to be retained been coordinated with Environmental, and identified and defined in the contract plans?	☐ Yes ☐ No
3.	Have steps been taken to minimize disturbed areas, such as locating temporary roadways to avoid stands of trees and shrubs and to follow existing contours to reduce cutting and filling?	☐ Complete
4.	Have impacts to preserved vegetation been considered while work is occurring in disturbed areas?	☒ Yes ☐ No
5.	Are all areas to be preserved delineated on the plans?	☐ Yes ☐ No

Treatment BMPs

Checklist T-1, Part 1

Prepared by: WRECO Date: August 2012 District-Co-Route: 04-SCl-101, 04-SCl-85

PM: 16.0/52.55, 23.0/24.1 Project ID (or EA): 04-2G7100 RWQCB: San Francisco Bay (2), Central Coast (3)

Consideration of Treatment BMPs - To be completed during PS&E

This checklist is used for projects that require the consideration of Approved Treatment BMPs, as determined from the process described in Section 4 (Project Treatment Consideration) and the Evaluation Documentation Form (EDF). This checklist will be used to determine which Treatment BMPs should be considered for each watershed and sub-watershed within the project. Supplemental data will be needed to verify siting and design applicability for final incorporation into a project.

Complete this checklist for each phase of the project, when considering Treatment BMPs. Use the responses to the questions as the basis when developing the narrative in Section 5 of the Storm Water Data Report to document that Treatment BMPs have been appropriately considered.

Answer all questions, unless otherwise directed. Questions 14 through 16 should be answered after all subwatershed (drainages) are considered using this checklist.

1. Is the project in a watershed with prescriptive TMDL treatment BMP requirements in an adopted TMDL implementation plan? ☐ **Yes** ☒ **No**

   If Yes, consult the District/Regional Storm Water Coordinator to determine whether the T-1 checklist should be used to propose alternative BMPs because the prescribed BMPs may not be feasible or other BMPs may be more cost-effective. Special documentation and regulatory response may be necessary.

2. Dry Weather Flow Diversion

   (a) Are dry weather flows generated by Caltrans anticipated to be persistent? ☐ **Yes** ☒ **No**

   (b) Is a sanitary sewer located on or near the site? ☒ **Yes** ☐ **No**

   If Yes to both 2 (a) and (b), continue to (c). If No to either, skip to question 3.

   (c) Is connection to the sanitary sewer possible without extraordinary plumbing, features or construction practices? ☐ **Yes** ☐ **No**

   (d) Is the domestic wastewater treatment authority willing to accept flow? ☐ **Yes** ☐ **No**

   If Yes was answered to all of these questions consider ***Dry Weather Flow Diversion***, complete and attach **Part 3** of this checklist

3. Is the receiving water on the 303(d) list for litter/trash or has a TMDL been issued for litter/trash? ☒ **Yes** ☐ **No**

If Yes, consider ***Gross Solids Removal Devices (GSRDs)***, complete and attach **Part 6** of this checklist. Note: Infiltration Devices, Detention Devices, Media Filters, MCTTs, and Wet Basins also can capture litter. Before considering GSRDs for stand-alone installation or in sequence with other BMPs, consult with District/Regional NPDES Storm Water Coordinator to determine whether Infiltration Devices, Detention Devices, Media Filters, MCTTs, and Wet Basins should be considered instead of GSRDs to meet litter/trash TMDL.

4. Is project located in an area (e.g., mountain regions) where traction sand is applied more than twice a year? ☐**Yes** ☒**No**

   If Yes, consider ***Traction Sand Traps***, complete and attach **Part 7** of this checklist.

5. Maximizing Biofiltration Strips and Swales

   Objectives:

   1) Quantify infiltration from biofiltration alone
   2) Identify highly infiltrating biofiltration (i.e. > 90%) and skip further BMP consideration.
   3) Identify whether amendments can substantially improve infiltration.

   (a) Have biofiltration strips and swales been designed for runoff from all project areas, including sheet flow and concentrated flow conveyance? If no, document justification in Section 5 of the SWDR. ☐**Yes** ☒**No**

   (b) Based on site conditions, estimate what percentage of the WQV[1] can be infiltrated. When calculating the WQV, use a 12-hour drawdown for Type A and B soils, a 24-hour drawdown for Type C soils, and a 48-hour drawdown for Type D soils.

   _X_ < 20% ☒**Complete**
   ___ 20 % - 50%
   ___ 50% - 90%
   ___ > 90%

   (c) Is infiltration greater than 90 percent? If Yes, skip to question 13. ☐**Yes** ☒**No**

[1] A complete methodology for determining WQV infiltration is available at: http://www.dot.ca.gov/hq/oppd/stormwtr/index.htm

(d) Can the infiltration ranking in question 5(b) above be increased by using soil amendments? Use the 'drain time' associated with the amended soil (the 12-hour WQV for Type A and B soils, the 24-hour WQV for Type C soils[2]). ☐Yes ☐No

If Yes, consider including soil amendments; increasing the infiltration ranking allows more flexibility in the selection of BMPs (strips and swales will show performance comparable to other BMPs). Record the new infiltration estimate below:

___ < 20% (skip to 6)
___ 20 % - 50% (skip to 6)
___ 50% - 90% (skip to 6)
___ >90%

☐Complete

(e) Is infiltration greater than 90 percent? If Yes, skip to question 13. ☐Yes ☐No

6. Biofiltration in Rural Areas

Is the project in a rural area (outside of urban areas that is covered under an NDPES Municipal Stormwater Permit[3]). If Yes proceed to question 13. ☐Yes ☒No

7. Estimating Infiltration for BMP Combinations

Objectives:

1) Identify high-infiltration biofiltration or biofiltration and infiltration BMP combinations and skip further BMP consideration.

2) If high infiltration is infeasible, then identify the infiltration level of all feasible BMP combinations for use in the subsequent BMP selection matrices

(a) Has concentrated infiltration (i.e., via earthen basins or earthen filters) been prohibited? Consult your District/Regional Storm Water Coordinator and/or environmental documents. ☐Yes ☒No

If No proceed to 7 (b); if Yes skip to question 8 and do not consider earthen basin-type BMPs

[2] Type D soils are not expected where amendments are incorporated

[3] See pages 39 and 40 of the Fact Sheets for the CGP.
http://www.waterboards.ca.gov/water_issues/programs/stormwater/docs/constpermits/wqo_2009_0009_factsheet.pdf

(b) Assess infiltration of an infiltration BMP that is used in conjunction with biofiltration. Include infiltration losses from biofiltration, if biofiltration is feasible. ☐Complete

(use 24 hr WQV)
___ < 20% (do not consider this BMP combination)
___ 20% - 50%
___ 50% - 90%
___ >90%

Is at least 90 percent infiltration estimated? If Yes proceed to 13. If No proceed to 7(c). ☐**Yes** ☐**No**

(c) Assess infiltration of biofiltration with combinations with remaining approved earthen BMPs using water quality volumes based on the drain time of those BMPs. This assessment will be used in subsequent BMP selection matrices.

Earthen Detention Basin (use 48 hr WQV)	Earthen Austin SF (use 48 hr WQV)
___ < 20%	___ < 20%
___ 20% - 50%	___ 20% - 50%
___ > 50%	___ > 50%

☐Complete

Continue to Question 8

8. Identifying BMPs based on the Target Design Constituents

(a) Does the project discharge to a water body that has been placed on the 303-d list or has had a TMDL adopted? If "No," use Matrix A to select BMPs, consider designing to treat 100% of the WQV, then skip to question 12. ☒**Yes** ☐**No**

If Yes, is the identified pollutant(s) considered a Targeted Design Constituent (TDC) (check all that apply below)?

☐ sediments
☐ phosphorus
☐ nitrogen
☐ copper (dissolved or total)
☐ lead (dissolved or total)
☐ zinc (dissolved or total)
☐ general metals (dissolved or total)[1]

(b) Treating Sediment. Is sediment a TDC? If Yes, use Matrix A to select BMPs, then skip to question 12. Otherwise, proceed to question 9. ☐**Yes** ☒**No**

[1] General metals include cadmium, nickel, chromium, and other trace metals. Note that selenium and arsenic are not metals. Mercury is a metal, but is considered later during BMP selection, under Question 12 below.

BMP Selection Matrix A: General Purpose Pollutant Removal			
Consider approaches to treat the remaining WQV with combinations of the BMPs in this table. The PE should select at least one BMP for the project; preference is for Tier 1 BMPs, followed by Tier 2 BMPs when Tier 1 BMPs are not feasible. Within each Tier, BMP selection will be determined by the site-specific determination of feasibility (Section 2.4.2.1). BMPs are chosen based on the infiltration category determined in question 7. BMPs in other categories should be ignored.			
	BMP ranking for infiltration category:		
	Infiltration < 20%	Infiltration 20% - 50%	Infiltration > 50%
Tier 1	Strip: HRT > 5 Austin filter (concrete) Austin filter (earthen) Delaware filter MCTT Wet basin	Austin filter (earthen) Detention (unlined) Infiltration basins* Infiltration trenches* Biofiltration Strip	Austin filter (earthen) Detention (unlined) Infiltration basins* Infiltration trenches* Biofiltration Strip Biofiltration Swale
Tier 2	Strip: HRT < 5 Biofiltration Swale Detention (unlined)	Austin filter (concrete) Delaware filter Biofiltration Swale MCTT Wet basin	Austin filter (concrete) Delaware filter MCTT Wet basin
HRT = hydraulic residence time (min) *Infiltration BMPs that infiltrate the water quality volume were considered previously, so only undersized infiltration BMPs or hybrid designs are considered where infiltration is less than 90% of the water quality volume.			

9. Treating both Metals and Nutrients.

   Is copper, lead, zinc, or general metals *AND* nitrogen or phosphorous a TDC? If Yes use Matrix D to select BMPs, then skip to question 12. Otherwise, proceed to question 10. ☐ **Yes** ☒ **No**

10. Treating Only Metals.

    Are copper, lead, zinc, or general metals listed TDCs? If Yes use Matrix B below to select BMPs, and skip to question 12. Otherwise, proceed to question 11. ☐ **Yes** ☒ **No**

BMP Selection Matrix B: Any metal is the TDC, but not nitrogen or phosphorous			
Consider approaches to treat the remaining WQV with combinations of the BMPs in this table. The PE should select at least one BMP for the project; preference is for Tier 1 BMPs, followed by Tier 2 BMPs when Tier 1 BMPs are not feasible. Within each Tier, BMP selection will be determined by the site-specific determination of feasibility (Section 2.4.2.1). BMPs are chosen based on the infiltration category determined in question 7. BMPs in other categories should be ignored.			
	BMP ranking for infiltration category:		
	Infiltration < 20%	Infiltration 20% - 50%	Infiltration > 50%
Tier 1	MCTT Wet basin Austin filter (earthen) Austin filter (concrete) Delaware filter	Austin filter (earthen) Detention (unlined) Infiltration basins* Infiltration trenches* MCTT Wet basin	Austin filter (earthen) Detention (unlined) Infiltration basins* Infiltration trenches* MCTT Biofiltration Strip Biofiltration Swale Wet basin
Tier 2	Strip: HRT > 5 Strip: HRT < 5 Biofiltration Swale Detention (unlined)	Austin filter (concrete) Delaware filter Biofiltration Strip Biofiltration Swale	Austin filter (concrete) Delaware filter
HRT = hydraulic residence time (min) *Infiltration BMPs that infiltrate the water quality volume were considered previously, so only undersized infiltration BMPs or hybrid designs are considered where infiltration is less than 90% of the water quality volume.			

11. Treating Only Nutrients.
    Are nitrogen and/or phosphorus listed TDCs? If "Yes," use Matrix C to select BMPs. If "No", please check your answer to 8(a). At this point one of the matrices should have been used for BMP selection for the TDC in question, unless no BMPs are feasible. ☐ **Yes** ☒ **No**

BMP Selection Matrix C: Phosphorous and / or nitrogen is the TDC, but no metals are the TDC			
Consider approaches to treat the remaining WQV with combinations of the BMPs in this table. The PE should select at least one BMP for the project; preference is for Tier 1 BMPs, followed by Tier 2 BMPs when Tier 1 BMPs are not feasible. Within each Tier, BMP selection will be determined by the site-specific determination of feasibility (Section 2.4.2.1). BMPs are chosen based on the infiltration category determined in question 7. BMPs in other categories should be ignored.			
	BMP ranking for infiltration category:		
	Infiltration < 20%	Infiltration 20% - 50%	Infiltration > 50%
Tier 1	Austin filter (earthen) Austin filter (concrete) Delaware filter**	Austin filter (earthen) Detention (unlined) Infiltration basins* Infiltration trenches*	Austin filter (earthen) Detention (unlined) Infiltration basins* Infiltration trenches* Biofiltration Strip Biofiltration Swale
Tier 2	Wet basin Biofiltration Strip Biofiltration Swale Detention (unlined)	Austin filter (concrete) Delaware filter Biofiltration Strip Biofiltration Swale Wet basin	Austin filter (concrete) Delaware filter Wet basin
* Infiltration BMPs that infiltrate the water quality volume were considered previously, so only undersized infiltration BMPs or hybrid designs are considered where infiltration is less than 90% of the water quality volume.			
** Delaware filters will be ranked in Tier 2 if the TDC is nitrogen only, as opposed to phosphorous only or both nitrogen and phosphorous.			

