Appendix D. Water Quality Management Plan

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Water Quality Management Plan (WQMP)

Project Name:

French Hotel Property
City Project Number: CUP 22-001
31861 Camino Capistrano
APN: 121-150-28, -29 & -30
AC22-002, CUP22-001, GPM22-003

Prepared for:

31861-31871 Camino Capistrano QOZB LLC, A California Limited Liability Company
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Job #24-044



Prepared on: 10/09/2025

Project Owner's Certification			
Permit/Application No.	CUP 22-001	Grading Permit No.	TBA
Tract/Parcel Map No.	Tract 103	Building Permit No.	TBA
CUP, SUP, and/or APN (Specify Lot Numbers if Portions of Tract)			APN: 121-150-28, -29 & -30

This Water Quality Management Plan (WQMP) has been prepared for 31861-31871 Camino Capistrano QOZB LLC, A California Limited Liability Company by C3 Civil Engineering, LLC. The WQMP is intended to comply with the requirements of the local NPDES Stormwater Program requiring the preparation of the plan.

The undersigned, while it owns the subject property, is responsible for the implementation of the provisions of this plan and will ensure that this plan is amended as appropriate to reflect up-to-date conditions on the site consistent with the current Orange County Drainage Area Management Plan (DAMP) and the intent of the non-point source NPDES Permit for Waste Discharge Requirements for the County of Orange, Orange County Flood Control District and the incorporated Cities of Orange County within the San Diego Region (South Orange County). Once the undersigned transfers its interest in the property, its successors-in-interest shall bear the aforementioned responsibility to implement and amend the WQMP. An appropriate number of approved and signed copies of this document shall be available on the subject site in perpetuity.

Owner/Developer: Dan Almquist			
Title	Manager		
Company	31861-31871 Camino Capistrano QOZB LLC, A California Limited Liability Company		
Address	31801 Paseo Adelanto, San Juan Capistrano, CA 92675		
Email	dan@frontierrei.com		
Telephone #	(949) 354-5600		
Signature		Date	

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Section 1 Discretionary Permit(s) and Water Quality Conditions

Project Infomation			
Permit/Application No.	CUP22-001	Site Address or Tract/Parcel Map No.	31861 Camino Capistrano, San Juan Capistrano, CA 92675
Additional Information/ Comments:	N/A		
Water Quality Conditions			
Water Quality Conditions from prior approvals or applicable watershed-based plans	The project is priority project based on the SOC TGD Section 1.2.3 classification: 2. New and redevelopment projects that create and/or replace 5,000 square feet or more of impervious surface (collectively over the entire project site), and consist primarily of one or more of the following uses. 4. Parking lots. This category is defined as a land area or facility for the temporary parking or storage of motor vehicles used personally, for business, or for commerce. 5. New or redevelopment projects that result in the disturbance of one or more acres of total land (impervious and pervious) and are expected to generate pollutants post-construction.		

Section 2 Project Description

2.1 General Description

Description of Proposed Project		
Site Location	The project is located at 31841, 31843 & 31871 Camino Capistrano in San Juan Capistrano. It is bound by existing commercial/retail property to the north, El Adobe de Capistrano restaurant to the south, Camino Capistrano to the east, and train tracks and Los Rios Street to the west.	
Project Area (ft^2): 73,140	Number of Dwelling Units: N/A	SIC Code: 7011-Hotels and Motels
Narrative Project Description:	The project is located within the South Orange County Permit Area. The existing site improvements include 2 existing buildings to remain along Camino Capistrano (La Casa de Garcias), one wood frame barn to be relocated and integrated into the final project, two barns (one wood framed and one metal framed) to be demolished, a paved parking area and driveway, and mature landscaping. The site is host to two Adobe structures (the Domingo Yorba and Manuel Garcia Adobes) listed on the National Register of Historic Places (NRHP). The proposed project will be redeveloped with a new luxury hotel development. The 2-story Manuel Garcia adobe will be brought back to its previous 1880's use as a hotel. West of the adobe, a one-story building will be constructed with a basement for kitchen and event usage. A three-wing 2-story hotel is situated on the west end around the hotel pool and spa. An existing one-story building on the eastern property line will be renovated for future use. Lastly, a four-story car lift will be constructed for guest parking at the luxury hotel. The existing site improvements will be demolished except for the two existing adobes/buildings along the eastern property line adjacent to Camino Capistrano. The total site area is 73,140sf. Driveway opening/closings are the only offsite improvements proposed with this project, aside from frontage/parkway improvements. One street light easement will be relocated. Loading docks and outdoor material storage areas are <u>not</u> included with the proposed development.	

Project Area (73,100 sf – total area)	Pervious		Impervious	
	Area (sq ft)	Percentage	Area (sq ft)	Percentage
Pre-Project Conditions	41,100	56.2%	32,000	43.8%
Post-Project Conditions	15,720	21.5%	57,420	78.5%

2.2 Post Development Drainage Characteristics

The proposed development will maintain the overall drainage pattern by discharging runoff to the south across the properties downstream of the site as it does historically. Ultimately, storm water runoff will discharge into the City of San Juan Capistrano public storm drain system at Del Obispo and Camino Capistrano, tributary to San Juan Creek (an engineered channel), then ultimately into the Pacific Ocean. See the project's Drainage Study for more details.

2.3 Property Ownership/Management

The site is currently owned by 31871 Camino Capistrano LLC, a California Limited Liability Company. It will be privately owned, and long-term stormwater maintenance will be the responsibility of the owner. All BMP's within the project will be privately owned. No drainage infrastructure will be transferred to any public agencies. There is potential for onsite water and sewer improvements to be owned by Santa Margarita Water District (SWMD).

Section 3 Site & Watershed Characterization

3.1 Site Conditions

3.1.1 Existing Site Conditions

Site Characteristics	
Hydrogeologic (Groundwater) Conditions	Based on the geotechnical report by GMU Engineers & Geologists, groundwater was not encountered to a depth of 15 feet below existing grade. Their report estimates the seasonal high groundwater at 82 Mean Sea Level (MSL).
Geotechnical Conditions (relevant to infiltration)	The soils report conducted multiple infiltration tests at tested depths of 8.5' below the existing grade. The infiltration test tested on the west side of the property ranged from 1.13-2.01 in/hr. The infiltration rates tested in the central of the property ranged from 1.44-4.32 in/hr factor of safety will be added for design purposes, but the recommended unfactored infiltration rate used for design is 1.44"/hr.
Off-Site Drainage	There are no offsite areas that discharge run-on to the project.
Utility and Infrastructure Information	Water utilities are available within Camino Capistrano. Sewer utilities are located onsite in an existing easement. There is no public storm drain systems within the adjacent roadways or onsite.
Topography	Moderately sloping, with slopes from 1-5%.
Drainage Patterns/Connections	The existing site is sloped from east to southwest to the southwest corner of the site. Storm water runoff sheet flows across vacant land to a low spot at the SWC of the site, with flows continuing to the adjacent property to the south. From the adjacent property, runoff continues to the south across several properties before discharging into the City's public storm drain on Del Obispo near the intersection with Camino Capistrano. This storm drain system is connected to San Juan Creek, an engineered channel, and ultimately discharges into the Pacific Ocean. Runoff from the roof of the historic buildings along Camino Capistrano discharges into the public street. Once in the street, runoff is conveyed via curb and gutter south on Camino Capistrano to a public catch basin at the corner of Del Obispo and Camino Capistrano.

Soil Type, Geology, and Infiltration Properties	Two separate infiltration tests was performed. The first infiltration test consisted of the excavation of 5 test pits with a backhoe to a maximum depth of 8.7 feet. The subsurface investigation encountered disturbed soil and/or undocumented artificial fill to a maximum depth of about 2 feet which is underlain by older alluvial materials. Infiltration testing was conducted within the older alluvial materials encountered at the bottom of the test pits (i.e., at depths ranging from about 8.3 to 8.7 feet below the ground surface). The materials where infiltration testing was conducted consist of yellowish brown, fine to medium grained silty sand. Where observed, the materials were damp to moist and medium dense. The second infiltration test consisted of the excavation of three test pits with a backhoe to a maximum depth of 8.0 feet. The purpose of the additional texting was to locate soils that appear suitable for infiltration and obtain infiltration for the encountered materials.
Existing Site Condition	The existing site improvements include 2 existing buildings to remain along Camino Capistrano (La Casa de Garcias), one wood frame barn to be relocated offsite, two barns (one wood framed and one metal framed) to be demolished, a paved parking area and driveway, and mature landscaping.

Existing Land Uses				
Land Use Description	Total Area (acres)	Impervious Area (acres)	Pervious Area (acres)	Imperviousness (%)
Business Commercial District	1.678	0.735	0.943	43.8
Total	1.678	0.735	0.943	43.8

3.1.2 Infiltration-Related Characteristics

Per the soils report prepared for the project, existing groundwater was not encountered to a depth of approximately 15ft below grade. Based on the infiltration rates from the soils report, infiltration is feasible at a depth of 8 feet below existing grade. See the infiltration testing report in Attachment E for more details.

3.1.2.1 Hydrogeologic Conditions

Per the soils report, groundwater was not encountered to a depth of approximately 15ft below surface grade during the test borings. The historic high groundwater is estimated at an elevation of 81 MSL or approximately 18-20' below the existing ground surface.

3.1.2.2 Soil and Geologic Infiltration Characteristics

The soils report conducted eight infiltration tests (open pit falling head procedure). Five infiltration test were conducted at a tested depth of 8.3-8.7ft below the existing grade. The resulting infiltration rates were calculated between 1.13-2.01 in/hr. Three infiltration tests were conducted at a tested depth of 7-8 feet below existing grate. The resulting infiltration rates were calculated between 1.44-4.32 in/hr. After adding a factor of safety, infiltration is feasible for this project at a depth of 8-9ft below existing grades.

3.1.2.3 Geotechnical Conditions

Recent infiltration testing was performed consisting of the excavation of 8 test pits with a backhoe to a maximum depth of 8.7 feet. The subsurface investigation encountered disturbed soil and/or undocumented artificial fill to a maximum depth of about 2 feet which is underlain by older alluvial materials. Infiltration testing was conducted within the older alluvial materials encountered at the bottom of the test pits (i.e., at depths ranging from about 8.3 to 8.7 feet below the ground surface). The materials where infiltration testing was conducted consist of yellowish brown, fine to medium grained silty sand. Where observed, the materials were damp to moist and medium dense.

3.1.2.4 Summary of Infiltration Opportunities and Constraints of Existing Site

As noted above, based on site characteristics, infiltration is a feasible option for BMP's for the project's development. And without a public storm drain system within the vicinity of the project, drainage design will be constrained to surface runoff from the site.

3.2 Proposed Site Development Activities

Please reference the WQMP plan in the Appendix for the proposed development showing land use, topography, drainage features, and landscape areas.

3.2.1 Overview of Site Development Activities

The proposed project will be redeveloped with a new luxury hotel development. The 2-story Manuel Garcia adobe will be brought back to its previous 1880's use as a hotel. West of the adobe, a one-story building will be constructed with a basement for kitchen and event usage. A three-wing 2-story hotel is situated on the west end around the hotel pool and spa. An existing one-story building on the eastern property line will be renovated for future use. Lastly, a four-story car lift will be constructed for guest parking at the luxury hotel.

The existing site improvements will be demolished except for the two existing adobes/buildings along the eastern property line adjacent to Camino Capistrano.

The total site area is 73,100sf.

Driveway opening/closings improvements are the only offsite improvements proposed with this project, aside from frontage/parkway improvements.

3.2.2 Project Attributes Influencing Stormwater Management

The proposed buildings will be used for hotel purposes (7011-Hotels and Motels).

There will be no truck docks, loading docks, fueling areas, and vehicle cleaning areas.

There are no outdoor food preparation areas planned for this project site.

There are no outdoor material storage areas planned for this project site.

There are no offsite areas that discharge run-on to the project site.

There are no environmentally sensitive areas within the property.

Outdoor activities include pedestrians walking and sitting in the outdoor pool area.

The proposed development will generate waste and a SWPPP report will be in place for the site during construction. Waste management and Hazardous Waste Management procedures and precautions will be implemented per the SWPPP report. The site will generate wastes such as PCC rubble, sediment, fill material, etc.

Construction materials will be delivered and stored per BMP WM-1 as specified in the project SWPPP report. The general material storage area will be located in the Contractor's yard as shown on the Erosion Control Plan in the project SWPPP report (with the Final WQMP). Very large items, such as light standards, framing, stockpiled lumber, will be stored in the open in the general storage area.

Proposed Land Uses

Land Use Description	Total Area (acres)	Impervious Area (acres)	Pervious Area (acres)	Imperviousness (%)
Business Commercial District	1.678	1.318	0.360	78.5%
Total	1.678	1.318	0.360	78.5%

3.2.3 Effects on Infiltration and Harvest and Use Feasibility

Infiltration is feasible for the site. Based on the drought tolerant landscaping that is proposed, the DCV cannot be used for site irrigation within 48hrs of the end of precipitation, therefore, Harvest and Use BMP's are not mandatory for the project and not required.

3.3 Receiving Waterbodies

Receiving Waters	The project is located in the San Juan Creek Watershed. The proposed project will discharge runoff onto the adjacent property. All the runoff from the site is eventually collected into a storm drain system at Del Obispo Street and Camino Capistrano. This public storm drain system is tributary to San Juan Creek, which is tributary to the Pacific Ocean.
303(d) Listed Impairments	1. San Juan Creek: Benthic Community Effects, DDE, Nitrogen, Oxygen (dissolved), Phosphorus, Selenium, Toxicity, Bifentrhin, Pyrethroids, Indicator Bacteria 2. Pacific Ocean Shoreline, Lower San Juan HAS, at San Juan Creek: Indicator Bacteria
Applicable TMDLs	1. San Juan Creek: Benthic Community Effects, DDE, Nitrogen, Oxygen (dissolved), Phosphorus, Selenium, Toxicity, Alkalinity as $CaCO_3$, Aluminum, Ammonia, Ammonia (unionized), Anthracene, Arsenic, Benzo(a)anthracene, Benzo(a)pyrene, Cadmium, Chlordane, Chloride, Chlorpyrifos, Chromium, Chrysene (C1-C4), Copper, Cyfluthrin, Cyhalothrin (Lambda), Cypermethrin, DDD, DDT, Deltramethrin, Diazinon, Dieldrin, Endrin, Esfenvalerate/Fenvalerate, Fenpropathrin, Fipronil, Fipronil Sulfide, Fipronil Sulfone, Fluoranthene, Fluorene, Iron, Lead, Lindane/gamma Hexachlorocyclohexane (gamma-HCH), Mercury, Methyl Parathion, Naphthalene, Nickel, PAHs, PCBs, Permethrin, Phenanthrene, Pyrene, Silver, Total DDT (sum of 4,4'- and 2,4'- isomers of DDT, DDE, and DDD), Total Dissolved Solids, Turbidity, Zinc, pH, Bifentrhin, Pyrethroids, Indicator Bacteria, Malathion, Manganese, Sulfates, Temperature (water) 2. Pacific Ocean Shoreline, Lower San Juan HAS, at San Juan Creek: Indicator Bacteria, Cadmium, Chloropyrifos, Copper, Diazinon, Lead, Malathion, Nickel, Selenium, Silver, Zinc
Pollutants of Concern for the Project	Suspended Solid/Sediments, Heavy metals, pathogens, oil & grease, toxic organic compounds, trash & debris. (Nutrients, Pesticides-Not anticipated since all landscape will be drought tolerant and landscape will be depressed)
Environmentally Sensitive and Special Biological Significant Areas	This project is not directly adjacent to or discharges directly into an ESA. San Juan Creek is listed on the 303 (d) listed, however per the WQMP TGD, the site is discharging into the City storm drain in Del Obispo Street and Camino Capistrano which comingles with downstream flows prior to discharging to the ESA. Therefore, the site is not susceptible to the requirements of discharging to an ESA.

3.4 Stormwater Pollutants or Conditions of Concern

Pollutants or Conditions of Concern				
Pollutant	Expected from Proposed Land Uses/ Activities (Yes or No)	Receiving Waterbody Impaired (Yes or No)	Priority Pollutant from WQIP or other Water Quality Condition? (Yes or No)	Pollutant of Concern (Primary, Other, or No)
Suspended-Solids	Yes	No	Yes	Primary
Nutrients	Yes	Yes	Yes	No
Heavy Metals	Yes	Yes	No	Primary
Bacteria/Virus/Pathogens	Yes	Yes	Yes	Primary
Pesticides	Yes	Yes	Yes	No
Oil and Grease	Yes	No	No	Other
Toxic Organic Compounds	Yes	Yes	Yes	Primary
Trash and Debris	Yes	No	Yes	Primary
Dry Weather Runoff	Yes	No	Yes	Primary

3.5 Hydrologic Conditions of Concern

Does a hydrologic condition of concern exist for this project?

As provided in the attachment, and as located on the Orange County HCOC Map, the project is located within an HCOC exempt area.

☒ No – An HCOC does not exist for this receiving water because:

☐ Project discharges directly to a protected conveyance (bed and bank are concrete lined the entire way from the point(s) of discharge to a receiving lake, reservoir, embayment, or the Ocean

☐ Project discharges directly to storm drains which discharge directly to a reservoir, lake, embayment, ocean or protected conveyance (as described above)

☒ The project discharges to an area identified in the WMAA as exempt from hydromodification concerns

☐ Yes – An HCOC does exist for this receiving water because none of the above are applicable.

Repeat this checklist for each different receiving water to which the project would discharge.

3.6 Critical Coarse Sediment Yield Areas

Critical coarse sediment provisions do not apply to projects that are HCOC exemption, per WQMP TGD Sections 2.3.1.3 & 2.3.5. San Juan Creek is not susceptible to coarse sediment yield.

Section 4 Site Plan and Drainage Plan

4.1 Drainage Management Area Delineation

The developed drainage pattern is consistent with the existing drainage pattern.

The proposed development has two storm water discharge locations from the site.

DMA A consists of 0.054 acres which has approximately 100% impervious land cover. This land area includes the public sidewalk along Camino Capistrano. A portion of runoff from the residential home, which is not a part of the project, also flows towards Camino Capistrano in this DMA. Runoff is conveyed in the curb and gutter to the south where it is collected in a public catch basin at the intersection of Camino Capistrano and Del Obispo Street. Runoff from this area cannot be feasibly captured as part of the project and will maintain its existing drainage pattern.

DMA B consists of 1.347 acres encompassing all the proposed buildings and drive aisle. Two grated inlets are proposed in the middle of the northerly and southerly property line to capture all storm water runoff. Roof drains from all buildings will be collected and piped to the nearest underground storm drain system. From the two grated inlets, stormwater will be piped into a series of three underground infiltration basins for water quality treatment and stormwater will infiltrate back into the native soil. The system is designed to capture the 100-year 24 hour storm. The underground infiltrations basin includes a gravel cover and base. The system is designed to infiltrate the 100-year 24 hour storm within 72-hrs. If the design storm is exceeded, or the system clogs due to lack of maintenance, storm water will overflow out of the two catch basins and find relief through a curb cut adjacent to the catch basins. From the curb cut, stormwater will flow along a landscape swale to the SWC of the property. From this location, runoff would follow the existing drainage pattern across the properties to the south, where it ultimately discharges to Del Obispo Street. Ultimately, this runoff is collected in the public storm drain system in Del Obispo Street. The storm drain main in Del Obispo St. is connected to the storm drain system at the intersection of Camino Capistrano and Del Obispo.

DMA C consists of 0.200 acres of the proposed pool and spa area of the hotel. Stormwater will be captured by a series of atrium drains that will be piped to an underground infiltration basin for water quality treatment and stormwater will infiltrate back into the native soil. The system is designed to capture the 100-year 24 hour storm. The underground infiltrations basin includes a gravel cover and base. The system is designed to infiltrate the 100-year 24 hour storm within 72-hrs. If the design storm is exceeded, or the system clogs due to lack of maintenance, storm water will overflow out of the two catch basins and find relief through a curb cut adjacent to the catch basins. From the curb cut, stormwater will flow along a landscape swale to the SWC of the property. From this location, runoff would follow the existing drainage pattern across the properties to the south, where it ultimately discharges to Del Obispo Street. Ultimately, this runoff is collected in the public storm drain system in Del Obispo Street. The storm drain main in Del Obispo St. is connected to the storm drain system at the intersection of Camino Capistrano and Del Obispo.

DMA D consists of 0.078 acres of at-grade landscape areas (100% pervious) along the westerly property line. Runoff in this area will mostly infiltrate into the native soils since the design infiltration rate is approximately 0.70"/hr.

Ultimately, this runoff is collected in the public storm drain system in Del Obispo Street. The storm drain main in Del Obispo St. is connected to the storm drain system at the intersection of Camino Capistrano and Del Obispo.

See Attachment C for the project's drainage map.

GPS coordinates for each BMP can be found on the WQMP Exhibit in Attachment C.

Trash capture devices will be implemented at each grated inlet, utilizing the FLEXSTORM full trash capture.

4.2 Overall Site Design BMPs

Minimize Impervious Area – N/A, project is almost entirely constructed on a podium.

Maximize Natural Infiltration Capacity- Infiltration is promoted in the underground infiltration system.

Preserve Existing Drainage Patterns and Time of Concentration -The proposed site will maintain the overall existing drainage pattern.

Disconnect Impervious Areas- Runoff from the podium will discharge into the landscaping along the western side of the site.

