Attachment J

Stormwater Documentation

Dist-County-Route: 04-SON-SOL-37

Post Mile Limits: SON 3.5/SOL R7.4

Type of Work: Capacity Improvement Project; Interim Project: Lane Reconfiguration; Ultimate Project: New Construction

Project ID (EA): 0418000329, EA 04-1Q760K

Program Identification: Not Applicable

Phase: ☒ PID ☐ PA/ED ☐ PS&E

Regional Water Quality Control Board(s): San Francisco Bay, Region 2

Total Disturbed Soil Area: Ph1: 28.4 (A1), 28.2 (A2) ac Ph2: 248.7 (A1), 169.6 (A2) ac

PCTA: Ph1: 21.1 (A1), 24.1 (A2) ac Ph2: 147.0 (A1), 144.6 (A2) ac

Alternative Compliance (acres): TBD in PS&E ATA 2 (50% Rule)? Yes (Ph2) ☒ No (Ph1) ☒

Estimated Const. Start Date: Ph1: 2025 Ph2: 2030

Estimated Const. Completion Date: Ph1: 2027 Ph2: 2035

Risk Level: RL 1 ☐ RL 2 ☒ RL 3 ☐ WPCP ☐ Other: _____

Is MWELO applicable? Yes ☒ No ☐

Is the Project within a TMDL watershed? Yes ☒ No ☐

TMDL Compliance Units (acres): TBD in PS&E

Notification of ADL reuse (if yes, provide date): Yes ☐ Date: TBD in PS&E 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 only.

Analette Ochoa — December 17, 2018

Analette Ochoa, Registered Project Engineer/Landscape Architect — *Date*

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

Kelly Hirschberg — 12-28-18

Kelly Hirschberg, *Project Manager* — *Date*

for — 12-27-2018

Amrinder Jhajj, *Designated Maintenance Representative* — *Date*

Alex McDonald — 12.21.2018

Alex McDonald, *Designated Landscape Architect Representative* — *Date*

Norman Gonsalves — 1/20/2019

Norman Gonsalves, *District/Regional Design SW Coordinator or Designee* — *Date*

[Stamp Required at PS&E only]

STORMWATER DATA INFORMATION

1. Project Description

California State Route 37 (SR 37) is an important regional connection linking the north, east, and west San Francisco Bay Area sub-regions. It serves commute, freight, and recreational traffic on weekdays and weekends. The SR 37 corridor currently experiences severe traffic congestion with extensive delays in the morning and evening weekday peak traffic periods and on weekends. The corridor has experienced flooding during winter storms and the flooding frequency and severity are expected to increase with sea level rise (SLR).

This project proposes interim (near-term) and ultimate (long-term) improvements on SR 37 from 0.25 miles west of the SR 121 intersection (SON 3.5) to 0.25 miles east of the Mare Island Interchange (SOL R7.4) to address the threat of SLR and traffic congestion (Project). The proposed improvements are the first steps in proactively identifying opportunities and solutions to the transportation, ecosystem, and SLR for the entire SR 37 corridor. The proposed interim and ultimate projects under consideration are as follows:

Interim Project Alternatives:

- Alternative I1, Three-Lane Facility with Contra Flow Lane: Provide three lanes on SR 37 between SR 121 and the the Mare Island Interchange with a contra-flow median HOV/managed lane via moveable barrier at existing elevation.
- Alternative I2, Four-Lane Facility: Convert existing shoulders to HOV/managed lane in peak periods.

Ultimate Project Alternatives:

- Alternative U1, Hybrid Section: Construct a new four-lane facility on SR 37 between SR 121 and the the Mare Island Interchange at SLR design elevations placed partly on embankment and partly on bridge structure.
- Alternative U2, Causeway Section: Construct a new four-lane facility on SR 37 between SR 121 and the Mare Island interchange at SLR Design Elevations on bridge structure.

Both the ultimate build alternatives include ecologic and hydrologic enhancements and reconfiguring the SR 37/SR 121 intersection and SR 37/Mare Island interchange.

This Project Study Report – Project Development Support (PSR-PDS) encompasses interim- and long-term projects for expedited delivery of improvements to address the current traffic congestion and the anticipated threat of SLR. The scope, schedule, and support costs necessary to complete needed studies and work during the Project Approval and Environmental Document (PA&ED) phase are identified.

Disturbed Soil Area (DSA) and Impervious Areas

The DSA was estimated from the proposed grading areas, added impervious areas, replaced impervious areas, removed impervious areas, and proposed staging areas. The net new impervious area (NNI) consists of the added impervious area minus the removed impervious area. Some existing impervious surfaces have been identified for replacement and are categorized under replaced impervious surface (RIS). The new impervious surface (NIS) is the sum of the NNI and the RIS. Table 1 below summarizes the DSA and impervious areas for each phase and alternative; these values

would be updated in the PA/ED phase and finalized during the Plans, Specifications, and Estimate (PS&E) phase.

Table 1. Disturbed Soil Area and Impervious Surface Improvements

Alt.	DSA (ac)	Pre-Project Impervious Area (ac)	Post-Project Impervious Area (ac)	NNI (ac)	Removed Impervious (ac)	RIS (ac)	NIS (ac)	PCTA (ac)	ATA 2 (%)
Interim Project									
I1	28.40	59.23	65.27	6.04	0.50	12.38	18.42	18.42	9.25
I2	28.18	59.23	59.78	0.55	0.50	20.79	21.34	21.34	0.92
Ultimate Project									
U1	248.67	69.24	133.88	64.64	57.41	11.83	76.47	76.47	48.28
U2	169.57	69.24	131.49	62.25	57.41	11.83	74.08	74.08	47.34

Stormwater treatment best management practices (BMPs) would be considered for all alternatives because the NIS is greater than 1 acre and Clean Water Act Section 401 *Water Quality Certifications* would be required. The Interim Project involves minimal roadway widening as well as intersection reconfiguration. The Ultimate Project entails constructing a new roadway parallel to the existing alignment and removal of the Interim Project's roadway surface. It is not anticipated that the Interim Project's treatment BMPs will be impacted by the Ultimate Project, but the impervious watersheds draining into the Interim Project's treatment BMPs would be altered by the Ultimate Project. For both the Interim and Ultimate Projects, the NNI is less than 50% of the post-Project impervious area; thus, all proposed alternatives would be required to treat the NIS. Additional Treated Area (ATA) Condition 1, impacts on existing treatment BMPs, would be determined during the PA/ED phase.

2. Site Data and Stormwater Quality Design Issues

The Project is within Caltrans right-of-way and under the jurisdiction of the San Francisco Bay Regional Water Quality Control Board (RWQCB), Region 2.

Hydrology

According to the Water Quality Planning Tool, the Project is located within two undefined hydrologic subareas (206.50 and 206.40) of the Napa River and Sonoma Creek hydrologic areas within the San Pablo hydrologic unit. The overall drainage pattern of the area is from the north to south.

Receiving Water bodies and Existing Water Quality

The receiving water bodies for Interim and Ultimate projects are anticipated to be the same. Waterbodies crossed or in close proximity to SR 37 from west to east include Tolay Creek, Sonoma Creek, Napa Slough, Dutchman Slough, and Napa River. Table 2 lists the beneficial uses of these water bodies as designated in the *Water Quality Control Plan for the San Francisco Bay Basin* (Basin Plan) (San Francisco Bay RWQCB 2017). Table 2 also details impairments of each water body as listed on the 2014-2016 Clean Water Act Section 303(d) List (State Water Resources Control Board 2017) and the respective Total Maximum Daily Load (TMDL) limits of the impairments. It is also important to note that, in addition to the receiving water bodies listed in Table 2 below, there are numerous aquatic resources along the Project alignment.

Table 2. Waterbodies, Beneficial Uses, Clean Water Act 2014-2016 303(d) List Impairments, and Total Maximum Daily Loads

Waterbody	Beneficial Uses	2014-2016 303(d) List Impairments	Total Maximum Daily Loads
Tolay Creek	RARE, WARM, WILD, REC1, REC2	None	None
Sonoma Creek, tidal	COMM, **COLD**, **MIGR**, RARE, **SPWN**, WARM, WILD, REC1, REC2	Nutrients (proposed for delisting), pathogens	Sonoma Creek Pathogen TMDL, Sonoma Creek Watershed Sediment TMDL and Habitat Enhancement Plan*, Sonoma Creek Nutrient TMDL
Napa Slough	COMM, EST, MIGR, RARE, WILD, REC1, REC2	None	None
Dutchman Slough	COMM, EST, MIGR, RARE, WILD, REC1, REC2	None	None
Napa River, tidal	COMM, EST, MIGR, RARE, WILD, REC1, REC2, NAV	Nutrients (proposed for delisting), pathogens	Napa River Pathogen TMDL, Napa River Watershed Sediment Reduction and Habitat Enhancement Basin Plan Amendment*, Napa River Nutrient TMDL
Napa River, Mare Island Strait	COMM, EST, MIGR, RARE, WILD, REC1, REC2, NAV	Chlordane, dieldrin, total DDT, mercury, PCBs	San Francisco Bay PCBs TMDL, San Francisco Bay Mercury TMDL

Notes:
COLD: cold freshwater habitat; COMM: commercial and sport fishing; EST: estuarine habitat; MIGR: fish migration; RARE: preservation of rare and endangered species; REC1: water contact recreation; REC2 non-contact water recreation; SPWN: spawning, reproduction, and/or early development; WARM: warm freshwater habitat; WILD: wildlife habitat
* = does not apply to tidally-influenced portions of Sonoma Creek or Napa River and their tributaries, which includes the project area (San Francisco Bay RWQCB 2017)

Sonoma Creek has a high receiving water risk because it has the combined beneficial uses of COLD, SPWN, and MIGR (Table 2). Although Sonoma Creek and Napa River and their tributaries (including Dutchman Slough), were previously subject to sediment/siltation-related TMDLs, these TMDLs no longer apply to the tidally influenced areas, which includes the Project area (San Francisco Bay RWCQB 2017).

The Project does not discharge to an Area of Special Biological Significance (ASBS). However, the Project passes through several publicly managed wildlife refuges, including the Napa-Sonoma

Marshes Wildlife Area (California Department of Fish and Wildlife [CDFW] jurisdiction) and San Pablo Bay National Wildlife Refuge (U.S. Fish and Wildlife Service [USFWS] jurisdiction). These wildlife areas/refuges contain aquatic resources and special-status species habitat that would need to be protected as Environmentally Sensitive Areas (ESAs) during construction.

Municipal Separate Storm Sewer Systems (MS4)

Project improvements located within Caltrans right-of-way must comply with the Statewide Storm Water Permit, Waste Discharge Requirements (WDRs) for the State of California Department of Transportation (Order No. 2012-0011 DWQ, National Pollutant Discharge Elimination System [NPDES] No. CAS0000003), also referred to as the Caltrans NPDES Permit.

If the Project proposes improvements within the City of Vallejo's right-of-way (near the Mare Island interchange), those improvements must comply with San Francisco Bay RWQCB Municipal Regional Stormwater NPDES Permit (Order R2-2015-0049), commonly referred to as the Municipal Regional Permit (MRP).

There are no urban MS4 permits that apply to the Project in unincorporated Sonoma, Napa, and Solano counties. See the attachments for MS4 permit boundary maps for Sonoma, Napa, and Solano counties.

Water Supply Reservoirs and Percolation Facilities

The *District 4 Work Plan* (Caltrans 2017) does not identify any water supply reservoirs or percolation facilities within the Project limits.

Topography

Topography along the Project alignment is relatively flat due to the close proximity of the San Pablo Bay, with the exception of dikes and levees that create topographic high points. Accordingly, elevations in the Project area range from near sea level to approximately 40 ft msl at the SR 37/121 interchange.

Climate

According to the Western Regional Climate Center, the Mare Island weather station (045333) receives a total of 19.78 inches of rain per year, with most of that rain falling between October and April.

Land Use

In Sonoma, Napa, and Solano counties, land uses along the Project alignment are agricultural and open space. The open space land uses contain extensive marshlands and aquatic resources under the management of the CDFW and the USFWS. There also appears to be some urban development associated with the former Mare Island Naval Shipyard in the eastern portion of the Project.

Soil

According to the Natural Resources Conservation Service's *Web Soil Survey*, soils within the Project area consist of Reyes silty clay (0% to 2% slopes), Reyes silty clay loam, Reyes silty clay loam (salt ponds), Reyes silty clay, Reyes silty clay loam (drained), made land, and Valdez silty clay loam (strongly saline, 0% to 2% slopes, MLRA 16). All soils within the Project limits are classified as

Hydrologic Soil Group D, which means they produce high volumes of runoff and have low infiltration rates.

A geotechnical investigation would be conducted during the PA/ED or PS&E phase, and the findings would be summarized in the PA/ED- and PS&E-phase Stormwater Data Report, as applicable.

Slope Stability

The *District 4 Work Plan* (Caltrans 2017) does not identify any areas prone to erosion within the Project limits.

Groundwater Hydrology

According to the Water Quality Planning Tool, the Project is located within the Petaluma Valley groundwater basin and subbasin near the SR 37/121 interchange and the Napa-Sonoma Valley groundwater basin from the SR 37/121 interchange to Mare Island. Within the Napa-Sonoma Valley groundwater basin, the Project traverses the Sonoma Valley and Napa-Sonoma Lowlands groundwater subbasins.

In general, groundwater within the Project limits is anticipated to be located at relatively shallow depths. Approximately 0.55 miles north of the SR 37/121 interchange at the Sonoma Raceway, groundwater levels vary between approximately 2.5 to 6.25 feet below ground surface (bgs). At the former Mare Island Naval Shipyard, approximately 0.4 miles south of the SR 37/Mare Island interchange, groundwater levels vary between approximately 5.1 to 5.75 feet bgs (Geotracker Groundwater Ambient Monitoring and Assessment 2018).

Groundwater Quality

Table 3 summarizes the groundwater basins and subbasins present within the Project limits, as well as the existing and potential beneficial uses listed in the Basin Plan (San Francisco Bay RWQCB 2017).

Table 3. Groundwater Beneficial Uses

Groundwater Basin	Groundwater Subbasin	Existing Beneficial Uses	Potential Beneficial Uses
Petaluma Valley	Petaluma Valley	MUN, AGR	PROC, IND
Napa-Sonoma Valley	Sonoma Valley	MUN, AGR	PROC, IND
	Napa-Sonoma Lowlands	MUN, AGR, PROC, IND	None

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

Hazardous Waste

There appears to be potential for soil contamination at the Northwestern Pacific railroad crossing near the SR 37/121 interchange. However, hazardous waste studies would be performed during the PA/ED and PS&E phases. The presence of aerially deposited lead (ADL), hazardous waste materials, and potentially contaminated groundwater would be assessed during the PA/ED phase. If applicable, the feasibility for the reuse of ADL-impacted soils within the Project limits would be determined during the PS&E phase.