BMP Selection Matrix D: Any metal, plus phosphorous and / or nitrogen are the TDCs			
Consider approaches to treat the remaining WQV with combinations of the BMPs in this table. The PE should select at least one BMP for the project; preference is for Tier 1 BMPs, followed by Tier 2 BMPs when Tier 1 BMPs are not feasible. Within each Tier, BMP selection will be determined by the site-specific determination of feasibility (Section 2.4.2.1). BMPs are chosen based on the infiltration category determined in question 7. BMPs in other categories should be ignored.			
	BMP ranking for infiltration category:		
	Infiltration < 20%	Infiltration 20% - 50%	Infiltration > 50%
Tier 1	Wet basin* Austin filter (earthen) Austin filter (concrete) Delaware filter**	Wet basin* Austin filter (earthen) Detention (unlined) Infiltration basins*** Infiltration trenches***	Wet basin* Austin filter (earthen) Detention (unlined) Infiltration basins*** Infiltration trenches*** Biofiltration Strip Biofiltration Swale
Tier 2	Biofiltration Strip Biofiltration Swale Detention (unlined)	Austin filter (concrete) Delaware filter Biofiltration Strip Biofiltration Swale	Austin filter (concrete) Delaware filter
* The wet basin should only be considered for phosphorus			
** In cases where earthen BMPs can infiltrate, Delaware filters are ranked in Tier 2 if the TDC is nitrogen only, but they are Tier 1 for phosphorous only or both nitrogen and phosphorous.			
*** Infiltration BMPs that infiltrate the water quality volume were considered previously, so only undersized infiltration BMPs or hybrid designs are considered where infiltration is less than 90% of the water quality volume.			

12. Does the project discharge to a waterbody that has been placed on the 303-d list or has had a TMDL adopted for mercury or low dissolved oxygen? ☒Yes ☐No

    If Yes contact the District/Regional NPDES Storm Water Coordinator to determine if standing water in a Delaware filter, wet basin, or MCTT will be a risk to downstream water quality.

13. After completing the above, identify and attach the checklists shown below for every Treatment BMP under consideration. (use one checklist every time the BMP is considered for a different drainage within the project) ☒Complete

    _X_ Biofiltration Strips and Biofiltration Swales: Checklist T-1, Part 2
    _____ Dry Weather Diversion: Checklist T-1, Part 3
    _____ Infiltration Devices: Checklist T-1, Part 4
    _____ Detention Devices: Checklist T-1, Part 5
    _____ GSRDs: Checklist T-1, Part 6
    _____ Traction Sand Traps: Checklist T-1, Part 7
    _____ Media Filter [Austin Sand Filter and Delaware Filter]: Checklist T-1, Part 8
    _____ Multi-Chambered Treatment Train: Checklist T-1, Part 9
    _____ Wet Basins: Checklist T-1, Part 10

14. Estimate what percentage of WQV (or WQF, depending upon the Treatment BMP selected) will be treated by the preferred Treatment BMP(s): _____% ☐Complete

    (a) Have Treatment BMPs been considered for use in parallel or series to increase this percentage? ☐Yes ☐No

15. Estimate what percentage of the net WQV (for all new impervious surfaces within the project) that will be treated by the preferred treatment BMP(s): _____% ☐Complete

16. Prepare cost estimate, including right-of-way, and site specific determination of feasibility (Section 2.4.2.1) for selected Treatment BMPs and include as supplemental information for SWDR approval. ☐Complete

Treatment BMPs

Checklist T-1, Part 2

Prepared by: WRECO Date: August 2012 District-Co-Route: 04-SCl-101, 04-SCl-85

PM: 16.0/52.55, 23.0/24.1 Project ID (or EA): 04-2G7100 RWQCB: San Francisco Bay (2), Central Coast (3)

Biofiltration Swales / Biofiltration Strips

Feasibility

1. Do the climate and site conditions allow vegetation to be established? ☒ **Yes** ☐ **No**

2. Are flow velocities from a peak drainage facility design event < 4 fps (i.e. low enough to prevent scour of the vegetated biofiltration swale as per HDM Table 873.3E)? ☒ **Yes** ☐ **No**

   If "No" to either question above, Biofiltration Swales and Biofiltration Strips are not feasible.

3. Are Biofiltration Swales proposed at sites where known contaminated soils or groundwater plumes exist? ☐ **Yes** ☒ **No**
   If "Yes", consult with District/Regional NPDES Coordinator about how to proceed.

4. Does adequate area exist within the right-of-way to place Biofiltration device(s)? ☒ **Yes** ☐ **No**
   If "Yes", continue to Design Elements section. If "No", continue to Question 5.

5. If adequate area does not exist within right-of-way, can suitable, additional right-of-way be acquired to site Biofiltration devices and how much right-of-way will be needed to treat WQF? _____ acres ☐ **Yes** ☐ **No**
   If "Yes", continue to Design Elements section. If "No", continue to Question 6.

6. If adequate area cannot be obtained, document in Section 5 of the SWDR that the inability to obtain adequate area prevents the incorporation of these Treatment BMPs into the project. ☐ **Complete**

Design Elements

Note: To be completed during the design phase.

* **Required** Design Element – A "Yes" response to these questions is required to further the consideration of this BMP into the project design. Document a "No" response in Section 5 of the SWDR to describe why this Treatment BMP cannot be included into the project design.

** **Recommended** Design Element – A "Yes" response is preferred for these questions, but not required for incorporation into a project design.

1. Has the District Landscape Architect provided vegetation mixes appropriate for climate and location? * ☐Yes ☐No
2. Can the biofiltration swale be designed as a conveyance system under any expected flows > the WQF event, as per HDM Chapter 800? * (e.g. freeboard, minimum slope, etc.) ☐Yes ☐No
3. Can the biofiltration swale be designed as a water quality treatment device under the WQF while meeting the required HRT, depth, and velocity criteria? (Reference Appendix B, Section B.2.3.1)* ☐Yes ☐No
4. Is the maximum length of a biofiltration strip ≤ 300 ft? * ☐Yes ☐No
5. Has the minimum width (in the direction of flow) of the invert of the biofiltration swale received the concurrence of Maintenance? * ☐Yes ☐No
6. Can biofiltration swales be located in natural or low cut sections to reduce maintenance problems caused by animals burrowing through the berm of the swale? ** ☐Yes ☐No
7. Is the biofiltration strip sized as long as possible in the direction of flow? ** ☐Yes ☐No
8. Have Biofiltration Systems been considered for locations upstream of other Treatment BMPs, as part of a treatment train? ** ☐Yes ☐No

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
4	SCl	101	16.0/52.2		

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

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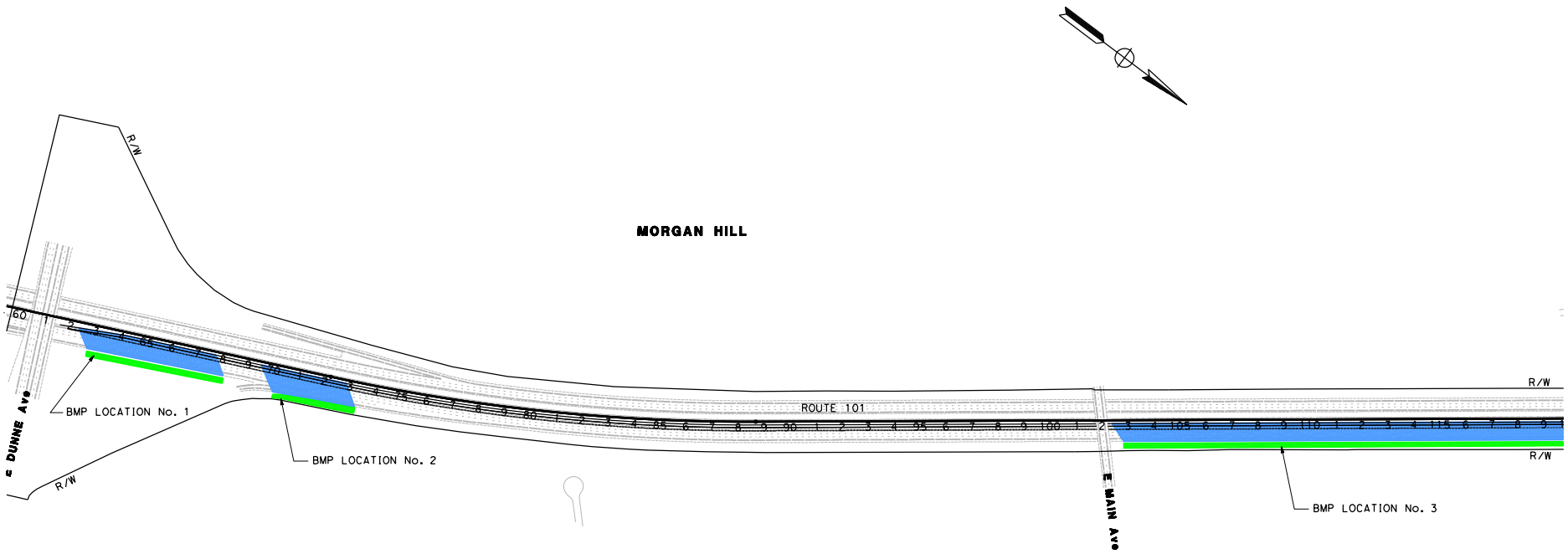
LEGEND:

POTENTIAL BMP LOCATION

Approx TREATED IMPERVIOUS AREA



POTENTIAL TREATMENT BMP LOCATIONS

SCALE: 1" = 200'

BMP-1

PRELIMINARY PLAN
SUBJECT TO REVISION

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DGN FILE => ...\WSM_BMP\BMP-01.dgn

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

UNIT XXXX

PROJECT NUMBER & PHASE 04000026710

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
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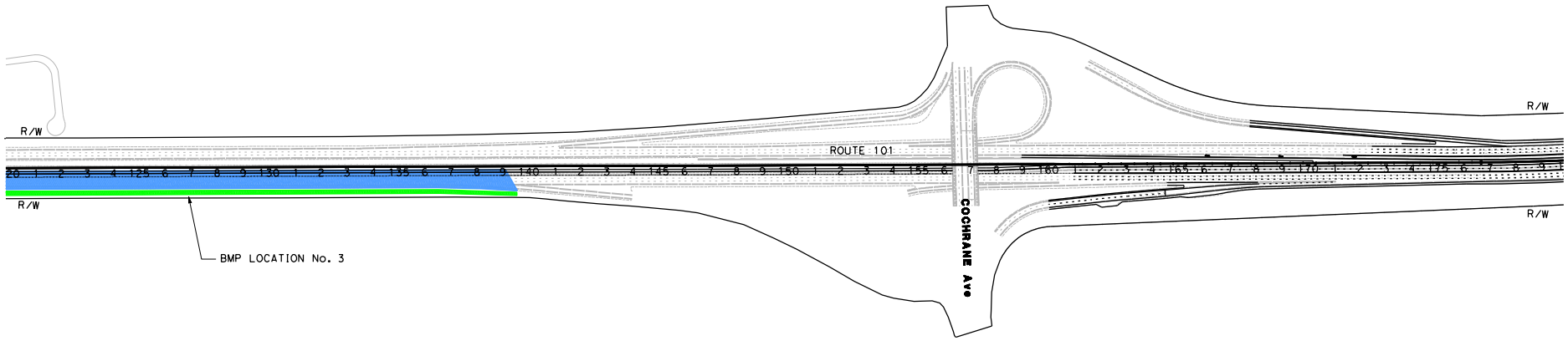
MORGAN HILL



POTENTIAL TREATMENT BMP LOCATIONS

SCALE: 1" = 200'

BMP-2

PRELIMINARY PLAN
SUBJECT TO REVISION

FOR NOTES, ABBREVIATIONS AND LEGEND, SEE SHEET BMP-1

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RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

UNIT 0000

PROJECT NUMBER & PHASE 04000026710

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
4	SCl	101	16.0/52.2		

REGISTERED CIVIL ENGINEER DATE

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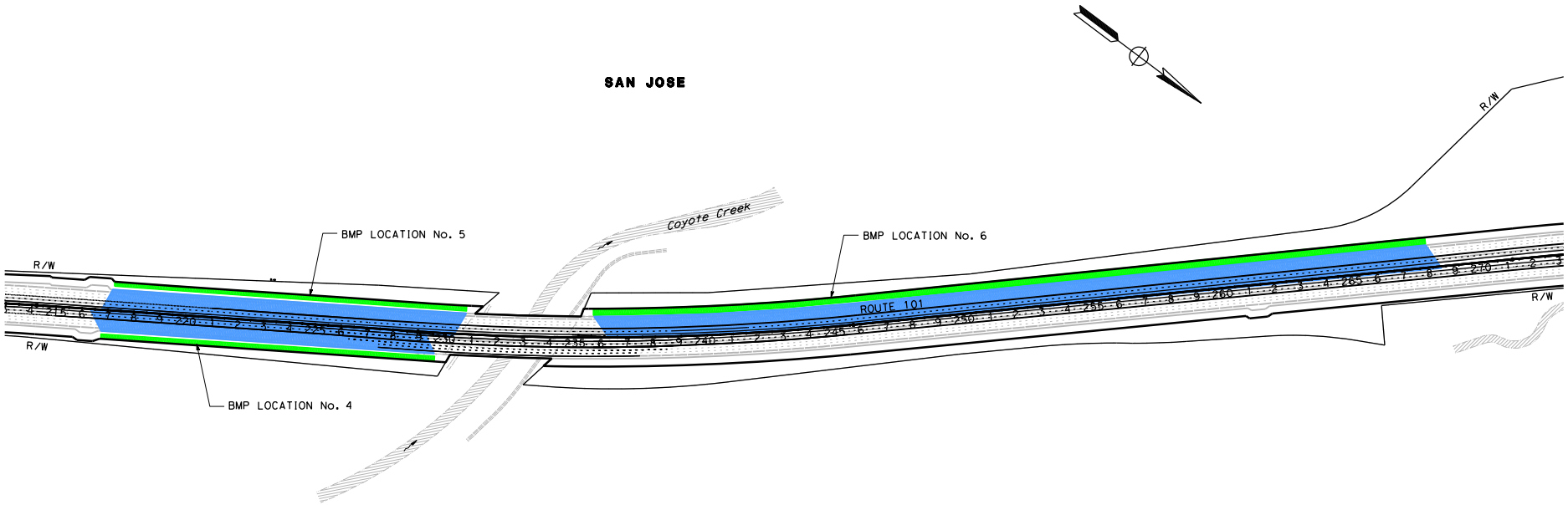

