

Monitoring: Refer to **Monitoring** required for **Mitigation Measures BIO-1, BIO-2, CUL-1, CUL-2, and CUL-3.**

	<i>Potentially Significant Impact</i>	<i>Less than Significant with Mitigation Incorporated</i>	<i>Less Than Significant Impact</i>	<i>No Impact</i>
49. Does the project have the potential to achieve short-term environmental goals, to the disadvantage of long-term environmental goals? (A short-term impact on the environment is one that occurs in a relatively brief, definitive period of time while long-term impacts will endure well into the future.)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

SOURCE: Staff review.

*49. Findings of Fact: **Less than Significant Impact.** Based on the analysis included in this Initial Study, the proposed project would not result in a significant short-term impact on the environment or a long-term impact enduring into the future. The proposed project would not achieve short-term environmental goals to the disadvantage of long-term environmental goals. No short-term or long-term significant unavoidable impacts would occur as a result of project implementation.*

Mitigation: None required.

Monitoring: None required.

Less Than Significant With Mitigation Incorporated. Similar to the Original Project, implementation of the Revised Project would not result in a significant short-term impact on the environment or a long-term impact enduring into the future. The Revised Project would not achieve short-term environmental goals to the disadvantage of long-term environmental goals. No short-term or long-term significant unavoidable impacts would occur as a result of implementation of the Revised Project.

Mitigation: None required.

Monitoring: None required.

	<i>Potentially Significant Impact</i>	<i>Less than Significant with Mitigation Incorporated</i>	<i>Less Than Significant Impact</i>	<i>No Impact</i>
50. Does the project have impacts which are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of an individual project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects as defined in California Code of Regulations, Section 15130)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

SOURCE: Staff review,

50. Findings of Fact: Less Than Significant With Mitigation Incorporated. The scope of the cumulative analysis is provided in Table 1.1. The proposed project includes the construction and subsequent operation proposed project. Based on the analysis provided in this Initial Study, the proposed project would not result in cumulative significant impacts with the implementation of mitigation measures for air quality, cultural resources, biological resources, and noise. As a result, there are no potential impacts resulting from implementation of the proposed project that are individually limited but cumulatively considerable.

Refer to **Mitigation Measures AIR-1, BIO-1, BIO-2, CUL-1, CUL-2, CUL-3, and NOI-1.**

Refer to **Monitoring** required for **Mitigation Measures AIR-1, BIO-1, BIO-2, CUL-1, CUL-2, CUL-3, and NOI-1.**

Less Than Significant With Mitigation Incorporated. Similar to the Original Project, implementation of the Revised Project would not result in cumulative significant impacts with the implementation of mitigation measures from the Final IS/MND for the Original Project. With implementation of the mitigation measures found in the Final IS/MND for the Original Project, the Revised Project would not result in effects that would be substantially more severe than those identified in the Final IS/MND for the Original Project.

Mitigation: Refer to **Mitigation Measures BIO-1, BIO-2, CUL-1, CUL-2, and CUL-3.**

Monitoring: Refer to **Monitoring** required for **Mitigation Measures BIO-1, BIO-2, CUL-1, CUL-2, and CUL-3.**

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
--	--------------------------------	--	------------------------------	-----------

51. Does the project have environmental effects that will cause substantial adverse effects on human beings, either directly or indirectly?

<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
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SOURCE: Staff review.

*51. Findings of Fact: **Less Than Significant Impact.** Based on the analysis provided in this Initial Study, the proposed project would not result in an environmental effect such as a significant release of hazardous or toxic materials that would cause substantial adverse effects on human beings, either directly or indirectly. The proposed project would not result in a substantial release of hazardous materials or waste, and the RCRMC would adhere to all requirement regulations and policies regarding hazards and hazardous materials to assure impacts remain less than significant.*

Less Than Significant Impact. Similar to the Original Project, the Revised Project would not result in an environmental effect such as a significant release of hazardous or toxic materials that would cause substantial adverse effects on human beings, either directly or indirectly. With adherence to all applicable requirements, the Revised Project would not result in effects that would be substantially more severe than those identified in the Final IS/MND for the Original Project.

Mitigation: None required.

Monitoring: None required.

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APPENDIX A

NOTICE OF DETERMINATION

STATE OF CALIFORNIA - THE RESOURCES AGENCY
DEPARTMENT OF FISH AND GAME
ENVIRONMENTAL FILING FEE CASH RECEIPT

Receipt #: 201000291

State Clearinghouse # (if applicable): _____

Lead Agency: RIVERSIDE COUNTY E.D.A. Date: 03/15/2010

County Agency of Filing: Riverside Document No: 201000291

Project Title: RIVERSIDE COUNTY REGIONAL MEDICAL CENTER EXPANSION

Project Applicant Name: RIVERSIDE COUNTY E.D.A. Phone Number: 951 955-8174

Project Applicant Address: 3133 MISSION INN AVE RIVERSIDE CA 92507-4138

Project Applicant: Local Public Agency

CHECK APPLICABLE FEES:

- | | |
|---|----------------|
| <input type="checkbox"/> Environmental Impact Report | _____ |
| <input checked="" type="checkbox"/> Negative Declaration | <u>2010.25</u> |
| <input type="checkbox"/> Application Fee Water Diversion (State Water Resources Control Board Only) | _____ |
| <input type="checkbox"/> Project Subject to Certified Regulatory Programs | _____ |
| <input checked="" type="checkbox"/> County Administration Fee | <u>\$64.00</u> |
| <input type="checkbox"/> Project that is exempt from fees (DFG No Effect Determination (Form Attached)) | _____ |
| <input type="checkbox"/> Project that is exempt from fees (Notice of Exemption) | _____ |
| Total Received | <u>2074.25</u> |

Signature and title of person receiving payment: _____


Notes:



FILED

MAR 15 2010

COUNTY CLERK

Notice of Determination

To:
 Office of Planning and Research
For U.S Mail: P.O. Box 3044
Sacramento, CA 95812-3044
Street Address: 1400 Tenth St.
Sacramento, CA 95814

From:
Public: County of Riverside
Agency: Economic Development Agency
Address: 3133 Mission Inn Avenue
Riverside, CA 92507-4138
Contact: Claudia Steiding
Phone: (951) 955-8174

County Clerk
County of: Riverside County Clerk
Address: 4080 Lemon Street, 1st Floor
Riverside, CA 92501

Lead Agency (if different from above):
Address: _____
Contact: _____
Phone: _____

SUBJECT: Filing of Notice of Determination in Compliance with Section 21108 or 21152 of the Public Resources Code.

State Clearinghouse Number (if submitted to State Clearinghouse): 2009101083

Project Title: Riverside County Regional Medical Center Expansion

Project Location (include county): The existing RCRM is located south of State Road 60 and east of Interstate 215, at 26520 Cactus Avenue, in Moreno Valley (Riverside County).

Project Description: The County of Riverside Economic Development Agency has proposed the expansion of the existing Riverside County Regional Medical Center (RCRMC) by developing two components: (1) an approximate 50,000 square-foot Plant Operations/Warehouse Facility, and (2) approximately 820 parking spaces of supplemental parking. The proposed Plant Operations/Warehouse Facility is intended to supplement the warehouse and receiving functions at the existing RCRM. Plant operations services would include craft support (i.e., electrical, plumbing and painting), maintenance, bio-medical engineering activities, and repairs and construction services for the existing RCRM facility. Plant operations services would also include a data center as well as other areas for data support and information technology (IT). Materials management services would include warehousing and storage of bulk supplies, servicing of soiled linens, distribution of clean linens, as well as the breakdown and distribution of various other materials and supplies to the main hospital. In addition, the proposed project would include the addition of approximately 820 new parking spaces.

This is to advise that the County of Riverside Board of Supervisor's approved the above project on Lead agency or Responsible Agency

February 23, 2010 and has made the following determinations regarding the above described project:
(Date)

1. The project will will not have a significant effect on the environment.
2. An Environmental Impact Report was prepared for this project pursuant to the provisions of CEQA.
 A Negative Declaration was prepared for this project pursuant to the provisions of CEQA.
3. Mitigation measures were were not made a condition of the approval of the project.
4. A Mitigation reporting or monitoring plan was was not adopted for this project.
5. A statement of Overriding Considerations was was not adopted for this project.
6. Findings were were not made pursuant to the provisions of CEQA.

This is to certify that the Final IS/MND with comments and responses and record of project approval, or the Negative Declaration, is available to the General Public at:

County of Riverside
 Economic Development Agency
 3133 Mission Inn Avenue
 Riverside, CA 92507

Signature: (Public Agency) *Sandi Schlemmer* Title: Deputy Clerk
 Sandi Schlemmer, Deputy Clerk for Kecia Harper-Ihem, Clerk of the Board of Supervisors
 Date: 02/23/10 Date received for filing at OPR: _____

Authority cited: Sections 21083, Public Resources Code.
 Reference Section 21000-21174, Public Resources Code.

APPENDIX B

WATER QUALITY MANAGEMENT PLAN

Project Specific Water Quality Management Plan

For: **Riverside County Regional Medical Center**
26250 Cactus Avenue, Moreno Valley, CA 92555

DEVELOPMENT NO. **APN #486280037, 486280025, 486280026**
DESIGN REVIEW NO.

Prepared for:
County of Riverside
3133 Mission Inn Avenue
Riverside, CA 92507
Telephone: (951) 955-4850

Prepared by:
Penco Engineering
One Technology Park, J-725
Irvine, CA 92618
Telephone: (949) 753-8111

WQMP Preparation/Revision Date: 03/19/2010

OWNER'S CERTIFICATION

This project-specific Water Quality Management Plan (WQMP) has been prepared for:

County of Riverside

by Penco Engineering for the project known as Riverside County Regional Medical Center at 26250 Cactus Avenue, Moreno Valley, CA 92555.

This WQMP is intended to comply with the requirements of County of Riverside for APN #486280037, 486280025, 486280026, which includes the requirement for the preparation and implementation of a project-specific WQMP.

The undersigned, while owning the property/project described in the preceding paragraph, shall be responsible for the implementation of this WQMP and will ensure that this WQMP is amended as appropriate to reflect up-to-date conditions on the site. This WQMP will be reviewed with the facility operator, facility supervisors, employees, tenants, maintenance and service contractors, or any other party (or parties) having responsibility for implementing portions of this WQMP. At least one copy of this WQMP will be maintained at the project site or project office in perpetuity.

The undersigned is authorized to certify and to approve implementation of this WQMP. The undersigned is aware that implementation of this WQMP is enforceable under County of Riverside Water Quality Ordinance.

