Draft
STORM WATER DATA REPORT
For
Mid County Parkway
EA 08-0F3200
(PN 0800000125)
08-Riv-MCP PM 0.0 – 16.3
08-Riv-I-215 PM 28.0 – 34.3
October 17, 2011

Submitted to:
California Department
of Transportation

Caltrans

Prepared for:
Riverside County
Transportation Commission

RCTC
Dist-County-Route: 08-RIV-MCP
Post Mile Limits: MCP PM 0.0/16.3, I-215 PM 28.0/34.3
Project Type: New Highway Construction
Project ID (or EA): EA08-0F3200 (PN 0800000125)
Program Identification: HE-14
Phase: ☒ PID  ☐ PA/ED  ☐ PS&E

Regional Water Quality Control Board(s): Santa Ana Region B

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: 2015

Total Disturbed Soil Area: 1,095.0 ac  
Risk Level: 2
Estimated Construction Start Date: January 2, 2016  
Construction Completion Date: December 31, 2019
Notification of Construction (NOC) Date to be submitted: December 1, 2015

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.

George Hsu, Registered Project Engineer/Landscape Architect  
Caltrans Designated Oversight Representative

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

Nassim Elias, Project Manager  Date

Cindy Garo, Designated Maintenance Representative  Date

Ray Desselle, Designated Landscape Architect Representative  Date

[Stamp Required for PS&E only]  Cathy B. Jochal, District/Regional Design SW Coordinator or Designee  Date

Caltrans Storm Water Quality Handbooks  
Project Planning and Design Guide  
July 2010
STORM WATER DATA INFORMATION

1. Project Description

The Riverside County Transportation Commission (RCTC), in cooperation with the California Department of Transportation (Caltrans) District 8, the County of Riverside (County), the City of San Jacinto, and the City of Perris, has initiated a study considering a range of alignment alternatives for a new west-east transportation corridor. The proposed action would adopt an alignment between Interstate 215 (I-215) on the west to State Route 79 (SR-79) on the east for the new corridor, named Mid County Parkway, a major, controlled access freeway to meet current and projected travel demand by the year 2040. To construct the Mid County Parkway, extensive roadwork, both new alignments and the improvement of existing facilities, will be necessary along the 16.3 miles reach on MCP and 6.3 miles reach on I-215. The alignment locations and vicinity map are shown in Figure 1. The alignment discussed in this report consists of Segment 1 Alternative 9, Segment 2 Common with San Jacinto River Bridge Design Variation, and Segment 3 San Jacinto South.

- Construction of the project would disturb the existing soils as a result of the following activities: construction staging, grading for the new roadway and interchanges, and grading of the resulting cut/fill slopes. Disturbed soil area is calculated based on existing topography and proposed grading plans. The disturbed soil area consists of the proposed grading on slopes, new impervious areas, and existing pavement that will be replaced by new pavement. The total disturbed area is estimated to be 1,095.0 acres (ac).

- The total existing impervious surface area within the project limits is estimated to be 238.9 ac. The impervious surface after the project is completed is estimated to be 686.4 ac resulting from new roadway construction, including local streets improvement, and 602.0 ac within Caltrans right-of-way. The new impervious surface area within the project limit is 479.5 ac. The permanent pavement removal area is estimated to be 32.0 ac.

- The project lies within several Municipal Separate Storm Sewer Systems (MS4) in Riverside County.

- The total construction cost of the project is $1.6 Billion.

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

- The project is located in the San Jacinto Valley watershed, including hydrologic sub-area 802.15, 802.14, 802.21 and 802.11. The watershed includes significant mountainous areas of the San Jacinto Mountains, as well as several significant canyons and the valley floor. At the project site, the San Jacinto River drains approximately 540 square miles of the watershed. Within the project area, the river flows west, crossing the existing Ramona Expressway and continues west toward the coast, draining into Canyon Lake and ultimately into Lake Elsinore. The Receiving
Water Bodies for this project are identified as San Jacinto River, Canyon Lake, and Lake Elsinore.

- Based on the U.S. Environmental Protection Agency's 303(d) list (USEPA, 2006), Canyon Lake is impaired by nutrients and pathogens and Lake Elsinore is impaired by nutrients, low DO levels, PCBs (Polychlorinated biphenyls), and unknown toxicity. The Pollutants of Concern are nutrients.
- Clean Water Act 401 Certification is required for any project that may result in a discharge into the waters of the state to ensure that the proposed project will not violate state water quality standards. The project will include bridge construction over the San Jacinto River, which consists of construction in the channel or overbank of an existing stream. Therefore, the project will require Regional Water Quality Control Board (RWQCB) 401 certification.
- No High Risk Areas (water supply reservoirs, groundwater percolation facilities, etc) exist within the project limits, according to the Caltrans Storm Water Management Program Regional Work Plan 2005/2006 for District 8.
- No TMDLs have been established for the San Jacinto River. For Lake Elsinore, TMDLs have been established for nutrients and low dissolved oxygen. For Canyon Lake, TMDLs have been established for nutrients.
- Proposed water quality mitigation measures and BMPs were evaluated for their applicability to local MS4 permit requirements. These mitigation measures and BMPs meet or exceed the local MS4 permit requirements. The BMPs proposed for this project are also approved for consideration by local agencies. No other local agency requirements and concerns regarding water quality are anticipated as described in the SWDR.
- Climate. The local climate is characterized as a Mediterranean climate. The project site has an arid climate with hot and dry summers, and moderately cool winters. Mean seasonal precipitation in Riverside County varies substantially according to elevation and distance from the ocean, and ranges from 3 inches per year in the eastern desert regions to 35 inches per year in the mountainous regions. The project site is located in the southern portion of the county, where the average rainfall is approximately 11.4 inches per year. The average maximum temperature is 80.5 degrees F, and the average minimum temperature is 53.5 degrees F (Western Regional Climate Center). The RWQCB has defined the rainy season as a year round. Topography. According to the United States Geological Survey (USGS) maps, the general runoff direction for the western portion of the watershed area is towards the Perris Valley Storm Drain. The eastern portion of the watershed area drains towards the San Jacinto River. The Perris Valley Storm Drain drains from north to south, into the San Jacinto River. The San Jacinto River flows from northeast to southwest. General topography is toward the San Jacinto River and then east to west. Where the roadway is south of the river, general flow is from south to north. Where the roadway is north of the river, general flow is from north to south.
Soil. West of the San Jacinto River crossing at Lakeview, the project is located completely in areas with soil groups B and C. The stretch within the San Jacinto River floodplain is designated as soil group D. East of the floodplain, the project is located predominantly in areas with soil groups B and C.

Geology. Geology in the watershed is underlain by metasedimentary bedrock known as Perris Block. Overlying the bedrock to the south and west of Lake Perris are old and very old alluvial fan deposits and artificial fills. Along the eastern half of the MCP south alignment, from the San Jacinto River to SR-79, the bedrock is overlain with active valley deposits and young alluvial fan, channel, and valley deposits. The San Jacinto fault zone crosses the alignment on the farther East near the Warren Road interchange.

Groundwater. Estimated depth to historically high groundwater is from 29 to 348 feet.

- No evidence of current or historical onsite hazardous waste disposal activities was observed during the site reconnaissance. No soil of the project site is anticipated to be impacted with aerially deposited lead (ADL) from vehicular emissions.
- Necessary right-of-way will be acquired for implementing storm water best management practices (BMPs) for the project. This will include Temporary Construction Easements needed to construct BMPs. Staged construction plans will be prepared during the PS&E phase. At this time, no staging areas are anticipated to be required outside the project limits.
- The project is designed to avoid or reduce stormwater impacts wherever feasible. Structures will be designed or located to reduce work in streams to minimize construction impacts. Slope disturbance and cut-and-fill slopes are minimized. New slopes shall be 1:4 or flatter where feasible. Slopes are rounded and shaped to reduce concentrated flow. Alternative materials for facilities are utilized wherever feasible to reduce future maintenance impacts on water quality. Permanent BMPs will be implemented early in the construction process to provide additional protection during the construction process. Project construction schedules will be phased to minimize construction during the rainy season as much as possible. Ease of maintenance is considered as well.
- Dry weather flows are present along portions of all proposed alignments. The flows were verified by site visits and examination of aerial photographs. Visible water and perennially green areas were indictors used to identify areas of dry weather flow. Potential sources include irrigation from offsite properties, natural springs, the open channel aqueduct, residential developments, and diverted streams. All of the dry weather flows are from offsite sources. Dry weather flows generated by Caltrans are not anticipated to be persistent within the project limits.
- There are no existing BMPS within project limit.