Protect Existing Vegetation and Sensitive Areas- N/A.

Revegetate Disturbed Areas –The existing landscape onsite will be removed, and new planting areas will be installed. All areas disturbed shall be revegetated within the proposed designated landscape areas.

Soil Stockpiling and Site Generated Organics- An erosion control plan will be provided in the Final WQMP.

Firescaping- The overall site will be completely developed, and drought tolerant plants will be installed at designed landscape areas. Landscape planters are not proposed directly adjacent to the building, providing additional fireproofing measures.

Water Efficient Landscaping- Drought tolerant planting will be designed for in the landscape areas and shall meet local jurisdiction requirements.

Slopes and Channel Buffers- Not required as the entire site will be completely developed. No exposed channels or slopes.

4.3 DMA Characteristics and Site Design BMPs

4.3.1 DMA A

DMA A consists of 0.054 acres which has approximately 100% impervious land cover. This land area includes the public sidewalk along Camino Capistrano and a small portion of the existing driveway. A portion of runoff from the residential home, which is not being disturbed as part of the project, also sheet flows towards Camino Capistrano in this DMA. Runoff is conveyed in the curb and gutter to the south where it is collected in a public catch basin at the intersection of Camino Capistrano and Del Obispo Street. Runoff from this area cannot be feasibly captured as part of the project and will maintain its existing drainage pattern. In addition, projects are not required to treat run-off from the sidewalk along project frontages. The only reason this area is included as

a DMA is because the land has not been dedicated in fee to the city and it is unreasonable to require treatment of this area.

4.3.2 DMA B

DMA B consists of 1.347 acres encompassing all the proposed buildings and drive aisle. See the description above for proposed improvements.

The proposed underground infiltration system has a total water storage of 19,522 cf in this area is proposed for this DA.

See Attachment C for design plans.

Sizing: See Worksheet 1 for infiltration feasibility and Worksheet 3 for Factor of Safety Design Rate for DMA B in the Attachments.

For this DMA, the DCV is V_{design} = 3,187 cf (per Worksheet 5 in Attachments)

Volume of BMP provided = 19,433 cf > 3,187 cf

Therefore, the proposed Underground Infiltration System is sufficient as treatment for this drainage area.

4.3.3 DMA C

DMA C consists of 0.200 acres of the proposed pool and spa area of the hotel. See the description above for proposed improvements.

The proposed underground infiltration system has a total water storage of 1,550 cf in this area is proposed for this DA.

See Attachment C for design plans.

Sizing: See Worksheet 1 for infiltration feasibility and Worksheet 3 for Factor of Safety Design Rate for DMA B in the Attachments.

For this DMA, the DCV is V_{design} = 464 cf (per Worksheet 5 in Attachments)

Volume of BMP provided = 1,550 cf > 464 cf

Therefore, the proposed Underground Infiltration System is sufficient as treatment for this drainage area.

4.3.4 DMA D

DMA D consists of 0.078 acres which has approximately 100% pervious land cover. This area includes the at-grade landscape areas at the lower level of the podium project. Runoff in this area will infiltrate into the native soils since the design infiltration rate is higher than 0.2"/hr per HSC-06. The landscape area is considered self-retaining since no runoff volume is anticipated for the 85th percentile 24-hr storm.

4.3.4 DMA Summary

Drainage Management Areas				
DMA (Number/Description)	Total Area (acres)	Imperviousness (%)	Infiltration Feasibility Category (Full, Partial, or No Infiltration)	Hydrologic Source Controls Used
A	0.054	89	No Infiltration	None
B	1.347	85	Full Infiltration	HSC-2
C	0.02	57	Full Infiltration	HSC-2
D	0.078	0	Full Infiltration	HSC-6

4.4 Source Control BMPs

Non-Structural Source Control BMPs				
Identifier	Name	Check One		Reason Source Control is Not Applicable
		Included	Not Applicable	
N1	Education for Property Owners, Tenants and Occupants	☒	☐	
N2	Activity Restrictions	☒	☐	
N3	Common Area Landscape Management	☒	☐	
N4	BMP Maintenance	☒	☐	
N5	Title 22 CCR Compliance (How development will comply)	☐	☒	No hazardous materials will be stored or generated onsite.
N6	Local Industrial Permit Compliance	☐	☒	No local permit
N7	Spill Contingency Plan	☐	☒	No hazardous materials will be stored or generated onsite.
N8	Underground Storage Tank Compliance	☐	☒	None onsite.

N9	Hazardous Materials Disclosure Compliance	☐	☒	No hazardous materials will be stored or generated onsite.
N10	Uniform Fire Code Implementation	☐	☒	No hazardous materials will be stored or generated onsite.
N11	Common Area Litter Control	☒	☐	
N12	Employee Training	☒	☐	
N13	Housekeeping of Loading Docks	☐	☒	No loading docks proposed.
N14	Common Area Catch Basin Inspection	☒	☐	
N15	Street Sweeping Private Streets and Parking Lots	☒	☐	
N16	Retail Gasoline Outlets	☐	☒	No gasoline outlets as part of project

Structural Source Control BMPs				
Identifier	Name	Check One		Reason Source Control is Not Applicable
		Included	Not Applicable	
S1	Provide storm drain system stenciling and signage	☒	☐	
S2	Design and construct outdoor material storage areas to reduce pollution introduction	☐	☒	No outdoor material storage for this project
S3	Design and construct trash and waste storage areas to reduce pollution introduction	☒	☐	
S4	Use efficient irrigation systems & landscape design, water conservation, smart controllers, and source control	☒	☐	
S5	Protect slopes and channels and provide energy dissipation	☐	☒	None on site
	Incorporate requirements applicable to individual priority project categories (from SDRWQCB NPDES Permit)	☐	☐	
S6	Dock areas	☐	☒	None on-site
S7	Maintenance bays	☐	☒	None on site
S8	Vehicle wash areas	☐	☒	None on site
S9	Outdoor processing areas	☐	☒	None on site
S10	Equipment wash areas	☐	☒	None on site
S11	Fueling areas	☐	☒	None on site
S12	Hillside landscaping	☐	☒	None on site
S13	Wash water control for food preparation areas	☐	☒	None on site
S14	Community car wash racks	☐	☒	None on site

Section 5 Low Impact Development BMPs

5.1 LID BMPs in DMA A

As noted in Section 4, this DMA does not include any BMP's since the sidewalk in front of the project cannot be feasibly captured and the residential house is not part of the project and cannot be disturbed based on an agreement with the resident.

5.1.1 Hydrologic Source Controls for DMA A

None applied to this area.

5.1.2 Structural LID BMP for DMA A

None applied to this area.

5.2 LID BMPs in DMA B

As noted in Section 4, an underground detention BMP will be used for this DMA. See section 4 for details and the Attachments for calculations.

5.2.1 Hydrologic Source Controls for DMA B

None applied to this area.

5.2.2 Structural LID BMP for DMA B

Underground Infiltration (INF-6)

An Underground Infiltration is a vault or chamber with an open bottom that is used to store runoff and percolate into the subsurface.

The runoff is piped to the underground system from upstream inlets and roof drains. Full Trash Captures will be inserted in each of the upstream inlets to minimize any potential clogging by removing pollutants. See Section 4.3.2 for calculations.

If the underground infiltration experiences slower infiltration rates or higher flow volumes, or the system clogs due to lack of maintenance, storm water will overflow out of the two catch basins and find relief through a curb cut adjacent to the catch basins. From the curb cut, stormwater will flow along a landscape swale to the SWC of the property.

The DMA is not self-retaining.

5.3 LID BMPs in DMA C

As noted in Section 4, an underground detention BMP will be used for this DMA. See section 4 for details and the Attachments for calculations.

5.3.1 Hydrologic Source Controls for DMA C

None applied to this area.

5.3.2 Structural LID BMP for DMA C

Underground Infiltration (INF-6)

An Underground Infiltration is a vault or chamber with an open bottom that is used to store runoff and percolate into the subsurface.

The runoff is piped to the underground system from upstream inlets and roof drains. Full Trash Captures will be inserted in each of the upstream inlets to minimize any potential clogging by removing pollutants. See Section 4.3.2 for calculations.

If the underground infiltration experiences slower infiltration rates or higher flow volumes, or the system clogs due to lack of maintenance, storm water will overflow out of the two catch basins and find relief through a curb cut adjacent to the catch basins. From the curb cut, stormwater will flow along a landscape swale to the SWC of the property.

The DMA is not self-retaining.

5.4 LID BMPs in DMA D

As noted in Section 4, this DMA does not include any BMP's since it is considered self-retaining.

5.4.1 Hydrologic Source Controls for DMA D

HSC-6 (Self-Retaining Area)

Landscape area has a soil infiltration rate that exceeds 0.2 inches per hour and is not anticipated to produce runoff greater than the 85th percentile 24'hr storm.

5.4.2 Structural LID BMP for DMA D

No Structural LID required.

5.4 Summary of LID BMPs

DMA	BMP	$V_{Required}$ (cf)	ZSA_{DESIGN} (cf)
A	-	-	-
B	Underground Infiltration	**19,522**	**7,290**
C	Underground Infiltration	**1,550**	**464**
D	Self- Retaining Area	-	-

Section 6 Hydromodification BMPs

Project is exempt from HCOCs.

Section 7 Educational Materials Index

Educational Materials			
Residential Material (http://www.ocwatersheds.com)	Check If Applicable	Business Material (http://www.ocwatersheds.com)	Check If Applicable
The Ocean Begins at Your Front Door	☒	Tips for the Automotive Industry	☐
Tips for Car Wash Fund-raisers	☐	Tips for Using Concrete and Mortar	☒
Tips for the Home Mechanic	☐	Tips for the Food Service Industry	☒
Homeowners Guide for Sustainable Water Use	☐	Proper Maintenance Practices for Your Business	☒
Household Tips	☐	Compliance BMPs for Mobile Businesses	☐
Proper Disposal of Household Hazardous Waste	☒	Other Material	Check If Attached
Recycle at Your Local Used Oil Collection Center (North County)	☐		
Recycle at Your Local Used Oil Collection Center (Central County)	☐	Building Maintenance	☒
Recycle at Your Local Used Oil Collection Center (South County)	☐	Concrete and Asphalt Production, Application and Cutting	☐
Tips for Maintaining a Septic Tank System	☐	Parking and Storage Area Maintenance	☒
Responsible Pest Control	☒	Spill Prevention and Clean-up	☒
Sewer Spill	☐	Fire Sprinkler Maintenance	☒
Tips for the Home Improvement Projects	☐	Eating and Drinking Establishments	☒
Tips for Horse Care	☐		☐
Tips for Landscaping and Gardening	☒		☐
Tips for Pet Care	☐		☐
Tips for Projects Using Paint	☐		☐

Attachment A: Educational Materials

The Ocean Begins at Your Front Door



Follow these simple steps to help reduce water pollution:

Household Activities

- Do not rinse spills with water. Use dry cleanup methods such as applying cat litter or another absorbent material, sweep and dispose of in the trash. Take items such as used or excess batteries, oven cleaners, automotive fluids, painting products and cathode ray tubes, like TVs and computer monitors, to a Household Hazardous Waste Collection Center (HHWCC).
- For a HHWCC near you call (714) 834-6752 or visit www.oclandfills.com.
- Do not hose down your driveway, sidewalk or patio to the street, gutter or storm drain. Sweep up debris and dispose of it in the trash.

Automotive

- Take your vehicle to a commercial car wash whenever possible. If you wash your vehicle at home, choose soaps, cleaners, or detergents labeled non-toxic, phosphate- free or biodegradable. Vegetable and citrus-based products are typically safest for the environment.
- Do not allow washwater from vehicle washing to drain into the street, gutter or storm drain. Excess washwater should be disposed of in the sanitary sewer (through a sink or toilet) or onto an absorbent surface like your lawn.
- Monitor your vehicles for leaks and place a pan under leaks. Keep your vehicles well maintained to stop and prevent leaks.
- Never pour oil or antifreeze in the street, gutter or storm drain. Recycle these substances at a service station, a waste oil collection center or used oil recycling center. For the nearest Used Oil Collection Center call 1-800-CLEANUP or visit www.1800cleanup.org.

Pool Maintenance

- Pool and spa water must be dechlorinated and free of excess acid, alkali or color to be allowed in the street, gutter or storm drain.
- When it is not raining, drain dechlorinated pool and spa water directly into the sanitary sewer.
- Some cities may have ordinances that do not allow pool water to be disposed of in the storm drain. Check with your city.

Landscape and Gardening

- Do not over-water. Water your lawn and garden by hand to control the amount of water you use or set irrigation systems to reflect seasonal water needs. If water flows off your yard onto your driveway or sidewalk, your system is over-watering. Periodically inspect and fix leaks and misdirected sprinklers.
- Do not rake or blow leaves, clippings or pruning waste into the street, gutter or storm drain. Instead, dispose of waste by composting, hauling it to a permitted landfill, or as green waste through your city's recycling program.
- Follow directions on pesticides and fertilizer, (measure, do not estimate amounts) and do not use if rain is predicted within 48 hours.
- Take unwanted pesticides to a HHWCC to be recycled. For locations and hours of HHWCC, call (714) 834-6752 or visit www.oclandfills.com.

Trash

- Place trash and litter that cannot be recycled in securely covered trash cans.
- Whenever possible, buy recycled products.
- Remember: Reduce, Reuse, Recycle.

Pet Care

- Always pick up after your pet. Flush waste down the toilet or dispose of it in the trash. Pet waste, if left outdoors, can wash into the street, gutter or storm drain.
- If possible, bathe your pets indoors. If you must bathe your pet outside, wash it on your lawn or another absorbent/permeable surface to keep the washwater from entering the street, gutter or storm drain.
- Follow directions for use of pet care products and dispose of any unused products at a HHWCC.

Common Pollutants

Home Maintenance

- Detergents, cleaners and solvents
- Oil and latex paint
- Swimming pool chemicals
- Outdoor trash and litter

Lawn and Garden

- Pet and animal waste
- Pesticides
- Clippings, leaves and soil
- Fertilizer

Automobile

- Oil and grease
- Radiator fluids and antifreeze
- Cleaning chemicals
- Brake pad dust

The Ocean Begins at Your Front Door



Never allow pollutants to enter the street, gutter or storm drain!

Did You Know?

- Most people believe that the largest source of water pollution in urban areas comes from specific sources such as factories and sewage treatment plants. In fact, the largest source of water pollution comes from city streets, neighborhoods, construction sites and parking lots. This type of pollution is sometimes called “non-point source” pollution.
- There are two types of non-point source pollution: stormwater and urban runoff pollution.
- Stormwater runoff results from rainfall. When rainstorms cause large volumes of water to rinse the urban landscape, picking up pollutants along the way.
- Urban runoff can happen any time of the year when excessive water use from irrigation, vehicle washing and other sources carries trash, lawn clippings and other urban pollutants into storm drains.

Where Does It Go?

- Anything we use outside homes, vehicles and businesses – like motor oil, paint, pesticides, fertilizers and cleaners – can be blown or washed into storm drains.
- A little water from a garden hose or rain can also send materials into storm drains.
- Storm drains are separate from our sanitary sewer systems; unlike water in sanitary sewers (from sinks or toilets), water in storm drains is not treated before entering our waterways.

Sources of Non-Point Source Pollution

- Automotive leaks and spills.
- Improper disposal of used oil and other engine fluids.
- Metals found in vehicle exhaust, weathered paint, rust, metal plating and tires.
- Pesticides and fertilizers from lawns, gardens and farms.
- Improper disposal of cleaners, paint and paint removers.
- Soil erosion and dust debris from landscape and construction activities.
- Litter, lawn clippings, animal waste, and other organic matter.
- Oil stains on parking lots and paved surfaces.



The Effect on the Ocean



Non-point source pollution can have a serious impact on water quality in Orange County. Pollutants from the storm drain system can harm marine life as well as coastal and wetland habitats. They can also degrade recreation areas such as beaches, harbors and bays.

Stormwater quality management programs have been developed throughout Orange County to educate and encourage the public to protect water quality, monitor runoff in the storm drain system, investigate illegal dumping and maintain storm drains.

Support from Orange County residents and businesses is needed to improve water quality and reduce urban runoff pollution. Proper use and disposal of materials will help stop pollution before it reaches the storm drain and the ocean.



For More Information

Orange County Stormwater Program

California Environmental Protection Agency
www.calepa.ca.gov

- **Air Resources Board**
  www.arb.ca.gov
- **Department of Pesticide Regulation**
  www.cdpr.ca.gov
- **Department of Toxic Substances Control**
  www.dtsc.ca.gov
- **Integrated Waste Management Board**
  www.ciwmb.ca.gov
- **Office of Environmental Health Hazard Assessment**
  www.oehha.ca.gov
- **State Water Resources Control Board**
  www.waterboards.ca.gov

Earth 911 - Community-Specific Environmental Information 1-800-cleanup or visit www.1800cleanup.org

Health Care Agency's Ocean and Bay Water Closure and Posting Hotline
(714) 433-6400 or visit www.ocbeachinfo.com

Integrated Waste Management Dept. of Orange County (714) 834-6752 or visit www.oclandfills.com for information on household hazardous waste collection centers, recycling centers and solid waste collection

O.C. Agriculture Commissioner
(714) 447-7100 or visit www.ocagcomm.com

Stormwater Best Management Practice Handbook
Visit www.cabmphandbooks.com

UC Master Gardener Hotline
(714) 708-1646 or visit www.uccemg.com

The Orange County Stormwater Program has created and moderates an electronic mailing list to facilitate communications, take questions and exchange ideas among its users about issues and topics related to stormwater and urban runoff and the implementation of program elements. To join the list, please send an email to ocstormwaterinfo-join@list.ocwatersheds.com

Aliso Viejo	(949) 425-2535
Anaheim Public Works Operations	(714) 765-6860
Brea Engineering	(714) 990-7666
Buena Park Public Works	(714) 562-3655
Costa Mesa Public Services	(714) 754-5323
Cypress Public Works	(714) 229-6740
Dana Point Public Works	(949) 248-3584
Fountain Valley Public Works	(714) 593-4441
Fullerton Engineering Dept.	(714) 738-6853
Garden Grove Public Works	(714) 741-5956
Huntington Beach Public Works	(714) 536-5431
Irvine Public Works	(949) 724-6315
La Habra Public Services	(562) 905-9792
La Palma Public Works	(714) 690-3310
Laguna Beach Water Quality	(949) 497-0378
Laguna Hills Public Services	(949) 707-2650
Laguna Niguel Public Works	(949) 362-4337
Laguna Woods Public Works	(949) 639-0500
Lake Forest Public Works	(949) 461-3480
Los Alamitos Community Dev.	(562) 431-3538
Mission Viejo Public Works	(949) 470-3056
Newport Beach, Code & Water Quality Enforcement	(949) 644-3215
Orange Public Works	(714) 532-6480
Placentia Public Works	(714) 993-8245
Rancho Santa Margarita	(949) 635-1800
San Clemente Environmental Programs	(949) 361-6143
San Juan Capistrano Engineering	(949) 234-4413
Santa Ana Public Works	(714) 647-3380
Seal Beach Engineering	(562) 431-2527 x317
Stanton Public Works	(714) 379-9222 x204
Tustin Public Works/Engineering	(714) 573-3150
Villa Park Engineering	(714) 998-1500
Westminster Public Works/Engineering	(714) 898-3311 x446
Yorba Linda Engineering	(714) 961-7138
Orange County Stormwater Program	(877) 897-7455
Orange County 24-Hour Water Pollution Problem Reporting Hotline 1-877-89-SPILL (1-877-897-7455)	

On-line Water Pollution Problem Reporting Form

www.ocwatersheds.com

Printed on Recycled Paper



Do your part to prevent water pollution in our creeks, rivers, bays and ocean.

Clean beaches and healthy creeks, rivers, bays and ocean are important to Orange County. However, not properly disposing of household hazardous waste can lead to water pollution. Batteries, electronics, paint, oil, gardening chemicals, cleaners and other hazardous materials cannot be thrown in the trash. They also must never be poured or thrown into yards, sidewalks, driveways, gutters or streets. Rain or other water could wash the materials into the storm drain and eventually into our waterways and the ocean. In addition, hazardous waste must not be poured in the sanitary sewers (sinks and toilets).

NEVER DISPOSE OF HOUSEHOLD HAZARDOUS WASTE IN THE TRASH, STREET, GUTTER, STORM DRAIN OR SEWER.

For more information, please call the **Orange County Stormwater Program** at **1-877-89-SPILL** (1-877-897-7455) or visit **www.ocwatersheds.com**

To Report Illegal Dumping of Household Hazardous Waste call 1-800-69-TOXIC

To report a spill, call the **Orange County 24-Hour Water Pollution Problem Reporting Hotline 1-877-89-SPILL** (1-877-897-7455)**.**

For emergencies, dial 911.

RECYCLE USED OIL

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Help Prevent Ocean Pollution:

Proper Disposal of Household Hazardous Waste



The Ocean Begins at Your Front Door

PROJECT Pollution PREVENTION

ORANGE COUNTY

Pollution Prevention

Leftover household products that contain corrosive, toxic, ignitable, or reactive ingredients are considered to be "household hazardous waste" or "HHW." HHW can be found throughout your home, including the bathroom, kitchen, laundry room and garage.

WHEN POSSIBLE, USE NON-HAZARDOUS OR LESS-HAZARDOUS PRODUCTS.

Disposal of HHW down the drain, on the ground, into storm drains, or in the trash is illegal and unsafe.