POTENTIAL TREATMENT BMP LOCATIONS

SCALE: 1" = 200'

PRELIMINARY PLAN
SUBJECT TO REVISION

FOR NOTES, ABBREVIATIONS AND LEGEND, SEE SHEET BMP-1

BMP-3

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Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
4	SCl	101	16.0/52.2		

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PLANS APPROVAL DATE

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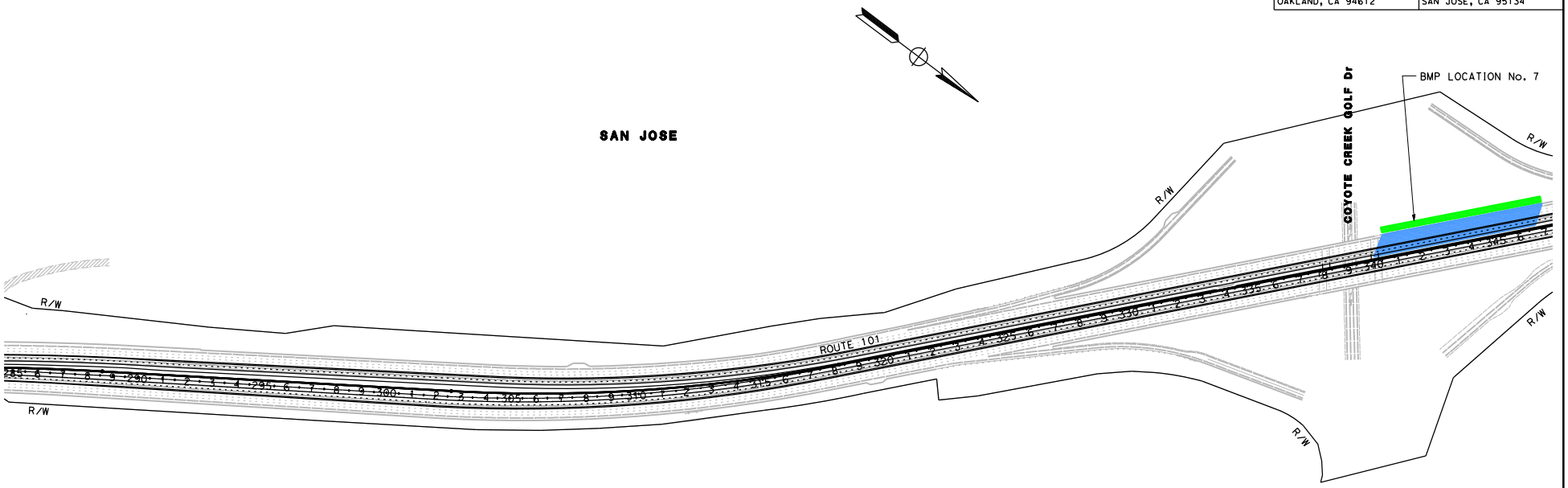

POTENTIAL TREATMENT BMP LOCATIONS

SCALE: 1" = 200'

PRELIMINARY PLAN
SUBJECT TO REVISION

FOR NOTES, ABBREVIATIONS AND LEGEND, SEE SHEET BMP-1

BMP-4

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UNIT XXXX

PROJECT NUMBER & PHASE 04000026710

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
4	SCI	101	16.0/52.2		

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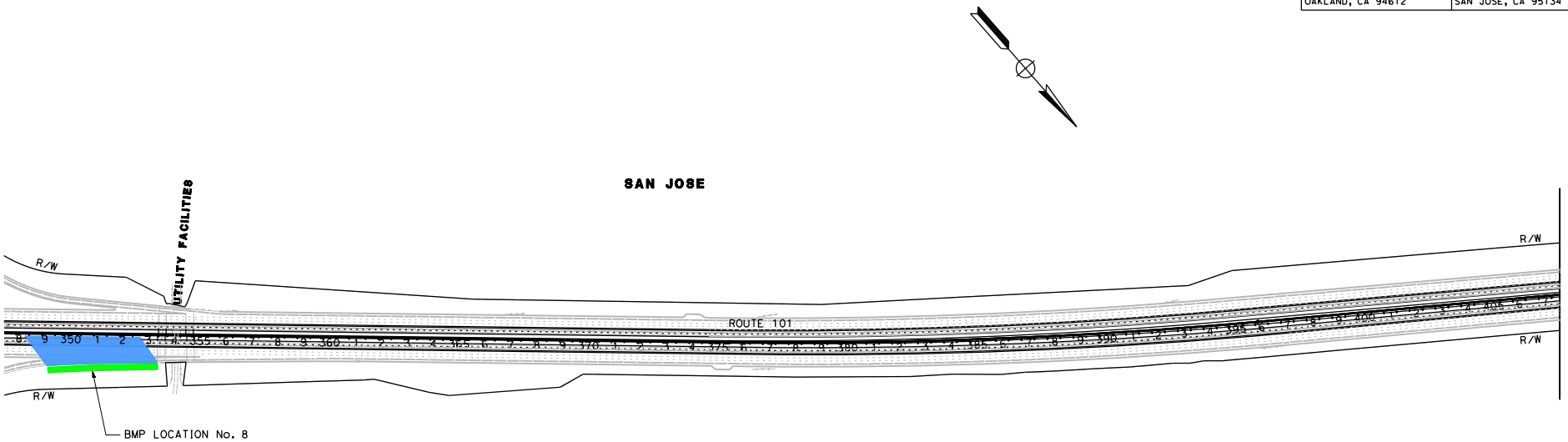

POTENTIAL TREATMENT BMP LOCATIONS

SCALE: 1" = 200'

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FOR NOTES, ABBREVIATIONS AND LEGEND, SEE SHEET BMP-1

BMP-5

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UNIT XXXX

PROJECT NUMBER & PHASE 04000026710

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
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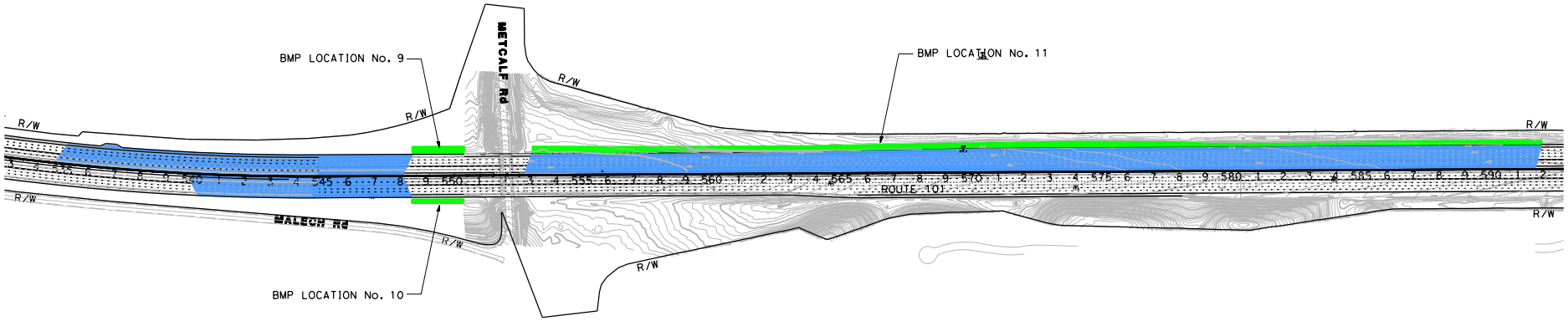

POTENTIAL TREATMENT BMP LOCATIONS

SCALE: 1" = 200'

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FOR NOTES, ABBREVIATIONS AND LEGEND, SEE SHEET BMP-1

BMP-6

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UNIT XXXX

PROJECT NUMBER & PHASE 04000026710

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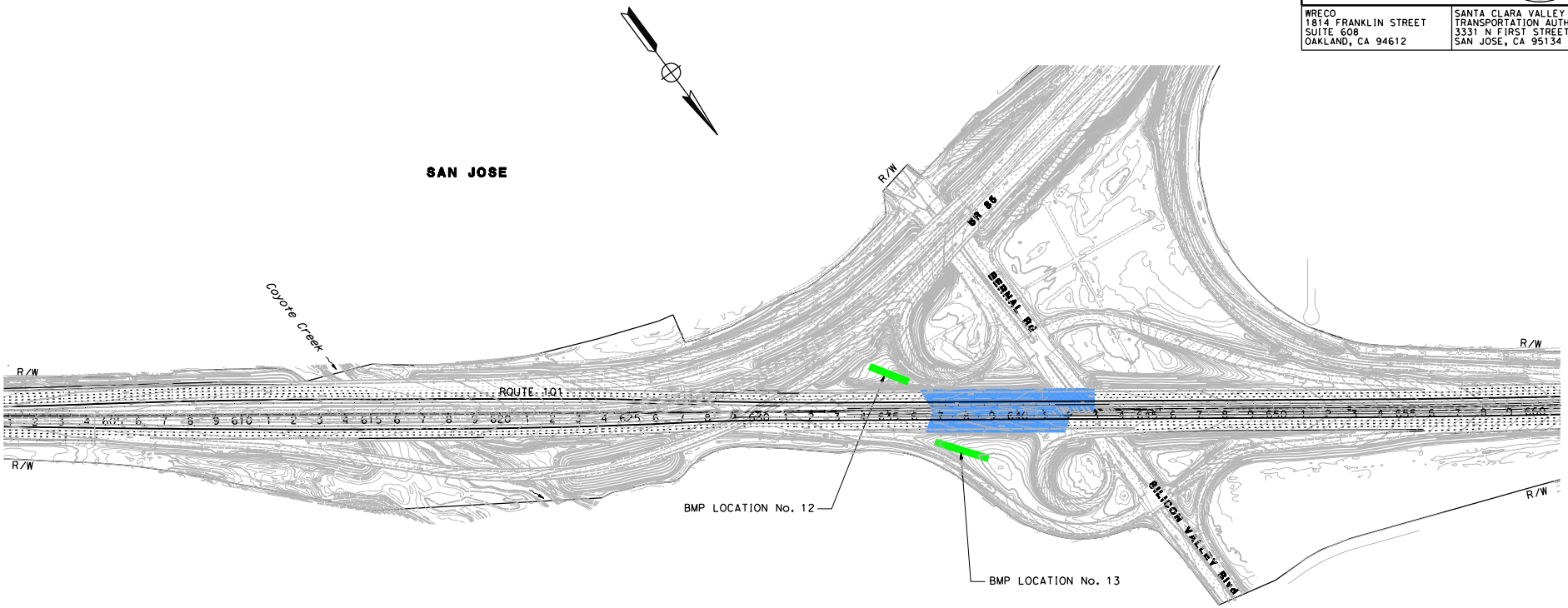

POTENTIAL TREATMENT BMP LOCATIONS

SCALE: 1" = 200'

PRELIMINARY PLAN
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FOR NOTES, ABBREVIATIONS AND LEGEND, SEE SHEET BMP-1

BMP-7

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UNIT XXXX

PROJECT NUMBER & PHASE 04000026710

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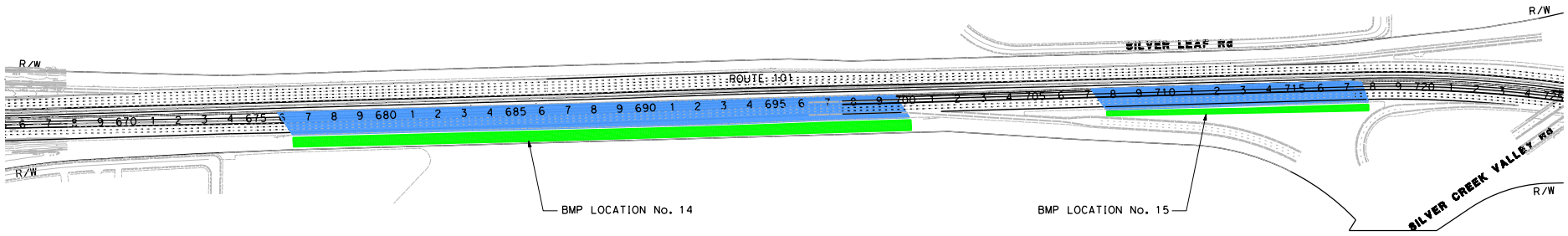