3. Construction Site BMPs

Storm Water Pollution Prevention Plan

The Project would disturb more than 1 acre of soil, so a Storm Water Pollution Prevention Plan (SWPPP) would be required to comply with the Construction General Permit (CGP). A 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, sampling, and analysis plans for non-visible pollutants, sediment and turbidity, and pH. As described below, the Project would likely be classified as a Risk Level 2 project. Risk Level 2 project requirements include the preparation of a Rain Event Action Plan prior to an anticipated rain event, performing stormwater sampling at all discharge locations during a qualifying rain event, compliance with numeric action levels, and preparation of annual reports detailing BMP and sampling efforts.

Risk Level Assessment

According to the CGP, receiving water risk is determined based on the sensitivity of receiving waterbodies to sediment. Sonoma Creek and Napa River have a high receiving water risk, while Tolay Creek has a low receiving water risk (Table 2).

The sediment risk is determined from the product of the rainfall runoff erosivity factor (I), the soil erodibility factor (K), and the length-slope factor (LS). The Caltrans Water Quality Planning Tool identifies the Project as having an R factor of 40, a K factor of 0.24, and an LS factor ranging from 0.33 to 0.37. The product of the R factor, K factor, and the higher LS factor is 3.52 tons of sediment per acre (40 x 0.24 x 0.37), while the product of the R factor, K factor, and the lower LS factor is 3.17 tons of sediment per acre (40 x 0.24 x 0.33). Therefore, the project has a low sediment risk.

Based on planning-level information, both the Interim and Ultimate projects would likely be classified as Risk Level 2 under the CGP. The Project risk level would be refined during the PA/ED and PS&E phases once more-detailed information is available.

Construction Site BMP Strategy

Construction of the Interim and Ultimate projects is estimated to last approximately multiple construction seasons, with the Ultimate Project anticipated to take substantially longer. When possible, the scheduling of earth-disturbing construction activities should not be made during anticipated rain events. To minimize potential runoff or run-on within the Project limits, construction site BMPs should be installed prior to the start of construction or as early as feasibly possible during construction. Project-specific BMP measures would be specified and quantified during PS&E; however, the general construction site BMP strategy for this Project consists of the following measures:

- Soil Stabilization
- Sediment Control
- Tracking Control
- Wind Erosion Control
- Non-stormwater Management
- Waste Management and Material Pollution Control
- Stormwater Sampling and Analysis

See the attachments for the PID-phase cost estimate for construction site BMPs.

4. Maintenance BMPs

All alternatives of the Project include multi-modal transportation improvements. Therefore, drain inlet stenciling should be considered for both the Interim and Ultimate projects. Implementation of maintenance BMPs, including maintenance-vehicle pullouts, would be considered during the PA/ED and PS&E phases and coordinated with the Caltrans Maintenance Area Manager.

5. Other Water Quality Requirements and Agreements

There are no negotiated understandings and/or agreements with the San Francisco Bay RWQCB at this time. A Clean Water Act Section 404 permit from the U.S. Army Corps of Engineers and a Clean Water Act Section 401 Certification from San Francisco Bay RWQCB are anticipated to be required for both the Interim and Ultimate projects. Dewatering is anticipated to be required for excavations and temporary stream diversion; if groundwater or surface water is found to be contaminated, a dewatering permit would be required. Communication with the San Francisco Bay RWQCB would be coordinated through the Office of Water Quality.

Additional permits from the USFWS, National Oceanic and Atmospheric Administration Fisheries, CDFW, and the San Francisco Bay Conservation and Development Commission may also be required. Permit applications would be prepared and submitted during later phases of the Project.

6. Permanent BMPs

Permanent BMPs are strategies and measures to minimize and avoid water quality impacts in the post-construction condition. Permanent BMPs include design pollution prevention (DPP) and treatment BMP strategies. Providing stormwater treatment for the entire post-construction treatment area (PCTA) is expected to be a challenge; refer to page 9 for a discussion regarding stormwater treatment.

Rapid Stability Assessment

Rapid Stability Assessments (RSA) may be required for both the Interim and Ultimate projects due to the following:

- Both the Interim and Ultimate projects include stream crossings.
- Both the Interim and Ultimate projects include 1 acre or more of NNI surface.
- The NNI is within the stream threshold drainage areas.
- Stream crossings within the Project limits are likely to be classified as “Waters of the U.S.” as defined by the U.S. Army Corps of Engineers’ latest guidance on determination of jurisdiction for Clean Water Act Section 404.

However, because the Project would require a Clean Water Act Section 401 Water Quality Certification for both the Interim and Ultimate projects, designers may need to use local hydromodification management criteria rather than Caltrans criteria, which would need to be determined by the Stormwater Coordinator.

Design Pollution Prevention (DPP) BMP Strategy

DPP BMPs would be incorporated into the design of the Project in order to avoid or minimize potential impacts on water quality by preventing downstream erosion and permanently stabilizing DSAs. The following sections provide a general overview of DPP BMPs that may be implemented as part of the Project. See the attachments for the PID-phase cost estimate for DPP BMPs.The

Maximum Applied Water Allowance (MAWA) and Estimated Total Water Use (ETWU) for this Project will be provided during the PS&E phase.

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

There would be an increase in imperviousness in the Project area under both the Interim and Ultimate projects (see Table 1). These NNI surfaces could increase the volume and velocity of stormwater runoff in the Project area, which could result in erosion in receiving waterbodies. However, this effect is likely to be minimal given the tidal influence of the receiving waters. The Project would incorporate BMPs — such as energy dissipation devices at discharge locations and flared culvert end sections — to minimize potential erosion of sediment. The Project would also incorporate low-impact development (LID) BMPs to maintain pre-Project hydrology and improve the quality of stormwater discharges to receiving water bodies.

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

Areas of cut and fill are required to satisfy the proposed geometry under both the Interim and Ultimate projects. For the Interim Project, minor cut and fill could be required for both alternatives to widen existing bridges at Tolay and Sonoma creeks. However, the Ultimate Project would require more cut and fill; this earthwork would be associated with providing new roadway embankment sections along a new alignment roughly parallel to the Interim Project alignment. Thus, Alternative 1 under the Ultimate Project would likely require more cut and fill as there would be a larger embankment profile than Alternative 2 of the Ultimate Project.

The Project does not anticipate the creation of slopes steeper than 2:1 (H:V). Areas with slopes between 4:1 (H:V) and 2:1 (H:V) would be coordinated with the Geotechnical Design unit, if required. If the Project involves slopes steeper than 4:1 (H:V), an erosion control plan would be developed during the design phase and submitted to the District Landscape Architect for approval.

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

The Interim Project could require upgrades to the existing drainage systems along SR 37. The Ultimate Project would require the construction of new drainage systems along a new highway alignment. The design of upgrades and/or new concentrated flow conveyance systems would occur during the PS&E phase once drainage calculations are available.

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

One of the Project's goals is to maximize the protection of existing vegetation for erosion and sediment control. Vegetation to be preserved would be delineated on plans during the PS&E phase. During construction, vegetation to be preserved — as well as wetlands and aquatic resources — would be surrounded with high-visibility temporary fencing (type ESA). Wetlands and aquatic resources that cannot be preserved will be mitigated with appropriate measures developed during the PS&E phase.

Treatment BMP Strategy

The Project is required to consider treatment BMPs in accordance with the July 2017 *Project Planning and Design Guide* (PPDG) and anticipated Clean Water Act Section 401 Certification requirements. However, because the Project would require a Clean Water Act Section 401 Water Quality Certification for both the Interim and Ultimate projects, designers may need to use local

stormwater treatment design criteria rather than Caltrans criteria, which would be determined by the Stormwater Coordinator.

Providing treatment for the PCTA under the Interim and Ultimate projects on-site is anticipated to be challenging due to the presence of fine native soils and shallow groundwater within a narrow corridor constrained by the presence of extensive aquatic resources. At this time, it is anticipated that an alternative compliance proposal would be necessary to treat the PCTA for both the Interim and Ultimate projects. However, an attempt should be made to provide as much treatment on-site as feasible to reduce treatment costs. Thus, the PA/ED and PS&E phases should consider extending the overall post-mile limits to include adjacent intersections where treatment can be installed. If alternative compliance is still required, the PA/ED and PS&E phases may also consider using alternative compliance options generated by previous projects, incorporating treatment BMPs into maintenance projects in the same watersheds, or implementation of treatment outside of Caltrans' right-of-way with a municipal partner.

For the Interim Project, the primary locations where treatment BMPs can be accommodated within the PID-phase footprint is along the roadway embankment shoulders and side slopes. However, some roadway widening may be required to accommodate additional traveled lanes under both alternatives, further constraining feasible locations for the installation of treatment BMPs along the roadway shoulder. Bioswales may be feasible in locations with larger pervious areas, such as at intersections. Additionally, repaving the roadways and parking lots at the existing scenic overlook areas near Sonoma Creek with pervious pavement could generate treatment credits.

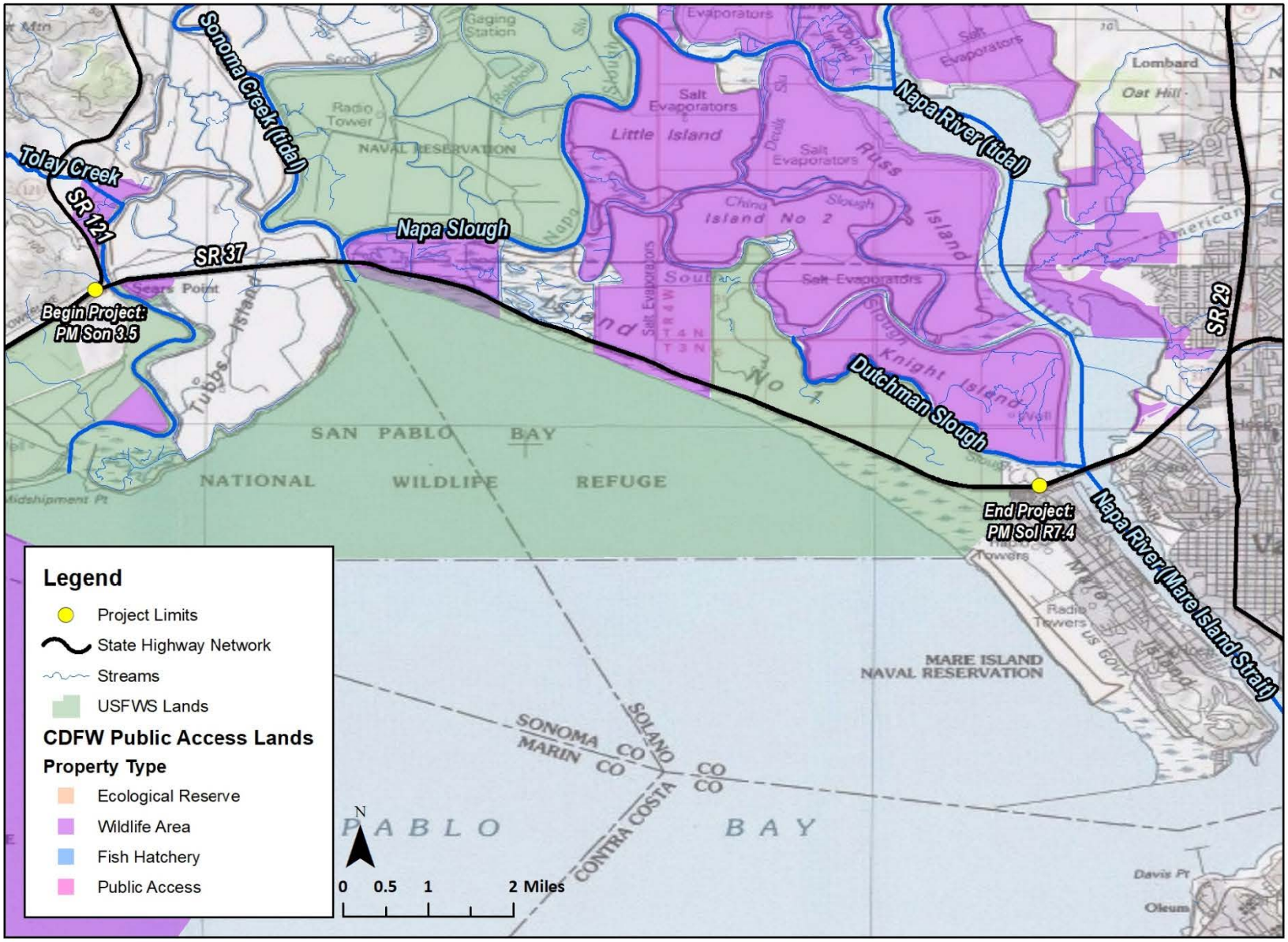
Due to the large PCTA for both Ultimate Project alternatives, the primary challenge will be locating enough acreage where the installation of treatment BMPs is feasible on-site. Whereas Alternative 1 would have some earthen areas along proposed embankment sections that could potentially be used for treatment BMPs, Alternative 2 would be particularly challenging as the entire roadway would be on an elevated concrete viaduct structure without earthen areas that can treat runoff. For Alternative 1, designers may want to explore using relatively flat slopes on embankment sections to provide more surface area on the embankment where treatment BMPs could be installed.

As a conservative approach, funds would be programmed for both the Interim and Ultimate projects assuming the entire PCTA would be treated offsite under an alternative compliance proposal. Project-specific treatment BMP measures will be specified and quantified during later phases of the Project. Studies used in the design of stormwater treatment BMPs, such as those that determine the infiltration capacity of existing soils and depth to groundwater, would occur during PA/ED and PS&E phases of the Project. When data becomes available, the T-1 checklist will be used to select appropriate treatment BMPs.

See the attachments for the PID-phase cost estimate for treatment BMPs.