If the undersigned transfers its interest in the subject property/project, its successor in interest the undersigned shall notify the successor in interest of its responsibility to implement this WQMP.

"I, the undersigned, certify under penalty of law that the provisions of this WQMP have been reviewed and accepted and that the WQMP will be transferred to future successors in interest."

Owner's Signature

Date

Owner's Printed Name

Owner's Title/Position

3133 Mission Inn Avenue
Riverside, CA 92507
(951) 955-4850

Contents

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III POLLUTANTS OF CONCERN	A-5
IV HYDROLOGIC CONDITIONS OF CONCERN	A-7
V BEST MANAGEMENT PRACTICES	A-8
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V.2 Source Control BMPs	A-13
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V.5 Regionally-Based Treatment Control BMPs	A-19
VI OPERATION AND MAINTENANCE RESPONSIBILITY FOR TREATMENT CONTROL BMPs	A-20
VII FUNDING	A-23

APPENDICES

A. CONDITIONS OF APPROVAL	
B. VICINITY MAP, WQMP SITE PLAN, AND RECEIVING WATERS MAP	
C. SUPPORTING DETAIL RELATED TO HYDRAULIC CONDITIONS OF CONCERN (IF APPLICABLE)	
D. EDUCATIONAL MATERIALS	
E. SOILS REPORT (IF APPLICABLE)	
F. TREATMENT CONTROL BMP SIZING CALCULATIONS AND DESIGN DETAILS	
G. AGREEMENTS – CC&RS, COVENANT AND AGREEMENTS AND/OR OTHER MECHANISMS FOR ENSURING ONGOING OPERATION, MAINTENANCE, FUNDING AND TRANSFER OF REQUIREMENTS FOR THIS PROJECT-SPECIFIC WQMP	
H. PHASE 1 ENVIRONMENTAL SITE ASSESSMENT – SUMMARY OF SITE REMEDIATION CONDUCTED AND USE RESTRICTIONS	

I. Project Description

Project Owner: County of Riverside
3133 Mission Inn Avenue
Riverside, CA 92507
Telephone: (951) 955-4850

WQMP Preparer: Penco Engineering, Inc.
One Technology Park, J-725
Irvine, CA 92618
Telephone: (949) 753-8111

**Water Quality Management Plan (WQMP)
Riverside County Regional Medical Center**

Project Site Address: 26520 Cactus Avenue
Moreno Valley, CA 92555

Planning Area/
Community Name/
Development Name: N/A

APN Number(s): APN #486280037, 486280025, 486280026

Thomas Bros. Map: T.G. Page 718 A & B 6

Project Watershed: Santa Ana River Basin

Sub-watershed: San Jacinto Valley

Project Site Size: 57.33 acres

Standard Industrial Classification (SIC) Code: N/A

Formation of Home Owners' Association (HOA) or Property Owners Association (POA):
Y N

Additional Permits/Approvals required for the Project

AGENCY	Permit required
State Department of Fish and Game, 1601 Streambed Alteration Agreement	Y <input type="checkbox"/> N <input checked="" type="checkbox"/>
State Water Resources Control Board, Clean Water Act (CWA) section 401 Water Quality Certification	Y <input type="checkbox"/> N <input checked="" type="checkbox"/>
US Army Corps of Engineers, CWA section 404 permit	Y <input type="checkbox"/> N <input checked="" type="checkbox"/>
US Fish and Wildlife, Endangered Species Act section 7 biological opinion	Y <input type="checkbox"/> N <input checked="" type="checkbox"/>
Other <i>(please list in the space below as required)</i>	

**Water Quality Management Plan (WQMP)
Riverside County Regional Medical Center**

The proposed Riverside County Hospital Expansion project consists of several new buildings. These structures will be located in existing parking areas or in existing undeveloped areas. The proposed building and square footage are the followings: (1) Operations Bldg-30,000 sf (2) Education Bldg-36,000 sf (3) Mental Health Bldg-90,000 sf (4) Emergency Dept. Expansion-36,000 sf (5) Emergency Treatment Services Bldg-13,000 sf. In addition, new parking are proposed on the SE, SW, and W'ly portion of the site. Existing parking on the site has 1003 spaces. At completion of this expansion project, the site will have 2655 spaces.

Appendix A of this project-specific WQMP includes a complete copy of the final Conditions of Approval. Appendix B of this project-specific WQMP shall include:

1. A Vicinity Map identifying the project site and surrounding planning areas in sufficient detail to allow the project site to be plotted on Co-Permittee base mapping; and
2. A Site Plan for the project. The Site Plan included as part of Appendix B depicts the following project features:
 - Location and identification of all structural BMPs, including Treatment Control BMPs.
 - Landscaped areas.
 - Paved areas and intended uses (i.e., parking, outdoor work area, outdoor material storage area, sidewalks, patios, tennis courts, etc.).
 - Number and type of structures and intended uses (i.e., buildings, tenant spaces, dwelling units, community facilities such as pools, recreation facilities, tot lots, etc.).
 - Infrastructure (i.e., streets, storm drains, etc.) that will revert to public agency ownership and operation.
 - Location of existing and proposed public and private storm drainage facilities (i.e., storm drains, channels, basins, etc.), including catch basins and other inlets/outlet structures. Existing and proposed drainage facilities should be clearly differentiated.
 - Location(s) of Receiving Waters to which the project directly or indirectly discharges.
 - Location of points where onsite (or tributary offsite) flows exit the property/project site.
 - Proposed drainage areas boundaries, including tributary offsite areas, for each location where flows exits the property/project site. Each tributary area should be clearly denoted.
 - Pre- and post-project topography.

Appendix G of this project-specific WQMP shall include copies of CC&Rs, Covenant and Agreements, and/or other mechanisms used to ensure the ongoing operation, maintenance, funding, transfer and implementation of the project-specific WQMP requirements.

II. Site Characterization

Land Use Designation or Zoning: Commercial

Current Property Use: Previously developed

Proposed Property Use: Commercial

Availability of Soils Report: Y N *Note: A soils report is required if infiltration BMPs are utilized. Attach report in Appendix E.*

Phase 1 Site Assessment: Y N *Note: If prepared, attached remediation summary and use restrictions in Appendix H.*

Water Quality Management Plan (WQMP)
Riverside County Regional Medical Center

Receiving Waters for Urban Runoff from Site

Receiving Waters	303(d) List Impairments	Designated Beneficial Uses	Proximity to RARE Beneficial Use
Riverside County Flood Control Storm Drain	None	None	Not a Water Body Classified as RARE
Perris Valley Channel	None	MUN/AGR/IND/PROC	Not a Water Body Classified as RARE
San Jacinto River (Reach/3)	None	AGR/GWR/REC1/2/WARM/WILD	Not a Water Body Classified as RARE
Canyon Lake	Pathogens, Nutrients	MUN/AGR/GWR/REC1/2/WARM/WILD	Not a Water Body Classified as RARE
San Jacinto River (Reach/1)	None	MUN/AGR/GWR/REC1/2/WARM/WILD	Not a Water Body Classified as RARE
Lake Elsinore	Nutrients, Organic Enrichment/Low Dissolved Oxygen, Sedimentation/Siltation, Unknown Toxicity	REC1/2/WARM/WILD	Not a Water Body Classified as RARE
Temescal Creek (Reach/6)	None	GWR/REC1/2/WARM/WILD	Not a Water Body Classified as RARE
Temescal Creek (Reach/5)	None	AGR/GWR/REC1/2/WARM/WILD	Add 17 Miles
Temescal Creek (Reach/4)	None	AGR/GWR/REC1/2/WARM/WILD/RARE	Add 6 Miles
Temescal Creek (Reach/3)	None	AGR/IND/GWR/REC1/2/WARM/WILD	Not a Water Body Classified as RARE
Temescal Creek (Reach/2)	None	AGR/IND/GWR/REC1/2/WARM/WILD	Not a Water Body Classified as RARE
Temescal Creek (Reach/1)	None	REC1/2/WARM/WILD	Not a Water Body Classified as RARE
Santa Ana River (Reach/3)	Pathogens	AGR/GWR/REC1/2/WARM/WILD/RARE	Add 19 Miles
Prado Basin Management Zone	None	REC1/2/WARM/WILD/RARE	Add 2 Miles
Santa Ana River (Reach/2)	None	AGR/GWR/REC1/2/WARM/WILD/RARE	Add 2 Miles
Santa Ana River (Reach/1)	None	REC1/2/WARM/WILD	Not a water Body Classified as RARE
Tidal Prism of Santa Ana River and Newport Slough	None	MAR/COMM/REC1/2/WILD	Add 9 Miles
Pacific Ocean Nearshore	None	BIOL/NAV/COMM/REC1/2/RARE/WILD/SPWN/MAR/SHEL	Add 1 Miles
Offshore	None	IND/NAV/COMM/REC1/2/RARE/WILD/SPWN/MAR	Add 2 Miles

III. Pollutants of Concern

Potential pollutants associated with Urban Runoff from the proposed project must be identified. Exhibit B of the WQMP provides brief descriptions of typical pollutants associated with Urban Runoff and a table that associates typical potential pollutants with types of development (land use). It should be noted that at the Co-Permittees discretion, the Co-Permittees may also accept updated studies from the California Association of Stormwater Quality Agencies (CASQA), USEPA, SWRCB and/or other commonly accepted agencies/associations acceptable to the Co-Permittee for determination of Pollutants of Concern associated with given land use. Additionally, in identifying Pollutants of Concern, the presence of legacy pesticides, nutrients, or hazardous substances in the site's soils as a result of past uses and their potential for exposure to Urban Runoff must be addressed in project-specific WQMPs. The Co-Permittee may also require specific pollutants commonly associated with urban runoff to be addressed based on known problems in the watershed. The list of potential Urban Runoff pollutants identified for the project must be compared with the pollutants identified as causing an impairment of Receiving Waters, if any. To identify pollutants impairing proximate Receiving Waters, each project proponent preparing a project-specific WQMP shall, at a minimum, do the following:

1. For each of the proposed project discharge points, identify the proximate Receiving Water for each discharge point, using hydrologic unit basin numbers as identified in the most recent version of the Water Quality Control Plan for the Santa Ana River Basin or the San Diego Region.
2. Identify each proximate identified above that is listed on the most recent list of Clean Water Act Section 303(d) list of impaired water bodies, which can be found at website www.swrcb.ca.gov/tmdl/303d_lists.html. List all pollutants for which the proximate Receiving Waters are impaired.
3. Compare the list of pollutants for which the proximate Receiving Waters are impaired with the pollutants expected to be generated by the project.