POTENTIAL TREATMENT BMP LOCATIONS

SCALE: 1" = 200'

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FOR NOTES, ABBREVIATIONS AND LEGEND, SEE SHEET BMP-1

BMP-8

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UNIT XXXX

PROJECT NUMBER & PHASE 04000026710

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
4	SCl	101	16.0/52.2		

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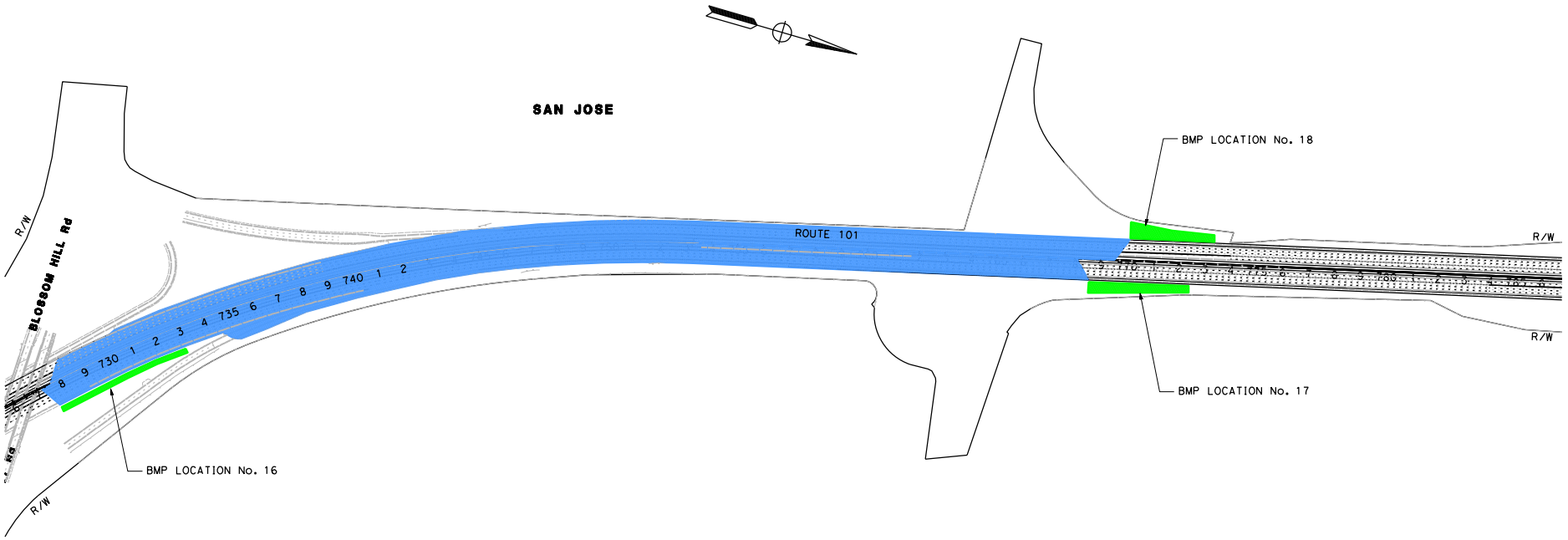

POTENTIAL TREATMENT BMP LOCATIONS

SCALE: 1" = 200'

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FOR NOTES, ABBREVIATIONS AND LEGEND, SEE SHEET BMP-1

BMP-9

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UNIT XXXX

PROJECT NUMBER & PHASE 04000026710

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
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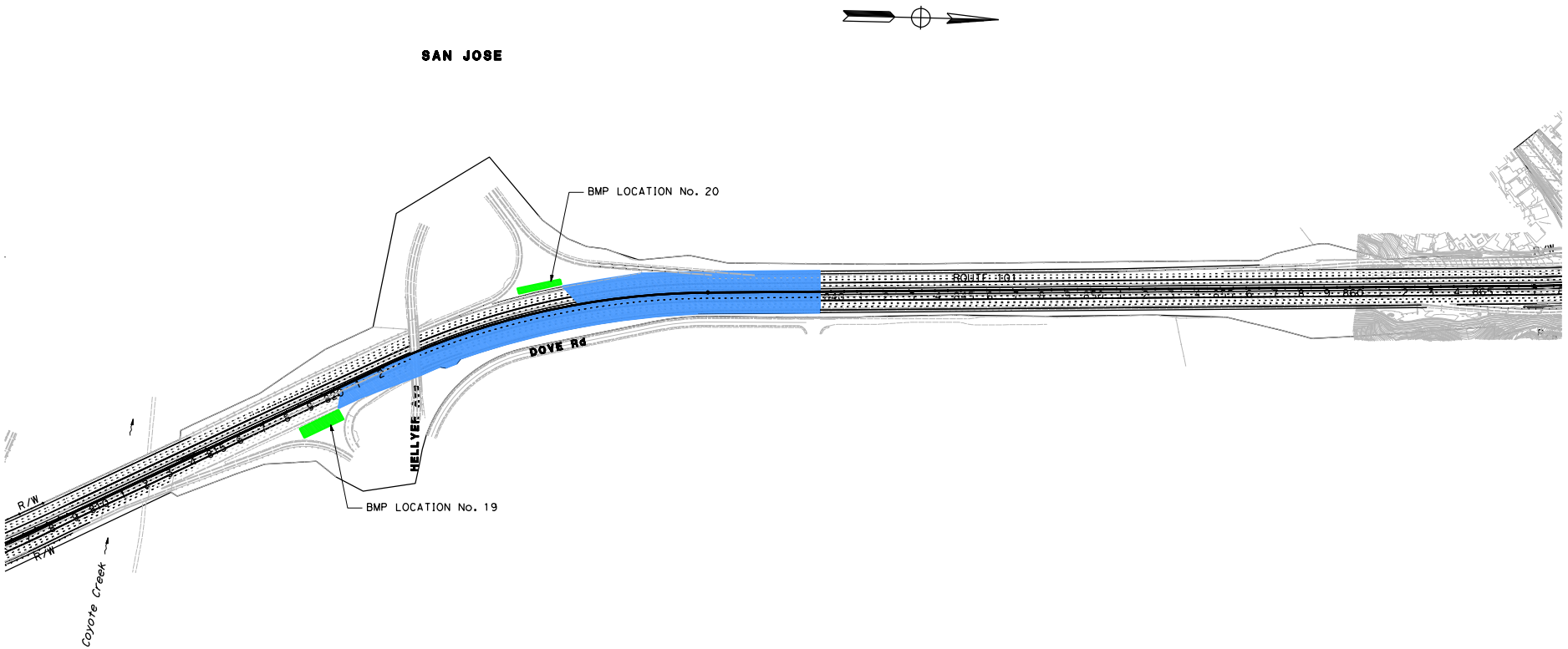

POTENTIAL TREATMENT BMP LOCATIONS

SCALE: 1" = 200'

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FOR NOTES, ABBREVIATIONS AND LEGEND, SEE SHEET BMP-1

BMP-10

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UNIT XXXX

PROJECT NUMBER & PHASE 04000026710

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
4	SCl	101	16.0/52.2		

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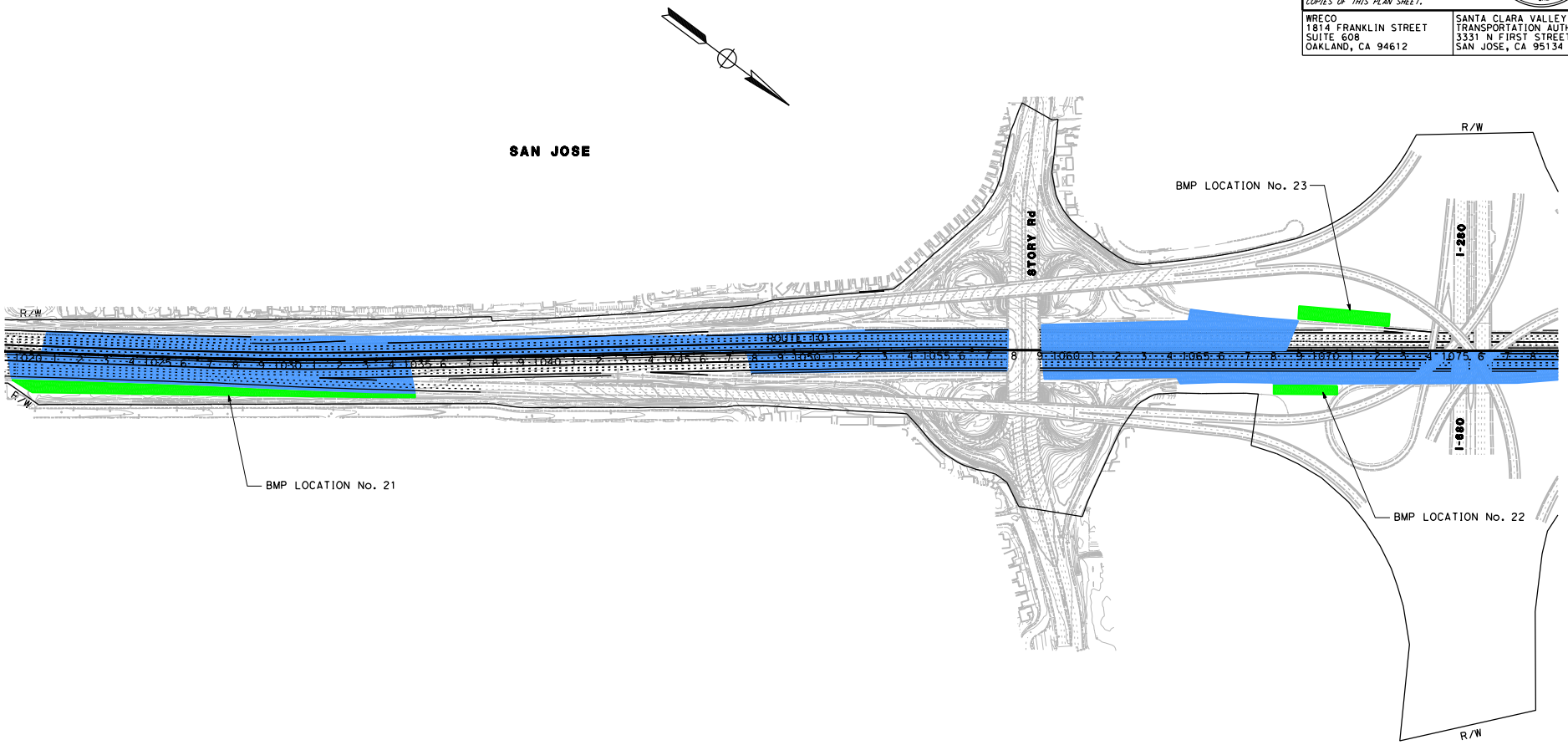

POTENTIAL TREATMENT BMP LOCATIONS

SCALE: 1" = 200'

PRELIMINARY PLAN
SUBJECT TO REVISION

FOR NOTES, ABBREVIATIONS AND LEGEND, SEE SHEET BMP-1

BMP-11

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RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

UNIT XXXX

PROJECT NUMBER & PHASE 04000026710

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
4	SCl	101	16.0/52.2		

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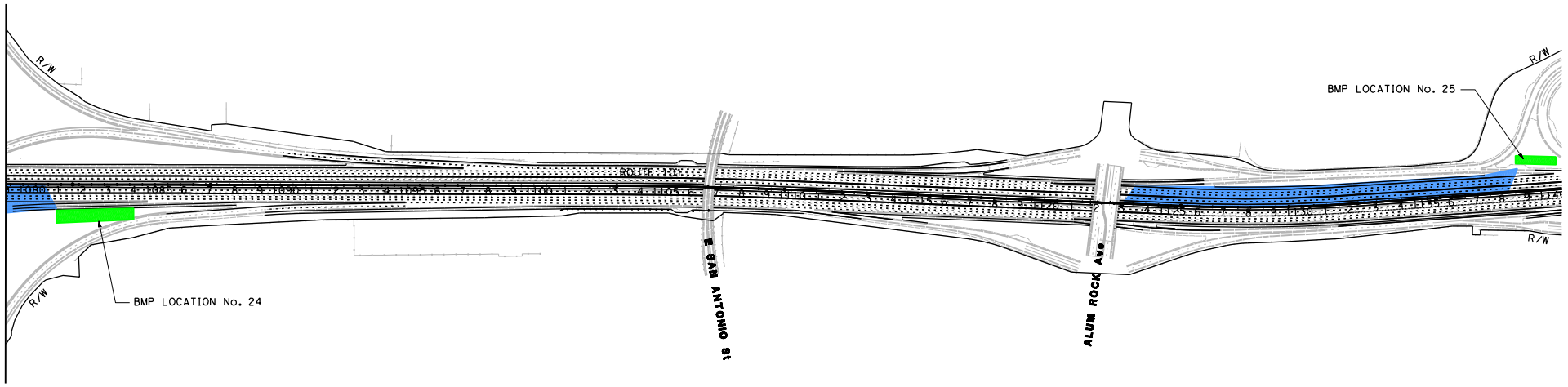

