



Appendix J Preliminary WQMP



Appendices

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Preliminary Water Quality Management Plan (WQMP)

Project Name: ONE METRO WEST

1683 SUNFLOWER AVENUE

COSTA MESA, CALIFORNIA 92626

VESTING TENTATIVE TRACT MAP NO. 19105 LOTS 1-5

Prepared for:

ROSE EQUITIES

18900 TELLER AVENUE

IRVINE, CA 92612

Contact: Brent Stoll

323-782-4300

Prepared by:

Urban Resource Corporation

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August 14, 2019

**Preliminary Water Quality Management Plan (WQMP)
ONE METRO WEST**

Project Owner's Certification			
Permit/ Application No.		Grading Permit No.	
Tract/Parcel Map No.	19105	Building Permit No.	
CUP, SUP, and/or APN (Specify Lot Numbers if Portions of Tract)			Lot 1-5

This Project Water Quality Management Plan (WQMP) has been prepared for Rose Equities by Urban Resource Corporation. 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 Santa Ana Region. 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:			
Title	Brent Stoll		
Company	Rose Equities		
Address	18900 Teller Avenue, Irvine CA 92612		
Email	Brent@RoseEquities.com		
Telephone #	323-782-4300		
Signature		Date	

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Section I Discretionary Permit(s) and Water Quality Conditions

Project Information	
Permit/Application No.	Tract/Parcel Map No. Tract 19105 Lots 1-5
Additional Information/ Comments:	
Water Quality Conditions	
Water Quality Conditions (list verbatim)	The discretionary permits, conditional use permits, or other final approvals required for this project are as follows: TBD. The water quality condition requiring preparation of this report is "Addition or replacement of 5,000 square feet or more of impervious surface on a developed site". The water quality condition that applies to this project specifies the following: "Prior to the issuance of preliminary or precise grading permits, the applicant shall submit to the Chief Building Official for review and approval, a Water Quality Management Plan (WQMP). The WQMP shall identify the Best Management Practices (BMPs) that will be used on the site to control predictable pollutant runoff."
Watershed-Based Plan Conditions	
Provide applicable conditions from watershed - based plans including WIHMPs and TMDLS.	N/A

Section II Project Description

II.1 Project Description

Description of Proposed Project			
Development Category (Verbatim from WQMP):	Redevelopment that creates or replaces 5,000 square feet or more of impervious surface		
Project Area: 15.2 acres	<table style="width: 100%; border: none;"> <tr> <td style="width: 60%; border: none;">Number of Dwelling Units: 1,057 apartment units</td> <td style="width: 40%; border: none;">SIC Code: 6513</td> </tr> </table>	Number of Dwelling Units: 1,057 apartment units	SIC Code: 6513
Number of Dwelling Units: 1,057 apartment units	SIC Code: 6513		
Narrative Project Description:	<p>One Metro West Vesting Tentative Tract 19105 is located at 1683 Sunflower Avenue in the City of Costa Mesa, and is bounded by existing commercial to the west, by existing commercial site SOCO to the east, by Interstate 405 Highway to the south, and by Sunflower Avenue to the north. The project has a total gross site acreage of approximately 15.2 acres and proposes three residential apartment buildings, a public park, and a tech building.</p> <p>The proposed project consists of 1,057 apartment units in three buildings, a public park, and a creative office building/tech building.</p> <p>Building A consists of 445 units, including studios, 1 bedroom, 2 bedroom, and 3 bedroom units. Building B consists of 383 dwelling units, including studios, 1 bedroom, 2 bedroom, and 3 bedroom units. Building C consists of 229 units, including studios, 1 bedroom, 2 bedroom, and 3 bedroom units.</p> <p>Activities may include but is not limited to events at the public park, events in the creative office building, events in the leasing center, events in the fitness center, and events/activities at the courtyards. Facility locations for activities can be found in the Water Quality Site Plan.</p> <p>Materials and products for activities, such as food, party supplies, office supplies, and meeting supplies, will be located at the facility location (ie. Park, pool area, courtyards, etc) and may be for temporary use only. Wastes generated for activities will primarily be trash. Also, refer to the project pollutants of concern in Section II.2.</p> <p>The following are not proposed for the project - Outdoor food preparation areas, outdoor processing areas, and equipment and maintenance repair areas. There will be no vehicle maintenance and</p>		

repair areas, including washing or cleaning.

Rose Equities or a Property Management Company will be responsible for long term maintenance responsibilities of the site. There will be no infrastructure transfer to public agencies for onsite infrastructure unless otherwise required.

Project Area	Pervious		Impervious	
	Area (acres or sq ft)	Percentage	Area (acres or sq ft)	Percentage
Pre-Project Conditions	2.7 acres	18%	12.5	82%
Post-Project Conditions	2.3 acres	15%	12.9	85%

Drainage
Patterns/Connections

The existing site drainage patterns primarily drain to the south and west, and ultimately into the existing 66" RCP storm drain, and south and east, and ultimately into an onsite 24" RCP storm drain located onsite. Based on field observation, it is assumed the easterly drainage area ultimately outlets into an existing 24" RCP storm drain located in the Caltrans right of way at the southeast corner of the project.

The proposed onsite drainage, and onsite storm drain system will maintain similar drainage patterns in order to convey flows back to their historical locations, to the maximum extent practicable.

II.2 Potential Stormwater Pollutants

Pollutants of Concern			
Pollutant	Circle One:		Additional Information and Comments
	E=Expected to be of concern	N=Not Expected to be of concern	
Suspended-Solid/ Sediment	<u>E</u>	N	Expected from erosion of soil
Nutrients	<u>E</u>	N	Expected from fertilizers, trash/debris, and eroded soils
Heavy Metals	<u>E</u>	N	Expected from vehicle brake pads, and metal products
Pathogens (Bacteria/Virus)	<u>E</u>	N	Expected from animal or human fecal waste
Pesticides	<u>E</u>	N	Expected from landscape areas
Oil and Grease	<u>E</u>	N	Expected from vehicles.
Toxic Organic Compounds	<u>E</u>	N	Expected from landscape maintenance areas.
Trash and Debris	<u>E</u>	N	Expected from littering, landscaping, etc.

II.3 Hydrologic Conditions of Concern

No - Show map

Yes - Describe applicable hydrologic conditions of concern below. *Refer to Section 2.2.3 in the TGD.*

The Project is not located in a stream susceptible area per Figure XVI-3c of the OC TGD.

II.4 Post Development Drainage Characteristics

Post development drainage will be similar to the existing condition and will drain southeasterly and southwesterly to existing storm drain systems.

This project does not discharge directly into a receiving water body.

II.5 Property Ownership/Management

The project will be owned and operated by Rose Equities. Rose Equities and/or the Property Management Company will be responsible for the long term maintenance of the project's storm water facilities.

Section III Site Description

III.1 Physical Setting

Planning Area/ Community Name	ONE METRO WEST
Location/ Address	1683 Sunflower Avenue
	Costa Mesa, CA
Land Use	High Density Residential
Zoning	Planned Development Residential - High Density - Specific Plan
Acreage	15.2 ACRES
Predominant Soil Type	NRCS Soil Type A/C

III.2 Site Characteristics

<i>Precipitation Zone</i>	<i>Rainfall Zone - Design Capture Storm Depth = 0.75", per Figure XVI-1, provided in Attachment C.</i>
<i>Topography</i>	<i>The existing site is generally flat, with two main drainage areas that convey the majority of stormwater southwesterly and southeasterly.</i>
<i>Drainage Patterns/Connections</i>	<i>Refer to Section II.1.</i>
<i>Soil Type, Geology, and Infiltration Properties</i>	Per NRCS, the soil type is Type A and Type C. The groundwater is shallow and depth to groundwater was encountered between 10' and 20' per the soils report provided in Attachment D. Additionally, the soils report specifies that the historic high groundwater depth is 10 feet below existing ground surface.

Site Characteristics (continued)

<i>Hydrogeologic (Groundwater) Conditions</i>	Refer to Section III.2.
<i>Geotechnical Conditions (relevant to infiltration)</i>	The site has shallow groundwater. Therefore, infiltration is not feasible.
<i>Off-Site Drainage</i>	No offsite drainage is anticipated onto this site.
<i>Utility and Infrastructure Information</i>	Existing wet utilities, including storm drain, domestic water, and sewer is available for the proposed development. Existing RCP storm drain is available for the project connection as there is an existing 66" RCP storm drain located on the west side of the site, and an existing 24" RCP storm drain located at the east side of the project. Both existing RCP storm drain lines convey flows southerly.

III.3 Watershed Description

Receiving Waters	Santa Ana River Reach 1 to Newport Slough
303(d) Listed Impairments	Santa Ana River Reach 1 - None Newport Slough - Enterococcus, Fecal Coliform, Total Coliform
Applicable TMDLs	Pathogens
Pollutants of Concern for the Project	Sediment, Nutrients, Pathogens, Pesticides, Metals, Organics, Oil and Grease, Trash/Debris
Environmentally Sensitive and Special Biological Significant Areas	The project is not located within 200 feet or adjacent to an Environmentally Sensitive Area (ESA), nor does it discharge directly into it.

Section IV Best Management Practices (BMPs)

IV. 1 Project Performance Criteria

(NOC Permit Area only) Is there an approved WIHMP or equivalent for the project area that includes more stringent LID feasibility criteria or if there are opportunities identified for implementing LID on regional or sub-regional basis?		YES <input type="checkbox"/>	NO <input checked="" type="checkbox"/>
If yes, describe WIHMP feasibility criteria or regional/sub-regional LID opportunities.	N/A		

Project Performance Criteria (continued)

<p>If HCOC exists, list applicable hydromodification control performance criteria (Section 7.II-2.4.2.2 in MWQMP)</p>	<p align="center">N/A</p>
<p>List applicable LID performance criteria (Section 7.II-2.4.3 from MWQMP)</p>	<ul style="list-style-type: none"> • Priority projects must infiltrate, harvest and use, evapotranspire, or biotreat/biofilter, the 85th percentile, 24-hour storm event (Design Capture Volume). • A properly designed biotreatment system may only be considered if infiltration, harvest and use, and evapotranspiration (ET) cannot be feasibly implemented for the full design capture volume. In this case, infiltration, harvest and use, and ET practices must be implemented to be the greatest extent feasible and biotreatment may be provided for the remaining design capture volume. <p>LID BMPs must be designed to:</p> <ul style="list-style-type: none"> • Retain, on-site, (infiltrate, harvest and use, or evapotranspire) stormwater runoff as feasible up to the Design Capture Volume, and • Recover (i.e., draw down) the storage volume as soon as possible after a storm event (see criteria for maximizing drawdown rate in the TGD Appendix XI), and, if necessary <p>Biotreat, on-site, additional runoff, as feasible, up to 80 percent average annual capture efficiency (cumulative, retention plus biotreatment, on-site plus off-site)</p>
<p>List applicable treatment control BMP performance criteria (Section 7.II-3.2.2 from MWQMP)</p>	<p align="center">N/A</p>

Calculate LID design storm capture volume for Project.

LID design storm capture volume will be calculated using the Capture Efficiency Method for Flow-Based BMPs. Preliminary calculations are provided in Attachment D.

IV.2. Site Design and Drainage Plan

SITE DESIGN PRACTICES

SITE PLANNING AND LAYOUT

1. **Minimize Impervious Area:** This project will minimize impervious areas with proposed outdoor amenities which will be beautifully landscaped. Building A, B, and C will incorporate landscaping within courtyards, and around the buildings. Additionally, the public park will be a significant source of pervious area.
2. **Maximize Natural Infiltration Capacity:** There will be natural infiltration that occurs throughout the site due to proposed pervious areas within courtyards, around buildings, and at the proposed public park. However, Infiltration BMPs to meet LID requirements is considered infeasible.
3. **Preserve Existing Drainage Pattern and Time of Concentration:** Existing drainage patterns will be maintained. Project runoff will ultimately drain southwesterly and southeasterly to existing RCP storm drain. The time of concentration will be similar to the existing condition time of concentration since the developed site will ultimately convey flows to the existing storm drain system, mimicking existing drainage patterns. The proposed condition will convey flows with the use of onsite vegetated swales, street gutters, area drain lines, and storm drain lines. The storm flows will be conveyed to the two existing RCP storm drain lines located on the west side and east side of the site, where existing storm flows primary outlet into.
4. **Disconnect Impervious Areas:** Some proposed impervious areas such as walkways will be graded to surface flow through landscaping prior to entering the storm drain system.

VEGETATIVE PROTECTION, SELECTIVE REVEGETATION, AND SOIL STOCKPILING

1. **Protect Existing Vegetation and Sensitive Areas:** Existing trees and landscaping along site perimeter will be protected, where required.
2. **Revegetate Disturbed Areas:** All disturbed areas will be developed and revegetated where new landscaping is proposed.
3. **Soil Stockpiling and Site Generated Organics:** The project will protect soil stockpile where possible to prevent excessive compaction and cover stockpile when practical to prevent significant erosion and leaching of nutrients.
4. **Firescaping:** The project is not located in a high risk wildfire zone.
5. **Xeriscape Landscaping:** Proposed landscaping considers practical turf areas, efficient irrigation, and practical turf areas on this project to reduce water use and decrease energy use.

SLOPES AND CHANNEL BUFFERS

Any small slopes within the project limits will be landscaped with native or drought tolerant vegetation. There are no onsite channel buffers or conveyance channels that require energy dissipators, or lining.

TECHNIQUES TO MINIMIZE LAND DISTURBANCE

Areas that do not require grading will be protected to the maximum extent practicable to avoid soil disturbance. Areas to be protected will be delineated with the use of silt fencing, gravel bags, green screen fencing, etc.

PRELIMINARY DRAINAGE MANAGEMENT AREAS AND LID BMPS

BMP No.	DMA	
	Treated	BMP Type/Model
1	1	MWS-L-6-8-V
2	2	MWS-L-8-8-V
3	3	MWS-L-8-8-V
4	4	MWS-L-6-8-V
5	5	MWS-L-4-8-V
6	6	MWS-L-6-8-V
7	7	MWS-L-4-8-V
8	8	MWS-L-8-8-V
9	9	MWS-L-4-6-V
10	10	MWS-L-8-8-V
11	11	MWS-L-6-8-V
12	12	MWS-L-4-8-V
13	13	MWS-L-4-15-V
14	14	MWS-L-4-15-V
15	15	MWS-L-4-8-V
16	16	MWS-L-8-8-V
17	17	MWS-L-6-8-V
18	18	MWS-L-8-8-V
19	19	MWS-L-8-12-V

Preliminary Drainage Management Areas and LID BMPs proposed are provided in the table above. Refer to the calculations table included in Attachment D for more information. LID BMPs will consist of Biotreatment BMPs such as the Modular Wetland, or approved similar.

The funding mechanism for the Operations and Maintenance Program will be Rose Equities.

IV.3 LID BMP Selection and Project Conformance Analysis

IV.3.1 Hydrologic Source Controls

Name	Included?
Localized on-lot infiltration	<input type="checkbox"/>
Impervious area dispersion (e.g. roof top disconnection)	<input type="checkbox"/>
Street trees (canopy interception)	<input type="checkbox"/>
Residential rain barrels (not actively managed)	<input type="checkbox"/>
Green roofs/Brown roofs	<input type="checkbox"/>
Blue roofs	<input type="checkbox"/>
Impervious area reduction (e.g. permeable pavers, site design)	<input type="checkbox"/>

HSCs are currently not being considered in this Preliminary WQMP report since the project will conform to LID sizing requirements with the use of Biotreatment BMPs, per the OC TGD. There are no numeric standards requiring the use of HSCs. Should HSCs be used during preparation of Construction Drawings, the Final WQMP report will indicate the use as required.

IV.3.2 Infiltration BMPs

Name	Included?
Bioretention without underdrains	<input type="checkbox"/>
Rain gardens	<input type="checkbox"/>
Porous landscaping	<input type="checkbox"/>
Infiltration planters	<input type="checkbox"/>
Retention swales	<input type="checkbox"/>
Infiltration trenches	<input type="checkbox"/>
Infiltration basins	<input type="checkbox"/>
Drywells	<input type="checkbox"/>
Subsurface infiltration galleries	<input type="checkbox"/>
French drains	<input type="checkbox"/>
Permeable asphalt	<input type="checkbox"/>
Permeable concrete	<input type="checkbox"/>
Permeable concrete pavers	<input type="checkbox"/>
Other:	<input type="checkbox"/>
Other:	<input type="checkbox"/>

Infiltration for this site is NOT FEASIBLE.

Justification: Per the soils report included in Attachment D, groundwater was encountered between 10' to 20', and the historic high groundwater depth is reported as 10 feet below existing ground surface. The potential for groundwater mounding can further raise groundwater, especially during the rainy season. Based on the shallow groundwater condition, infiltration for this project cannot be justified, and therefore is considered NOT FEASIBLE.

IV.3.3 Evapotranspiration, Rainwater Harvesting BMPs

Name	Included?
All HSCs; <i>See Section IV.3.1</i>	<input type="checkbox"/>
Surface-based infiltration BMPs	<input type="checkbox"/>
Biotreatment BMPs	<input type="checkbox"/>
Above-ground cisterns and basins	<input type="checkbox"/>
Underground detention	<input type="checkbox"/>
Other:	<input type="checkbox"/>
Other:	<input type="checkbox"/>
Other:	<input type="checkbox"/>

CALCULATIONS

Harvest and Reuse is **NOT FEASIBLE**.

Worksheet J is included herewith in Attachment D to rule out irrigation demand.

IV.3.4 Biotreatment BMPs

Name	Included?
Bioretention with underdrains	<input type="checkbox"/>
Stormwater planter boxes with underdrains	<input type="checkbox"/>
Rain gardens with underdrains	<input type="checkbox"/>
Constructed wetlands	<input type="checkbox"/>
Vegetated swales	<input type="checkbox"/>
Vegetated filter strips	<input type="checkbox"/>
Proprietary vegetated biotreatment systems	<input type="checkbox"/>
Wet extended detention basin	<input type="checkbox"/>
Dry extended detention basins	<input type="checkbox"/>
Other: Modular Wetland System	<input checked="" type="checkbox"/>
Other:	<input type="checkbox"/>

CALCULATIONS

Site water quality requirement will be met with the use of the Modular Wetland system, or Approved Similar. MWS Linear systems are designed for LID flow rate and is designed based on 80% capture efficiency.

Calculations will be incorporated at a later time.

IV.3.5 Hydromodification Control BMPs

Hydromodification Control BMPs	
BMP Name	BMP Description
N/A	

IV.3.6 Regional/Sub-Regional LID BMPs

Regional/Sub-Regional LID BMPs
N/A

IV.3.7 Treatment Control BMPs

Treatment Control BMPs	
BMP Name	BMP Description
N/A	

IV.3.8 Non-structural Source Control BMPs

Non-Structural Source Control BMPs				
Identifier	Name	Check One		If not applicable, state brief reason
		Included	Not Applicable	
N1	Education for Property Owners, Tenants and Occupants	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
N2	Activity Restrictions	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
N3	Common Area Landscape Management	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
N4	BMP Maintenance	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
N5	Title 22 CCR Compliance (How development will comply)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	No Hazardous Waste
N6	Local Industrial Permit Compliance	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
N7	Spill Contingency Plan	<input type="checkbox"/>	<input checked="" type="checkbox"/>	N/A for project
N8	Underground Storage Tank Compliance	<input type="checkbox"/>	<input checked="" type="checkbox"/>	No Underground Storage Tank
N9	Hazardous Materials Disclosure Compliance	<input type="checkbox"/>	<input checked="" type="checkbox"/>	No Hazardous Materials
N10	Uniform Fire Code Implementation	<input type="checkbox"/>	<input checked="" type="checkbox"/>	No Hazardous Materials
N11	Common Area Litter Control	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
N12	Employee Training	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
N13	Housekeeping of Loading Docks	<input type="checkbox"/>	<input checked="" type="checkbox"/>	No Loading Docks
N14	Common Area Catch Basin Inspection	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
N15	Street Sweeping Private Streets and Parking Lots	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
N16	Retail Gasoline Outlets	<input type="checkbox"/>	<input checked="" type="checkbox"/>	No Gasoline Outlets

N1. Education for Property Owners and Tenant of the Site – Prior to occupancy, Rose Equities will provide the CC&R’s (if applicable) and environmental awareness education materials to the new tenants. These materials are included in this report in Attachment G. See Attachment F for maintenance details.

The concepts that will be addressed by the education and training include, but is not limited to, the discussion of the use of chemicals (including household types) that should be limited

to the property, with no discharge of wastes via hosing or other direct discharge to gutters, catch basins, and storm drains. A list of educational materials for this project is provided in Section VII. Additional information can also be found at www.ocwatersheds.com.

- N2. Activity Restrictions – Rules or guidelines for One Metro West are established within appropriate documents, if applicable, which prohibit activities that can result in discharges of pollutants. When the tenant has moved in, Rose Equities will have the WQMP available for the tenant’s needs and recommend the tenant review the WQMP.
- N3. Landscape Management for the Site – City-approved Landscape Construction Plans will be prepared. All landscape maintenance activities will conform to the Orange County Management Guidelines for the Use of Fertilizers and Pesticides (M.G.F.P.). Landscape management is the responsibility of the Rose Equities, and a monthly review of landscape maintenance and irrigation procedures to ensure effectiveness shall be performed. Rose Equities shall manage landscaping in accordance with the County of Orange Water Conservation Ordinance No. 3802 and with management guidelines for use of fertilizers and pesticides, or City equivalent. The key applicable landscape BMPs are explained further below.
- Minimize irrigation runoff by using controllers to provide several short cycles instead of one long cycle for each area. The irrigation controller can be mechanical or electrical, however the new systems are typically electromechanical or electronic controllers. Weather based evapo-transpiration irrigation controller was encouraged by the the MS4 Permit and is encouraged for use on this project. Most controllers have a capability for setting the frequency of irrigation, the start time, and the duration of watering. Some controllers have additional features such as multiple programs to allow different watering frequencies for different types of plants, rain delay settings, input terminals for sensors such as rain, weather data, and remote operation. An ET irrigation controller will account for water loss in the soil through evaporation, assisting in controlling the moisture balance in the soil, to avoid over-watering, and thus minimize irrigation runoff.
 - Immediately correct any irrigation design or maintenance deficiencies that cause excessive runoff of irrigation water.
 - Have application, storage, handling, and transportation of fertilizer follow the recommendations of the Orange County M.G.F.P., Sections 2.0.4 and 2.0.5.
 - Prohibit application of chemicals less than three days prior to predicted chance of rain.
 - Follow all fertilizer application with light irrigation to permit the fertilizer to soak into the landscape area.
 - Conduct annual testing of turf soil until results stabilize and an accurate determination can be made of fertilization needs in addition to a corresponding reduction in the application of unnecessary fertilizers. Soil testing and pursuant recommendations for fertilizer use will be conducted by a qualified fertilizer specialist as recommended in the Orange County M.G.F.P., Section 2.3.1.
 - Limit weed control to either mechanical methods or EPA-labeled herbicides.

- Pesticides are to be used only after recommendation from a state-licensed pest control advisor per the Orange County M.G.F.P., Section 3.3.1.
 - Pesticides are only to be applied by, or under the direct supervision of, a state-licensed or certified pesticide applicator or by workers with equivalent training per the Orange County M.G.F.P., Section 3.4.1.
 - The storage, handling, and transportation of pesticides will follow the recommendations of the Orange County M.G.F.P., Section 3.0.
- N4. BMP Maintenance – Rose Equities will be responsible for implementing each of the stated non-structural BMP's. These inspections shall be done with regular maintenance activities on a monthly basis.
- N6. Local Water Quality Permit Compliance – The City of Costa Mesa does not issue water quality permits.
- N11. Common Area Litter Control – Rose Equities will implement trash management and litter control procedures on the site aimed at reducing pollution of drainage water. The Property Management Company may contract with its landscape maintenance firms to provide this service during regularly scheduled maintenance. It will consist of litter patrol and emptying of trash receptacles. Maintenance includes weekly sweeping and trash pickup within landscape areas and outside walkways. In addition, daily inspection of trash receptacles to ensure that lids are closed and any excess trash on the ground is picked up shall be provided.
- N12. Employee Training – Employee training shall be provided to maintenance personnel, and is the responsibility of Rose Equities. Implementation shall be provided monthly for both maintenance personnel and employees. Concepts can include, but is not limited to, training on the proper storage and use of fertilizers and pesticides, or training on implementation of hazardous spill contingency plans.
- N14. Catch Basin Inspection – Rose Equities shall clean debris and silt at the bottom of catch basins monthly. Additionally, Rose Equities shall inspect, and if necessary clean, catch basins within the project site prior to the storm season and no later than October 1ST of each year. Effective post-construction maintenance of storm collection and conveyance facilities will ensure not only their intended use, but will also prevent excessive pollutants from entering the drainage system. Occasionally, catch basins and other drainage facilities become clogged by sediment and debris accumulation. In addition, it is not uncommon for illicit dumping of waste material – particularly used motor oil – to occur at catch basins and drainage facilities. Periodic cleaning of catch basins and storm drains will provide the following benefits. Removal of pollutant loads from storm drain system
- Reduction of high pollutant concentration during the "first flush" event
 - Prevention of clogging of the downstream storm water conveyance system
- N15. Sweeping of Streets and Parking Lots – Rose Equities shall sweep streets and parking areas within the site on a weekly basis. Inspection and maintenance shall be intensified around October 1st of each year prior to the “first flush” storm, according to the City of Costa Mesa street sweeping program schedule.

IV.3.9 Structural Source Control BMPs

Structural Source Control BMPs				
Identifier	Name	Check One		If not applicable, state brief reason
		Included	Not Applicable	
S1	Provide storm drain system stenciling and signage	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
S2	Design and construct outdoor material storage areas to reduce pollution introduction	<input type="checkbox"/>	<input checked="" type="checkbox"/>	No Outdoor Material Storage Areas
S3	Design and construct trash and waste storage areas to reduce pollution introduction	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
S4	Use efficient irrigation systems & landscape design, water conservation, smart controllers, and source control	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
S5	Protect slopes and channels and provide energy dissipation	<input type="checkbox"/>	<input checked="" type="checkbox"/>	There are no slopes or channels
	Incorporate requirements applicable to individual priority project categories (from SDRWQCB NPDES Permit)	<input type="checkbox"/>	<input type="checkbox"/>	
S6	Dock areas	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Not proposed for project
S7	Maintenance bays	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Not proposed for project
S8	Vehicle wash areas	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Not proposed for project
S9	Outdoor processing areas	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Not proposed for project
S10	Equipment wash areas	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Not proposed for project
S11	Fueling areas	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Not proposed for project
S12	Hillside landscaping	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Not proposed for project
S13	Wash water control for food preparation areas	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Not proposed for project
S14	Community car wash racks	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Not proposed for project

PROVIDE STORM DRAIN STENCILING AND SIGNAGE

Phrase “No Dumping – Drains to Ocean” phrase to be stenciled on catch basins to alert the public to the destination of pollutants discharged into storm water. ROSE EQUITIES to inspect a minimum once a year for re-stenciling needs, and re-stencil as necessary, but no less than once every five years.

DESIGN OUTDOOR HAZARDOUS MATERIAL STORAGE AREAS TO REDUCE POLLUTANT INTRODUCTION

There are no outdoor areas for storage of hazardous materials that may contribute pollutants to the municipal storm drain system.

DESIGN TRASH STORAGE AREAS TO REDUCE POLLUTANT INTRODUCTION

All trash container areas shall provide attached lids on all trash containers that exclude rain. Roof and awning to minimize direct precipitation is not applicable since the permanent trash enclosure location is located indoor. Connection of trash area drains to the municipal storm drain is not allowed. Trash container areas shall be paved with an impervious surface. ROSE EQUITIES shall maintain monthly during regular maintenance activities. Provide litter patrol, emptying of trash receptacles, noting of trash disposal violations by tenants or employees and reporting of violations to the Rose Equities or property management for investigation.

USE EFFICIENT IRRIGATION SYSTEMS AND LANDSCAPE DESIGN

Fertilizer/ pesticide/herbicide and irrigation management practices and landscape management practices will be maintained consistent with the County Ordinance Amending the Zoning Code regarding the Conservation of Water in Landscaping for Common Areas of Multifamily and Non-Residential Development. Fertilizer and pesticide usage will be administered consistent with the Orange County’s “Management Guidelines for the Use of Fertilizers and Pesticides” (M.G.F.P.). The design and maintenance of the irrigation system would incorporate methods to minimize both the amount of water applied and the amount of runoff. The system will also be designed with the criteria established by the County of Orange and the City of Costa Mesa. These methods can include employing shutoff devices to prevent irrigation after precipitation, designing irrigation systems to each landscape area’s specific water requirements, using flow reducers or shutoff valves triggered by a pressure drop to control water loss in the event of broken sprinkler heads or lines, designing the timing and application methods of irrigation water to minimize excess irrigation water into the municipal storm drain system, grouping plants with similar water requirements, and choosing plants with low irrigation requirements. Irrigation design or maintenance deficiencies that cause excessive runoff of irrigation water will be immediately corrected. Furthermore, the

new MS4 permit (Order R8-2009-0030) encourages use of weather based evapo-transpiration (ET) irrigation controllers for new developments. See Attachment F for maintenance details.

Verify that runoff minimizing landscape design continues to function by checking that water sensors are functioning properly to eliminate overspray in hardscape areas, and to verify that irrigation timing and cycle lengths are adjusted in accordance with water demands, given time of year, weather and day or night time temperatures. Rose Equities to maintain once a week in conjunction with maintenance activities.

IV.4 ALTERNATIVE COMPLIANCE PLAN (IF APPLICABLE)

IV.4.1 Water Quality Credits

Description of Proposed Project				
Project Types that Qualify for Water Quality Credits (Select all that apply):				
<input type="checkbox"/> Redevelopment projects that reduce the overall impervious footprint of the project site.	<input type="checkbox"/> Brownfield redevelopment, meaning redevelopment, expansion, or reuse of real property which may be complicated by the presence or potential presence of hazardous substances, pollutants or contaminants, and which have the potential to contribute to adverse ground or surface WQ if not redeveloped.	<input type="checkbox"/> Higher density development projects which include two distinct categories (credits can only be taken for one category): those with more than seven units per acre of development (lower credit allowance); vertical density developments, for example, those with a Floor to Area Ratio (FAR) of 2 or those having more than 18 units per acre (greater credit allowance).		
<input type="checkbox"/> Mixed use development, such as a combination of residential, commercial, industrial, office, institutional, or other land uses which incorporate design principles that can demonstrate environmental benefits that would not be realized through single use projects (e.g. reduced vehicle trip traffic with the potential to reduce sources of water or air pollution).	<input type="checkbox"/> Transit-oriented developments, such as a mixed use residential or commercial area designed to maximize access to public transportation; similar to above criterion, but where the development center is within one half mile of a mass transit center (e.g. bus, rail, light rail or commuter train station). Such projects would not be able to take credit for both categories, but may have greater credit assigned		<input type="checkbox"/> Redevelopment projects in an established historic district, historic preservation area, or similar significant city area including core City Center areas (to be defined through mapping).	
<input type="checkbox"/> Developments with dedication of undeveloped portions to parks, preservation areas and other pervious uses.	<input type="checkbox"/> Developments in a city center area.	<input type="checkbox"/> Developments in historic districts or historic preservation areas.	<input type="checkbox"/> Live-work developments, a variety of developments designed to support residential and vocational needs together – similar to criteria to mixed use development; would not be able to take credit for both categories.	<input type="checkbox"/> In-fill projects, the conversion of empty lots and other underused spaces into more beneficially used spaces, such as residential or commercial areas.
Calculation of Water Quality Credits (if applicable)	Not applicable			

IV.4.2 Alternative Compliance Plan Information

Not applicable

Section V Inspection/Maintenance Responsibility for BMPs

Rose Equities will be responsible for the long term inspection and maintenance of all non-structural and structural source control BMPs and all Treatment Control BMPs. The contact at Rose Equities is Brent Stoll, and his contact information is provided on the Owner's Certification page at the beginning of this report. Refer to Attachment F for Operations and Maintenance (O&M) Plan.

Section VI Site Plan and Drainage Plan

VI.1 SITE PLAN AND DRAINAGE PLAN

A site plan and drainage plan sheet set containing the following minimum information is provided:

- Project location
- Site boundary
- Land uses and land covers, as applicable
- Suitability/feasibility constraints
- Structural BMP locations
- Drainage delineations and flow information
- Drainage connections
- BMP details

VI.2 ELECTRONIC DATA SUBMITTAL

The minimum requirement is to provide submittal of PDF exhibits in addition to hard copies. Format must not require specialized software to open.

If the local jurisdiction requires specialized electronic document formats (CAD, GIS) to be submitted, this section will be used to describe the contents (e.g., layering, nomenclature, georeferencing, etc.) of these documents so that they may be interpreted efficiently and accurately.

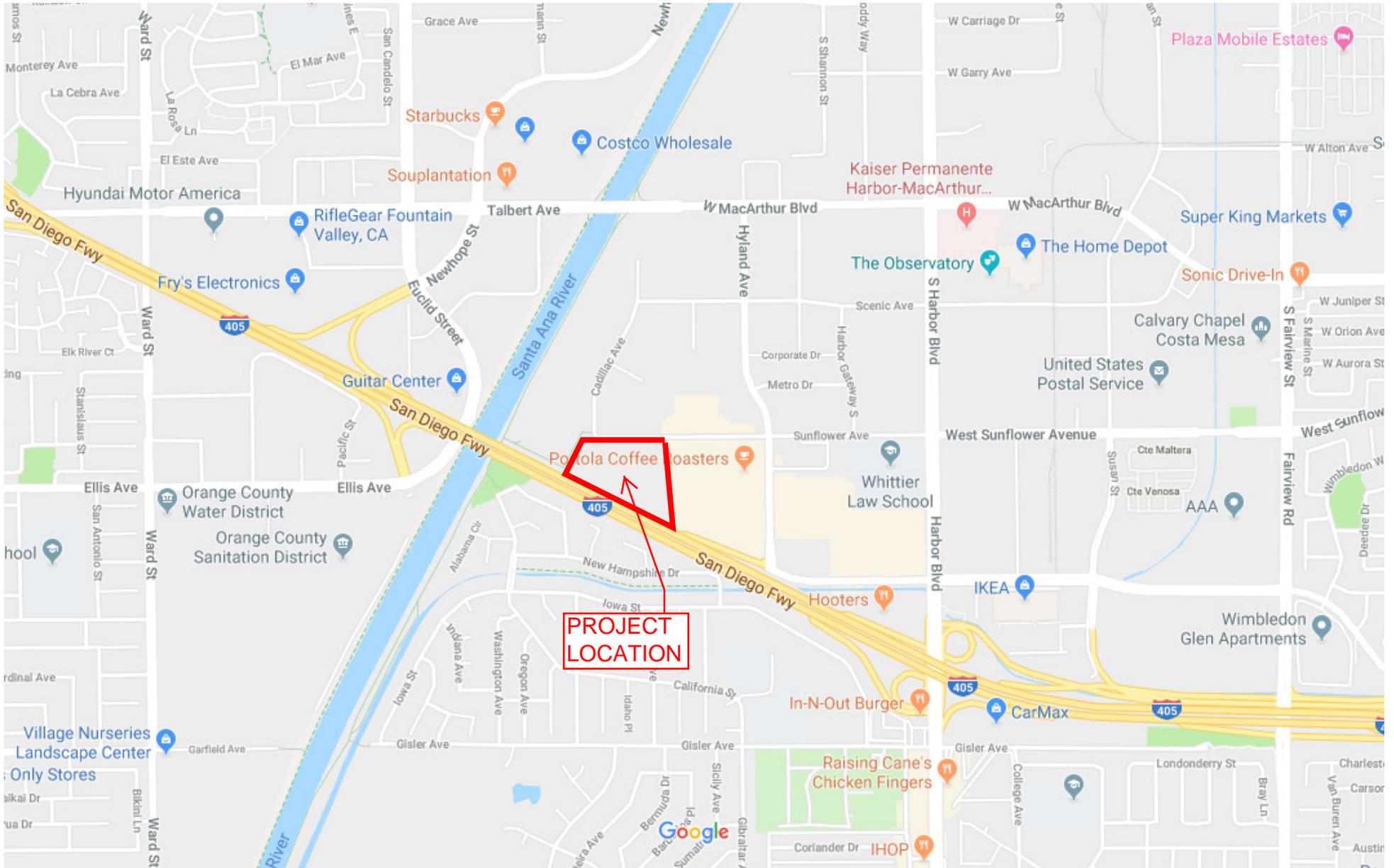
Section VII Educational Materials

Please refer to Attachment G for Education Materials.

Education 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	<input checked="" type="checkbox"/>	Tips for the Automotive Industry	<input type="checkbox"/>
Tips for Car Wash Fund-raisers	<input type="checkbox"/>	Tips for Using Concrete and Mortar	<input checked="" type="checkbox"/>
Tips for the Home Mechanic	<input type="checkbox"/>	Tips for the Food Service Industry	<input type="checkbox"/>
Homeowners Guide for Sustainable Water Use	<input checked="" type="checkbox"/>	Proper Maintenance Practices for Your Business	<input checked="" type="checkbox"/>
Household Tips	<input checked="" type="checkbox"/>	Other Material	Check If Attached
Proper Disposal of Household Hazardous Waste	<input checked="" type="checkbox"/>		
Recycle at Your Local Used Oil Collection Center (North County)	<input type="checkbox"/>		<input type="checkbox"/>
Recycle at Your Local Used Oil Collection Center (Central County)	<input type="checkbox"/>		<input type="checkbox"/>
Recycle at Your Local Used Oil Collection Center (South County)	<input type="checkbox"/>		<input type="checkbox"/>
Tips for Maintaining a Septic Tank System	<input type="checkbox"/>		<input type="checkbox"/>
Responsible Pest Control	<input checked="" type="checkbox"/>		<input type="checkbox"/>
Sewer Spill	<input type="checkbox"/>		<input type="checkbox"/>
Tips for the Home Improvement Projects	<input checked="" type="checkbox"/>		<input type="checkbox"/>
Tips for Horse Care	<input type="checkbox"/>		<input type="checkbox"/>
Tips for Landscaping and Gardening	<input checked="" type="checkbox"/>		<input type="checkbox"/>
Tips for Pet Care	<input checked="" type="checkbox"/>		<input type="checkbox"/>
Tips for Pool Maintenance	<input checked="" type="checkbox"/>		<input type="checkbox"/>
Tips for Residential Pool, Landscape and Hardscape Drains	<input checked="" type="checkbox"/>		<input type="checkbox"/>
Tips for Projects Using Paint	<input checked="" type="checkbox"/>		<input type="checkbox"/>

ATTACHMENT A

VICINITY MAP



ATTACHMENT B

SITE PLAN

ATTACHMENT C

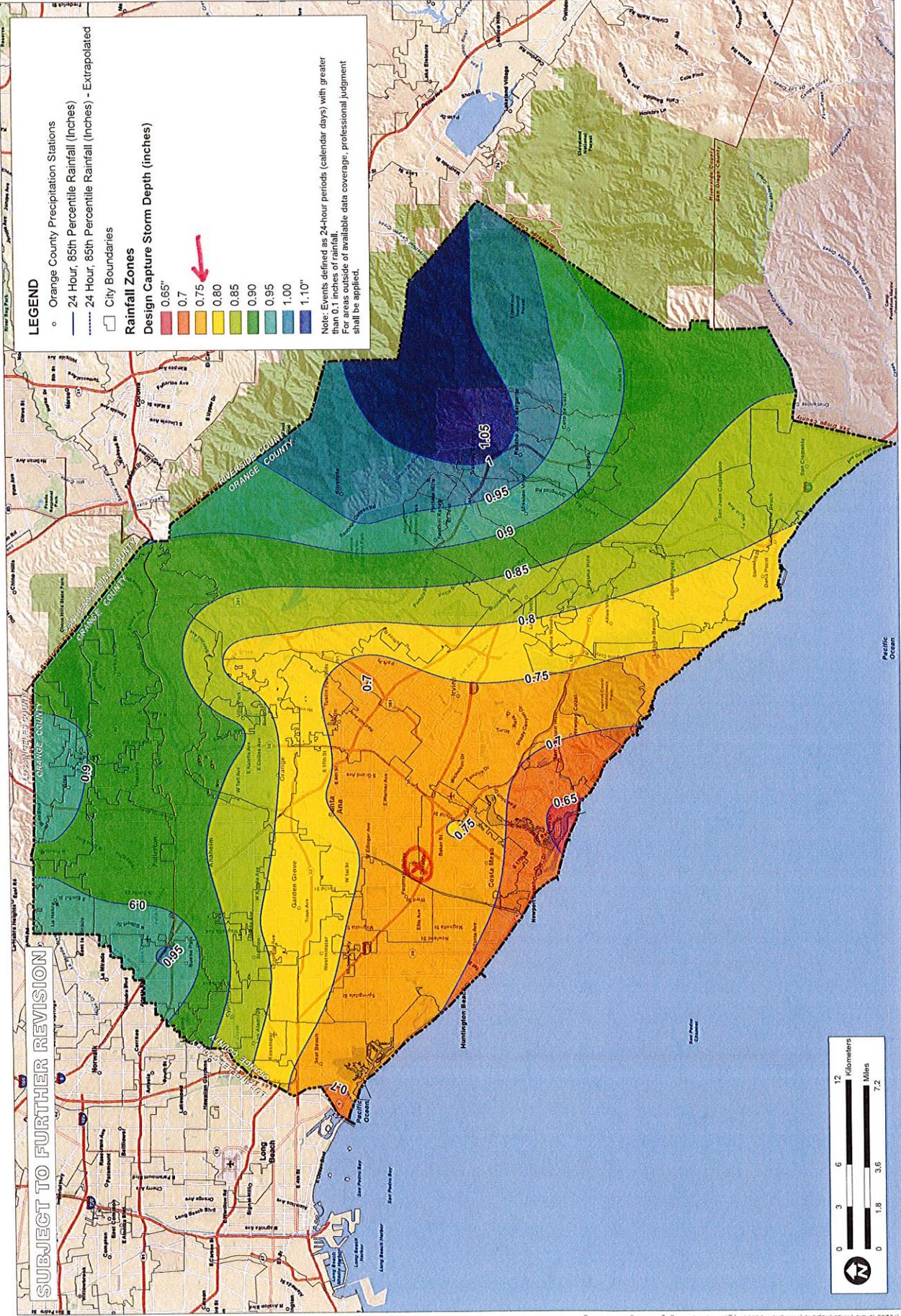
FIGURES AND MAP

SCALE	1" = 1 Mile
DESIGNER	TH
CHECKED	TH
DATE	04/22/10
JOB NO.	5026

**ORANGE COUNTY
TECHNICAL GUIDANCE
DOCUMENT**

CA

RAINFALL ZONES



ATTACHMENT D

CALCULATIONS AND SUPPORTING
DOCUMENTS

ONE METRO WEST
Preliminary Biofiltration Calculations
Date: 8/7/19

BMP No.	DMA Treated	BMP Type/Model	Drainage Area (ac.)	%Imp	C	I	Q _{design}	Q _{capacity}	A _{capacity} (ac.)
1		MWS-L-6-8-V	0.59	85	0.7875	0.2625	0.122	0.147	0.71
2		MWS-L-8-8-V	0.87	85	0.7875	0.2625	0.180	0.231	1.12
3		MWS-L-8-8-V	0.93	85	0.7875	0.2625	0.192	0.231	1.12
4		MWS-L-6-8-V	0.68	85	0.7875	0.2625	0.141	0.147	0.71
5		MWS-L-4-8-V	0.58	80	0.75	0.2625	0.114	0.115	0.58
6		MWS-L-6-8-V	0.75	80	0.75	0.2625	0.148	0.147	0.75
7		MWS-L-4-8-V	0.38	85	0.7875	0.2625	0.079	0.115	0.56
8		MWS-L-8-8-V	1.06	85	0.7875	0.2625	0.219	0.231	1.12
9		MWS-L-4-6-V	0.28	85	0.7875	0.2625	0.058	0.073	0.35
10		MWS-L-8-8-V	0.96	85	0.7875	0.2625	0.198	0.231	1.12
11		MWS-L-6-8-V	0.67	80	0.75	0.2625	0.132	0.147	0.75
12		MWS-L-4-8-V	0.47	90	0.825	0.2625	0.102	0.115	0.53
13		MWS-L-4-15-V	0.89	80	0.75	0.2625	0.175	0.175	0.89
14		MWS-L-4-15-V	0.79	90	0.825	0.2625	0.171	0.175	0.81
15		MWS-L-4-8-V	0.44	85	0.7875	0.2625	0.091	0.115	0.56
16		MWS-L-8-8-V	1.14	80	0.75	0.2625	0.224	0.231	1.17
17		MWS-L-6-8-V	0.70	90	0.825	0.2625	0.152	0.147	0.68
18		MWS-L-8-8-V	0.89	90	0.825	0.2625	0.193	0.231	1.07
19		MWS-L-8-12-V	2.06	50	0.525	0.2625	0.284	0.346	2.51
			15.13				2.974	3.35	17.09

Notes:

1. MWS Model Size based on C, I, and equivalent drainage area unit is treating. imperviousness
2. Average Intensity used, based on Tc=5min (Conservative)
3. A_{capacity} column provided to show units have been sized to treat greater than or equal to the total drainage area.
4. DMA acreage is preliminary, and will be updated during final engineering.