Proper disposal of HHW is actually easy. Simply drop them off at a Household Hazardous Waste Collection Center (HHWCC) for free disposal and recycling. Many materials including anti-freeze, latex-based paint, motor oil and batteries can be recycled. Some centers have a "Stop & Swap" program that lets you take partially used home, garden, and automobile products free of charge. There are four HHWCCs in Orange County:

Anaheim:.....1071 N. Blue Gum St
Huntington Beach:.....17121 Nichols St
Irvine:..... 6411 Oak Canyon
San Juan Capistrano:... 32250 La Pata Ave

Centers are open Tuesday-Saturday, 9 a.m.-3 p.m. Centers are closed on rainy days and major holidays. For more information, call **(714) 834-6752** or visit **www.oclandfills.com.**

Common household hazardous wastes

- Batteries
- Paint and paint products
- Adhesives
- Drain openers
- Household cleaning products
- Wood and metal cleaners and polishes
- Pesticides
- Fungicides/wood preservatives
- Automotive products (antifreeze, motor oil, fluids)
- Grease and rust solvents
- Fluorescent lamps
- Mercury (thermometers & thermostats)
- All forms of electronic waste including computers and microwaves
- Pool & spa chemicals
- Cleaners
- Medications
- Propane (camping & BBQ)
- Mercury-containing lamps
- Television & monitors (CRTs, flatscreens)

Tips for household hazardous waste

- Never dispose of HHW in the trash, street, gutter, storm drain or sewer.
- Keep these materials in closed, labeled containers and store materials indoors or under a cover.
- When possible, use non-hazardous products.
- Reuse products whenever possible or share with family and friends.
- Purchase only as much of a product as you'll need. Empty containers may be disposed of in the trash.
- HHW can be harmful to humans, pets and the environment. Report emergencies to 911.





Clean beaches and healthy creeks, rivers, bays and ocean are important to Orange County. However, many common activities such as pest control can lead to water pollution if you're not careful. Pesticide treatments must be planned and applied properly to ensure that pesticides do not enter the street, gutter or storm drain. Unlike water in sanitary sewers (from sinks and toilets), water in storm drains is not treated before entering our waterways.

You would never dump pesticides into the ocean, so don't let it enter the storm drains. Pesticides can cause significant damage to our environment if used improperly. If you are thinking of using a pesticide to control a pest, there are some important things to consider.

For more information,
please call
University of California Cooperative
Extension Master Gardeners at
(714) 708-1646
or visit these Web sites:
www.uccemg.org
www.ipm.ucdavis.edu

For instructions on collecting a specimen sample visit the Orange County Agriculture Commissioner's website at:
http://www.ocagcomm.com/ser_lab.asp

To report a spill, call the
Orange County 24-Hour Water Pollution Problem Reporting Hotline at 1-877-89-SPILL (1-877-897-7455).

For emergencies, dial 911.

Information From:
Cheryl Wilen, Area IPM Advisor; Darren Haver, Watershed Management Advisor; Mary Louise Flint, IPM Education and Publication Director; Pamela M. Geisel, Environmental Horticulture Advisor; Carolyn L. Unruh, University of California Cooperative Extension staff writer. Photos courtesy of the UC Statewide IPM Program and Darren Haver.

Funding for this brochure has been provided in full or in part through an agreement with the State Water Resources Control Board (SWRCB) pursuant to the Costa-Machado Water Act of 2000 (Prop. 13).

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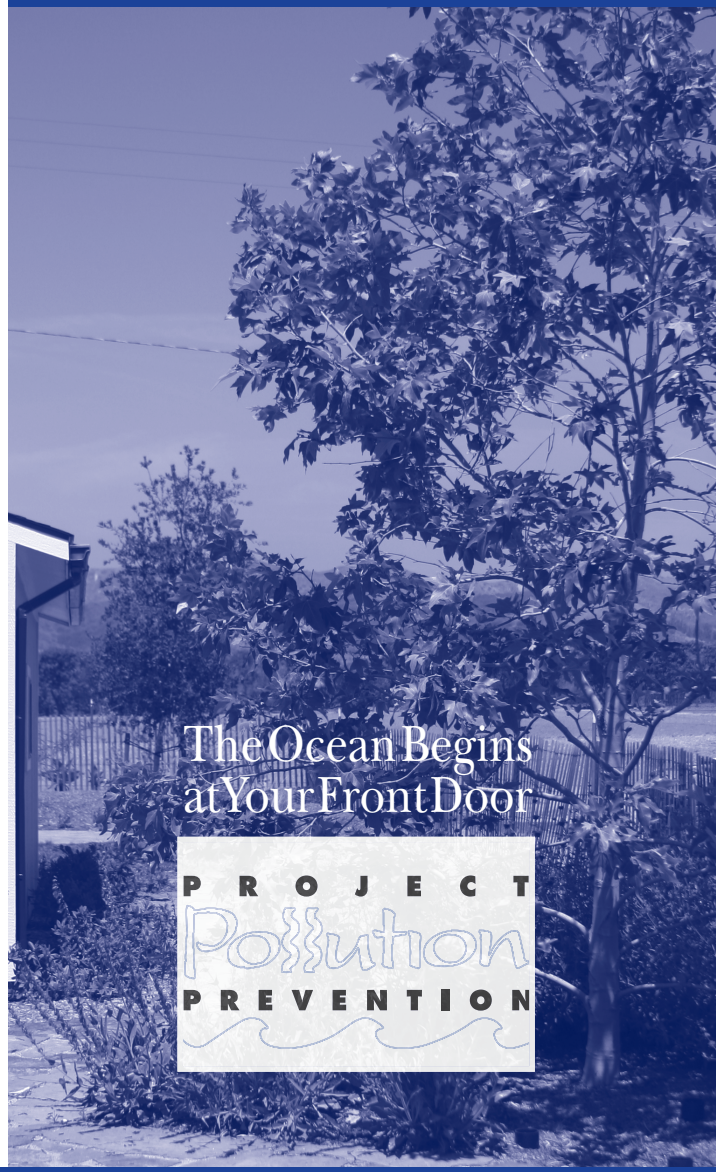
Help Prevent Ocean Pollution:

Responsible Pest Control



Tips for Pest Control

Key Steps to Follow:

Step 1: Correctly identify the pest (insect, weed, rodent, or disease) and verify that it is actually causing the problem.



Three life stages of the common lady beetle, a beneficial insect.

This is important because beneficial insects are often mistaken for pests and sprayed with pesticides needlessly.

Consult with a Certified Nursery Professional at a local nursery or garden center or send a sample of the pest to the Orange County Agricultural Commissioner's Office.

Determine if the pest is still present – even though you see damage, the pest may have left.

Step 2: Determine how many pests are present and causing damage.



Small pest populations may be controlled more safely using non-pesticide techniques. These include removing food sources, washing off leaves with a strong stream of water, blocking entry into the home using caulking and replacing problem plants with ones less susceptible to pests.

Integrated Pest Management (IPM) usually combines several least toxic pest control methods for long-term prevention and management of pest problems without harming you, your family, or the environment.

UC CE University of California Cooperative Extension

Step 3: If a pesticide must be used, choose the least toxic chemical.

Obtain information on the least toxic pesticides that are effective at controlling the target pest from the UC Statewide Integrated Pest Management (IPM) Program's Web site at www.ipm.ucdavis.edu.

Seek out the assistance of a Certified Nursery Professional at a local nursery or garden center when selecting a pesticide. Purchase the smallest amount of pesticide available.

Apply the pesticide to the pest during its most vulnerable life stage. This information can be found on the pesticide label.

Step 4: Wear appropriate protective clothing.

Follow pesticide labels regarding specific types of protective equipment you should wear. Protective clothing should always be washed separately from other clothing.

Step 5: Continuously monitor external conditions when applying pesticides such as weather, irrigation, and the presence of children and animals.

Never apply pesticides when rain is predicted within the next 48 hours. Also, do not water after applying pesticides unless the directions say it is necessary.

Apply pesticides when the air is still; breezy conditions may cause the spray or dust to drift away from your targeted area.

In case of an emergency call 911 and/or the regional poison control number at (714) 634-5988 or (800) 544-4404 (CA only).

For general questions you may also visit www.calpoison.org.

Step 6: In the event of accidental spills, sweep up or use an absorbent agent to remove any excess pesticides. Avoid the use of water.

Be prepared. Have a broom, dust pan, or dry absorbent material, such as cat litter, newspapers or paper towels, ready to assist in cleaning up spills.

Contain and clean up the spill right away. Place contaminated materials in a doubled plastic bag. All materials used to clean up the spill should be properly disposed of according to your local Household Hazardous Waste Disposal site.

Step 7: Properly store and dispose of unused pesticides.



Purchase Ready-To-Use (RTU) products to avoid storing large concentrated quantities of pesticides.

Store unused chemicals in a locked cabinet.

Unused pesticide chemicals may be disposed of at a Household Hazardous Waste Collection Center.

Empty pesticide containers should be triple rinsed prior to disposing of them in the trash.

Household Hazardous Waste Collection Center
(714) 834-6752
www.oclandfills.com

PROJECT Pollution PREVENTION



Clean beaches and healthy creeks, rivers, bays and ocean are important to Orange County. However, many common activities can lead to water pollution if you're not careful. Fertilizers, pesticides and other chemicals that are left on yards or driveways can be blown or washed into storm drains that flow to the ocean. Overwatering lawns can also send materials into storm drains. Unlike water in sanitary sewers (from sinks and toilets), water in storm drains is not treated before entering our waterways.

You would never pour gardening products into the ocean, so don't let them enter the storm drains. Follow these easy tips to help prevent water pollution.

For more information,
please call the
Orange County Stormwater Program
at **1-877-89-SPILL** (1-877-897-7455)
or visit
www.ocwatersheds.com

UCCE Master Gardener Hotline:
(714) 708-1646

To report a spill,
call the
Orange County 24-Hour
Water Pollution Problem
Reporting Hotline
1-877-89-SPILL (1-877-897-7455)**.**

For emergencies, dial 911.

The tips contained in this brochure provide useful information to help prevent water pollution while landscaping or gardening. If you have other suggestions, please contact your city's stormwater representatives or call the Orange County Stormwater Program.

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Help Prevent Ocean Pollution:

Tips for Landscape & Gardening



The Ocean Begins at Your Front Door

PROJECT Pollution PREVENTION

Tips for Landscape & Gardening

Never allow gardening products or polluted water to enter the street, gutter or storm drain.

General Landscaping Tips

- Protect stockpiles and materials from wind and rain by storing them under tarps or secured plastic sheeting.
- Prevent erosion of slopes by planting fast-growing, dense ground covering plants. These will shield and bind the soil.
- Plant native vegetation to reduce the amount of water, fertilizers, and pesticide applied to the landscape.



- Never apply pesticides or fertilizers when rain is predicted within the next 48 hours.

Garden & Lawn Maintenance

- Do not overwater. Use irrigation practices such as drip irrigation, soaker hoses or micro spray systems. Periodically inspect and fix leaks and misdirected sprinklers.
- Do not rake or blow leaves, clippings or pruning waste into the street, gutter or storm drain. Instead, dispose of green waste by composting, hauling it to a permitted landfill, or recycling it through your city's program.



- Use slow-release fertilizers to minimize leaching, and use organic fertilizers.
- Read labels and use only as directed. Do not over-apply pesticides or fertilizers. Apply to spots as needed, rather than blanketing an entire area.
- Store pesticides, fertilizers and other chemicals in a dry covered area to prevent exposure that may result in the deterioration of containers and packaging.



- Rinse empty pesticide containers and re-use rinse water as you would use the product. Do not dump rinse water down storm drains. Dispose of empty containers in the trash.
- When available, use non-toxic alternatives to traditional pesticides, and use pesticides specifically designed to control the pest you are targeting. For more information, visit **www.ipm.ucdavis.edu**.
- If fertilizer is spilled, sweep up the spill before irrigating. If the spill is liquid, apply an absorbent material such as cat litter, and then sweep it up and dispose of it in the trash.
- Take unwanted pesticides to a Household Hazardous Waste Collection Center to be recycled. Locations are provided below.

Household Hazardous Waste Collection Centers

Anaheim:	1071 N. Blue Gum St.
Huntington Beach:	17121 Nichols St.
Irvine:	6411 Oak Canyon
San Juan Capistrano:	32250 La Pata Ave.

For more information, call (714) 834-6752 or visit www.oclandfills.com



Clean beaches and healthy creeks, rivers, bays, and ocean are important to Orange County. However, many common activities can lead to water pollution if you're not careful. Materials and excess concrete or mortar can be blown or washed into the storm drains that flow to the ocean. Unlike water in sanitary sewers (from sinks and toilets), water in storm drains is not treated before entering our waterways.

You would never throw building materials into the ocean, so don't let them enter the storm drains. Follow these easy tips to help prevent water pollution.

For more information,
please call the
Orange County Stormwater Program
at **1-877-89-SPILL** (1-877-897-7455)
or visit
www.ocwatersheds.com.

To report a spill,
call the
Orange County 24-Hour
Water Pollution Reporting Hotline
at **1-877-89-SPILL** (1-877-897-7455).

For emergencies, dial 911.

The Tips contained in this brochure provide useful information about how you can keep materials and washwater from entering the storm drain system. If you have other suggestions for how water and materials may be contained, please contact your city's stormwater representative or call the Orange County Stormwater Program.

Tips for Using Concrete and Mortar

The Ocean Begins at Your Front Door

PROJECT Pollution PREVENTION

Tips for Using Concrete and Mortar

Never allow materials or washwater to enter the street or storm drain.

Before the Project

- Schedule projects for dry weather.
- Store materials under cover, with temporary roofs or plastic sheets, to eliminate or reduce the possibility that the materials can be carried from the project site to streets, storm drains or adjacent properties via rainfall, runoff or wind.
- Minimize waste by ordering only the amount of materials needed to complete the job.
- Take measures to block nearby storm drain inlets.

During the Project

- Set up and operate small mixers on tarps or heavy drop cloths.
- Do not mix more fresh concrete or cement than is needed for the job.



- When breaking up pavement, pick up all chunks and pieces and recycle them at a local construction and demolition recycling company. (See information to the right)
- When making saw cuts in pavement, protect nearby storm drain inlets during the saw-cutting operation and contain the slurry. Collect the slurry residue from the pavement or gutter and remove from the site.



Clean-Up

- Dispose of small amounts of dry concrete, grout or mortar in the trash.
- Never hose materials from exposed aggregate concrete, asphalt or similar treatments into a street, gutter, parking lot, or storm drain.
- Wash concrete mixers and equipment in designated washout areas where the water can flow into a containment area or onto dirt. Small amounts of dried material can be disposed of in the trash. Large amounts should be recycled at a local construction and demolition recycling company. (See information below)



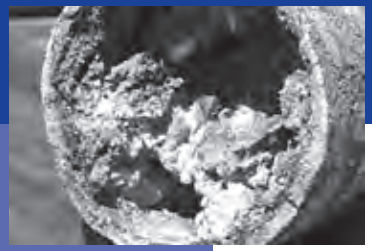
- Recycle cement wash water by pumping it back into cement mixers for reuse.

Spills

- Never hose down pavement or impermeable surfaces where fluids have spilled. Use an absorbent material such as cat litter to soak up a spill, then sweep and dispose in the trash.
- Clean spills on dirt areas by digging up and properly disposing of contaminated dry soil in trash.
- Immediately report significant spills to the County's 24-Hour Water Pollution Problem Reporting Hotline at 714-567-6363 or log onto the County's website at www.ocwatersheds.com and fill out an incident reporting form.

For a list of construction and demolition recycling locations in your area visit www.ciwmb.ca.gov/Recycle/.

For additional information on how to control, prevent, remove, and reduce pollution refer to the Stormwater Best Management Practice Handbook, available on-line at www.cabmphandbooks.com.



Clean beaches and healthy creeks, rivers, bays and ocean are important to Orange County. Fats, oils and grease from restaurants and food service facilities can cause sewer line blockages that may result in sewage overflow into your facility and into storm drains. Unlike water in sanitary sewers (from sinks and toilets), water in storm drains is not treated before entering our waterways and should never contain washwater, trash, grease or other materials.

You would never dump oil and trash into the ocean, so don't let it enter the storm drains. Follow these tips to help prevent water pollution.

For more information,
please call the
Orange County Stormwater Program
at **1-877-89-SPILL** (1-877-897-7455)
or visit
www.ocwatersheds.com

Report sewage spills and
discharges that are not
contained to your site to the
Orange County 24-Hour
Water Pollution Problem
Reporting Hotline
at **1-877-89-SPILL** (1-877-897-7455)

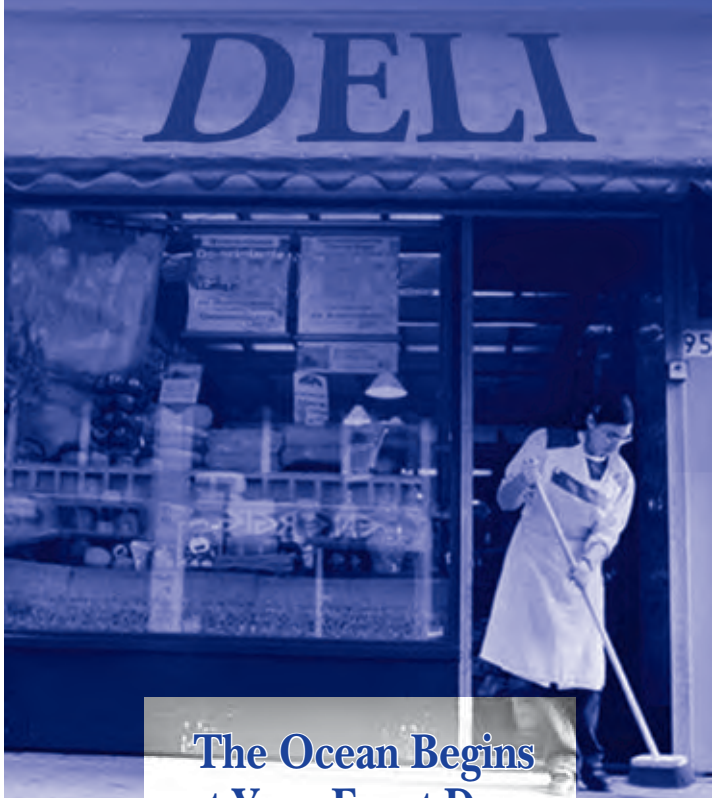
For emergencies, dial 911.

CALIFORNIA Restaurant ASSOCIATION SINCE 1906

Printed on Recycled Paper

Help Prevent Ocean Pollution:

Tips for the Food Service Industry



The Ocean Begins at Your Front Door

PROJECT Pollution PREVENTION

Best Kitchen Practices

Food Waste Disposal

- Scrape food waste off of plates, utensils, pots, food preparation and cooking areas and dispose of it in the trash.
- Never put food waste down the drain. Food scraps often contain grease, which can clog sewer pipes and result in sewage backups and overflows.

Grease & Oil Disposal

- Never put oil or grease down the drain. Contain grease and oil by using covered grease storage containers or installing a grease interceptor.
- Never overfill your grease storage container or transport it without a cover.
- Grease control devices must be emptied and cleaned by permitted companies.
- Keep maintenance records on site.



- For a list of oil/grease recycling companies, contact the CIWMB at **www.ciwmb.ca.gov/foodwaste/render.htm** or contact your local sanitation district.

Minor Spill Cleanup

- Always use dry cleanup methods, such as a rag, damp mop or broom.
- Never hose a spill into the street, gutter or storm drain.



Major Spill Cleanup

- Have spill containment and clean-up kits readily available, and train all employees on how to use them.
- Immediately contain and clean the spill using dry methods.
- If the spill leaves your site, call **(714) 567-6363**.

Dumpster Cleanup

- Pick up all debris around the dumpster.
- Always keep the lid on the dumpster closed.



- Never pour liquids into the dumpster or hose it out.

Floor Mat Cleaning

- Sweep the floor mats regularly, discarding the debris into the trash.
- Hose off the mats in a mop sink, at a floor drain, or in an outdoor area that can contain the water.



- Never hose the mats in an area where the wastewater can flow to the street, gutter or storm drain.

Washwater Disposal

- Dispose of washwater in a mop sink or an area with a floor drain.
- Never dispose of washwater in the street, gutter or storm drain.

PROJECT Pollution PREVENTION



Preventing water pollution at your commercial/industrial site

Clean beaches and healthy creeks, rivers, bays and ocean are important to Orange County. However, many landscape and building maintenance activities can lead to water pollution if you're not careful. Paint, chemicals, plant clippings and other materials can be blown or washed into storm drains that flow to the ocean. Unlike water in sanitary sewers (from sinks and toilets), water in storm drains is not treated before entering our waterways.

You would never pour soap or fertilizers into the ocean, so why would you let them enter the storm drains? Follow these easy tips to help prevent water pollution.

Some types of industrial facilities are required to obtain coverage under the State General Industrial Permit. For more information visit: **www.swrcb.ca.gov/stormwater/industrial.html**

For more information, please call the **Orange County Stormwater Program** at **1-877-89-SPILL** (1-877-897-7455) or visit **www.ocwatersheds.com**

To report a spill, call the **Orange County 24-Hour Water Pollution Problem Reporting Hotline** at **1-877-89-SPILL** (1-877-897-7455).

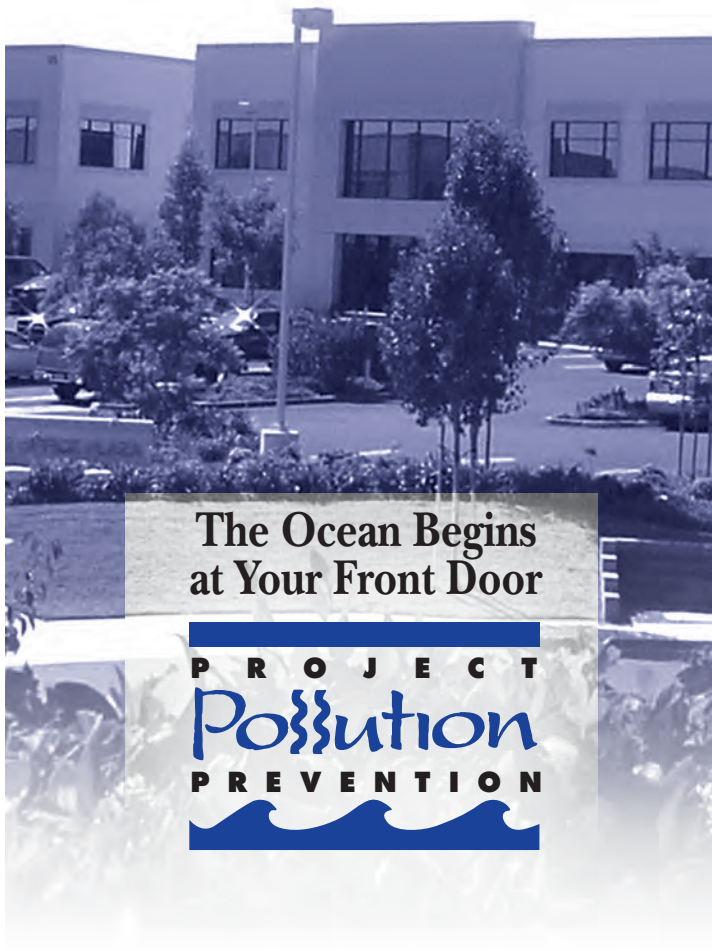
For emergencies, dial 911.

RECYCLE USED OIL

Printed on Recycled Paper

Help Prevent Ocean Pollution:

Proper Maintenance Practices for Your Business



The Ocean Begins at Your Front Door

PROJECT Pollution PREVENTION

Proper Maintenance Practices for your Business

Landscape Maintenance

- Compost grass clippings, leaves, sticks and other vegetation, or dispose of it at a permitted landfill or in green waste containers. Do not dispose of these materials in the street, gutter or storm drain.
- Irrigate slowly and inspect the system for leaks, overspraying and runoff. Adjust automatic timers to avoid overwatering.
- Follow label directions for the use and disposal of fertilizers and pesticides.
- Do not apply pesticides or fertilizers if rain is expected within 48 hours or if wind speeds are above 5 mph.
- Do not spray pesticides within 100 feet of waterways.
- Fertilizers should be worked into the soil rather than dumped onto the surface.
- If fertilizer is spilled on the pavement or sidewalk, sweep it up immediately and place it back in the container.

Building Maintenance

- Never allow washwater, sweepings or sediment to enter the storm drain.
- Sweep up dry spills and use cat litter, towels or similar materials to absorb wet spills. Dispose of it in the trash.
- If you wash your building, sidewalk or parking lot, you **must** contain the water. Use a shop vac to collect the water and contact your city or sanitation agency for proper disposal information. Do not let water enter the street, gutter or storm drain.
- Use drop cloths underneath outdoor painting, scraping, and sandblasting work, and properly dispose of materials in the trash.
- Use a ground cloth or oversized tub for mixing paint and cleaning tools.
- Use a damp mop or broom to clean floors.
- Cover dumpsters to keep insects, animals, rainwater and sand from entering. Keep the area around the dumpster clear of trash and debris. Do not overfill the dumpster.
- Call your trash hauler to replace leaking dumpsters.
- Do not dump any toxic substance or liquid waste on the pavement, the ground, or near a storm drain. Even materials that seem harmless such as latex paint or biodegradable cleaners can damage the environment.

NEVER DISPOSE OF ANYTHING IN THE STORM DRAIN.

- Recycle paints, solvents and other materials. For more information about recycling and collection centers, visit **www.oclandfills.com**.
- Store materials indoors or under cover and away from storm drains.
- Use a construction and demolition recycling company to recycle lumber, paper, cardboard, metals, masonry, carpet, plastic, pipes, drywall, rocks, dirt, and green waste. For a listing of construction and demolition recycling locations in your area, visit **www.ciwmb.ca.gov/recycle.**
- Properly label materials. Familiarize employees with Material Safety Data Sheets.

PROJECT Pollution PREVENTION

IC3. BUILDING MAINTENANCE

Best Management Practices (BMPs)

A BMP is a technique, measure or structural control that is used for a given set of conditions to improve the quality of the stormwater runoff in a cost effective manner[1]. The minimum required BMPs for this activity are outlined in the box to the right. Implementation of pollution prevention/good housekeeping measures may reduce or eliminate the need to implement other more costly or complicated procedures. Proper employee training is key to the success of BMP implementation.

MINIMUM BEST MANAGEMENT PRACTICES

Pollution Prevention/Good Housekeeping

- Properly collect and dispose of water when pressure washing buildings, rooftops, and other large objects.
- Properly prepare work area before conducting building maintenance.
- Properly clean and dispose of equipment and wastes used and generated during building maintenance.
- Store toxic material under cover when not in use and during precipitation events.

Stencil storm drains

Training

- Train employees on these BMPs, storm water discharge prohibitions, and wastewater discharge requirements.
- Provide on-going employee training in pollution prevention.

The BMPs outlined in this fact sheet target the following pollutants:

Targeted Constituents	
Sediment	x
Nutrients	x
Floatable Materials	
Metals	x
Bacteria	x
Oil & Grease	
Organics & Toxicants	
Pesticides	
Oxygen Demanding	

Provided below are specific procedures associated with each of the minimum BMPs along with procedures for additional BMPs that should be considered if this activity takes place at a facility located near a sensitive waterbody. In order to meet the requirements for medium and high priority facilities, the owners/operators must select, install and maintain appropriate BMPs on site. Since the selection of the appropriate BMPs is a site-specific process, the types and numbers of additional BMPs will vary for each facility.

1. Properly collect and dispose of water when pressure washing buildings, rooftops, and other large objects.
    - If pressure washing where the surrounding area is paved, use a water collection device that enables collection of wash water and associated solids. Use a sump pump, wet vacuum or similarly effective device to collect the runoff and loose materials. Dispose of the collected runoff and solids properly. Refer to fact sheet *IC24 Wastewater Disposal* for guidance on appropriate methods for disposal of wash water to the sanitary sewer.
    - If pressure washing on a landscaped area (with or without soap), runoff must be dispersed as sheet flow as much as possible, rather than as a concentrated stream. The wash runoff must remain on the landscaping and not drain to pavement.
2. Properly prepare work area before conducting building maintenance.
    - Use ground or drop cloths underneath outdoor painting, scraping, and sandblasting work, and properly dispose of collected material daily.
    - Use a ground cloth or oversized tub for activities such as paint mixing and tool cleaning.

[1] EPA " *Preliminary Data Summary of Urban Stormwater Best Management Practices"*

3. Properly clean and dispose of equipment and wastes used and generated during building maintenance.
    - Clean paint brushes and tools covered with water-based paints in sinks connected to sanitary sewers or in portable containers that can be dumped into a sanitary sewer drain. Brushes and tools covered with non-water-based paints, finishes, or other materials must be cleaned in a manner that enables collection of used solvents (e.g., paint thinner, turpentine, etc.) for recycling or proper disposal.
    - Properly dispose of wash water, sweepings, and sediments.
    - Properly store equipment, chemicals, and wastes.
    - Do not dump any toxic substance or liquid waste on the pavement, the ground, or toward a storm drain.

    OPTIONAL:
    - Recycle residual paints, solvents, lumber, and other materials to the maximum extent practicable
4. Employ soil erosion and stabilization techniques when exposing large areas of soil.
    - Confine excavated materials to pervious surfaces away from storm drain inlets, sidewalks, pavement, and ditches. Material must be covered if rain is expected.
    - Use chemical stabilization or geosynthetics to stabilize bare ground surfaces.
5. Store toxic material under cover when not in use and during precipitation events.
6. Properly dispose of fluids from air conditioning, cooling tower, and condensate drains.
7. Regularly inspect air emission control equipment under AQMD permit.
8. Switch to non-toxic chemicals for maintenance when possible.
    - If cleaning agents are used, select biodegradable products whenever feasible
    - Consider using a waterless and non-toxic chemical cleaning method for graffiti removal (e.g. gels or spray compounds).
9. Use chemicals that can be recycled.
    - Buy recycled products to the maximum extent practicable

Training

1. Train employees on these BMPs, storm water discharge prohibitions, and wastewater discharge requirements.
2. Train employees on proper spill containment and cleanup.
    - Establish training that provides employees with the proper tools and knowledge to immediately begin cleaning up a spill.
    - Ensure that employees are familiar with the site's spill control plan and/or proper spill cleanup procedures.
    - Fact sheet IC17 discusses Spill Prevention and Control in detail.
3. Establish a regular training schedule, train all new employees, and conduct annual refresher training.
4. Use a training log or similar method to document training.

Stencil storm drains

Storm drain system signs act as highly visible source controls that are typically stenciled directly adjacent to storm drain inlets. Stencils should read "No Dumping Drains to Ocean".

References

California Storm Water Best Management Practice Handbook. Industrial and Commercial. 2003. www.cabmphandbooks.com

California Storm Water Best Management Practice Handbooks. Industrial/Commercial Best Management Practice Handbook. Prepared by Camp Dresser& McKee, Larry Walker Associates, Uribe and Associates, Resources Planning Associates for Stormwater Quality Task Force. March 1993.

King County Stormwater Pollution Control Manual. Best Management Practices for Businesses. King County Surface Water Management. July 1995. On-line: http://dnr.metrokc.gov/wlr/dss/spcm.htm

Stormwater Management Manual for Western Washington. Volume IV Source Control BMPs. Prepared by Washington State Department of Ecology Water Quality Program. Publication No. 99-14. August 2001.

For additional information contact:

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Main: (714) 955-0600
24 hr Water Pollution Hotline: 1-877-89-SPILL
or visit our website at www.ocwatersheds.com

IC7. LANDSCAPE MAINTENANCE

Best Management Practices (BMPs)

A BMP is a technique, measure or structural control that is used for a given set of conditions to improve the quality of the stormwater runoff in a cost effective manner[1]. The minimum required BMPs for this activity are outlined in the box to the right. Implementation of pollution prevention/good housekeeping measures may reduce or eliminate the need to implement other more costly or complicated procedures. Proper employee training is key to the success of BMP implementation.

MINIMUM BEST MANAGEMENT PRACTICES

Pollution Prevention/Good Housekeeping

- Properly store and dispose of gardening wastes.
- Use mulch or other erosion control measures on exposed soils.
- Properly manage irrigation and runoff.
- Properly store and dispose of chemicals.
- Properly manage pesticide and herbicide use.
- Properly manage fertilizer use.

Stencil storm drains

Training

- Train employees on these BMPs, storm water discharge prohibitions, and wastewater discharge requirements.
- Provide on-going employee training in pollution prevention.

The BMPs outlined in this fact sheet target the following pollutants:

Targeted Constituents	
Sediment	x
Nutrients	x
Floatable Materials	x
Metals	
Bacteria	x
Oil & Grease	
Organics & Toxicants	
Pesticides	x
Oxygen Demanding	x

Provided below are specific procedures associated with each of the minimum BMPs along with procedures for additional BMPs that should be considered if this activity takes place at a facility located near a sensitive waterbody. In order to meet the requirements for medium and high priority facilities, the owners/operators must select, install and maintain appropriate BMPs on site. Since the selection of the appropriate BMPs is a site-specific process, the types and numbers of additional BMPs will vary for each facility.

1. Take steps to reduce landscape maintenance requirements.
    - Where feasible, retain and/or plant native vegetation with features that are determined to be beneficial. Native vegetation usually requires less maintenance than planting new vegetation.
    - When planting or replanting consider using low water use flowers, trees, shrubs, and groundcovers.
    - Consider alternative landscaping techniques such as naturescaping and xeriscaping.
2. Properly store and dispose of gardening wastes.
    - Dispose of grass clippings, leaves, sticks, or other collected vegetation as garbage at a permitted landfill or by composting.
    - Do not dispose of gardening wastes in streets, waterways, or storm drainage systems.
    - Place temporarily stockpiled material away from watercourses and storm drain inlets, and berm and/or cover.
3. Use mulch or other erosion control measures on exposed soils.

[1] EPA " *Preliminary Data Summary of Urban Stormwater Best Management Practices"*

4. Properly manage irrigation and runoff.
    - Irrigate slowly or pulse irrigate so the infiltration rate of the soil is not exceeded.
    - Inspect irrigation system regularly for leaks and to ensure that excessive runoff is not occurring.
    - If re-claimed water is used for irrigation, ensure that there is no runoff from the landscaped area(s).
    - If bailing of muddy water is required (e.g. when repairing a water line leak), do not put it in the storm drain; pour over landscaped areas.
    - Use automatic timers to minimize runoff.
    - Use popup sprinkler heads in areas with a lot of activity or where pipes may be broken. Consider the use of mechanisms that reduce water flow to broken sprinkler heads.
5. Properly store and dispose of chemicals.
    - Implement storage requirements for pesticide products with guidance from the local fire department and/or County Agricultural Commissioner.
    - Provide secondary containment for chemical storage.
    - Dispose of empty containers according to the instructions on the container label.
    - Triple rinse containers and use rinse water as product.
6. Properly manage pesticide and herbicide use.
    - Follow all federal, state, and local laws and regulations governing the use, storage, and disposal of pesticides and herbicides and training of applicators and pest control advisors.
    - Follow manufacturers' recommendations and label directions.
    - Use pesticides only if there is an actual pest problem (not on a regular preventative schedule). When applicable use less toxic pesticides that will do the job. Avoid use of copper-based pesticides if possible. Use the minimum amount of chemicals needed for the job.
    - Do not apply pesticides if rain is expected or if wind speeds are above 5 mph.
    - Do not mix or prepare pesticides for application near storm drains. Prepare the minimum amount of pesticide needed for the job and use the lowest rate that will effectively control the targeted pest.
    - Whenever possible, use mechanical methods of vegetation removal rather than applying herbicides. Use hand weeding where practical.
    - Do not apply any chemicals directly to surface waters, unless the application is approved and permitted by the state. Do not spray pesticides within 100 feet of open waters.
    - Employ techniques to minimize off-target application (e.g. spray drift) of pesticides, including consideration of alternative application techniques.
    - When conducting mechanical or manual weed control, avoid loosening the soil, which could lead to erosion.
    - Purchase only the amount of pesticide that you can reasonably use in a given time period.
    - Careful soil mixing and layering techniques using a topsoil mix or composted organic material can be used as an effective measure to reduce herbicide use and watering.
7. Properly manage fertilizer use.
    - Follow all federal, state, and local laws and regulations governing the use, storage, and disposal of fertilizers.
    - Follow manufacturers' recommendations and label directions.
    - Employ techniques to minimize off-target application (e.g. spray drift) of fertilizer, including consideration of alternative application techniques. Calibrate fertilizer distributors to avoid excessive application.
    - Periodically test soils for determining proper fertilizer use.
    - Fertilizers should be worked into the soil rather than dumped or broadcast onto the surface.
    - Sweep pavement and sidewalk if fertilizer is spilled on these surfaces before applying irrigation water.
    - Use slow release fertilizers whenever possible to minimize leaching

8. Incorporate the following integrated pest management techniques where appropriate:
    - Mulching can be used to prevent weeds where turf is absent.
    - Remove insects by hand and place in soapy water or vegetable oil. Alternatively, remove insects with water or vacuum them off the plants.
    - Use species-specific traps (e.g. pheromone-based traps or colored sticky cards).
    - Sprinkle the ground surface with abrasive diatomaceous earth to prevent infestations by soft-bodied insects and slugs. Slugs also can be trapped in small cups filled with beer that are set in the ground so the slugs can get in easily.
    - In cases where microscopic parasites, such as bacteria and fungi, are causing damage to plants, the affected plant material can be removed and disposed of (pruning equipment should be disinfected with bleach to prevent spreading the disease organism).
    - Small mammals and birds can be excluded using fences, netting, and tree trunk guards.
    - Promote beneficial organisms, such as bats, birds, green lacewings, ladybugs, praying mantis, ground beetles, parasitic nematodes, trichogramma wasps, seedhead weevils, and spiders that prey on detrimental pest species.

Training

1. Train employees on these BMPs, storm water discharge prohibitions, and wastewater discharge requirements.
2. Educate and train employees on the use of pesticides and pesticide application techniques. Only employees properly trained to use pesticides can apply them.
3. Train and encourage employees to use integrated pest management techniques.
4. Train employees on proper spill containment and cleanup.
    - Establish training that provides employees with the proper tools and knowledge to immediately begin cleaning up a spill.
    - Ensure that employees are familiar with the site's spill control plan and/or proper spill cleanup procedures.
    - Fact sheet IC17 discusses Spill Prevention and Control in detail.
5. Establish a regular training schedule, train all new employees, and conduct annual refresher training.
6. Use a training log or similar method to document training.

Stencil storm drains

Storm drain system signs act as highly visible source controls that are typically stenciled directly adjacent to storm drain inlets. Stencils should read "No Dumping Drains to Ocean".

References

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California Storm Water Best Management Practice Handbooks. Industrial/Commercial Best Management Practice Handbook. Prepared by Camp Dresser& McKee, Larry Walker Associates, Uribe and Associates, Resources Planning Associates for Stormwater Quality Task Force. March 1993.

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Stormwater Management Manual for Western Washington. Volume IV Source Control BMPs. Prepared by Washington State Department of Ecology Water Quality Program. Publication No. 99-14. August 2001.

Water Quality Handbook for Nurseries. Oklahoma Cooperative Extension Service. Division of Agricultural Sciences and Natural Resources. Oklahoma State University. E-951. September 1999.

For additional information contact:

County of Orange/ OC Watersheds
Main: (714) 955-0600
24 hr Water Pollution Hotline: 1-877-89-SPILL
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IC15. PARKING AND STORAGE AREA MAINTENANCE

Best Management Practices (BMPs)

A BMP is a technique, measure or structural control that is used for a given set of conditions to improve the quality of the stormwater runoff in a cost effective manner[1]. The minimum required BMPs for this activity are outlined in the box to the right. Implementation of pollution prevention/good housekeeping measures may reduce or eliminate the need to implement other more costly or complicated procedures. Proper employee training is key to the success of BMP implementation.

MINIMUM BEST MANAGEMENT PRACTICES

Pollution Prevention/Good Housekeeping

- Conduct regular cleaning.
- Properly collect and dispose of wash water.
- Keep the parking and storage areas clean and orderly.
- Use absorbent materials and properly dispose of them when cleaning heavy oily deposits.
- When conducting surface repair work cover materials and clean paintbrushes and tools appropriately.

Stencil storm drains

Training

- Train employees on these BMPs, storm water discharge prohibitions, and wastewater discharge requirements.
- Provide on-going employee training in pollution prevention.

The BMPs outlined in this fact sheet target the following pollutants:

Targeted Constituents	
Sediment	x
Nutrients	x
Floatable Materials	x
Metals	x
Bacteria	x
Oil & Grease	x
Organics & Toxicants	x
Pesticides	x
Oxygen Demanding	x

Provided below are specific procedures associated with each of the minimum BMPs along with procedures for additional BMPs that should be considered if this activity takes place at a facility located near a sensitive waterbody. In order to meet the requirements for medium and high priority facilities, the owners/operators must select, install and maintain appropriate BMPs on site. Since the selection of the appropriate BMPs is a site-specific process, the types and numbers of additional BMPs will vary for each facility.

1. Conduct regular cleaning.
    - Sweeping or vacuuming the parking facility is encouraged over other methods.
    - Sweep all parking lots at least once before the onset of the wet season.
    - Establish frequency of sweeping based on usage and field observations of waste accumulation.
2. Properly collect and dispose of wash water.
    - Block the storm drain or contain runoff.
    - Wash water should be collected and pumped to the sanitary sewer or discharged to a pervious surface, do not allow wash water to enter storm drains. Refer to fact sheet *IC24 Wastewater Disposal* for guidance on appropriate methods for disposal of wash water to the sanitary sewer.
    - Dispose of parking lot sweeping debris and dirt at a landfill.
3. Consider use of source treatment BMPs to treat runoff.
    - Allow sheet runoff to flow into biofilters (vegetated strip and swale) and/or infiltration devices.
    - Utilize sand filters or oleophilic collectors for oily waste in low quantities.

[1] EPA " *Preliminary Data Summary of Urban Stormwater Best Management Practices"*

4. Keep the parking and storage areas clean and orderly.
    - Clean out and cover litter receptacles frequently to prevent spillage.
    - Remove debris in a timely fashion.

    OPTIONAL:
    - Post "No Littering" signs.
5. When cleaning heavy oily deposits:
    - If possible, clean oily spots with absorbent materials.
    - Do not allow discharges to the storm drain.
    - Appropriately dispose of spilled materials and absorbents.
6. When conducting surface repair work:
    - Pre-heat, transfer or load hot bituminous material away from storm drain inlets.
    - Conduct surface repair work during dry weather to prevent contamination from contacting stormwater runoff.
    - Cover and seal nearby storm drain inlets (with waterproof material or mesh) and manholes before applying seal coat, slurry seal, etc. Leave covers in place until job is complete and clean any debris for proper disposal.
    - To avoid runoff, use only as much water as necessary for dust control.
    - Use drip pans or absorbent material to catch drips from paving equipment that is not in use. Dispose of collected material and absorbents properly.
7. Conduct inspections on a regular basis.
    - Designate personnel to conduct inspections of the parking facilities and stormwater conveyance systems associated with them.
    - Inspect cleaning equipment/sweepers for leaks on a regular basis.
8. Keep accurate maintenance logs to evaluate materials removed/stored and improvements made.
9. Arrange rooftop drains to prevent drainage directly onto paved surfaces.

Training

1. Train employees on these BMPs, storm water discharge prohibitions, and wastewater discharge requirements.
2. Train employees on proper spill containment and cleanup.
    - Establish training that provides employees with the proper tools and knowledge to immediately begin cleaning up a spill.
    - Ensure that employees are familiar with the site's spill control plan and/or proper spill cleanup procedures.
    - Fact sheet IC17 discusses Spill Prevention and Control in detail.
3. Provide regular training to field employees and/or contractors regarding cleaning of paved areas and proper operation of equipment.
4. Establish a regular training schedule, train all new employees, and conduct annual refresher training.
5. Use a training log or similar method to document training.

Stencil storm drains

Storm drain system signs act as highly visible source controls that are typically stenciled directly adjacent to storm drain inlets. Stencils should read "No Dumping Drains to Ocean".

References

California Storm Water Best Management Practice Handbook. Industrial and Commercial. 2003. www.cabmphandbooks.com

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Model Urban Runoff Program: A How-To Guide for Developing Urban Runoff Programs for Small Municipalities. Prepared by City of Monterey, City of Santa Cruz, California Coastal Commission, Monterey Bay National Marine Sanctuary, Association of Monterey Bay Area Governments, Woodward-Clyde, Central Coast Regional Water Quality Control Board. July 1998 (Revised February 2002 by the California Coastal Commission).

Stormwater Management Manual for Western Washington. Volume IV Source Control BMPs. Prepared by Washington State Department of Ecology Water Quality Program. Publication No. 99-14. August 2001.

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IC17. SPILL PREVENTION AND CLEANUP

Best Management Practices (BMPs)

A BMP is a technique, measure or structural control that is used for a given set of conditions to improve the quality of the stormwater runoff in a cost effective manner[1]. The minimum required BMPs for this activity are outlined in the box to the right. Implementation of pollution prevention/good housekeeping measures may reduce or eliminate the need to implement other more costly or complicated procedures. Proper employee training is key to the success of BMP implementation.

The BMPs outlined in this fact sheet target the following pollutants:

Targeted Constituents	
Sediment	x
Nutrients	x
Floatable Materials	x
Metals	x
Bacteria	x
Oil & Grease	x
Organics & Toxicants	x
Pesticides	x
Oxygen Demanding	x

MINIMUM BEST MANAGEMENT PRACTICES

Pollution Prevention/Good Housekeeping

- Develop procedures to prevent/mitigate spills to storm drain systems.
- Post "No Dumping" signs with a phone number for reporting illegal dumping and disposal.
- Conduct routine cleaning, inspections, and maintenance.
- Properly store and handle chemical materials.
- Protect materials stored outside from stormwater runon.
- Secure drums stored in an area where unauthorized persons may gain access to prevent accidental spillage, pilferage, or any unauthorized use.
- Identify key spill response personnel.
- Clean up leaks and spills immediately.
- Report and track spills.

Stencil storm drains

Training

- Train employees on these BMPs, storm water discharge prohibitions, and wastewater discharge requirements.
- Provide on-going employee training in pollution prevention.

Provided below are specific procedures associated with each of the minimum BMPs along with procedures for additional BMPs that should be considered if this activity takes place at a facility located near a sensitive waterbody. In order to meet the requirements for medium and high priority facilities, the owners/operators must select, install and maintain appropriate BMPs on site. Since the selection of the appropriate BMPs is a site-specific process, the types and numbers of additional BMPs will vary for each facility.

Spill Prevention

1. Develop procedures to prevent/mitigate spills to storm drain systems.
   Standardize reporting procedures, containment, storage, and disposal activities, documentation, and follow-up procedures.
2. Post "No Dumping" signs with a phone number for reporting illegal dumping and disposal.
3. Conduct routine cleaning, inspections, and maintenance
   - Sweep and clean storage areas consistently at a designated frequency (e.g. weekly, monthly). DO NOT hose down areas to storm drains.
   - Place drip pans or absorbent materials beneath all mounted taps, and at all potential drip and spill locations during filling and unloading of tanks. Reuse, recycle, or properly dispose of any collected liquids or soiled absorbent materials.
   - Check tanks (and any containment sumps) frequently for leaks and spills. Replace tanks that are leaking, corroded, or otherwise deteriorating with tanks in good condition. Collect all spilled liquids and properly dispose of them.

[1] EPA " *Preliminary Data Summary of Urban Stormwater Best Management Practices"*

- Check for external corrosion of material containers, structural failures, spills and overfills due to operator error, failure of piping system, etc.
- Inspect tank foundations, connections, coatings, and tank walls and piping system.

4. Properly store and handle chemical materials.
    - Designate a secure material storage area that is paved with Portland cement concrete, free of cracks and gaps, and impervious in order to contain leaks and spills.
    - Do not store chemicals, drums, or bagged materials directly on the ground. Place these items in secondary containers.
    - Keep chemicals in their original containers, if feasible.
    - Keep containers well labeled according to their contents (e.g., solvent, gasoline).
    - Label hazardous substances regarding the potential hazard (corrosive, radioactive, flammable, explosive, poisonous).
    - Prominently display required labels on transported hazardous and toxic materials (per US DOT regulations).
5. Utilize secondary containment systems for liquid materials.
    - Surround storage tanks with a berm or other secondary containment system.
    - Slope the area inside the berm to a drain.
    - Drain liquids to the sanitary sewer if available. DO NOT discharge wash water to sanitary sewer until contacting the local sewer authority to find out if pretreatment is required
    - Pass accumulated stormwater in petroleum storage areas through an oil/water separator.
    - Use catch basin filtration inserts.
6. Protect materials stored outside from stormwater runon. Construct a berm around the perimeter of the material storage area to prevent the runon of uncontaminated stormwater from adjacent areas as well as runoff of stormwater from the material.
7. Secure drums stored in an area where unauthorized persons may gain access to prevent accidental spillage, pilferage, or any unauthorized use.

Spill Control and Cleanup Activities

8. Identify key spill response personnel.
9. Adopt the Orange County Hazardous Materials Area Plan or an equivalent plan, which includes a set of planned responses to hazardous materials emergencies. The plan should include:
    - Description of the facility, owner and address, activities and chemicals present
    - Facility map
    - Notification and evacuation procedures
    - Cleanup instructions
    - Identification of responsible departments
10. Clean up leaks and spills immediately.
    - Place a stockpile of spill cleanup materials where they will be readily accessible (e.g. near storage and maintenance areas).
    - Utilize dry cleaning methods to clean up spills to minimize the use of water. Use a rag for small spills, a damp mop for general cleanup, and absorbent material for larger spills. If the spilled material is hazardous, then used cleanup materials are also hazardous and must be sent to a certified laundry (rags) or disposed of as hazardous waste. Physical methods for the cleanup of dry chemicals include the use brooms, shovels, sweepers, or plows.
    - Never hose down or bury dry material spills. Sweep up the material and dispose of properly.
    - Clean up chemical materials with absorbents, gels, and foams. Use adsorbent materials on small spills rather than hosing down the spill. Remove the adsorbent materials promptly and dispose of properly.
    - For larger spills, a private spill cleanup company or Hazmat team may be necessary.

11. Reporting
    1. Report spills that pose an immediate threat to human health or the environment to local agencies, such as the fire department, and the Regional Water Quality Control Board.
    2. Establish a system for tracking incidents. The system should be designed to identify the following:
        - Types and quantities (in some cases) of wastes
        - Patterns in time of occurrence (time of day/night, month, or year)
        - Mode of dumping (abandoned containers, "midnight dumping" from moving vehicles, direct dumping of materials, accidents/spills)
        - Responsible parties
    3. Federal regulations require that any oil spill into a water body or onto an adjoining shoreline be reported to the National Response Center (NRC) at 800-424-8802 (24 hour).

Training
1. Educate employees about spill prevention and cleanup.
    - Establish training that provides employees with the proper tools and knowledge to immediately begin cleaning up a spill.
    - Educate employees on aboveground storage tank requirements.
    - Train all employees upon hiring and conduct annual refresher training.
2. Train employees responsible for aboveground storage tanks and liquid transfers on the Spill Prevention Control and Countermeasure Plan.

Stencil storm drains

Storm drain system signs act as highly visible source controls that are typically stenciled directly adjacent to storm drain inlets. Stencils should read "No Dumping Drains to Ocean".

References

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California Storm Water Best Management Practice Handbooks. Industrial/Commercial Best Management Practice Handbook. Prepared by Camp Dresser& McKee, Larry Walker Associates, Uribe and Associates, Resources Planning Associates for Stormwater Quality Task Force. March 1993.

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IC18. VEHICLE AND EQUIPMENT FUELING

Best Management Practices (BMPs)

A BMP is a technique, measure or structural control that is used for a given set of conditions to improve the quality of the stormwater runoff in a cost effective manner[1]. The minimum required BMPs for this activity are outlined in the box to the right. Implementation of pollution prevention/good housekeeping measures may reduce or eliminate the need to implement other more costly or complicated procedures. Proper employee training is key to the success of BMP implementation.

MINIMUM BEST MANAGEMENT PRACTICES

Pollution Prevention/Good Housekeeping

- Maintain clean fuel-dispensing areas.
- Utilize fueling safeguards.
- Conduct regular inspections of fueling equipment.

Stencil storm drains

Training

- Train employees on these BMPs, storm water discharge prohibitions, and wastewater discharge requirements.
- Provide on-going employee training in pollution prevention.

The BMPs outlined in this fact sheet target the following pollutants:

Targeted Constituents	
Sediment	
Nutrients	
Floatable Materials	x
Metals	x
Bacteria	
Oil & Grease	x
Organics & Toxicants	x
Pesticides	
Oxygen Demanding	

Provided below are specific procedures associated with each of the minimum BMPs along with procedures for additional BMPs that should be considered if this activity takes place at a facility located near a sensitive waterbody. In order to meet the requirements for medium and high priority facilities, the owners/operators must select, install and maintain appropriate BMPs on site. Since the selection of the appropriate BMPs is a site-specific process, the types and numbers of additional BMPs will vary for each facility.

1. Use properly maintained off-site fueling stations whenever possible. These businesses are better equipped to handle fueling and spills.
2. Maintain clean fuel-dispensing areas.
    - Use dry cleanup methods such as sweeping for removal of litter and debris, or use of rags and absorbents for leaks and spills.
    - If cleaning by washing, place a temporary plug in the downstream storm drain and pump out the accumulated water. Properly dispose of the water. DO NOT discharge wash water to sanitary sewer until contacting the local sewer authority to find out if pretreatment is required.
3. Design fueling areas to minimize stormwater exposure.
    - Cover the fuel dispensing area such that the cover's minimum dimensions are equal to or greater than the area within the grade break or fuel dispensing area. Position roof downspouts to direct water away from fueling areas.
    - Pave fuel area with Portland cement concrete or equivalent smooth impervious surface. Grade with a 2 to 4 percent slope to prevent ponding.

[1] EPA " *Preliminary Data Summary of Urban Stormwater Best Management Practices"*

- Use secondary containment. Construct a berm around the perimeter of the material storage area to prevent the runon of uncontaminated stormwater from adjacent areas as well as stormwater runoff.

4. Minimize pooling of water.
    - Use a perimeter drain or slope pavement inward with drainage to sump. A minimum slope of 1.5 percent is recommended.
    - Install inlet catch basin equipped with a small sedimentation basin or grit chamber to remove large particles from stormwater in impervious areas.
    - During the wet season, release accumulated stormwater frequently.
5. If conducting mobile fueling, designate mobile fueling areas and bring equipment to these areas.
    - Use secondary containment when conducting mobile fueling.
    - Cover storm drains in the vicinity during transfer.
6. Utilize fueling safeguards.
    - Use overflow protection devices on tank systems to warn the operator to automatically shutdown transfer pumps when the tank reaches full capacity.
    - Install protective guards around tanks and piping to prevent vehicle or forklift damage.
    - Clearly tag or label all valves to reduce human error.
    - Place spill kits at fueling areas and/or on vehicles.
    - Install vapor recovery nozzles to help control drips as well as air pollution.
    - Eliminate or post hose bibs.
    - Fit fuel dispensing nozzles with "hold-open latches" (automatic shutoffs) except where prohibited by local fire departments.
7. Conduct regular inspections of fueling equipment.
    - Check fueling equipment for external corrosion and structural failure.
    - Check for spills and overfills due to operator error.
    - Check for failure of piping system.
    - Check for leaks or spills during pumping of liquids or gases from truck or rail car to a storage facility or visa versa.
    - Visually inspect new tank or container installation for loose fittings, poor welding, and/or improper or poorly fitting gaskets.
    - Inspect tank foundations, connections, leaks, cracks, scratches, and other physical damage that may weaken the tank or container system.
    - Report leaking vehicles to fleet maintenance.
    - Periodically, have a qualified professional conduct integrity testing.
8. Use secondary containment when transferring fuel from the tank truck to the fuel tank and cover storm drains in the vicinity during transfer.
9. Fit underground storage tanks (USTs) with spill containment and overfill prevention systems meeting the requirements of Section 2635(b) of Title 23 of the California Code of Regulations.
10. Equip USTs with spill and overfill protection.
11. Install required AQMD equipment and post a notice.
12. Post signs to remind employees and customers not to top off the fuel tank when filling and signs that ban customers and employees from changing engine oil or other fluids at that location.

Training

1. Train employees on these BMPs, storm water discharge prohibitions, and wastewater discharge requirements.
2. Train employees on proper fueling and cleanup procedures.
3. Train employees on proper spill containment and cleanup.
    - Establish training that provides employees with the proper tools and knowledge to immediately begin cleaning up a spill.
    - Ensure that employees are familiar with the site's spill control plan and/or proper spill cleanup procedures.
    - Fact sheet IC17 discusses Spill Prevention and Control in detail.
4. Establish a regular training schedule, train all new employees, and conduct annual refresher training.
5. Use a training log or similar method to document training.

Stencil storm drains

Storm drain system signs act as highly visible source controls that are typically stenciled directly adjacent to storm drain inlets. Stencils should read "No Dumping Drains to Ocean".

References

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IC20. VEHICLE AND EQUIPMENT WASHING AND STEAM CLEANING

Best Management Practices (BMPs)

A BMP is a technique, measure or structural control that is used for a given set of conditions to improve the quality of the stormwater runoff in a cost effective manner[1]. The minimum required BMPs for this activity are outlined in the box to the right. Implementation of pollution prevention/good housekeeping measures may reduce or eliminate the need to implement other more costly or complicated procedures. Proper employee training is key to the success of BMP implementation.

MINIMUM BEST MANAGEMENT PRACTICES

Pollution Prevention/Good Housekeeping

- Consider using off-site commercial washing and/or steam cleaning businesses, if feasible.
- Use commercial washing and/or steam cleaning businesses capable of properly disposing of wastewater (Refer to fact sheet *IC24 Wastewater Disposal* for guidance on appropriate methods for disposal of wash water to the sanitary sewer).
- Designate an impervious indoor or outdoor area to be used solely for vehicle and equipment washing/steam cleaning.
- Clearly mark the vehicle and equipment washing/steam cleaning area.
- If the area is outdoors, cover the wash area when not in use to prevent contact with rainwater.
- Provide trash containers in wash area and empty on a regular basis.
- Use hoses with nozzles that automatically turn off when left unattended.

Stencil storm drains

Training

- Train employees on these BMPs, storm water discharge prohibitions, and wastewater discharge requirements.
- Provide on-going employee training in pollution prevention.

The BMPs outlined in this fact sheet target the following pollutants:

Targeted Constituents	
Sediment	x
Nutrients	x
Floatable Materials	
Metals	x
Bacteria	
Oil & Grease	x
Organics & Toxicants	
Pesticides	
Oxygen Demanding	x

Provided below are specific procedures associated with each of the minimum BMPs along with procedures for additional BMPs that should be considered if this activity takes place at a facility located near a sensitive waterbody. In order to meet the requirements for medium and high priority facilities, the owners/operators must select, install and maintain appropriate BMPs on site. Since the selection of the appropriate BMPs is a site-specific process, the types and numbers of additional BMPs will vary for each facility.

1. Use off-site commercial washing and/or steam cleaning businesses. These businesses are better equipped to handle and properly dispose of the wash waters.
2. Use commercial washing and/or steam cleaning businesses capable of disposing of wastewater.
    - Mobile cleaning businesses should use a leak proof cover device that will catch and contain all contaminated (i.e. chemical additives such as soaps, solvents, or degreasers are used) wastewater runoff for later disposal in a manner that complies with all city, county, state, and federal codes.
    - Refer to fact sheet *IC24 Wastewater Disposal* for guidance on appropriate methods for disposal of wastewater to the sanitary sewer.

3. Designate an impervious indoor or outdoor area to be used solely for vehicle and equipment washing/steam cleaning. Do not conduct oil changes and other engine maintenance in the designated washing area.

[1] EPA " *Preliminary Data Summary of Urban Stormwater Best Management Practices"*

4. Clearly mark the vehicle and equipment washing/steam cleaning area. Design wash area to properly collect and dispose of wash water and/or effluent generated.
    - Install sumps or drain lines to collect wash water.
    - Construct a berm around the designated area and grade to collect wash water as well as to prevent storm water runon.
    - Use portable containment (such as ground cover devices) and vacuum collection of wastewater.
    - Inspect and maintain equipment (such as ground cover devices) regularly to ensure proper and effective functioning.
5. If the area is outdoors, cover the wash area when not in use to prevent contact with rainwater.
6. Provide trash containers in wash area and empty on a regular basis.
7. Use hoses with nozzles that automatically turn off when left unattended.
8. Use biodegradable, phosphate-free detergents if possible.
9. Recycle waste materials, whenever possible
    - Recycling is always preferable to disposal of unwanted materials.
    - Separate wastes for easier recycling. Keep hazardous and non-hazardous wastes separate, do not mix used oil and solvents, and keep chlorinated solvents separate from non-chlorinated solvents.
    - Label and track the recycling of waste material (e.g. used oil, spent solvents, batteries).
    - Purchase recycled products to support the market for recycled materials.
12. If possible, eliminate or reduce the amount of hazardous materials and waste by substituting non-hazardous or less hazardous material:
    - Use non-caustic detergents instead of caustic cleaning for parts cleaning.
    - Use a water-based cleaning service and have tank cleaned. Use detergent-based or water-based cleaning systems in place of organic solvent degreasers.
    - Replace chlorinated organic solvents with non-chlorinated solvents. Non-chlorinated solvents like kerosene or mineral spirits are less toxic and less expensive to dispose of properly. Check list of active ingredients to see whether it contains chlorinated solvents.
    - Choose cleaning agents that can be recycled.

Training

1. Train employees on these BMPs, storm water discharge prohibitions, and wastewater discharge requirements.
2. Train staff on the proper maintenance of the wash area.
3. Train employees on proper spill containment and cleanup.
    - Establish training that provides employees with the proper tools and knowledge to immediately begin cleaning up a spill.
    - Ensure that employees are familiar with the site's spill control plan and/or proper spill cleanup procedures.
    - Fact sheet IC17 discusses Spill Prevention and Control in detail.
4. Establish a regular training schedule, train all new employees, and conduct annual refresher training.
5. Use a training log or similar method to document training.

Stencil storm drains

Storm drain system signs act as highly visible source controls that are typically stenciled directly adjacent to storm drain inlets. Stencils should read "No Dumping Drains to Ocean".

References

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IC21. WASTE HANDLING AND DISPOSAL

Best Management Practices (BMPs)

A BMP is a technique, measure or structural control that is used for a given set of conditions to improve the quality of the stormwater runoff in a cost effective manner[1]. The minimum required BMPs for this activity are outlined in the box to the right. Implementation of pollution prevention/good housekeeping measures may reduce or eliminate the need to implement other more costly or complicated procedures. Proper employee training is key to the success of BMP implementation.

MINIMUM BEST MANAGEMENT PRACTICES

Pollution Prevention/Good Housekeeping

- Prevent waste materials from coming in direct contact with wind or rain. .
- Keep waste collection areas clean.
- Secure solid waste containers when not in use.
- Regularly inspect, repair, and/or replace waste containers.
- Use all of a product before disposing of the container.
- Label and store hazardous wastes according to hazardous waste regulations.

Stencil storm drains

Training

- Train employees on these BMPs, storm water discharge prohibitions, and wastewater discharge requirements.
- Provide on-going employee training in pollution prevention.