POTENTIAL TREATMENT BMP LOCATIONS

SCALE: 1" = 200'

PRELIMINARY PLAN
SUBJECT TO REVISION

FOR NOTES, ABBREVIATIONS AND LEGEND, SEE SHEET BMP-1

BMP-12

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UNIT XXXX

PROJECT NUMBER & PHASE 04000026710

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
4	SCl	101	16.0/52.2		

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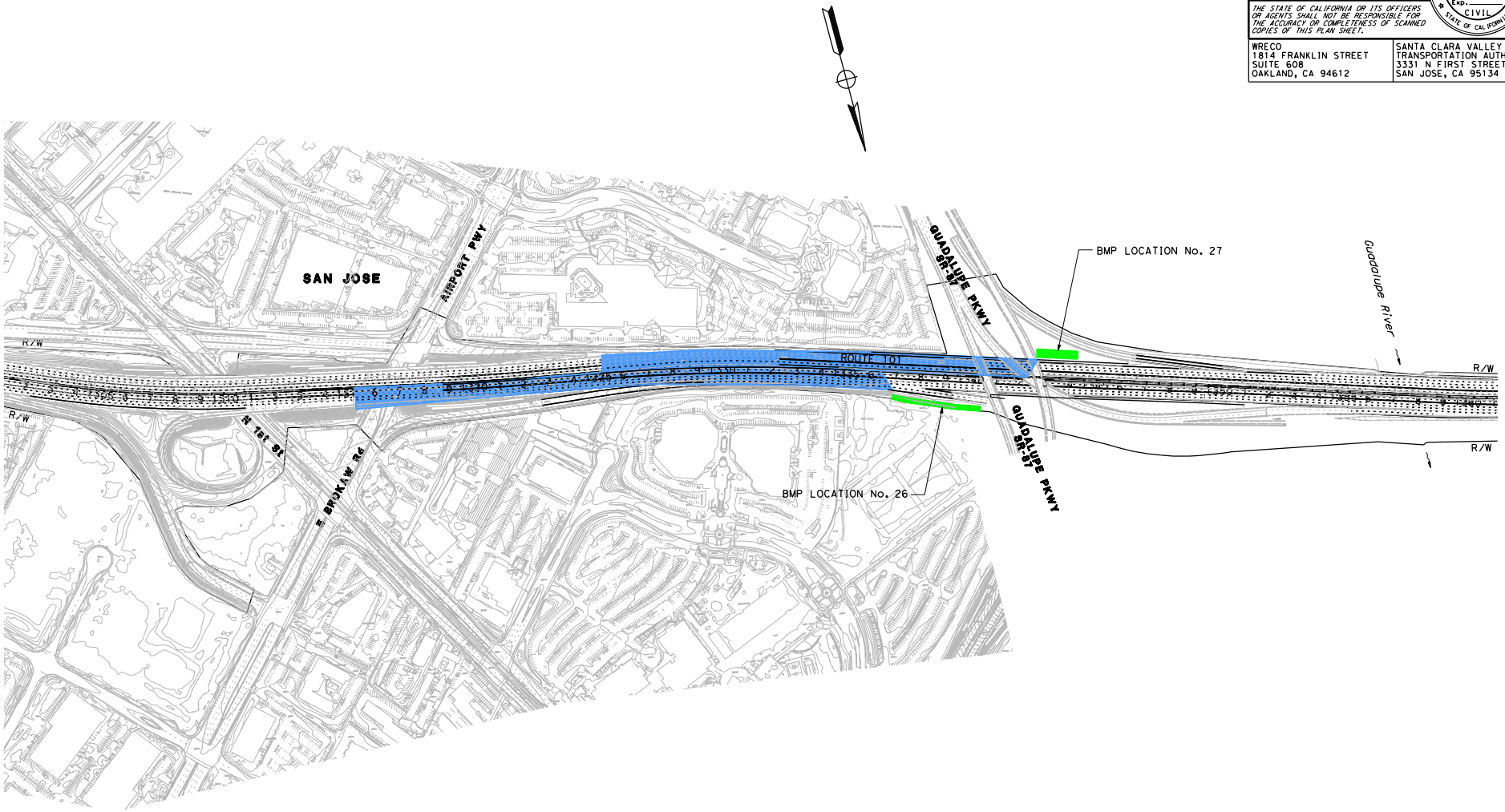

POTENTIAL TREATMENT BMP LOCATIONS

SCALE: 1" = 200'

PRELIMINARY PLAN
SUBJECT TO REVISION

FOR NOTES, ABBREVIATIONS AND LEGEND, SEE SHEET BMP-1

BMP-13

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TIME PLOTTED => 4:33:55 PM

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USERNAME => irene_liu
DGN FILE => ...\WSM_BMP\BMP-13.dgn

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

UNIT XXXX

PROJECT NUMBER & PHASE 04000026710

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
4	SCl	101	16.0/52.2		

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER No. Exp. CIVIL STATE OF CALIFORNIA

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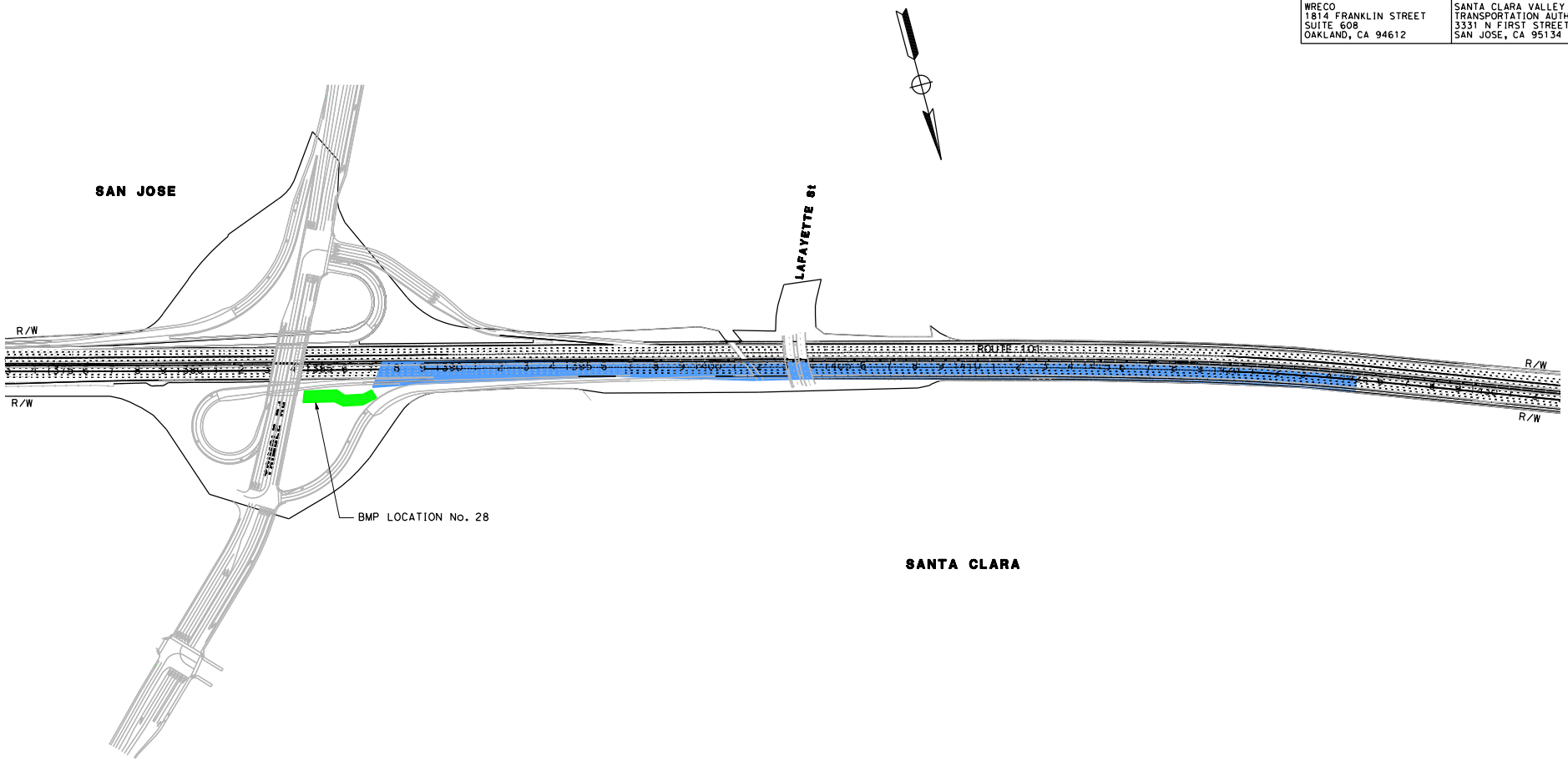
SAN JOSE, CA 95134

NOTE:

FOR ACCURATE RIGHT OF WAY DATA, CONTACT
RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.



POTENTIAL TREATMENT BMP LOCATIONS

SCALE: 1" = 200'

PRELIMINARY PLAN
SUBJECT TO REVISION

FOR NOTES, ABBREVIATIONS AND LEGEND, SEE SHEET BMP-1

BMP-14

REVISED BY	DATE REVISED
X	X

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X	X

CONSULTANT FUNCTIONAL SUPERVISOR: X

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LAST REVISION 00-00-00
DATE PLOTTED => 10/31/2012
TIME PLOTTED => 4:33:56 PM

BORDER LAST REVISED 7/2/2010

USERNAME => irene_liu
DGN FILE => ...\WSM_BMP\BMP-14.dgn

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

UNIT XXXX

PROJECT NUMBER & PHASE 04000026710

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
4	SCI	101	16.0/52.2		

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

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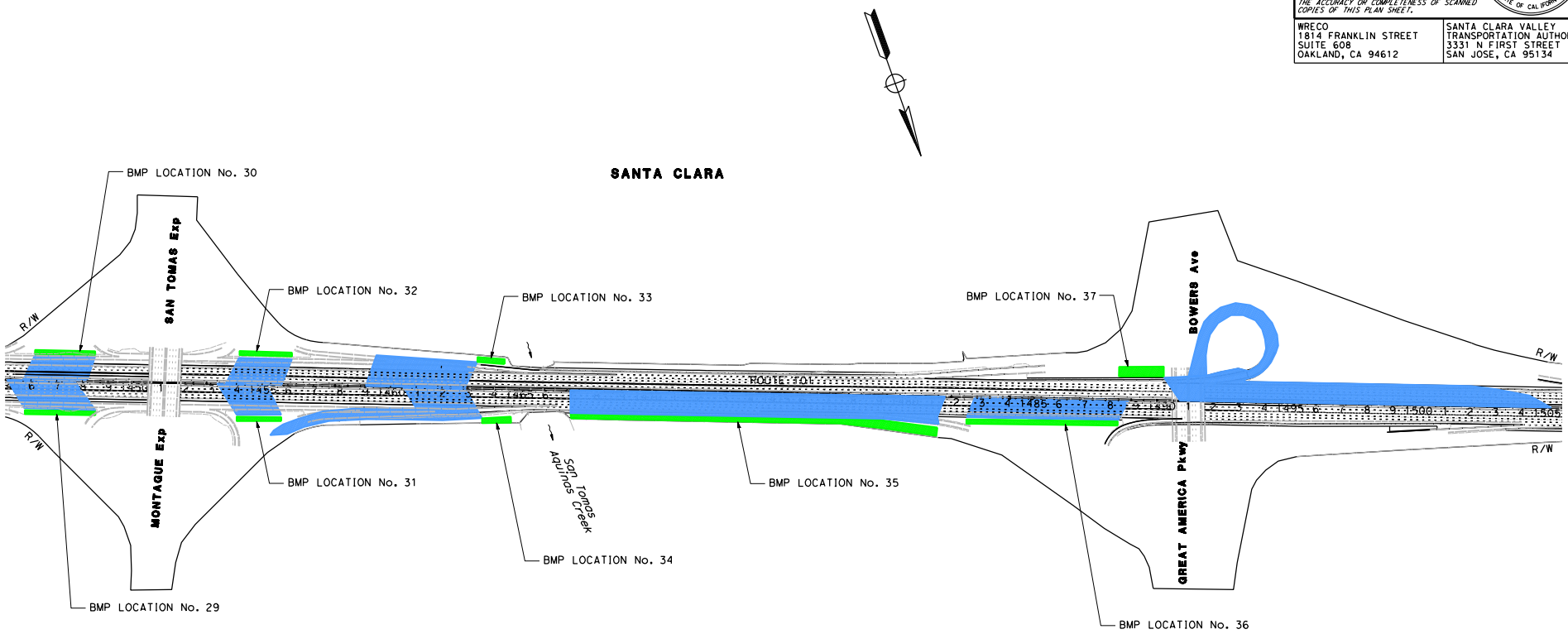

POTENTIAL TREATMENT BMP LOCATIONS

SCALE: 1" = 200'

PRELIMINARY PLAN
SUBJECT TO REVISION

FOR NOTES, ABBREVIATIONS AND LEGEND, SEE SHEET BMP-1

BMP-15

REVISED BY	DATE REVISED	CALCULATED-DESIGNED BY	CHECKED BY	CONSULTANT FUNCTIONAL SUPERVISOR
X	X	X	X	X

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LAST REVISION 00-00-00
DATE PLOTTED => 10/31/2012
TIME PLOTTED => 4:33:56 PM