3. Regional Water Quality Control Board Agreements
- The project site lies within the jurisdiction of RWQCB Region 8 (Santa Ana). The project shall conform to Caltrans National Pollutant Discharge Elimination System (NPDES) statewide storm permit (Order No. 99-06-DWQ, NPDES Permit No. CAS000003) and Construction General Permit (Order No. 2009-0009-DWQ, NPDES General Permit No. CAS000002). There are currently no agreements between Caltrans and Region 8 that are specific to the project area.
- Notification of Construction (NOC) shall be submitted to RWQCB Region 8, 30 days prior to Construction.

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 site is adjacent and drains to the San Jacinto River. The project will construct new freeway and interchanges, resulting in an increase of impervious area of 447.5 ac. As a consequence, runoff volume and flow velocity will increase. Potential increased erosion from higher runoff flows is minimized by using erosion control measures such as rock slope protection. Some channels, where drainage systems outfall to, are unlined. Upon the completion of the project, adverse impacts to the downstream channel conditions and sediment loading potential are anticipated but will be minimized.

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

- The alignment along the existing terrain is in gentle rolling hills. Construction of the project requires the creation of new cut-and-fill slopes. New slopes in the project area would be 4:1 (H:V) wherever possible, except where steeper slopes are necessary. Mountainous stretches will typically incorporate slopes of 2:1 or flatter. Retaining walls will be incorporated to reduce steepness of slopes or to shorten slopes. Slopes will be rounded and shaped to reduce concentrated flow.
- The permanent erosion control strategy includes erosion control measures and highway planting. Upon completion of the project, all new and modified slopes would be sprayed with a Landscape Architect approved erosion-control mix and planting. Concrete paving could be used under the bridge abutment and rock blankets at pipe outlets.

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

- Existing crossing-culverts will be kept as needed and extended to the new cut/fill line. Where cross-culverts convey onsite and offsite runoff under the highway, flared end sections will be specified at the inlet/outlet of the culverts; and RSP will be provided at the culvert outlets to minimize scour and erosion at cross-culvert transitions.

Preservation of Existing Vegetation, Checklist DPP-1, Parts 1 and 5
Vegetation and landscaping on existing slopes will be preserved to the greatest extent possible. But, the clearing and grubbing could be between right-of-way to right-of-way.

The project will require removal of existing non-irrigated vegetation. All existing vegetation that is removed or disturbed due to construction will be replaced following Caltrans Replacement Planting Policy and Procedure.

Some environmental sensitive areas (ESA) have been identified as off-limits to the Contractor.

Project layout has been considered to increase preservation and avoid floodplains, wetlands, problem soils, and steep slopes to the maximum extent possible.

The costs for Design Pollution Prevention BMPs is estimated to be $15,386,500, which includes flared end sections, RSP, RSP fabric, AC dike, overside drains, and landscape. The cost summary is presented in the attachment.

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

Treatment BMP Strategy, Checklist T-1

- A project must consider treatment for a Targeted Design Constituent (TDC) when an affected water body within the project limits is on the 303(d) list for one or more of these constituents. The TDCs identified for the project are nutrients (phosphorus).

- The water quality depth was determined based on rainfall stations near the project site according to Basin Sizer (Caltrans method). For the segment 1, 2 and 3 the water quality depths are 0.70 inch, 0.78 inch, and 0.73 inch, respectively. Water quality flow (WQF) has been negotiated between the SWRCB and each of the local RWQCBs. The water quality flow is based on a precipitation rate of 0.20 inch/hr for Region 8 (Santa Ana River).

  Upon completion of the project, the total paved area is estimated to be 686.4 ac. If all proposed BMPs are implemented, 74.8% stormwater runoff from paved area will be treated, and 114.8% of the net WQV (from new impervious surfaces) will be treated.

- The Treatment BMP strategy is to consider the existing site constraints and determine the feasibility of BMP implementation at the site-specific location. The goal is for the BMPs to treat as much of the paved area runoff to the maximum extent practicable (MEP). Treatment BMPs have been evaluated individually for implementation on the proposed project in accordance with the guidelines provided in the PPDG (Caltrans, 2010).

  A description of the evaluation performed for each of these potential BMPs and associated design criteria are provided below.

Biofiltration Swales/Strips, Checklist T-1, Parts 1 and 2
Long Form - Storm Water Data Report

- Biofiltration swales are feasible Treatment BMPs for some site conditions that have been incorporated into the project. Two biofiltration swales (Sites BSW1637RT and BSW361RT) are proposed for this project. These biofiltration swales will treat 5.4 ac paved area. Funding has been allocated to allow for the implementation of these devices.

_Dry Weather Diversion, Checklist T-1, Parts 1 and 3_

- Dry weather diversions are not appropriate for this project because dry weather flows generated by Caltrans are not anticipated to be persistent.

_Infiltration Devices – Checklist T-1, Parts 1 and 4_

- Infiltration Basins are potential treatment BMPs for this project. Wherever soil is appropriate (infiltration > 20%), infiltration basins will be implemented in this project. A total of 36 infiltration basins are proposed for this project, which will treat approximately 508.2 ac of paved area. The supplemental attachments show the location of each basin. Funding has been allocated to allow for the implementation of these devices.

_Detention Devices, Checklist T-1, Parts 1 and 5_

- Detention devices are feasible treatment BMPs that have been considered for the project. During PS&E phase, if the infiltration testing results indicate the infiltration rate is less than 0.50 in/hr for the site, the infiltration basin is not appropriate and a detention basin will be implemented for the project. All detention basins within the right of way will be landscaped. Funding has been allocated to allow for the implementation of this device.

_Gross Solids Removal Devices (GSRDs), Checklist T-1, Parts 1 and 6_

TMDL for trash has not been established for the San Jacinto Valley watershed; therefore, GSRDs have not been considered for the project.

_Traction Sand Traps, Checklist T-1, Parts 1 and 7_

- The project is not located where sand or other traction enhancing substances are applied to the roadway at least twice per year. Therefore, Traction Sand Traps are not proposed.

_Media Filters, Checklist T-1, Parts 1 and 8_

- Media Filters are considered, but will not be implemented for this project, because infiltration basins and detention basin are proposed to treat the same tributary area and sufficient hydraulic head may be not available for some of the potential BMP sites.

_Multi-Chambered Treatment Trains (MCTTs), Checklist T-1, Parts 1 and 9_
Long Form - Storm Water Data Report

- The project site does not contain a critical pollutant source area, such as vehicle service facilities, parking areas, paved storage areas and fueling stations. Therefore, MCTTs are not feasible and not recommended for implementation on this project.

Wet Basins, Checklist T-1, Parts 1 and 10

- The project site does not have a permanent source of water to maintain a pool and the groundwater is too far below the surface to be considered as a source of water. Therefore, a wet basin is not feasible and is not proposed to be incorporated on this project.

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

- The project involves grading (cut and fill slopes), constructing bridges, adding drainage inlets and cross-culverts, trenching, base paving, AC paving, and striping. The strategy for Construction Site BMPs is to limit construction-related sediment transport during construction. These Construction Site BMPs were selected to provide an effective solution for protecting the water quality in the downstream receiving water bodies during construction.

- The following Construction Site BMPs may be implemented and included as separate Bid Line Items:
  - Scheduling
  - Preservation of Existing Vegetation (ESA Fencing)
  - Move-in/Move-out (Temporary Erosion Control)
  - Temporary Hydraulic Mulch (Bonded Fiber Matrix)
  - Temporary Fiber Rolls
  - Temporary Check Dams
  - Temporary Silt Fence
  - Temporary Gravel Bag Berm
  - Temporary Drainage Inlet Protection
  - Temporary Construction Entrance
  - Temporary Construction Roadway
  - Temporary Concrete Washout Bin
  - Temporary Stream Crossing
  - Clear Water Diversion
  - Rain Event Action Plan
  - Storm Water Annual Report
  - Storm Water Sampling and Analysis Day
  - Prepare Storm Water Pollution Prevention Plan

- The following Construction Site BMPs may be implemented and incorporated as a lump sum. It is anticipated that the project may employ:
Long Form - Storm Water Data Report

- Street Sweeping
- Wind Erosion Control
- Supplemental Work
  - Storm Water Sampling and Analysis
  - Additional Water Pollution Control
  - Water Pollution Control Maintenance Sharing
- Construction Site Management per Caltrans SSP 07-346
  - Waste Management and Materials Pollution Control
    - Material Delivery and Storage
    - Material Use
    - Spill Prevention and Control
    - Stockpile Management
    - Waste Management
      - Solid Waste
      - Hazardous Waste
      - Concrete Waste
      - Sanitary and Septic Waste
      - Liquid Waste Management
  - Non-Storm Water Management
    - Water Conservation Practices
    - Dewatering Operation
    - Paving and Grinding Operations
    - Illicit Connection/Illegal Discharge Detention and Reporting
    - Potable Water/Irrigation
    - Vehicle and Equipment Cleaning
    - Vehicle and Equipment Fueling and Maintenance
    - Pile Driving
    - Concrete Curing
    - Material and Equipment Use Over Water
    - Concrete Finishing
    - Structure Demolition/Removal Over or Adjacent to Waters

- This project is identified as Risk Level 2. The project proposes to have 4 monitoring locations for each 1 mile. The monitoring locations will be determined when drainage design is done during PS&E phase.
Dewatering will be required to remove accumulated precipitation during storm events. No separate dewatering permit is anticipated to be required. Any dewatering will follow the provisions stated in SSP S5-630.

- The receiving water is not sensitive to sediment loading. Therefore, Active Treatment Systems (ATS) are not required for this project.
- The total costs for Construction Site BMPs are estimated to be $20,000,000.

7. Maintenance BMPs (Drain Inlet Stenciling)

Drain inlet stenciling is not required for this project on the State Highway, but will be required for any inlets on the local streets within the project limit.

Required Attachments

- Vicinity Map
- Evaluation Documentation Form (EDF)
- Risk Level Determination Documentation
- Treatment BMP Summary Spreadsheets

Supplemental Attachments

- Storm Water BMP Cost Summary
- Checklist SW-1, Site Data Sources
- Checklist SW-2, Storm Water Quality Issues Summary
- Checklist SW-3, Measures for Avoiding or Reducing Potential Storm Water BMPs
- Checklists DPP-1, Parts 1–5 (Design Pollution Prevention BMPs)
- Checklists T-1, Parts 1, 2, 4, 5, 8, 9, and 10 (Treatment BMPs)
- Conceptual BMP Plans
## Evaluation Documentation Form

**DATE:** March 11, 2011  
**Project ID (or EA):** 0F3200 (PN 08000000125)

<table>
<thead>
<tr>
<th>NO.</th>
<th>CRITERIA</th>
<th>YES</th>
<th>Supplier</th>
<th>SUPPLEMENTAL INFORMATION FOR EVALUATION</th>
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<tbody>
<tr>
<td>1.</td>
<td>Begin Project Evaluation regarding requirement for consideration of Treatment BMPs</td>
<td>✓</td>
<td></td>
<td>See Figure 4-1, Project Evaluation Process for Consideration of Permanent Treatment BMPs. Go to 2.</td>
</tr>
<tr>
<td>2.</td>
<td>Is this an emergency project?</td>
<td>✓</td>
<td></td>
<td>If Yes, go to 10.</td>
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<td></td>
<td></td>
<td>✓</td>
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<td>If No, continue to 3.</td>
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</table>
| 3.  | Have TMDLs or other Pollution Control Requirements been established for surface waters within the project limits? Information provided in the water quality assessment or equivalent document. | ✓   |          | If Yes, contact the District/Regional NPDES Coordinator to discuss the Department's obligations under the TMDL (if Applicable) or Pollution Control Requirements, go to 9 or 4.  
|     |                                                                           |      |          | (Dist./Reg. SW Coordinator Initials)    |
|     |                                                                           |      |          | If No, continue to 4.                   |
| 4.  | Is the project located within an area of a local MS4 Permittee?          | ✓   |          | If Yes. *(Riverside County MS4)*, go to 5. |
|     |                                                                           |      |          | If No, document in SWDR go to 5.        |
| 5.  | Is the project directly or indirectly discharging to surface waters?     | ✓   |          | If Yes, continue to 6.                  |
|     |                                                                           |      |          | If No, go to 10.                        |
| 6.  | Is it a new facility or major reconstruction?                            | ✓   |          | If Yes, continue to 8.                  |
|     |                                                                           |      |          | If No, go to 7.                         |
| 7.  | Will there be a change in line/grade or hydraulic capacity?              | ✓   |          | If Yes, continue to 8.                  |
|     |                                                                           |      |          | If No, go to 10.                        |
| 8.  | Does the project result in a net increase of one acre or more of new impervious surface? | ✓   |          | If Yes, continue to 9.                  |
|     |                                                                           |      |          | If No, go to 10.                        |
|     |                                                                           |      |          | *447.5 ac. (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.                      | ✓   |          | Document for Project Files by completing this form, and attaching it to the SWDR. |

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**See Figure 4-1, Project Evaluation Process for Consideration of Permanent Treatment BMPs**
<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
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<tbody>
<tr>
<td><strong>Sediment Risk Factor Worksheet</strong></td>
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<th>A</th>
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<tr>
<td>1</td>
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<tr>
<td><strong>A) R Factor</strong></td>
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<td>Analyses of data indicated that when factors other than rainfall are held constant, soil loss is directly proportional to a rainfall factor composed of total storm kinetic energy (E) times the maximum 30-min intensity (I30) (Wischmeier and Smith, 1958). The numerical value of R is the average annual sum of E130 for storm events during a rainfall record of at least 22 years. &quot;Isoerodent&quot; maps were developed based on R values calculated for more than 1000 locations in the Western U.S. Refer to the link below to determine the R factor for the project site.</td>
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<td></td>
<td><a href="http://cfpub.epa.gov/npdes/stormwater/LEWlewCalculator.cfm">http://cfpub.epa.gov/npdes/stormwater/LEWlewCalculator.cfm</a></td>
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<tr>
<td>3</td>
<td>R Factor Value</td>
<td>47.81</td>
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<tr>
<th>A</th>
<th>B</th>
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<tr>
<td><strong>B) K Factor (weighted average, by area, for all site soils)</strong></td>
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<td>The soil-erodibility factor K represents: (1) susceptibility of soil or surface material to erosion, (2) transportability of the sediment, and (3) the amount and rate of runoff given a particular rainfall input, as measured under a standard condition. Fine-textured soils that are high in clay have low K values (about 0.05 to 0.15) because the particles are resistant to detachment. Coarse-textured soils, such as sandy soils, also have low K values (about 0.05 to 0.2) because of high infiltration resulting in low runoff even though these particles are easily detached. Medium-textured soils, such as a silt loam, have moderate K values (about 0.25 to 0.45) because they are moderately susceptible to particle detachment and they produce runoff at moderate rates. Soils having a high silt content are especially susceptible to erosion and have high K values, which can exceed 0.45 and can be as large as 0.85. Silt-size particles are easily detached and tend to crust, producing high rates and large volumes of runoff. Use Site-specific data must be submitted.</td>
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<td>Site-specific K factor guidance</td>
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<td>K Factor Value</td>
<td>0.21</td>
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<tr>
<td><strong>C) LS Factor (weighted average, by area, for all slopes)</strong></td>
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<tr>
<td>The effect of topography on erosion is accounted for by the LS factor, which combines the effects of a hillslope-length factor, L, and a hillslope-gradient factor, S. Generally speaking, as hillslope length and/or hillslope gradient increase, soil loss increases. As hillslope length increases, total soil loss and soil loss per unit area increase due to the progressive accumulation of runoff in the downslope direction. As the hillslope gradient increases, the velocity and erosivity of runoff increases. Use the LS table located in separate tab of this spreadsheet to determine LS factors. Estimate the weighted LS for the site prior to construction.</td>
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<td>LS Factor Value</td>
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<tr>
<td>9</td>
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<tr>
<td><strong>Watershed Erosion Estimate (=RxKxLS) in tons/acre</strong></td>
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<td>45.1</td>
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<tr>
<td><strong>Site Sediment Risk Factor</strong></td>
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<td>Medium</td>
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<tr>
<td>Low Sediment Risk: &lt; 15 tons/acre</td>
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<tr>
<td>Medium Sediment Risk: &gt;=15 and &lt;75 tons/acre</td>
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<tr>
<td>High Sediment Risk: &gt;= 75 tons/acre</td>
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Combined Risk Level Matrix