Urban Runoff Pollutants: Metals, Nutrients, Sediments, Trash and Debris, Oil and Grease

IV. Hydrologic Conditions of Concern

Impacts to the hydrologic regime resulting from the Project may include increased runoff volume and velocity; reduced infiltration; increased flow frequency, duration, and peaks; faster time to reach peak flow; and water quality degradation. Under certain circumstances, changes could also result in the reduction in the amount of available sediment for transport; storm flows could fill this sediment-carrying capacity by eroding the downstream channel. These changes have the potential to permanently impact downstream channels and habitat integrity. A change to the hydrologic regime of a Project's site would be considered a hydrologic condition of concern if the change would have a significant impact on downstream erosion compared to the pre-development condition or have significant impacts on stream habitat, alone or as part of a cumulative impact from development in the watershed.

This project-specific WQMP must address the issue of Hydrologic Conditions of Concern unless one of the following conditions are met:

- **Condition A:** Runoff from the Project is discharged directly to a publicly-owned, operated and maintained MS4; the discharge is in full compliance with Co-Permittee requirements for connections and discharges to the MS4 (including both quality and quantity requirements); the discharge would not significantly impact stream habitat in proximate Receiving Waters; and the discharge is authorized by the Co-Permittee.
- **Condition B:** The project disturbs less than 1 acre. The disturbed area calculation should include all disturbances associated with larger plans of development.
- **Condition C:** The project's runoff flow rate, volume, velocity and duration for the post-development condition do not exceed the pre-development condition for the 2-year, 24-hour and 10-year 24-hour rainfall events. This condition can be achieved by minimizing impervious area on a site and incorporating other site-design concepts that mimic pre-development conditions. This condition must be substantiated by hydrologic modeling methods acceptable to the Co-Permittee.

This Project meets the following condition: CONDITION A

V. Best Management Practices

V.1 SITE DESIGN BMPs

Project proponents shall implement Site Design concepts that achieve each of the following:

- 1) Minimize Urban Runoff
- 2) Minimize Impervious Footprint
- 3) Conserve Natural Areas
- 4) Minimize Directly Connected Impervious Areas (DCIAs)

The project proponent should identify the specific BMPs implemented to achieve each Site Design concept and provide a brief explanation for those Site Design concepts considered not applicable.

Table 1. Site Design BMPs

Design Concept	Technique	Specific BMP	Included		
			Yes	No	N/A
<i>Site Design Concept 1</i>	<i>Minimize Urban Runoff</i>	1) Maximize the permeable area (See Section 4.5.1 in Appendix D of the WQMP).	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
		2) Incorporate landscaped buffer areas between sidewalks and streets.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		3) Maximize canopy interception and water conservation by preserving existing native trees and shrubs, and planting additional native or drought tolerant trees and large shrubs.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		4) Use natural drainage systems.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
		5) Where soils conditions are suitable, use perforated pipe or gravel filtration pits for low flow infiltration.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
		6) Construct onsite ponding areas or retention facilities to increase opportunities for infiltration consistent with vector control objectives.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
		7) Other comparable and equally effective site design concepts as approved by the Co-Permittee (Note: Additional narrative required to describe BMP and how it addresses Site Design concept).	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Water Quality Management Plan (WQMP)
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Table 1. Site Design BMPs (Cont.)

Design Concept	Technique	Specific BMP	Included		
			Yes	No	N/A
<i>Site Design Concept 2</i>	<i>Minimize Impervious Footprint</i>	1) Maximize the permeable area (See Section 4.5.1 in Appendix D of the WQMP).	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
		2) Construct walkways, trails, patios, overflow parking lots, alleys, driveways, low-traffic streets and other low-traffic areas with open-jointed paving materials or permeable surfaces, such as pervious concrete, porous asphalt, unit pavers, and granular materials.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
		3) Construct streets, sidewalks and parking lot aisles to the minimum widths necessary, provided that public safety and a walk able environment for pedestrians are not compromised.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		4) Reduce widths of street where off-street parking is available.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
		5) Minimize the use of impervious surfaces, such as decorative concrete, in the landscape design.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<i>Site Design Concept 3</i>	<i>Conserve Natural Areas</i>	6) Other comparable and equally effective site design concepts as approved by the Co-Permittee (Note: Additional narrative required describing BMP and how it addresses Site Design concept).	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
		7) Conserve natural areas (See WQMP Section 4.5.1).	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
		8) Maximize canopy interception and water conservation by preserving existing native trees and shrubs, and planting additional native or drought tolerant trees and large shrubs.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		9) Use natural drainage systems.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
		10) Other comparable and equally effective site design concepts as approved by the Co-Permittee (Note: Additional narrative required describing BMP and how it addresses Site Design concept).	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Table 1. Site Design BMPs (Cont.)

Design Concept	Technique	Specific BMP	Included		
			Yes	No	N/A
Site Design Concept 4	<i>Minimize Directly Connected Impervious Areas (DCIAs)</i>	1) Residential and commercial sites must be designed to contain and infiltrate roof runoff, or direct roof runoff to vegetative swales or buffer areas, where feasible.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
		2) Where landscaping is proposed, drain impervious sidewalks, walkways, trails, and patios into adjacent landscaping.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		3) Increase the use of vegetated drainage swales in lieu of underground piping or imperviously lined swales.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
		4) Rural swale system: street sheet flows to vegetated swale or gravel shoulder, curbs at street corners, culverts under driveways and street crossings.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
		5) Urban curb/swale system: street slopes to curb; periodic swale inlets drain to vegetated swale/biofilter.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
		6) Dual drainage system: First flush captured in street catch basins and discharged to adjacent vegetated swale or gravel shoulder, high flows connect directly to MS4s.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
		7) Design driveways with shared access, flared (single lane at street) or wheel strips (paving only under tires); or, drain into landscaping prior to discharging to the MS4.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
		8) Uncovered temporary or guest parking on private residential lots may be paved with a permeable surface, or designed to drain into landscaping prior to discharging to the MS4.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
		9) Where landscaping is proposed in parking areas, incorporate landscape areas into the drainage design.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
		10) Overflow parking (parking stalls provided in excess of the Co-Permittee's minimum parking requirements) may be constructed with permeable paving.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
		11) Other comparable and equally effective design concepts as approved by the Co-Permittee (Note: Additional narrative required describing BMP and how it addresses Site Design concept).	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Non-applicable Site Design BMPs:

Site Design Concept 1 –

- 1) The medical center expansion will result in the creation of impermeable surfaces. No parks or other areas of open-space are proposed within the project site.
- 4) Natural drainage systems do not exist within the proposed project boundary.
- 5) Hydroconsolidation tests were performed on the existing soils. If the loose soils at the site become fully saturated, this could result in hydroconsolidation settlement of approximately 2 inches. Therefore, no infiltration measure will be implemented to minimize risk of settlement.
- 6) No ponding areas or retention facilities will be implemented in order to minimize hydroconsolidation.
- 7) No further comparable and equally effective site design concepts will be considered to minimize urban runoff due to the project site soils condition.

Site Design Concept 2 –

- 1) The medical center expansion will result in the creation of impermeable surfaces. No parks or other areas of open-space are proposed within the project site.
- 2) Due to the site soils condition, no permeable surfaces will be considered.
- 4) Not applicable to the proposed project.
- 6) No further comparable and equally effective site design concepts will be considered to minimize impervious footprint due to the project site soils condition and site design.

Site Design Concept 3 –

- 7) The proposed expansion site is barren. No natural areas will be conserved.
- 9) Natural drainage systems do not exist within the proposed project boundary.
- 10) No further comparable and equally effective site design concepts will be considered to conserve natural areas due to the project site soils condition and site design.

Site Design Concept 4 –

- 1) Direct roof runoff will not be considered due to soils condition.
- 2) Due to the site design, drain impervious sidewalks and patios into adjacent landscaping are not achievable.
- 3) Due to the site soils condition, no vegetated drainage swales will be considered.
- 4) Rural swale system will not be considered due to poor soils condition and project design.
- 5) Urban curb/swale system will not be considered due to poor soils condition and project design.
- 6) In lieu of dual drainage system, majority of project flows will be conveyed, via onsite storm drain, to water quality treatment devices located at the downstream of storm drain.
- 7) No alternative driveways design will be implemented due to site design.
- 8) No parking area will use permeable surface due to poor soils condition.
- 9) The runoff from the parking areas will drain toward curb and gutter and street catch basins.
- 10) No parking area will use permeable surface due to poor soils condition for the overflow parkings.
- 11) The project does not include any overflow parking areas.

Project Site Design BMPs:

Site Design Concept 1 –

- 2) Landscape buffer areas are in place between sidewalks and streets.
- 3) Drought tolerant trees are planted per landscape plan.

Site Design Concept 2 –

- 3) Parking lot aisles are constructed to the minimum width required by the fire lane access and the public safety and a walk able environment for pedestrians are not compromised.
- 5) Minimize the use of decorative concrete in the landscape design per landscape plan.

V.2 SOURCE CONTROL BMPs

Table 2. Source Control BMPs

BMP Name	Check One		If not applicable, state brief reason
	Included	Not Applicable	
Non-Structural Source Control BMPs			
Education for Property Owners, Operators, Tenants, Occupants, or Employees	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Activity Restrictions	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Irrigation System and Landscape Maintenance	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Common Area Litter Control	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Street Sweeping Private Streets and Parking Lots	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Drainage Facility Inspection and Maintenance	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Structural Source Control BMPs			
MS4 Stenciling and Signage	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Landscape and Irrigation System Design	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Protect Slopes and Channels	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Provide Community Car Wash Racks	<input type="checkbox"/>	<input checked="" type="checkbox"/>	No Community Car Wash Areas Designed.
Properly Design:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Fueling Areas	<input type="checkbox"/>	<input checked="" type="checkbox"/>	No Fueling Areas Designed.
Air/Water Supply Area Drainage	<input type="checkbox"/>	<input checked="" type="checkbox"/>	No Air/Water Supply Areas Designed.
Trash Storage Areas	<input type="checkbox"/>	<input checked="" type="checkbox"/>	No Trash Storage Areas
Loading Docks	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Maintenance Bays	<input type="checkbox"/>	<input checked="" type="checkbox"/>	No Maintenance Bays Designed.
Vehicle and Equipment Wash Areas	<input type="checkbox"/>	<input checked="" type="checkbox"/>	No Vehicle and Equipment Wash Areas Designed.
Outdoor Material Storage Areas	<input type="checkbox"/>	<input checked="" type="checkbox"/>	No Outdoor Material Storage Areas Designed.
Outdoor Work Areas or Processing Areas	<input type="checkbox"/>	<input checked="" type="checkbox"/>	No Outdoor Work Areas Or Processing Areas Designed.
Provide Wash Water Controls for Food Preparation Areas	<input type="checkbox"/>	<input checked="" type="checkbox"/>	No Wash Water Controls for Food Preparation Areas Designed.