BORDER LAST REVISED 7/2/2010

USERNAME => irene_liu
DGN FILE => ...\WSM_BMP\BMP-15.dgn

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

UNIT XXXX

PROJECT NUMBER & PHASE 04000026710

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
4	SCl	101	16.0/52.2		

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER No. Exp. CIVIL STATE OF CALIFORNIA

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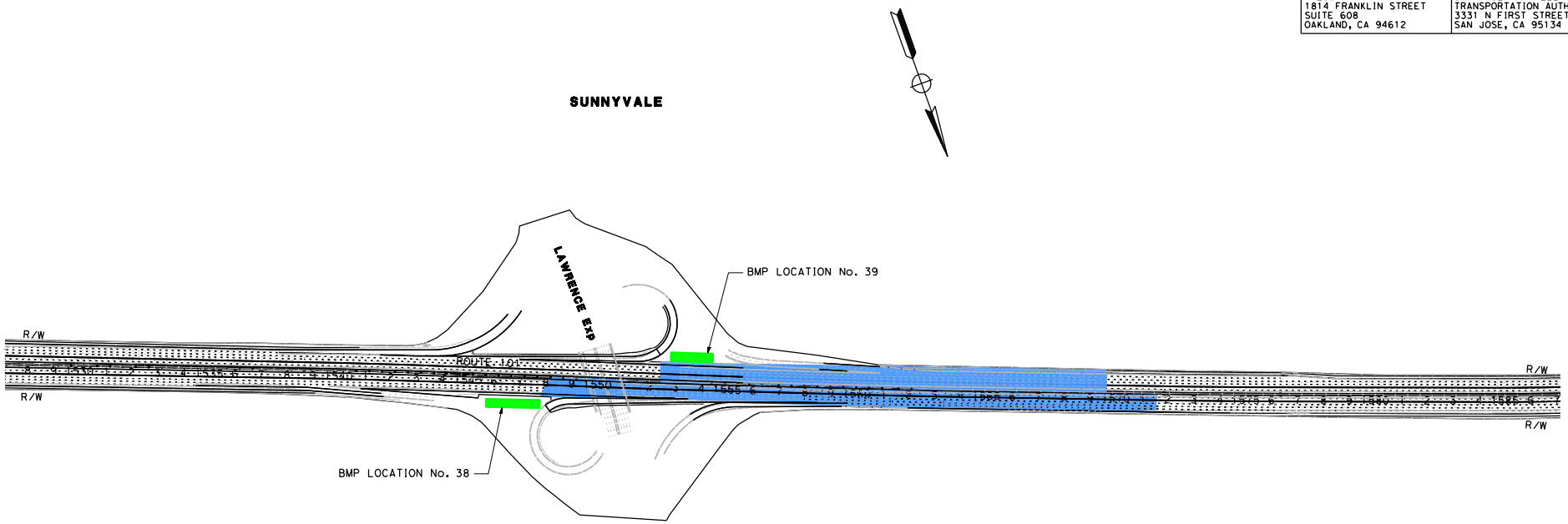
RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.



POTENTIAL TREATMENT BMP LOCATIONS

SCALE: 1" = 200'

PRELIMINARY PLAN
SUBJECT TO REVISION

FOR NOTES, ABBREVIATIONS AND LEGEND, SEE SHEET BMP-1

BMP-16

REVISED BY	DATE REVISED
X	X

CALCULATED-DESIGNED BY: X
CHECKED BY: X

CONSULTANT FUNCTIONAL SUPERVISOR: X

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans

LAST REVISION 00-00-00
DATE PLOTTED => 10/31/2012
TIME PLOTTED => 4:33:56 PM

BORDER LAST REVISED 7/2/2010

USERNAME => irene_liu
DGN FILE => ...\WSM_BMP\BMP-16.dgn

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

UNIT XXXX

PROJECT NUMBER & PHASE 04000026710

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
4	SCl	101	16.0/52.2		

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER No. Exp. CIVIL STATE OF CALIFORNIA

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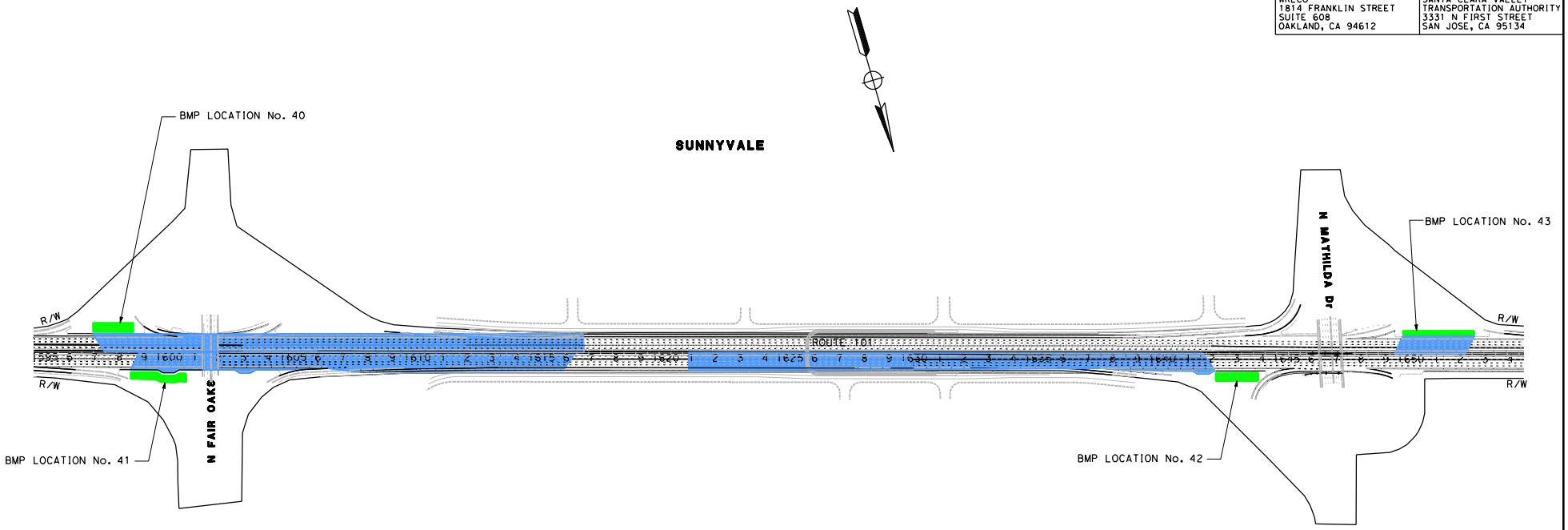

POTENTIAL TREATMENT BMP LOCATIONS

SCALE: 1" = 200'

PRELIMINARY PLAN
SUBJECT TO REVISION

FOR NOTES, ABBREVIATIONS AND LEGEND, SEE SHEET BMP-1

BMP-17

REVISED BY	DATE REVISED	CALCULATED-DESIGNED BY	CHECKED BY	CONSULTANT FUNCTIONAL SUPERVISOR
X	X	X	X	X

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

LAST REVISION 00-00-00
DATE PLOTTED => 10/31/2012
TIME PLOTTED => 4:33:57 PM

BORDER LAST REVISED 7/2/2010

USERNAME => irene_liu
DGN FILE => ...\WSM_BMP\BMP-17.dgn

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

UNIT XXXX

PROJECT NUMBER & PHASE 04000026710

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
4	SCI	101	16.0/52.2		

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — No. — Exp. — CIVIL — STATE OF CALIFORNIA

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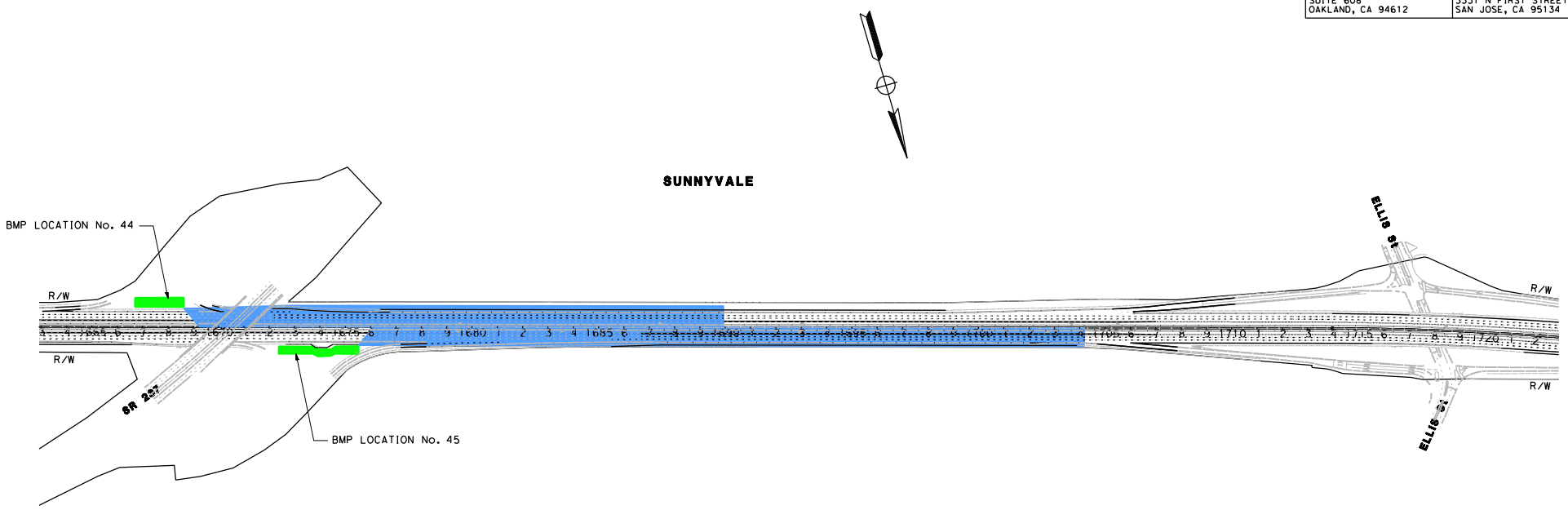

POTENTIAL TREATMENT BMP LOCATIONS

SCALE: 1" = 200'

PRELIMINARY PLAN
SUBJECT TO REVISION

FOR NOTES, ABBREVIATIONS AND LEGEND, SEE SHEET BMP-1

BMP-18

REVISED BY	DATE REVISED
X	X

CALCULATED-DESIGNED BY: X
CHECKED BY: X

CONSULTANT FUNCTIONAL SUPERVISOR: X

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans

LAST REVISION 00-00-00
DATE PLOTTED => 10/31/2012
TIME PLOTTED => 4:33:57 PM

BORDER LAST REVISED 7/2/2010

USERNAME => irene_liu
DGN FILE => ...\WSM_BMP\BMP-18.dgn

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

UNIT XXXX

PROJECT NUMBER & PHASE 04000026710

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
4	SCI	101	16.0/52.2		

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

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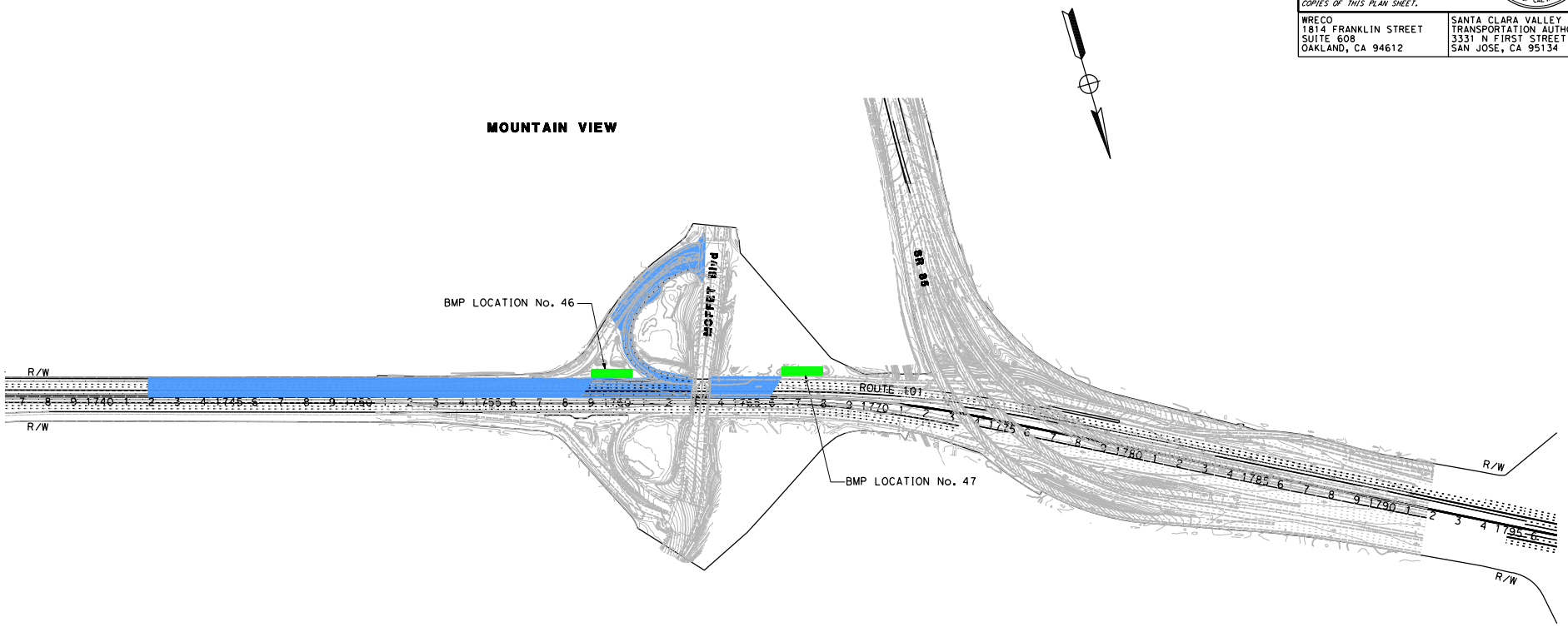
RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.