The BMPs outlined in this fact sheet target the following pollutants:

Targeted Constituents	
Sediment	x
Nutrients	x
Floatable Materials	x
Metals	x
Bacteria	x
Oil & Grease	x
Organics & Toxicants	x
Pesticides	x
Oxygen Demanding	x

Provided below are specific procedures associated with each of the minimum BMPs along with procedures for additional BMPs that should be considered if this activity takes place at a facility located near a sensitive waterbody. In order to meet the requirements for medium and high priority facilities, the owners/operators must select, install and maintain appropriate BMPs on site. Since the selection of the appropriate BMPs is a site-specific process, the types and numbers of additional BMPs will vary for each facility.

1. Prevent waste materials from coming in direct contact with wind or rain.
    - Cover the waste management area with a permanent roof.
    - If this is not feasible, cover waste piles with temporary covering material such as reinforced tarpaulin, polyethylene, polyurethane, polypropylene, or hypalon.
    - Cover dumpsters to prevent rain from washing out waste materials.
2. Design waste handling and disposal area to prevent stormwater runon.
    - Enclose the waste handling and disposal area or build a berm around it.
    - Position roof downspouts to direct stormwater away from waste handling and disposal area.
3. Design waste handling and disposal area to contain spills.
    - Place dumpsters or other waste receptacles on an impervious surface.
    - Construct a berm around the area to contain spills.
    - Install drains connected to the public sewer or the facility's process wastewater system within these contained areas. DO NOT discharge to a public sewer until contacting the local sewer authority to find out if pretreatment is required.

[1] EPA " *Preliminary Data Summary of Urban Stormwater Best Management Practices"*

4. Keep waste collection areas clean.
    - When cleaning around waste handling and disposal areas use dry methods when possible (e.g. sweeping, use of absorbents).
    - If water must be used, collect water and discharge to the sewer if permitted to do so. DO NOT discharge to a public sewer until contacting the local sewer authority to find out if pretreatment is required. If discharge to the sanitary sewer is not allowed, pump water to a tank and dispose of properly.
    - Post "No Littering" signs.
5. Secure solid waste containers when not in use.
6. Regularly inspect, repair, and/or replace waste containers.
7. Do not fill waste containers with washout water or any other liquid.
8. Use all of a product before disposing of the container.
9. Segregate wastes by type and label and date wastes.
    - Do not mix wastes; this can cause chemical reactions, make recycling impossible, and complicate disposal.
    - Ensure that only appropriate solid wastes are added to solid waste containers.
    - Certain wastes such as hazardous wastes, appliances, fluorescent lamps, pesticides, etc. may not be disposed of in solid waste containers.
10. Label and store hazardous wastes according to hazardous waste regulations.
    - Consult your local hazardous waste agency or Fire Department for details.
    - Obtain a hazardous waste generator license or permit if necessary.
12. Minimize waste.
    - Recycle materials whenever possible.
    - Modify processes or equipment to increase efficiency.
    - Identify and promote use of non-hazardous alternatives.
    - Reduction in the amount of waste generated can be accomplished using many different types of source controls such as:
        - Production planning and sequencing
        - Process or equipment modification
        - Raw material substitution or elimination
        - Loss prevention and housekeeping
        - Waste segregation and separation
        - Close loop recycling
    - Establish a material tracking system to increase awareness about material usage. This may reduce spills and minimize contamination, thus reducing the amount of waste produced.

Training

1. Train employees on these BMPs, storm water discharge prohibitions, and wastewater discharge requirements.
2. Train employees in proper waste handling and disposal.
3. Train employees on proper spill containment and cleanup.
    - Establish training that provides employees with the proper tools and knowledge to immediately begin cleaning up a spill.
    - Ensure that employees are familiar with the site's spill control plan and/or proper spill cleanup procedures.
    - Fact sheet IC17 discusses Spill Prevention and Control in detail.

4. Establish a regular training schedule, train all new employees, and conduct annual refresher training.
5. Use a training log or similar method to document training.

Stencil storm drains

Storm drain system signs act as highly visible source controls that are typically stenciled directly adjacent to storm drain inlets. Stencils should read “No Dumping Drains to Ocean”.

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IC23. FIRE SPRINKLER TESTING/MAINTENANCE

Best Management Practices (BMPs)

A BMP is a technique, measure or structural control that is used for a given set of conditions to improve the quality of the stormwater runoff in a cost effective manner[1]. The minimum required BMPs for this activity are outlined in the box to the right. Implementation of pollution prevention/good housekeeping measures may reduce or eliminate the need to implement other more costly or complicated procedures. Proper employee training is key to the success of BMP implementation.

Provided below are specific procedures associated with this activity. In order to meet the requirements for medium and high priority facilities, the owners/operators must select, install and maintain appropriate BMPs on site. Since the selection of the appropriate BMPs is a site-specific process, the types and numbers of additional BMPs will vary for each facility.

MINIMUM BEST MANAGEMENT PRACTICES

Pollution Prevention/Good Housekeeping

- Conduct activity on non-rainy days and for the shortest duration possible to minimize discharge volume.
- Inspect flow path and remove all debris and materials prior to testing or maintenance.

Training

- Train employees on these BMPs, storm water discharge prohibitions, and wastewater discharge requirements.
- Provide on-going employee training in pollution prevention.

The BMPs outlined in this fact sheet target the following pollutants:

Targeted Constituents	
Sediment	
Nutrients	
Floatable Materials	
Metals	x
Bacteria	
Oil & Grease	x
Organics & Toxicants	
Pesticides	
Oxygen Demanding	

Best Management Practices

1. Contain flows onsite and/or direct the water flows to landscaped or green areas whenever possible and safe to do so without causing damage or erosion.
2. Divert sprinkler system flows to the sewer, when practicable and with the permission of the local sewer agency. Refer to fact sheet *IC24 Wastewater Disposal* for guidance on appropriate methods for disposal of wash water to the sanitary sewer.
3. Training
   a. Train employees on these BMPs, storm water discharge prohibitions, and wastewater discharge requirements.
   b. Establish a regular training schedule, train all new employees, and conduct annual refresher training.
   c. Use a training log or similar method to document training.

References

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[1] EPA " *Preliminary Data Summary of Urban Stormwater Best Management Practices"*

IC22. EATING AND DRINKING ESTABLISHMENTS

Best Management Practices (BMPs)

A BMP is a technique, measure or structural control that is used for a given set of conditions to improve the quality of the stormwater runoff in a cost effective manner[1]. The minimum required BMPs for this activity are outlined in the box to the right. Implementation of pollution prevention/good housekeeping measures may reduce or eliminate the need to implement other more costly or complicated procedures. Proper employee training is key to the success of BMP implementation.

MINIMUM BEST MANAGEMENT PRACTICES

Pollution Prevention/Good Housekeeping

- Use dry cleaning methods instead of water
- Clean equipment (floor mats, grease filters, grills, garbage cans, etc.) indoors or in a covered outdoor wash area that is plumbed to the sanitary sewer or in an area that will contain the wash water (Refer to fact sheet *IC24 Wastewater Disposal* for guidance on appropriate methods for disposal of wash water to the sanitary sewer).
- Recycle and/or properly dispose of grease and oil.
- Block the storm drain when hosing or steam/pressure washing outside dumpster areas, sidewalks, and common areas.

Stencil storm drains

Training

- Train employees on these BMPs, storm water discharge prohibitions, and wastewater discharge requirements.

The BMPs outlined in this fact sheet target the following pollutants:

Targeted Constituents	
Sediment	
Nutrients	x
Floatable Materials	x
Metals	
Bacteria	x
Oil & Grease	x
Organics & Toxicants	x
Pesticides	x
Oxygen Demanding	x

Provided below are specific procedures associated with each of the minimum BMPs along with procedures for additional BMPs that should be considered if this activity takes place at a facility located near a sensitive waterbody. In order to meet the requirements for medium and high priority facilities, the owners/operators must select, install and maintain appropriate BMPs on site. Since the selection of the appropriate BMPs is a site-specific process, the types and numbers of additional BMPs will vary for each facility.

1. Practice good housekeeping.
    - Conduct regular sweeping or vacuuming of outdoor areas: Dry sweep pavement areas including "drive-thru" areas, parking lots, sidewalks, outdoor eating areas and dumpster storage areas frequently.
    - Keep outside areas free of trash & debris.
    - Do not hose out dumpsters or fill them with liquid waste.
    - Regularly inspect, repair, and/or replace dumpsters.
2. Clean equipment (floor mats, grease filters, grills, garbage cans, etc.) indoors or in a covered outdoor wash area that is plumbed to the sanitary sewer.
    - Clean equipment in a mop sink if possible (never in a food preparation sink). If there is no mop sink, dedicate an indoor cleaning area where a drain is plumbed to the sanitary sewer.
    - Dispose mop water from cleaning floors in a mop sink, toilet or other drain that is plumbed to the sanitary sewer. Refer to fact sheet *IC24 Wastewater Disposal* for guidance on appropriate methods for disposal of wash water to the sanitary sewer.
    - Do not pour wash water outside or into a street, gutter, or storm drain.

[1] EPA " *Preliminary Data Summary of Urban Stormwater Best Management Practices"*

- Dispose of all wastewater containing oil and grease in a grease trap or interceptor.

3. Recycle and/or properly dispose of grease and oil. Collect and dispose of concentrated waste oil and grease and disposed of by a certified waste grease hauler. NEVER pour grease or oil into a sink, floor drain, storm drain or dumpster.
4. Block storm drain(s) when cleaning (hosing or steam/pressure washing) outside dumpster areas, sidewalks, and common areas with hot water, soap, or other cleaning agent. Collect water/waste and discharge to the sanitary sewer (with approval of the local sanitation district).

Training

1. Train employees on these BMPs, storm water discharge prohibitions, and wastewater discharge requirements.
2. Train employees on proper spill containment and cleanup.
    - Establish training that provides employees with the proper tools and knowledge to immediately begin cleaning up a spill.
    - Ensure that employees are familiar with the site's spill control plan and/or proper spill cleanup procedures.
    - Fact sheet IC17 discusses Spill Prevention and Control in detail.
3. Establish a regular training schedule, train all new employees, and conduct annual refresher training.
4. Use a training log or similar method to document training.

Stencil storm drains

Storm drain system signs act as highly visible source controls that are typically stenciled directly adjacent to storm drain inlets. Stencils should read "No Dumping Drains to Ocean".

References

California Storm Water Best Management Practice Handbook. Industrial and Commercial. 2003. www.cabmphandbooks.com

Carlsbad Jurisdictional Urban Runoff Management Plan. Best Management Practices for Restaurants. City of Carlsbad. February 2002. On-line: http://www.ci.carlsbad.ca.us/cserv/jurmp.html

Orange County Stormwater Program. 2001. Water Quality Guidelines for Exterior Restaurant Cleaning Operations. Brochure. June.

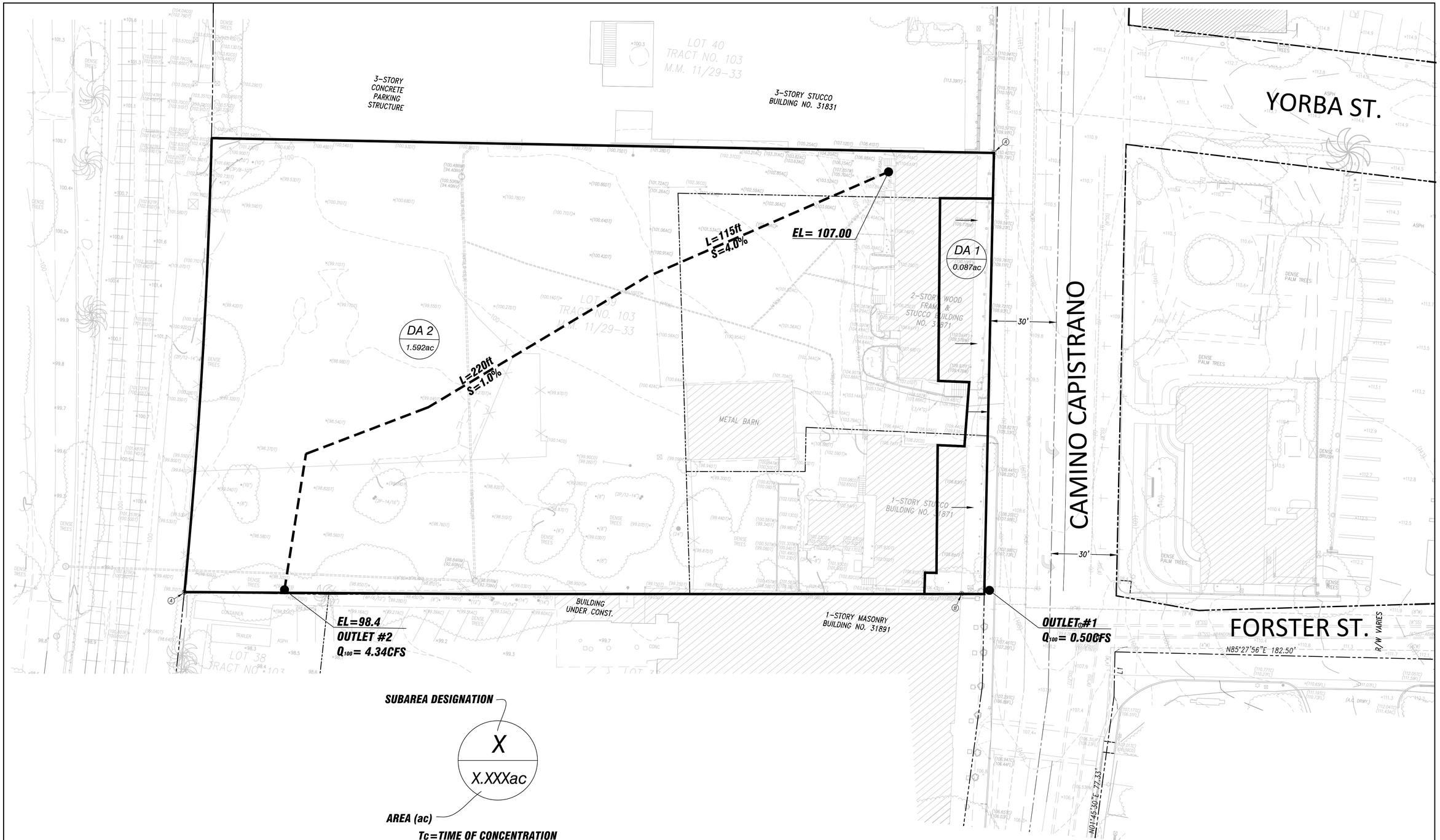
Orange County Stormwater Program. Good Cleaning Practices Food & Restaurant Industry. Poster. Courtesy of the City and County of LA.

For additional information contact:

County of Orange/ OC Watersheds
Main: (714) 955-0600
24 hr Water Pollution Hotline: 1-877-89-SPILL
or visit our website at www.ocwatersheds.com

Attachment B: Operations and Maintenance Plan

Attachment C: Exhibits and Plans



SUBAREA DESIGNATION

X

X.XXXac

AREA (ac)

Tc=TIME OF CONCENTRATION
L=LENGTH OF SUBAREA FLOW PATH
S=SLOPE

BASIN LIMITS
FLOW PATH
FLOW DIRECTION

PRIVATE ENGINEER'S NOTICE TO CONTRACTOR

THE EXISTENCE AND LOCATION OF ANY UNDERGROUND UTILITIES OR STRUCTURES SHOWN IN THESE PLANS ARE OBTAINED BY A SEARCH OF AVAILABLE RECORDS, AND TO THE BEST OF OUR KNOWLEDGE, THERE ARE NOT EXISTING UTILITIES EXCEPT THOSE SHOWN ON THESE PLANS. THE CONTRACTOR IS REQUIRED TO TAKE ALL PRECAUTIONARY MEASURES TO PROTECT THE UTILITIES SHOWN, AND ANY OTHER LINES OR STRUCTURES NOT SHOWN ON THESE PLANS, AND IS RESPONSIBLE FOR THE PROTECTION OF AND ANY DAMAGE TO THESE LINES OR STRUCTURES.

CONSTRUCTION CONTRACTOR AGREES THAT IN ACCORDANCE WITH GENERALLY ACCEPTED CONSTRUCTION PRACTICES, CONSTRUCTION CONTRACTOR WILL BE REQUIRED TO ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THE PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY; THAT THIS REQUIREMENT SHALL BE MADE TO APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS, AND CONSTRUCTION CONTRACTOR FURTHER AGREES TO DEFEND, INDEMNIFY, AND HOLD HARMLESS THE CITY, ITS EMPLOYEES, AND AGENTS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT.

THE CONTRACTOR SHALL BE RESPONSIBLE TO REPORT DISCREPANCIES IN PLANS AND/OR FIELD CONDITIONS IMMEDIATELY TO THE DESIGN ENGINEER FOR RESOLUTION PRIOR TO CONSTRUCTION, AND SHALL BE RESPONSIBLE FOR DISCREPANCIES NOT SO REPORTED AND RESOLVED.

DIGALERT

CALL BEFORE YOU DIG
1-800-227-2600
AT LEAST
2 WORKING DAY
NOTICE REQUIRED

N

0 20 40
SCALE: 1:20

REVISION RECORD

#	DATE	DESCRIPTION

FRENCH HOTEL

31861 CAMINO CAPISTRANO
SAN JUAN CAPISTRANO, CA 92675

C3 CIVIL ENGINEERING
10870 W. FAIRVIEW DR
STE 102-1187
BOISE, ID 83713
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PROFESSIONAL SEAL

REGISTERED PROFESSIONAL ENGINEER THOMAS W. HAWKSWORTH No. 68771 Exp. 06/30/2026 CIVIL STATE OF CALIFORNIA

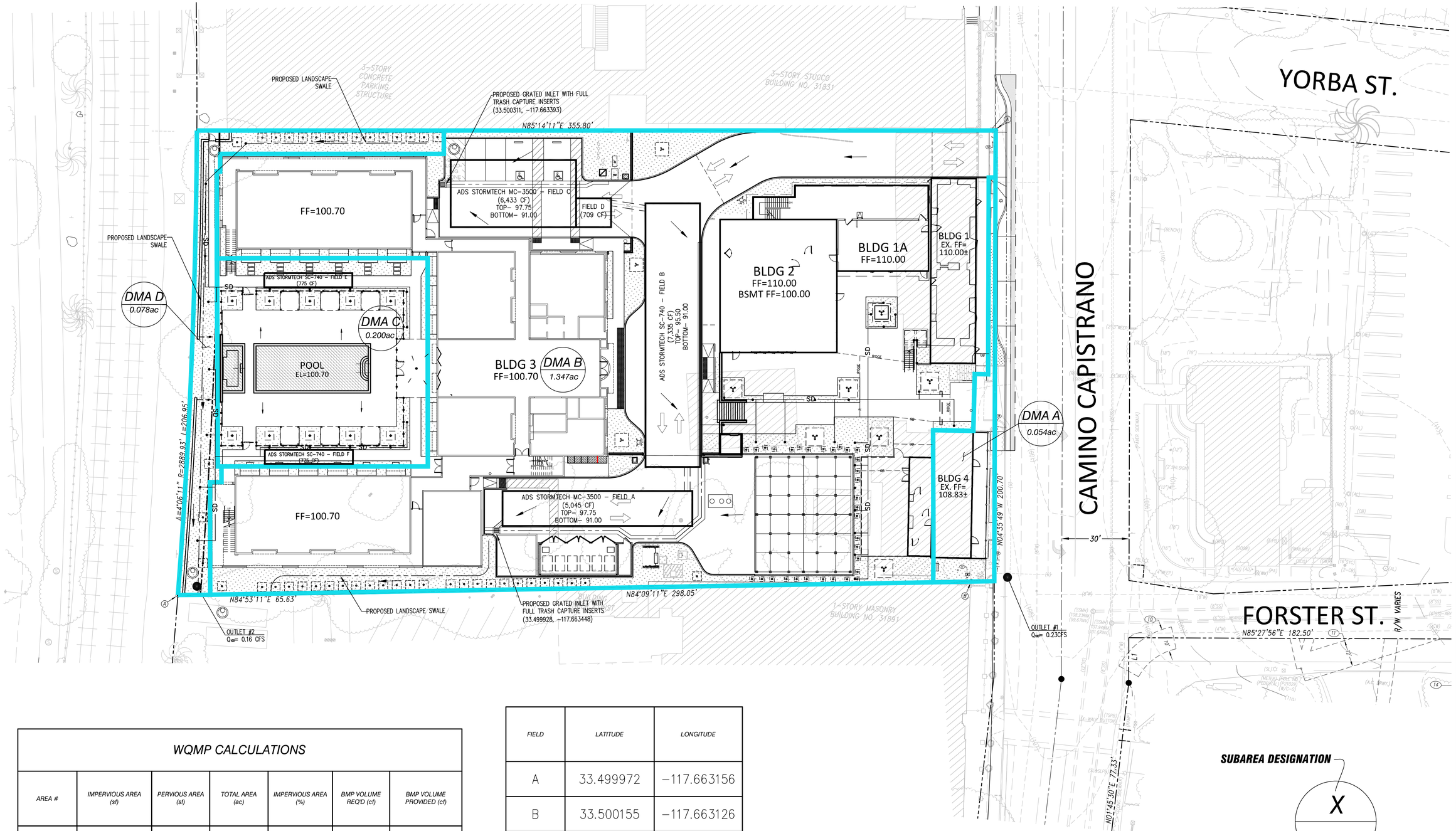
DATE: 10/09/2025
C3 JOB NO: 24-044
DRAWN BY: NM
CHECKED BY: TH