Required Attachments

- Vicinity Map
- Evaluation Documentation Form
- Risk Level Determination Documentation


Sonoma Creek (tidal)
Tolay Creek
SR 121
SR 37
Napa Slough
Begin Project:
PM Son 3.5
Napa River (tidal)
Dutchman Slough
SR 29
End Project:
PM Sol R7.4
Napa River (Mare Island Strait)
SAN PABLO BAY
NATIONAL WILDLIFE REFUGE
MARE ISLAND
NAVAL RESERVATION
SONOMA CO
MARIN CO
SOLANO CO
CONTRA COSTA CO
PABLO BAY
Legend
Project Limits
State Highway Network
Streams
USFWS Lands
CDFW Public Access Lands
Property Type
Ecological Reserve
Wildlife Area
Fish Hatchery
Public Access
N
0 0.5 1 2 Miles

DATE: _ December 2018_____

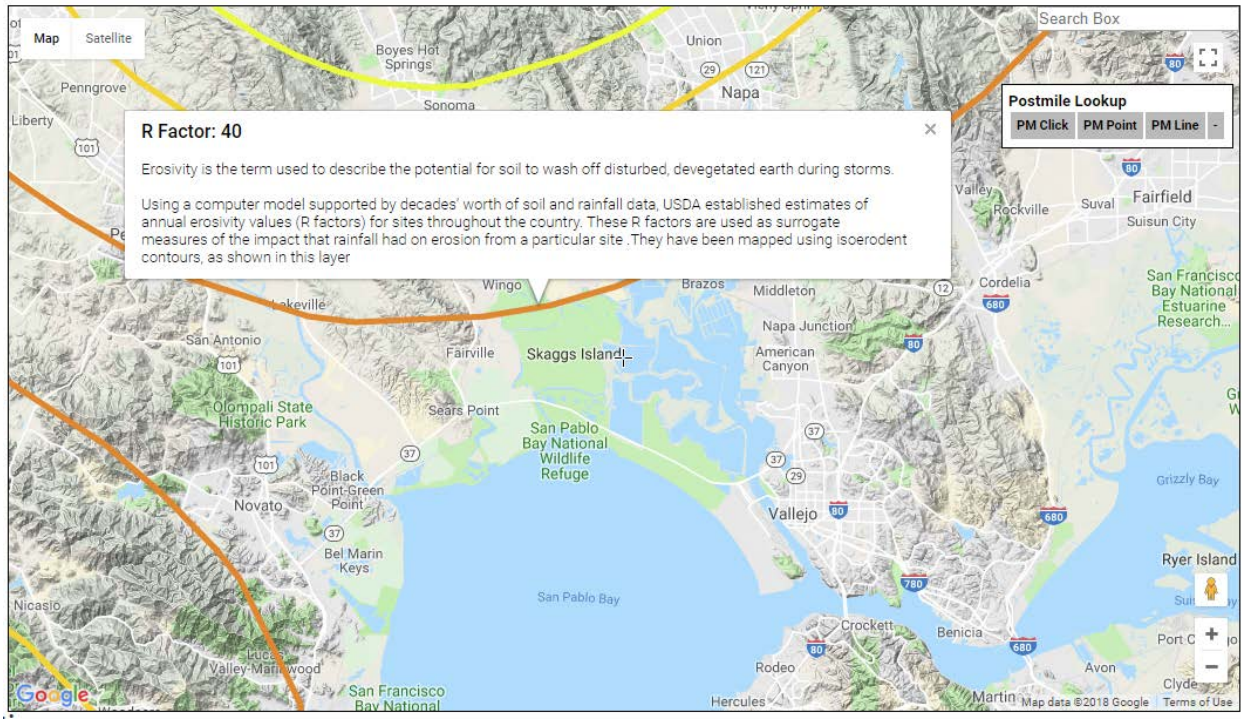
Project ID (EA): _ 04-1Q760K_____

No.	Criteria	Yes ✓	No ✓	Supplemental Information for Evaluation
1.	Begin Project evaluation regarding requirement for implementation of Treatment BMPs	✓		See Figure 4-1, Project Evaluation Process for Consideration of Treatment BMPs. Continue to 2.
2.	Is the scope of the Project to install Treatment BMPs (e.g., Alternative Compliance or TMDL Compliance Units)?		✓	If **Yes**, go to 8. If **No**, continue to 3.
3.	Is there a direct or indirect discharge to surface waters?	✓		If **Yes**, continue to 4. If **No**, go to 9.
4.	As defined in the WQAR or ED, does the project: a. discharge to Areas of Special Biological Significance (ASBS), or b. discharge to a TMDL watershed where Caltrans is named stakeholder, or c. have other pollution control requirements for surface waters within the project limits?		✓	If **Yes to any**, contact the District/Regional Design Stormwater Coordinator or District/Regional NPDES Coordinator to discuss the Department's obligations, go to 8 or 5. _____*(Dist./Reg. Coordinator initials)* If **No** to all, continue to 5.
		✓		
			✓	
5.	Are any existing Treatment BMPs partially or completely removed? (ATA Condition 1, Section 4.4.1)	TBD in PA/ED	TBD in PA/ED	If **Yes**, go to 8 **AND** continue to 6. If **No**, continue to 6.
6.	Is this a Routine Maintenance Project?		✓	If **Yes**, go to 9. If **No**, continue to 7.
7.	Does the project result in an increase of one acre or more of new impervious surface (NIS)?	✓		If **Yes**, go to 8. If **No**, go to 9.
8.	Project is required to implement Treatment BMPs.	Complete Checklist T-1, Part 1.		
9.	Project is not required to implement 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.		

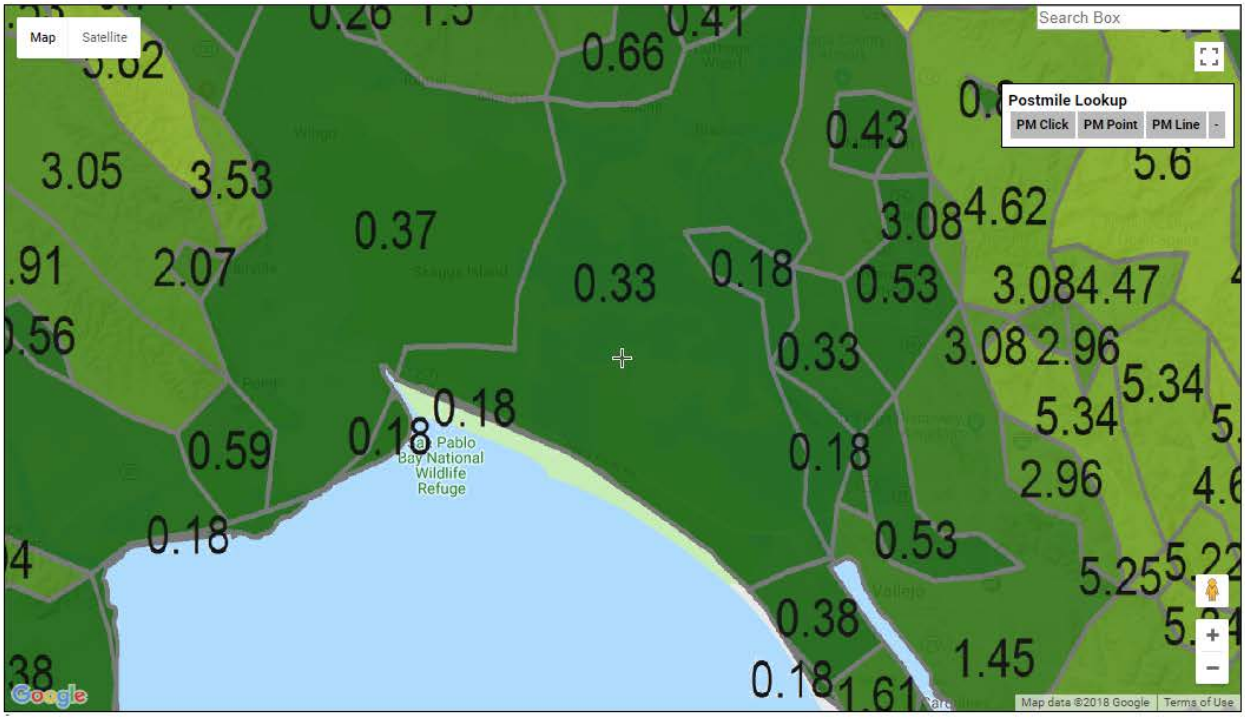
CONSTRUCTION GENERAL PERMIT RISK LEVEL DOCUMENTATION

K Factor (0.24)

R Factor (40)

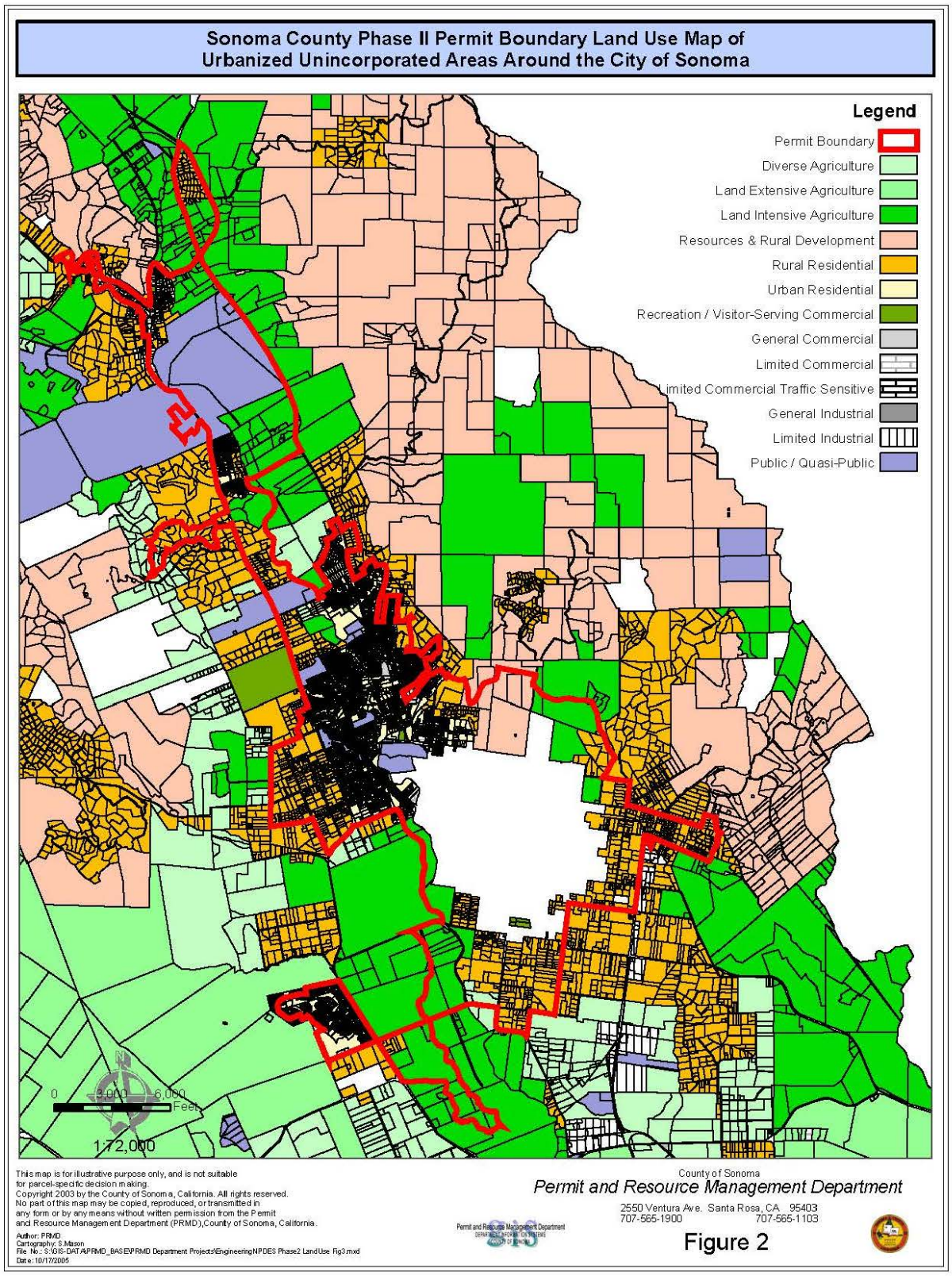


LS Factor (0.33 and 0.37)



Supplemental Attachments

- Local MS4 Permit Boundary Maps
- Checklist SW-1, Site Data Sources
- Checklist T-1, Part 1 (Treatment BMPs)
- Cost Estimate for Construction Site, DPP, and Treatment BMPs
- Checklist SW-2, Stormwater Quality Issues Summary
- Checklist SW-3, Measures for Avoiding or Reducing Potential Stormwater Impacts
- Checklist DPP-1, Parts 1–5 (Design Pollution Prevention BMPs)
- Checklist T-1, Parts 2–8 & 11 (Treatment BMPs)
- Construction Site BMP Consideration Form
- Checklist CS-1, Parts 1–6 (Construction Site BMPs)


Sonoma County Phase II Permit Boundary Land Use Map of
Urbanized Unincorporated Areas Around the City of Sonoma
Legend
Permit Boundary
Diverse Agriculture
Land Extensive Agriculture
Land Intensive Agriculture
Resources & Rural Development
Rural Residential
Urban Residential
Recreation / Visitor-Serving Commercial
General Commercial
Limited Commercial
Limited Commercial Traffic Sensitive
General Industrial
Limited Industrial
Public / Quasi-Public
N
0
3,000
6,000
Feet
1:72,000
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for parcel-specific decision making.
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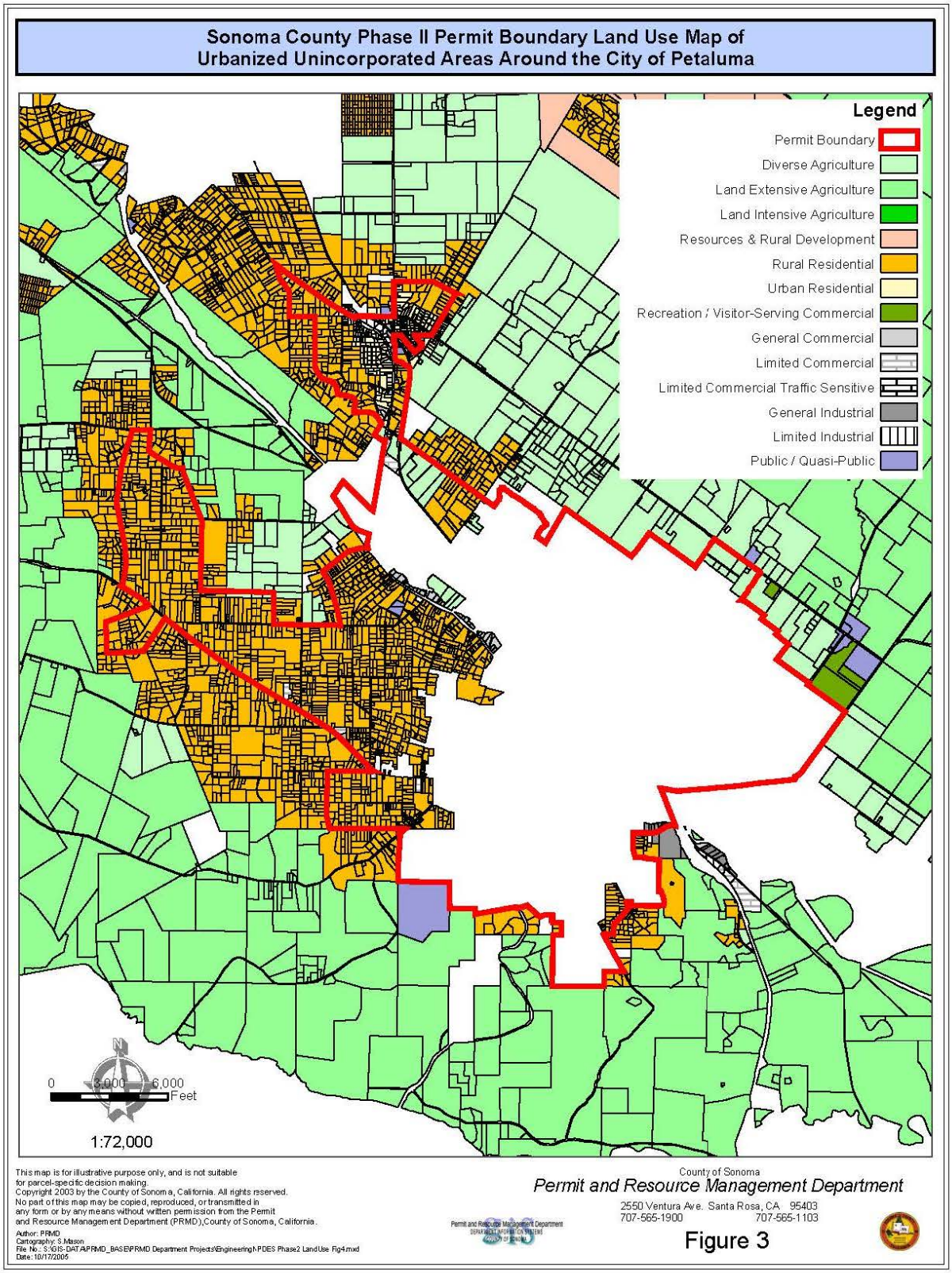
and Resource Management Department (PRMD),County of Sonoma, California.
Author: PRMD
Cartography: S.Mason
File No.: S:\GIS-DATA\PRMD_BASE\PRMD Department Projects\Engineering\NPDES Phase2 Land Use Fig3.mxd
Date: 10/17/2005
County of Sonoma
Permit and Resource Management Department
2550 Ventura Ave. Santa Rosa, CA 95403
707-565-1900 707-565-1103
Figure 2


Sonoma County Phase II Permit Boundary Land Use Map of
Urbanized Unincorporated Areas Around the City of Petaluma
Legend
Permit Boundary
Diverse Agriculture
Land Extensive Agriculture
Land Intensive Agriculture
Resources & Rural Development
Rural Residential
Urban Residential
Recreation / Visitor-Serving Commercial
General Commercial
Limited Commercial
Limited Commercial Traffic Sensitive
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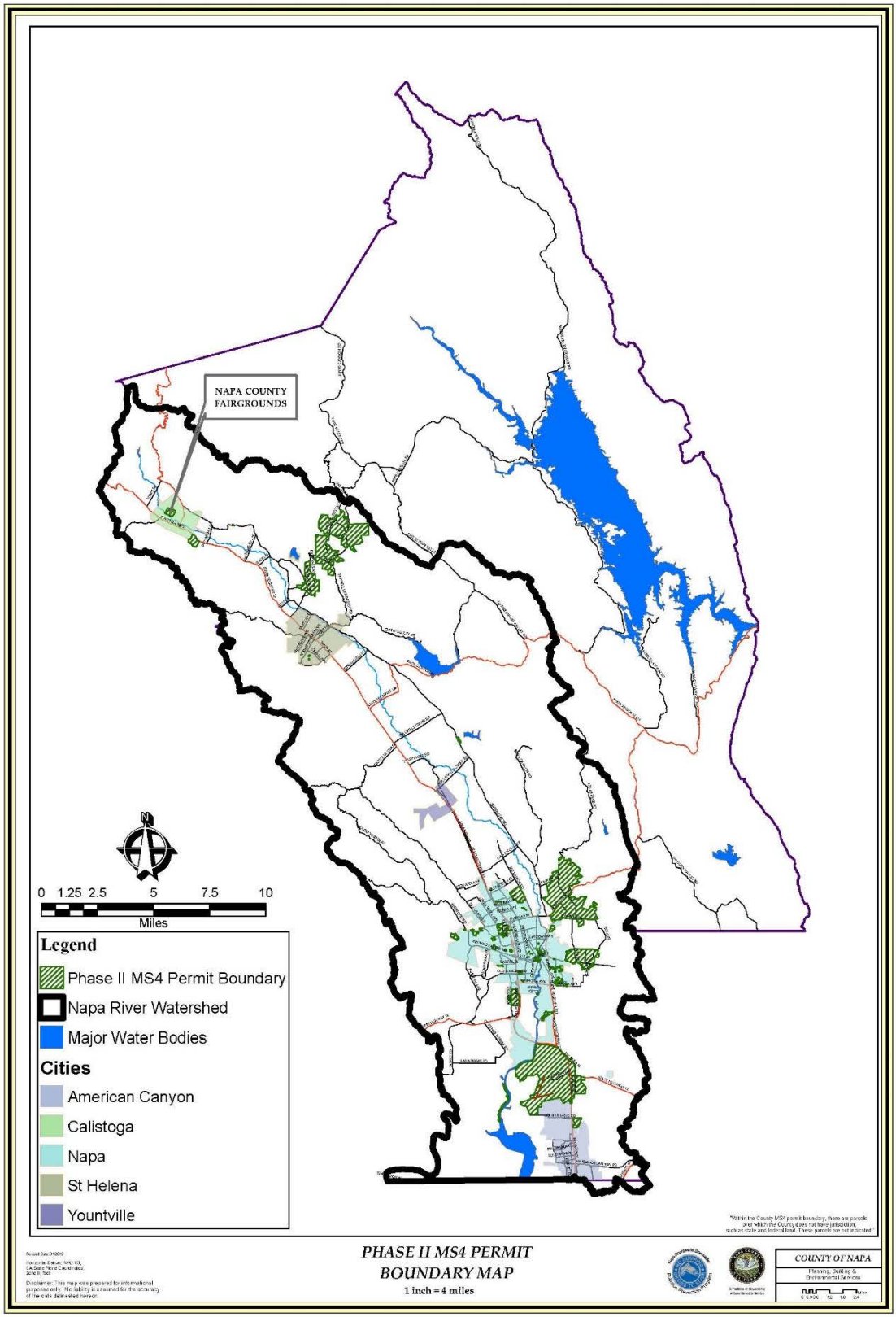
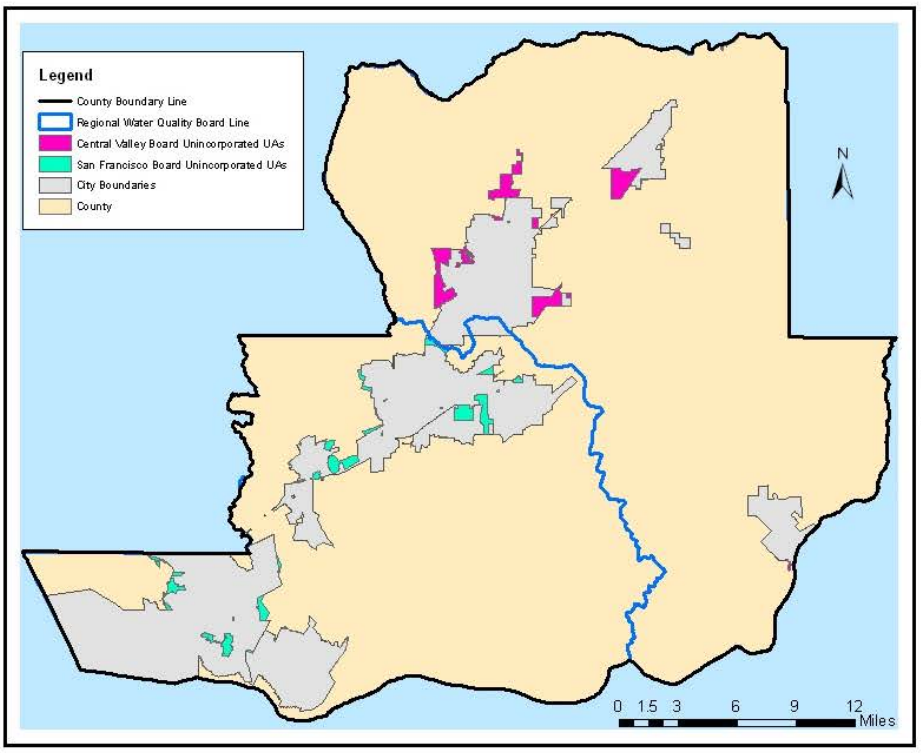
Author: PRMD
Cartography: S.Mason
File No.: S:\GIS-DATA\PRMD_BASE\PRMD Department Projects\Engineering\NPDES Phase2 LandUse Fig4.mxd
Date: 10/17/2005
County of Sonoma
Permit and Resource Management Department
2550 Ventura Ave. Santa Rosa, CA 95403
707-565-1900 707-565-1103
Figure 3


NAPA COUNTY FAIRGROUNDS
0 1.25 2.5 5 7.5 10
Miles
Legend
Phase II MS4 Permit Boundary
Napa River Watershed
Major Water Bodies
Cities
American Canyon
Calistoga
Napa
St Helena
Yountville
PHASE II MS4 PERMIT BOUNDARY MAP
1 inch = 4 miles
COUNTY OF NAPA

Solano County

Unincorporated UAs by Regional Water Board



Central Valley

Urbanized Area:
4,394 Acres

Population in UAs:
2,930 people

Minus clipping errors:
1,666 people

San Francisco

Urbanized Area:
3,784 Acres

Population in UAs:
5,579 people

Minus clipping/annex:
4,601 people

Checklist SW-1, Site Data Sources

Prepared by: WRECO Date: December 10, 2018 District-Co-Route: 04-Son-Sol-37

PM: Son 3.5/Sol R7.4 Project ID (or EA): 04-1Q760K RWQCB: San Francisco Bay (R2)

Information for the following data categories should be obtained, reviewed and referenced as necessary throughout the project planning phase. Collect available project reports and 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 6.4.3.2. Example categories have been listed below; add additional categories, as needed. Summarize pertinent information in Section 2 of the SWDR.

DATA CATEGORY/SOURCES	Date
Water Quality	
Caltrans Water Quality Planning Tool	Last Accessed: August 7, 2018
San Francisco Bay Regional Water Quality Control Board. Clean Water Act Sections 303(d) and 305(b) 2016 Integrated Report for the San Francisco Bay Region, Staff Report. https://www.waterboards.ca.gov/rwqcb2/water_issues/programs/TMDLs/2016_303d/2016IR_RB2_StaffReport.pdf	February, 2017
San Francisco Bay Regional Water Quality Control Board. Water Quality Control Plan (Basin Plan) for the San Francisco Bay Basin.	May 4, 2017
State Water Resources Control Board. 2014/2016 California Integrated Report (303(d) List/305(b) Report).	October 3, 2017
Geotechnical	
United States Department of Agriculture. Natural Resources Conservation Science. Web Soil Survey.	Last Accessed: August 7, 2018
Topographic	
ESRI world topographic basemap	Last Accessed: August 7, 2018
Climatic	
Western Regional Climate Center	Last Accessed: August 7, 2018
Other Data Categories	
Caltrans. District 4 Work Plan Fiscal Year 2018-2019. CTSW-RT-17-316.11.1.	October 1, 2017

Treatment BMPs
Checklist T-1, Part 1

Prepared by: WRECO Date: December 10, 2018 District-Co-Route: 04-Son-Sol-37

PM: Son 3.5/Sol R7.4 Project ID (or EA): 04-1Q760K RWQCB: San Francisco Bay (R2)

*To be updated during the PA/ED phase

Consideration of Treatment BMPs

This checklist is used for projects that require the consideration of Approved Treatment BMPs, as determined from the process described in Section 4 (Treatment Consideration) and the Evaluation Documentation Form (EDF). This checklist will be used to determine which Treatment BMPs should be considered for each BMP contributing drainage area 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. This will help to determine if any changes to the BMP strategy are necessary, based on site specific information gathered during later phases. Use the responses to the questions as the basis of developing the narrative in Section 6 of the Stormwater Data Report to document that Treatment BMPs have been appropriately considered and/or incorporated.

Before evaluating an area for treatment capabilities or to incorporate a Treatment BMP, calculate the numeric sizing requirement for each contributing drainage area (WQV from the 85th percentile 24-hour storm event or WQF rate). Soil and geometric information for the project area will be necessary to use this Checklist.

Identify the overall project PCTA

Refer to Section 4.4 Treatment Areas for more information on defining these areas.

PCTA = NNI + RIS + ATA (1 Impervious) + ATA (2)

NNI = Net New Impervious Area

RIS = Replaced Impervious Surface

ATA (1 Impervious) = Additional Treatment Area required for existing Treatment BMPs that were removed or modified as part of the project

ATA (2) = Additional Treatment Area required when NNI is 50 percent or greater than total project impervious

What is the PCTA for the project? I1: 18.42; **I2:** 21.34; **U1:** 76.47; **U2:** 74.08 **Acres**

The PCTA is the impervious area required to be treated by the project. The PE is to incorporate BMPs until the summation of the treated impervious area of all the BMPs is equivalent to the PCTA for the Project.

Once this area and any ATA 1 (Pervious) has been treated, the project is in compliance with the post construction treatment requirement.

Total Maximum Daily Load (TMDL) Retrofit Projects

If the project is installing Treatment BMPs to only address TMDL requirements, then there is no required PCTA. The Treatment BMPs for a TMDL retrofit project should be designed to treat the impervious and pervious contributing drainage areas, as they are both eligible for compliance unit (CU) credits.

Overall Project Evaluation

Answer all questions, unless otherwise directed.

A. Overall Project Consideration

1. Is the project in a watershed with prescriptive Treatment BMP requirements in an adopted TMDL implementation plan or are there any other requirements for project area (e.g., District, Regional Board, Lawsuit)? ☒ Yes ☐ No

   If Yes, consult the District/Regional Design Stormwater Coordinator or District/Regional NPDES Coordinator to determine if there are written agreements related to specific Treatment BMPs. In this case, determine if the rest of this checklist needs to be followed to address other post construction requirements. If not, document BMP(s) in the Individual Treatment BMP Summary Table, provide information on the basis of the BMP requirement and any regulatory coordination in the SWDR narrative, and complete Table E-2. Otherwise, continue.

   If No, continue.

2. Does the receiving water have a TMDL for litter/trash, or is there a region specific requirement related to trash? ☒ Yes ☐ No

   If Yes, first evaluate BMPs that can treat other pollutants and are considered to be full capture devices (GSRDs or other) for litter/trash. If other BMPs cannot be sited, consult with the District/Regional Design Stormwater Coordinator or District/Regional NPDES Coordinator to determine if standalone full capture devices (GSRDs or other) are required to be incorporated. If standalone devices are required and no other Treatment BMPs are being considered, go to question 6 of "Individual BMP Evaluation".

   If No, continue.

3. Is the project located in an area that uses traction sand more than twice a year? ☐ Yes ☒ No

   If Yes, first consider BMPs that can treat other pollutants and can capture traction sand. If other BMPs cannot be sited, consult the District/Regional Design Stormwater Coordinator to determine if standalone traction sand trap devices should be incorporated.

   If standalone devices are required and no other Treatment BMPs are being considered, go to question 6 of "Individual BMP Evaluation". Otherwise, continue with this checklist to identify Treatment BMPs that provide traction sand and other pollutant removal, or to design Treatment BMPs in series.

   If No, continue.

B. Dual Purpose Facilities

Does the project have (or propose to include) any dual purpose facilities that could meet treatment requirements (e.g., Dry Weather Flow Diversion, flood control basins, etc.)? ☐ Yes ☒ No

If Yes and 100 percent of the PCTA and ATA 1 (Pervious) will be treated by the dual purpose facility, go to question 6 of "Individual BMP Evaluation".

If Yes, but 100 percent of the PCTA and ATA 1 (Pervious) has not been addressed, continue.

If No, continue.

C. Evaluate overall project area for infiltration opportunities using existing and proposed roadside surfaces (DPP Infiltration Areas). Assure the DPP Infiltration Area is stabilized to handle highway drainage design flows, for both sheet and concentrated flows (See HDM Section 800).

Document DPP Infiltration Areas on the "Individual Treatment BMP Summary Table" located at the end of this checklist.

1. Based on site conditions, do the DPP Infiltration Areas infiltrate 100 percent of the WQV generated by the PCTA and ATA 1 (Pervious) for the project? ☐ Yes ☒ No

   Yes, go to question 6 of "Individual BMP Evaluation".

   If No, account for area infiltrated and continue.

2. Can infiltration for these areas be increased by using soil amendments or other means? ☐ Yes ☐ No

   If Yes, and 100 percent of the WQV generated by the PCTA and ATA 1 (Pervious) is infiltrated, go to question 6 of "Individual BMP Evaluation".

   If Yes, but 100 percent of the WQV generated by the PCTA and ATA 1 (Pervious) is not infiltrated, continue with this checklist to identify Treatment BMPs that will treat the remaining PCTA and ATA 1 (Pervious).

   If No, continue.

Individual BMP Evaluation

Answer the following questions for each Treatment BMP location being considered. The following process must be followed until the PCTA and ATA 1 (Pervious) or desired treatment area (Alternative Compliance or TMDL CUs) has been achieved; for TMDL CUs, consider both impervious and pervious contributing drainage areas. Use the Individual Treatment BMP Summary Table at the end of the checklist to summarize the selected BMP(s) based on the findings of the following questions for each BMP contributing drainage area.

1. Infiltration Devices (Infiltration Basin, Trench, or other device)

   a. Can 100 percent of the BMP contributing drainage area WQV (or remaining WQV, if in series with a DPP Infiltration Area or other BMP) be infiltrated? ☐ Yes ☒ No

      If Yes, go to question 6.

      If No, continue.

2. Biofiltration Devices (Biofiltration Strips and Swales)

   a. Is this a TMDL retrofit project or is the project within a TMDL watershed or 303(d) impaired receiving water body area? ☒ Yes ☐ No

      If Yes, when designing the biofiltration device, determine the percent WQV infiltrated from both the impervious and pervious BMP contributing drainage areas. Consider using existing or amended soils:

      i. If infiltration is >50 percent, continue to b.

      ii. If infiltration is ≤50 percent, go to question 3.

      If No, continue to b.

   b. Can biofiltration devices be designed to: ☐ Yes ☒ No

      i. Treat 100 percent of the WQF/WQV (or remainder, if in series with a DPP Infiltration Area or other BMP) from the BMP contributing drainage area, and

      ii. Meet the siting and design criteria of the Caltrans biofiltration device design guidance.

      If Yes, continue to c.

      If No, go to question 3.

   c. Biofiltration devices are considered to be an effective method of treatment, go to question 6.

3. Earthen type BMPs (Detention Devices, Media Filters, or other devices)

   a. Is this a TMDL retrofit project or is the project within a TMDL watershed or 303(d) impaired receiving water body area? ☒ Yes ☐ No

   If Yes, when designing the earthen type BMP, determine the percent WQV infiltrated from both the impervious and pervious BMP contributing drainage area. Consider using existing or amended soils:

   i. If infiltration is >50 percent, continue to b.

   ii. If infiltration is ≤50 percent, go to question 4.

   If No, continue to b.

   b. Can earthen type BMPs (standalone or in series with other approved Treatment BMPs) be designed to: ☒ Yes ☐ No

   iii. Treat 100 percent of the WQV (or remainder, if in series with a DPP Infiltration Area or other BMP) from the BMP contributing drainage area, and

   iv. Meet the criteria of the Caltrans design guidance for the treatment device being considered.

   If Yes, continue to c.

   If No, go to question 4.

   c. Earthen type BMPs are considered to be an effective method of treatment, go to question 6.

4. Targeted Design Constituent (TDC)

   This approach will compare the effectiveness of individual BMPs and allow the PE to use judgment when evaluating BMP feasibility (site constraints, safety, maintenance requirements, life-cycle costs, etc.).

   a. Does the project discharge to a 303(d) impaired receiving water or a receiving water in a TMDL watershed where Caltrans is a named stakeholder? ☒ Yes ☐ No

      If Yes, is the identified pollutant(s) considered to be a TDC (check all that apply below)? Continue to b. ☒ Yes ☐ No

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

      If No or if no TDC is identified, use Matrix A to select BMPs and go to question 5.

   b. Treating Only Sediment. Is sediment a TDC? ☒ Yes ☐ No

      If Yes, use Matrix A to select BMPs and go to question 5.

      If No, continue to c.

   c. Treating Only Metals. Are copper, lead, zinc, or general metals listed TDCs? ☐ Yes ☒ No

      If Yes, use Matrix B to select BMPs, and go to question 5.

      If No, continue to d.

   d. Treating Only Nutrients. Are nitrogen and/or phosphorus listed TDCs? ☒ Yes ☐ No

      If Yes, use Matrix C to select BMPs, and go to question 5.

      If No, continue e.

   e. Treating both Metals and Nutrients. Is copper, lead, zinc, or general metals AND nitrogen or phosphorous a TDC? ☐ Yes ☒ No

      If yes, use Matrix D to select BMPs, and go to question 5.

      If No, continue.

[1] General metals is a designation used by Regional Water Boards when specific metals have not yet been identified as causing the impairment.

BMP Selection Matrix A: General Purpose Pollutant Removal			
Consider BMPs (or combinations of) to treat the contributing drainage area WQV with BMPs listed in this table. First evaluate 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. BMPs are chosen based on the infiltration category determined for BMP contributing drainage area. BMPs in other infiltration 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	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	Austin filter (concrete) Delaware filter
HRT = hydraulic residence time (min) All BMPs shown are considered to be effective, but some more than others. The PE should use professional judgment when selecting BMPs based on overall feasibility. All BMPs are shown to demonstrate equivalent effectiveness.			

BMP Selection Matrix B: Any metal is the TDC, but not nitrogen or phosphorous			
Consider BMPs (or combinations of) to treat the contributing drainage area WQV with BMPs listed in this table. First evaluate 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. BMPs are chosen based on the infiltration category determined for BMP contributing drainage area. BMPs in other infiltration 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	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) All BMPs shown are considered to be effective, but some more than others. The PE should use professional judgment when selecting BMPs based on overall feasibility. All BMPs are shown to demonstrate equivalent effectiveness.			

BMP Selection Matrix C: Phosphorous and / or nitrogen is the TDC, but no metals are the TDC			
Consider BMPs (or combinations of) to treat the contributing drainage area WQV with BMPs listed in this table. First evaluate 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. BMPs are chosen based on the infiltration category determined for BMP contributing drainage area. BMPs in other infiltration 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	Biofiltration Strip Biofiltration Swale Detention (unlined)	Austin filter (concrete) Delaware filter Biofiltration Strip Biofiltration Swale	Austin filter (concrete) Delaware filter
All BMPs shown are considered to be effective, but some more than others. The PE should use professional judgment when selecting BMPs based on overall feasibility. All BMPs are shown to demonstrate equivalent effectiveness.			
*Delaware filters would 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 BMPs (or combinations of) to treat the contributing drainage area WQV with BMPs listed in this table. First evaluate 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. BMPs are chosen based on the infiltration category determined for BMP contributing drainage area. BMPs in other infiltration 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	Biofiltration Strip Biofiltration Swale Detention (unlined)	Austin filter (concrete) Delaware filter Biofiltration Strip Biofiltration Swale	Austin filter (concrete) Delaware filter
All BMPs shown are considered to be effective, but some more than others. The PE should use professional judgment when selecting BMPs based on overall feasibility. All BMPs are shown to demonstrate equivalent effectiveness.			
*In cases where earthen BMPs also 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.			

5. Does the project discharge to a 303(d) receiving water that is listed for mercury or low dissolved oxygen? ☒ Yes ☐ No

   If Yes, contact the District/Regional NPDES Coordinator to determine if standing water in a Delaware Media Filter or Wet Basin would be a risk to downstream water quality. Continue to question 6.

   If No, continue to question 6.

6. Identify the Treatment BMPs being considered and complete the Individual Treatment BMP Summary Table and Overall Project Treatment Summary Table on the following pages. Refer to Appendix B of the PPDG and review the checklists identified below for every Treatment BMP under consideration. ☒ Complete

   Document the basis of design in the SWDR narrative and complete Table E-2.

   __X__ DPP Infiltration Areas: Checklist T-1, Part 11

   ____ Infiltration Devices: Checklist T-1, Part 2

   __X__ Biofiltration Strips and Biofiltration Swales: Checklist T-1, Part 3

   __X__ Detention Devices: Checklist T-1, Part 4

   ____ Traction Sand Traps: Checklist T-1, Part 5

   ____ Dry Weather Diversion: Checklist T-1, Part 6

   __X__ GSRDs: Checklist T-1, Part 7

   __X__ Media Filter [Austin Sand Filter and Delaware Filter]: Checklist T-1, Part 8

   Note:

   Multi-Chamber Treatment Train (MCTT) is not listed here because Caltrans has found that other approved BMPs are equally effective and more sustainable due to lower life cycle costs.

   Wet Basins are not listed here due to feasibility issues due to site feasibility and issues with long term operation and maintenance.

   MCTT and Wet Basins may be considered or implemented upon the recommendation of the District/Regional Design Stormwater Coordinator.

7. Prepare cost estimate, including right-of-way, and identify any pertinent site specific determination of feasibility for selected Treatment BMPs and include in the SWDR for approval. ☐ Complete

Cost Estimates for Construction Site, DPP, and Treatment BMPs

Construction Site BMPs

The Project Initiation Cost Estimate Method, Appendix F.3.1, 2017 PPDG, was used to estimate construction site BMP costs for the Interim and Ultimate project alternatives. The PID phase cost estimate for construction site BMPs was estimated to be 1.00% of the escalated cost of roadway items as well as line items in Section 5A.

Alternative	Cost Estimate
Interim Project	
I1	$2,535,000
I2	$2,135,000
Ultimate Project	
U1	$12,250,000
U2	$7,110,000

DPP and Treatment BMPs

The Project Initiation Cost Estimate Method, Appendix F.3.1, 2017 PPDG, was not used to estimate DPP and treatment BMP costs for any of the alternatives, because the resulting estimates were evaluated to be too low based on site-specific environmental constraints. Thus, the cost of DPP and treatment BMPs for the Interim and Ultimate projects were estimated assuming the full PCTA would be treated off-site using a unit cost of $400,000 per acre. The following estimates do not include cost escalation or potential costs associated with right-of-way acquisition or drainage easements.

Alternative	Cost Estimate
Interim Project	
I1	$7,368,000
I2	$8,536,000
Ultimate Project	
U1	$30,588,000
U2	$29,632,000

Checklist SW-2, Stormwater Quality Issues Summary

Prepared by: WRECO Date: December 10, 2018 District-Co-Route: 04-Son-Sol-37

PM: Son 3.5/Sol R7.4 Project ID (or EA): 04-1Q760K RWQCB: San Francisco Bay (R2)

*To be updated during the PA/ED phase

The following questions provide a guide to collecting critical information relevant to project stormwater quality issues. Consult other Caltrans functional units (Environmental, Landscape Architecture, Maintenance, etc.) and the District/Regional Design Stormwater Coordinator as necessary. Summarize pertinent responses in Section 2 of the SWDR; do not discuss items identified as not applicable.

1. Determine the receiving waters for the project	☒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, as shown by DWP.	☒Complete	☐NA
4. Determine the RWQCB special requirements, including TMDLs, effluent limits, 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. Identify rainy season.	☒Complete	☐NA
8. If applicable, 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).	☐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 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
16. Determine if project area has any slope stabilization concerns.	☒Complete	☐NA
17. Describe the local land use within the project area and adjacent areas.	☒Complete	☐NA
18. Evaluate the presence of dry weather flow.	☐Complete	☒NA

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

Prepared by: WRECO Date: December 10, 2018 District-Co-Route: 04-Son-Sol-37

PM: Son 3.5/Sol R7.4 Project ID (or EA): 04-1Q760K RWQCB: San Francisco Bay (R2)

*To be updated during the PA/ED phase

The PE should 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; do not discuss items identified as not applicable.

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 stormwater 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 stormwater impacts?	☒Yes	☐No	☐NA

Design Pollution Prevention BMPs
Checklist DPP-1, Part 1

Prepared by: WRECO Date: December 10, 2018 District-Co-Route: 04-Son-Sol-37

PM: Son 3.5/Sol R7.4 Project ID (or EA): 04-1Q760K RWQCB: San Francisco Bay (R2)

Consideration of Design Pollution Prevention BMPs

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

Will the project increase velocity or volume of downstream flow?	☒Yes	☐No	☐NA
Will the project discharge to unlined channels?	☒Yes	☐No	☐NA
Will the 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 Checklist DPP-1, Part 2.

Slope/Surface Protection Systems

Will the 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 Checklist DPP-1, Part 3.

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 Checklist DPP-1, Part 4.

Preservation of Existing Vegetation, Soils, and Stream Buffer Areas

It is the goal of the Stormwater Program to maximize the protection of desirable existing vegetation, soils, and stream buffer areas to provide erosion and sediment control benefits on all projects. ☒Complete

Consider ***Preservation of Existing Vegetation, soils, and stream buffer areas***, complete the Checklist DPP-1, Part 5.

Design Pollution Prevention BMPs
Checklist DPP-1, Part 2

Prepared by: WRECO Date: December 10, 2018 District-Co-Route: 04-Son-Sol-37

PM: Son 3.5/Sol R7.4 Project ID (or EA): 04-1Q760K RWQCB: San Francisco Bay (R2)

*To be updated during the PA/ED phase

Downstream Effects Related to Potentially Increased Flow

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 construction limits as well as downstream. Consider scour velocity. If erosion control measures are required downstream of construction limits obtain the appropriate permits and right of way documents to include work within the construction limits.	☐ 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
6. Calculate the water quality volume infiltrated within the project limits. These calculations will be used in the Checklist T-1, Part 1.	☐ Complete

Design Pollution Prevention BMPs

Checklist DPP-1, Part 3

Prepared by: WRECO Date: December 10, 2018 District-Co-Route: 04-Son-Sol-37

PM: Son 3.5/Sol R7.4 Project ID (or EA): 04-1Q760K RWQCB: San Francisco Bay (R2)

*To be updated during the PA/ED phase

Slope / Surface Protection Systems

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 shorten slope length?	☐Yes	☐No
3.	Were concentrated flows collected in stabilized drains or channels?	☐Yes	☐No
4.	Are new or disturbed slopes > 4:1 horizontal:vertical (h:v)?	☐Yes	☐No
	If Yes, District Landscape Architect is responsible for an erosion control strategy and may prepare an erosion control plan.		
5.	Are new or disturbed slopes > 2:1 (h:v)?	☐Yes	☒No
	If Yes, DES Geotechnical Design unit 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 Stormwater Coordinator for slopes steeper than 2:1 (h:v).		

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.	Plan transition BMPs from construction to permanent establishment.	☐Complete	
5.	Have vegetated areas and supporting permanent irrigation systems been designed to comply with the Model Water Efficient Landscape Ordinance (MWELO)?	☐Yes	☐No
6.	Minimize overland and concentrated flow depths and velocities.	☐Complete	

HARD SURFACES

1.	Are hard surfaces minimized?	☒Yes	☐No
	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: December 10, 2018 District-Co-Route: 04-Son-Sol-37

PM: Son 3.5/Sol R7.4 Project ID (or EA): 04-1Q760K RWQCB: San Francisco Bay (R2)

*To be updated during the PA/ED phase

Concentrated Flow Conveyance Systems

Ditches, Berms, Dikes and Swales

1. Consider Ditches, Berms, Dikes, and Swales as per Topics 813, 834.3, 835, and Chapter 860 of the HDM. ☒Complete
2. Review existing and proposed conditions to remove any dike not required for slope stability, erosion control, and water conveyance. ☐Complete
3. Evaluate risks due to erosion, overtopping, flow backups or washout. ☐Complete
4. Consider outlet protection where localized scour is anticipated. ☐Complete
5. Examine the site for run-on from off-site sources. ☐Complete
6. Consider permissible shear and velocity when selecting lining material (See Table 865.2 in the HDM). ☐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: December 10, 2018 District-Co-Route: 04-Son-Sol-37

PM: Son 3.5/Sol R7.4 Project ID (or EA): 04-1Q760K RWQCB: San Francisco Bay (R2)

*To be updated during the PA/ED phase

Preservation of Existing Vegetation, Soils, and Stream Buffer Areas

1. Review Preservation of Property, (Clearing and Grubbing) to reduce clearing and grubbing and maximize preservation of existing vegetation, soils, and stream buffer areas. ☒Complete
2. Has all vegetation, soils, and stream buffer areas 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, soils, and stream buffer areas 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 2

Prepared by: WRECO Date: December 10, 2018 District-Co-Route: 04-Son-Sol-37

PM: Son 3.5/Sol R7.4 Project ID (or EA): 04-1Q760K RWQCB: San Francisco Bay (R2)

*To be updated during the PA/ED phase

Infiltration Devices

Feasibility

1. Does local Basin Plan or other local ordinance provide influent limits on quality of water that can be infiltrated, and would infiltration pose a threat to groundwater quality? ☐Yes ☒No
2. Does infiltration at the site compromise the integrity of any slopes in the area? ☐Yes ☐No
3. Is site located over a previously identified contaminated groundwater plume? ☐Yes ☐No

   If "Yes" to any question above, Infiltration Devices are not feasible; stop here and consider other approved Treatment BMPs.

4. At the invert, does the soil type classify as NRCS Hydrologic Soil Group (HSG) D, or does the soil have an infiltration rate < 0.5 inches/hr? ☐Yes ☐No

   If "Yes", the location can only be considered if vector control has been addressed (e.g., underground).

5. (a) Does site have groundwater within 5 ft of basin invert? ☐Yes ☐No

   (b) Does site investigation indicate that the infiltration rate is significantly greater than 2.5 inches/hr? ☐Yes ☐No

   If "Yes" to either part of Question 5, adequate groundwater information must be available or contact RWQCB for concurrence before approving the site for infiltration.

6. Does adequate area exist within the RW to place Infiltration Device(s)? ☐Yes ☐No
   If "Yes", continue to Design Elements sections. If "No", continue to Question 7.
7. If adequate area does not exist within RW, can suitable, additional RW be acquired to site Infiltration Devices and how much RW would be needed to treat WQV, or a portion thereof? _____ acres ☐Yes ☐No

   If Yes, continue to Design Elements section.

   If No, continue to Question 8.

8. If adequate area cannot be obtained, document in Section 6 of the SWDR that the inability to obtain adequate area prevents the incorporation of this Treatment BMP into the project. ☐Complete

Design Elements – Infiltration Basin

* **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 6 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 an investigation been conducted, including subsurface soil investigation, in-hole conductivity testing and groundwater elevation determination? (This report must be completed for PS&E level design.) *	☐Yes	☐No
2.	Has an upstream bypass or overflow spillway with scour protection been provided? *	☐Yes	☐No
3.	Is the Infiltration Basin size sufficient to capture the WQV, or portion thereof, with a maximum 96-hour drawdown time? Longer drawdown times may be allowable if vector controls have been implemented (e.g., underground chamber with flap gates) and coordinated with the District/Regional Design Stormwater Coordinator.*	☐Yes	☐No
4.	Can access be provided to the invert of the Infiltration Basin? *	☐Yes	☐No
5.	Can the Infiltration Basin accommodate the freeboard above the overflow event elevation (reference Appendix B.1.5.1)? *	☐Yes	☐No
6.	Can the Infiltration Basin be designed with interior side slopes no steeper than 4:1 (h:v) (may be 3:1 [h:v] with approval by District Maintenance)? *	☐Yes	☐No
7.	Can vegetation be established in an earthen basin at the invert and on the side slopes for erosion control and to minimize re-suspension? If No, consider rock or similar protective system. Note: Infiltration Basins may be lined, in which case no vegetation would be required for lined areas.**	☐Yes	☐No
8.	Can diversion be designed, constructed, and maintained to bypass flows exceeding the WQV? **	☐Yes	☐No
9.	Can a gravity-fed maintenance drain be placed? **	☐Yes	☐No

Design Elements – Infiltration Trench

1.	Has an investigation been conducted, including subsurface soil investigation, in-hole conductivity testing and groundwater elevation determination? (This report must be completed for PS&E level design.) *	☐Yes	☐No
2.	Is the surrounding soil within Hydrologic Soil Groups (HSG) Types A, B, and C while preserving an acceptable infiltration rate? *	☐Yes	☐No
3.	Is the Infiltration Trench size sufficient to capture the WQV, or portion thereof, with a maximum 96-hour drawdown time? Longer drawdown times may be allowable, coordinate with the District/Regional Design Stormwater Coordinator.*	☐Yes	☐No
4.	Is the depth of the Infiltration Trench ≤ 13 ft? *	☐Yes	☐No
5.	Can an observation well be placed in the trench? **	☐Yes	☐No
6.	Can access be provided to the Infiltration Trench? *	☐Yes	☐No
7.	Can pretreatment be provided to capture sediment in the runoff (such as using vegetation or a flow splitter with a sump)? **	☐Yes	☐No
8.	Can flow diversion be designed, constructed, and maintained to bypass flows exceeding the Water Quality event? **	☐Yes	☐No
9.	Does a perimeter curb or similar device need to be provided (to limit wheel loads upon the trench)? **	☐Yes	☐No

Treatment BMPs

Checklist T-1, Part 3

Prepared by: WRECO Date: December 10, 2018 District-Co-Route: 04-Son-Sol-37

PM: Son 3.5/Sol R7.4 Project ID (or EA): 04-1Q760K RWQCB: San Francisco Bay (R2)

*To be updated during the PA/ED phase

Biofiltration Swales / Biofiltration Strips

Feasibility

1. Do the climate and site conditions allow vegetation to be established? ☒Yes ☐No
   If "No", evaluate other BMPs.
2. Can biofiltration swale be designed with a slope between 0.25 and 6 percent (with 1 to 2 percent preferred)? ☒Yes ☐No
   If "No", Biofiltration Swales are not feasible.
3. Can biofiltration strips be designed with a maximum slope of 2H:1V (with 4H:1V or flatter preferred)? ☒Yes ☐No
   If "No", Biofiltration Strips are not feasible.
4. Are Biofiltration device(s) proposed at sites where known contaminated soils exist? ☐Yes ☐No
   If "Yes", consult with District/Regional NPDES Coordinator about how to proceed.
5. Does adequate area exist within the RW to place Biofiltration device(s)? ☐Yes ☐No
   If "Yes", continue to Design Elements section. If "No", continue to Question 6.
6. If adequate area does not exist within RW, can suitable, additional RW be acquired to site Biofiltration devices and how much RW would be needed to treat WQF? ☐Yes ☐No
   _____ acres
   If "Yes", continue to Design Elements section. If "No", continue to Question 7.
7. If adequate area cannot be obtained, document in Section 6 of the SWDR that the inability to obtain adequate area prevents the incorporation of these Treatment BMPs into the project. ☐Complete

Design Elements

* **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 6 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)	☐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.4.3)*	☐Yes	☐No
4.	Is the maximum length of a biofiltration strip ≤ 100 ft? Strips > 100 ft. may still be considered as long as potential erosion issues have been addressed. **	☐Yes	☐No
5.	Has the minimum width (perpendicular to flow) of the invert of the biofiltration swale received the concurrence of District 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.	Has the infiltration rate of the bio-filtration device been calculated and maximized through amendments where appropriate?**	☐Yes	☐No
8.	Have Biofiltration Systems been considered for locations upstream of other Treatment BMPs, as part of a treatment train or pretreatment? ** If "Yes", document the amount of runoff treated (WQV/WQF).	☐Yes	☐No
9.	Has the lining material been selected based on the permissible shear and velocity (refer to HDM Chapter 860 and Table 865.2)?*	☐Yes	☐No

Treatment BMPs

Checklist T-1, Part 4

Prepared by: WRECO Date: December 10, 2018 District-Co-Route: 04-Son-Sol-37

PM: Son 3.5/Sol R7.4 Project ID (or EA): 04-1Q760K RWQCB: San Francisco Bay (R2)

*To be updated during the PA/ED phase

Detention Devices

Feasibility

1. Is there sufficient head to prevent objectionable backwater conditions in the upstream drainage systems? ☐Yes ☐No

2. Is basin invert ≥ 5 ft above seasonally high groundwater or can it be designed with an impermeable liner? (Note: If an impermeable liner is used, the seasonally high groundwater elevation must not encroach within 12 inches of the invert.) ☐Yes ☐No

   If No to any question above, then Detention Devices are not feasible.

3. If the Detention Device is being used to capture traction sand, is the total volume of the device at least equal to the WQV designed to be treated plus the anticipated volume of traction sand, while maintaining a minimum 12-inch freeboard (1 ft)? ☐Yes ☐No

   If No, then Detention Devices are not feasible.

4. Does adequate area exist within the RW to place Detention Device? ☐Yes ☐No

   If Yes, continue to the Design Elements section. If No, continue to Question 5.

5. If adequate area does not exist within RW, can suitable, additional RW be acquired to site Detention Device and how much RW would be needed to treat WQV? _____ acres ☐Yes ☐No

   If Yes, continue to the Design Elements section. If No, continue to Question 6.

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

Design Elements

* **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 6 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 location of the Detention Device been evaluated for any effects to the adjacent roadway and subgrade? *	☐Yes	☐No
2.	Can a minimum freeboard of 12 inches be provided above the overflow event elevation? *	☐Yes	☐No
3.	Is an upstream bypass or overflow outlet provided? *	☐Yes	☐No
4.	Is the drawdown time of the Detention Device a maximum of 96 hours? *	☐Yes	☐No
5.	Is the basin outlet designed to minimize clogging (minimum outlet orifice diameter of 0.5 inches)? *	☐Yes	☐No
6.	Are the inlet and outlet structures designed to prevent scour and re-suspension of settled materials, and to enhance quiescent conditions? *	☐Yes	☐No
7.	Can vegetation be established in an earthen basin at the invert and on the side slopes for erosion control and to minimize re-suspension? Otherwise include rock or similar protective system. Note: Detention Basins may be lined, in which case no vegetation would be required for lined areas.*	☐Yes	☐No
8.	Has sufficient access for maintenance been provided? *	☐Yes	☐No
9.	Is the side slope 4:1 (h:v) or flatter for interior slopes? ** (Note: Side slopes up to 3:1 (h:v) allowed with approval by District Maintenance.)	☐Yes	☐No
10.	If significant sediment is expected from nearby slopes, can the Detention Device be designed with additional volume equal to the expected annual loading? **	☐Yes	☐No
11.	Is flow path as long as possible (> 2:1 length to width ratio at WQV elevation is recommended)? **	☐Yes	☐No

Treatment BMPs

Checklist T-1, Part 5

Prepared by: WRECO Date: December 10, 2018 District-Co-Route: 04-Son-Sol-37

PM: Son 3.5/Sol R7.4 Project ID (or EA): 04-1Q760K RWQCB: San Francisco Bay (R2)

Traction Sand Traps

Feasibility

1. Can a Detention Device be sized to capture the estimated traction sand and the WQV, or portion thereof, from the tributary area? ☐Yes ☐No
   If Yes, then a separate Traction Sand Trap may not be necessary. Coordinate with the District/Regional Design Stormwater Coordinator and also complete Checklist T-1, Part 5.

2. Is the Traction Sand Trap proposed for a site where sand or other traction enhancing substances are applied to the roadway at least twice per year? ☐Yes ☒No

3. Is adequate space provided for maintenance staff and equipment access for annual cleanout? ☐Yes ☐No

If the answer to any one of Questions 2 or 3 is No, then a Traction Sand Trap is not feasible.

4. Does adequate area exist within the RW to place Traction Sand Traps? ☐Yes ☐No
   If Yes, continue to Design Elements section. If No, continue to Question 5.

5. If adequate area does not exist within RW, can suitable, additional RW be acquired to site Traction Sand Traps and how much RW would be needed? ☐Yes ☐No
   _____ acres
   If Yes, continue to the Design Elements section. If No, continue to Question 6.

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

Design Elements

* **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. Was the local Caltrans Maintenance Station contacted to provide the amount of traction sand used annually at the location? *
   List application rate reported. _____ yd^3 ☐Yes ☐No

2. Does the Traction Sand Trap have enough volume to store settled sand over the winter (see Section 3.2 of *Caltrans TST Design Guidance*)? * ☐Yes ☐No

3. If the Traction Sand Trap has either an open bottom or weep holes, is the invert a minimum of 3 ft above seasonally high groundwater? * * ☐Yes ☐No

4. Is the maximum depth of the storage within 10 ft of the ground surface, or another depth as required by District Maintenance? * (Inlet or vault type) ☐Yes ☐No

5. Can peak flow be diverted around the device? ** (Inlet or vault type) ☐Yes ☐No

6. Is a 6-inch separation provided between the top of the captured traction sand and the outlet from the device, in order to minimize re-suspension of the solids? ** (Inlet or vault type) ☐Yes ☐No

Treatment BMPs

Checklist T-1, Part 6

Prepared by: WRECO Date: December 10, 2018 District-Co-Route: 04-Son-Sol-37

PM: Son 3.5/Sol R7.4 Project ID (or EA): 04-1Q760K RWQCB: San Francisco Bay (R2)

Dry Weather Flow Diversion

Feasibility

1.	Is a Dry-Weather Flow Diversion acceptable to a Publicly Owned Treatment Works (POTW)?	☐Yes	☐No
2.	Would a connection require ordinary (i.e., not extraordinary) plumbing, features or construction methods to implement?	☐Yes	☒No
	If "No" to either question above, Dry Weather Flow Diversion is not feasible.		
3.	Does adequate area exist within the RW to place Dry Weather Flow Diversion devices? If "Yes", continue to Design Elements sections. If "No", continue to Question 4.	☐Yes	☐No
4.	If adequate area does not exist within RW, can suitable, additional RW be acquired to site Dry Weather Flow Diversion devices and how much RW would be needed? _____ (acres) If "Yes", continue to the Design Elements section. If "No", continue to Question 5.	☐Yes	☐No
5.	If adequate area cannot be obtained, document in Section 6 of the SWDR that the inability to obtain adequate area prevents the incorporation of this Treatment BMP into the project.	☐Complete	

Design Elements

* **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 6 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.	Does the existing sanitary sewer pipeline have adequate capacity to accept project dry weather flows, or can an upgrade be implemented to handle the anticipated dry weather flows within the project's budget and objectives? *	☐Yes	☐No
2.	Can the connection be designed to allow for maintenance vehicle access? *	☐Yes	☐No
3.	Can gate, weir, or valve be designed to stop diversion during storm events? *	☐Yes	☐No
4.	Can the inlet be designed to reduce chances of clogging the diversion pipe or channel? *	☐Yes	☐No
5.	Can a back flow prevention device be designed to prevent sanitary sewage from entering storm drain? *	☐Yes	☐No

Treatment BMPs

Checklist T-1, Part 7

Prepared by: WRECO Date: December 10, 2018 District-Co-Route: 04-Son-Sol-37

PM: Son 3.5/Sol R7.4 Project ID (or EA): 04-1Q760K RWQCB: San Francisco Bay (R2)

*To be updated during the PA/ED phase

Gross Solids Removal Devices (GSRDs)

Feasibility

1.	Is the receiving water body downstream of the tributary area to the proposed GSRD on a 303(d) list or has a TMDL for litter been established?	☒Yes	☐No
2.	Are the devices sized for flows generated by the peak drainage facility design event (1-year, 1-hour) or can peak flow be diverted?	☐Yes	☐No
3.	Are the devices sized to contain gross solids (litter and vegetation) for a period of one year?	☐Yes	☐No
4.	Is there sufficient access for maintenance and large equipment (vacuum truck)?	☐Yes	☐No

If "No" to any question above, then Gross Solids Removal Devices are not feasible. Note that Biofiltration Systems, Infiltration Devices, Detention Devices, Dry Weather Flow Diversion, and Media Filters may be considered for litter capture, but consult with District/Regional NPDES Coordinator if proposed to meet a TMDL for litter.

5.	Does adequate area exist within the RW to place Gross Solids Removal Devices? If "Yes", continue to Design Elements section. If "No", continue to Question 6.	☐Yes	☐No
6.	If adequate area does not exist within RW, can suitable, additional RW be acquired to site Gross Solids Removal Devices and how much RW would be needed? _____ acres If "Yes", continue to Design Elements section. If "No", continue to Question 7.	☐Yes	☐No
7.	If adequate area cannot be obtained, document in Section 6 of the SWDR that the inability to obtain adequate area prevents the incorporation of this Treatment BMP into the project.	☐Complete	

Design Elements – Linear Radial Device

* **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 6 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. Does sufficient hydraulic head exist to place the Linear Radial GSRD? * ☐Yes ☐No
2. Is a fiberglass reinforced plastic frame and grate being considered for high vandalism areas? Consult District Maintenance. ** ☐Yes ☐No
3. Was the litter accumulation rate of 10 ft^3/ac/yr (or a different rate recommended by District Maintenance) used to size the device? * ☐Yes ☐No
4. Was the overflow release device sized for the design storm event?* ☐Yes ☐No
5. Were the standard detail sheets used for the layout of the devices? ** ☐Yes ☐No
   If No, consult with OHSD and District/Regional Design Stormwater Coordinator.
6. Is the maximum depth of the storage within 10 ft of the ground surface, or another depth as required by District Maintenance? * ☐Yes ☐No

Design Elements – Inclined Screen

* **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 6 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. Does sufficient hydraulic head exist to place the Inclined Screen GSRD? * ☐Yes ☐No
2. Was the litter accumulation rate of 10 ft^3/ac/yr (or a different rate recommended by District Maintenance) used to size the device? * ☐Yes ☐No
3. Is a fiberglass reinforced plastic frame and grate being considered for high vandalism areas? Consult District Maintenance. ** ☐Yes ☐No
4. Was the overflow release device sized for the design storm event?* ☐Yes ☐No
5. Were the standard details sheets used for the layout of the devices? ** ☐Yes ☐No
   If No, consult with OHSD and District/Regional Design Stormwater Coordinator.
6. Is the maximum depth of the storage within 10 ft of the ground surface, or another depth as required by District Maintenance? * ☐Yes ☐No

Treatment BMPs

Checklist T-1, Part 8

Prepared by: WRECO Date: December 10, 2018 District-Co-Route: 04-Son-Sol-37

PM: Son 3.5/Sol R7.4 Project ID (or EA): 04-1Q760K RWQCB: San Francisco Bay (R2)

*To be updated during the PA/ED phase

Media Filters

Caltrans has approved two types of Media Filters: Austin Sand Filter and Delaware Filter. An Austin Sand filter is typically designed for a larger contributing drainage area, while a Delaware Filter is typically designed for a smaller contributing drainage area. The Austin Sand Filter is constructed with an open top and may have a concrete or earthen invert, while the Delaware is always constructed as a vault.

Feasibility – Austin Sand Filter

1. Is the volume of the Austin Sand Filter equal to the WQV, or portion thereof, using a 24-hour drawdown? [1] ☐Yes ☐No
2. Is there sufficient hydraulic head to operate the device (minimum 2 ft between the inflow and outflow chambers)? ☐Yes ☐No
3. If device has an earthen bottom, is the invert ≥ 5 ft above seasonally high groundwater? ☐Yes ☐No
4. If a vault is used for either chamber, is the level of the concrete base of the vault above seasonally high groundwater or is a special design provided? ☐Yes ☐No
   If No to any question above, then an Austin Sand Filter is not feasible.
5. Does adequate area exist within the RW to place an Austin Sand Filter? ☐Yes ☐No
   If Yes, continue to Design Elements sections. If No, continue to Question 6.
6. If adequate area does not exist within RW, can suitable, additional RW be acquired to site the device and how much RW would be needed to treat WQV, or portion thereof? _____ acres ☐Yes ☐No
   If Yes, continue to the Design Elements section.
   If No, continue to Question 7.
7. If adequate area cannot be obtained, document in Section 6 of the SWDR that the inability to obtain adequate area prevents the incorporation of this Treatment BMP into the project. ☐Complete

   If an Austin Sand Filter meets these feasibility requirements, continue to the Design Elements – Austin Sand Filter below.

[1]*Longer drawdown times being considered. Refer to the Austin Media Filter Design Guidance.*

Feasibility- Delaware Filter

1.	Is the volume of the Delaware Filter equal to the WQV, or portion thereof, using a 40 to 48-hour drawdown? [1]	☐Yes	☐No
2.	Is there sufficient hydraulic head to operate the device (minimum 2 ft between the inflow and outflow chambers)?	☐Yes	☐No
3.	Would a permanent pool of water be allowed by the local vector control agency? Confirm that check valves and vector proof lid as shown on standard detail sheets will be allowed, and used.	☐Yes	☒No
4.	Does the project discharge to a water body that has been placed on the 303(d) or has had a TMDL adopted for bacteria, mercury, sulfides, or low dissolved oxygen? If Yes, contact the District/Regional NPDES Coordinator to determine if standing water in this Treatment BMP would be a risk to downstream water quality. If standing water is a potential issue, consider use of another Treatment BMP. If No to any question, then a Delaware Filter is not feasible	☒Yes	☐No
5.	Does adequate area exist within the RW to place a Delaware Filter? If Yes, continue to Design Elements section. If No, continue to Question 6.	☐Yes	☐No
6.	If adequate area does not exist within RW, can suitable, additional RW be acquired to site the device and how much RW would be needed to treat WQV, or portion thereof? _____ acres If Yes, continue to the Design Elements section. If No, continue to Question 7.	☐Yes	☐No
7.	If adequate area cannot be obtained, document in Section 6 of the SWDR that the inability to obtain adequate area prevents the incorporation of this Treatment BMP into the project.	☐Complete	

[1]*Longer drawdown times being considered. Refer to the Delaware Media Filter Design Guidance.*

Design Elements – Austin Sand Filter

* **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 6 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.	Is the drawdown time of the device 24 hours? (Longer drawdown times being considered, refer to the *Austin Media Filter Design Guidance*)*	☐Yes	☐No
2.	Is access for maintenance vehicles provided to the Austin Sand Filter? *	☐Yes	☐No
3.	Is a bypass/overflow provided for storms > WQV? *	☐Yes	☐No
4.	Is the flow path length to width ratio for the sedimentation chamber of the "full" Austin Sand Filter ≥ 2:1? **	☐Yes	☐No
5.	Can pretreatment be provided to capture sediment and litter in the runoff (such as using vegetation)? **	☐Yes	☐No
6.	Can the Austin Sand Filter be placed using an earthen configuration? ** If No, go to Question 10.	☐Yes	☐No
7.	Is the Austin Sand Filter invert separated from the seasonally high groundwater table by ≥ 5 ft)? * (If AVSF, see Table B-8 3rd bullet in Application/Siting column.) If No, design with an impermeable liner.	☐Yes	☐No
8.	Are side slopes of the earthen chamber 3:1 (h:v) or flatter? *	☐Yes	☐No
9.	Can vegetation be established at the invert and on the side slopes for erosion control and to minimize re-suspension? If No, include rock or similar protective system. Note: Austin Sand Filters may be lined, in which case no vegetation would be required for lined areas.*	☐Yes	☐No
10.	Is maximum depth of sedimentation chamber ≤ 13 ft below ground surface? * If greater than 13 feet, a special design is required.	☐Yes	☐No
11.	Can the Austin Sand Filter be placed in an offline configuration? ** If No, go to Question 12.	☐Yes	☐No
12.	Is the flow line elevation of the over flow pipe set at the same elevation as the top of gabion wall elevation? ** Typically, the flow line should match the top of gabion wall elevation. However, the pipe may require adjustment to fit site condition requirements such as grading and pipe cover conflicts and utility conflicts. Additional overflow designs may be considered (see the *Partial Sedimentation Austin Vault Sand Filter Design Guidance*).	☐Yes	☐No

Design Elements – Delaware Filter

* **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 6 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.	Is the drawdown time of the device between 40 and 48 hours, typically 40-hrs? (Longer drawdown times being considered, refer to the *Delaware Media Filter Design Guidance)* *	☐Yes	☐No
2.	Is access for maintenance vehicles provided to the Delaware Filter? *	☐Yes	☐No
3.	Is a bypass/overflow provided for storms > WQV? *	☐Yes	☐No
4.	Can pretreatment be provided to capture sediment and litter in the runoff (such as using vegetation)? **	☐Yes	☐No
5.	Is maximum depth of sedimentation chamber ≤ 13 ft below ground surface? *	☐Yes	☐No

Treatment BMPs

Checklist T-1, Part 11

Prepared by: WRECO Date: December 10, 2018 District-Co-Route: 04-Son-Sol-37

PM: Son 3.5/Sol R7.4 Project ID (or EA): 04-1Q760K RWQCB: San Francisco Bay (R2)

*To be updated during the PA/ED phase

DPP Infiltration Areas

Feasibility[1]

1. Does local Basin Plan or other local ordinance provide influent limits on quality of water that can be infiltrated, and would infiltration pose a threat to groundwater quality? ☐Yes ☒No
2. Does infiltration at the site compromise the integrity of any slopes in the area? ☐Yes ☐No

   If "Yes" to any question above, DPP Infiltration Areas are not feasible; stop here and consider other approved Treatment BMPs.
3. Are DPP Infiltration Areas 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. If adequate area cannot be obtained, document in Section 6 of the SWDR that the inability to obtain adequate area prevents the incorporation of these Treatment BMPs into the project. ☐Complete

Design Elements

* **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 6 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 native soil gradation and infiltration rate been determined (see Design Guidance for more detail)? (Must be completed for PS&E level design.) * ☐Yes ☐No
2. Has the infiltration rate of the DPP Infiltration Area been calculated and maximized through amendments where appropriate? ** ☐Yes ☐No
3. Is the DPP Infiltration Area capacity sufficient to capture the WQV, or portion thereof? ** ☐Yes ☐No

   If "No", document the percentage and amount of the WQV captured. ☐ Complete
4. Is a surface reinforcing material required? ☐Yes ☐No

   If "Yes", select material based on the permissible shear and velocity (refer to HDM Chapter 860 and Table 865.2).* ☐ Complete

[1] *This feasibility evaluation is applicable to areas that are being modified for infiltration as part of the project treatment strategy. For existing areas within the project limits that are being delineated as DPP Infiltration Areas, proceed to the Design Elements section.*

DATE: _December 2018_____

Project ID / EA: _04-1Q760K_____

Project Evaluation Process for the Consideration of Construction Site BMPs

No.	Criteria	Yes ✓	No ✓	Supplemental Information
1.	Will construction of the project result in areas of disturbed soil as defined by the Project Planning and Design Guide (PPDG)?	✓		If Yes, Construction Site BMPs for Soil Stabilization (SS) will be required. Review CS-1, Part 1. Continue to 2. If No, Continue to 3.
2.	Is there a potential for disturbed soil areas within the project to discharge to storm drain inlets, drainage ditches, areas outside the RW, etc.?	✓		If Yes, Construction Site BMPs for Sediment Control (SC) will be required. Review CS-1, Part 2. Continue to 3.
3.	Is there a potential for sediment or construction related materials and wastes to be tracked offsite and deposited on private or public paved roads by construction vehicles and equipment?	✓		If Yes, Construction Site BMPs for Tracking Control (TC) will be required. Review CS-1, Part 3. Continue to 4.
4.	Is there a potential for wind to transport soil and dust offsite during the period of construction?	✓		If Yes, Construction Site BMPs for Wind Erosion Control (WE) will be required. Review CS-1, Part 4. Continue to 5.
5.	Is dewatering anticipated or will construction activities occur within or adjacent to a live channel or stream?	✓		If Yes, Construction Site BMPs for Non-Stormwater Management (NS) will be required. Review CS-1, Part 5. Continue to 6.
6.	Will construction include saw-cutting, grinding, drilling, concrete or mortar mixing, hydro-demolition, blasting, sandblasting, painting, paving, or other activities that produce residues?	✓		If Yes, Construction Site BMPs for Non-Stormwater Management (NS) will be required. Review CS-1, Parts 5 & 6. Continue to 7.
7.	Are stockpiles of soil, construction related materials, and/or wastes anticipated?	✓		If Yes, Construction Site BMPs for Waste Management and Materials Pollution Control (WM) will be required. Review CS-1, Part 6. Continue to 8.
8.	Is there a potential for construction related materials and wastes to have direct contact with stormwater; be dispersed by wind; be dumped and/or spilled into storm drain systems?	✓		If Yes, Construction Site BMPs for Waste Management and Materials Pollution Control (WM) will be required. Review CS-1, Part 6.