POTENTIAL TREATMENT BMP LOCATIONS

SCALE: 1" = 200'

PRELIMINARY PLAN
SUBJECT TO REVISION

FOR NOTES, ABBREVIATIONS AND LEGEND, SEE SHEET BMP-1

BMP-19

	REVISED BY	CALCULATED-DESIGNED BY	CONSULTANT FUNCTIONAL SUPERVISOR
	X	X	X
	DATE REVISED	CHECKED BY	

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

LAST REVISION 00-00-00
DATE PLOTTED => 10/31/2012
TIME PLOTTED => 4:33:57 PM

BORDER LAST REVISED 7/2/2010

USERNAME => irene_liu
DGN FILE => ...\WSM_BMP\BMP-19.dgn

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

UNIT XXXX

PROJECT NUMBER & PHASE 04000026710

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
4	SCl	101	16.0/52.2		

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — No. — Exp. — CIVIL — STATE OF CALIFORNIA

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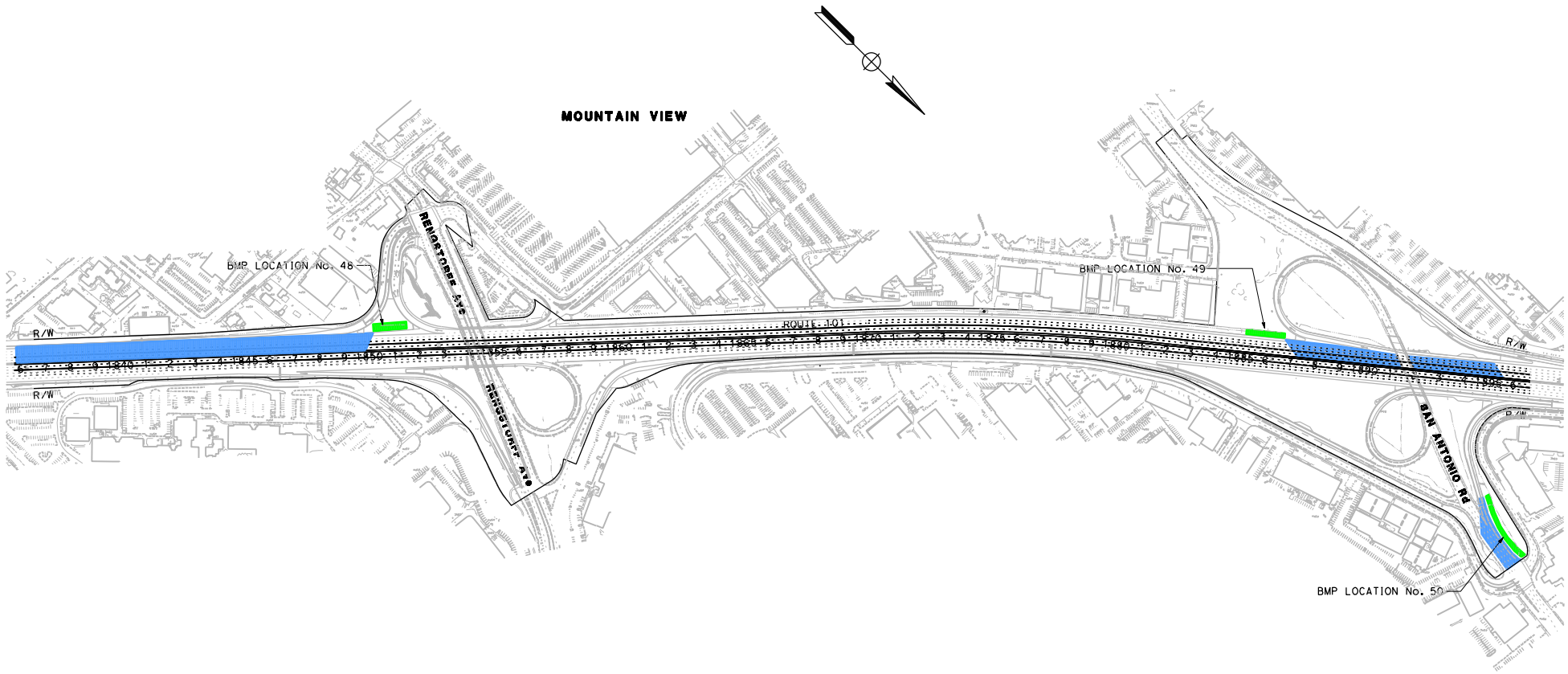

POTENTIAL TREATMENT BMP LOCATIONS

SCALE: 1" = 200'

PRELIMINARY PLAN
SUBJECT TO REVISION

FOR NOTES, ABBREVIATIONS AND LEGEND, SEE SHEET BMP-1

BMP-20

	REVISED BY	DATE REVISED
	X	X

CALCULATED-DESIGNED BY: X
CHECKED BY: X

CONSULTANT FUNCTIONAL SUPERVISOR: X

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LAST REVISION 00-00-00
DATE PLOTTED => 10/31/2012
TIME PLOTTED => 4:33:59 PM

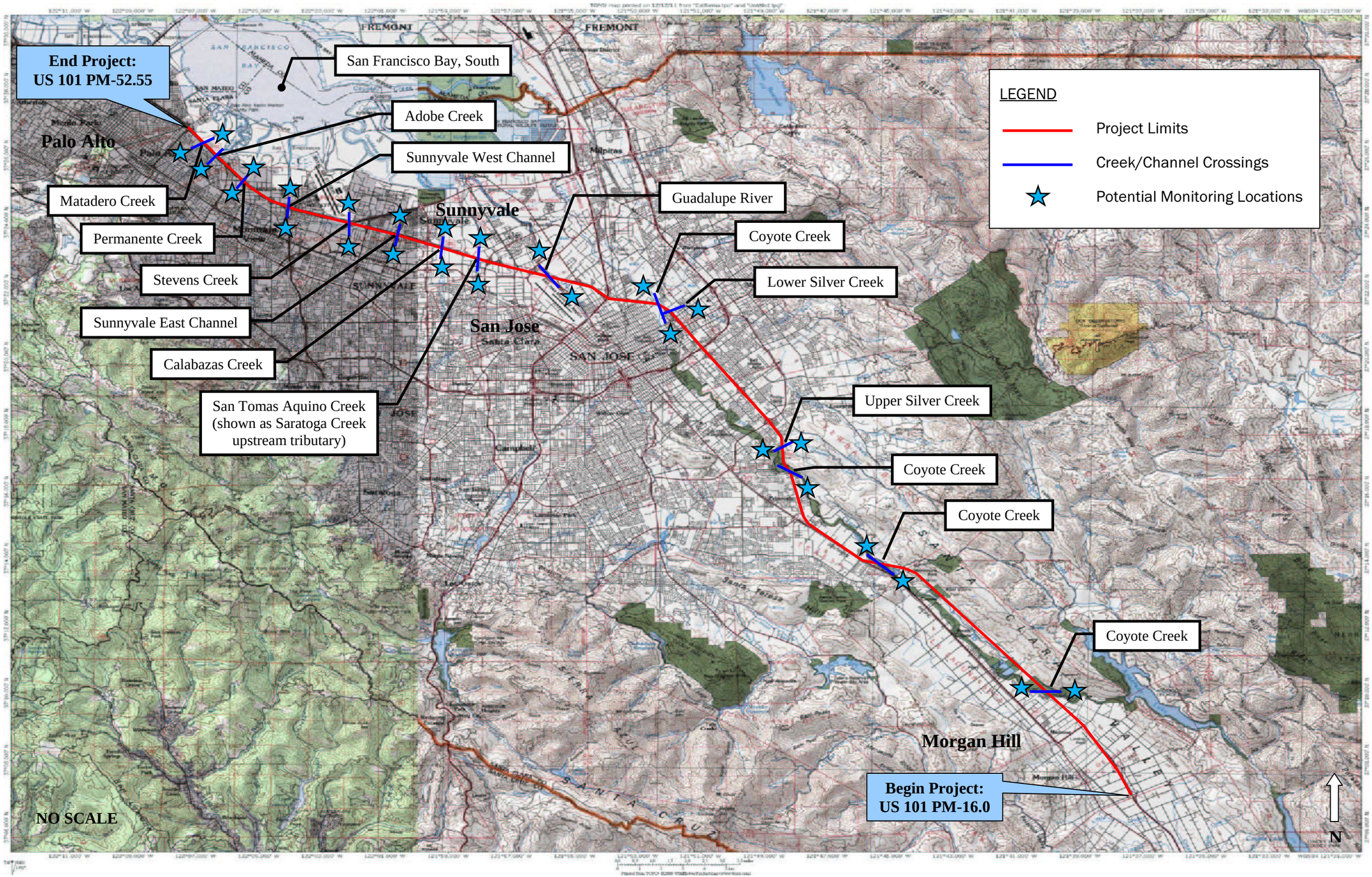
BORDER LAST REVISED 7/2/2010

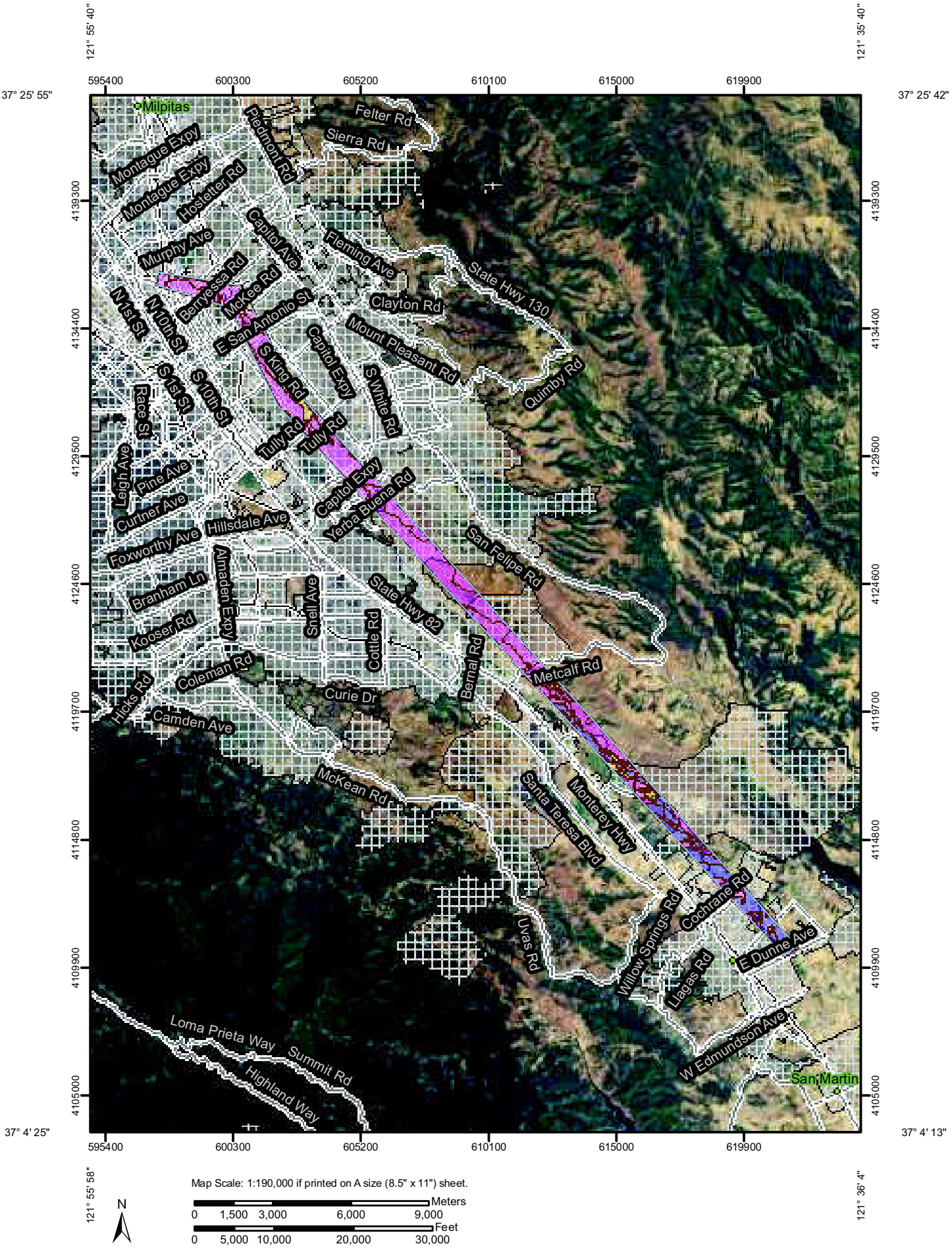
USERNAME => irene_liu
DGN FILE => ...\WSM_BMP\BMP-20.dgn