<table>
<thead>
<tr>
<th>Receiving Water Risk</th>
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<th>Medium</th>
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Project Sediment Risk: Medium  
Project RW Risk: Low  
Project Combined Risk: Level 2
Rainfall Erosivity Factor Calculator for Small Construction Sites

Facility Information

Facility Name: MCP
Start Date: 01/02/2016
End Date: 12/31/2019
Latitude: 33.8386
Longitude: -117.1197

Erosivity Index Calculator Results

AN EROSIVITY INDEX VALUE OF 47.81 HAS BEEN DETERMINED FOR THE CONSTRUCTION PERIOD OF 01/02/2016 - 12/31/2019.

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

Start Over
### Water Quality Storm Depth for C=1.0 & 48-hr drawdown

**Safety Factor:** 0.70 in/area

**F-215 Alignment**

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<th>Basin Depth (ft)</th>
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### MCP Alignment

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Water Quality Storm Depth for C=1.0 & 48-hr drawdown: 0.76 in/area  
Safety Factor: 1.5 (accounts for berm grading)
## Water Quality Storm Depth for C=1.0 & 48-hr drawdown:
- **0.73 in/area**

**Safety Factor:** 1.5 (accounts for berm grading)

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### Storm Water BMP Cost Summary

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<tr>
<th>Total Treatment BMP Costs</th>
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<tr>
<td>Total Design Pollution Prevention BMP Costs</td>
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<tr>
<td><strong>Total Permanent Storm Water BMP Costs</strong></td>
<td><strong>$32,300,500</strong></td>
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- **Subtotal Soil Stabilization BMPs**: $ -
- **Subtotal Sediment Control BMPs**: $ -
- **Subtotal Wind Erosion Control BMPs**: $ -
- **Subtotal Tracking Control BMPs**: $ -
- **Subtotal Waste Management & Materials Handling BMPs**: $ -
- **Subtotal Non-Storm Water Management**: $ -
- **Subtotal Miscellaneous Items**: $ -

| Total Construction Site BMP Costs | $20,000,000 |

**TOTAL COST FOR STORM WATER BMPs**: $52,300,500

**Note**: Please enter data in the fields shaded on this and the following pages. The totals will be reflected on this sheet automatically.
# Storm Water BMP Cost Summary

## Treatment BMPs

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<th>BEES</th>
<th>Pollution Prevention BMPs Appendix A</th>
<th>PPDG (#, Y or N)</th>
<th>SSP/nSSP (Y or N)</th>
<th>STD. Det. (Y or N)</th>
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<th>Unit</th>
<th>Unit Cost ($/Unit)</th>
<th>Cost ($)</th>
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**Total Treatment BMP Costs**  
$16,914,000

## Design Pollution Prevention BMPs

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<th>Unit Cost ($/Unit)</th>
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<td>- Preservation of Existing Vegetation</td>
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**Total Design Pollution Prevention BMP Costs**  
$15,386,500

**Total Permanent Storm Water BMP Costs**  
$32,300,500
## Temporary Construction Site BMPs

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<td>Geotextiles, Mats/Plastic Covers and Erosion Control Blankets</td>
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**Subtotal Soil Stabilization BMPs**: $
## Storm Water BMP Cost Summary

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<th>Std. Det. (Y or N)</th>
<th>Quantity</th>
<th>Unit</th>
<th>Unit Cost ($/Unit)</th>
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**Subtotal Sediment Control BMPs**

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**Subtotal Wind Erosion Control BMPs**

<table>
<thead>
<tr>
<th>ID</th>
<th>BEES</th>
<th>Temporary Tracking Control</th>
<th>SSP/nSSP (#, Y or N)</th>
<th>Std. Det. (Y or N)</th>
<th>Quantity</th>
<th>Unit</th>
<th>Unit Cost ($/Unit)</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>TC-1</td>
<td>074033</td>
<td>Stabilized Constr. Entrance/Exit</td>
<td>07-480</td>
<td>Yes</td>
<td>EA</td>
<td>$</td>
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<tr>
<td>TC-2</td>
<td>074033</td>
<td>Stabilized Construction Roadway</td>
<td>07-481</td>
<td>Yes</td>
<td>LS</td>
<td>$</td>
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<tr>
<td>TC-3</td>
<td>074033</td>
<td>Entrance/Outlet Tire Wash</td>
<td></td>
<td>No</td>
<td>EA</td>
<td>$</td>
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**Subtotal Tracking Control BMPs**

<table>
<thead>
<tr>
<th>ID</th>
<th>BEES</th>
<th>Temporary Waste Management Control</th>
<th>SSP/nSSP (#, Y or N)</th>
<th>Std. Det. (Y or N)</th>
<th>Quantity</th>
<th>Unit</th>
<th>Unit Cost ($/Unit)</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>WM-1</td>
<td>CSM*</td>
<td>Material Delivery and Storage</td>
<td>07-346</td>
<td>No</td>
<td>LS</td>
<td>$</td>
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<td>WM-2</td>
<td>CSM*</td>
<td>Material Use</td>
<td>07-346</td>
<td>No</td>
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<td>$</td>
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<td>WM-3</td>
<td>CSM*</td>
<td>Stockpile Management</td>
<td>07-346</td>
<td>No</td>
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<td>WM-4</td>
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<td>WM-9</td>
<td>CSM*</td>
<td>Temporary Concrete Washout</td>
<td>07-405</td>
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<td>WM-10</td>
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<td>WM-11</td>
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<td>Grinding PCC (Displ of PCC Pavent Grooving &amp; Grinding Residues)</td>
<td>42-600</td>
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<td>WM-12</td>
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<td>WM-13</td>
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<td>No</td>
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**Subtotal Waste Management & Materials Handling BMPs**

<table>
<thead>
<tr>
<th>ID</th>
<th>BEES</th>
<th>Temporary Non-Storm Water Management</th>
<th>SSP/nSSP (#, Y or N)</th>
<th>Std. Det. (Y or N)</th>
<th>Quantity</th>
<th>Unit</th>
<th>Unit Cost ($/Unit)</th>
<th>Cost</th>
</tr>
</thead>
</table>

---

Construction Site BMPs

Page 2 of 3

5Jul05
## Storm Water BMP Cost Summary

| NS-1  | CSM* | Water Conservation Practices | 07-346 | No | LS | $ - |
| NS-2  | CSM* | Dewatering Operations | 07-341 | No | LS | $ - |
| NS-3  | CSM* | Paving & Grinding Operations | 07-346 | No | LS | $ - |
|       |      | Pavements | S5-250 | No | ft² | $ - |
| NS-4  |      | Temporary Stream Crossing | 07-495 | No | LS | $ - |
| NS-5  |      | Clear Water Diversion | 07-346 | No | LS | $ - |
| NS-6  | CSM* | Illicit Connection/Illlegal Discharge Detection and Reporting | 07-346 | No | LS | $ - |
| NS-7  | CSM* | Potable Water/Irrigation | 07-346 | No | LS | $ - |
| NS-8  | CSM* | Vehicle and Equipment Cleaning | 07-346 | No | LS | $ - |
| NS-9  | CSM* | Vehicle and Equipment Fueling | 07-346 | No | LS | $ - |
| NS-10 | CSM* | Vehicle and Equipmt Maintenance | 07-346 | No | LS | $ - |
| NS-11 | CSM* | Pile Driving Operations | 07-346 | No | LS | $ - |
| NS-12 | CSM* | Concrete Curing | 07-346 | No | LS | $ - |
| NS-13 | CSM* | Material & Equipmt use over water | 07-346 | No | LS | $ - |
| NS-14 | CSM* | Concrete Finishing | 07-346 | No | LS | $ - |
| NS-15 | CSM* | Structure Demolition/Removal Over or Adjacent to Water | 07-346 | No | LS | $ - |
| NS-16 |      | Temporary Batch Plants | 07-346 | No | LS | $ - |
| NS-17 |      | Streambank Stabilization | 07-346 | No | LS | $ - |
|      | CSM* | *Construction Site Management | 07-346 | No | LS | $ - |

**Subtotal Non-Storm Water Management** $ -

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<th>ID</th>
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<th>SSP/nSSP (#, Y or N)</th>
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<td>Prepare Water Pollution Control Program</td>
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<td>Storm Water Sampling and Analysis Payments (&lt; 1 acre)</td>
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<td>Rain Event Action Plan</td>
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<td>Storm Water Annual Report</td>
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<td>074058</td>
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**Subtotal Miscellaneous Items** $ -

**Total Construction Site BMP Costs** $ 20,000,000

At PA&ED phase, Construction Site BMP costs are estimated based on 1.25% of total project cost (1.6 B) per Table F-3 PPDG 2010

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**Construction Site BMPs**

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5Jul05
# Checklist SW-1, Site Data Sources

MCP 0.0/16.3  EA 0F3200  
PM: I-215 28.0/34.3  Project ID (or EA): PN 0800000125  RWQCB: Santa Ana Region 8

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.

<table>
<thead>
<tr>
<th>DATA CATEGORY/SOURCES</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Topographic</strong></td>
<td></td>
</tr>
<tr>
<td>USGS Topo Quad Maps</td>
<td>January 3, 2011</td>
</tr>
</tbody>
</table>
Checklist SW-2, Storm Water Quality Issues Summary

MCP 0.0/16.3  EA 0F3200
PM : I-215 28.0/34.3  Project ID (or EA): PN 0800000125  RWQCB; Santa Ana Region 8

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

1. Determine the receiving waters that may be affected by the project throughout the project life cycle (i.e., construction, maintenance and operation).
   - Complete  NA

2. For the project limits, list the 303(d) impaired receiving water bodies and their constituents of concern.
   - Complete  NA

3. Determine if there are any municipal or domestic water supply reservoirs or groundwater percolation facilities within the project limits. Consider appropriate spill contamination and spill prevention control measures for these new areas.
   - Complete  NA

4. Determine the RWQCB special requirements, including TMDLs, 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. List rainy season dates.
   - Complete  NA

8. Determine the general climate of the project area. Identify annual rainfall and rainfall intensity curves.
   - Complete  NA

9. If considering Treatment BMPs, determine the soil classification, permeability, erodibility, and depth to groundwater.
   - Complete  NA

10. Determine contaminated soils within the project area.
    - Complete  NA

11. Determine the total disturbed soil area of the project.
    - Complete  NA

12. Describe the topography of the project site.
    - Complete  NA

13. List any areas outside of the Caltrans right-of-way that will be included in the project (e.g. contractor’s staging yard, work from barges, easements for staging, etc.).
    - Complete  NA

14. Determine if additional right-of-way acquisition or easements and right-of-entry will be required for design, construction and maintenance of BMPs. If so, how much?
    - Complete  NA

15. Determine if a right-of-way certification is required.
    - Complete  NA

16. Determine the estimated unit costs for right-of-way should it be needed for Treatment BMPs, stabilized conveyance systems, lay-back slopes, or interception ditches.
    - Complete  NA

17. Determine if project area has any slope stabilization concerns.
    - Complete  NA

18. Describe the local land use within the project area and adjacent areas.
    - Complete  NA

19. Evaluate the presence of dry weather flow.
    - Complete  NA
Checklist SW-3, Measures for Avoiding or Reducing Potential Storm Water Impacts

MCP 0.0/16.3 EA 0F3200
PM: I-2.5 28.0/34.3 Project ID (or EA): PN 0800000125 RWQCB: Santa Ana Region 8

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

Caltrans Storm Water Quality Handbooks
Project Planning and Design Guide
July 2010
## Consideration of Design Pollution Prevention BMPs

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

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>No</th>
<th>NA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Will project increase velocity or volume of downstream flow?</td>
<td>☑</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Will the project discharge to unlined channels?</td>
<td>☑</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Will project increase potential sediment load of downstream flow?</td>
<td>☑</td>
<td></td>
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</tr>
<tr>
<td>Will project encroach, cross, realign, or cause other hydraulic changes to a stream that may affect downstream channel stability?</td>
<td>☑</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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**

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>No</th>
<th>NA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Will project create new slopes or modify existing slopes?</td>
<td>☑</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

**Concentrated Flow Conveyance Systems**

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>No</th>
<th>NA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Will the project create or modify ditches, dikes, berms, or swales?</td>
<td>☑</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Will project create new slopes or modify existing slopes?</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Will it be necessary to direct or intercept surface runoff?</td>
<td>☑</td>
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<td></td>
</tr>
<tr>
<td>Will cross drains be modified?</td>
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</tr>
</tbody>
</table>

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.

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

Checklist DPP-1, Part 2

MCP 0.0/16.3 EA OF3200
PM: I-215 28.0/34.3 Project ID (or EA): PN 0800000125 RWQCB: Santa Ana Region 8

Downstream Effects Related to Potentially Increased Flow

1. Review total paved area and reduce to the maximum extent practicable.

2. Review channel lining materials and design for stream bank erosion control.
   (a) See Chapters 860 and 870 of the HDM.
   (b) Consider channel erosion control measures within the project limits as well as downstream. Consider scour velocity.

3. Include, where appropriate, energy dissipation devices at culvert outlets.

4. Ensure all transitions between culvert outlets/headwalls/wingwalls and channels are smooth to reduce turbulence and scour.

5. Include, if appropriate, peak flow attenuation basins or devices to reduce peak discharges.

Complete

Caltrans Storm Water Quality Handbooks
Project Planning and Design Guide
July 2010
Design Pollution Prevention BMPs
Checklist DPP-1, Part 3

MCP 0.0/16.3 EA 0F3200
PM: I-215 28.0/34.3 Project ID (or EA): PN 0800000125 RWQCB: Santa Ana Region 8

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)?
   If Yes, District Landscape Architect must prepare or approve an erosion control plan, at the District's discretion.
   □ Yes ☒ No

6. Are new or disturbed slopes > 2:1 (h:v)?
   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).
   □ Yes ☒ No

7. Estimate the net new impervious area that will result from this project. 447.5 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.

Review appropriate SSPs for Vegetated Surface and Hard Surface Protection Systems.
Design Pollution Prevention BMPs
Checklist DPP-1, Part 4

Prepared by: T. Guo Date: Mar. 11, 2011 District-Co-Route: 08-RIV-MCP/L-215
MCP 0.0/16.3 EA OF3200
PM: I-215 28.0/34.3 Project ID (or EA): PN 0800000125 RWQCB: Santa Ana Region 8

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.
2. Evaluate risks due to erosion, overtopping, flow backups or washout.
3. Consider outlet protection where localized scour is anticipated.
4. Examine the site for run-on from off-site sources.
5. Consider channel lining when velocities exceed scour velocity for soil.

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

Flared Culvert End Sections
1. Consider flared end sections on culvert inlets and outlets as per Chapter 827 of the HDM.

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.

Review appropriate SSPs for Concentrated Flow Conveyance Systems.
Design Pollution Prevention BMPs
Checklist DPP-1, Part 5

MCP 0.0/16.3 EA 0F3200
PM: I-215 28.0/34.3 Project ID (or EA): PN 08000000125 RWQCB: Santa Ana Region 8

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
### Treatment BMPs

#### Checklist T-1, Part 1

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<td>MCP 0.0/16.3</td>
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<td>Project ID (or EA): PN 0800000125</td>
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<td>PM: I-215 28.0/34.3</td>
<td>RWQCB: Santa Ana Region 8</td>
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#### 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

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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 □ Yes □ No

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

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

   □ Yes □ No

   (b) Based on site conditions, estimate what percentage of the WQV 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.

   □ Complete

   ___ < 20%
   ____ 20% - 50%
   ____ 50% - 90%
   ____ > 90%

   (c) Is infiltration greater than 90 percent? If Yes, skip to question 13.

   □ Yes □ No

1 A complete methodology for determining WQV infiltration is available at: http://www.dot.ca.gov/hq/oppd/stormwtr/index.htm
(d) Can the infiltration ranking in question 5(b) above be increased by using soil amendments? Use the 'drain time' associated with the amended soil (the 12-hour WQV for Type A and B soils, the 24-hour WQV for Type C soils\(^2\)).

If Yes, consider including soil amendments; increasing the infiltration ranking allows more flexibility in the selection of BMP's (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%

\(\checkmark\) Complete

(e) Is infiltration greater than 90 percent? If Yes, skip to question 13.

\[\square\text{Yes} \quad \square\text{No}\]

6. Biofiltration in Rural Areas

Is the project in a rural area (outside of urban areas that is covered under an NDPES Municipal Stormwater Permit\(^3\)). If Yes proceed to question 13.

\[\square\text{Yes} \quad \square\text{No}\]

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.

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

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\(^2\) Type D soils are not expected where amendments are incorporated.

\(^3\) See pages 39 and 40 of the Fact Sheets for the CGP.


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

(Use 24 hr WQV)

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

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

Yes □ No □

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

Earthen Detention Basin (use 48 hr WQV) Earthen Austin SF (use 48 hr WQV)

- < 20%
- x 20% - 50%
- □ > 50%

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.

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

- □ sediments
- □ phosphorus
- □ nitrogen
- □ copper (dissolved or total)
- □ lead (dissolved or total)
- □ zinc (dissolved or total)
- □ general metals (dissolved or total)¹

(b) Treating Sediment. Is sediment a TDC? If Yes, use Matrix A to select BMPs, then skip to question 12. Otherwise, proceed to question 9.

Yes □ No □

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

Consider approaches to treat the remaining WQV with combinations of the BMPs in this table. The PE should select at least one BMP for the project; preference is for Tier 1 BMPs, followed by Tier 2 BMPs when Tier 1 BMPs are not feasible. Within each Tier, BMP selection will be determined by the site-specific determination of feasibility (Section 2.4.2.1). BMPs are chosen based on the infiltration category determined in question 7. BMPs in other categories should be ignored.

<table>
<thead>
<tr>
<th>Infiltration Category</th>
<th>Tier 1</th>
<th>Tier 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 20%</td>
<td>Strip: HRT &gt; 5&lt;br&gt;Austin filter (concrete)&lt;br&gt;Austin filter (earthen)&lt;br&gt;Delaware filter&lt;br&gt;MCTT&lt;br&gt;Wet basin</td>
<td>Strip: HRT &lt; 5&lt;br&gt;Biofiltration Swale&lt;br&gt;Detention (unlined)</td>
</tr>
<tr>
<td>20% - 50%</td>
<td>Austin filter (earthen)&lt;br&gt;Detention (unlined)&lt;br&gt;Infiltration basins*&lt;br&gt;Infiltration trenches*&lt;br&gt;Biofiltration Strip</td>
<td>Austin filter (concrete)&lt;br&gt;Delaware filter&lt;br&gt;Biofiltration Swale&lt;br&gt;MCTT&lt;br&gt;Wet basin</td>
</tr>
<tr>
<td>&gt; 50%</td>
<td>Austin filter (earthen)&lt;br&gt;Detention (unlined)&lt;br&gt;Infiltration basins*&lt;br&gt;Infiltration trenches*&lt;br&gt;Biofiltration Strip</td>
<td>Austin filter (concrete)&lt;br&gt;Delaware filter&lt;br&gt;Biofiltration Swale&lt;br&gt;MCTT&lt;br&gt;Wet basin</td>
</tr>
</tbody>
</table>

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 [x] 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 [x] No
BMP Selection Matrix B: Any metal is the TDC, but not nitrogen or phosphorous

Consider approaches to treat the remaining WQV with combinations of the BMPs in this table. The PE should select at least one BMP for the project; preference is for Tier 1 BMPs, followed by Tier 2 BMPs when Tier 1 BMPs are not feasible. Within each Tier, BMP selection will be determined by the site-specific determination of feasibility (Section 2.4.2.1). BMPs are chosen based on the infiltration category determined in question 7. BMPs in other categories should be ignored.

<table>
<thead>
<tr>
<th>Tier</th>
<th>Infiltration &lt; 20%</th>
<th>Infiltration 20% - 50%</th>
<th>Infiltration &gt; 50%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MCTT</td>
<td>Austin filter (earthen) Detention (unlined) Infiltration basins* Infiltration trenches*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Wet basin</td>
<td></td>
<td>MCTT Biofiltration Strip</td>
</tr>
<tr>
<td></td>
<td>Austin filter (concrete)</td>
<td></td>
<td>Biofiltration Swale Wet basin</td>
</tr>
<tr>
<td></td>
<td>Delaware filter</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tier 2</td>
<td>Strip: HRT &gt; 5</td>
<td>Austin filter (concrete) Delaware filter Biofiltration Strip</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Strip: HRT &lt; 5</td>
<td></td>
<td>Biofiltration Swale</td>
</tr>
<tr>
<td></td>
<td>Biofiltration Swale Detention (unlined)</td>
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HRT = hydraulic residence time (min)
*Infiltration BMPs that infiltrate the water quality volume were considered previously, so only undersized infiltration BMPs or hybrid designs are considered where infiltration is less than 90% of the water quality volume.

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

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**BMP Selection Matrix C: Phosphorous and/or nitrogen is the TDC, but no metals are the TDC**

Consider approaches to treat the remaining WQV with combinations of the BMPs in this table. The PE should select at least one BMP for the project; preference is for Tier 1 BMPs, followed by Tier 2 BMPs when Tier 1 BMPs are not feasible. Within each Tier, BMP selection will be determined by the site-specific determination of feasibility (Section 2.4.2.1). BMPs are chosen based on the infiltration category determined in question 7. BMPs in other categories should be ignored.

<table>
<thead>
<tr>
<th>Infiltration &lt; 20%</th>
<th>Infiltration 20% - 50%</th>
<th>Infiltration &gt; 50%</th>
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</thead>
<tbody>
<tr>
<td>Tier 1</td>
<td></td>
<td></td>
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<tr>
<td>Austin filter (earthen)</td>
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<td></td>
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<tr>
<td>Austin filter (concrete)</td>
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<td></td>
</tr>
<tr>
<td>Delaware filter**</td>
<td>Austin filter (earthen)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Detention (unlined)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Infiltration basins*</td>
<td></td>
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<tr>
<td></td>
<td>Infiltration trenches*</td>
<td></td>
</tr>
<tr>
<td>Tier 2</td>
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<td></td>
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<tr>
<td>Wet basin</td>
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<tr>
<td>Biofiltration Strip</td>
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<tr>
<td>Biofiltration Swale</td>
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<tr>
<td>Detention (unlined)</td>
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<tr>
<td>Austin filter (concrete)</td>
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<td>Delaware filter</td>
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<td>Biofiltration Strip</td>
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<tr>
<td>Biofiltration Swale</td>
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<tr>
<td>Wet basin</td>
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<tr>
<td>** 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.</td>
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<tr>
<td>** Delaware filters would be ranked in Tier 2 if the TDC is nitrogen only, as opposed to phosphorous only or both nitrogen and phosphorous.</td>
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**BMP Selection Matrix D: Any metal, plus phosphorous and/or nitrogen are the TDCs**

Consider approaches to treat the remaining WQV with combinations of the BMPs in this table. The PE should select at least one BMP for the project; preference is for Tier 1 BMPs, followed by Tier 2 BMPs when Tier 1 BMPs are not feasible. Within each Tier, BMP selection will be determined by the site-specific determination of feasibility (Section 2.4.2.1). BMPs are chosen based on the infiltration category determined in question 7. BMPs in other categories should be ignored.

<table>
<thead>
<tr>
<th>Tier 1</th>
<th>Infiltration &lt; 20%</th>
<th>Infiltration 20% - 50%</th>
<th>Infiltration &gt; 50%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wet basin*</td>
<td>Wet basin*</td>
<td>Wet basin*</td>
<td></td>
</tr>
<tr>
<td>Austin filter (earthen)</td>
<td>Austin filter (earthen)</td>
<td>Detention (unlined)</td>
<td></td>
</tr>
<tr>
<td>Austin filter (concrete)</td>
<td>Infiltration basins***</td>
<td>Infiltration trenches***</td>
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<tr>
<td>Delaware filter**</td>
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<thead>
<tr>
<th>Tier 2</th>
<th>Infiltration &lt; 20%</th>
<th>Infiltration 20% - 50%</th>
<th>Infiltration &gt; 50%</th>
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<tbody>
<tr>
<td>Biofiltration Strip</td>
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<td>Biofiltration Swale</td>
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<td>Detention (unlined)</td>
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<td>Delaware filter</td>
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* 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.

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)
   - ☑ 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
   ☑ Complete

14. Estimate what percentage of WQV (or WQF, depending upon the Treatment BMP selected) will be treated by the preferred Treatment BMP(s): 74.8 %
   ☑ 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): 114.8 %
   ☑ Complete

16. Prepare cost estimate, including right-of-way, and site specific determination of feasibility (Section 2.4.2.1) for selected Treatment BMPs and include as supplemental information for SWDR approval.
   ☑ Complete
Treatment BMPs
Checklist T-1, Part 2

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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

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

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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
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. Per survey data or U.S. Geological Survey (USGS) Quad Map, are existing slopes at the proposed device site >15%?  ☐Yes  ☒No

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

5. 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.

6. (a) Does site have groundwater within 10 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 6, the RWQCB must be consulted, and the RWQCB must conclude that the groundwater quality will not be compromised, before approving the site for infiltration.

7. Does adequate area exist within the right-of-way to place Infiltration Device(s)?  ☒Yes  ☐No

   If "Yes", continue to Design Elements sections. If "No", continue to Question 8.

8. If adequate area does not exist within right-of-way, can suitable, additional right-of-way be acquired to site Infiltration Devices and how much right-of-way would be needed to treat WQV? _________ acres

   If Yes, continue to Design Elements section.
   If No, continue to Question 9.

9. If adequate area cannot be obtained, document in Section 5 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 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 a detailed 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 overflow spillway with scour protection been provided? *
   □ Yes   □ No

3. Is the Infiltration Basin size sufficient to capture the WQV while maintaining a 40-48 hour drawdown time? (Note: the WQV must be \( \geq 4,356 \text{ ft}^3 \) [0.1 acre-feet]) *
   □ Yes   □ No

4. Can access be placed 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.1.3.1)? *
   □ 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 the Infiltration Basin? **
   □ 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

* Required Design Element – (see definition above)

** Recommended Design Element – (see definition above)

1. Has a detailed 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 or B? *
   □ Yes   □ No

3. Is the volume of the Infiltration Trench equal to at least the 2.85x the WQV, while maintaining a drawdown time of \( \leq 96 \) hours? It is recommended to use a drawdown time between 40 and 48 hours. (Note: the WQV must be \( \geq 4,356 \text{ ft}^3 \) [0.1 acre-feet], unless the District/Regional NPDES Storm Water Coordinator will allow a volume between 2,830 \( \text{ ft}^3 \) and 4,356 \( \text{ ft}^3 \) to be considered.) *
   □ Yes   □ No

4. Is the depth of the Infiltration Trench \( \leq 13 \) 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)? *
   □ Yes   □ No

8. Can flow diversion be designed, constructed, and maintained to bypass flows exceeding the Water Quality event? **
   □ Yes   □ No

9. Can a perimeter curb or similar device be provided (to limit wheel loads upon the trench)? **
   □ Yes   □ No
## Treatment BMPs
### Checklist T-1, Part 5

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<td>PM :I-215 28.0/34.3</td>
<td>Project ID (or EA): PN 0800000125</td>
<td>RWQCB: Santa Ana Region 8</td>
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### Detention Devices

#### Feasibility

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

2. 2a) Is the volume of the Detention Device equal to at least the WQV? (Note: the WQV must be ≥ 4,356 ft³ [0.1 acre-feet])  
   - Yes □ No □
   
   Only answer (b) if the Detention Device is being used also to capture traction sand.

2b) Is the total volume of the Detention Device at least equal to the WQV plus the anticipated volume of traction sand, while maintaining a minimum 12 inch freeboard (1 ft)?  
   - Yes □ No □

3. Is basin invert ≥ 10 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.

4. Does adequate area exist within the right-of-way to place Detention Device(s)?  
   - Yes □ No □
   
   If Yes, continue to the 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 Detention Device(s) and how much right-of way 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 5 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. Has the geotechnical integrity of the site been evaluated to determine potential impacts to surrounding slopes due to incidental infiltration? If incidental infiltration through the invert of an unlined Detention Device is a concern, consider using an impermeable liner. *

2. Has the location of the Detention Device been evaluated for any effects to the adjacent roadway and subgrade? *

3. Can a minimum freeboard of 12 inches be provided above the overflow event elevation? *

4. Is an overflow outlet provided? *

5. Is the drawdown time of the Detention Device within 24 to 72 hours with 40-hrs the preferred design drawdown time? *

6. Is the basin outlet designed to minimize clogging (minimum outlet orifice diameter of 0.5 inches)? *

7. Are the inlet and outlet structures designed to prevent scour and re-suspension of settled materials, and to enhance quiescent conditions? *

8. Can vegetation be established in an earthen basin at the invert and on the side slopes for erosion control and to minimize re-suspension? Note: Detention Basins may be lined, in which case no vegetation would be required for lined areas.*

9. Has sufficient access for Maintenance been provided? *

10. 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.)

11. If significant sediment is expected from nearby slopes, can the Detention Device be designed with additional volume equal to the expected annual loading? **

12. Is flow path as long as possible (≥ 2:1 length to width ratio at WQV elevation is recommended)? **
Media Filters

Caltrans has approved two types of Media Filter: Austin Sand Filters and Delaware Filters. Austin Sand filters are typically designed for larger drainage areas, while Delaware Filters are typically designed for smaller drainage areas. 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. See Appendix B, Media Filters, for a further description of Media Filters.

Feasibility – Austin Sand Filter

1. Is the volume of the Austin Sand Filter equal to at least the WQV using a 24 hour drawdown? (Note: the WQV must be ≥ 4,356 ft³ [0.1 acre-feet])
   - Yes [ ] No [ ]

2. Is there sufficient hydraulic head to operate the device (minimum 3 ft between the inflow and outflow chambers)?
   - Yes [ ] No [ ]

3. If initial chamber has an earthen bottom, is initial chamber invert ≥ 3 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 right-of-way to place an Austin Sand Filter(s)?
   - Yes [ ] No [ ]
   - If Yes, continue to Design Elements sections. If No, continue to Question 6.

6. If adequate area does not exist within right-of-way, can suitable, additional right-of-way be acquired to site the device and how much right-of-way would be needed to treat WQV? ________ 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 5 of the SWDR that the inability to obtain adequate area prevents the incorporation of this Treatment BMP into the project.
   - Yes [ ] No [ ]
   - If an Austin Sand Filter meets these feasibility requirements, continue to the Design Elements – Austin Sand Filter below.
   - Complete [ ]
Feasibility - Delaware Filter

1. Is the volume of the Delaware Filter equal to at least the WQV using a 40 to 48 hour drawdown? (Note: the WQV must be ≥ 4,356 ft³ [0.1 acre-feet], consult with District/Regional Design Storm Water Coordinator if a lesser volume is under consideration.)
   □ Yes □ No

2. Is there sufficient hydraulic head to operate the device (minimum 3 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, is used.
   □ Yes □ No

If No to any question, then a Delaware Filter is not feasible

4. Does adequate area exist within the right-of-way to place a Delaware Filter (s)?
   If Yes, continue to Design Elements sections. If No, continue to Question 5.
   □ Yes □ No

5. If adequate area does not exist within right-of-way, can suitable, additional right-of-way be acquired to site the device and how much right-of-way would be needed to treat WQV? ________ acres
   If Yes, continue to the Design Elements section. If No, continue to Question 6.
   □ Yes □ No

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 this Treatment BMP into the project.
   □ Complete

7. Does the project discharge to a waterbody that has been placed on the 303-d list or has had a TMDL adopted for bacteria, mercury, sulfides, or low dissolved oxygen?
   If yes, contact the Regional/District NPDES Storm Water 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 a Delaware Filter is still under consideration, continue to the Design Elements – Delaware Filter section.
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 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. Is the drawdown time of the 2nd chamber 24 hours? *
   □ 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? **

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 9.
   □ Yes □ No

7. Is the Austin Sand Filter invert separated from the seasonally high groundwater table by ≥ 10 ft)? *
   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. Is maximum depth ≤ 13 ft below ground surface? *
   □ Yes □ No

10. Can the Austin Sand Filter be placed in an offline configuration? **
    □ 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 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. Is the drawdown time of the 2nd chamber between 40 and 48 hours, typically 40-hrs? *
   - 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 ≤ 13 ft below ground surface? *
   - Yes [ ] No [ ]
Treatment BMPs
Checklist T-1, Part 9
MCP 0.0/16.3  EA 0F3200
PM: I-215 28.0/34.3  Project ID (or EA): PN 0800000125  RWQCB: Santa Ana Region 8

MCTT (Multi-chambered Treatment Train)

Feasibility

1. Is the proposed location for the MCTT located to serve a "critical source area" (i.e. vehicle service facility, parking area, paved storage area, or fueling station)?
   □ Yes  □ No

2. Is the WQV ≥ 4,346 ft³ [0.1 acre-foot]?
   □ Yes  □ No

3. Is there sufficient hydraulic head (typically ≥ 6 feet) to operate the device?
   □ Yes  □ No

4. 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 be allowed.
   □ Yes  □ No
   If No to any question above, then an MCTT is not feasible.

5. Does adequate area exist within the right-of-way to place an MCTT(s)?
   If Yes, continue to Design Elements sections. If No, continue to Question 6.
   □ Yes  □ No

6. If adequate area does not exist within right-of-way, can suitable, additional right-of-way be acquired to site the device and how much right-of-way would be needed to treat WQV?
   ___________ 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 5 of the SWDR that the inability to obtain adequate area prevents the incorporation of this Treatment BMP into the project.
   □ Complete

8. Does the project discharge to a waterbody that has been placed on the 303-d list or has had a TMDL adopted for bacteria, mercury, sulfides, low dissolved oxygen, or odors?
   If yes, contact the Regional/District NPDES Storm Water 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.
   □ Yes  □ No

Caltrans Storm Water Quality Handbooks
Project Planning and Design Guide
July 2010
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. Is the maximum depth of the 3rd chamber ≤ 13 ft below ground surface and has Maintenance accepted this depth? *  
   - Yes □  No □

2. Is the drawdown time in the 3rd chamber between 24 and 48 hours, typically designed for 24-hrs? *  
   - Yes □  No □

3. Is access for Maintenance vehicles provided to all chambers of the MCTT? *  
   - Yes □  No □

4. Is there sufficient hydraulic head to operate the device? *  
   - Yes □  No □

5. Has a bypass/overflow been provided for storms > WQV? *  
   - Yes □  No □

6. Can pretreatment be provided to capture sediment and litter in the runoff (such as using vegetation)? **  
   - Yes □  No □
Wet Basin

Feasibility

1. Is the volume of the Wet Basin above the permanent pool equal to at least the WQV using a 24 to 96 hour drawdown (40 to 48 hour drawdown preferred)? (Note: the WQV must be ≥ 4,356 ft³ [0.1 acre-feet] and the permanent pool must be at least 3x the WQV.)
   - Yes
   - No

2. Is a permanent source of water available in sufficient quantities to maintain the permanent pool for the Wet Basin?
   - Yes
   - No

3. Is proposed site in a location where naturally occurring wetlands do not exist?
   - Yes
   - No

Answer either question 4 or question 5:

4. For Wet Basins with a proposed invert above the seasonally high groundwater, Are NRCS Hydrologic Soil Groups [HSG] C and D at the proposed invert elevation, or can an impermeable liner be used? (Note: If an impermeable liner is used, the seasonally high groundwater elevation must not encroach within 12 inches of the invert.)
   - Yes
   - No

5. For Wet Basins with a proposed invert below the groundwater table: Can written approval from the local Regional Water Quality Control Board be obtained to place the Wet Basin in direct hydraulic connectivity to the groundwater?
   - Yes
   - No

6. Is freeboard provided ≥ 1 foot?
   - Yes
   - No

7. Is the maximum impoundment volume < 14.75 acre-feet?
   - Yes
   - No

8. Would a permanent pool of water be allowed by the local vector control agency? If No to any question above, then a Wet Basin is not feasible.
   - Yes
   - No

9. Is the maximum basin width ≤ 49 ft as suggested in Section B.10.2? If No, consult with the local vector control agency and District Maintenance.
   - Yes
   - No
10. Does adequate area exist within the right-of-way to place a Wet Basin? □Yes □No

   If Yes, continue to Design Elements sections.
   If No, continue to Question 11.

11. If adequate area does not exist within right-of-way, can suitable, additional right-of-way be acquired to site the device and how much right-of-way would be needed to treat WQV? _______ acres

   If Yes, continue to Design Elements section.
   If No, continue to Question 12.

12. Have the appropriate state and federal regulatory agencies been contacted to discuss location and potential to attract and harbor sensitive or endangered species? □Yes □No

   If No, contact the Regional/District NPDES Coordinator

13. If adequate area cannot be obtained, document in Section 5 of the SWDR that the inability to obtain adequate area prevents the incorporation of this Treatment BMP into the project. □Complete

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

   If yes, contact the Regional/District NPDES Storm Water 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.
**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. Can a controlled outlet and an overflow structure be designed for storm events larger than the Water Quality event? *
   - [ ] Yes
   - [ ] No

2. Is access for Maintenance vehicles provided? *
   - [ ] Yes
   - [ ] No

3. Is the drawdown time for the WQV between 24 and 96 hours? *
   - [ ] Yes
   - [ ] No

4. Has appropriate vegetation been selected for each hydrologic zone? *
   - [ ] Yes
   - [ ] No

5. Can all design elements required by the local vector control agency be incorporated? *
   - [ ] Yes
   - [ ] No

6. Has a minimum flow path length-to-width ration of at least 2:1 been provided? **
   - [ ] Yes
   - [ ] No

7. Has an upstream bypass been provided for storms > WQV? **
   - [ ] Yes
   - [ ] No

8. Can pretreatment be provided to capture sediment and litter in the runoff (such as using vegetation, or a forebay)? **
   - [ ] Yes
   - [ ] No

9. Can public access be restricted using a fence if proposed at locations accessible on foot by the public? **
   - [ ] Yes
   - [ ] No

10. Is the maximum depth < 10 ft?"
ALTERNATIVE 9
MCP SEGMENT 1
TO BE CONSTRUCTED
BY OTHERS