SHEET TITLE

EXISTING DRAINAGE MAP

SHEET NUMBER

7 of 9



WQMP CALCULATIONS

AREA #	IMPERVIOUS AREA (sf)	PERVIOUS AREA (sf)	TOTAL AREA (ac)	IMPERVIOUS AREA (%)	BMP VOLUME REQ'D (cf)	BMP VOLUME PROVIDED (cf)
DMA A	2,102	254	0.054	89	–	–
DMA B	50,317	8,355	1.347	86	3187	19,522
DMA C	5,000	3,697	0.200	57	364	1,550
DMA D	0	3,414	0.078	0	–	–

FIELD	LATITUDE	LONGITUDE
A	33.499972	-117.663156
B	33.500155	-117.663126
C	33.500304	-117.663324
D	33.500282	-117.663251
E	33.500192	-117.663588
F	33.500001	-117.663581

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N

0 20 40
SCALE: 1:20

SUBAREA DESIGNATION
X
X.XXXac
AREA (ac)

Tc=TIME OF CONCENTRATION
L=LENGTH OF SUBAREA FLOW PATH
S=SLOPE
DMA LIMITS
FLOW PATH
FLOW DIRECTION

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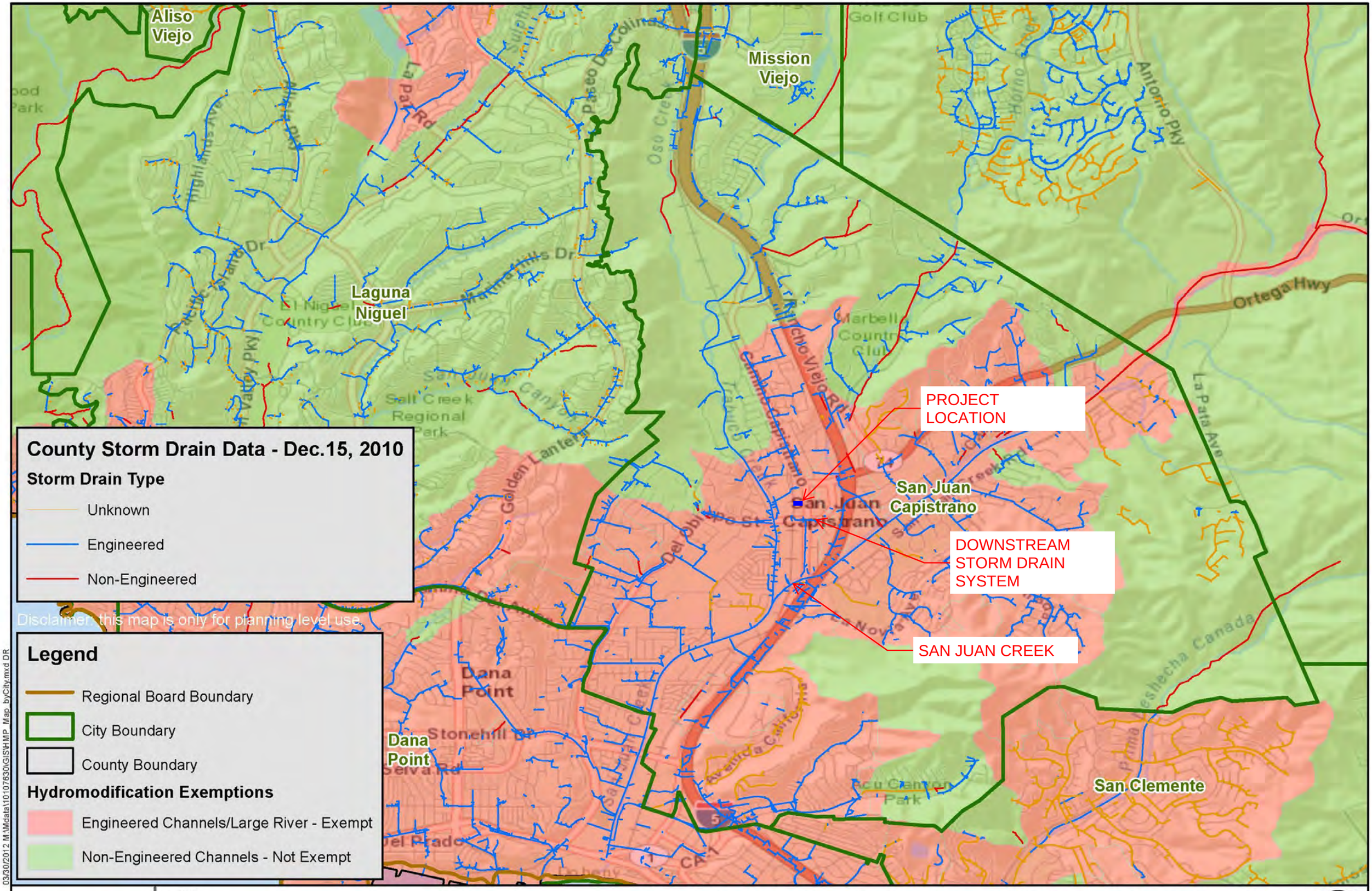
SHEET TITLE
DMA EXHIBIT

SHEET NUMBER
9 of 9



South Orange County Engineered Channel Exemption Areas
San Juan Capistrano Exemption Map

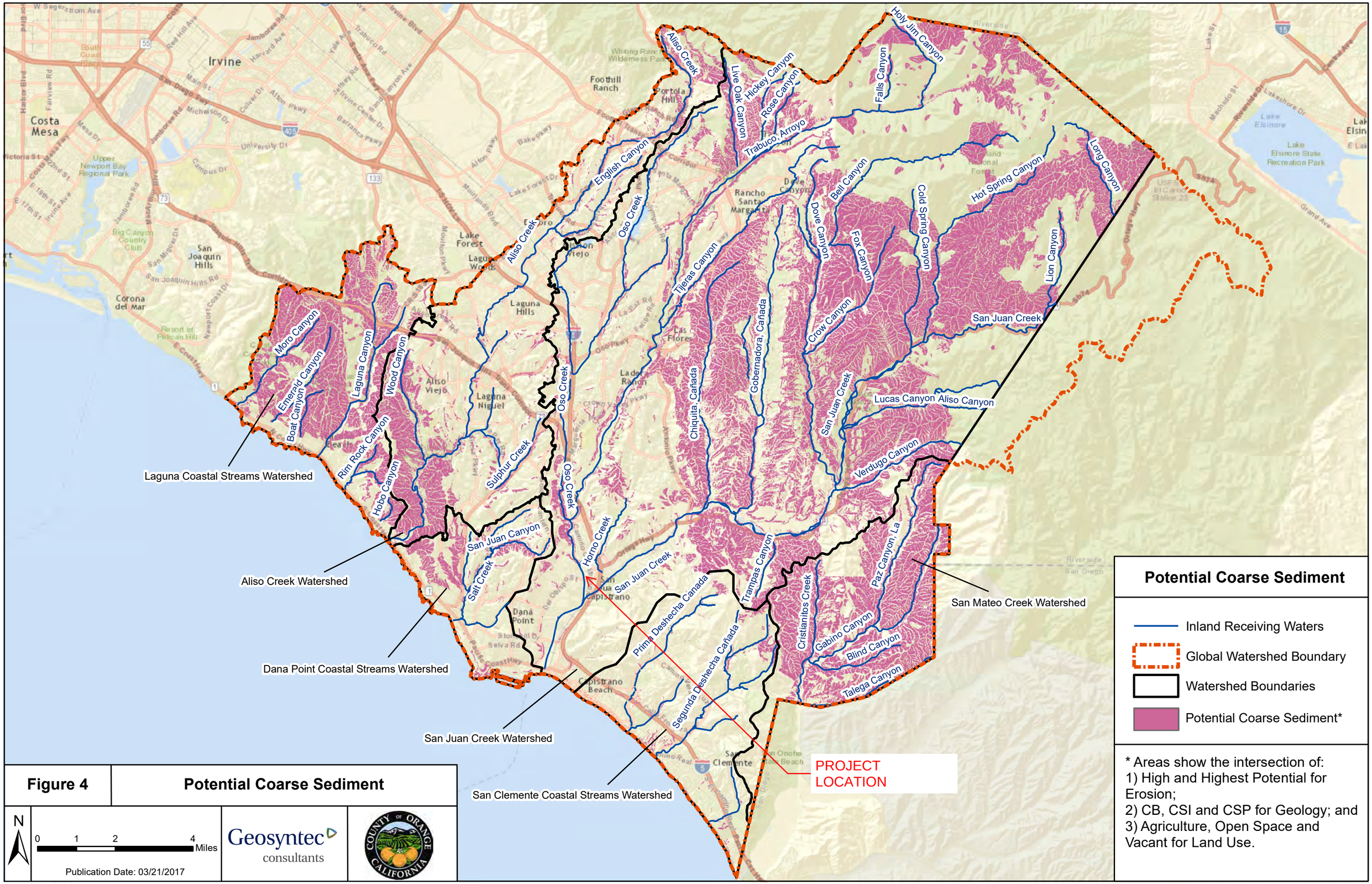


Figure 4 | **Potential Coarse Sediment**

Service Layer Credits: Sources: Esri, HERE, DeLorme, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), MapmyIndia, NGCC, © OpenStreetMap contributors, and the GIS User Community

INF-6: UNDERGROUND INFILTRATION

Category: Full Infiltration

Also known as:
- Infiltration Vault
- Infiltration Chamber
- Infiltration Gallery
- Recharge Vault

Note, this fact sheet also supports use of infiltration galleries as a supplemental retention BMP in combination with proprietary biotreatment to provide partial infiltration.



Source: Contech

Underground infiltration is a vault or chamber with an open bottom that is used to store runoff and infiltrate it into the underlying soil. These vaults or chambers may be designed using any number of configurations or structural components as long as they meet the requirements of the permit. A number of vendors offer proprietary products that allow for subsurface storage while offering durable prefabricated structures. There are many varieties of proprietary products that can be used to store runoff below roads and parking lots, parks and open spaces, single and multi-family residential, or mixed-use and commercial uses, and infiltrate it into the underlying soil. These facilities can be used to retain and infiltrate the full DCV as stand-alone BMPs or can be used to provide supplemental retention for proprietary biotreatment BMPs. Pretreatment is a mandatory and integral element of underground infiltration, as the ability to remove sediment and scarify the infiltrating surface is limited in most designs. When used as part of a treatment train downstream of biotreatment BMPs, they are used to provide supplemental retention.

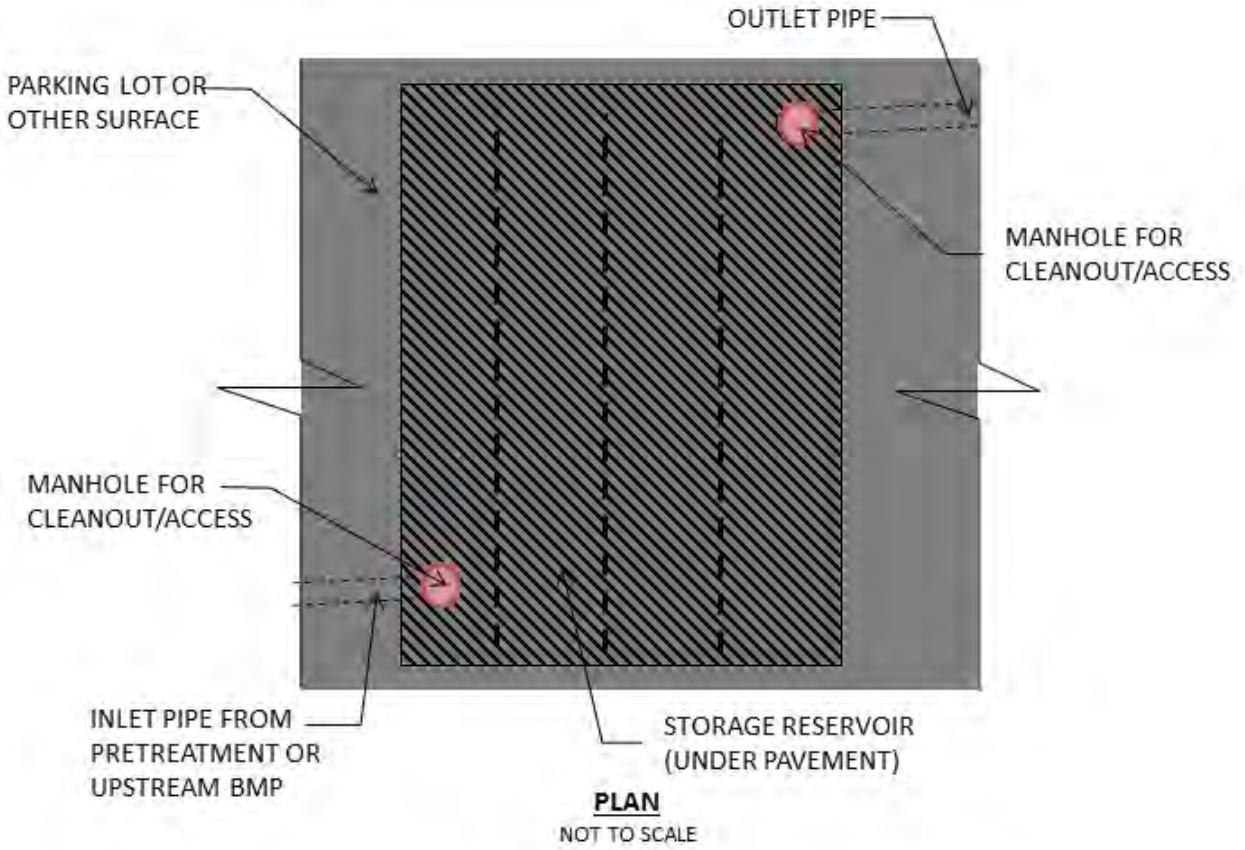
Pollutant Removal Considerations

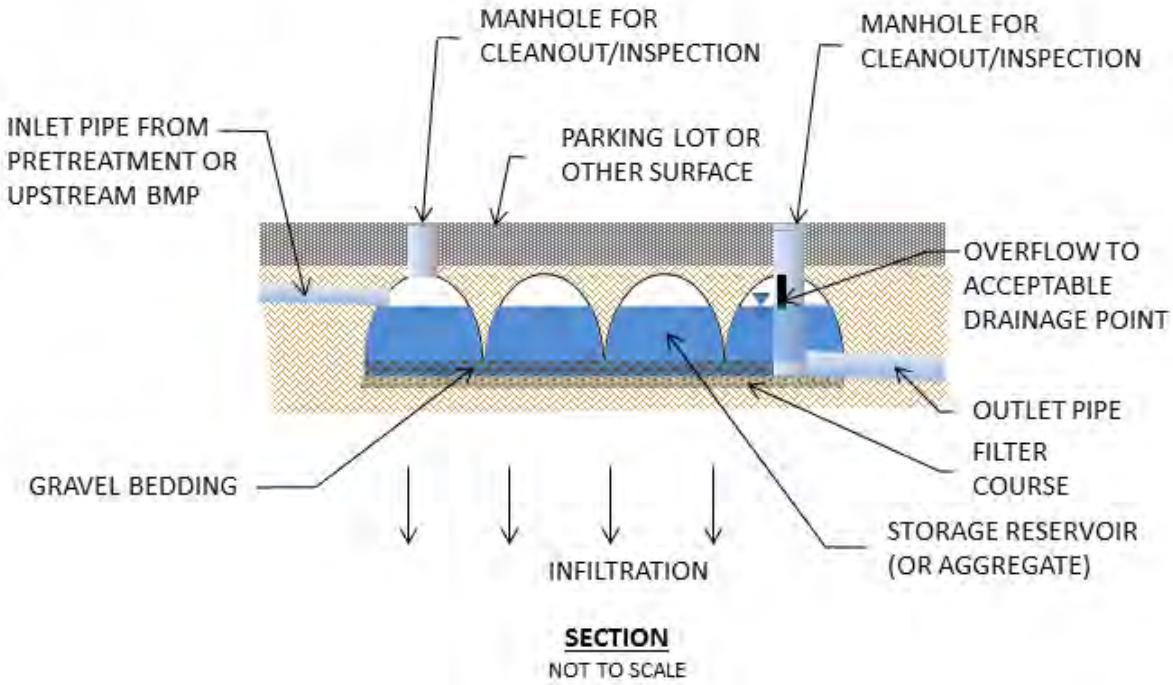
Sediment	Phosphorus	Nitrogen	Metals	Bacteria	Oil & Grease	Organics
H	H	H	H	H	H	H

Recommended Siting Criteria

	Siting Criteria	Intent/Rationale
☐	BMP placement adheres to geotechnical recommendations with respect to geological hazards and setbacks.	Must not negatively impact existing site geotechnical concerns.
☐	BMP is located in areas of the site most suitable for full infiltration.	A full infiltration BMP must be sited such that the underlying soil infiltration rates will facilitate infiltration of the full DCV and where this can be assured through construction and operation.
☐	BMP should not be located in fill areas or within infiltrating surface more than 10 feet below existing grade.	The ability to fully infiltrate the DCV must be determined prior to construction and assured through construction. In areas that will have fill, it is not possible to determine the infiltration rate prior to construction. Additionally, where the infiltrating surface is too deep below existing grade, the quality of investigation may be compromised. A borehole test provides a poor approximation of full scale infiltration from this BMP.
☐	BMP can be placed beneath roads, parking lots, parks, and athletic fields. For facilities located under roads, traffic loading requirements (e.g., HS-20, H-20) is observed.	This type of facility allows the overlying land use to serve a different purpose other than stormwater management. The overlying land use needs (e.g., structural, geotechnical, aesthetical, etc.) is addressed in the design. The activities over top of the BMP must not interfere with appropriate inspection and maintenance and reconstruction of the system on a 10- to 30-year lifecycle. Placement beneath buildings or other infrastructure is not recommended unless appropriate considerations are given for access and maintenance. .
☐	Sediment sources are controlled prior to operation of the system.	Facility should not be used in areas that will continue to receive elevated sediment loading following construction, such as from open space area.

Example Schematic Design - Plan and Section View





Recommended BMP Component Dimensions

BMP Component	Dimension	Intent/Rationale
Freeboard from Grate/Manhole Cover	≥ 1 foot	Freeboard provides room for head over overflow structures and minimizes risk of uncontrolled surface discharge. Lower freeboard is allowable if there is an acceptable alternative overflow method.
Access Hatch Diameter	≥ 24 inches (36 inches preferred)	Facilitates maintenance entry and sediment cleanout.
Bottom Coarse Sand Layer	≥ 4 inches	Typically sand to provide filtering of fine sediment prior to infiltration into subsurface soils.

Recommended Design Criteria and Considerations

Design Criteria	Intent/Rationale
Pretreatment	
☐ Pretreatment should be appropriately selected based on estimated loading, BMP depth, and target time to clog per guidance provided in **TGD Chapter 4.4 and Appendix E.4**.	Pretreatment is mandatory for underground infiltration due to the elevated risk of failure and cost to restore infiltration capacity if failure occurs.
Storage Reservoir	
☐ Reservoir chamber depth preferably less than 3 feet effective depth. Depth should be selected based on drawdown rate into underlying soils, potential for mounding, and clogging risk.	Deeper systems may take longer to drain, have higher risk of groundwater mounding, and be more susceptible to clogging.
☐ The bottom of the storage reservoir is flat	This allows uniform infiltration.
☐ A wide range of products is potentially acceptable, at the discretion of the reviewing jurisdiction.	Product suitability and durability should be reviewed.
☐ An observation port should be included in each distinct cell of the facility to inspect drawdown. A manhole can serve as an observation port.	This is needed to periodically inspect for drawdown rate.
Bottom Filter Course	
☐ Sand is coarse washed sand as described in the filter course specifications in MISC-3.	Washed sand free of larger objects will help eliminate fines and obstructions that could clog the aggregate storage layer void spaces or subgrade.
Inflow, Outflow, and Access Structures	
☐ Inflow, outflow, and access structures are accessible for inspection and maintenance.	Maintenance access is essential to ensure long-term performance.
☐ A stabilized overflow is required to safely convey overflow to the downstream receiving system.	Planning for controlled overflow lessens the risk of property damage due to flooding.

Calculations and Sizing Method

See **Appendix E** for acceptable sizing methods. The entire volume below the overflow elevation can be tabulated as infiltration volume.

Construction Guidance

	Construction Guidance	Intent/Rationale
☐	Plans should include a construction sequence for the BMP. Revisions proposed by the contractor should be reviewed by the engineer. The construction sequence should address erosion control, utilities, BMP installation, inspections, testing and certifications, final grading, vegetation, stabilization, and post-construction monitoring.	Construction sequencing is critical to avoid issues/damage and allow appropriate inspections, testing, and certifications to be performed.
☐	Excavate in dry weather or at least 48 hours after the end of rainfall.	Wetter soil is typically more susceptible to compaction.
☐	Avoid compaction of the base and sidewalls of facilities. Alleviate compaction as needed using mechanical tilling equipment (e.g., rototiller).	Infiltration rates are typically very susceptible to compaction. Infiltration should be maximized.
☐	Keep sediment out of the facility during construction as much as practicable using sediment and erosion control measures (e.g., silt fence, filter logs, check dams). Remove any confining layer that accumulates as a result of sedimentation. If the location of BMP is used as a temporary erosion and sediment control facility, it should be completely rehabilitated via over excavation, before being placed into service as a post-construction BMP.	Sediment accumulation can impair infiltration rates.
☐	Traffic within the BMP should be avoided unless impractical. If traffic within the system is allowed, only wide track and low-ground pressure equipment is allowed.	Compaction of the system must be avoided as much as possible.
☐	Establish the construction sequence to allow for inspection of buried infrastructure before it is buried.	It is impractical to inspect buried elements once they are covered.
☐	Fully stabilize sources of sediment within the tributary area (i.e., no exposed soil) prior to placing the finished BMP into service.	Erosion and sedimentation can seriously impair the hydraulic conductivity of the basin subgrade soils and require restoration and revegetation of the basin bottom.
☐	For deep installs, shoring with sheet piling or other methods are used to provide safe excavation. Proper bedding and backfill is used to stabilize the	Facilities must be safely and properly installed.

	Construction Guidance	Intent/Rationale
	structure. Proprietary structures are installed per manufacturer's specifications.	
☐	As part of verifying the system, conduct infiltration testing of underlying soil before placing chambers to confirm infiltration rates are equal or greater than the design infiltration rate. Require remediation if infiltration rates are lower than design.	The proponent must demonstrate that the BMP is constructed per design. Infiltration rate is an important design parameter.

Adaptability Considerations

This type of BMP has limited adaptability should actual conditions differ from those estimated as part of the design level investigation. Infiltration galleries should only be used as standalone BMPs in locations where the ability to reliably infiltrate can be determined in the design phase. Reliability can be improved through (1) conducting a thorough investigation, (2) minimizing construction impacts that could change conditions, and (3) providing a higher factor of safety in design.

The most practical option for adaptability is to utilize a proprietary biotreatment BMP as a pretreatment system. If this BMP is sized for the 150 percent of the DCV (full biotreatment sizing criteria), then the infiltration gallery can serve a complementary volume reduction purpose without being required to fully infiltrate the DCV. This could allow the depth of the infiltration gallery to be reduced should actual infiltration rates be lower than design infiltration rates.

If this option is used, it must be identified as a contingency plan in the Conceptual/ Preliminary WQMP as part of discretionary approval and appropriately supported with design phase and/or construction phase investigation to justify the need to infiltrate less than the full DCV.

O&M Activities and Frequencies

Activity	Frequency
GENERAL INSPECTIONS	
Inspect condition of pretreatment BMP to determine need for maintenance	Four times per year during wet season, including inspection just before the wet season and within 24 hours after at least two storm events ≥ 0.5 inches.
Inspect degree of sediment accumulation in storage reservoir, if possible	
Observe and record drawdown rate	
Identify any needed corrective maintenance that will require site-specific planning or design	
ROUTINE MAINTENANCE	
Pretreatment System	
Remove accumulated trash and debris	Each visit; as needed
Remove sediment from pretreatment system per manufacturer's recommendations or when sediment storage volume is more than 50% full	Per manufacturer recommendation, or as needed
Storage Reservoir	
It is not typically practical to maintain the storage reservoir or infiltrating surface; plan for overall reconstruction when infiltration falls below the design infiltration rate	Estimate frequency of clogging maintenance using guidance in **Appendix E.4**.
If infiltration has declined and the system has the flexibility to be adapted to serve as a biotreatment BMP with partial infiltration (i.e., through use of a proprietary BMP as a pretreatment system), then adjust outlet to infiltrate a shallower depth of water and operate as biotreatment with partial infiltration system while infiltration rates allow. This can extend the period before rehabilitation is needed.	As needed and acceptable.
Inflow and Outflow Structures	
Inspect inlets and outlets and remove accumulated sediment	Four times per year during wet season, including inspection just before the wet season.
Repair structural damage to inlets and outlets	As needed
CORRECTIVE (MAJOR) MAINTENANCE	
Prepare documentation of issues and resolutions for review by appropriate parties; modify WQMP if needed.	Before major maintenance
Document major maintenance activities; record modified WQMP and as-built plan set if needed	After major maintenance
Take photographs before and after from the same vantage point	Before and after

HSC-6: SELF-RETAINING AREAS

Self-retaining areas are DMAs with the project site that do not generate runoff volumes or pollutant loads higher than natural conditions during a design capture storm event (85th percentile, 24-hour event). These DMAs can be excluded from sizing of downstream LID BMPs. There are two primary types of self-retaining DMAs:

- DMAs with impervious surface where the full effects of the impervious surface are mitigated by HSCs.
- DMAs without impervious surface where the condition of the pervious surface does not generate elevated runoff volumes or pollutant loads.

The following subsections provide criteria and examples for each type of DMA.

Criteria for DMAs with Impervious Surfaces

- HSC-1, HSC-2, HSC-5, if adequately sized, have the potential to fully mitigate the hydrologic effects of impervious surfaces and associated pollutant loading.
- In order to be self-retaining, these HSCs must be sized per the criteria in the respective fact sheet to provide a d_{HSC} that is equal to greater than the design capture storm depth for the project location. Sizing approaches differ by HSC.
- These HSCs must be clearly delineated in the WQMP and O&M Plan with appropriate covenents or similar mechanisms to ensure that they are maintained for the life of the project.

Criteria for DMAs without Impervious Surfaces

- If landscaped areas are designed as described in HSC-2 (impervious area dispersion), they are considered self-retaining.
- Other pervious areas may be considered self-retaining if it is reasonably demonstrated that they are not expected to produce runoff during the 85th percentile, 24-hour event. Examples of demonstration of self-retaining areas are provided below.

Examples of Methods of Demonstrating Self-Retaining Areas

In areas that can allow some infiltration and do not require underdrains, examples of demonstrating self-retaining criteria include:

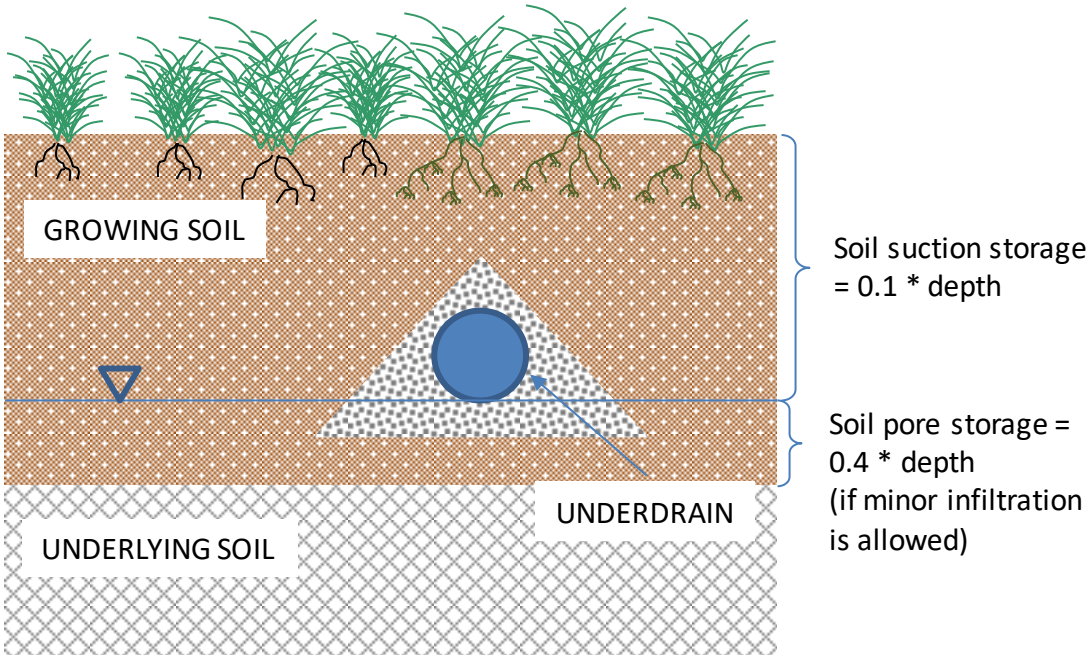
- Showing that soil infiltration rates reliably exceed 0.2 inches per hour.
- Showing that soil amendments provide freely drained pore spaces equal to at least the design capture storm depth.

In locations where partial infiltration is not feasible or pervious areas are designed with underdrain systems, this poses special considerations. Examples of how these areas could be considered self-retaining include:

- Do not allow excessive fertilizer or pesticides in the landscaped or turf areas that could wash through into underdrains, and

- Minimize nutrient content of growing soils consistent with MISC-1, and
- The soil above the underdrains should have suction (non-drained) storage capacity equal to the design capture storm depth. A reasonable estimate of 0.1 times the soil depth can be used to estimate the soil suction storage depth, or
- A water retention layer is provided below the elevation of the underdrains equal to the portion of the design capture storm depth that is not retained in the soil suction storage. This option requires that a small amount of infiltrated volume is feasible.
- Diagrams of these compartments are provided below. Note that this is not a preferred case; an underdrain below pervious area should only be used where needed for other reasons.

Diagrams of Water Retention Compartments in Pervious Areas with Underdrains



Attachment D: Calculations

Worksheet 1: Infiltration Feasibility Categorization – DMA B

Categorization of Infiltration Feasibility Condition			*Page 1 of 5*
Part 1: Physical Limitations of Infiltration Based on the criteria for physical limitations of infiltration described in Section 4.2.2.2, what level of physical feasibility of infiltration is the maximum that the BMP location will support?			
	Physical Infiltration Feasibility Category	**Mark applicable category**	**Next step**
1	Full Infiltration of the DCV	X	Continue to Part 2
	Biotreatment with Partial Infiltration		Continue to Part 3
	Biotreatment with No Infiltration		Select and Utilize Biotreatment without Infiltration
Provide summary of basis: See Geotech Report for Infiltration testing. Summarize findings of studies, provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.			

<table>
<tr><th colspan="2">Categorization of Infiltration Feasibility Condition</th><th colspan="2">Page 2 of 5</th></tr>
<tr><td colspan="2">Part 2: Risks Limiting Full Infiltration of the DCV –Would infiltration of the full DCV introduce risks of undesirable consequences that cannot reasonably be mitigated?</td><td>Yes</td><td>No</td></tr>
<tr><td>2</td><td>Would infiltration of the DCV pose significant risk for groundwater related concerns? Use criteria described in Section 4.2.2.3 and results from Worksheet 2 (Appendix C) to describe groundwater-related infiltration feasibility criteria.</td><td></td><td>X</td></tr>
<tr><td colspan="4">Provide basis:

Summarize findings of studies provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.</td></tr>
<tr><td>3</td><td>Would infiltration of the full DCV pose significant risk of increasing risk of geotechnical hazards that cannot be mitigated to an acceptable level? Use criteria described in Section 4.2.2.4.</td><td></td><td>X</td></tr>
<tr><td colspan="4">Provide basis:

Summarize findings of studies provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.</td></tr>
<tr><td>4</td><td>Would infiltration of the DCV cause an increase in groundwater flow or decrease in surface runoff over predevelopment conditions that would cause impairment to downstream beneficial uses, such as change of seasonality of ephemeral washes or increased discharge of contaminated groundwater to surface waters? Use criteria in Section 4.2.2.5</td><td></td><td>X</td></tr>
<tr><td colspan="4">Provide basis:

Summarize findings of studies provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.</td></tr>
</table>

Categorization of Infiltration Feasibility Condition		*Page 3 of 5*	
Part 2 (continued): Risks Limiting Full Infiltration of the DCV –*Would infiltration of the full DCV introduce risks of undesirable consequences that cannot reasonably be mitigated?*		***Yes***	***No***
5	Is there substantial evidence that infiltration of the DCV would **result in a significant increase in I&I to the sanitary sewer** that cannot be sufficiently mitigated?		X
Provide basis: Summarize findings of studies provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.			
6	Would infiltration of the DCV **violate downstream water rights**?		X
Provide basis: Summarize findings of studies provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.			
Part 2 Result	If the answer to all questions 2-6 are “No”, then the DMA is categorized as “Full Infiltration” for the purposes of LID BMP type selection. Describe finding. At the Preliminary/Conceptual WQMP phase, describe the additional design-phase testing required to confirm this determination and identify contingencies for final design. At the Final Project WQMP phase, identify any required construction-phase testing and identify the design contingencies that should result based on construction-phase testing. If the answer to any of questions 2-6 is “Yes” then the site cannot be categorized as “Full Infiltration”. Continue to Part 3: Partial Infiltration Feasibility		

Categorization of Infiltration Feasibility Condition		***Page 4 of 5***	
Part 3: Partial Infiltration Feasibility Criteria –*Would infiltration of any appreciable volume of stormwater result in risks of undesirable consequences that cannot reasonably be mitigated?*		***Yes***	***No***
8	**Would use of biotreatment BMPs with partial infiltration pose significant risk for groundwater related concerns?** Refer to criteria in Section 4.2.2.3 and Worksheet 1 (Appendix C) for guidance on groundwater-related infiltration feasibility criteria.		
Provide basis: Summarize findings of studies provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.			
9	**Would the use of biotreatment BMPs with partial infiltration pose elevated risks of geotechnical hazards that cannot be mitigated to an acceptable level**? Refer to Section 4.2.2.4.		
Provide basis: Summarize findings of studies provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.			
10	**Would the use of biotreatment BMPs with partial infiltration elevate risks or introduced conflicts related to groundwater balance, inflow and infiltration, or water rights?** Refer to Section 4.2.2.5. Note: this is uncommon and must be supported by site-specific analysis if it is used as a basis to reject biotreatment with partial infiltration.		
Provide basis: Summarize findings of studies provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.			

Categorization of Infiltration Feasibility Condition		*Page 5 of 5*
Part 3 Result	If the answer to all questions 8-10 are “No”, then the DMA is categorized as “Biotreatment with Partial Infiltration” for the purposes of LID BMP type selection. If the answer to any of questions 8-10 is “Yes” then the site is categorized as “Biotreatment with No Infiltration” for the purposes of LID BMP type selection.	

Worksheet 3: Factor of Safety and Design Infiltration Rate and Worksheet (DMA B)

Factor Category		Factor Description	Assigned Weight (w)	Factor Value (v)	Product (p) p = w x v
A	Suitability Assessment	Soil assessment methods	0.25	1	0.25
		Predominant soil texture	0.25	2	0.50
		Site soil variability	0.25	1	0.25
		Depth to groundwater / impervious layer	0.25	2	0.5
		Suitability Assessment Safety Factor, $S_A = \Sigma p$			1.5
B	Design	Tributary area size	0.25	1	0.25
		Level of pretreatment/ expected sediment loads	0.25	1	0.25
		Redundancy/contingency plan	0.25	3	0.75
		Compaction during construction	0.25	1	0.25
		Design Safety Factor, $S_B = \Sigma p$			1.5
Combined Safety Factor, $S_{Total} = S_A \times S_B$					3.0
Observed Infiltration Rate, inch/hr, K_{obs} (corrected for test-specific bias)					4.32
Design Infiltration Rate, in/hr, $K_{design} = K_{obs} / S_{Total}$					1.44

Supporting Data

Briefly describe infiltration test and provide reference to test forms:

See Geotech for infiltration testing methods and results.

Note: The minimum combined adjustment factor shall not be less than 2.0 and the maximum combined adjustment factor shall not exceed 9.0.

Worksheet 3: Factor of Safety and Design Infiltration Rate and Worksheet (DMA C)

Factor Category		Factor Description	Assigned Weight (w)	Factor Value (v)	Product (p) p = w x v
A	Suitability Assessment	Soil assessment methods	0.25	1	0.25
		Predominant soil texture	0.25	2	0.50
		Site soil variability	0.25	1	0.25
		Depth to groundwater / impervious layer	0.25	2	0.5
		Suitability Assessment Safety Factor, $S_A = \Sigma p$			1.5
B	Design	Tributary area size	0.25	1	0.25
		Level of pretreatment/ expected sediment loads	0.25	1	0.25
		Redundancy/contingency plan	0.25	3	0.75
		Compaction during construction	0.25	1	0.25
		Design Safety Factor, $S_B = \Sigma p$			1.5
Combined Safety Factor, $S_{Total} = S_A \times S_B$					3.0
Observed Infiltration Rate, inch/hr, K_{obs} (corrected for test-specific bias)					4.32
Design Infiltration Rate, in/hr, $K_{design} = K_{obs} / S_{Total}$					1.44

Supporting Data

Briefly describe infiltration test and provide reference to test forms:

See Geotech for infiltration testing methods and results.

Note: The minimum combined adjustment factor shall not be less than 2.0 and the maximum combined adjustment factor shall not exceed 9.0.

Worksheet 5: Simple Design Capture Volume Sizing Method for Full Infiltration BMPs

Area DMA B

Part 1: Calculate the DCV				
1	Enter design capture storm depth, *d* (inches)	d=	0.82	inches
2a	Enter the combined effect of provided HSCs, d_{HSC} (inches) (based on Worksheet 4) including any other upstream BMPs	d_{HSC}=	0	inches
2b	Calculate the remainder of the design capture storm depth, $d_{remainder} = d - d_{HSC}$	$d_{remainder}$=	0.82	inches
3a	Enter DMA area tributary to BMP(s), *A* (acres) excluding any self-retaining areas	A=	1.347	acres
3b	Enter DMA Imperviousness, imp (unitless) after removal of self-retaining areas	imp=	0.85	
3c	Calculate runoff coefficient, *C= (0.75 x imp) + 0.15*	C=	0.78	
3d	Calculate runoff volume, *DCV = (C x $d_{remainder}$ x A x 43560 x (1/12)) (See Section E.2.2)*	DCV=	3,127	cu-ft
Part 2: Design BMP and Calculate Effective Storage Depth and Footprint				
4	Enter total effective storage depth (sum of values below)	$D_{total\_effective}$	38.4	inches
4a	Ponding storage depth	D_{pond}	36.0	inches
4b	Media effective storage depth (depth * 0.2)	$D_{media\_effective}$	0	inches
4c	Gravel effective storage (depth * 0.4)	$D_{gravel\_effective}$	2.4	inches
5	Determine required effective footprint: A_{BMP} = DCV /(D_{Total} *12 inches/ft) If sides are sloped, measure A_{BMP} at the mid-ponding depth of the BMP.	A_{BMP}=	1,268	sq-ft
Part 3: Check Drawdown Time				
6a	Calculate design infiltration rate, $K_{design} = K_{observed} / S_{total}$ (See Worksheet 3 and Appendix D)	K_{design}=	0.71	in/hr
6b	Calculate drawdown time ($D_{total\_effective} / K_{design}$) (must be less than or equal to 48 hours).	$T_{drawdown}$=	54	hours
6c	If using Method 2 for drawdown (Section E.2.5) which accounts for sidewall infiltration, insert result and attach relevant calculations below.	$T_{drawdown}$=	28.4	hours
Part 4: ***Check Minimum Infiltrating Surface Area for Premature Clogging***				
7a	Calculate BMP infiltrating surface area as percent of tributary impervious area ($A_{infiltrating}$/(A * imp * 43560 sq-ft/ac)		2.0	%
7b	Calculate minimum infiltrating surface area required for BMP to avoid premature clogging (Section E.4.1)		1.0	%

Worksheet 5: Simple Design Capture Volume Sizing Method for Full Infiltration BMPs

DMA C

Part 1: Calculate the DCV				
1	Enter design capture storm depth, *d* (inches)	d=	0.82	inches
2a	Enter the combined effect of provided HSCs, d_{HSC} (inches) (based on Worksheet 4) including any other upstream BMPs	d_{HSC}=	0	inches
2b	Calculate the remainder of the design capture storm depth, $d_{remainder}$ = d – d_{HSC}	$d_{remainder}$=	0.82	inches
3a	Enter DMA area tributary to BMP(s), *A* (acres) excluding any self-retaining areas	A=	0.20	acres
3b	Enter DMA Imperviousness, imp (unitless) after removal of self-retaining areas	imp=	0.85	
3c	Calculate runoff coefficient, *C= (0.75 x imp) + 0.15*	C=	0.78	
3d	Calculate runoff volume, *DCV = (C x $d_{remainder}$ x A x 43560 x (1/12)) (See Section E.2.2)*	DCV=	464	cu-ft
Part 2: Design BMP and Calculate Effective Storage Depth and Footprint				
4	Enter total effective storage depth (sum of values below)	$D_{total\_effective}$		inches
4a	Ponding storage depth	D_{pond}		inches
4b	Media effective storage depth (depth * 0.2)	$D_{media\_effective}$		inches
4c	Gravel effective storage (depth * 0.4)	$D_{gravel\_effective}$		inches
5	Determine required effective footprint: A_{BMP} = DCV /(D_{Total} *12 inches/ft) If sides are sloped, measure A_{BMP} at the mid-ponding depth of the BMP.	A_{BMP}=		sq-ft
Part 3: Check Drawdown Time				
6a	Calculate design infiltration rate, K_{design} = $K_{observed}$ / S_{total} (See Worksheet 3 and Appendix D)	K_{design}=		in/hr
6b	Calculate drawdown time ($D_{total\_effective}$ / K_{design}) (must be less than or equal to 48 hours).	$T_{drawdown}$=		hours
6c	If using Method 2 for drawdown (Section E.2.5) which accounts for sidewall infiltration, insert result and attach relevant calculations below.	$T_{drawdown}$=		hours
Part 4: ***Check Minimum Infiltrating Surface Area for Premature Clogging***				
7a	Calculate BMP infiltrating surface area as percent of tributary impervious area ($A_{infiltrating}$/(A * imp * 43560 sq-ft/ac)			%
7b	Calculate minimum infiltrating surface area required for BMP to avoid premature clogging (Section E.4.1)			%