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

UNIT XXXX

PROJECT NUMBER & PHASE 04000026710


End Project:
US 101 PM-52.55
San Francisco Bay, South
Adobe Creek
Sunnyvale West Channel
Matadero Creek
Permanente Creek
Stevens Creek
Sunnyvale East Channel
Calabazas Creek
San Tomas Aquino Creek
(shown as Saratoga Creek
upstream tributary)
Guadalupe River
Coyote Creek
Lower Silver Creek
Upper Silver Creek
Coyote Creek
Coyote Creek
Coyote Creek
Begin Project:
US 101 PM-16.0
LEGEND
Project Limits
Creek/Channel Crossings
Potential Monitoring Locations
Palo Alto
Sunnyvale
San Jose
Morgan Hill
FREMONT
SAN JOSE
NO SCALE
N


121° 55' 40"
121° 35' 40"
595400
600300
605200
610100
615000
619900
37° 25' 55"
37° 25' 42"
Milpitas
Felter Rd
Sierra Rd
Piedmont Rd
Montague Expy
Hostetter Rd
Capitol Ave
Fleming Ave
Murphy Ave
Berryessa Rd
McKee Rd
State Hwy 130
Clayton Rd
E San Antonio St
N 1st St
N 10th St
S 1st St
S 10th St
Race St
S King Rd
Capitol Expy
Mount Pleasant Rd
S White Rd
Quimby Rd
Tully Rd
Leigh Ave
Pine Ave
Curtner Ave
Hillsdale Ave
Foxworthy Ave
Yerba Buena Rd
San Felipe Rd
Branham Ln
Almaden Expy
Snell Ave
State Hwy 82
Kooser Rd
Cottle Rd
Bernal Rd
Metcalf Rd
Coleman Rd
Hicks Rd
Curie Dr
Camden Ave
McKean Rd
Santa Teresa Blvd
Monterey Hwy
Cochrane Rd
Uvas Rd
Willow Springs Rd
Llagas Rd
E Dunne Ave
Loma Prieta Way
Summit Rd
Highland Way
W Edmundson Ave
San Martin
4139300
4134400
4129500
4124600
4119700
4114800
4109900
4105000
37° 4' 25"
37° 4' 13"
121° 55' 58"
121° 36' 4"
Map Scale: 1:190,000 if printed on A size (8.5" x 11") sheet.
N
Meters
0 1,500 3,000 6,000 9,000
Feet
0 5,000 10,000 20,000 30,000

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Units

Soil Ratings

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Political Features

- Cities

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads

MAP INFORMATION

Map Scale: 1:190,000 if printed on A size (8.5" × 11") sheet.

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for accurate map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: UTM Zone 10N NAD83

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Eastern Santa Clara Area, California
Survey Area Data: Version 6, Jul 27, 2010

Soil Survey Area: Santa Clara Area, California, Western Part
Survey Area Data: Version 1, Jul 27, 2010

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

Date(s) aerial images were photographed: Data not available.

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Hydrologic Soil Group— Summary by Map Unit — Eastern Santa Clara Area, California (CA646)				
Map unit symbol	**Map unit name**	**Rating**	**Acres in AOI**	**Percent of AOI**
303scl	Montara-Santerhill complex, 15 to 30 percent slopes	D	154.9	2.3%
AcE	Altamont clay, 15 to 30 percent slopes	D	86.4	1.3%
AcF	Altamont clay, 30 to 50 percent slopes	D	13.7	0.2%
ArA	Arbuckle gravelly loam, 0 to 2 percent slopes	B	551.6	8.1%
ClD	Climara clay, 9 to 30 percent slopes	D	81.4	1.2%
CoB	Cortina very gravelly loam, 0 to 5 percent slopes	A	21.1	0.3%
DaD	Diablo clay, 9 to 15 percent slopes	C	99.7	1.5%
GaA	Garretson loam, gravel substratum, 0 to 2 percent slopes	B	212.3	3.1%
GoF	Gilroy clay loam, 30 to 50 percent slopes	C	15.7	0.2%
HfD2	Hillgate silt loam, 9 to 15 percent slopes, eroded	D	19.6	0.3%
InG2	Inks rocky clay loam, 50 to 75 percent slopes, eroded	D	72.2	1.1%
LrC	Los Robles clay loam, 2 to 9 percent slopes	B	20.9	0.3%
McB	Maxwell clay, 0 to 5 percent slopes	D	118.7	1.7%
MwF2	Montara rocky clay loam, 15 to 50 percent slopes, eroded	D	317.8	4.7%
PoA	Pleasanton loam, 0 to 2 percent slopes	B	68.7	1.0%
Rg	Riverwash	D	46.9	0.7%
RnG	Rock land	D	70.6	1.0%
SbE2	San Benito clay loam, 15 to 30 percent slopes, eroded	B	37.7	0.6%
SbF3	San Benito clay loam, 30 to 50 percent slopes, severely eroded	B	338.0	5.0%
SdA	San Ysidro loam, 0 to 2 percent slopes	D	122.1	1.8%
TeF	Terrace escarpments		0.2	0.0%
W	WATER		1.0	0.0%
YaA	Yolo loam, 0 to 2 percent slopes	B	9.6	0.1%
YeC	Yolo silty clay loam, 2 to 9 percent slopes	B	90.2	1.3%
Subtotals for Soil Survey Area			**2,570.8**	**37.7%**
Totals for Area of Interest			**6,819.9**	**100.0%**

Hydrologic Soil Group— Summary by Map Unit — Santa Clara Area, California, Western Part (CA641)				
Map unit symbol	**Map unit name**	**Rating**	**Acres in AOI**	**Percent of AOI**
102	Urban land, 0 to 2 percent slopes, alluvial fans	D	160.0	2.3%
130	Urban land-Still complex, 0 to 2 percent slopes	D	250.0	3.7%
131	Urban land-Elpaloalto complex, 0 to 2 percent slopes	D	992.7	14.6%
160	Urbanland-Clear Lake complex, 0 to 2 percent slopes	C	180.6	2.6%
165	Urbanland-Campbell complex, 0 to 2 percent slopes, protected	D	147.5	2.2%
173	Caninecreek-Elder complex, 0 to 2 percent slopes, rarely flooded	A	13.4	0.2%
174	Urban Land-Caninecreek-Elder complex, 0 to 2 percent slopes	D	111.6	1.6%
180	Urbanland-Newpark complex, 0 to 2 percent slopes	D	520.3	7.6%
302	Montara-Rock outcrop complex, 30 to 50 percent slopes	D	1,015.4	14.9%
303	Montara-Santerhill complex, 15 to 30 percent slopes	D	486.9	7.1%
305	Alo-Altamont complex, 15 to 30 percent slopes	D	317.9	4.7%
309	Urbanland-Altamont-Alo complex, 9 to 15 percent slopes	D	5.1	0.1%
317	Urbanland-Cropley complex, 0 to 2 percent slopes	D	47.8	0.7%
Subtotals for Soil Survey Area			**4,249.4**	**62.3%**
Totals for Area of Interest			**6,819.9**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

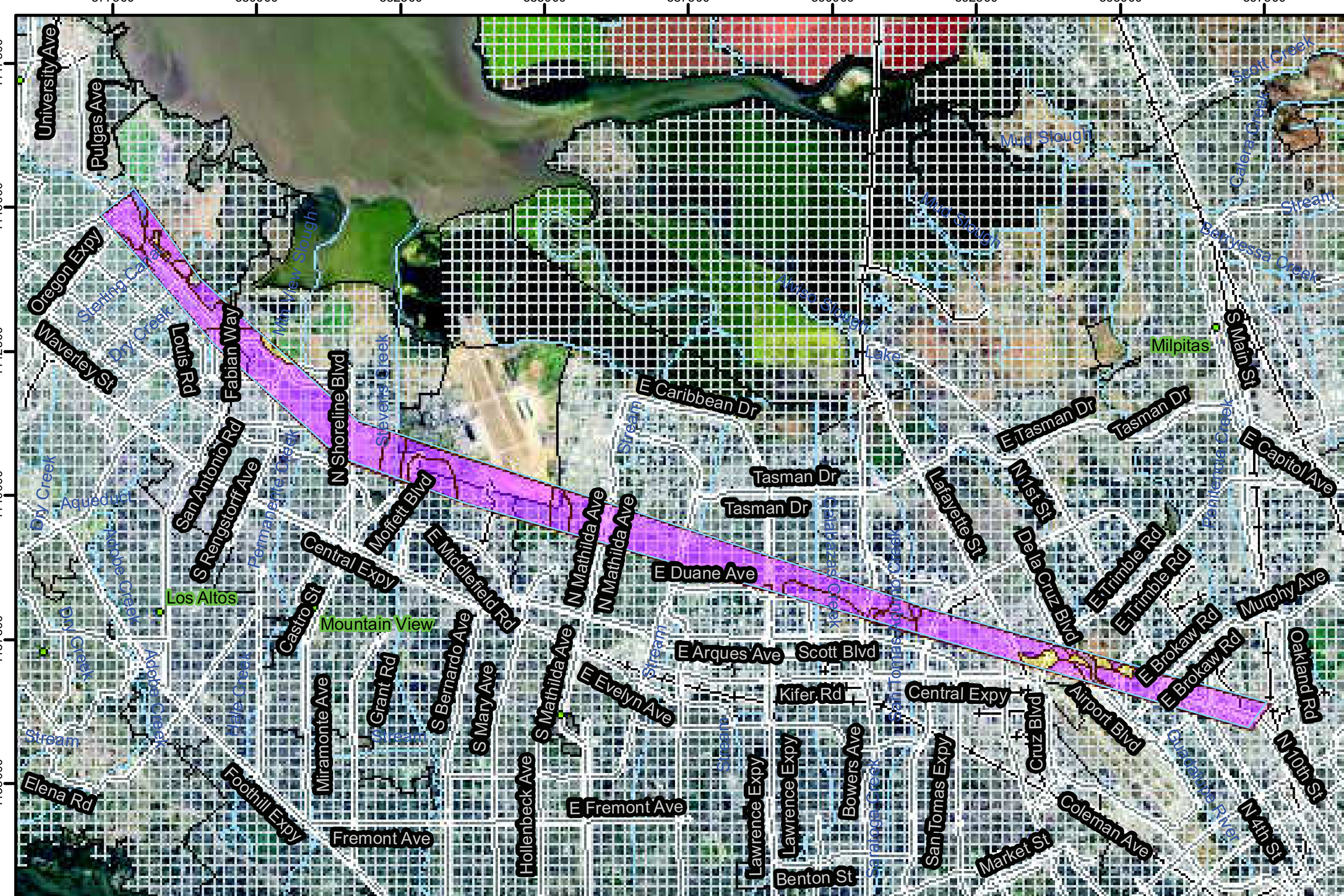
Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

122° 8' 30"
121° 52' 51"



122° 8' 35"
121° 52' 59"

Map Scale: 1:110,000 if printed on A size (8.5" x 11") sheet.

N

Meters: 0, 1,500, 3,000, 6,000, 9,000

Feet: 0, 5,000, 10,000, 20,000, 30,000

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Units

Soil Ratings

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Political Features

- Cities

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads

MAP INFORMATION

Map Scale: 1:110,000 if printed on A size (8.5" × 11") sheet.

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for accurate map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: UTM Zone 10N NAD83

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Santa Clara Area, California, Western Part
Survey Area Data: Version 1, Jul 27, 2010

Date(s) aerial images were photographed: 6/12/2005; 6/13/2005

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Hydrologic Soil Group— Summary by Map Unit — Santa Clara Area, California, Western Part (CA641)				
Map unit symbol	**Map unit name**	**Rating**	**Acres in AOI**	**Percent of AOI**
101	Urban land, 0 to 2 percent slopes, basins	D	375.4	11.2%
102	Urban land, 0 to 2 percent slopes, alluvial fans	D	47.1	1.4%
120	Aquic Xerorthents, bay mud subtratum, 0 to 2 percent slopes	B	18.8	0.6%
121	Aquic Xerorthents, bay mud substratum, 2 to 5 percent slopes	B	2.5	0.1%
145	Urbanland-Hangerone complex, 0 to 2 percent slopes, drained	D	1,778.0	53.2%
146	Hangerone clay loam, drained, 0 to 2 percent slopes	C	52.6	1.6%
150	Urbanland-Embarcadero complex, 0 to 2 percent slopes, drained	D	199.2	6.0%
157	Novato clay, 0 to 1 percent slopes, protected	D	94.3	2.8%
165	Urbanland-Campbell complex, 0 to 2 percent slopes, protected	D	532.0	15.9%
166	Campbell silt loam, 0 to 2 percent slopes, protected	C	39.2	1.2%
169	Urbanland-Elder complex, 0 to 2 percent slopes, protected	D	0.2	0.0%
171	Elder fine sandy loam, 0 to 2 percent slopes, rarely flooded	A	20.4	0.6%
185	Urban Land - Bayshore complex, 0 to 2 percent slopes, drained	D	166.1	5.0%
W	Water		19.0	0.6%
Totals for Area of Interest			**3,340.7**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher