



Dist-County-Route: 03-SAC-005
 Post Mile Limits: 9.5/22.7
 Project Type: SAC 5, HOV Lanes
 Project ID (or EA): 3C000
 Program Identification: Measure A
 Phase: PID
 PA/ED
 PS&E

Regional Water Quality Control Board(s): Central Valley

Is the Project required to consider Treatment BMPs? Yes No
 If yes, can Treatment BMPs be incorporated into the project? Yes No

If No, a Technical Data Report must be submitted to the RWQCB at least 30 days prior to the projects RTL date. List RTL Date: _____

Total Disturbed Soil Area: 36.77 acres Risk Level: 2
 Estimated: Construction Start Date: 4/15/28 Construction Completion Date: 10/15/33
 Notification of Construction (NOC) Date to be submitted: 3/15/28

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

Mohammad U Sadiq 5/15/11
 Mohammad U Sadiq, Registered Project Engineer/Landscape Architect Date

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

Jess Avila 5/15/11
 Jess Avila, Project Manager Date

Brian Toepfer 5/15/11
 Brian Toepfer, Designated Maintenance Representative Date

T. Chris Johnson 5/17/11
 T. Chris Johnson, Designated Landscape Architect Representative Date

Heath Hathaway 5/23/11
 Heath Hathaway, District/Regional Design SW Coordinator or Designee Date

[Stamp Required for PS&E only]

STORM WATER DATA INFORMATION

1. Project Description

- This project proposes to widen the Interstate 5 (I-5) to construct High Occupancy Vehicle (HOV) lanes to reduce congestion from 1.1 miles south of Elk Grove Blvd. to United States 50 (US 50) in Sacramento County (PM 9.5 to 22.7). Mainline structures will be widened at Land Park UP, Sutterville Road, Gloria Drive OC, South Land Park OC, Beach Lake Bridge and the Rte 5/160 Separation to accommodate the roadway widening. Casilada Pedestrian Over-Crossing (POC) will be replaced to meet the Americans with Disabilities Act (ADA) requirements. New soundwalls are proposed to mitigate freeway noise. The project will be funded through the Measure A Program in the 2014/15 Fiscal Year (FY).
- This project may include the following preliminary design features: road widening; bridge work; road cut/fill; grinding; equipment staging area; drainage/culvert work; ramp closures; right-of-way acquisition; temporary easements; utility relocation; ground disturbance; vegetation and/or tree removal; noise mitigation; pile driving; night work; and stream channel work.
- Most of the work will occur within state right of way (R/W). New right of way acquisition is not anticipated at this time. A temporary construction easement (TEC) will be required for the widening at Morrison Creek (Bridge Nos. 24-0262L, 24-0262R). A temporary bridge over this section of Morrison Creek may be necessary to move heavy equipment from one side of the project to the other. Although some additional TCE areas, as well as storage and staging areas, have been identified, others may be added as design progresses.
- There will be approximately 36.77 acres of ground disturbance as a result of this project. An additional 19.43 acres of impervious surface area will be added, which in increase of approximately 8% from existing condition.
- This project is within the City and County of Sacramento MS4 permit area.
- The total construction cost for the project is estimated to be approximately \$129,234 million. Construction is expected to begin in early 2028.

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

- The Central Valley Regional Water Quality Control Board has jurisdiction within the project limits.
- The project corridor begins in agricultural land that is being rapidly developed for commercial and residential purposes, and extends into the metropolitan Sacramento area. It contains many neighborhoods, schools, parks, and commercial facilities. Over 85 percent of the highway along the corridor is either cut or fill soils. The terrain is generally flat with intermittent vistas made available by increased elevations at bridges.

- The runoff in the area is conveyed in a series of drainage channels, where, according to the City of Sacramento Department of Utilities Engineering Supervisor, Andy Hunt, the majority is eliminated through infiltration. A small portion of the flow is directed to the City of Sacramento's Sump 90, located west of Interstate 5 and Morrison Creek, where it is pumped through the levee and into the Sacramento River. An analysis will need to be performed on the additional flows directed to this pump to determine if mitigation is necessary.
- The project area is located in the Hydrologic Unit Numbers 510.00 and 519.11. The runoff is conveyed in drainage channels to levees where is pumped into the Sacramento River in close proximity to Morrison Creek. The Delta Waterways (eastern portion) are 303(d) listed for Chlorpyrifos, DDT, Diazinon, Group A Pesticides, Mercury, and Unknown Toxicity. Potential sources for these are Agriculture, Urban Runoff/Storm Sewers, Resource Extraction (abandoned mines), and Sources Unknown. Morrison Creek is 303(d) listed for Diazinon with potential sources being Agriculture (aerial deposition) and Urban Runoff/Storm Sewers. None of the impairing constituents are Caltrans Targeted Design Constituents (TDC) and therefore only General Purpose Treatment Best Management Practices (BMPs) will be considered. The Water Quality Volume (WQV) depth is 0.64 inches as determined by using the Basin Sizer design tool with the Clarksburg, Sacramento AP, and Sacramento 5 ESE rain gauges. The Water Quality Flow (WQF) is 0.16 inches/hour.
- **Permits from the following agencies are anticipated (additional permits for material and disposal sites may be required):** U.S. Army Corps of Engineers (USACE) 404, Regional Water Quality Control Board (RWQCB) 401, California Department of Fish and Game (DFG) 1602 & 2081, USFWS formal consultation under Section 7 of the Federal Endangered Species Act, and NOAA Fisheries formal consultation under Section 7 of the Federal Endangered Species Act and for potential impacts to Essential Fish Habitat (EFH) pursuant to the Magnuson-Stevens Fishery Conservation and Management Act.
- **Describe RWQCB special requirements/concerns, including TMDLs or effluent limits:** None.
- **Describe local agency requirements/concerns:** Recent discussions with the City of Sacramento have confirmed I-5 is no longer within the 100-year FEMA floodplain and therefore concrete median barrier may be constructed. During a meeting with the Sacramento County on April 15, 2008, agreement was reached that the placement of concrete median barrier from the beginning of the project to the County limit would not create a significant impact on the 100-year flood plain if MBGR was placed between the leaves of the South Reach of Beach Lake. A copy of this amendment was sent to each of the contacts listed in the original FHS, along with the Pete Ghelfi, SAFCA Director of Engineering.
- **Describe project design considerations:**
Climate:
The rainy season has been defined by the RWQCB as October 15 to April 15. The climate is mild with temperatures ranging from lows in the upper 30s in January and

highs in the low 90s in July. The average precipitation ranges from 0.04 inches in July to 3.74 inches in January. Rainfall intensities based on the Sacramento City Rain Gauge are 0.73 inches/hour for a 10-year return and 1.03 inches/hour for a 100-year return period.

Soils:

The soil in the project vicinity is mainly Type D with a few areas of Type C. There will be fill slopes associated with the construction of this project and will be made as flat as possible, not exceeding 1:4. A review of Log of Test Borings for the Hood/Franklin Rd. O.C., Elk Grove Blvd. O.C., Beach Lake Bridge, Route 5/160 S.O.H., Florin Rd. O.C., and the Seamas Ave. U.C. show the ground water to be from 6.0 feet to 32.5 feet below OG.

- **Describe project risk level determination and identify project risk level:** The project risk level is 2 and it was determined with the worksheet that is attached.
 - **Identify if project involves reuse of soil containing Aerially Deposited Lead (ADL):** A Preliminary Site Investigation (PSI) will need to be performed during this PS&E phase to determine if aerially deposited lead (ADL) is present in the soil. If concentration of the lead in the soil exceeds the allowed threshold, the soil will need to be hauled to an appropriate disposal facility. If the need for further studies is revealed during the PSI, a Site Investigation (SI) will also be performed to do more in depth analysis within the projects limits.
 - **Identify Right-of-way costs for BMPs:** All work will be performed within the existing right-of-way. New right-of-way acquisition is not anticipated at this time. Temporary construction easements (TCE) will be required for the widening at Morrison Creek (Bridge Nos. 24-0262L and 24-0262R) and at the I-5/160 separation (Bridge Nos. 24-0296L and 24-0296R). Although some additional TCE areas, as well as storage and staging areas, have been identified, others may be added as design progresses.
 - **Describe measures for avoiding or reducing potential stormwater impacts:** Temporary Construction Site BMPs and Permanent Treatment BMPs are going to be deployed throughout the construction of the project to reduce potential stormwater impacts.
 - **Identify any existing Treatment BMPs within the project limits and association with the project:** There is an existing Treatment BMP, Biostrips which is within the project limits and right-of-way.
- 3. Regional Water Quality Control Board Agreements**
- There are no negotiated understandings or agreements with the Central Valley RWQCB pertaining to this project. The District 3 NPDES coordinator will discuss the project with the NCRWQCB and update the SWDR for PS&E.
- 4. Proposed Design Pollution Prevention BMPs to be used on the Project.**
- **Downstream Effects Related to Potentially Increased Flow, Checklist DPP-1, Parts 1 and 2**
 - The project will increase the velocity and volume of the flow within the project limits. The proposed addition of the median lanes and auxiliary lanes does not change the overall drainage area but greatly increase the impervious areas.

- [Slope/Surface Protection Systems, Checklist DPP-1, Parts 1 and 3](#)
 - Slope will be disturbed at the abutments of the structures where widening is necessary, and these slopes will exceed 1:4. Slope paving may be required in these areas. In the areas of the auxiliary construction, slopes will be constructed at 1:4 or flatter when possible. A Geotechnical Report as well as an Erosion Control Plan, and Slope Approval from Landscape Architecture and Maintenance, may be required in non-standard retaining walls or soundwalls are determined to be necessary.
 - [Concentrated Flow Conveyance Systems, Checklist DPP-1, Parts 1 and 4](#)
 - The runoff in the median area is collected in the drain inlets and conveyed through culverts to the outside drainage ditches and channels. Most of these drain inlets and culverts will be plugged and abandoned due to the median paving, and the runoff will then sheet flow the outside shoulder and into the roadside ditches and canals.
 - Flared end sections and energy dissipaters will be installed where required as determined by the drainage evaluation during PS&E phase.
 - [Preservation of Existing Vegetation, Checklist DPP-1 and 5](#)
 - Existing vegetation will be preserved to the maximum extent practicable. The project will involve clearing and grubbing of which 19.43 acres will be paved.
 - The work in the unpaved median before the beginning of the median paving, soundwall construction and reconstruction, staging areas, and P.O.C. reconstruction, will require restoration of the existing landscape plant and irrigation inventory. Plant material and irrigation improvements within the last 3 - 15 years include: interior live oak, oleander, western redbud, eucalyptus, sycamore, arbutus, and valley oaks.
- 5. Proposed Permanent Treatment BMPs to be used on the Project**
- [Treatment BMP Strategy, Checklist T-1](#)
 - There is some design constituents mentioned in the Receiving Water Bodies 303(d) list as follows. Group A Pesticides and Mercury (general metal).
 - Base on the site condition, the estimate percentage of the WQV can be infiltrated is < 20% because the soil is type D. At PS&E phase the WQV will be reviewed with the Design SW Coordinator.
 - The Treatment BMP strategy deployed for the watersheds within the project limits was based in accordance with the July 2010 Project Planning and Design Guide, Checklist T-1, Part 1. Matrix A was used to select BMPs. Due to the right of way limitations and the fully developed nature of the surrounding land use, treatment opportunities are limited. Approximately 27% of the existing runoff is captured in a storm drain system and is untreatable. While all potentially feasible BMPs will be further evaluated during the project environmental phase, the primary Treatment BMP strategy is to be deployed biofiltration where feasible on the project. In addition, the existing shoulder roadside ditches will be evaluated for the feasibility of biofiltration to treat the remaining 73% of the existing runoff and the project impervious area runoff.
 - [Biofiltration Swales/Stirps, Checklist T-1, Parts 1 and 2](#)

- It is anticipated that through biofiltration deployment on this project, approximately 11% of the runoff will be treated, and along with the assumption that 57% of the runoff will be treated by the existing vegetation, unmodified by this project, a total of 68% of the runoff from the project and the existing condition will be treated. The previous values will be revised and finalized at PS&E phase.
- At PS&E phase the quantities for biofiltration swales and strips tributary areas will be calculated.

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

- Temporary construction site BMPs will be deployed under a contractor prepared SWPPP. Temporary concrete washouts, temporary fiber roll, temporary silt fence temporary drainage inlet protection, temporary construction entrance/exits, temporary erosion control, and temporary covers have been identified as potential contract bid line items. Additional items may be identified during the project design phase. All remaining water pollution control items will be included in the BEES Construction Site Management lump sum bid item. Construction site BMP cost has been estimated at \$1,938,510.00 using Method 1, Percentage of Total Construction Cost as shown in Appendix F of the PPDG. 1.5% of total construction cost was used. Attachment of the completed Construction Site BMP Consideration Form in accordance with current North Region directives.

7. Maintenance BMPs (Drain Inlet Stenciling)

- Drain inlet stenciling will be considered if drain inlets are located where there is pedestrian or bicycle access.

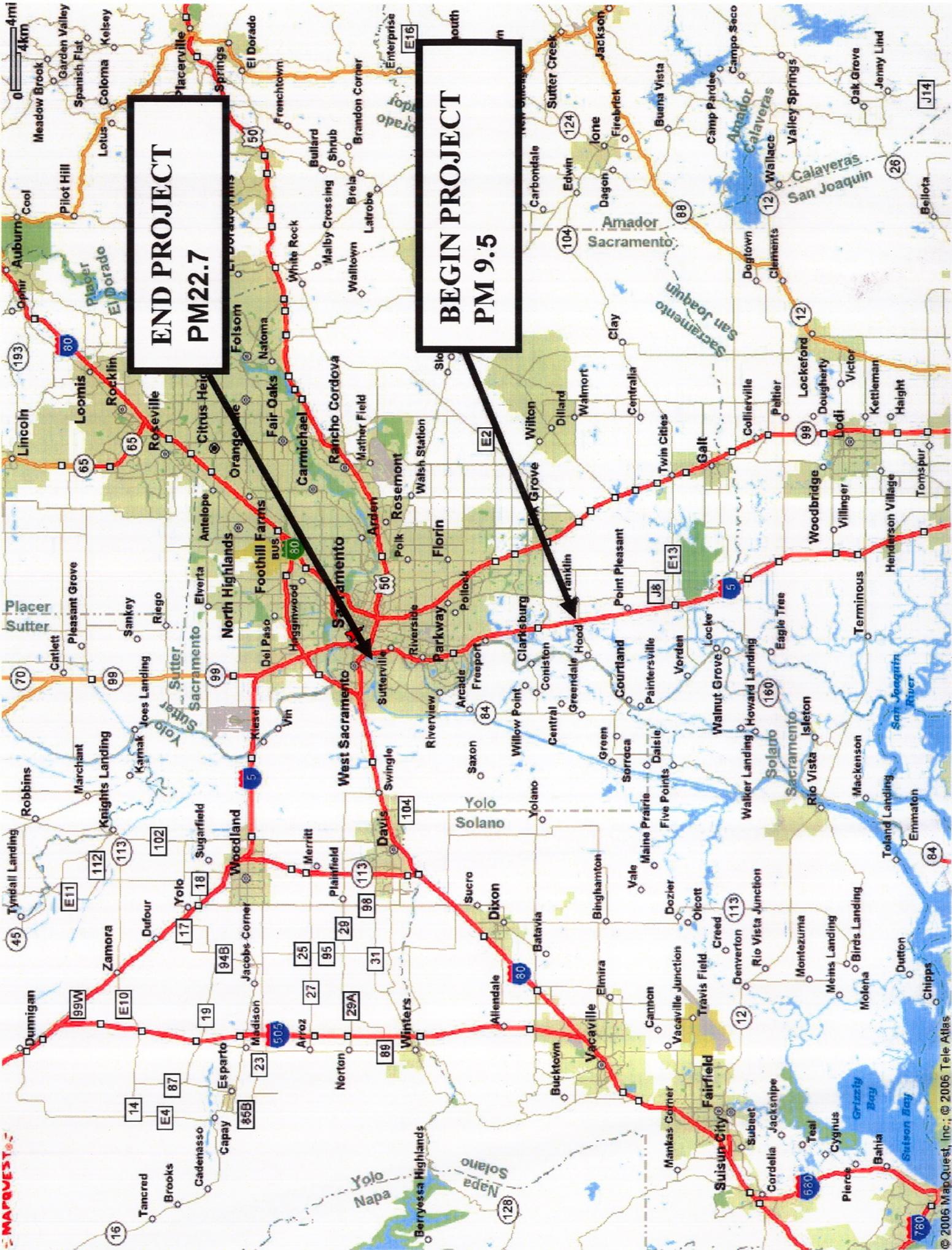
Required Attachments

- Vicinity Map
- Evaluation Documentation Form (EDF)
- Construction Site BMP Consideration Form
- Risk Level Determination Documentation

Supplemental Attachments

- BMP cost information from: Construction site BMP cost has been estimated using Method 1
- Checklist SW-1, Site Data Sources
- Checklist SW-2, Storm Water Quality Summary
- Checklist SW-3, Measures for Avoiding or Reducing Potential Storm Water BMPs
- Checklist DPP-1, Parts 1-5 (Design Pollution Prevention BMPs)
- Checklist T-1, Parts 1-2 (Treatment BMPs)

VICINITY MAP



**END PROJECT
PM22.7**

**BEGIN PROJECT
PM 9.5**

**EVALUATION
DOCUMENTATION FORM (EDF)**

APPENDIX E

Evaluation Documentation Form

DATE: March/2011

Project ID (or EA): 3C000

NO.	CRITERIA	YES ✓	NO ✓	SUPPLEMENTAL INFORMATION FOR EVALUATION
1.	Begin Project Evaluation regarding requirement for consideration of Treatment BMPs	✓		See Figure 4-1, Project Evaluation Process for Consideration of Permanent Treatment BMPs. Go to 2
2.	Is this an emergency project?		✓	If Yes , go to 10. If No , continue to 3.
3.	Have TMDLs or other Pollution Control Requirements been established for surface waters within the project limits? Information provided in the water quality assessment or equivalent document.	✓		If Yes , contact the District/Regional NPDES Coordinator to discuss the Department's obligations under the TMDL (if Applicable) or Pollution Control Requirements, go to 9 or 4. <u>RP</u> (Dist./Reg. SW Coordinator initials) If No , continue to 4.
4.	Is the project located within an area of a local MS4 Permittee?	✓		If Yes , (City/County of Sacramento), go to 5. If No , document in SWDR go to 5.
5.	Is the project directly or indirectly discharging to surface waters?	✓		If Yes , continue to 6. If No , go to 10.
6.	Is it a new facility or major reconstruction?	✓		If Yes , continue to 8. If No , go to 7.
7.	Will there be a change in line/grade or hydraulic capacity?			If Yes , continue to 8. If No , go to 10.
8.	Does the project result in a <u>net increase of one acre or more of new impervious surface</u> ?	✓		If Yes , continue to 9. If No , go to 10. <u>19.43 acres</u> (Net Increase New Impervious Surface)
9.	Project is required to consider approved Treatment BMPs.	✓		See Sections 2.4 and either Section 5.5 or 6.5 for BMP Evaluation and Selection Process. Complete Checklist T-1 in this Appendix E.
10.	Project is not required to consider Treatment BMPs. <u>RP</u> (Dist./Reg. Design SW Coord. Initials) _____(Project Engineer Initials) _____(Date)			Document for Project Files by completing this form, and attaching it to the SWDR.

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

**CONSTRUCTION SITE BMP
CONSIDERATION FORM**

APPENDIX E

Construction Site BMP Consideration Form

DATE: March/2011

Project ID (or EA): 3C000

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. Complete 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 right-of-way, etc?	✓		If Yes, Construction Site BMPs for Sediment Control (SC) will be required. Complete 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. Complete 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. Complete 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-Storm Water Management (NS) will be required. Complete 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-Storm Water Management (NS) will be required. Complete 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. Complete CS-1, Part 6. Continue to 8.
8.	Is there a potential for construction related materials and wastes to have direct contact with precipitation; stormwater run-on, or stormwater runoff; 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. Complete CS-1, Part 6. Continue to 9.
9.	End of checklist.	✓		Document for Project Files by completing this form, and attaching it to the SWDR.

PE to initialize after concurrence with Construction (PS&E only)

Date

**RISK LEVEL DETERMINATION
DOCUMENTATION**

A	B	C	D	E	F	G
1	Version 6/10/2009					
2	Risk Determination Worksheet					
3						
4	Step 1	Determine Sediment Risk via one of the options listed:				
5		1. GIS Map Method - EPA Rainfall Erosivity Calculator & GIS map				
6		2. Individual Method - EPA Rainfall Erosivity Calculator & Individual Data				
7	Step 2	Determine Receiving Water Risk via one of the options listed:				
8		1. GIS map of Sediment Sensitive Watersheds provided (in development)				
9		2. List of Sediment Sensitive Watersheds provided				
10	Step 3	Determine Combined Risk Level				
11						
12						
13	EA:	03-3C0001 - I-5 HOV				
14		03-Sac-5				
15		HOV Lanes				
16	Lat	38.81				
17	Long	121.197				
18						
19	Const Start	4/15/2016				
20	CCA Date	10/15/2019				
	Project Combined Risk					
21		Level 2				

**CHECKLIST SW-1, SITE DATA
SOURCES**

Checklist SW-1, Site Data Sources

Prepared by: A Cruz Date: March, 2011 District-Co-Route: 03-SAC-5

PM : 9.5/22.7 Project ID (or EA): 3C000 RWQCB: Central Valley

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

DATA CATEGORY/SOURCES	Date
Topographic	
• Aerial Mapping	1/13/06
• USGS	1/17/06
•	
Hydraulic	
• As-Built Log of Test Borings	1/18/06
• Rainfall Intensity Curves	1/25/06
• Water Quality Planning Tool, CSUS	2/02/06
Soils	
• Solis Map	1/17/06
•	
•	
Climatic	
• Designation or Rain Seasons, Statewide Storm Water Management Plan, April 2002	1/17/06
• Weather Underground Records	1/17/06
•	
Water Quality	
• 2002 CWA Section 303d List of Water Quality Segment and TMDL Priority Schedule	1/17/06
•	
•	
Other Data Categories	
• Project Planning and Design Guide, July 2010 Revision	1/12/2011
•	
•	

**CHECKLIST SW-2, STORM
WATER QUALITY ISSUES
SUMMARY**

Checklist SW-2, Storm Water Quality Issues Summary

Prepared by: A Cruz Date: March, 2011 District-Co-Route: 03-SAC-5

PM : 9.5/22.7 Project ID (or EA): 3C000 RWQCB: Central Valley

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

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

**CHECKLIST SW-3, MEASURES
FOR AVOIDING OR REDUCING
POTENTIAL STORM WATER
IMPACTS**

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

Prepared by: A Cruz Date: March, 2011 District-Co-Route: 03-SAC-5

PM : 9.5/22.7 Project ID (or EA): 3C000 RWQCB: Central Valley

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

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

1. Can the project be relocated or realigned to avoid/reduce impacts to receiving waters or to increase the preservation of critical (or problematic) areas such as floodplains, steep slopes, wetlands, and areas with erosive or unstable soil conditions? Yes No NA

2. Can structures and bridges be designed or located to reduce work in live streams and minimize construction impacts? Yes No NA

3. Can any of the following methods be utilized to minimize erosion from slopes:
 - a. Disturbing existing slopes only when necessary? Yes No NA
 - b. Minimizing cut and fill areas to reduce slope lengths? Yes No NA
 - c. Incorporating retaining walls to reduce steepness of slopes or to shorten slopes? Yes No NA
 - d. Acquiring right-of-way easements (such as grading easements) to reduce steepness of slopes? Yes No NA
 - e. Avoiding soils or formations that will be particularly difficult to re-stabilize? Yes No NA
 - f. Providing cut and fill slopes flat enough to allow re-vegetation and limit erosion to pre-construction rates? Yes No NA
 - g. Providing benches or terraces on high cut and fill slopes to reduce concentration of flows? Yes No NA
 - h. Rounding and shaping slopes to reduce concentrated flow? Yes No NA
 - i. Collecting concentrated flows in stabilized drains and channels? Yes No NA

4. Does the project design allow for the ease of maintaining all BMPs? Yes No

5. Can the project be scheduled or phased to minimize soil-disturbing work during the rainy season? Yes No

6. Can permanent storm water pollution controls such as paved slopes, vegetated slopes, basins, and conveyance systems be installed early in the construction process to provide additional protection and to possibly utilize them in addressing construction storm water impacts? Yes No NA

**CHECKLIST DPP-1, PARTS 1-5
(DESIGN POLLUTION
PREVENTION BMPs)**

Design Pollution Prevention BMPs		
Checklist DPP-1, Part 1		
Prepared by: <u> A Cruz </u>	Date: <u> March, 2011 </u>	District-Co-Route: <u> 03-SAC-5 </u>
PM : <u> 9.5/22.7 </u>	Project ID (or EA): <u> 3C000 </u>	RWQCB: <u> Central Valley </u>

Consideration of Design Pollution Prevention BMPs

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

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

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

Slope/Surface Protection Systems

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

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

Concentrated Flow Conveyance Systems

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

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

Preservation of Existing Vegetation

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

Complete

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

Design Pollution Prevention BMPs			
Checklist DPP-1, Part 2			
Prepared by: <u> A Cruz </u>	Date: <u> March, 2011 </u>	District-Co-Route: <u> 03-SAC-5 </u>	
PM : <u> 9.5/22.7 </u>	Project ID (or EA): <u> 3C000 </u>	RWQCB: <u> Central Valley </u>	

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 project limits as well as downstream. Consider scour velocity. Complete
- 3. Include, where appropriate, energy dissipation devices at culvert outlets. Complete
- 4. Ensure all transitions between culvert outlets/headwalls/wingwalls and channels are smooth to reduce turbulence and scour. Complete
- 5. Include, if appropriate, peak flow attenuation basins or devices to reduce peak discharges. Complete

Design Pollution Prevention BMPs			
Checklist DPP-1, Part 3			
Prepared by: <u> A Cruz </u>	Date: <u> March, 2011 </u>	District-Co-Route: <u> 03-SAC-5 </u>	
PM : <u> 9.5/22.7 </u>	Project ID (or EA): <u> 3C000 </u>	RWQCB: <u> Central Valley </u>	

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 reduce concentration of flows? Yes No
3. Were slopes rounded and/or shaped to reduce concentrated flow? Yes No
4. Were concentrated flows collected in stabilized drains or channels? Yes No
5. Are new or disturbed slopes > 4:1 horizontal:vertical (h:v)? Yes No
 If Yes, District Landscape Architect must prepare or approve an erosion control plan, at the District's discretion.
6. Are new or disturbed slopes > 2:1 (h:v)? Yes No
 If Yes, Geotechnical Services must prepare a Geotechnical Design Report, and the District Landscape Architect should prepare or approve an erosion control plan. Concurrence must be obtained from the District Maintenance Storm Water Coordinator for slopes steeper than 2:1 (h:v).
7. Estimate the net new impervious area that will result from this project. 37 acres Complete

VEGETATED SURFACES

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

HARD SURFACES

1. Are hard surfaces required? Yes No
 If Yes, document purpose (safety, maintenance, soil stabilization, etc.), types, and general locations of the installations. Complete
- Review appropriate SSPs for Vegetated Surface and Hard Surface Protection Systems. Complete

Design Pollution Prevention BMPs			
Checklist DPP-1, Part 4			
Prepared by: <u> A Cruz </u>	Date: <u> March, 2011 </u>	District-Co-Route: <u> 03-SAC-5 </u>	
PM : <u> 9.5/22.7 </u>	Project ID (or EA): <u> 3C000 </u>	RWQCB: <u> Central Valley </u>	

Concentrated Flow Conveyance Systems

Ditches, Berms, Dikes and Swales

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

Overside Drains

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

Flared Culvert End Sections

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

Outlet Protection/Velocity Dissipation Devices

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

Review appropriate SSPs for Concentrated Flow Conveyance Systems. Complete

Design Pollution Prevention BMPs			
Checklist DPP-1, Part 5			
Prepared by:	<u>A Cruz</u>	Date:	<u>March, 2011</u>
		District-Co-Route:	<u>03-SAC-5</u>
PM :	<u>9.5/22.7</u>	Project ID (or EA):	<u>3C000</u>
		RWQCB:	<u>Central Valley</u>

Preservation of Existing Vegetation

- 1. Review Preservation of Property, Standard Specifications 16.1.01 and 16-1.02 (Clearing and Grubbing) to reduce clearing and grubbing and maximize preservation of existing vegetation. Complete

- 2. Has all vegetation to be retained been coordinated with Environmental, and identified and defined in the contract plans? Yes No

- 3. Have steps been taken to minimize disturbed areas, such as locating temporary roadways to avoid stands of trees and shrubs and to follow existing contours to reduce cutting and filling? Complete

- 4. Have impacts to preserved vegetation been considered while work is occurring in disturbed areas? Yes No

- 5. Are all areas to be preserved delineated on the plans? Yes No

**CHECKLIST T-1, PARTS 1-2
(TREATMENT BMPs)**

Treatment BMPs			
Checklist T-1, Part 1			
Prepared by: <u> A Cruz </u>	Date: <u> March, 2011 </u>	District-Co-Route: <u> 03-SAC-5 </u>	
PM : <u> 9.5/22.7 </u>	Project ID (or EA): <u> 3C000 </u>	RWQCB: <u> Central Valley </u>	

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 (Project Treatment Consideration) and the Evaluation Documentation Form (EDF). This checklist will be used to determine which Treatment BMPs should be considered for each watershed and sub-watershed within the project. Supplemental data will be needed to verify siting and design applicability for final incorporation into a project.

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

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

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

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

2. Dry Weather Flow Diversion

- (a) Are dry weather flows generated by Caltrans anticipated to be persistent? Yes No
- (b) Is a sanitary sewer located on or near the site? Yes No

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

- (c) Is connection to the sanitary sewer possible without extraordinary plumbing, features or construction practices? Yes No
- (d) Is the domestic wastewater treatment authority willing to accept flow? Yes No

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

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

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

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

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

5. Maximizing Biofiltration Strips and Swales

Objectives:

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

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

(b) Based on site conditions, estimate what percentage of the WQV¹ can be infiltrated. When calculating the WQV, use a 12-hour drawdown for Type A and B soils, a 24-hour drawdown for Type C soils, and a 48-hour drawdown for Type D soils.