Construction Site BMPs

Checklist CS-1, Part 1

Prepared by: WRECO Date: December 10, 2018 District-Co-Route: 04-Son-Sol-37

PM: Son 3.5/Sol R7.4 Project ID (or EA): 04-1Q760K RWQCB: San Francisco Bay (R2)

*To be updated during the PA/ED phase

Temporary Soil Stabilization

General Parameters

1. How many rainy seasons are anticipated between begin and end of construction? — **Interim**: 2, **Ultimate**: 5

2. What is the total disturbed soil area for the project? (ac) — **I1:** 28.4, **I2**: 28.2, **U1:** 248.7, **U2**: 169.6

3. Consult your District/Regional Design Stormwater Coordinator for the minimum required combination of temporary soil stabilization and temporary sediment controls and barriers for area, slope inclinations, rainy and non-rainy season, and active and non-active disturbed soil areas. — ☐ Complete

Scheduling

4. Does the project have a duration of more than one rainy season and have disturbed soil area in excess of 25 acres? — ☒ Yes ☐ No

   (a) Include multiple mobilizations (Move-in/Move-out) as a separate contract bid line item to implement permanent erosion control or revegetation work on slopes that are substantially complete. (Estimate at least 6 mobilizations for each additional rainy season. Designated Construction Representative may suggest an alternate number of mobilizations.) — ☐ Complete

   (b) Edit specifications for permanent erosion control or revegetation work to be implemented on slopes that are substantially complete. — ☐ Complete

   (c) Edit permanent erosion control or revegetation specifications to require seeding and planting work to be performed when optimal. — ☐ Complete

Preservation of Existing Vegetation

5. Do Environmentally Sensitive Areas (ESAs) exist within or adjacent to the construction limits? (Verify the completion of DPP-1, Part 5) — ☒ Yes ☐ No

   (a) Verify the protection of ESAs through delineation on all project plans. — ☐ Complete

(b) Protect from clearing and grubbing and other construction disturbance by enclosing the ESA perimeter with high visibility plastic fence or other BMP. ☐Complete

6. Are there areas of existing vegetation (mature trees, native vegetation, landscape planting, etc.) that need not be disturbed by project construction? Will areas designated for proposed or existing Treatment BMPs need protection (infiltration characteristics, vegetative cover, etc.)? (Coordinate with District Environmental and Construction to determine limits of work necessary to preserve existing vegetation to the maximum extent practicable.) ☒Yes ☐No

(a) Designate as outside of limits of work (or designate as ESAs) and show on all project plans. ☐Complete

(b) Protect with high visibility plastic fence or other BMP. ☐Complete

7. If yes for 5, 6, or both, then designate ESA fencing as a separate contract bid line item, *if not already incorporated as part of design pollution prevention work (See DPP-1, Part 5).* ☐Complete

Slope Protection

8. Provide a temporary soil stabilization BMP(s) appropriate for the DSA, slope steepness, slope length, and soil erodibility. (Consult with District Landscape Architect.)

(a) Select Hydraulic Mulch, Hydroseeding, Soil Binders, Straw Mulch, Geotextiles, Mats, Plastic Covers, and Erosion Control Blankets, Wood Mulching, other BMPs or a combination to cover the DSA throughout the project's rainy season. ☒Complete

(b) Increase the quantities by 25 percent for each additional rainy season. (Designated Construction Representative may suggest an alternate increase.) ☐Complete

(c) Designate as a separate contract bid line item. ☐Complete

Slope Interrupter Devices

9. For projects with temporary erosion control requirements, provide slope interrupter devices for all slopes with slope lengths equal to or greater than of 20 ft in length, in accordance with CGP requirements.

(a) Select Fiber Rolls or other BMPs to protect slopes throughout the project's rainy season. ☒Complete

(b) For slope inclination of 4:1 (h:v) and flatter, Fiber Rolls or other BMPs shall be placed along the contour and spaced 20 ft on center. ☒Complete

(c) For slope inclination between 4:1 (h:v) and 2:1 (h:v), Fiber Rolls or other BMPs shall be placed along the contour and spaced 15 ft on center. ☒Complete

(d) For slope inclination of 2:1 (h:v) and greater, Fiber Rolls or other BMPs shall be placed along the contour and spaced 10 ft on center. ☒Complete

(e) Increase the quantities by 25 percent for each additional rainy season. (Designated Construction Representative may suggest alternate increase.) ☐Complete

(f) Designate as a separate contract bid line item. ☐Complete

Channelized Flow

10. Identify locations within the project site where concentrated flow from stormwater runoff can erode areas of soil disturbance. Identify locations of concentrated flow that enters the site from outside of the RW (off-site run-on). ☐Complete

(a) Utilize Geotextiles, Mats, Plastic Covers, and Erosion Control Blankets, Earth Dikes/Swales, Ditches, Outlet Protection/Velocity Dissipation, Slope Drains, Check Dams, or other BMPs to convey concentrated flows in a non-erosive manner. ☐Complete

(b) Designate as a separate contract bid line item, as appropriate. ☐Complete

Construction Site BMPs

Checklist CS-1, Part 2

Prepared by: WRECO Date: December 10, 2018 District-Co-Route: 04-Son-Sol-37

PM: Son 3.5/Sol R7.4 Project ID (or EA): 04-1Q760K RWQCB: San Francisco Bay (R2)

*To be updated during the PA/ED phase

Sediment Control

Perimeter Controls - Run-off Control

1. Is there a potential for sediment laden sheet and concentrated flows to discharge offsite from runoff cleared and grubbed areas, below cut slopes, embankment slopes, etc.? ☒Yes ☐No

   (a) Select linear sediment barrier such as Silt Fence, Fiber Rolls, Gravel Bag Berm, Sand Bag Barrier, Straw Bale Barrier, or a combination to protect wetlands, water courses, roads (paved and unpaved), construction activities, and adjacent properties. (Coordinate with District Construction for selection and preference of linear sediment barrier BMPs.) ☒Complete

   (b) Increase the quantities by 25 percent for each additional rainy season. (Designated Construction Representative may suggest an alternate increase.) ☐Complete

   (c) Designate as a separate contract bid line item. ☐Complete

Perimeter Controls - Run-on Control

2. Do locations exist where sheet flow upslope of the project site and where concentrated flow upstream of the project site may contact DSA and construction activities? ☒Yes ☐No

   (a) Utilize linear sediment barriers such as Earth Dike/Drainage Swales and Lined Ditches, Fiber Rolls, Gravel Bag Berm, Sand Bag Barrier, Straw Bale Barrier, or other BMPs to convey flows through and/or around the project site. (Coordinate with District Construction for selection and preference of perimeter control BMPs.) ☒Complete

   (b) Designate as a separate contract bid line item, as appropriate. ☐Complete

Storm Drain Inlets

3. Do existing or proposed drainage inlets exist within the construction limits? ☒Yes ☐No

   (a) Select Drainage Inlet Protection to protect municipal storm drain systems or receiving waters wetlands at each drainage inlet. (Coordinate with District Construction for selection and preference of inlet protection BMPs.) ☒Complete

   (b) Designate as a separate contract bid line item. ☐Complete

4. Can existing or proposed drainage inlets utilize an excavated sediment trap as described in Drainage Inlet Protection - Type 2? ☐Yes ☐No

   (a) Include with other types of Drainage Inlet Protection. ☐Complete

Sediment/Desilting Basin

5. Does the project lie within a Rainfall Area where the required combination of temporary soil stabilization and sediment control BMPs includes desilting basins? ☐Yes ☒No

   (a) Consider feasibility for desilting basin allowing for available right-of-way within the construction limits, topography, soil type, disturbed soil area within the watershed, and climate conditions. Document if the inclusion of sediment/desilting basins is infeasible. ☐Complete

   (b) If feasible, design desilting basin(s) per the guidance in the *CASQA Construction BMP Guidance Handbook* to maximize capture of sediment-laden runoff. ☐Complete

   (c) Designate as a separate contract bid item ☐Complete

6. Is ATS to be used for controlling sediment? ☐Yes ☒No

   (a) If yes, then will desilting basin or other means of natural storage be used? ☐Yes ☐No

   (b) If no, then plan for storage tanks sufficient to hold treatment volume. ☐Complete

7. Will the project benefit from the early implementation of proposed permanent Treatment BMPs? (Coordinate with District Construction.) ☐Yes ☐No

   (a) Edit specifications for permanent Treatment BMP work to be implemented in a manner that will allow its use as a Construction Site BMP. ☐Complete

Sediment Trap

8. Can sediment traps be located to collect channelized runoff from disturbed soil areas prior to discharge? ☐Yes ☒No

   (a) Design sediment traps in accordance with the *CASQA Construction BMP Guidance Handbook*. ☐Complete

   (b) Designate as a separate contract bid line item. ☐Complete

Construction Site BMPs

Checklist CS-1, Part 3

Prepared by: WRECO Date: December 10, 2018 District-Co-Route: 04-Son-Sol-37

PM: Son 3.5/Sol R7.4 Project ID (or EA): 04-1Q760K RWQCB: San Francisco Bay (R2)

*To be updated during the PA/ED phase

Tracking Controls

Stabilized Construction Entrance/Exit

1. Are there points of entrance and exit from the project site to paved roads where mud and dirt could be transported offsite by construction equipment? (Coordinate with District Construction for selection and preference of tracking control BMPs.) ☒Yes ☐No

   (a) Identify and designate these entrance/exit points as stabilized construction entrances. ☐Complete

   (b) Designate as a separate contract bid line item. ☐Complete

Tire/Wheel Wash

2. Are site conditions anticipated that would require additional or modified tracking controls such as entrance/outlet tire wash? (Coordinate with District Construction.) ☐Yes ☐No

   (a) Designate as a separate contract bid line item. ☐Complete

Stabilized Construction Roadway

3. Are temporary access roads necessary to access remote construction activity locations or to transport materials and equipment? (In addition to controlling dust and sediment tracking, access roads limit impact to sensitive areas by limiting ingress, and provide enhanced bearing capacity.) (Coordinate with District Construction.) ☐Yes ☐No

   (a) Designate these temporary access roads as stabilized construction roadways. ☐Complete

   (b) Designate as a separate contract bid line item. ☐Complete

Street Sweeping and Vacuuming

4. Is there a potential for tracked sediment or construction related residues to be transported offsite and deposited on public or private roads? (Coordinate with District Construction for preference of including street sweeping and vacuuming with tracking control BMPs.) ☒Yes ☐No

   (a) Designate as a separate contract bid line item. ☐Complete

Construction Site BMPs

Checklist CS-1, Part 4

Prepared by: WRECO Date: December 10, 2018 District-Co-Route: 04-Son-Sol-37

PM: Son 3.5/Sol R7.4 Project ID (or EA): 04-1Q760K RWQCB: San Francisco Bay (R2)

***To be updated during the PA/ED phase**

Wind Erosion Controls

Wind Erosion Control

1. Is the project located in an area where standard dust control practices in accordance with *Standard Specifications*, Section 14-903: Dust Control, are anticipated to be inadequate during construction to prevent the transport of dust offsite by wind? *(Note: Dust control by water truck application is paid for through the various items of work. Dust palliative, if it is included, is paid for as a separate item.)* ☒Yes ☐No

   (a) Select Hydraulic Mulch, Hydroseeding, Soil Binders, Geotextiles, Mats, Plastic Covers, and Erosion Control Blankets, Wood Mulching or a combination to cover the DSA subject to wind erosion year-round, especially when significant wind and dry conditions are anticipated during project construction. (Coordinate with District Construction for selection and preference of wind erosion control BMPs.) ☒Complete

   (b) Designate as a separate contract bid line item. ☐Complete

Construction Site BMPs

Checklist CS-1, Part 5

Prepared by: WRECO Date: December 10, 2018 District-Co-Route: 04-Son-Sol-37

PM: Son 3.5/Sol R7.4 Project ID (or EA): 04-1Q760K RWQCB: San Francisco Bay (R2)

*To be updated during the PA/ED phase

Non-Stormwater Management

Temporary Stream Crossing & Clear Water Diversion

1. Will construction activities occur within a water body or watercourse such as a lake, wetland, or stream? (Coordinate with District Construction for selection and preference for stream crossing and clear water diversion BMPs.) ☒Yes ☐No

   (a) Select from types offered in Temporary Stream Crossing to provide access through watercourses consistent with permits and agreements.[1] ☐Complete

   (b) Select from types offered in Clear Water Diversion to divert watercourse consistent with permits and agreements.[1] ☐Complete

   (c) Designate as a separate contract bid line item(s). ☐Complete

Other Non-Stormwater Management BMPs

2. Are construction activities anticipated that will generate wastes or residues with the potential to discharge pollutants? ☒Yes ☐No

   (a) Identify potential pollutants associated with the anticipated construction activity and select the corresponding BMP such as Water Conservation Practices, Dewatering Operations, Paving and Grinding Operations, Potable Water/Irrigation, Vehicle and Equipment Cleaning, Vehicle and Equipment Fueling, Vehicle and Equipment Maintenance, Pile Driving Operations, Concrete Curing, Material and Equipment Use Over Water, Concrete Finishing, and Structure Demolition/Removal Over or Adjacent to Water.[1] ☐Complete

   (b) Verify that costs for non-stormwater management BMPs are identified in the contract documents. Designate BMP as a separate contract bid line item if the requirements in Job Site Management *Standard Specifications* Section 13 are anticipated to be inadequate or if requested by Construction. ☐Complete

[1] *Coordinate with District Environmental for consistency with US Army Corps of Engineers 404 and 401 permits and Dept. of Fish and Game 1601 Streambed alteration Agreements.*

Construction Site BMPs

Checklist CS-1, Part 6

Prepared by: WRECO Date: December 10, 2018 District-Co-Route: 04-Son-Sol-37

PM: Son 3.5/Sol R7.4 Project ID (or EA): 04-1Q760K RWQCB: San Francisco Bay (R2)

*To be updated during the PA/ED phase

Waste Management & Materials Pollution Control

Concrete Waste Management

1. Does the project include concrete placement or mortar mixing? ☒Yes ☐No

   (a) Select from types offered in Concrete Waste Management to provide concrete washout facilities. In addition, consider portable concrete washouts and vendor supplied concrete waste management services. (Coordinate with District Construction for selection and preference of waste management and materials pollution control BMPs.) ☐Complete

   (b) Designate as a separate contract bid line item if the quantity of concrete waste and washout are anticipated to exceed 5.2 yd^3 or if requested by Construction. ☐Complete

Other Waste Management and Materials Pollution Controls

2. Are construction activities anticipated that will generate wastes or residues with the potential to discharge pollutants? ☒Yes ☐No

   (a) Identify potential pollutants associated with the anticipated construction activity and select the corresponding BMP such as Material Delivery and Storage, Material Use, Spill Prevention and Control, Solid Waste Management, Hazardous Waste Management, Contaminated Soil Management, Sanitary/Septic Waste Management, and Liquid Waste Management ☐Complete

   (b) Verify that costs for waste management and materials pollution control BMPs are identified in the contract documents. Designate BMP as a separate contract bid line item if the requirements in Job Site Management *Standard Specifications* Section 13 are anticipated to be inadequate or if requested by Construction. ☐Complete

Temporary Stockpiles (Soil, Materials, and Wastes)

3. Are stockpiles of soil, etc. anticipated during construction? ☒Yes ☐No

   (a) Verify that costs for stockpile management and associated sediment control and temporary soil stabilization BMPs for temporary stockpiles are identified in the contract documents. Designate as a separate contract bid line item if the requirements in Job Site Management *Standard Specifications* Section 13 are anticipated to be inadequate or if requested by Construction. ☐Complete