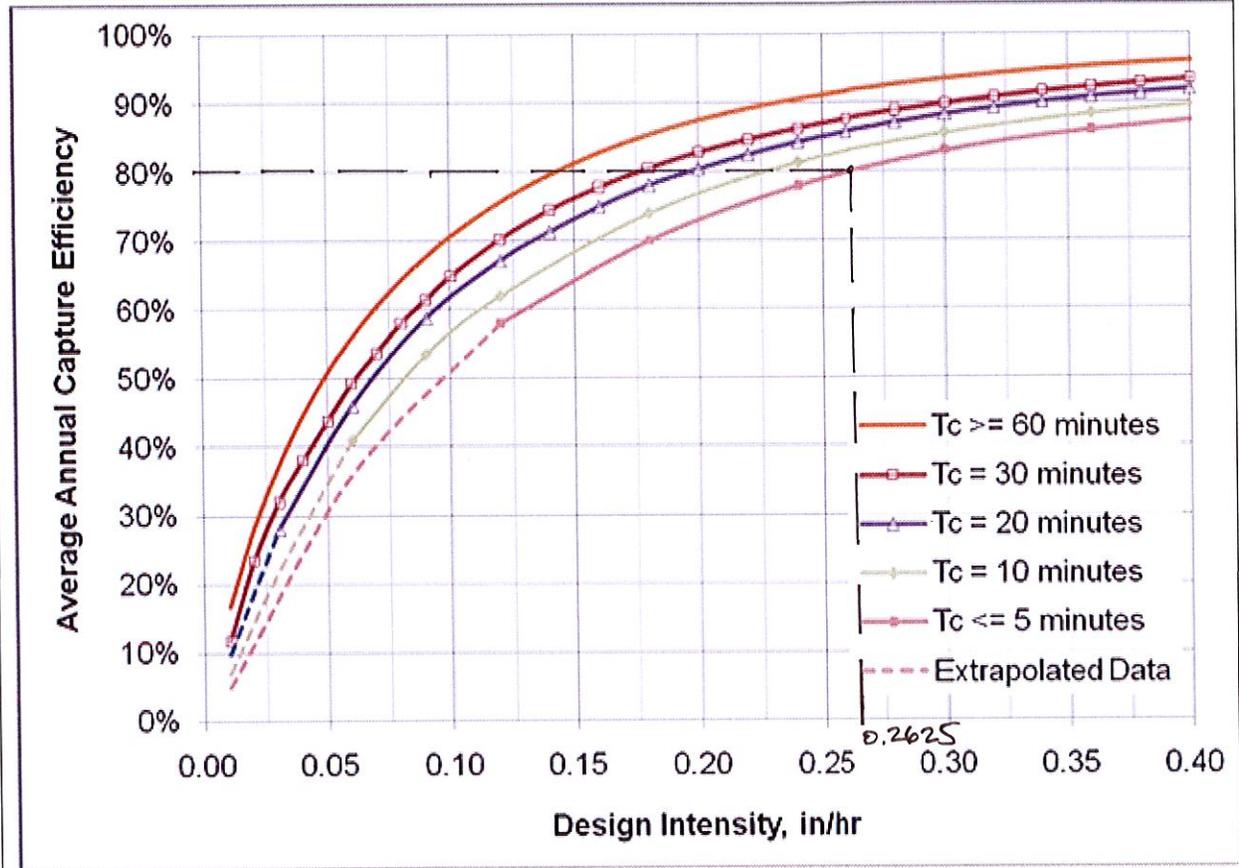
Sample Calc. (Typical)
 BMP# 1
 *See Table in Appendix D for
 all calculations

Worksheet D: Capture Efficiency Method for Flow-Based BMPs

Step 1: Determine the design capture storm depth used for calculating volume			
1	Enter the time of concentration, T_c (min) (See Appendix IV.2)	$T_c =$	5
2	Using Figure III.4, determine the design intensity at which the estimated time of concentration (T_c) achieves 80% capture efficiency, I_1	$I_1 =$	0.2625 in/hr
3	Enter the effect depth of provided HSCs upstream, d_{HSC} (inches) (Worksheet A)	$d_{HSC} =$	— inches
4	Enter capture efficiency corresponding to d_{HSC} , Y_2 (Worksheet A)	$Y_2 =$	— %
5	Using Figure III.4, determine the design intensity at which the time of concentration (T_c) achieves the upstream capture efficiency (Y_2), I_2	$I_2 =$	—
6	Determine the design intensity that must be provided by BMP, $I_{design} = I_1 - I_2$	$I_{design} =$	0.2625
Step 2: Calculate the design flowrate			
1	Enter Project area tributary to BMP (s), A (acres)	$A =$	0.59 acres
2	Enter Project Imperviousness, imp (unitless)	$imp =$	0.85
3	Calculate runoff coefficient, $C = (0.75 \times imp) + 0.15$	$C =$	0.7875
4	Calculate design flowrate, $Q_{design} = (C \times I_{design} \times A)$	$Q_{design} =$	0.122 cfs
Supporting Calculations			
Describe system: Modular Wetland Biofiltration System MWS-L-6-8-V			
Provide time of concentration assumptions: $T_c = 5 \text{ min. (Conservative)}$			

Worksheet D: Capture Efficiency Method for Flow-Based BMPs

Graphical Operations



Provide supporting graphical operations. See Example III.7.



MWS LINEAR 2.0 HGL SIZING CALCULATIONS

MWS MODEL SIZE	WETLAND PERIMETER LENGTH	LOADING RATE GPM/5F	HGL HEIGHT																											
			SHALLOW MODELS														HIGH CAPACITY MODELS													
			1.4	1.5	1.6	1.7	1.8	1.9	2.0	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.8	2.9	3.0	3.1	3.2	3.3	3.4	3.5	3.6	3.7	3.8	3.9	3.95	
MWS-L-4-4	6.70	1.0	0.022	0.023	0.025	0.026	0.028	0.029	0.031	0.032	0.034	0.035	0.037	0.038	0.040	0.042	0.043	0.045	0.046	0.048	0.051	0.052	0.054	0.055	0.057	0.058	0.059	0.060	0.061	
MWS-L-3-6	10.06	1.0	0.032	0.035	0.037	0.039	0.042	0.044	0.046	0.048	0.051	0.053	0.055	0.058	0.060	0.062	0.065	0.067	0.069	0.072	0.074	0.076	0.081	0.083	0.085	0.087	0.088	0.089	0.091	
MWS-L-4-6	9.30	1.0	0.030	0.032	0.034	0.036	0.038	0.041	0.043	0.045	0.047	0.049	0.051	0.053	0.055	0.058	0.060	0.062	0.064	0.066	0.068	0.070	0.075	0.077	0.079	0.080	0.081	0.082	0.084	
MWS-L-4-8	14.80	1.0	0.048	0.051	0.054	0.058	0.061	0.065	0.068	0.071	0.075	0.078	0.082	0.085	0.088	0.092	0.095	0.099	0.102	0.105	0.109	0.112	0.119	0.122	0.124	0.127	0.129	0.131	0.134	
MWS-L-4-13	18.40	1.0	0.059	0.063	0.068	0.072	0.076	0.080	0.084	0.089	0.093	0.097	0.101	0.106	0.110	0.114	0.118	0.122	0.127	0.131	0.135	0.139	0.148	0.152	0.156	0.158	0.160	0.163	0.167	
MWS-L-4-15	22.40	1.0	0.072	0.077	0.082	0.087	0.093	0.098	0.103	0.108	0.113	0.118	0.123	0.129	0.134	0.139	0.144	0.149	0.154	0.159	0.165	0.170	0.180	0.185	0.188	0.190	0.193	0.198	0.203	
MWS-L-4-17	26.40	1.0	0.085	0.091	0.097	0.103	0.109	0.115	0.121	0.127	0.133	0.139	0.145	0.151	0.158	0.164	0.170	0.176	0.182	0.188	0.194	0.200	0.212	0.218	0.221	0.224	0.230	0.233	0.239	
MWS-L-4-19	30.40	1.0	0.098	0.105	0.112	0.119	0.126	0.133	0.140	0.147	0.153	0.160	0.167	0.174	0.181	0.188	0.195	0.202	0.209	0.216	0.223	0.230	0.244	0.251	0.255	0.258	0.265	0.269	0.276	
MWS-L-4-21	34.40	1.0	0.111	0.118	0.126	0.134	0.142	0.150	0.158	0.166	0.174	0.182	0.189	0.197	0.205	0.213	0.221	0.229	0.237	0.245	0.253	0.261	0.276	0.284	0.288	0.296	0.300	0.304	0.312	
MWS-L-6-8	18.80	1.0	0.060	0.065	0.069	0.073	0.078	0.082	0.086	0.091	0.095	0.099	0.104	0.108	0.112	0.116	0.121	0.125	0.129	0.134	0.138	0.142	0.151	0.155	0.160	0.162	0.164	0.166	0.170	
MWS-L-8-8	29.60	1.0	0.095	0.102	0.109	0.115	0.122	0.129	0.136	0.143	0.149	0.156	0.163	0.170	0.177	0.183	0.190	0.197	0.204	0.211	0.217	0.224	0.238	0.245	0.248	0.251	0.255	0.262	0.268	
MWS-L-8-12	44.40	1.0	0.143	0.153	0.163	0.173	0.183	0.194	0.204	0.214	0.224	0.234	0.245	0.255	0.265	0.275	0.285	0.296	0.306	0.316	0.326	0.336	0.357	0.367	0.372	0.377	0.382	0.387	0.402	
MWS-L-8-16	59.20	1.0	0.190	0.204	0.217	0.231	0.245	0.258	0.272	0.285	0.299	0.312	0.326	0.340	0.353	0.367	0.380	0.394	0.408	0.421	0.435	0.448	0.476	0.489	0.496	0.503	0.509	0.516	0.537	
MWS-L-8-20	74.00	1.0	0.238	0.255	0.272	0.289	0.306	0.323	0.340	0.357	0.374	0.391	0.408	0.425	0.442	0.459	0.476	0.493	0.509	0.526	0.543	0.560	0.594	0.611	0.620	0.628	0.637	0.645	0.671	
MWS-L-10-20 or MWS-L-8-24	88.80	1.0	0.285	0.306	0.326	0.346	0.367	0.387	0.408	0.428	0.448	0.469	0.489	0.509	0.530	0.550	0.571	0.591	0.611	0.632	0.652	0.673	0.713	0.734	0.744	0.754	0.764	0.774	0.805	
4"x4" media cap	14.80	1.0	0.048	0.051	0.054	0.058	0.061	0.065	0.068	0.071	0.075	0.078	0.082	0.085	0.088	0.092	0.095	0.099	0.102	0.105	0.109	0.112	0.119	0.122	0.124					

Table 2.7: Infiltration BMP Feasibility Worksheet

	Infeasibility Criteria	Yes	No
1	Would Infiltration BMPs pose significant risk for groundwater related concerns? Refer to Appendix VII (Worksheet I) for guidance on groundwater-related infiltration feasibility criteria.	X	
<p>Provide basis: <i>Refer to Worksheet I in Attachment D.</i></p> <p>Summarize findings of studies provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.</p>			
2	<p>Would Infiltration BMPs pose significant risk of increasing risk of geotechnical hazards that cannot be mitigated to an acceptable level? (Yes if the answer to any of the following questions is yes, as established by a geotechnical expert):</p> <ul style="list-style-type: none"> • The BMP can only be located less than 50 feet away from slopes steeper than 15 percent • The BMP can only be located less than eight feet from building foundations or an alternative setback. • A study prepared by a geotechnical professional or an available watershed study substantiates that stormwater infiltration would potentially result in significantly increased risks of geotechnical hazards that cannot be mitigated to an acceptable level. 		X
<p>Provide basis:</p> <p>Summarize findings of studies provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.</p>			
3	Would infiltration of the DCV from drainage area violate downstream water rights?		X
<p>Provide basis:</p> <p>Summarize findings of studies provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.</p>			

Table 2.7: Infiltration BMP Feasibility Worksheet (continued)

	Partial Infeasibility Criteria	Yes	No
4	Is proposed infiltration facility located on HSG D soils or the site geotechnical investigation identifies presence of soil characteristics which support categorization as D soils?		X
Provide basis: Summarize findings of studies provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.			
5	Is measured infiltration rate below proposed facility less than 0.3 inches per hour ? This calculation shall be based on the methods described in Appendix VII.	X	
Provide basis: <i>See soils report in Attachment E. There are tested locations with infiltration rate less than 0.3 in/hr.</i> Summarize findings of studies provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.			
6	Would reduction of over predeveloped conditions cause impairments to downstream beneficial uses, such as change of seasonality of ephemeral washes or increased discharge of contaminated groundwater to surface waters ?		X
Provide citation to applicable study and summarize findings relative to the amount of infiltration that is permissible: Summarize findings of studies provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.			
7	Would an increase in infiltration over predeveloped conditions cause impairments to downstream beneficial uses, such as change of seasonality of ephemeral washes or increased discharge of contaminated groundwater to surface waters ?		
Provide citation to applicable study and summarize findings relative to the amount of infiltration that is permissible: Summarize findings of studies provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.			

Table 2.7: Infiltration BMP Feasibility Worksheet (continued)

Infiltration Screening Results (check box corresponding to result):		
8	<p>Is there substantial evidence that infiltration from the project would result in a significant increase in I&I to the sanitary sewer that cannot be sufficiently mitigated? (See Appendix XVII)</p> <p>Provide narrative discussion and supporting evidence:</p> <p>Summarize findings of studies provide reference to studies, calculations, maps, data sources, etc. Provide narrative discussion of study/data source applicability.</p>	
9	<p>If any answer from row 1-3 is yes: infiltration of any volume is not feasible within the DMA or equivalent.</p> <p>Provide basis: <i>Refer to Worksheet I Groundwater-related Feasibility Criteria. Shallow groundwater condition.</i> Summarize findings of infeasibility screening</p>	YES
10	<p>If any answer from row 4-7 is yes, infiltration is permissible but is not presumed to be feasible for the entire DCV. Criteria for designing biotreatment BMPs to achieve the maximum feasible infiltration and ET shall apply.</p> <p>Provide basis:</p> <p>Summarize findings of infeasibility screening</p>	
11	<p>If all answers to rows 1 through 11 are no, infiltration of the full DCV is potentially feasible, BMPs must be designed to infiltrate the full DCV to the maximum extent practicable.</p>	

Worksheet I: Summary of Groundwater-related Feasibility Criteria

1	Is project large or small? (as defined by Table VIII.2) circle one	<u>Large</u>	Small
2	What is the tributary area to the BMP?	A	acres
3	What type of BMP is proposed?		
4	What is the infiltrating surface area of the proposed BMP?	A _{BMP}	sq-ft
5	What land use activities are present in the tributary area (list all)		
6	What land use-based risk category is applicable?	L	M H
7	If M or H, what pretreatment and source isolation BMPs have been considered and are proposed (describe all):		
8	What minimum separation to mounded seasonally high groundwater applies to the proposed BMP? See Section VIII.2 (circle one)	<u>5 ft</u>	10 ft
9	Provide rationale for selection of applicable minimum separation to seasonally high mounded groundwater: <i>Per Section VIII.2 of the OC TGD the separation between the infiltrating surface and the seasonally high mounded groundwater table shall not be less than 5 feet for all BMP types.</i>		
10	What is separation from the infiltrating surface to seasonally high groundwater?	SHGWT	< 5 ft
11	What is separation from the infiltrating surface to mounded seasonally high groundwater?	Mounded SHGWT	< 5 ft
12	Describe assumptions and methods used for mounding analysis: <i>Typical Infiltration BMP (i.e. Rain Garden, etc) requires 18" Ponding Max, 2" Mulch, 18" Soil Media, for a total depth = 3.17' (Bottom) ⇒ Seasonal High Groundwater = 10' (per Geotech) ⇒ Seepage @ 7ft per Soils Report</i>		
13	Is the site within a plume protection boundary (See Figure)	Y	N N/A

Worksheet I: Summary of Groundwater-related Feasibility Criteria

	VIII.2)?	
14	Is the site within a selenium source area or other natural plume area (See Figure VIII.2)?	Y N N/A
15	Is the site within 250 feet of a contaminated site?	Y N N/A
16	If site-specific study has been prepared, provide citation and briefly summarize relevant findings:	
17	Is the site within 100 feet of a water supply well, spring, septic system?	Y N N/A
18	Is infiltration feasible on the site relative to groundwater-related criteria?	Y <input checked="" type="checkbox"/> N
<p>Provide rationale for feasibility determination:</p> <p>It is our professional judgement that the separation from the infiltrating surface to the mounded seasonally high groundwater can be less than 5 feet based on the findings of the Preliminary Geotechnical Investigation Report dated 4/3/19. The relevant information taken from the report is the groundwater seepage encountered @ 7 feet, and a seasonal high groundwater of 18 feet. Due to the potential of not satisfying the minimum separation criteria, infiltration is considered <u>INFEASIBLE</u>.</p>		

Note: if a single criterion or group of criteria would render infiltration infeasible, it is not necessary to evaluate every question in this worksheet.

Modular Wetlands System™ Linear

Biofiltration

Comprehensive Stormwater Solutions

Bio  Clean
A Forterra Company



OVERVIEW

The Bio Clean Modular Wetlands System™ Linear (MWS Linear) represents a pioneering breakthrough in stormwater technology as the only biofiltration system to utilize patented horizontal flow, allowing for a smaller footprint and higher treatment capacity. While most biofilters use little or no pretreatment, the MWS Linear incorporates an advanced pretreatment chamber that includes separation and pre-filter cartridges. In this chamber, sediment and hydrocarbons are removed from runoff before entering the biofiltration chamber, in turn reducing maintenance costs and improving performance.

The Urban Impact

For hundreds of years, natural wetlands surrounding our shores have played an integral role as nature's stormwater treatment

system. But as our cities grow and develop, these natural wetlands have perished under countless roads, rooftops, and parking lots.

Plant A Wetland

Without natural wetlands, our cities are deprived of water purification, flood control, and land stability. Modular Wetlands and the MWS Linear re-establish nature's presence and rejuvenate waterways in urban areas.



PERFORMANCE

The MWS Linear continues to outperform other treatment methods with superior pollutant removal for TSS, heavy metals, nutrients, hydrocarbons, and bacteria. Since 2007 the MWS Linear has been field tested on numerous sites across the country. With its advanced pretreatment chamber and innovative horizontal flow biofilter, the system is able to effectively remove pollutants through a combination of physical, chemical, and biological filtration processes. With the same biological processes found in natural wetlands, the MWS Linear harnesses nature's ability to process, transform, and remove even the most harmful pollutants.

66%
REMOVAL
OF
DISSOLVED
ZINC

69%
REMOVAL
OF TOTAL
ZINC

38%
REMOVAL
OF
DISSOLVED
COPPER

64%
REMOVAL
OF TOTAL
PHOSPHORUS

45%
REMOVAL
OF
NITROGEN

50%
REMOVAL
OF TOTAL
COPPER

95%
REMOVAL
OF MOTOR
OIL

67%
REMOVAL
OF ORTHO
PHOSPHORUS

85%
REMOVAL
OF TSS

APPROVALS

The MWS Linear has successfully met years of challenging technical reviews and testing from some of the most prestigious and demanding agencies in the nation and perhaps the world.



WASHINGTON STATE TAPE APPROVED

The MWS Linear is approved for General Use Level Designation (GULD) for Basic, Enhanced, and Phosphorus treatment at 1 gpm/ft² loading rate. The highest performing BMP on the market for all main pollutant categories.



DEQ ASSIGNMENT

The Virginia Department of Environmental Quality assigned the MWS Linear, the highest phosphorus removal rating for manufactured treatment devices to meet the new Virginia Stormwater Management Program (VSMP) Regulation technical criteria.



MARYLAND DEPARTMENT OF THE ENVIRONMENT APPROVED

Granted Environmental Site Design (ESD) status for new construction, redevelopment, and retrofitting when designed in accordance with the design manual.



MASTEP EVALUATION

The University of Massachusetts at Amherst - Water Resources Research Center issued a technical evaluation report noting removal rates up to 84% TSS, 70% total phosphorus, 68.5% total zinc, and more.



RHODE ISLAND DEM APPROVED

Approved as an authorized BMP and noted to achieve the following minimum removal efficiencies: 85% TSS, 60% pathogens, 30% total phosphorus, and 30% total nitrogen.

ADVANTAGES

- HORIZONTAL FLOW BIOFILTRATION
- GREATER FILTER SURFACE AREA
- PRETREATMENT CHAMBER
- PATENTED PERIMETER VOID AREA
- FLOW CONTROL
- NO DEPRESSED PLANTER AREA
- AUTO DRAINDOWN MEANS NO MOSQUITO VECTOR

OPERATION

The MWS Linear is the most efficient and versatile biofiltration system on the market, and it is the only system with horizontal flow which improves performance, reduces footprint, and minimizes maintenance. Figure 1 and Figure 2 illustrate the invaluable benefits of horizontal flow and the multiple treatment stages.

1 PRETREATMENT

SEPARATION

- Trash, sediment, and debris are separated before entering the pre-filter cartridges
- Designed for easy maintenance access

PRE-FILTER CARTRIDGES

- Over 25 sq. ft. of surface area per cartridge
- Utilizes BioMediaGREEN filter material
- Removes over 80% of TSS and 90% of hydrocarbons
- Prevents pollutants that cause clogging from migrating to the biofiltration chamber

Individual Media Filters

Pre-filter Cartridge

Curb Inlet

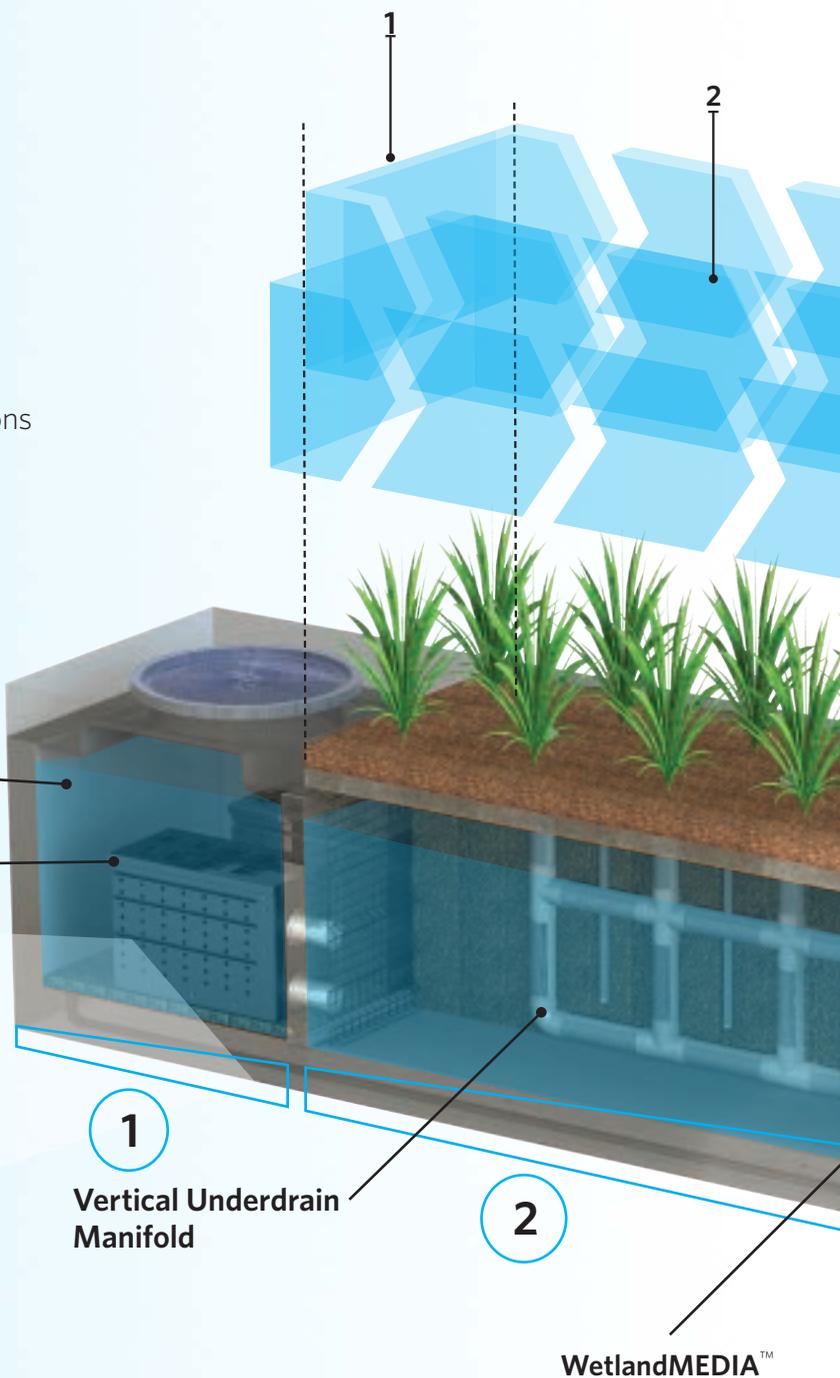
Cartridge Housing

BioMediaGREEN™

1
Vertical Underdrain
Manifold

2

WetlandMEDIA™



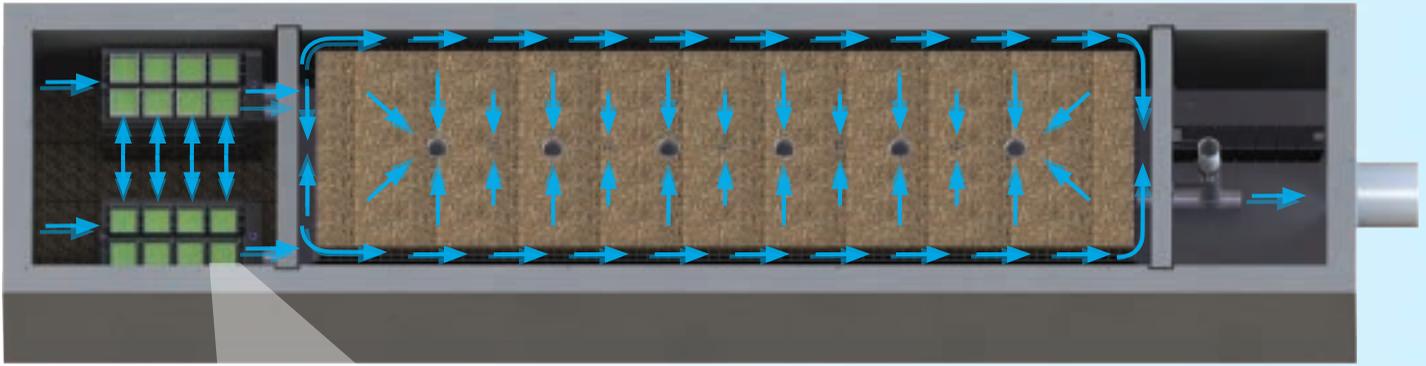


Figure 2,
Top View

2x to 3x more surface area than traditional downward flow bioretention systems.

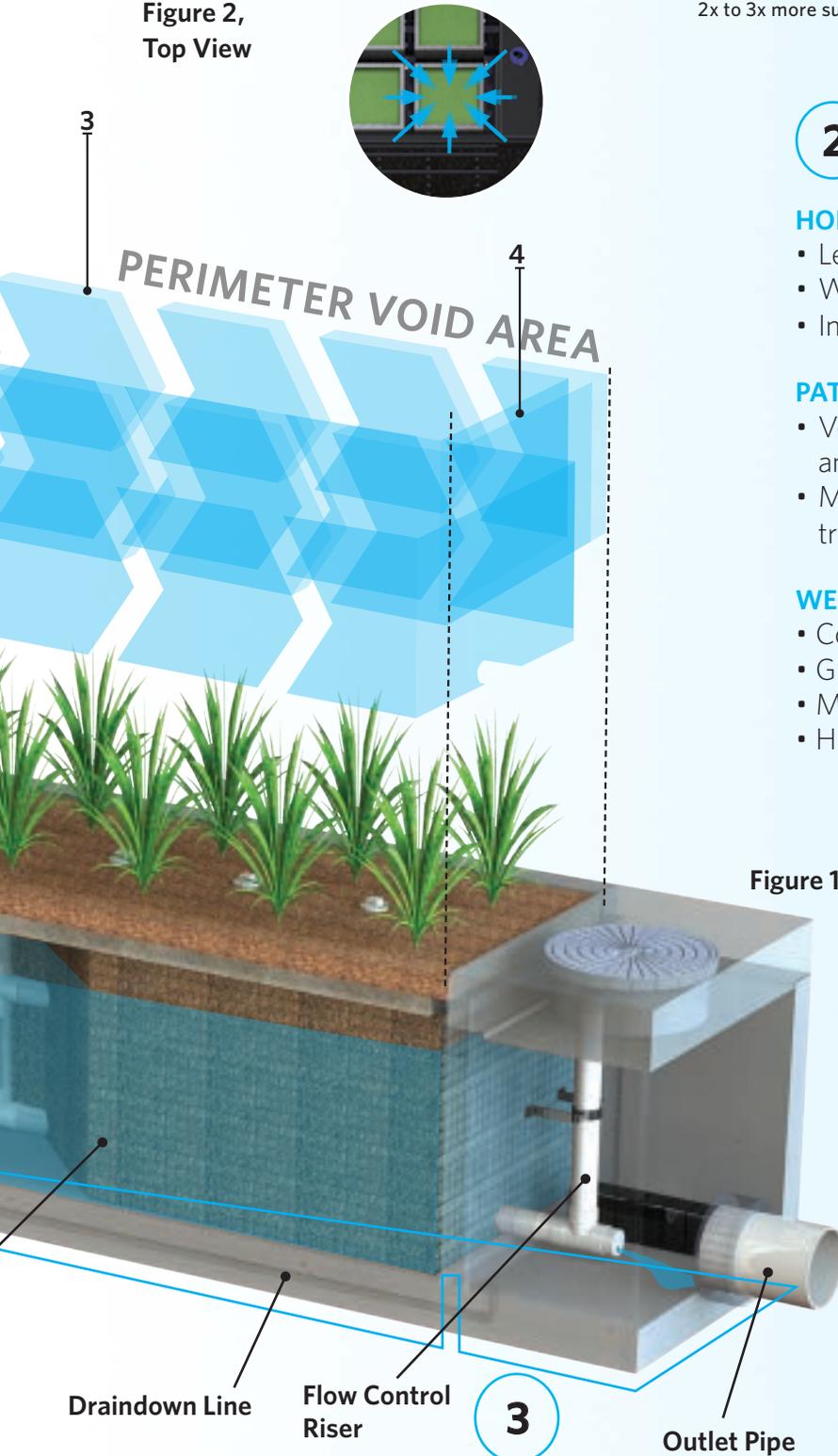


Figure 1

2 BIOFILTRATION

HORIZONTAL FLOW

- Less clogging than downward flow biofilters
- Water flow is subsurface
- Improves biological filtration

PATENTED PERIMETER VOID AREA

- Vertically extends void area between the walls and the WetlandMEDIA on all four sides
- Maximizes surface area of the media for higher treatment capacity

WETLANDMEDIA

- Contains no organics and removes phosphorus
- Greater surface area and 48% void space
- Maximum evapotranspiration
- High ion exchange capacity and lightweight

3 DISCHARGE

FLOW CONTROL

- Orifice plate controls flow of water through WetlandMEDIA to a level lower than the media's capacity
- Extends the life of the media and improves performance

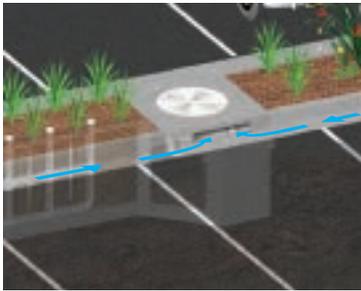
DRAINDOWN FILTER

- The draindown is an optional feature that completely drains the pretreatment chamber
- Water that drains from the pretreatment chamber between storm events will be treated



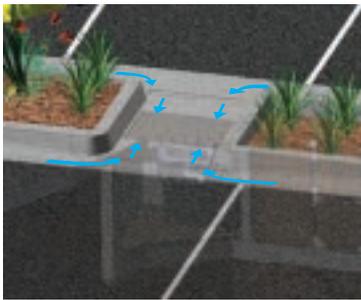
CONFIGURATIONS

The MWS Linear is the preferred biofiltration system of civil engineers across the country due to its versatile design. This highly versatile system has available “pipe-in” options on most models, along with built-in curb or grated inlets for simple integration into your storm drain design.



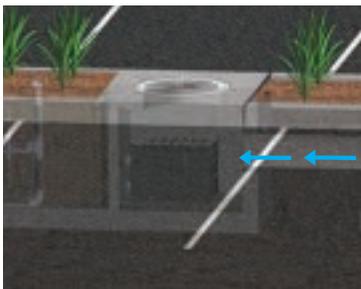
CURB TYPE

The Curb Type configuration accepts sheet flow through a curb opening and is commonly used along roadways and parking lots. It can be used in sump or flow-by conditions. Length of curb opening varies based on model and size.



GRATE TYPE

The Grate Type configuration offers the same features and benefits as the Curb Type but with a grated/drop inlet above the systems pretreatment chamber. It has the added benefit of allowing pedestrian access over the inlet. ADA-compliant grates are available to assure easy and safe access. The Grate Type can also be used in scenarios where runoff needs to be intercepted on both sides of landscape islands.



VAULT TYPE

The system’s patented horizontal flow biofilter is able to accept inflow pipes directly into the pretreatment chamber, meaning the MWS Linear can be used in end-of-the-line installations. This greatly improves feasibility over typical decentralized designs that are required with other biofiltration/bioretenion systems. Another benefit of the “pipe-in” design is the ability to install the system downstream of underground detention systems to meet water quality volume requirements.



DOWNSPOUT TYPE

The Downspout Type is a variation of the Vault Type and is designed to accept a vertical downspout pipe from rooftop and podium areas. Some models have the option of utilizing an internal bypass, simplifying the overall design. The system can be installed as a raised planter, and the exterior can be stuccoed or covered with other finishes to match the look of adjacent buildings.

ORIENTATIONS

SIDE-BY-SIDE

The Side-By-Side orientation places the pretreatment and discharge chamber adjacent to one another with the biofiltration chamber running parallel on either side. This minimizes the system length, providing a highly compact footprint. It has been proven useful in situations such as streets with directly adjacent sidewalks, as half of the system can be placed under that sidewalk. This orientation also offers internal bypass options as discussed below.



END-TO-END

The End-To-End orientation places the pretreatment and discharge chambers on opposite ends of the biofiltration chamber, therefore minimizing the width of the system to 5 ft. (outside dimension). This orientation is perfect for linear projects and street retrofits where existing utilities and sidewalks limit the amount of space available for installation. One limitation of this orientation is that bypass must be external.



BYPASS

INTERNAL BYPASS WEIR (SIDE-BY-SIDE ONLY)

The Side-By-Side orientation places the pretreatment and discharge chambers adjacent to one another allowing for integration of internal bypass. The wall between these chambers can act as a bypass weir when flows exceed the system's treatment capacity, thus allowing bypass from the pretreatment chamber directly to the discharge chamber.

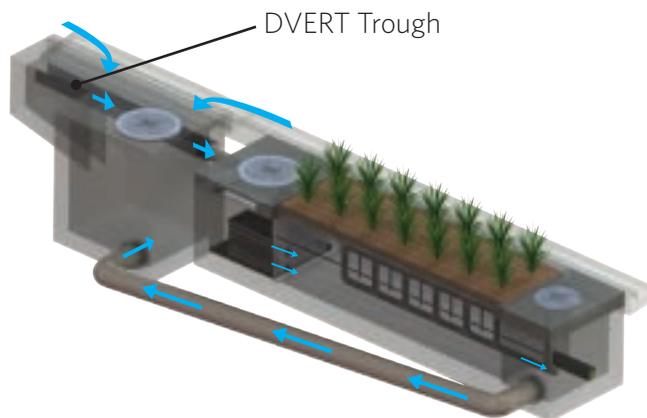
EXTERNAL DIVERSION WEIR STRUCTURE

This traditional offline diversion method can be used with the MWS Linear in scenarios where runoff is being piped to the system. These simple and effective structures are generally configured with two outflow pipes. The first is a smaller pipe on the upstream side of the diversion weir - to divert low flows over to the MWS Linear for treatment. The second is the main pipe that receives water once the system has exceeded treatment capacity and water flows over the weir.

FLOW-BY-DESIGN

This method is one in which the system is placed just upstream of a standard curb or grate inlet to intercept the first flush. Higher flows simply pass by the MWS Linear and into the standard inlet downstream.

DVERT LOW FLOW DIVERSION



This simple yet innovative diversion trough can be installed in existing or new curb and grate inlets to divert the first flush to the MWS Linear via pipe. It works similar to a rain gutter and is installed just below the opening into the inlet. It captures the low flows and channels them over to a connecting pipe exiting out the wall of the inlet and leading to the MWS Linear. The DVERT is perfect for retrofit and green street applications that allow the MWS Linear to be installed anywhere space is available.

SPECIFICATIONS

FLOW-BASED

The MWS Linear can be used in stand-alone applications to meet treatment flow requirements. Since the MWS Linear is the only biofiltration system that can accept inflow pipes several feet below the surface, it can be used not only in decentralized design applications but also as a large central end-of-the-line application for maximum feasibility.

MODEL #	DIMENSIONS	WETLAND MEDIA SURFACE AREA (sq.ft.)	TREATMENT FLOW RATE (cfs)
MWS-L-4-4	4' x 4'	23	0.052
MWS-L-4-6	4' x 6'	32	0.073
MWS-L-4-8	4' x 8'	50	0.115
MWS-L-4-13	4' x 13'	63	0.144
MWS-L-4-15	4' x 15'	76	0.175
MWS-L-4-17	4' x 17'	90	0.206
MWS-L-4-19	4' x 19'	103	0.237
MWS-L-4-21	4' x 21'	117	0.268
MWS-L-6-8	7' x 9'	64	0.147
MWS-L-8-8	8' x 8'	100	0.230
MWS-L-8-12	8' x 12'	151	0.346
MWS-L-8-16	8' x 16'	201	0.462
MWS-L-8-20	9' x 21'	252	0.577
MWS-L-8-24	9' x 25'	302	0.693

SPECIFICATIONS

VOLUME-BASED

Many states require treatment of a water quality volume and do not offer the option of flow-based design. The MWS Linear and its unique horizontal flow makes it the only biofilter that can be used in volume-based design installed downstream of ponds, detention basins, and underground storage systems.

MODEL #	TREATMENT CAPACITY (cu. ft.) @ 24-HOUR DRAINDOWN	TREATMENT CAPACITY (cu. ft.) @ 48-HOUR DRAINDOWN
MWS-L-4-4	1140	2280
MWS-L-4-6	1600	3200
MWS-L-4-8	2518	5036
MWS-L-4-13	3131	6261
MWS-L-4-15	3811	7623
MWS-L-4-17	4492	8984
MWS-L-4-19	5172	10345
MWS-L-4-21	5853	11706
MWS-L-6-8	3191	6382
MWS-L-8-8	5036	10072
MWS-L-8-12	7554	15109
MWS-L-8-16	10073	20145
MWS-L-8-20	12560	25120
MWS-L-8-24	15108	30216

APPLICATIONS

The MWS Linear has been successfully used on numerous new construction and retrofit projects. The system's superior versatility makes it beneficial for a wide range of stormwater and waste water applications - treating rooftops, streetscapes, parking lots, and industrial sites.



INDUSTRIAL

Many states enforce strict regulations for discharges from industrial sites. The MWS Linear has helped various sites meet difficult EPA-mandated effluent limits for dissolved metals and other pollutants.



RESIDENTIAL

Low to high density developments can benefit from the versatile design of the MWS Linear. The system can be used in both decentralized LID design and cost-effective end-of-the-line configurations.



STREETS

Street applications can be challenging due to limited space. The MWS Linear is very adaptable, and it offers the smallest footprint to work around the constraints of existing utilities on retrofit projects.



PARKING LOTS

Parking lots are designed to maximize space and the MWS Linear's 4 ft. standard planter width allows for easy integration into parking lot islands and other landscape medians.



COMMERCIAL

Compared to bioretention systems, the MWS Linear can treat far more area in less space, meeting treatment and volume control requirements.



MIXED USE

The MWS Linear can be installed as a raised planter to treat runoff from rooftops or patios, making it perfect for sustainable "live-work" spaces.

More applications include:

- Agriculture
- Reuse
- Low Impact Development
- Waste Water

PLANT SELECTION

Abundant plants, trees, and grasses bring value and an aesthetic benefit to any urban setting, but those in the MWS Linear do even more - they increase pollutant removal. What's not seen, but very important, is that below grade, the stormwater runoff/flow is being subjected to nature's secret weapon: a dynamic physical, chemical, and biological process working to break down and remove non-point source pollutants. The flow rate is controlled in the MWS Linear, giving the plants more contact time so that pollutants are more successfully decomposed, volatilized, and incorporated into the biomass of the MWS Linear's micro/macro flora and fauna.



A wide range of plants are suitable for use in the MWS Linear, but selections vary by location and climate. View suitable plants by visiting biocleanenvironmental.com/plants.

INSTALLATION



The MWS Linear is simple, easy to install, and has a space-efficient design that offers lower excavation and installation costs compared to traditional tree-box type systems. The structure of the system resembles precast catch basin or utility vaults and is installed in a similar fashion.

The system is delivered fully assembled for quick installation. Generally, the structure can be unloaded and set in place in 15 minutes. Our experienced team of field technicians are available to supervise installations and provide technical support.

MAINTENANCE



Reduce your maintenance costs, man hours, and materials with the MWS Linear. Unlike other biofiltration systems that provide no pretreatment, the MWS Linear is a self-contained treatment train which incorporates simple and effective pretreatment.

Maintenance requirements for the biofilter itself are almost completely eliminated, as the pretreatment chamber removes and isolates trash, sediments, and hydrocarbons. What's left is the simple maintenance of an easily accessible pretreatment chamber that can be cleaned by hand or with a standard vac truck. Only periodic replacement of low-cost media in the pre-filter cartridges is required for long-term operation, and there is absolutely no need to replace expensive biofiltration media.



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biocleanenvironmental.com

ATTACHMENT E

GEOTECHNICAL REPORT

**PRELIMINARY GEOTECHNICAL
INVESTIGATION**

**PROPOSED MULTI-FAMILY
RESIDENTIAL DEVELOPMENT
1683 SUNFLOWER AVENUE
COSTA MESA, CALIFORNIA**



**GEOCON
WEST, INC.**

**GEOTECHNICAL
ENVIRONMENTAL
MATERIALS**

DRAFT

PREPARED FOR

**ROSE EQUITIES
BEVERLY HILLS, CALIFORNIA**

PROJECT NO. A9933-88-01

APRIL 3, 2019



Project No. A9933-88-01
April 3, 2019

Rose Equities
8383 Wilshire Boulevard, Suite 632
Beverly Hills, California 90211

Attention: Mr. Brent Stoll

Subject: PRELIMINARY GEOTECHNICAL INVESTIGATION
PROPOSED MULTI-FAMILY RESIDENTIAL DEVELOPMENT
1683 SUNFLOWER AVENUE
COSTA MESA, CALIFORNIA

Dear Mr. Stoll,

In accordance with your authorization of our proposal with a revised date of February 4, 2019, we have prepared a preliminary geotechnical investigation for the proposed multi-family residential development located at 1683 Sunflower Avenue in the City of Costa Mesa, California. The accompanying report presents the findings of our study, and our conclusions and recommendations pertaining to the geotechnical aspects of proposed design and construction. Based on the results of our investigation, it is our opinion that the site can be developed as proposed, provided the recommendations of this report are followed and implemented during design and construction.

The primary intent of this study was to address potential geologic hazards and geotechnical conditions that could impact the project and to provide preliminary design recommendations. As the project design progresses, updated geotechnical recommendations should be provided for design and construction.

If you have any questions regarding this report, or if we may be of further service, please contact the undersigned.

Very truly yours,

GEOCON WEST, INC.

DRAFT

Jamie K. Fink
CEG 2636

Jelisa Thomas Adams
GE 3092

John Hoobs
CEG 1524

(Email) Addressee

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- CLIQ LIQUEFACTION ANALYSIS REPORT
(CD Only)

DRAFT

PRELIMINARY GEOTECHNICAL INVESTIGATION

1. PURPOSE AND SCOPE

This report presents the results of a preliminary geotechnical investigation for the proposed multi-family residential development located at 1683 Sunflower Avenue in the City of Costa Mesa, California (see Vicinity Map, Figure 1). The purpose of the investigation was to evaluate subsurface soil and geologic conditions underlying the site and, based on conditions encountered, to provide preliminary conclusions and recommendations pertaining to the geotechnical aspects of design and construction. As the project design progresses, updated geotechnical recommendations should be provided for design and construction.

The scope of this investigation included a site reconnaissance, field exploration, laboratory testing, engineering analysis, and the preparation of this report. The site was explored on February 12, 25, and 26, 2019, by excavating a total of thirteen 8-inch diameter borings using a hollow stem auger drilling machine and by advancing five cone penetrometer tests (CPTs). The borings were excavated to depths ranging from 6 to 50½ feet below the ground surface. The CPTs were advanced to depths ranging from approximately 60 to 64 feet below the ground surface. It should be noted that the numbers CPT-3 and CPT-4 were not used. The approximate locations of the borings and CPTs are depicted on the Site Plan (see Figure 2). A detailed discussion of the field investigation, including boring logs and CPT soundings, is presented in Appendix A.

Laboratory tests were performed on selected soil samples obtained during the investigation to determine pertinent physical and chemical soil properties. Appendix B presents a summary of the laboratory test results.

The recommendations presented herein are based on analysis of the data obtained during the investigation and our experience with similar soil and geologic conditions. References reviewed to prepare this report are provided in the *List of References* section.

If project details vary significantly from those described above, Geocon should be contacted to determine the necessity for review and possible revision of this report.

2. SITE AND PROJECT DESCRIPTION

The subject site is located at 1683 Sunflower Avenue in the City of Costa Mesa, California. The site is approximately 15.75 acres and is currently occupied by a warehouse structure and on-grade parking. The site is bounded by Sunflower Avenue and one and two-story commercial structures to the north, by the 405 San Diego Freeway to the south, by a one and two-story commercial shopping center to the east, and by a one-story commercial structure and associated parking to the west. The site is relatively level, with no pronounced highs or lows. Surface water drainage at the site appears to be by sheet flow along the existing ground contours to the city streets. Vegetation onsite consists of grass and trees, which are located in isolated landscape areas.

Based on the information provided by the Client, it is our understanding that the proposed development will include three multi-family residential buildings and a commercial building on the subject site. The multi-family residential buildings are further described as 'Building A', a wrap style six-story residential apartment building to be constructed at or near present grade; 'Building B', a podium style seven-story residential apartment building underlain by one level subterranean parking; and 'Building C', a wrap style seven-story residential apartment building to be constructed at or near present grade. A four-story creative office building, comprised of 3 office levels over one level of parking to be constructed at or near present grade, is planned at the southwest portion of the site. Additional site improvements will include parking areas, courtyards, an in-ground swimming pool, landscape areas, and fire access driveways. The proposed development is depicted on the Site Plan (see Figure 2).

Based on the preliminary nature of the design at this time, wall and column loads were not available. Column loads and wall loads for the proposed parking structure are estimated to be up to 650 kips and 35 kips per linear foot, respectively. Column loads and wall loads for the proposed apartment building are estimated to be up to 175 kips and 6 kips per linear foot, respectively.

We understand that final design of the project has not been completed, hence, once the design phase proceeds to a more finalized plan, the recommendations within this report should be reviewed and revised, if necessary. Any changes in the design, location or elevation of any structure, as outlined in this report, should be reviewed by this office. Geocon should be contacted to determine the necessity for review and possible revision of this report.

3. BACKGROUND REVIEW

As a part of the preparation of this report, we reviewed a prior report provided to us by the Client:

Geotechnical Engineering Investigation, Proposed Project, 1683 Sunflower Avenue, Costa Mesa, California, prepared by Moore Twining Associates, Inc., dated October 3, 2013.

A prior geotechnical investigation of the subject site was performed in 2013 by Moore Twining Associates, Inc., (MTA). The prior investigation included the excavation and logging of ten borings to depths ranging from 10 to 51½ feet below the ground surface. Additionally, four Cone Penetrometer Tests (CPTs) were advanced to depths of approximately 50 feet below the ground surface. The locations of the prior borings and CPTs are indicated on the Site Plan (Figure 2). Perched groundwater was encountered in one boring at a depth of 10 feet, and groundwater was encountered in another boring at a depth of 18 feet. A copy of the report prepared by Geotechnologies is provided in Appendix C.

Geocon West, Inc. has reviewed the referenced report by MTA, and the recommendations presented herein are based on analysis of the subsurface and laboratory data obtained from the prior investigation by MTA, as well as our own subsurface and laboratory data. Furthermore, we assume responsibility for the utilization of the exploration and laboratory data presented within the geotechnical report by

MTA. Geocon West, Inc. is the Geotechnical Consultant of Record and will be providing all necessary geotechnical consultation, plan review, design recommendations, inspection and testing services for this project. Where differing, the recommendations presented herein supersede all previous recommendations.

4. GEOLOGIC SETTING

The subject site is located in the central portion of the Orange County Coastal Plain, a relatively flat-lying alluviated surface with an average slope of less than 20 feet per mile. The lowland surface is bounded by hills and mountains on the north and east and by the Pacific Ocean to the south and southwest. Prominent structural features within the Orange County Coastal Plain include the central lowland plain, the northwest trending line of low hills and mesas near the coast underlain by the Newport-Inglewood Fault Zone (Newport Mesa, Huntington Beach Mesa, Bolsa Chica Mesa, and Landing Hill), and the San Joaquin Hills to the southeast (Department of Water Resources, 1967).

5. SOIL AND GEOLOGIC CONDITIONS

Based on our field investigation and published geologic maps of the area, the site is underlain by artificial fill and unconsolidated Holocene age alluvial fan deposits consisting of sand, silt and clay (California Geological Survey [CGS], 2012). Detailed stratigraphic profiles of the materials encountered at the site are provided on the boring logs and CPT soundings in Appendix A.

5.1 Artificial Fill

Artificial fill was encountered in our field explorations to a maximum depth of 5½ feet below existing ground surface. The artificial fill generally consists of light brown to brown to gray brown silty sand and sandy silt and sandy clay. The artificial fill is characterized as slightly moist to moist and soft to firm or medium dense. The fill is likely the result of past grading or construction activities at the site. Deeper fill may exist between excavations and in other portions of the site that were not directly explored.

5.2 Alluvial Fan Deposits

The artificial fill is underlain by Holocene age alluvial fan deposits that generally consists of brown to olive and gray brown sandy clay, sandy silt, clay, and both poorly graded and well graded sands. In general, the upper 20 to 25 feet of alluvial deposits generally consist of relatively soft to firm clay and silt which is underlain by approximately 10 to 15 feet of medium dense to dense sand.

Based on review of a published geologic map showing the distribution of localized peat deposits in the Orange County area (CDMG, 1976), the subject site is situated along the northern and western boundaries of a 'T-shaped' area identified as having a strong probability of peat deposits. As discussed in the text accompanying the geologic map, the boundaries of the identified areas are generalized because of lack of subsurface data and the maps do not establish the distribution or thicknesses of the peat deposits.

The current and prior subsurface exploration recorded the presence of organic odor in several borings (Geocon borings B-2, B-5, and B-7 and MTA Borings B2, B3, B5, B6) at depths ranging from 8.5 to 17 feet below ground surface (See Figure B20). The presence of roots and/or organics were observed in Geocon borings B-1 through B-7 ranging from 6 to 20 feet below ground surface.

6. GROUNDWATER

Review of the Seismic Hazard Zone Report for the Anaheim and Newport Beach 7.5-Minute Quadrangle (California Division of Mines and Geology [CDMG], 2001) indicates the historically highest groundwater level in the area is approximately 10 feet beneath the ground surface.

Groundwater was encountered in our borings at depths ranging from approximately 10 to 20 feet below the existing ground surface. Seepage was also noted in boring B5 at 7 feet. Considering the historic high groundwater level and the depth to groundwater observed in our borings, groundwater may be encountered during construction. It is not uncommon for groundwater levels to vary seasonally or for groundwater seepage conditions to develop where none previously existed, especially in impermeable fine-grained soils which are heavily irrigated or after seasonal rainfall. Proper surface drainage of irrigation and precipitation will be critical for future performance of the project. Recommendations for drainage are provided in the *Surface Drainage* section of this report (see Section 8.24).

7. GEOLOGIC HAZARDS

7.1 Surface Fault Rupture

The numerous faults in Southern California include active, potentially active, and inactive faults. The criteria for these major groups are based on criteria developed by the California Geological Survey (formerly known as CDMG) for the Alquist-Priolo Earthquake Fault Zone Program (CGS, 2018a). By definition, an active fault is one that has had surface displacement within Holocene time (about the last 11,700 years). A potentially active fault has demonstrated surface displacement during Quaternary time (approximately the last 1.6 million years), but has had no known Holocene movement. Faults that have not moved in the last 1.6 million years are considered inactive.

The site is not within a state-designated Alquist-Priolo Earthquake Fault Zone for surface fault rupture hazards (CGS, 2018b). No active or potentially active faults with the potential for surface fault rupture are known to pass directly beneath the site. Therefore, the potential for surface rupture due to faulting occurring beneath the site during the design life of the proposed development is considered low. However, the site is located in the seismically active Southern California region, and could be subjected to moderate to strong ground shaking in the event of an earthquake on one of the many active Southern California faults. The faults in the vicinity of the site are shown in Figure 3, Regional Fault Map.

8.1.11 Groundwater was encountered at depths of approximately 10 to 20 feet during the field investigation at the subject site. The depth to groundwater at the time of construction may be different. We expect groundwater would be encountered during the installation of rammed aggregate piers.

8.1.12 The historic high groundwater level beneath the site is reported as 10 feet below the existing ground surface. If the subterranean portion of the structure extends below the historic high groundwater level, that portion of the structure should be designed for full hydrostatic pressure.

8.1.13 Due to the nature of the proposed design and intent for a subterranean level, waterproofing of subterranean walls and slabs is suggested. Particular care should be taken in the design and installation of waterproofing to avoid moisture problems or actual water seepage into the structure through any normal shrinkage cracks which may develop in the concrete walls, floor slab, foundations and/or construction joints. The design and inspection of the waterproofing is not the responsibility of the geotechnical engineer. A waterproofing consultant should be retained in order to recommend a product or method, which would provide protection to subterranean walls, floor slabs and foundations. In addition, a waterproofing inspector should be retained to check proper installation of the system during construction.

8.1.14 It is anticipated that stable excavations for the recommended grading associated with the proposed structures can be achieved with sloping measures. However, if excavations in close proximity to an adjacent property line and/or structure are required, special excavation measures may be necessary in order to maintain lateral support of offsite improvements. Excavation recommendations are provided in the *Temporary Excavations* section of this report (Section 8.21).

8.1.15 Improvements which are not supported on deepened foundations, such as walkways, paving, pool decks, and utilities, may still be subject to seismic and/or static settlement. Furthermore, the upper portion of existing site soils have a medium expansive potential and could be subject to heave and settlement if the soil is subjected to repeated wetting and drying. The client should consider the flexibility of the products and pavements being installed. It is recommended that all utilities traversing through existing site soils utilize flexible connections in order to minimize the damage to underground installations caused by potential soil movements.

8.1.16 Foundations for small outlying structures, such as block walls less than 6 feet high, planter walls or trash enclosures, which will not be tied to the proposed structure, may be supported on conventional foundations deriving support on a minimum of 12 inches of newly placed engineered fill which extends laterally at least 12 inches beyond the foundation area. Where excavation and proper compaction cannot be performed or is undesirable, foundations may derive support directly in the undisturbed alluvial soils found at or below a depth of 24 inches

8.23 Stormwater Infiltration

8.23.1 During the February 25 and 26 site explorations, borings P1 through P6 were utilized to perform percolation testing. The borings were advanced to the depths listed in the table below. Slotted casing was placed in the borings, and the annular space between the casing and excavation was filled with gravel. The borings were then filled with water to pre-saturate the soils. On February 27, 2019, the casings were refilled with water and percolation test readings were performed after repeated flooding of the cased excavation. Based on the test results, the average infiltration rate (adjusted percolation rate), for the earth materials encountered, is provided in the following table. The field-measured percolation rate has been adjusted to infiltration rates in accordance with the County of Orange Technical Guidance Document for the Preparation of Conceptual/Preliminary and/or Project Water Quality Management Plans (December 2013). Additional correction factors may be required and should be applied by the engineer in responsible charge of the design of the stormwater infiltration system and based on applicable guidelines. Percolation test results are provided on Figures 17 through 22.

Boring	Infiltration Depth (ft)	Average Infiltration Rate (in / hour)
P1	0.5	1.76
P2	0.5	2.0
P3	0-5	0.98
P4	0-5	0.03
P5	0.5	1.69
P6	0-5	0.27

8.23.2 The results of the percolation testing indicate that some of the onsite soils are conducive to infiltration. It is our opinion that where a minimum infiltration rate of 0.3 inches per hour was achieved, the soils encountered at the depths and locations as listed in the table above are suitable for infiltration of stormwater.

- 8.23.3 It is our opinion infiltration of stormwater at the depths and locations indicated above will not induce excessive hydro-consolidation, will not saturate soils supported by existing or proposed retaining walls, and will not increase the potential for liquefaction. Due to the expansive and clayey nature of the onsite soils, the design and implementation of a stormwater infiltration system must consider the potential for activating expansive soils and creating perched water conditions. The design of a stormwater infiltration system should also consider how the grading recommendations presented herein may alter the existing soil conditions. Once the location of the stormwater infiltration system is finalized, if a prior test is not in close proximity, additional percolation testing should be considered in order confirm the soil conditions at that location.
- 8.23.4 The infiltration system should be located such that the closest distance between an adjacent foundation is at least 10 feet in all directions from the zone of saturation. The zone of saturation may be assumed to project downward from the discharge of the infiltration facility at a gradient of 1:1. Additional property line or foundation setbacks may be required by the governing jurisdiction and should be incorporated into the stormwater infiltration system design as necessary.
- 8.23.5 Subsequent to the placement of the infiltration system, it is acceptable to backfill the resulting void space between the excavation sidewalls and the infiltration system with minimum 2-sack slurry provided the slurry is not placed in the infiltration zone. It is recommended that pea gravel be utilized adjacent to the infiltration zone so communication of water to the soil is not hindered.
- 8.23.6 Due to the preliminary nature of the project at this time, the type of stormwater infiltration system and location of the stormwater infiltration systems has not yet been determined. The design drawings should be reviewed and approved by the Geotechnical Engineer. The installation of the stormwater infiltration system should be observed and approved by the Geotechnical Engineer (a representative of Geocon).

8.24 Surface Drainage

- 8.24.1 Proper surface drainage is critical to the future performance of the project. Uncontrolled infiltration of irrigation excess and storm runoff into the soils can adversely affect the performance of the planned improvements. Saturation of a soil can cause it to lose internal shear strength and increase its compressibility, resulting in a change in the original designed engineering properties. Proper drainage should be maintained at all times.
- 8.24.2 Site drainage should be collected and controlled in non-erosive drainage devices. Drainage should not be allowed to pond anywhere on the site, and especially not against any foundation or retaining wall. The site should be graded and maintained such that surface drainage is directed away from structures in accordance with 2016 CBC 1804.4 or other applicable

standards. In addition, drainage should not be allowed to flow uncontrolled over any descending slope. Discharge from downspouts, roof drains and scuppers are not recommended onto unprotected soils within 5 feet of the building perimeter. Planters which are located adjacent to foundations should be sealed to prevent moisture intrusion into the soils providing foundation support. Landscape irrigation is not recommended within 5 feet of the building perimeter footings except when enclosed in protected planters.

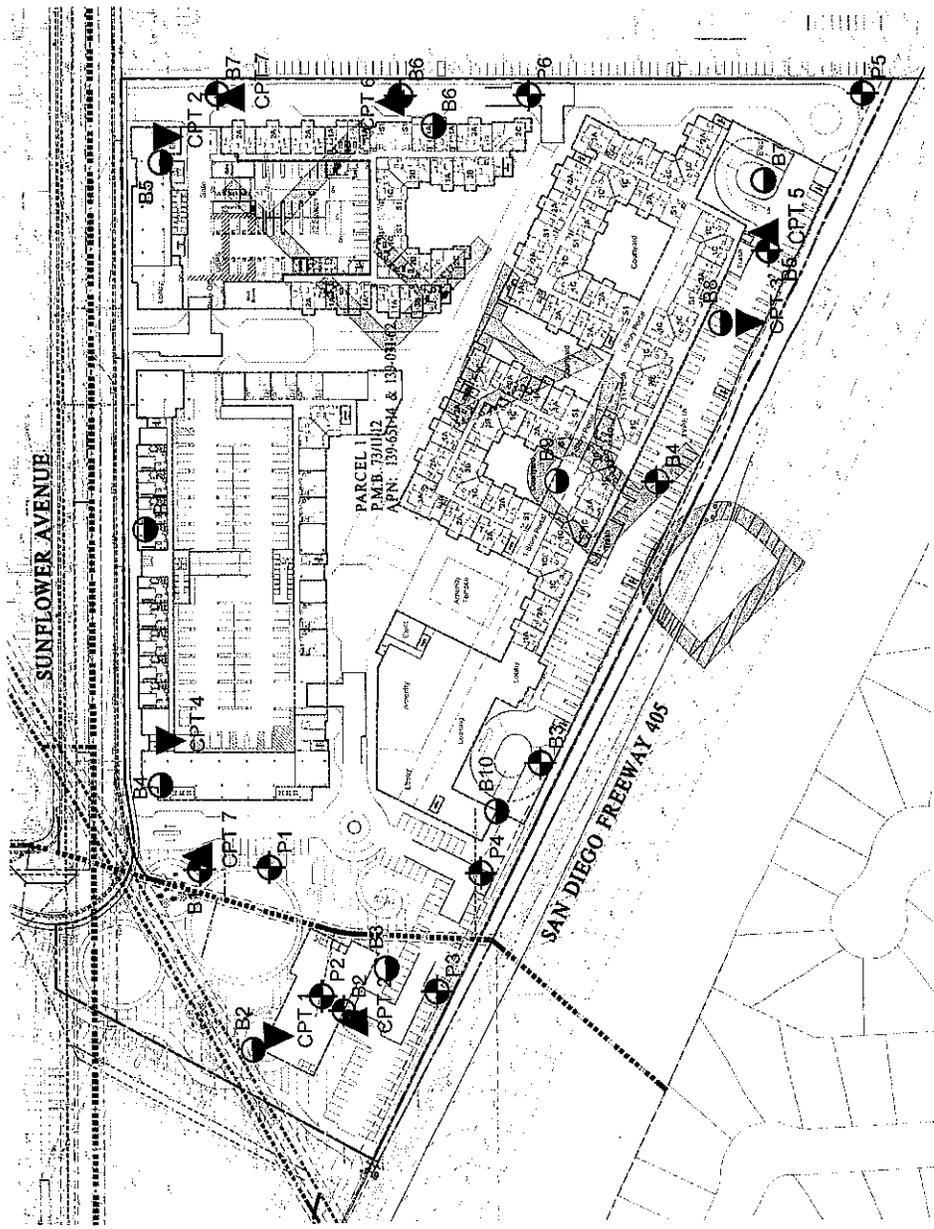
8.24.3 Positive site drainage should be provided away from structures, pavement, and the tops of slopes to swales or other controlled drainage structures. The building pads and pavement areas should be fine graded such that water is not allowed to pond.

8.24.4 Landscaping planters immediately adjacent to paved areas are not recommended due to the potential for surface or irrigation water to infiltrate the pavement's subgrade and base course. Either a subdrain, which collects excess irrigation water and transmits it to drainage structures, or an impervious above-grade planter boxes should be used. In addition, where landscaping is planned adjacent to the pavement, it is recommended that consideration be given to providing a cutoff wall along the edge of the pavement that extends at least 12 inches below the base material.

8.25 Plan Review

8.25.1 Grading, foundation, and shoring plans should be reviewed by the Geotechnical Engineer prior to finalization to check that the plans have been prepared in substantial conformance with the recommendations of this report and to provide additional analyses or recommendations, if necessary.

DRAFT



LEGEND

-  B7 Location of Boring (Geocon, 2019)
-  P6 Location of Percolation Boring (Geocon, 2019)
-  CPT 7 Location of CPT (Geocon, 2019)
-  B10 Location of Boring (MTA, 2013)
-  CPT 4 Location of CPT (MTA, 2013)

 GEOCON W E S T I N C. ENVIRONMENTAL GEOTECHNICAL MATERIALS 15520 ROCKFIELD BOULEVARD, SUITE J1 IRVINE, CA 92618 PHONE (949) 491-6570 FAX (949) 286-4560	SITE PLAN ROSE EQUITIES 1683 SUNFLOWER AVENUE COSTA MESA, CALIFORNIA APRIL 2019 PROJECT NO. A9933-88-01
DRAFTED BY: JS	CHECKED BY: JTA
FIG. 2	

ATTACHMENT F

OPERATIONS AND MAINTENANCE PLAN

Operations and Maintenance (O&M) Plan

**Preliminary Water Quality Management Plan
for**

ONE METRO WEST

**NOTE: INSPECTION AND MAINTENANCE RECORDS WILL BE KEPT FOR A
MINIMUM FIVE YEARS FOR INSPECTION BY CITY INSPECTORS.**

Exhibit A, Operations and Maintenance Plan

City of Irvine

BMP Applicable? Yes/No	BMP Name and BMP Implementation, Maintenance, and Inspection Procedures	Implementation, Maintenance, and Inspection Frequency and Schedule	Person or Entity with Operation & Maintenance Responsibility
Non-Structural Source Control BMPs			
YES	<p>N1. Education for Property Owners, Tenants and Occupants Rose Equities shall periodically provide environmental awareness education materials to its tenants.</p>	<p>Prior to building occupancy Rose Equities will provide the CC&R's (if applicable) and environmental awareness education materials to the new tenants. A copy of the educational materials is provided in Attachment G.</p>	<p>Rose Equities 1683 Sunflower Avenue, Costa Mesa, CA 92612 Contact: - Brent Stoll 323-782-4300</p>
YES	<p>N2. Activity Restriction Rules or guidelines for Pistoia are established within appropriate documents, if applicable, which prohibit activities that can result in discharges of pollutants. Activity restrictions are the responsibility of Rose Equities</p>	<p>When the tenant has moved into the building, Rose Equities will have the WQMP available for the tenant's needs and recommend the tenant review the WQMP.</p>	<p>Rose Equities 1683 Sunflower Avenue, Costa Mesa, CA 92612 Contact: - Brent Stoll 323-782-4300</p>
YES	<p>N3. Common Area Landscape Management City-approved Landscape Construction Plans will be prepared. All landscape maintenance activities will conform to the Orange County Management Guidelines for the Use of Fertilizers and Pesticides (M.G.F.P.).</p>	<p>Monthly during regular maintenance. Manage landscaping in accordance with the County of Orange Water Conservation Ordinance No. 3802 and with management guidelines for use of fertilizers and pesticides, or City equivalent.</p>	<p>Rose Equities 1683 Sunflower Avenue, Costa Mesa, CA 92612 Contact: - Brent Stoll 323-782-4300</p>
YES	<p>N4. BMP Maintenance Rose Equities will be responsible for implementing each of the stated non-structural BMP's.</p>	<p>Shall be done with regular maintenance activities on a monthly basis.</p>	<p>Rose Equities 1683 Sunflower Avenue, Costa Mesa, CA 92612 Contact: - Brent Stoll 323-782-4300</p>

Exhibit A, Operations and Maintenance Plan

BMP Applicable? Yes/No	BMP Name and BMP Implementation, Maintenance, and Inspection Procedures	Implementation, Maintenance, and Inspection Frequency and Schedule	Person or Entity with Operation & Maintenance Responsibility
YES	<p>N11. Common Area Litter Control Rose Equities will implement trash management and litter control procedures on the site aimed at reducing pollution of drainage water. Rose Equities may contract with its landscape maintenance firms to provide this service during regularly scheduled maintenance. It will consist of litter patrol and emptying of trash receptacles.</p>	<p>Weekly sweeping and trash pick-up within landscape areas and outside walkways. Daily inspection of trash receptacles to ensure that lids are closed and any excess trash on the ground is picked up.</p>	<p>Rose Equities 1683 Sunflower Avenue, Costa Mesa, CA 92612 Contact: - Brent Stoll 323-782-4300</p>
YES	<p>N12. Employee Training Employee training shall be provided to maintenance personnel and is the responsibility of Rose Equities.</p>	<p>Monthly for both maintenance personnel and employees.</p>	<p>Rose Equities 1683 Sunflower Avenue, Costa Mesa, CA 92612 Contact: - Brent Stoll 323-782-4300</p>
YES	<p>N14. Common Area Catch Basin Inspection Effective post-construction maintenance of storm collection and conveyance facilities will ensure not only their intended use, but will also prevent excessive pollutants from entering the drainage system. Occasionally, catch basins and other drainage facilities become clogged by sediment and debris accumulation. In addition, it is not uncommon for illicit dumping of waste material—particularly used motor oil—to occur at catch basins and drainage facilities. Periodic cleaning of catch basins and storm drains will provide the following benefits.</p>	<p>Once a month to clean debris and silt in bottom of catch basins. Intensified around October 1st of each year prior to the “first flush” storm.</p>	<p>Rose Equities 1683 Sunflower Avenue, Costa Mesa, CA 92612 Contact: - Brent Stoll 323-782-4300</p>
YES	<p>N15. Street Sweeping Private Streets and Parking Lots Rose Equities shall sweep streets and parking areas within the site.</p>	<p>Weekly vacuum sweeping. Intensified around October 1st of each year prior to “first flush” storm according to the City of Costa Mesa street sweeping program schedule.</p>	<p>Rose Equities 1683 Sunflower Avenue, Costa Mesa, CA 92612 Contact: - Brent Stoll 323-782-4300</p>

Exhibit A, Operations and Maintenance Plan

BMP Applicable? Yes/No	BMP Name and BMP Implementation, Maintenance, and Inspection Procedures	Implementation, Maintenance, and Inspection Frequency and Schedule	Person or Entity with Operation & Maintenance Responsibility
Structural Source Control BMPs			
YES	<p>S1. Provide Storm Drain System Stenciling and Signage Phrase "No Dumping - Drains to Ocean" phrase to be stenciled on catch basins to alert the public to the destination of pollutants discharged into storm water.</p>	Inspect stenciling for legibility no later than the beginning of the rainy season on October 1 st of each year. Stenciling must be re-stenciled to maintain legibility as necessary and when deemed necessary by the local inspecting agency.	<p>Rose Equities 1683 Sunflower Avenue, Costa Mesa, CA 92612 Contact: - Brent Stoll 323-782-4300</p>
YES	<p>S3. Design and Construct Trash and Waste Storage Areas to Reduce Pollutant Introduction All trash container areas shall provide attached lids on all trash containers that exclude rain. Roof and awning to minimize direct precipitation is not applicable since the permanent trash enclosure location is located indoor. Connection of trash area drains to the municipal storm drain is not allowed. Trash container areas shall be paved with an impervious surface.</p>	Monthly during regular maintenance. Litter patrol, emptying trash receptacles, noting trash disposal violations by tenants or employees and reporting the violations to Rose Equities or property management for investigation.	<p>Rose Equities 1683 Sunflower Avenue, Costa Mesa, CA 92612 Contact: - Brent Stoll 323-782-4300</p>

Exhibit A, Operations and Maintenance Plan

BMP Applicable? Yes/No	BMP Name and BMP Implementation, Maintenance, and Inspection Procedures	Implementation, Maintenance, and Inspection Frequency and Schedule	Person or Entity with Operation & Maintenance Responsibility
YES	<p>S4. Use Efficient Irrigation Systems & Landscape Design Fertilizer/pesticide/herbicide and irrigation management practices and landscape management practices will be maintained consistent with the County Ordinance Amending the Zoning Code Regarding the Conservation of Water in Landscaping for Common Areas of Multifamily and Non-Residential Development. Fertilizer and pesticide usage will be administered consistent with the Orange County's "Management Guidelines for the Use of Fertilizers and Pesticides" (M.G.F.P.). The design and maintenance of the irrigation system would incorporate methods to minimize both the amount of water applied and the amount of runoff. The system will also be designed with the criteria established by the County of Orange and the City of Costa Mesa. These methods can include employing shutoff devices to prevent irrigation after precipitation, designing irrigation systems to each landscape area's specific water requirements, using flow reducers or shutoff valves triggered by a pressure drop to control water loss in the event of broken sprinkler heads or lines, designing the timing and application methods of irrigation water to minimize excess irrigation water into the municipal storm drain system, grouping plants with similar water requirements, and choosing plants with low irrigation requirements. Irrigation design or maintenance deficiencies that cause excessive runoff of irrigation water will be immediately corrected. Furthermore, the new MS4 permit (Order R8-2009-0030) encourages use of weather based evapo-transpiration (ET) irrigation controllers for new developments.</p>	<p>Monitor landscape irrigation areas weekly in conjunction with maintenance activities. Verify that runoff minimizing landscape design continues to function by checking that water sensors are functioning properly, that irrigation heads are adjusted properly to eliminate overspray in hardscape areas, and to verify that irrigation timing and cycle lengths are adjusted in accordance with water demands, given time of year, weather and day or night time temperatures.</p>	<p>Rose Equities 1683 Sunflower Avenue, Costa Mesa, CA 92612 Contact: - Brent Stoll 323-782-4300</p>

Exhibit A, Operations and Maintenance Plan

BMP Applicable? Yes/No	BMP Name and BMP Implementation, Maintenance, and Inspection Procedures	Implementation, Maintenance, and Inspection Frequency and Schedule	Person or Entity with Operation & Maintenance Responsibility
LID/Treatment Control BMPs			
YES	Biotreatment LID BMP # 1 Modular Wetland System	Trash shall be removed from Screening Device annually. Sediment from Separation Chamber shall be removed annually. Cartridge Filter Media shall be replaced annually. Drain Down Filter Media shall be replaced annually. Vegetation shall be trimmed annually. For additional information, refer to Operation and Maintenance Guide for Modular Wetland Systems included herewith.	Rose Equities 1683 Sunflower Avenue, Costa Mesa, CA 92612 Contact: - Brent Stoll 323-782-4300 Modular Wetland or approved Maintenance Contractor

Exhibit A, Operations and Maintenance Plan

Required Permits

No permits are required.

Forms to Record BMP Implementation, Maintenance, and Inspection

The form that will be used to record implementation, maintenance, and inspection of BMPs is attached.

Recordkeeping

All records must be maintained for at least five (5) years and must be made available for review upon request.

RECORD OF BMP IMPLEMENTATION, MAINTENANCE, AND INSPECTION

Today's Date: _____

**Name of Person Performing Activity
(Printed):** _____

Signature: _____

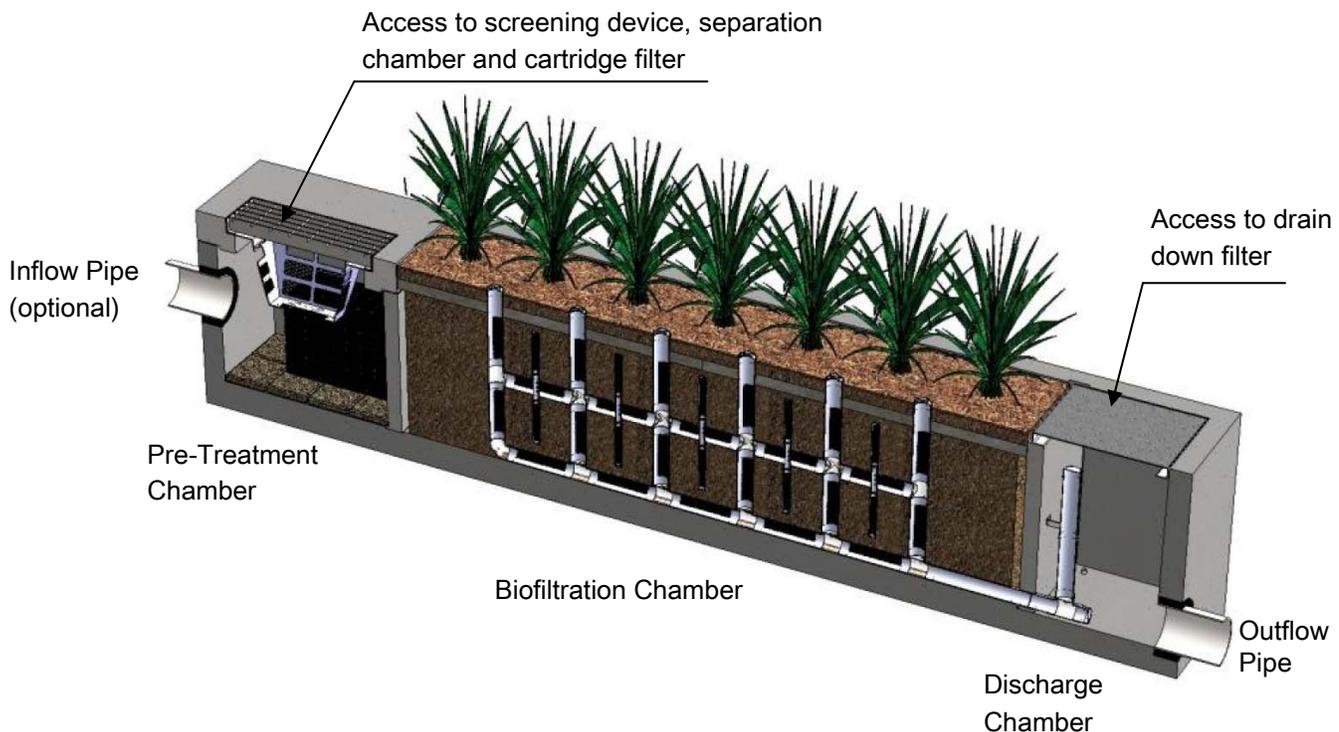
BMP Name (As Shown in O&M Plan)	Brief Description of Implementation, Maintenance, and Inspection Activity Performed

Maintenance Guidelines for Modular Wetland System - Linear

Maintenance Summary

- Remove Trash from Screening Device – average maintenance interval is 6 to 12 months.
 - *(5 minute average service time).*
- Remove Sediment from Separation Chamber – average maintenance interval is 12 to 24 months.
 - *(10 minute average service time).*
- Replace Cartridge Filter Media – average maintenance interval 12 to 24 months.
 - *(10-15 minute per cartridge average service time).*
- Replace Drain Down Filter Media – average maintenance interval is 12 to 24 months.
 - *(5 minute average service time).*
- Trim Vegetation – average maintenance interval is 6 to 12 months.
 - *(Service time varies).*

System Diagram



Maintenance Procedures

Screening Device

1. Remove grate or manhole cover to gain access to the screening device in the Pre-Treatment Chamber. Vault type units do not have screening device. Maintenance can be performed without entry.
2. Remove all pollutants collected by the screening device. Removal can be done manually or with the use of a vacuum truck. The hose of the vacuum truck will not damage the screening device.
3. Screening device can easily be removed from the Pre-Treatment Chamber to gain access to separation chamber and media filters below. Replace grate or manhole cover when completed.

Separation Chamber

1. Perform maintenance procedures of screening device listed above before maintaining the separation chamber.
2. With a pressure washer spray down pollutants accumulated on walls and cartridge filters.
3. Vacuum out Separation Chamber and remove all accumulated pollutants. Replace screening device, grate or manhole cover when completed.

Cartridge Filters

1. Perform maintenance procedures on screening device and separation chamber before maintaining cartridge filters.
2. Enter separation chamber.
3. Unscrew the two bolts holding the lid on each cartridge filter and remove lid.
4. Remove each of 4 to 8 media cages holding the media in place.
5. Spray down the cartridge filter to remove any accumulated pollutants.
6. Vacuum out old media and accumulated pollutants.
7. Reinstall media cages and fill with new media from manufacturer or outside supplier. Manufacturer will provide specification of media and sources to purchase.
8. Replace the lid and tighten down bolts. Replace screening device, grate or manhole cover when completed.

Drain Down Filter

1. Remove hatch or manhole cover over discharge chamber and enter chamber.
2. Unlock and lift drain down filter housing and remove old media block. Replace with new media block. Lower drain down filter housing and lock into place.
3. Exit chamber and replace hatch or manhole cover.



Maintenance Notes

1. Following maintenance and/or inspection, it is recommended the maintenance operator prepare a maintenance/inspection record. The record should include any maintenance activities performed, amount and description of debris collected, and condition of the system and its various filter mechanisms.
2. The owner should keep maintenance/inspection record(s) for a minimum of five years from the date of maintenance. These records should be made available to the governing municipality for inspection upon request at any time.
3. Transport all debris, trash, organics and sediments to approved facility for disposal in accordance with local and state requirements.
4. Entry into chambers may require confined space training based on state and local regulations.
5. No fertilizer shall be used in the Biofiltration Chamber.
6. Irrigation should be provided as recommended by manufacturer and/or landscape architect. Amount of irrigation required is dependent on plant species. Some plants may require irrigation.

Maintenance Procedure Illustration

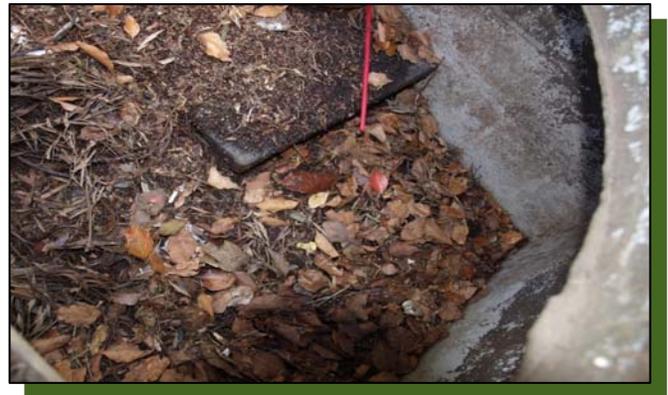
Screening Device

The screening device is located directly under the manhole or grate over the Pre-Treatment Chamber. It's mounted directly underneath for easy access and cleaning. Device can be cleaned by hand or with a vacuum truck.



Separation Chamber

The separation chamber is located directly beneath the screening device. It can be quickly cleaned using a vacuum truck or by hand. A pressure washer is useful to assist in the cleaning process.



Cartridge Filters

The cartridge filters are located in the Pre-Treatment chamber connected to the wall adjacent to the biofiltration chamber. The cartridges have removable tops to access the individual media filters. Once the cartridge is open media can be easily removed and replaced by hand or a vacuum truck.



Drain Down Filter

The drain down filter is located in the Discharge Chamber. The drain filter unlocks from the wall mount and hinges up. Remove filter block and replace with new block.



Trim Vegetation

Vegetation should be maintained in the same manner as surrounding vegetation and trimmed as needed. No fertilizer shall be used on the plants. Irrigation per the recommendation of the manufacturer and or landscape architect. Different types of vegetation requires different amounts of irrigation.





Inspection Form



Modular Wetland System, Inc.

P. 760.433-7640

F. 760-433-3176

E. Info@modularwetlands.com

www.modularwetlands.com



Inspection Report Modular Wetlands System



Project Name _____

Project Address _____ (city) (Zip Code)

Owner / Management Company _____

Contact _____

Phone () -

Inspector Name _____

Date ____ / ____ / ____

Time _____ AM / PM

Type of Inspection Routine Follow Up Complaint

Storm

Storm Event in Last 72-hours? No Yes

Weather Condition _____

Additional Notes _____

For Office Use Only
(Reviewed By)
(Date) Office personnel to complete section to the left.

Inspection Checklist

Modular Wetland System Type (Curb, Grate or UG Vault): _____ Size (22', 14' or etc.): _____

Structural Integrity:	Yes	No	Comments
Damage to pre-treatment access cover (manhole cover/grate) or cannot be opened using normal lifting pressure?			
Damage to discharge chamber access cover (manhole cover/grate) or cannot be opened using normal lifting pressure?			
Does the MWS unit show signs of structural deterioration (cracks in the wall, damage to frame)?			
Is the inlet/outlet pipe or drain down pipe damaged or otherwise not functioning properly?			
Working Condition:			
Is there evidence of illicit discharge or excessive oil, grease, or other automobile fluids entering and clogging the unit?			
Is there standing water in inappropriate areas after a dry period?			
Is the filter insert (if applicable) at capacity and/or is there an accumulation of debris/trash on the shelf system?			
Does the depth of sediment/trash/debris suggest a blockage of the inflow pipe, bypass or cartridge filter? If yes, specify which one in the comments section. Note depth of accumulation in in pre-treatment chamber.			Depth:
Does the cartridge filter media need replacement in pre-treatment chamber and/or discharge chamber?			Chamber:
Any signs of improper functioning in the discharge chamber? Note issues in comments section.			
Other Inspection Items:			
Is there an accumulation of sediment/trash/debris in the wetland media (if applicable)?			
Is it evident that the plants are alive and healthy (if applicable)? Please note Plant Information below.			
Is there a septic or foul odor coming from inside the system?			

Waste:	Yes	No
Sediment / Silt / Clay		
Trash / Bags / Bottles		
Green Waste / Leaves / Foliage		

Recommended Maintenance	
No Cleaning Needed	
Schedule Maintenance as Planned	
Needs Immediate Maintenance	

Plant Information	
Damage to Plants	
Plant Replacement	
Plant Trimming	

Additional Notes: _____

Maintenance Report



Modular Wetland System, Inc.

P. 760.433-7640

F. 760-433-3176

E. Info@modularwetlands.com

www.modularwetlands.com



Cleaning and Maintenance Report Modular Wetlands System



Project Name _____

Project Address _____
(city) (Zip Code)

Owner / Management Company _____

Contact _____ Phone () -

Inspector Name _____ Date ____ / ____ / ____ Time _____ AM / PM

Type of Inspection Routine Follow Up Complaint Storm Storm Event in Last 72-hours? No Yes

Weather Condition _____ Additional Notes _____

For Office Use Only

(Reviewed By) _____

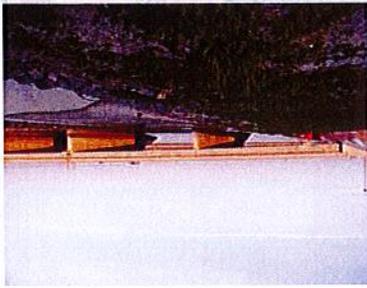
(Date) _____
 Office personnel to complete section to the left.

Site Map #	GPS Coordinates of Insert	Manufacturer / Description / Sizing	Trash Accumulation	Foliage Accumulation	Sediment Accumulation	Total Debris Accumulation	Condition of Media 25/50/75/100 (will be changed @ 75%)	Operational Per Manufactures' Specifications (If not, why?)
	Lat: Long:	MWS Catch Basins						
		MWS Sedimentation Basin						
		Media Filter Condition						
		Plant Condition						
		Drain Down Media Condition						
		Discharge Chamber Condition						
		Drain Down Pipe Condition						
		Inlet and Outlet Pipe Condition						

Comments:

ATTACHMENT G

EDUCATIONAL MATERIALS



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.

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.

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.



The Effect on the Ocean



- Automotive leaks and spills.
- Improper disposal of used oil and other engine fluids.
- Metals found in vehicle exhausts, 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.

Sources of Non-Point Source Pollution

- 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.

Where Does It Go?

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. Stormwater runoff results from rainfall. When rainstorms cause large volumes of water to rise 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.

Did You Know?

Even if you live miles from the Pacific Ocean, you may be unknowingly polluting it.

Dumping one quart of motor oil into a storm drain can contaminate 250,000 gallons of water.

For More Information

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.ciwm.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.oilandfills.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

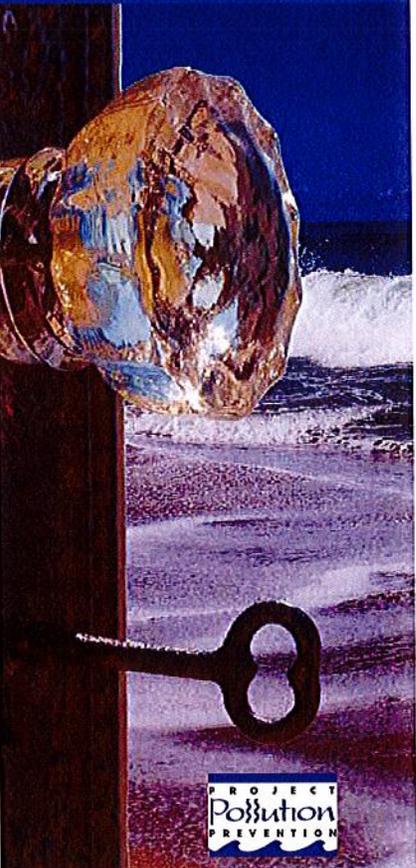
UC Master Gardener Hotline
(714) 708-1646 or visit www.uccemg.com

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 ocsstormwaterinfo@list.ocwatersheds.com

Orange County Stormwater Program

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)	503-4141
Fullerton Engineering Dept.	(714)	738-6853
Garden Grove Public Works	(714)	741-5056
Huntington Beach Public Works	(714)	536-5431
Irvine Public Works	(949)	724-6313
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)	431-3338
Mission Viejo Public Works	(949)	470-3056
Newport Beach, Code & Water Quality Enforcement	(949)	644-3213
Orange Public Works	(714)	532-6180
Placentia Public Works	(714)	993-8245
Rancho Santa Margarita	(949)	635-1800
San Clemente Environmental Programs	(949)	361-6143
San Juan Capistrano Engineering	(949)	254-4413
Santa Ana Public Works	(714)	647-3380
Seal Beach Engineering	(562)	431-2327 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



The Ocean Begins at Your Front Door



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

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.oelandfills.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.oelandfills.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 Pollution Solution

Several residential activities can result in water pollution. Among these activities are car washing and hosing off driveways and sidewalks. Both activities can waste water and result in excess runoff. Water conservation methods described in this pamphlet can prevent considerable amounts of runoff and conserve water. By taking your car to a commercial car wash and by sweeping driveways and sidewalks, you can further prevent the transport of pollutants to Orange County waterways. Here are some of the common pollutants for which you can be part of the solution.