- | | |
|---|--|
| <input checked="" type="checkbox"/> < 20% | <input checked="" type="checkbox"/> Complete |
| <input type="checkbox"/> 20% - 50% | |
| <input type="checkbox"/> 50% - 90% | |
| <input type="checkbox"/> > 90% | |

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

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

(d) Can the infiltration ranking in question 5(b) above be increased by using soil amendments? Use the 'drain time' associated with the amended soil (the 12-hour WQV for Type A and B soils, the 24-hour WQV for Type C soils²). Yes No

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

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

Complete

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

6. Biofiltration in Rural Areas

Is the project in a rural area (outside of urban areas that is covered under an NDPEs Municipal Stormwater Permit³). If Yes proceed to question 13. Yes No

7. Estimating Infiltration for BMP Combinations

Objectives:

- 1) Identify high-infiltration biofiltration or biofiltration and infiltration BMP combinations and skip further BMP consideration.
- 2) If high infiltration is infeasible, then identify the infiltration level of all feasible BMP combinations for use in the subsequent BMP selection matrices

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

Note: At PS&E phase review with Heath Hathaway, Design North Regional SW Coordinator.

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

² Type D soils are not expected where amendments are incorporated

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

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

(use 24 hr WQV)

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

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

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

Earthen Detention Basin
(use 48 hr WQV)

- ___ < 20%
- ___ 20% - 50%
- ___ > 50%

Earthen Austin SF
(use 48 hr WQV)

- ___ < 20%
- ___ 20% - 50%
- ___ > 50%

Complete

Continue to Question 8

8. Identifying BMPs based on the Target Design Constituents

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

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

- | | |
|---|---|
| <input checked="" type="checkbox"/> sediments | <input type="checkbox"/> copper (dissolved or total) |
| <input type="checkbox"/> phosphorus | <input type="checkbox"/> lead (dissolved or total) |
| <input type="checkbox"/> nitrogen | <input type="checkbox"/> zinc (dissolved or total) |
| | <input type="checkbox"/> general metals (dissolved or total) ¹ |

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

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

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

9. Treating both Metals and Nutrients.

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

10. Treating Only Metals.

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

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

11. Treating Only Nutrients.

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

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

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

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

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

Note: At PS&E phase review with Heath Hathaway, Design North Regional SW Coordinator.

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

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

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

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

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

Note: At PS&E phase review with Heath Hathaway, Design North Regional SW Coordinator

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

Treatment BMPs			
Checklist T-1, Part 2			
Prepared by: <u>A Cruz</u>	Date: <u>March, 2011</u>	District-Co-Route: <u>03-SAC-5</u>	
PM: <u>9.5/22.7</u>	Project ID (or EA): <u>3C000</u>	RWQCB: <u>Central Valley</u>	

Biofiltration Swales / Biofiltration Strips

Feasibility

1. Do the climate and site conditions allow vegetation to be established? Yes No
2. Are flow velocities from a peak drainage facility design event < 4 fps (i.e. low enough to prevent scour of the vegetated biofiltration swale as per HDM Table 873.3E)? Yes No
 If "No" to either question above, Biofiltration Swales and Biofiltration Strips are not feasible.
3. Are Biofiltration Swales proposed at sites where known contaminated soils or groundwater plumes exist? Yes No
 If "Yes", consult with District/Regional NPDES Coordinator about how to proceed.
4. Does adequate area exist within the right-of-way to place Biofiltration device(s)? Yes No
 If "Yes", continue to Design Elements section. If "No", continue to Question 5.
5. If adequate area does not exist within right-of-way, can suitable, additional right-of-way be acquired to site Biofiltration devices and how much right-of-way would be needed to treat WQF? _____ acres Yes No
 If "Yes", continue to Design Elements section. If "No", continue to Question 6.
6. If adequate area cannot be obtained, document in Section 5 of the SWDR that the inability to obtain adequate area prevents the incorporation of these Treatment BMPs into the project. Complete

Design Elements

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

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

1. Has the District Landscape Architect provided vegetation mixes appropriate for climate and location? * Yes No
2. Can the biofiltration swale be designed as a conveyance system under any expected flows > the WQF event, as per HDM Chapter 800? * (e.g. freeboard, minimum slope, etc.) Yes No

- 3. Can the biofiltration swale be designed as a water quality treatment device under the WQF while meeting the required HRT, depth, and velocity criteria? (Reference Appendix B, Section B.2.3.1)* Yes No
- 4. Is the maximum length of a biofiltration strip ≤ 300 ft? * Yes No
- 5. Has the minimum width (in the direction of flow) of the invert of the biofiltration swale received the concurrence of Maintenance? * Yes No
- 6. Can biofiltration swales be located in natural or low cut sections to reduce maintenance problems caused by animals burrowing through the berm of the swale? ** Yes No
- 7. Is the biofiltration strip sized as long as possible in the direction of flow? ** Yes No
- 8. Have Biofiltration Systems been considered for locations upstream of other Treatment BMPs, as part of a treatment train? ** Yes No