The location of each structural BMP must also be shown on the WQMP Site Plan included in Appendix B.

Non-Structural Source Control BMPs

Education of Property Owners, Operators, Tenants, Occupants, and Employees

The owner will familiarize themselves with the educational materials and BMP fact sheets in Appendix "D". The owner will ensure that the tenant is also familiar with onsite BMP's and necessary maintenance required of the tenant. Employees shall be trained to clean up spills and participate in ongoing maintenance. The owner will check with City and County at least once a year to obtain new or updated educational materials and provide these materials to tenants. Employees shall be trained to clean up spills and participate in ongoing maintenance. The WQMP requires annual employee training and new hires within 6 months.

Activity Restrictions.

Any activity restrictions shall be included in the CC & R's. Lease agreements with tenant may also include certain restrictions. All "NO" activities will be listed in the CC&Rs.

Such activities may include, but not limited to the following:

- Prohibit the hosing down of paved surfaces as a method of cleaning.
- Prohibit blowing or Sweeping of debris into streets or storm drains.
- Prohibit vehicle washing, maintenance, or repairs on the project site.
- Prohibit outdoor storage of materials or liquids on the project site.

Irrigation System and Landscape Maintenance

SD-12: Efficient Irrigation/SC-73: Landscape Maintenance

Description of BMP: Irrigation systems shall include reducers or shutoff valves triggered by a pressure drop to control water loss in the event of broken sprinkler heads or lines. Timers will be used to avoid over watering and watering cycles and duration shall be adjusted seasonally by the landscape maintenance contractor. The landscaping areas will be grouped with plants that have similar water requirements. Native or drought tolerant species shall also be used where appropriate to reduce excess irrigation runoff and promote surface filtration.

Maintenance Responsibility: Owner

Funding Source: Owner

Maintenance Schedule: Irrigation system shall be inspected monthly by landscape contractor to check for over-watering, leaks, or excessive runoff to paved areas. Landscape maintenance will be inspected and maintained weekly by a qualified contractor and all landscape waste will be disposed of properly.

Start up date: When landscaping is complete.

Common Area Litter Control

SC-11: Spill Prevention, Control and Cleanup

Description of BMP: Tenant shall have a spill contingency plan in place appropriate for anticipated materials that will be kept onsite. Proper clean up materials will be available for any spills. Any spills of liquid or materials will be cleaned up immediately.

Maintenance Responsibility: Tenant

Funding Source: Tenant

Maintenance Schedule: Ongoing

Start up date: When project site is complete.

SC-60: Housekeeping Practices

Description of BMP: Overall good housekeeping practices shall be implemented daily.

Maintenance Responsibility: Owner/Tenant

Funding Source: Owner/Tenant

Maintenance Schedule: Ongoing

Start up date: When project site is complete.

Street Sweeping Private Streets and Parking Lots

SC-43: Parking/Storage Area Maintenance

Description of BMP: Parking lots and drive aisles will be swept weekly by a sweeping contractor to prevent sediment, garden waste, and trash from entering the storm drain systems.

Maintenance Responsibility: Owner

Funding Source: Owner

Maintenance Schedule: The owner will maintain site weekly or more often if necessary

Start up date: When paving is complete

Drainage Facility Inspection and Maintenance

SC-44: Drainage System Maintenance

Description of BMP: The storm drain and catch basins shall be maintained by a qualified maintenance service contractor

Maintenance Responsibility: Owner

Funding Source: Owner

Maintenance Schedule: The catch basins shall be inspected and cleaned on a semi-annual basis by the owner and shall be inspected and cleaned by the vendor or an equally qualified contractor on an annual frequency.

Start update: When storm drain system is complete.

Appendix D includes copies of the educational materials that will be used in implementing this project-specific WQMP.

V.3 TREATMENT CONTROL BMPs

Supporting engineering calculations for Q_{BMP} and/or V_{BMP} , and Treatment Control BMP design details are included in Appendix F.

Both flow based BMPs, curb inlet baskets and baffle box, will be implemented for this project site. Flow base BMP is to treat 0.2 inch per hour rainfall as recommended by California BMP handbook. Design treatment flow rates are provided in Appendix F.

Curb Inlet Basket:

The curb inlet baskets will be installed for all the existing and proposed catch basins throughout the project site. The contracted service crews need to remove manhole and vacuum out basket located directly under the manhole. Maintenance at least twice a year is recommended to sustain effectiveness.

Nutrient Separating Baffle Box:

One baffle box will be installed at down stream of each tributary area. The contract service crews need to open access manholes and vacuum gross solids from screening basket then vacuum out sedimentation chamber. Maintenance at least once a year to sustain effectiveness. See manufacturer's specifications for additional maintenance requirements in Appendix G.

Table 3: Treatment Control BMP Selection Matrix ⁽¹⁾

Pollutant of Concern	Treatment Control BMP Categories ⁽²⁾									
	Veg. Swale & Veg. Filter Strips ⁽³⁾	Detention Basins ⁽⁴⁾	Infiltration Basins, Trenches, & Porous Pavement ⁽⁵⁾	Wet Ponds or Wetlands ⁽⁶⁾	Sand Filter or Media Filters	Water Quality Inlets	Hydrodynamic Separator Systems ⁽⁷⁾	Manufactured / Proprietary Devices ⁽⁸⁾		
Sediment/Turbidity	H/M	M	H/M	H/M	H/M	L	H/M (L for turbidity)	U		
	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
Nutrients	L	M	H/M	H/M	L/M	L	L	U		
	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Organic Compounds	U	U	U	U	H/M	L	L	U		
	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Trash & Debris	L	M	U	U	H/M	M	H/M	U		
	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
Oxygen Demanding Substances	L	M	H/M	H/M	H/M	L	L	U		
	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Bacteria & Viruses	U	U	H/M	U	H/M	L	L	U		
	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Oils & Grease	H/M	M	U	U	H/M	M	L/M	U		
	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
Pesticides (non-soil bound)	U	U	U	U	U	L	L	U		
	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Metals	H/M	M	H	H	H	L	L	U		
	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		

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Abbreviations:

L: Low removal efficiency

H/M: High or medium removal efficiency

U: Unknown removal efficiency

Notes:

- (1) Periodic performance assessment and updating of the guidance provided by this table may be necessary.
- (2) Project applicants should base BMP designs on the Riverside County Stormwater Quality Best Management Practice Design Handbook. However, project applicants may also wish to reference the California Stormwater BMP Handbook – New Development and Redevelopment (www.cabmphandbooks.com). The Handbook contains additional information on BMP operation and maintenance.
- (3) Includes grass swales, grass strips, wetland vegetation swales, and bioretention.
- (4) Includes extended/dry detention basins with grass lining and extended/dry detention basins with impervious lining. Effectiveness based upon minimum 36-48-hour drawdown time.
- (5) Projects that will utilize infiltration-based Treatment Control BMPs (e.g., Infiltration Basins, Infiltration Trenches, Porous Pavement, etc.) must include a copy of the property/project soils report as Appendix E to the project-specific WQMP. The selection of a Treatment Control BMP (or BMPs) for the project must specifically consider the effectiveness of the Treatment Control BMP for pollutants identified as causing an impairment of Receiving Waters to which the project will discharge Urban Runoff.
- (6) Includes permanent pool wet ponds and constructed wetlands.
- (7) Also known as hydrodynamic devices, baffle boxes, swirl concentrators, or cyclone separators.
- (8) Includes proprietary stormwater treatment devices as listed in the CASQA Stormwater Best Management Practices Handbooks, other stormwater treatment BMPs not specifically listed in this WQMP, or newly developed/emerging stormwater treatment technologies.

V.4 EQUIVALENT TREATMENT CONTROL ALTERNATIVES

Not applicable.

V.5 REGIONALLY-BASED TREATMENT CONTROL BMPS

Not applicable.

VI. Operation and Maintenance Responsibility for Treatment Control BMPs

Operation and maintenance (O&M) requirements for all structural Source Control and Treatment Control BMPs shall be identified in the project-specific WQMP. The project-specific WQMP shall address the following:

- Identification of each BMP that requires O&M.
- Thorough description of O&M activities, the O&M process, and the handling and placement of any wastes.
- BMP start-up dates.
- Schedule of the frequency of O&M for each BMP.
- Identification of the parties (name, address, and telephone number) responsible for O&M, including a written agreement with the entities responsible for O&M. This agreement can take the form of a Covenant and Agreement recorded by the Project Proponent with the County Recorder, HOA or POA CC&Rs, formation of a maintenance district or assessment district or other instrument sufficient to guarantee perpetual O&M. The preparer of this project-specific WQMP should carefully review Section 4.6 of the WQMP prior to completing this section of the project-specific WQMP.
- Self-inspections and record-keeping requirements for BMPs (review local specific requirements regarding self-inspections and/or annual reporting), including identification of responsible parties for inspection and record-keeping.
- Thorough descriptions of water quality monitoring, if required by the Co-Permittee.

Where a public agency is identified as the funding source and responsible party for a Treatment Control BMP, a copy of the written agreement stating the public agency's acceptance of these responsibilities must be provided in Appendix G.

Education of Property Owners, Operators, Tenants, Occupants, and Employees

The owner will familiarize themselves with the educational materials and BMP fact sheets in Appendix "D". The owner will ensure that the tenant is also familiar with onsite BMP's and necessary maintenance required of the tenant. Employees shall be trained to clean up spills and participate in ongoing maintenance. The owner will check with City and County at least once a year to obtain new or updated educational materials and provide these materials to tenants. Employees shall be trained to clean up spills and participate in ongoing maintenance. The WQMP requires annual employee training and new hires within 6 months.

Activity Restrictions.

Any activity restrictions shall be included in the CC & R's. Lease agreements with tenant may also include certain restrictions. All "NO" activities will be listed in the CC&Rs.

Such activities may include, but not limited to the following:

- Prohibit the hosing down of paved surfaces as a method of cleaning.
- Prohibit blowing or Sweeping of debris into streets or storm drains.
- Prohibit vehicle washing, maintenance, or repairs on the project site.