1 Pesticides and Fertilizers

Pesticides: These are chemicals that are designed to be toxic to pests that can harm our plants. Pesticides can have an equally lethal impact on our marine life. The same fertilizer that promotes plant growth in lawns and gardens can also create nuisance algae blooms, water and cob webs in waterways.

Solution: Never use pesticides or fertilizers within 48 hours of an anticipated rainstorm. Use only as much as is directed on the label and keep it off driveways and sidewalks.

2 Dirt and Sediment

Pollution: Dirt or sediment can impede the flow of the stormwater and negatively impact stream habitat as it travels through waterways and deposits downstream. Pollutants can attach to sediment, which can then be transported through our waterways.

Solution: Prevent dirt, rocks, or debris from entering your storm drain system by covering them with leaves or fabric. Debris can be swept to a curb or into a trash can before it enters the storm drain system.

3 Metals

Pollution: Metals and other toxins present in car wash water can harm important plant life, which forms the base of the aquatic food chain.

Solution: Take your car to a commercial car wash where the wash water is captured and treated at a local wastewater treatment plant.

DID YOU KNOW?
Only you know what most of the pollution found in our waterways is not from a single source. Just from a "three-point" source meaning the accurate steps of pollution from residents and businesses throughout the community.



4 Pet Waste

Pollution: Pet waste carries bacteria through our waterheds and eventually will be washed out to the ocean. This can pose a health risk to swimmers and surfers.

Solution: Pick-up after your pet!

5 Trash and Debris

Pollution: Trash and debris can enter waterways by wind, littering and careless maintenance of trash receptacles. Street sweeping collects some of the litter, but combined winds up in our storm drain system where it flows untreated out to the ocean.

Solution: Don't litter and make sure trash containers are properly covered. It is far more expensive to clean up the litter and treat the waste than to prevent it from littering in the first place. Come out to one of Orange County's many locations for Coastal and Intra-Coastal Cleanup Day, which is held in September.

6 Motor Oil / Vehicle Fluids

Pollution: Oil and petroleum products from our vehicles are toxic to people, wildlife and plants.

Solution: Fix any leaks from your vehicle and keep the maintenance up on your car. Use absorbent material such as cat litter on oil spills, and dispose of it in the trash. Recycle used motor oil at a local Household Hazardous Waste Collection Center.



A TEAM EFFORT

The Orange County Stormwater Program has teamed with the Municipal Water District of Orange County (MUDOC) and the University of California Cooperative Extension Program (UCEP) to develop this pamphlet.

Low Impact Development (LID) and sustainable water use prevents water pollution and conserves water for drinking and reuse. Reducing your water use and the amount of water flowing from your home protects the environment and saves you money.

Thank you for making water protection a priority!

For more information, please visit our website at www.mudoc.com/publiced/

www.mudoc.com

www.ucep.org



To report a spill, call the Orange County 24-Hour Water Pollution Prevention Reporting Helpline at 1-877-89-SPILL (1-877-892-7495)

Special Thanks to

The Metropolitan Water District of Southern California for the use of the California-Friendly Plant and Native Habitat photos



Homeowners Guide for Sustainable Water Use

Low Impact Development, Water Conservation & Pollution Prevention

The Ocean Begins at Your Front Door



RUNOFF, RAINWATER AND REUSE

Where Does Water Runoff Go?

Stormwater, or water from rainfall events, and runoff from outdoor water use such as sprinklers and hoses flows from homes directly into catch basins and the storm drain system. After entering the storm drain, the water flows untreated into streams, rivers, bays and ultimately the Pacific Ocean. Runoff can come from lawns, gardens, driveways, sidewalks and roads. As it flows over hard, impervious surfaces, it picks up pollutants. Some pollutants carried by the water runoff include trash, pet waste, pesticides, fertilizer, motor oil and more.

Water Conservation

Pollution not only impairs the water quality for habitat and recreation, it can also reduce the water available for reuse. Runoff allowed to soak into the ground is cleaned as it percolates through the soil, replenishing depleted groundwater supplies. Groundwater provides at least 50% of the total water for drinking and other indoor household activities in north and central Orange County. When land is covered with roads, parking lots, homes, etc., there is less land to take in the water and more hard surfaces over which the water can flow.

In Orange County, 60-70% of water used by residents and businesses goes to irrigation and other outdoor uses. Reusing rainwater to irrigate our lawn not only reduces the impact of water pollution from runoff, but it also is a great way to conserve our precious water resources and replenish our groundwater base.

What is Low Impact Development (LID)?

Low Impact Development (LID) is a means of development that seeks to maintain the natural hydrologic characteristics of an area. LID provides a more sustainable and pollution-preventative approach to water management.

New water quality regulations set implementation standards for LID. LID practices are designed to reduce runoff, improve water quality, and reduce pollution to our environment. Contact your local water utility for more information on LID practices. www.waterutility.com



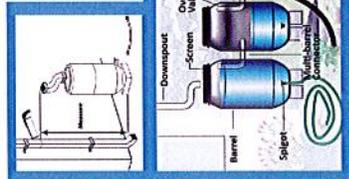
OPTIONS FOR RAINWATER HARVESTING AND REUSE

Rainwater harvesting is a great way to save money, prevent pollution and reduce potable water use. To harvest your rainwater, simply redirect the runoff from roofs and downspouts to rain barrels. Rain gardens are another option. These reduce runoff, as well as encourage infiltration.

Downspout Disconnection/Redirection
Disconnecting downspouts from pipes running to the gutter prevents runoff from transporting pollutants to the storm drain. Once disconnected, downspouts can be redirected to rain gardens or other vegetated areas, or be connected to a rain barrel.

Rain Barrels
Rain barrels capture rainwater flow from roofs for reuse in landscape irrigation. Capacity of rain barrels needed for your yard depends on the amount of roof area and rainfall received. When purchasing your rain barrel, make sure it includes a screen, a spout to siphon water for use, an overflow tube to allow for excess water to run out and a connector if you wish to connect multiple barrels to add capacity of water storage.

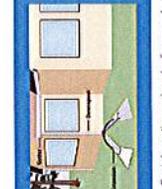
Mosquito growth prevention is very important when installing a rain barrel. The best way to prevent mosquito breeding is to eliminate entry points by ensuring all openings are sealed tightly. If these methods are not used, it is important to be available to fill mosquito larvicide. The use of larvicide is essential. Please visit the Orange County Vector Control website for more information at www.ocvecd.org/inquiries3.php.



For information on how to disconnect a downspout or to install and maintain a rain barrel or rain garden at your home, please see the Los Angeles Rainwater Harvesting Program, A Homeowner's "How-to" Guide, November 2009 at www.larainwaterharvesting.org/

Rain Gardens
Rain gardens allow runoff to be directed from your roof downspout into a landscaped area. Vegetation and rocks in the garden will slow the flow of water to allow for infiltration into the soil. Plants and soil particles will absorb pollutants from the roof runoff. By utilizing a native plant palette, rain gardens can be maintained all year with minimal additional irrigation. These plants are adapted to the semi-arid climate of Southern California, require less water and can reduce your water bill.

Before modifying your yard to install a rain garden, please consult your local building and/or planning departments to ensure your garden plan follows pertinent building codes and ordinances. Building codes and ordinances, zoning home owner associations also have guidelines for yard modifications. If your property is in an area that includes engineered slopes, please seek professional advice before proceeding with changes.



OTHER WATER CONSERVATION AND POLLUTION PREVENTION TECHNIQUES

Native Vegetation and Maintenance
"California Friendly" plants or native vegetation can significantly reduce water use. These plants often require far less fertilizers and pesticides, which are two significant pollutants found in Orange County waterways. Replacing water "thirsty" plants and grass types with water efficient natives is a great way to save water and reduce the need for potentially harmful pesticides and fertilizer. Please see the California Friendly Garden Guide produced by the Metropolitan Water District of Southern California and associated Southern California Water Agencies for a catalog of California friendly plants and other garden resources at www.socalwater.com/GardenGuide.

Weed Free Yards

Weeds are water thieves. They often reproduce quickly and rob your yard of both water and nutrients. Weed your yard by hand if possible. If you use herbicide, control the weeds, use only the amount recommended on the label and never use it if rain is forecast within the next 48 hours.

Soil Amendments

Soil amendments such as green waste (e.g. grass clippings, compost, etc.) can be a significant source of nutrients and can help keep the soil near the roots of plants moist. However, they can cause algal blooms if they get into our waterways, which reduces the amount of oxygen in the water and impacts most aquatic organisms. It is important to apply soil amendments more than 48 hours prior to predicted rainfall.



IRRIGATE EFFICIENTLY

Smart Irrigation Controllers

Smart Irrigation Controllers save natural resources as well as sensors that tell them of the sprinklers in response to environmental changes. If it is raining, too windy or too hot, the smart irrigation controller will automatically shut off.

Check with your local water agency for available rebates on irrigation controllers and smart timers.

• Aim your sprinklers at your lawn, not the sidewalk. By simply adjusting the direction of your sprinklers, you can save water, prevent water pollution from runoff, keep your lawn healthy and save money.

• **Set a timer for your sprinklers** - Learn about the water they need to stay healthy within a few minutes of turning on the sprinklers. Time your sprinklers when water begins running off your lawn, you can turn them off. Your timer can be set to water your lawn for this duration every time.

• **Water at Sunrise** - (Starting early in the morning will reduce water loss due to evaporation. Additionally, winds tend to be calm in the early morning so the water will get to the lawn as intended.

• **Water by hand** - Instead of using sprinklers, consider watering your yard by hand. Hand watering ensures that all plants get the proper amount of water and you will prevent any water runoff, which will save water and prevent pollutants from entering our waterways.

• **Fix leaks** - Unfortunately, households waste one billion gallons of water a year to leaks - 70% is enough water to serve the entire state of Texas for a year. If your garden hose is leaking, replace the nylon or rubber hose washer and replace a tight connection. Fix broken sprinklers immediately.



Help Prevent Ocean Pollution:

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, many common household activities can lead to water pollution if you're not careful.

Litter, oil, chemicals and other substances that are left on your yard or driveway can be blown or washed into storm drains that flow to the ocean. Over-watering your lawn and washing your car can also flush materials into the storm drains in sanitary sewers (from sinks and toilets), water in storm drains is not treated.

You would never pour soap, fertilizers or oil into the ocean, so don't let them enter streets, gutters or storm drains. Follow the easy tips in this brochure to help prevent water pollution.

REMEMBER THE WATER IN YOUR STORM DRAIN IS NOT TREATED BEFORE IT ENTERS OUR WATERWAYS

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

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 performing everyday household activities. If you have other suggestions, please contact your city's stormwater representatives or call the Orange County Stormwater Program.



Household Tips



The Ocean Begins at Your Front Door

P R O J E C T
Pollution
P R E V E N T I O N

Pollution Prevention

Household Activities

- **Do not rinse spills with water!** Sweep outdoor spills and dispose of in the trash. For wet spills like oil, apply cat litter or another absorbent material, then sweep and bring to a household hazardous waste collection center (HHWCC).
- Securely cover trash cans.
- Take household hazardous waste to a household hazardous waste collection center.
- Store household hazardous waste in closed, labeled containers inside or under a cover.
- Do not hose down your driveway, sidewalk or patio. Sweep up debris and dispose of in trash.
- Always pick up after your pet. Flush waste down the toilet or dispose of in the trash.
- Bathe pets indoors or have them professionally groomed.

Household Hazardous Wastes include:

- ▲ Batteries
- ▲ Paint thinners, paint strippers and removers
- ▲ Adhesives
- ▲ Drain openers
- ▲ Oven cleaners
- ▲ Wood and metal cleaners and polishes
- ▲ Herbicides and pesticides
- ▲ Fungicides/wood preservatives
- ▲ Automotive fluids and products
- ▲ Grease and rust solvents
- ▲ Thermometers and other products containing mercury
- ▲ Fluorescent lamps
- ▲ Cathode ray tubes, e.g. TVs, computer monitors
- ▲ Pool and spa chemicals

Gardening Activities

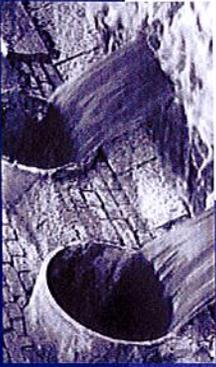
- Follow directions on pesticides and fertilizers, (measure, do not estimate amounts) and do not use if rain is predicted within 48 hours.
- Water your lawn and garden by hand to control the amount of water you use. Set irrigation systems to reflect seasonal water needs. If water flows off your yard and onto your driveway or sidewalk, your system is over-watering.
- Mulch clippings or leave them on the lawn. If necessary, dispose in a green waste container.
- Cultivate your garden often to control weeds.

Washing and Maintaining Your Car

- Take your car to a commercial car wash whenever possible.
- Choose soaps, cleaners, or detergents labeled “non-toxic,” “phosphate free” or “biodegradable.” Vegetable and citrus-based products are typically safest for the environment, **but even these should not be allowed into the storm drain.**
- Shake floor mats into a trash can or vacuum to clean.

- Do not use acid-based wheel cleaners and “hose off” engine degreasers at home. They can be used at a commercial facility, which can properly process the washwater.
- **Do not dump washwater onto your driveway, sidewalk, street, gutter or storm drain.** Excess washwater should be disposed of in the sanitary sewers (through a sink, or toilet) or onto an absorbent surface like your lawn.
- Use a nozzle to turn off water when not actively washing down automobile.
- Monitor vehicles for leaks and place pans under leaks. Keep your car well maintained to stop and prevent leaks.
- Use cat litter or other absorbents and sweep to remove any materials deposited by vehicles. Contain sweepings and dispose of at a HHWCC.
- Perform automobile repair and maintenance under a covered area and use drip pans or plastic sheeting to keep spills and waste material from reaching storm drains.
- **Never pour oil or antifreeze in the street, gutter or storm drains.** Recycle these substances at a service station, HHWCC, or used oil recycling center. For the nearest Used Oil Collection Center call 1-800-CLEANUP or visit www.ciwmb.ca.gov/UsedOil.

For locations and hours of Household Hazardous Waste Collection Centers in Anaheim, Huntington Beach, Irvine and San Juan Capistrano, call (714)834-6752 or visit www.oilandfills.com.



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

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

drain and eventually into our waterways and the ocean. In addition, hazardous waste must not be poured in the sanitary sewers (sinks and toilets).

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.



Printed on Recycled Paper

Help Prevent Ocean Pollution: Proper Disposal of Household Hazardous Waste



The Ocean Begins at Your Front Door

P R O J E C T
Pollution
P R E V E N T I O N

ORANGE COUNTY

Pollution Prevention

Leftover household products that contain corrosive, toxic, ignitable, or reactive ingredients are considered to

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

be "household hazardous waste" or "HHW." HHW can be found throughout your home, including the bathroom, kitchen, laundry room and garage.

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 oceans 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.

Help Prevent Ocean Pollution:

Responsible Pest Control

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

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University of California Cooperative

Extension staff writer. Photos courtesy of

the UC Statewide IPM Program and

Darren Haver.

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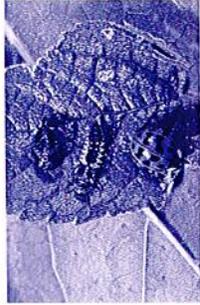
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Tips for Pest Control

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.



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 quantities of pesticides.

Store unused chemicals in a locked cabinet.

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

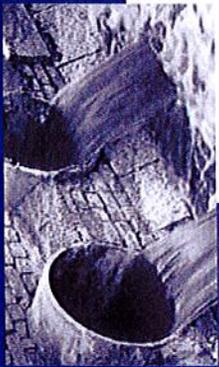
Empty pesticide containers should be triple rinsed prior to disposing of them in the trash.



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



Help Prevent Ocean Pollution: Tips for Home Improvement Projects



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. Home improvement projects and work sites must be maintained to ensure that building materials 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 building materials into the ocean, so don't let them 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

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.

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



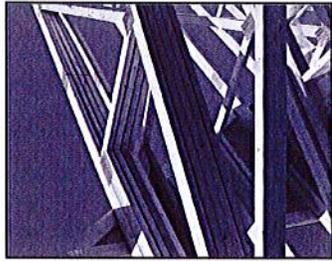
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Tips for Home Improvement Projects

Home improvement projects can cause significant damage to the environment. Whether you hire a contractor or work on the house yourself, it is important to follow these simple tips while renovating, remodeling or improving your home:

General Construction

- Schedule projects for dry weather.
- Keep all construction debris away from the street, gutter and storm drain.
- Store materials under cover with temporary roofs or plastic sheets to eliminate or reduce the possibility that rainfall, runoff or wind will carry materials from the project site to the street, storm drain or adjacent properties.



Building Materials

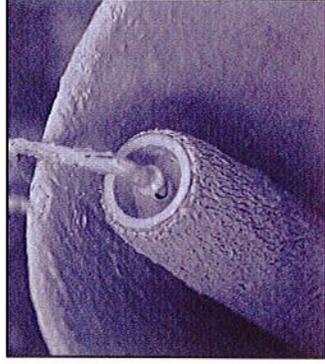
- Never hose materials into a street, gutter or storm drain.
- Exposed piles of construction material should not be stored on the street or sidewalk.
- Minimize waste by ordering only the amount of materials needed to complete the job.
- Do not mix more fresh concrete than is needed for each project.
- Wash concrete mixers and equipment in a designated washout area where the water can flow into a containment area or onto dirt.
- Dispose of small amounts of dry excess materials in the trash. Powdery waste, such as dry concrete, must be properly contained within a box or bag prior to disposal. Call your local trash hauler for weight and size limits.

Paint

- Measure the room or object to be painted, then buy only the amount needed.
- Place the lid on firmly and store the paint can upside-down in a dry location away from the elements.
- Tools such as brushes, buckets and rags should never be washed where excess water can drain into the street, gutter or storm drain. All tools should be rinsed in a sink connected to the sanitary sewer.

When disposing of paint, never put wet paint in the trash.

- Dispose of water-based paint by removing the lid and letting it dry in the can. Large amounts must be taken to a Household Hazardous Waste Collection Center (HHWCC).



Oil-based paint is a household hazardous waste. All leftover paint should be taken to a HHWCC.

- For HHWCC locations and hours, call (714) 834-6752 or visit www.oilandfills.com.

Erosion Control

- Schedule grading and excavation projects for dry weather.
- When temporarily removing soil, pile it in a contained, covered area where it cannot spill into the street, or obtain the required temporary encroachment or street closure permit and follow the conditions instructed by the permit.

- When permanently removing large quantities of soil, a disposal location must be found prior to excavation. Numerous businesses are available to handle disposal needs. For disposal options, visit www.ctwmb.ca.gov/SWIS.

- Prevent erosion by planting fast-growing annual and perennial grasses. They will shield and bind the soil.

Recycle

- Use a construction and demolition recycling company to recycle lumber, paper, cardboard, metals, masonry (bricks, concrete, etc.), carpet, plastic, pipes (plastic, metal and clay), drywall, rocks, dirt and green waste.



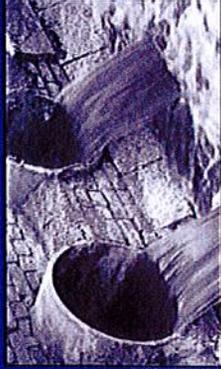
- For a listing of construction and demolition recycling locations in your area, visit www.ctwmb.ca.gov/recycle.

Spills

- Clean up spills immediately by using an absorbent material such as cat litter, then sweep it up and dispose of it in the trash.
- Immediately report spills that have entered the street, gutter or storm drain to the County's 24-Hour Water Pollution Problem Reporting Hotline at (714) 567-6363 or visit www.ocwatersheds.com to fill out an incident reporting form.

Help Prevent Ocean Pollution:

Tips for Landscape & Gardening



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.

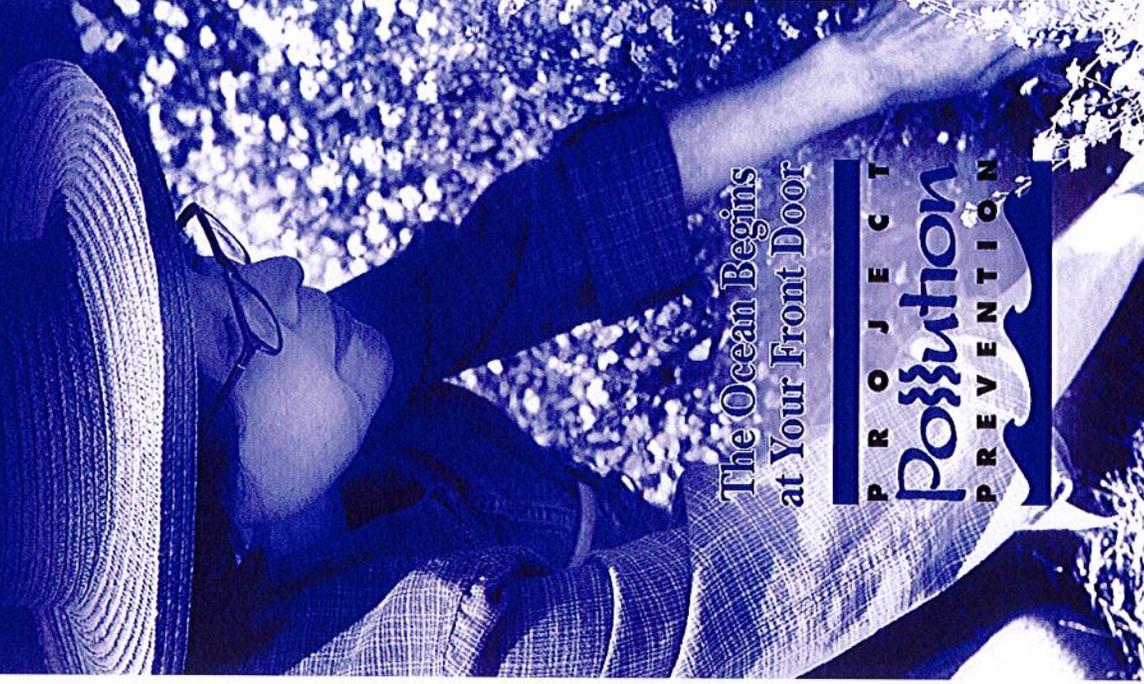
The tips contained in this brochure provide useful information to help prevent water pollution while landscaping or gardening. If you have other suggestions, please contact your city's stormwater representatives or call the Orange County Stormwater Program.



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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.



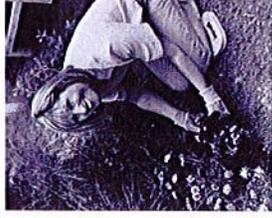
■ Plant native vegetation to reduce the amount of water, fertilizers, and pesticide applied to the landscape.

- 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.

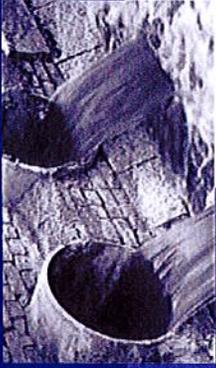
- If fertilizer is spilled, sweep up the spill before irrigating. If the spill is liquid, apply an absorbent material such as cat litter, and then sweep it up and dispose of it in the trash.

- 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.oilandfills.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. Pet waste and pet care products can be 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 put pet waste or pet care 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

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**.

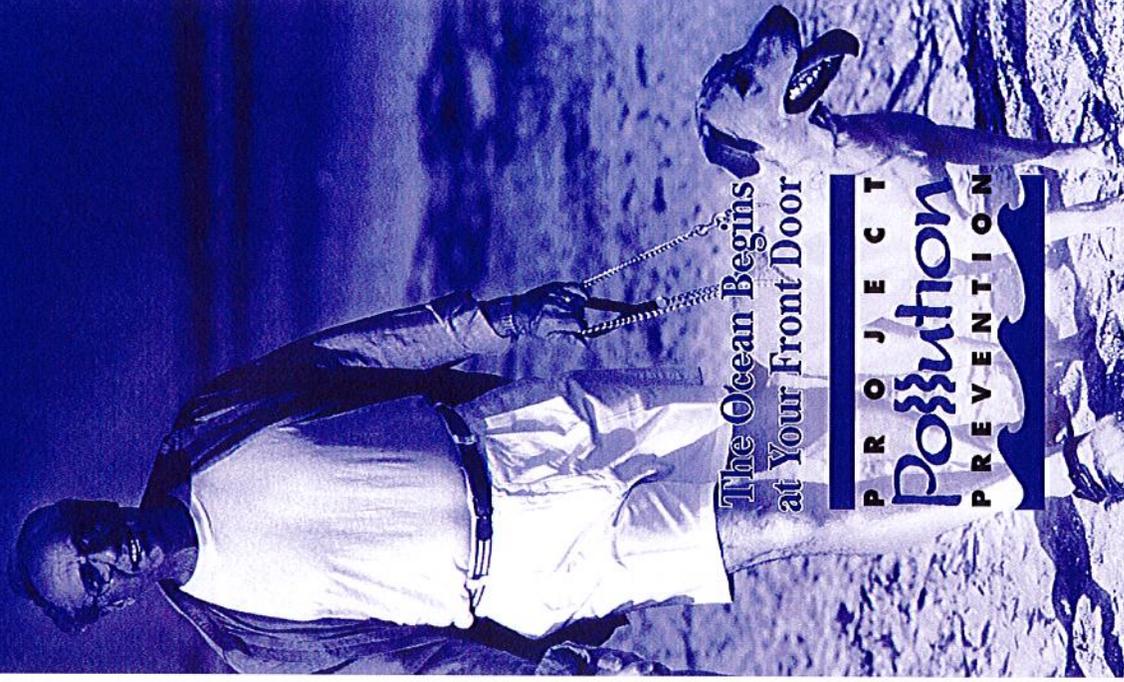
The tips contained in this brochure provide useful information to help prevent water pollution while caring for your pet. If you have other suggestions, please contact your city's stormwater representatives or call the Orange County Stormwater Program.



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Help Prevent Ocean Pollution:

Tips for Pet Care



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Tips for Pet Care

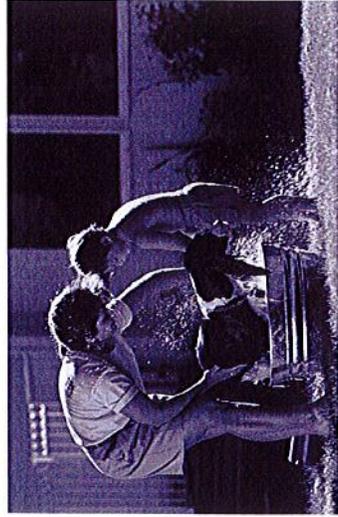
Never let any pet care products or wastewater run off your yard and into the street, gutter or storm drain.

Washing Your Pets

Even biodegradable soaps and shampoos can be harmful to marine life and the environment.

■ If possible, bathe your pets indoors using less-toxic shampoos or have your pet professionally groomed. Follow instructions on the products and clean up spills.

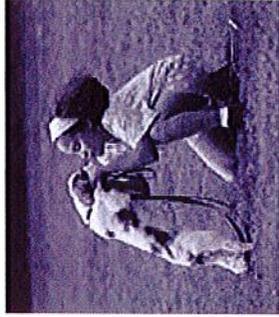
■ If you bathe your pet outside, wash it on your lawn or another absorbent/permeable surface to keep the washwater from running into the street, gutter or storm drain.



Flea Control

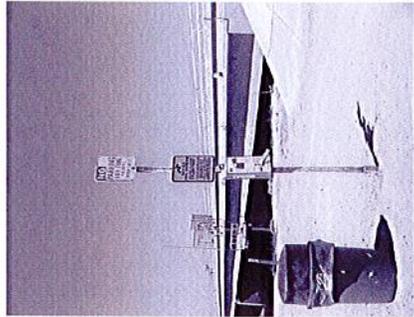
■ Consider using oral or topical flea control products.

■ If you use flea control products such as shampoos, sprays or collars, make sure to dispose of any unused products at a Household Hazardous Waste Collection Center. For location information, call (714) 834-6752.



Why You Should Pick Up After Your Pet

It's the law!
Every city has an ordinance requiring you to pick up after your pet. Besides being a nuisance, pet



waste can lead to water pollution, even if you live inland. During rainfall, pet waste left outdoors can wash into storm drains. This waste flows directly into our waterways and the ocean where it can harm human health, marine life and the environment.

As it decomposes, pet waste demands a high level of oxygen from water.

This decomposition can contribute to killing marine life by reducing the amount of dissolved oxygen available to them.

Have fun with your pets, but please be a responsible pet owner by taking care of them and the environment.

■ Take a bag with you on walks to pick up after your pet.

■ Dispose of the waste in the trash or in a toilet.



Tips for Pool Maintenance

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.

Swimming pools and spas are common in Orange County, but they must be maintained properly to guarantee that chemicals aren't allowed to enter the street, where they can flow into the storm drains and then into the waterways. Unlike water in sanitary sewers (from sinks and toilets), water in storm drains is not treated before entering our waterways.

You would never dump pool chemicals into the ocean, so don't let it 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 1-877-89-SPILL (1-877-897-7455).

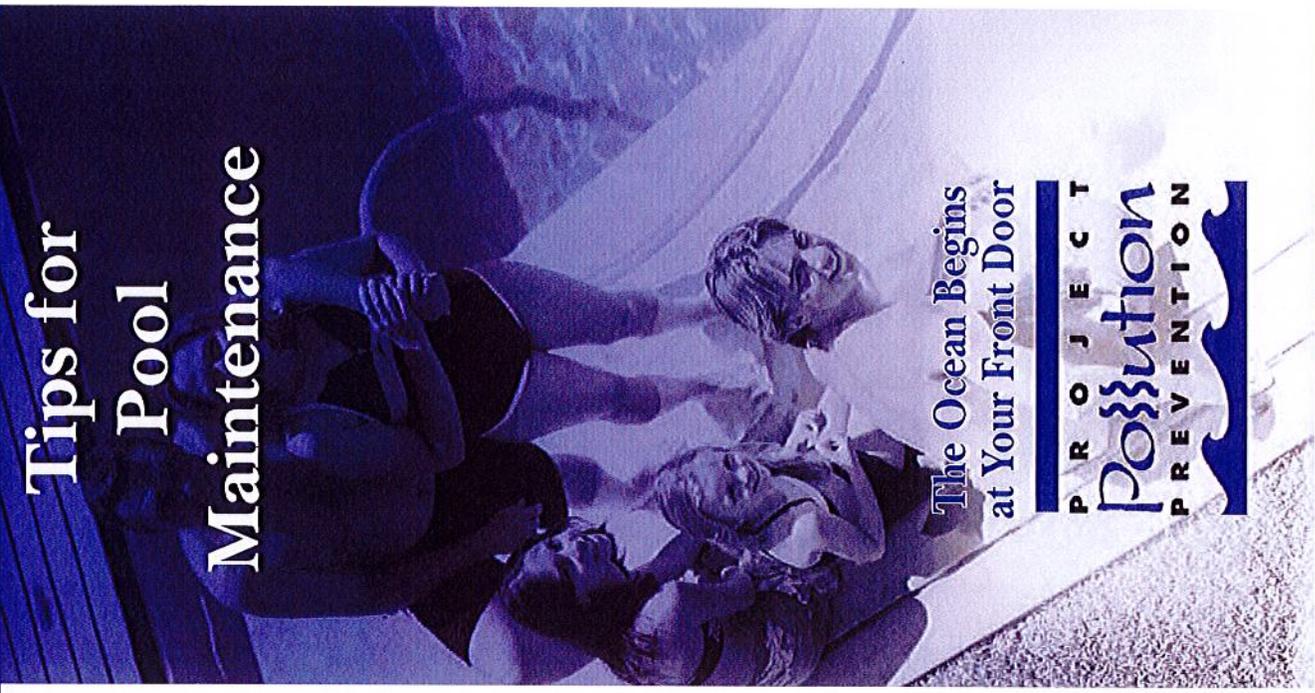
For emergencies, dial 911.

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

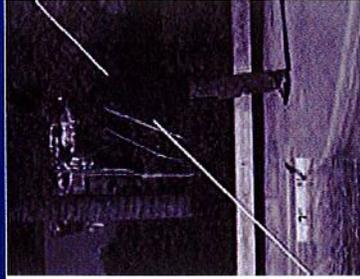


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Tips for Pool Maintenance



Many pools are plumbed to allow the pool to drain directly to the sanitary sewer. If yours is not, follow these instructions for disposing of pool and spa water.

Acceptable and Preferred Method of Disposal

When you cannot dispose of pool water in the sanitary sewer, the release of dechlorinated swimming pool water is allowed if all of these tips are followed:

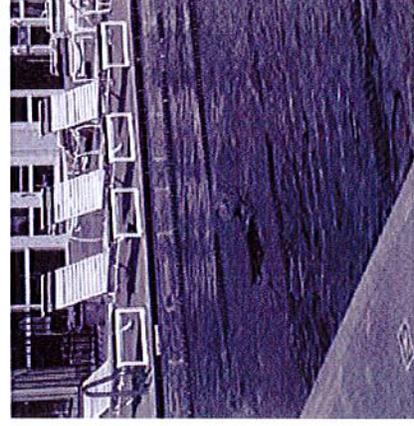
- The residual chlorine does not exceed 0.1 mg/l (parts per million).
- The pH is between 6.5 and 8.5.
- The water is free of any unusual coloration, dirt or algae.
- There is no discharge of filter media.
- There is no discharge of acid cleaning wastes.



- Some cities may have ordinances that do not allow pool water to be disposed into a storm drain. Check with your city.

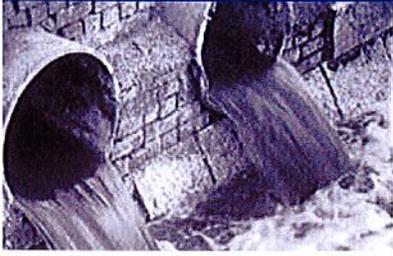
How to Know if You're Following the Standards

You can find out how much chlorine is in your water by using a pool testing kit. Excess chlorine can be removed by discontinuing the use of chlorine for a few days prior to discharge or by purchasing dechlorinating chemicals from a local pool supply company. Always make sure to follow the instructions that come with any products you use.



Doing Your Part

By complying with these guidelines, you will make a significant contribution toward keeping pollutants out of Orange County's creeks, streams, rivers, bays and the ocean. This helps to protect organisms that are sensitive to pool chemicals, and helps to maintain the health of our environment.



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.

The tips contained in this brochure provide useful information to help prevent water pollution. 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 Residential Pool, Landscape and Hardscape Drains



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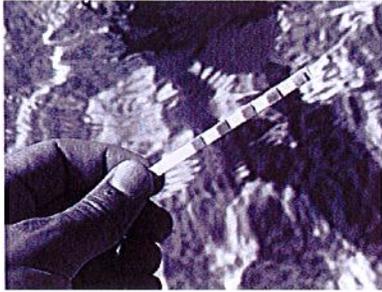


Tips for Residential Pool, Landscape and Hardscape Drains

Pool Maintenance

All pool water discharged to the curb, gutter or permitted pool drain from your property must meet the following water quality criteria:

- The residual chlorine does not exceed 0.1 mg/L (parts per million).
- The pH is between 6.5 and 8.5.
- The water is free of any unusual coloration.
- There is no discharge of filter media or acid cleaning wastes.



Some cities have ordinances that do not allow pool water to be discharged to the storm drain. Check with your city.

Landscape and Hardscape Drains

The following recommendations will help reduce or prevent pollutants from your landscape and hardscape drains from entering the street, gutter or storm drain. Unlike water that enters the sewer (from sinks and toilets), water that enters a landscape or hardscape drain is not treated before entering our creeks, rivers, bays and ocean.

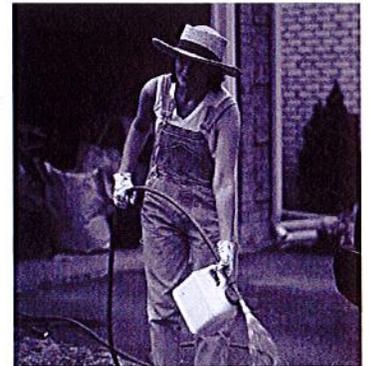
Household Activities

- Do not rinse spills of materials or chemicals to any drain.
- Use dry cleanup methods such as applying cat litter or another absorbent material, then sweep it up and dispose of it in the trash. If the material is hazardous, dispose of it at a Household Hazardous Waste Collection Center (HHWCC). For locations, call (714) 834-6752 or visit www.oilandfills.com.
- Do not hose down your driveways, sidewalks or patios to your landscape or hardscape drain. Sweep up debris and dispose of it in the trash.
- Always pick up after your pet. Flush waste down the toilet or dispose of it in the trash.

- Do not store items such as cleaners, batteries, automotive fluids, paint products, TVs, or computer monitors uncovered outdoors. Take them to a HHWCC for disposal.

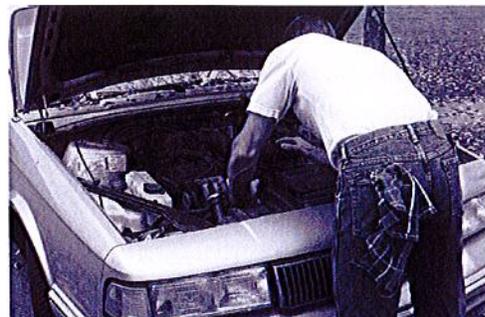
Yard Maintenance

- Do not overwater. Water by hand or set automated irrigation systems to reflect seasonal water needs.
- Follow directions on pesticides and fertilizers (measure, do not estimate amounts) and do not use if rain is predicted within 48 hours.
- Cultivate your garden often to control weeds and reduce the need to use chemicals.



Vehicle Maintenance

- Never pour oil or antifreeze down your landscape or hardscape drain. Recycle these substances at a service station, a waste collection center or used oil recycling center. For locations, contact the Used Oil Program at 1-800-CLEANUP or visit www.CLEANUP.org.
- Whenever possible, take your vehicle to a commercial car wash.
- If you do wash your vehicle at home, do not allow the washwater to go down your landscape or hardscape drain. Instead, dispose of it in the sanitary sewer (a sink or toilet) or onto an absorbent surface such as your lawn.
- Use a spray nozzle that will shut off the water when not in use.





Clean beaches and healthy creeks, rivers, bays and ocean are important to Orange County. However, many common activities such as painting can lead to water pollution if you're not careful. Paint must be used, stored and disposed of properly to ensure that it does 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 paint into the ocean, so don't let it enter the storm drains. Follow these easy tips to help prevent water pollution.

Help Prevent Ocean Pollution:

Tips for Projects Using Paint

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.

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



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Tips for Projects Using Paint

Paint can cause significant damage to our environment. Whether you hire a contractor or do it yourself, it is important to follow these simple tips when purchasing, using, cleaning, storing and disposing of paint.

Purchasing Paint

- Measure the room or object to be painted, then buy only the amount needed.
- Whenever possible, use water-based paint since it usually does not require hazardous solvents such as paint thinner for cleanup.

Painting

- Use only one brush or roller per color of paint to reduce the amount of water needed for cleaning.
- Place open paint containers or trays on a stable surface and in a position that is unlikely to spill.
- Always use a tarp under the area or object being painted to collect paint drips and contain spills.

Cleaning

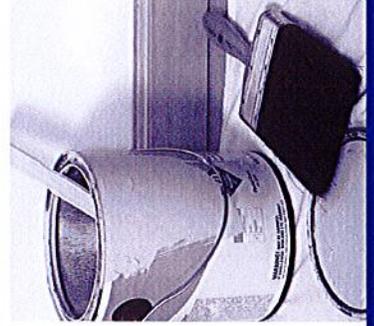
- Never clean brushes or rinse paint containers in the street, gutter or storm drain.
- For oil-based products, use as much of the paint on the brushes as possible. Clean brushes with thinner. To reuse thinner, pour it through a fine filter (e.g. nylon, metal gauze or filter paper) to remove solids such as leftover traces of paint.
- For water-based products, use as much of the paint on the brushes as possible, then rinse in the sink.
- Collect all paint chips and dust. Chips and dust from marine paints or paints containing lead, mercury or tributyl tin are hazardous waste. Sweep up and dispose of at a Household Hazardous Waste Collection Center (HHWCC).

Storing Paint

- Store paint in a dry location away from the elements.
- Store leftover water-based paint, oil-based paint and solvents separately in original or clearly marked containers.
- Avoid storing paint cans directly on cement floors. The bottom of the can will rust much faster on cement.
- Place the lid on firmly and store the paint can upside-down to prevent air from entering. This will keep the paint usable longer. Oil-based paint is usable for up to 15 years. Water-based paint remains usable for up to 10 years.

Alternatives to Disposal

- Use excess paint to apply another coat, for touch-ups, or to paint a closet, garage, basement or attic.
- Give extra paint to friends or family. Extra paint can also be donated to a local theatre group, low-income housing program or school.
- Take extra paint to an exchange program such as the “Stop & Swap” that allows you to drop off or pick up partially used home care products free of charge. “Stop & Swap” programs are available at most HHWCCs.
- For HHWCC locations and hours, call (714) 834-6752 or visit www.oilandfills.com.



Disposing of Paint

- Never put wet paint in the trash.
- **For water-based paint:**
 - If possible, brush the leftover paint on cardboard or newspaper. Otherwise, allow the paint to dry in the can with the lid off in a well-ventilated area protected from the elements, children and pets. Stirring the paint every few days will speed up the drying.
 - Large quantities of extra paint should be taken to a HHWCC.
 - Once dried, paint and painted surfaces may be disposed of in the trash. When setting a dried paint can out for trash collection, leave the lid off so the collector will see that the paint has dried.
- **For oil-based paint:**
 - Oil-based paint is a household hazardous waste. All leftover paint should be taken to a HHWCC.
- **Aerosol paint:**
 - Dispose of aerosol paint cans at a HHWCC.

Spills

- Never hose down pavement or other impermeable surfaces where paint has spilled.
- Clean up spills immediately by using an absorbent material such as cat litter. Cat litter used to clean water-based paint spills can be disposed of in the trash. When cleaning oil-based paint spills with cat litter, it must be taken to a HHWCC.
- Immediately report spills that have entered the street, gutter or storm drain to the County's 24-Hour Water Pollution Problem Reporting Hotline at (714) 567-6363 or visit www.ocwatersheds.com to fill out an incident reporting form.

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.

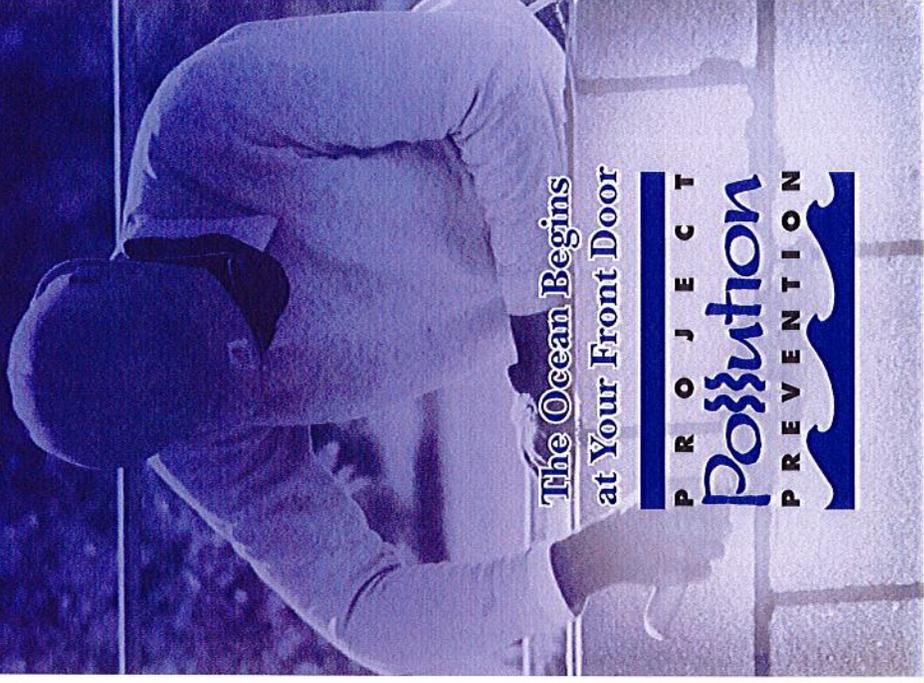
To report a spill, call the Orange County 24-Hour Water Pollution Reporting Hotline at 1-877-89-SPILL (1-877-897-7455).

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

P R O J E C T
Pollution
P R E V E N T I O N

Tips for Using Concrete and Mortar

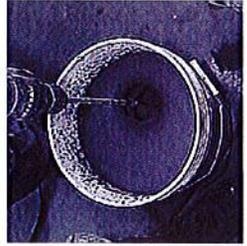
Never allow materials or washwater to enter the street or storm drain.

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.ciwmmb.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.