- Prohibit outdoor storage of materials or liquids on the project site.

Irrigation System and Landscape Maintenance

SD-12: Efficient Irrigation/SC-73: Landscape Maintenance

Description of BMP: Irrigation systems shall include reducers or shutoff valves triggered by a pressure drop to control water loss in the event of broken sprinkler heads or lines. Timers will be used to avoid over watering and watering cycles and duration shall be adjusted seasonally by the landscape maintenance contractor. The landscaping areas will be grouped with plants that have similar water requirements. Native or drought tolerant species shall also be used where appropriate to reduce excess irrigation runoff and promote surface filtration.

Maintenance Responsibility: Owner

Funding Source: Owner

Maintenance Schedule: Irrigation system shall be inspected monthly by landscape contractor to check for over-watering, leaks, or excessive runoff to paved areas. Landscape maintenance will be inspected and maintained weekly by a qualified contractor and all landscape waste will be disposed of properly.

Start up date: When landscaping is complete.

Properly Design: Trash Storage Areas

SD-32: Trash Storage Areas

Description of BMP: The trash enclosure areas will be paved with an impervious surface to mitigate spills. The trash container areas will not be below grade. The trash containers shall have lids and covered to prevent rainfall from entering containers. In addition, storm water runoff from adjoining roofs and pavement must be diverted around the trash area and signs should be posted informing users that hazardous materials are not to be disposed of therein.

Maintenance Responsibility: Owner/Tenant

Funding Source: Owner/tenant

Maintenance Schedule: Weekly inspection of trash area. Remove trash as needed.

Start up date: When construction is complete.

Properly Design: Vehicle and Equipment Wash Areas

This project site has not been designed to accommodate vehicle and equipment wash areas and this activity will be prohibited through CC&R's or lease agreements.

Properly Design: Outdoor Material Storage Areas

Outdoor storage is not anticipated at this time and is prohibited on the project site. If outdoor storage is necessary by tenants the following requirements must be met:

Materials with the potential to contaminate storm water must be (1) placed in an enclosure such as, but not limited to, a cabinet, shed or similar structure that prevents contact with runoff or spillage to the storm drain system or (2) protected by a secondary containment structure such as berms, dikes, or curbs.

The storage area must be paved and sufficiently impervious to contain leaks and spills. The storage area should slope towards a dead-end sump to contain spills and direct runoff from downspouts/roofs should be directed away from the storage area. The storage area must have a roof or awning to minimize collection of storm water within the secondary containment areas.

Please note that outdoor storage of certain items or materials may require the tenant to file for coverage under the General Stormwater Industrial Permit from the state of California. A revision to the WQMP would also be necessary.

VII. Funding

A funding source or sources for the O&M of each Treatment Control BMP identified in the project-specific WQMP must be identified. By certifying the project-specific WQMP, the Project applicant is certifying that the funding responsibilities have been addressed and will be transferred to future owners. One example of how to adhere to the requirement to transfer O&M responsibilities is to record the project-specific WQMP against the title to the property.

Sergio Pena
Riverside County Facilities Management
3133 Mission Inn Avenue
Riverside, CA 92507
Tel: (951) 955-2809

Appendix A

Conditions of Approval

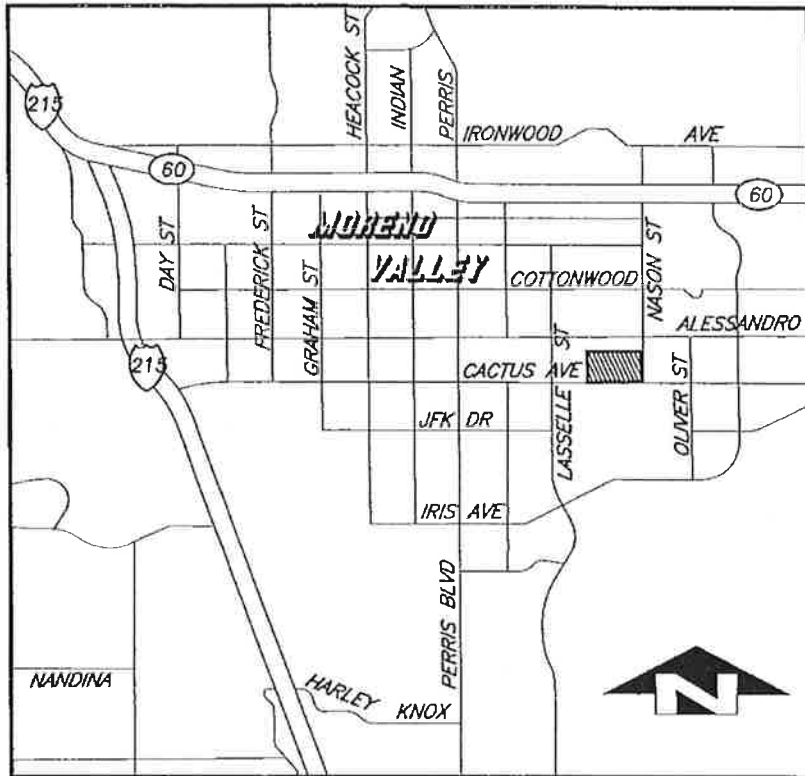
Planning Commission Resolution _____

Dated _____

COA for this project Not available.

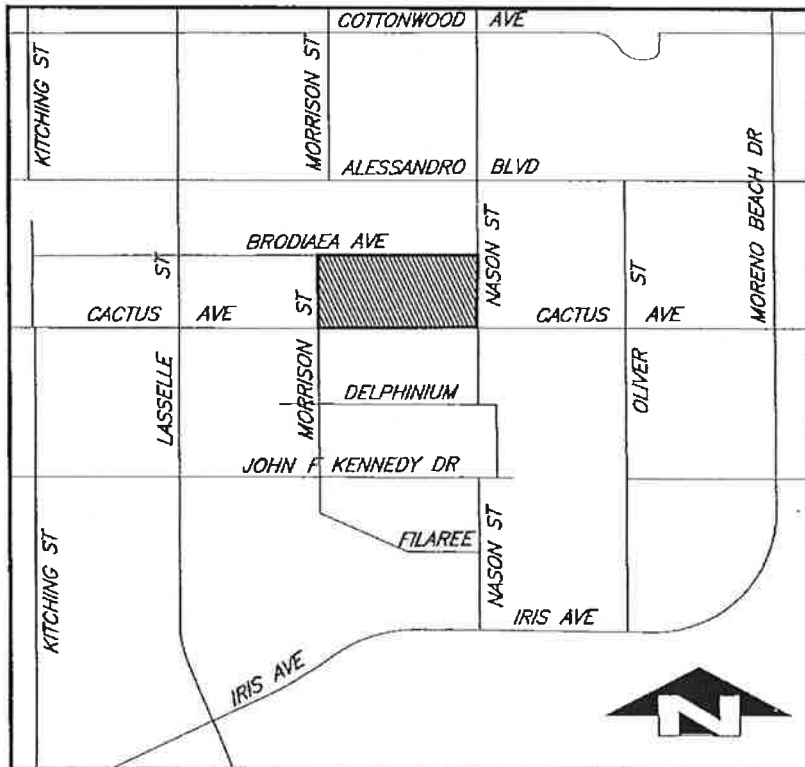
Appendix B

Vicinity Map, WQMP Site Plan, and Receiving Waters Map



LOCATION MAP

N.T.S.

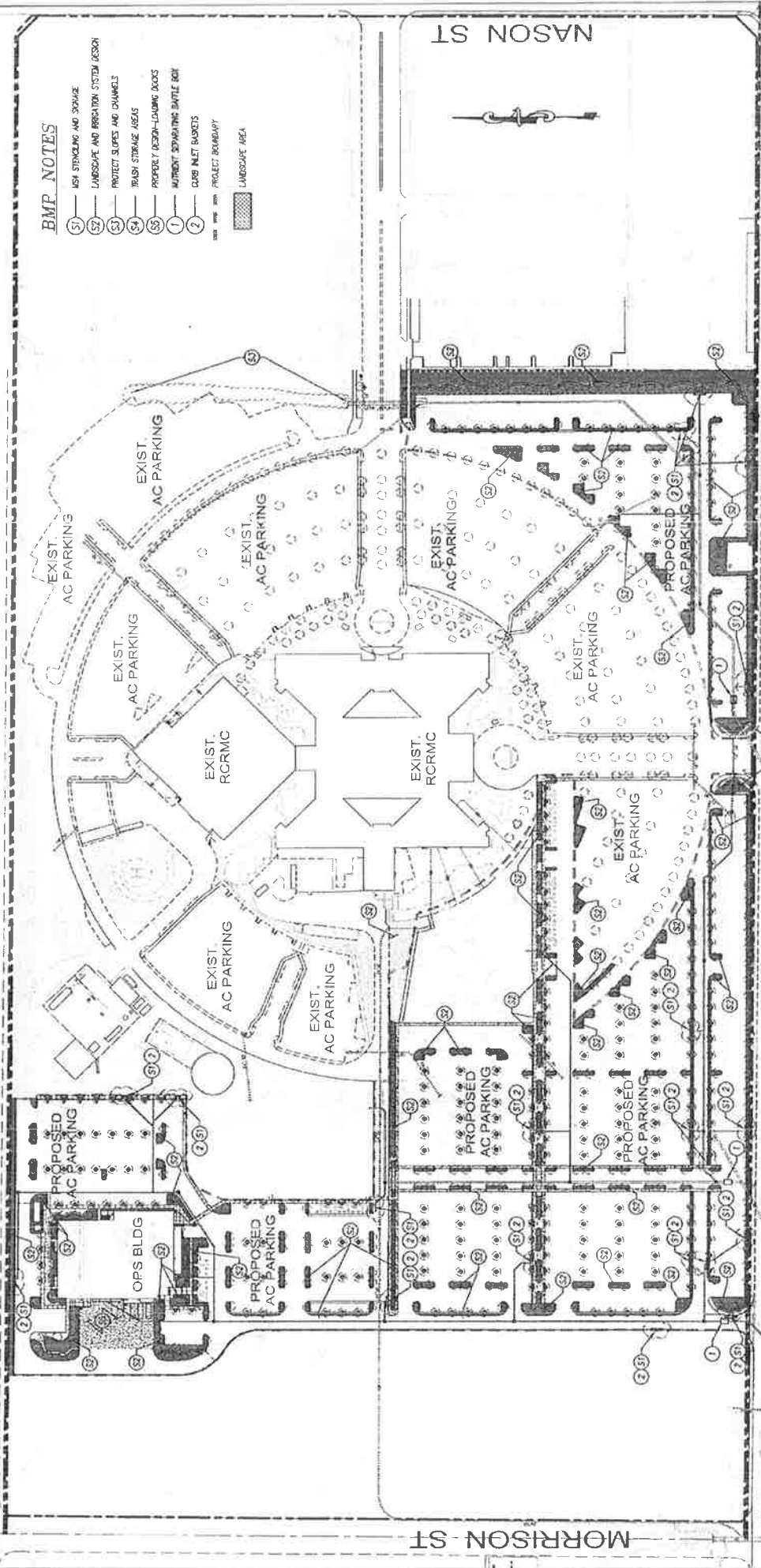


VICINITY MAP

N.T.S.

WQMP
SITE PLAN

BRODIAEA AVE



MORRISON ST

CACTUS AVE

NASON ST

NOTE:

- The names and areas shown on this map are the same as used by the Department of Water Resources (DWR) in their Bulletin 130 Series except as explained below.
- The numbering system used on this map is a modification of the numbering system used in the 130 Series.
- The boundary between Region 6 and Region 4 is the boundary between the San Bernardino County Hydrologic Unit and the San Bernardino County Hydrologic Unit. The San Bernardino County Hydrologic Unit is divided into sub-units 481.21, 481.22, and 481.23. The San Bernardino County Hydrologic Unit is divided into sub-units 481.21, 481.22, and 481.23. The San Bernardino County Hydrologic Unit is divided into sub-units 481.21, 481.22, and 481.23.
- The 1988 updated names shown on the map are in accordance with an agreement with DWR and the US Geological Survey.

1. The names and areas shown on this map are the same as used by the Department of Water Resources (DWR) in their Bulletin 130 Series except as explained below.

2. The numbering system used on this map is a modification of the numbering system used in the 130 Series.

SAN JACINTO VALLEY HYDROLOGIC UNIT

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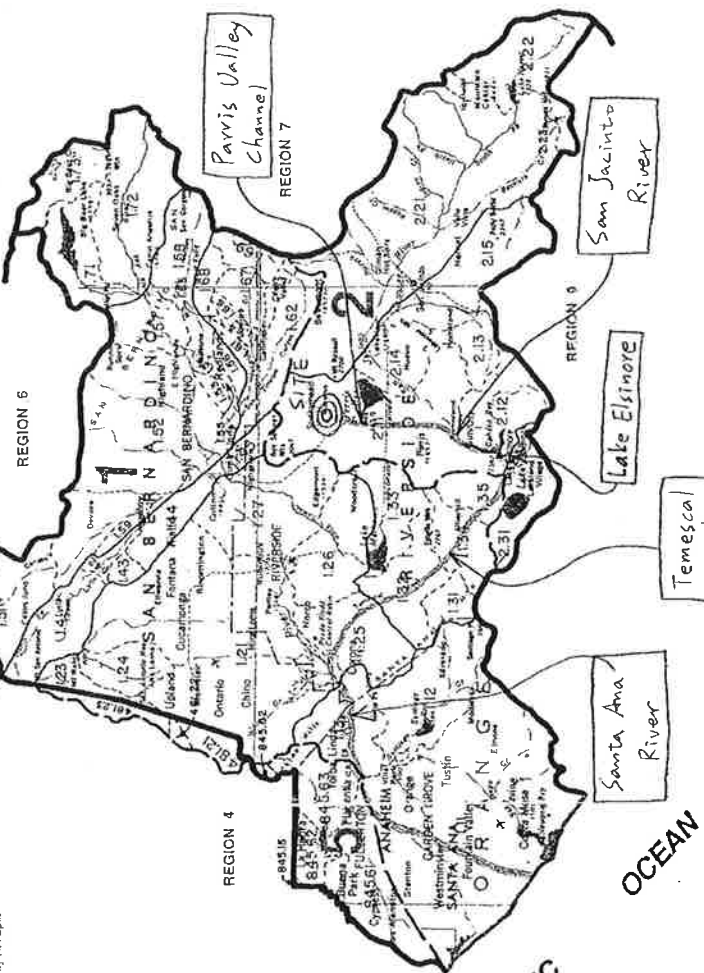
LOS ANGELES-SAN GABRIEL RIVER HYDROLOGIC UNIT

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REGION 8 INDEX

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LEGEND

STREAM

REGIONAL BOUNDARY

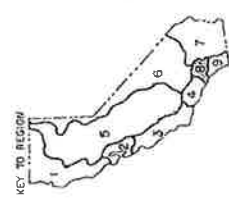
HYDROLOGIC UNIT BOUNDARY (HU)

HYDROLOGIC AREA BOUNDARY (HA)

HYDROLOGIC SUBAREA BOUNDARY (SA)

HYDROLOGIC UNIT NUMBER

5



State of California
REGIONAL WATER QUALITY CONTROL BOARD
Santa Ana Region (8)
SANTA ANA HYDROLOGIC BASIN PLANNING AREA (SA)

Scale in feet
0 8 16 24 32
Scale 1:50,000

April 1973
Revised: July 1976
Revised: August 1986

State Water Resources Control Board
Surveillance and Mapping Section
T.E. Lawrence, P.E. Technical Director

Description

Trash storage areas are areas where a trash receptacle (s) are located for use as a repository for solid wastes. Stormwater runoff from areas where trash is stored or disposed of can be polluted. In addition, loose trash and debris can be easily transported by water or wind into nearby storm drain inlets, channels, and/or creeks. Waste handling operations that may be sources of stormwater pollution include dumpsters, litter control, and waste piles.

Approach

This fact sheet contains details on the specific measures required to prevent or reduce pollutants in stormwater runoff associated with trash storage and handling. Preventative measures including enclosures, containment structures, and impervious pavements to mitigate spills, should be used to reduce the likelihood of contamination.

Suitable Applications

Appropriate applications include residential, commercial and industrial areas planned for development or redevelopment. (Detached residential single-family homes are typically excluded from this requirement.)

Design Considerations

Design requirements for waste handling areas are governed by Building and Fire Codes, and by current local agency ordinances and zoning requirements. The design criteria described in this fact sheet are meant to enhance and be consistent with these code and ordinance requirements. Hazardous waste should be handled in accordance with legal requirements established in Title 22, California Code of Regulation.

Wastes from commercial and industrial sites are typically hauled by either public or commercial carriers that may have design or access requirements for waste storage areas. The design criteria in this fact sheet are recommendations and are not intended to be in conflict with requirements established by the waste hauler. The waste hauler should be contacted prior to the design of your site trash collection areas. Conflicts or issues should be discussed with the local agency.

Designing New Installations

Trash storage areas should be designed to consider the following structural or treatment control BMPs:

- Design trash container areas so that drainage from adjoining roofs and pavement is diverted around the area(s) to avoid run-on. This might include berming or grading the waste handling area to prevent run-on of stormwater.
- Make sure trash container areas are screened or walled to prevent off-site transport of trash.

Design Objectives

- Maximize Infiltration
- Provide Retention
- Slow Runoff
- Minimize Impervious Land Coverage
- Prohibit Dumping of Improper Materials
- Contain Pollutants
- Collect and Convey



- Use lined bins or dumpsters to reduce leaking of liquid waste.
- Provide roofs, awnings, or attached lids on all trash containers to minimize direct precipitation and prevent rainfall from entering containers.
- Pave trash storage areas with an impervious surface to mitigate spills.
- Do not locate storm drains in immediate vicinity of the trash storage area.
- Post signs on all dumpsters informing users that hazardous materials are not to be disposed of therein.

Redeveloping Existing Installations

Various jurisdictional stormwater management and mitigation plans (SUSMP, WQMP, etc.) define "redevelopment" in terms of amounts of additional impervious area, increases in gross floor area and/or exterior construction, and land disturbing activities with structural or impervious surfaces. The definition of "redevelopment" must be consulted to determine whether or not the requirements for new development apply to areas intended for redevelopment. If the definition applies, the steps outlined under "designing new installations" above should be followed.

Additional Information***Maintenance Considerations***

The integrity of structural elements that are subject to damage (i.e., screens, covers, and signs) must be maintained by the owner/operator. Maintenance agreements between the local agency and the owner/operator may be required. Some agencies will require maintenance deed restrictions to be recorded of the property title. If required by the local agency, maintenance agreements or deed restrictions must be executed by the owner/operator before improvement plans are approved.

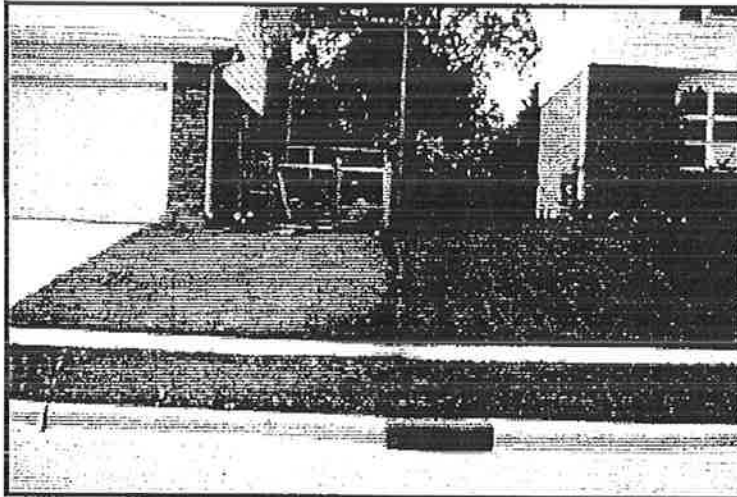
Other Resources

A Manual for the Standard Urban Stormwater Mitigation Plan (SUSMP), Los Angeles County Department of Public Works, May 2002.

Model Standard Urban Storm Water Mitigation Plan (SUSMP) for San Diego County, Port of San Diego, and Cities in San Diego County, February 14, 2002.

Model Water Quality Management Plan (WQMP) for County of Orange, Orange County Flood Control District, and the Incorporated Cities of Orange County, Draft February 2003.

Ventura Countywide Technical Guidance Manual for Stormwater Quality Control Measures, July 2002.



Design Objectives

- Maximize Infiltration
- Provide Retention
- Slow Runoff
- Minimize Impervious Land Coverage
- Prohibit Dumping of Improper Materials
- Contain Pollutants
- Collect and Convey

Description

Irrigation water provided to landscaped areas may result in excess irrigation water being conveyed into stormwater drainage systems.

Approach

Project plan designs for development and redevelopment should include application methods of irrigation water that minimize runoff of excess irrigation water into the stormwater conveyance system.

Suitable Applications

Appropriate applications include residential, commercial and industrial areas planned for development or redevelopment. (Detached residential single-family homes are typically excluded from this requirement.)

Design Considerations

Designing New Installations

The following methods to reduce excessive irrigation runoff should be considered, and incorporated and implemented where determined applicable and feasible by the Permittee:

- Employ rain-triggered shutoff devices to prevent irrigation after precipitation.
- Design irrigation systems to each landscape area's specific water requirements.
- Include design featuring flow reducers or shutoff valves triggered by a pressure drop to control water loss in the event of broken sprinkler heads or lines.
- Implement landscape plans consistent with County or City water conservation resolutions, which may include provision of water sensors, programmable irrigation times (for short cycles), etc.



- Design timing and application methods of irrigation water to minimize the runoff of excess irrigation water into the storm water drainage system.
- Group plants with similar water requirements in order to reduce excess irrigation runoff and promote surface filtration. Choose plants with low irrigation requirements (for example, native or drought tolerant species). Consider design features such as:
 - Using mulches (such as wood chips or bar) in planter areas without ground cover to minimize sediment in runoff
 - Installing appropriate plant materials for the location, in accordance with amount of sunlight and climate, and use native plant materials where possible and/or as recommended by the landscape architect
 - Leaving a vegetative barrier along the property boundary and interior watercourses, to act as a pollutant filter, where appropriate and feasible
 - Choosing plants that minimize or eliminate the use of fertilizer or pesticides to sustain growth
- Employ other comparable, equally effective methods to reduce irrigation water runoff.

Redeveloping Existing Installations

Various jurisdictional stormwater management and mitigation plans (SUSMP, WQMP, etc.) define "redevelopment" in terms of amounts of additional impervious area, increases in gross floor area and/or exterior construction, and land disturbing activities with structural or impervious surfaces. The definition of "redevelopment" must be consulted to determine whether or not the requirements for new development apply to areas intended for redevelopment. If the definition applies, the steps outlined under "designing new installations" above should be followed.

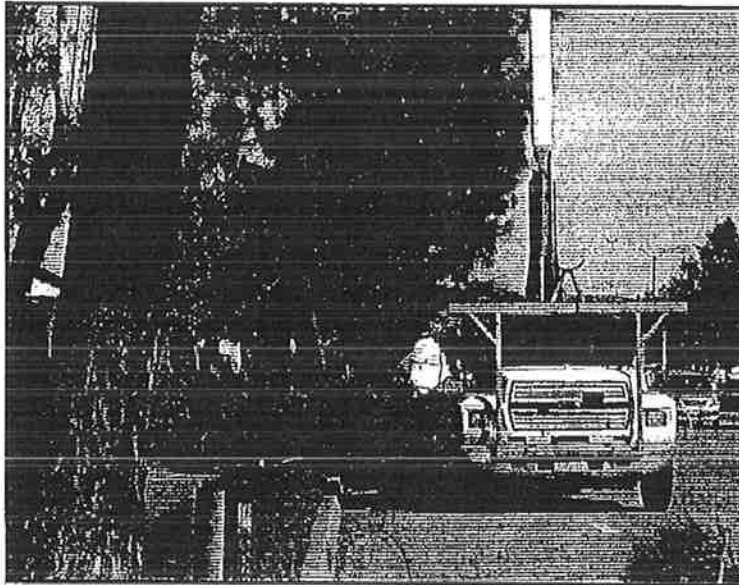
Other Resources

A Manual for the Standard Urban Stormwater Mitigation Plan (SUSMP), Los Angeles County Department of Public Works, May 2002.

Model Standard Urban Storm Water Mitigation Plan (SUSMP) for San Diego County, Port of San Diego, and Cities in San Diego County, February 14, 2002.

Model Water Quality Management Plan (WQMP) for County of Orange, Orange County Flood Control District, and the Incorporated Cities of Orange County, Draft February 2003.

Ventura Countywide Technical Guidance Manual for Stormwater Quality Control Measures, July 2002.



Description

Landscape maintenance activities include vegetation removal; herbicide and insecticide application; fertilizer application; watering; and other gardening and lawn care practices. Vegetation control typically involves a combination of chemical (herbicide) application and mechanical methods. All of these maintenance practices have the potential to contribute pollutants to the storm drain system. The major objectives of this BMP are to minimize the discharge of pesticides, herbicides and fertilizers to the storm drain system and receiving waters; prevent the disposal of landscape waste into the storm drain system by collecting and properly disposing of clippings and cuttings, and educating employees and the public.

Approach

Pollution Prevention

- Implement an integrated pest management (IPM) program. IPM is a sustainable approach to managing pests by combining biological, cultural, physical, and chemical tools.
- Choose low water using flowers, trees, shrubs, and groundcover.
- Consider alternative landscaping techniques such as naturscaping and xeriscaping.
- Conduct appropriate maintenance (i.e. properly timed fertilizing, weeding, pest control, and pruning) to help preserve the landscapes water efficiency.

Objectives

- Contain
- Educate
- Reduce/Minimize
- Product Substitution

Targeted Constituents

Sediment	<input checked="" type="checkbox"/>
Nutrients	<input checked="" type="checkbox"/>
Trash	<input checked="" type="checkbox"/>
Metals	
Bacteria	
Oil and Grease	
Organics	
Oxygen Demanding	<input checked="" type="checkbox"/>



- Consider grass cycling (grass cycling is the natural recycling of grass by leaving the clippings on the lawn when mowing. Grass clippings decompose quickly and release valuable nutrients back into the lawn).

Suggested Protocols

Mowing, Trimming, and Weeding

- Whenever possible use mechanical methods of vegetation removal (e.g. mowing with tractor-type or push mowers, hand cutting with gas or electric powered weed trimmers) rather than applying herbicides. Use hand weeding where practical.
- Avoid loosening the soil when conducting mechanical or manual weed control, this could lead to erosion. Use mulch or other erosion control measures when soils are exposed.
- Performing mowing at optimal times. Mowing should not be performed if significant rain events are predicted.
- Mulching mowers may be recommended for certain flat areas. Other techniques may be employed to minimize mowing such as selective vegetative planting using low maintenance grasses and shrubs.
- Collect lawn and garden clippings, pruning waste, tree trimmings, and weeds. Chip if necessary, and compost or dispose of at a landfill (see waste management section of this fact sheet).
- Place temporarily stockpiled material away from watercourses, and berm or cover stockpiles to prevent material releases to storm drains.

Planting

- Determine existing native vegetation features (location, species, size, function, importance) and consider the feasibility of protecting them. Consider elements such as their effect on drainage and erosion, hardiness, maintenance requirements, and possible conflicts between preserving vegetation and the resulting maintenance needs.
- Retain and/or plant selected native vegetation whose features are determined to be beneficial, where feasible. Native vegetation usually requires less maintenance (e.g., irrigation, fertilizer) than planting new vegetation.
- Consider using low water use groundcovers when planting or replanting.

Waste Management

- Compost leaves, sticks, or other collected vegetation or dispose of at a permitted landfill. Do not dispose of collected vegetation into waterways or storm drainage systems.
- Place temporarily stockpiled material away from watercourses and storm drain inlets, and berm or cover stockpiles to prevent material releases to the storm drain system.
- Reduce the use of high nitrogen fertilizers that produce excess growth requiring more frequent mowing or trimming.

- Avoid landscape wastes in and around storm drain inlets by either using bagging equipment or by manually picking up the material.

Irrigation

- Where practical, use automatic timers to minimize runoff.
- Use popup sprinkler heads in areas with a lot of activity or where there is a chance the pipes may be broken. Consider the use of mechanisms that reduce water flow to sprinkler heads if broken.
- Ensure that there is no runoff from the landscaped area(s) if re-claimed water is used for irrigation.
- If bailing of muddy water is required (e.g. when repairing a water line leak), do not put it in the storm drain; pour over landscaped areas.
- Irrigate slowly or pulse irrigate to prevent runoff and then only irrigate as much as is needed.
- Apply water at rates that do not exceed the infiltration rate of the soil.

Fertilizer and Pesticide Management

- Utilize a comprehensive management system that incorporates integrated pest management (IPM) techniques. There are many methods and types of IPM, including the following:
 - Mulching can be used to prevent weeds where turf is absent, fencing installed to keep rodents out, and netting used to keep birds and insects away from leaves and fruit.
 - Visible insects can be removed by hand (with gloves or tweezers) and placed in soapy water or vegetable oil. Alternatively, insects can be sprayed off the plant with water or in some cases vacuumed off of larger plants.
 - Store-bought traps, such as species-specific, pheromone-based traps or colored sticky cards, can be used.
 - Slugs can be trapped in small cups filled with beer that are set in the ground so the slugs can get in easily.
 - In cases where microscopic parasites, such as bacteria and fungi, are causing damage to plants, the affected plant material can be removed and disposed of (pruning equipment should be disinfected with bleach to prevent spreading the disease organism).
 - Small mammals and birds can be excluded using fences, netting, tree trunk guards.
 - Beneficial organisms, such as bats, birds, green lacewings, ladybugs, praying mantis, ground beetles, parasitic nematodes, trichogramma wasps, seed head weevils, and spiders that prey on detrimental pest species can be promoted.
- Follow all federal, state, and local laws and regulations governing the use, storage, and disposal of fertilizers and pesticides and training of applicators and pest control advisors.

- Use pesticides only if there is an actual pest problem (not on a regular preventative schedule).
- Do not use pesticides if rain is expected. Apply pesticides only when wind speeds are low (less than 5 mph).
- Do not mix or prepare pesticides for application near storm drains.
- Prepare the minimum amount of pesticide needed for the job and use the lowest rate that will effectively control the pest.
- Employ techniques to minimize off-target application (e.g. spray drift) of pesticides, including consideration of alternative application techniques.
- Fertilizers should be worked into the soil rather than dumped or broadcast onto the surface.
- Calibrate fertilizer and pesticide application equipment to avoid excessive application.
- Periodically test soils for determining proper fertilizer use.
- Sweep pavement and sidewalk if fertilizer is spilled on these surfaces before applying irrigation water.
- Purchase only the amount of pesticide that you can reasonably use in a given time period (month or year depending on the product).
- Triple rinse containers, and use rinse water as product. Dispose of unused pesticide as hazardous waste.
- Dispose of empty pesticide containers according to the instructions on the container label.

Inspection

- Inspect irrigation system periodically to ensure that the right amount of water is being applied and that excessive runoff is not occurring. Minimize excess watering, and repair leaks in the irrigation system as soon as they are observed.
- Inspect pesticide/fertilizer equipment and transportation vehicles daily.

Training

- Educate and train employees on use of pesticides and in pesticide application techniques to prevent pollution. Pesticide application must be under the supervision of a California qualified pesticide applicator.
- Train/encourage municipal maintenance crews to use IPM techniques for managing public green areas.
- Annually train employees within departments responsible for pesticide application on the appropriate portions of the agency's IPM Policy, SOPs, and BMPs, and the latest IPM techniques.

- Employees who are not authorized and trained to apply pesticides should be periodically (at least annually) informed that they cannot use over-the-counter pesticides in or around the workplace.
- Use a training log or similar method to document training.

Spill Response and Prevention

- Refer to SC-11, Spill Prevention, Control & Cleanup
- Have spill cleanup materials readily available and in a known location
- Cleanup spills immediately and use dry methods if possible.
- Properly dispose of spill cleanup material.

Other Considerations

- The Federal Pesticide, Fungicide, and Rodenticide Act and California Title 3, Division 6, Pesticides and Pest Control Operations place strict controls over pesticide application and handling and specify training, annual refresher, and testing requirements. The regulations generally cover: a list of approved pesticides and selected uses, updated regularly; general application information; equipment use and maintenance procedures; and record keeping. The California Department of Pesticide Regulations and the County Agricultural Commission coordinate and maintain the licensing and certification programs. All public agency employees who apply pesticides and herbicides in "agricultural use" areas such as parks, golf courses, rights-of-way and recreation areas should be properly certified in accordance with state regulations. Contracts for landscape maintenance should include similar requirements.
- All employees who handle pesticides should be familiar with the most recent material safety data sheet (MSDS) files.
- Municipalities do not have the authority to regulate the use of pesticides by school districts, however the California Healthy Schools Act of 2000 (AB 2260) has imposed requirements on California school districts regarding pesticide use in schools. Posting of notification prior to the application of pesticides is now required, and IPM is stated as the preferred approach to pest management in schools.

Requirements

Costs

Additional training of municipal employees will be required to address IPM techniques and BMPs. IPM methods will likely increase labor cost for pest control which may be offset by lower chemical costs.

Maintenance

Not applicable

Supplemental Information***Further Detail of the BMP******Waste Management***

Composting is one of the better disposal alternatives if locally available. Most municipalities either have or are planning yard waste composting facilities as a means of reducing the amount of waste going to the landfill. Lawn clippings from municipal maintenance programs as well as private sources would probably be compatible with most composting facilities

Contractors and Other Pesticide Users

Municipal agencies should develop and implement a process to ensure that any contractor employed to conduct pest control and pesticide application on municipal property engages in pest control methods consistent with the IPM Policy adopted by the agency. Specifically, municipalities should require contractors to follow the agency's IPM policy, SOPs, and BMPs; provide evidence to the agency of having received training on current IPM techniques when feasible; provide documentation of pesticide use on agency property to the agency in a timely manner.

References and Resources

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

Los Angeles County Stormwater Quality Model Programs. Public Agency Activities
http://ladpw.org/wmd/npdes/model_links.cfm

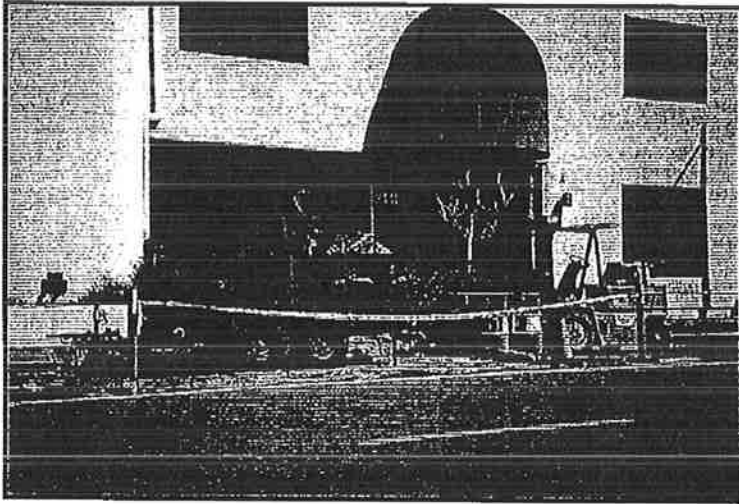
Model Urban Runoff Program: A How-To Guide for Developing Urban Runoff Programs for Small Municipalities. Prepared by City of Monterey, City of Santa Cruz, California Coastal Commission, Monterey Bay National Marine Sanctuary, Association of Monterey Bay Area Governments, Woodward-Clyde, Central Coast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

Orange County Stormwater Program
http://www.ocwatersheds.com/StormWater/swp_introduction.asp

Santa Clara Valley Urban Runoff Pollution Prevention Program. 1997 Urban Runoff Management Plan. September 1997, updated October 2000.

United States Environmental Protection Agency (USEPA). 2002. Pollution Prevention/Good Housekeeping for Municipal Operations Landscaping and Lawn Care. Office of Water. Office of Wastewater Management. On-line: http://www.epa.gov/npdes/menuofbmps/poll_8.htm

Spill Prevention, Control & Cleanup SC-11



Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution

Description

Spills and leaks, if not properly controlled, can adversely impact the storm drain system and receiving waters. Due to the type of work or the materials involved, many activities that occur either at a municipal facility or as a part of municipal field programs have the potential for accidental spills and leaks. Proper spill response planning and preparation can enable municipal employees to effectively respond to problems when they occur and minimize the discharge of pollutants to the environment.

Approach

- An effective spill response and control plan should include:
 - Spill/leak prevention measures;
 - Spill response procedures;
 - Spill cleanup procedures;
 - Reporting; and
 - Training
- A well thought out and implemented plan can prevent pollutants from entering the storm drainage system and can be used as a tool for training personnel to prevent and control future spills as well.

Pollution Prevention

- Develop and implement a Spill Prevention Control and Response Plan. The plan should include:

Targeted Constituents

Sediment	
Nutrients	<input checked="" type="checkbox"/>
Trash	
Metals	<input checked="" type="checkbox"/>
Bacteria	
Oil and Grease	<input checked="" type="checkbox"/>
Organics	<input checked="" type="checkbox"/>
Oxygen Demanding	<input checked="" type="checkbox"/>



SC-11 Spill Prevention, Control & Cleanup

- A description of the facility, the address, activities and materials involved
- Identification of key spill response personnel
- Identification of the potential spill areas or operations prone to spills/leaks
- Identification of which areas should be or are bermed to contain spills/leaks
- Facility map identifying the key locations of areas, activities, materials, structural BMPs, etc.
- Material handling procedures
- Spill response procedures including:
 - Assessment of the site and potential impacts
 - Containment of the material
 - Notification of the proper personnel and evacuation procedures
 - Clean up of the site
 - Disposal of the waste material and
 - Proper record keeping
- Product substitution – use less toxic materials (i.e. use water based paints instead of oil based paints)
- Recycle, reclaim, or reuse materials whenever possible. This will reduce the amount of materials that are brought into the facility or into the field.

Suggested Protocols

Spill/Leak Prevention Measures

- If possible, move material handling indoors, under cover, or away from storm drains or sensitive water bodies.
- Properly label all containers so that the contents are easily identifiable.
- Berm storage areas so that if a spill or leak occurs, the material is contained.
- Cover outside storage areas either with a permanent structure or with a seasonal one such as a tarp so that rain can not come into contact with the materials.
- Check containers (and any containment sumps) often for leaks and spills. Replace containers that are leaking, corroded, or otherwise deteriorating with containers in good condition. Collect all spilled liquids and properly dispose of them.

Spill Prevention, Control & Cleanup SC-11

- Store, contain and transfer liquid materials in such a manner that if the container is ruptured or the contents spilled, they will not discharge, flow or be washed into the storm drainage system, surface waters, or groundwater.
- Place drip pans or absorbent materials beneath all mounted taps and at all potential drip and spill locations during the filling and unloading of containers. Any collected liquids or soiled absorbent materials should be reused/recycled or properly disposed of.
- For field programs, only transport the minimum amount of material needed for the daily activities and transfer materials between containers at a municipal yard where leaks and spill are easier to control.
- If paved, sweep and clean storage areas monthly, do not use water to hose down the area unless all of the water will be collected and disposed of properly.
- Install a spill control device (such as a tee section) in any catch basins that collect runoff from any storage areas if the materials stored are oil, gas, or other materials that separate from and float on water. This will allow for easier cleanup if a spill occurs.
- If necessary, protect catch basins while conducting field activities so that if a spill occurs, the material will be contained.

Training

- Educate employees about spill prevention, spill response and cleanup on a routine basis.
- Well-trained employees can reduce human errors that lead to accidental releases or spills:
 - The employees should have the tools and knowledge to immediately begin cleaning up a spill if one should occur.
 - Employees should be familiar with the Spill Prevention Control and Countermeasure Plan if one is available.
- Training of staff from all municipal departments should focus on recognizing and reporting potential or current spills/leaks and who they should contact.
- Employees responsible for aboveground storage tanks and liquid transfers for large bulk containers should be thoroughly familiar with the Spill Prevention Control and Countermeasure Plan and the plan should be readily available.

Spill Response and Prevention

- Identify key spill response personnel and train employees on who they are.
- Store and maintain appropriate spill cleanup materials in a clearly marked location near storage areas; and train employees to ensure familiarity with the site's spill control plan and/or proper spill cleanup procedures.
- Locate spill cleanup materials, such as absorbents, where they will be readily accessible (e.g. near storage and maintenance areas, on field trucks).

SC-11 Spill Prevention, Control & Cleanup

- Follow the Spill Prevention Control and Countermeasure Plan if one is available.
- If a spill occurs, notify the key spill response personnel immediately. If the material is unknown or hazardous, the local fire department may also need to be contacted.
- If safe to do so, attempt to contain the material and block the nearby storm drains so that the area impacted is minimized. If the material is unknown or hazardous wait for properly trained personnel to contain the materials.
- Perform an assessment of the area where the spill occurred and the downstream area that it could impact. Relay this information to the key spill response and clean up personnel.

Spill Cleanup Procedures

- Small non-hazardous spills
 - Use a rag, damp cloth or absorbent materials for general clean up of liquids
 - Use brooms or shovels for the general clean up of dry materials
 - If water is used, it must be collected and properly disposed of. The wash water can not be allowed to enter the storm drain.
 - Dispose of any waste materials properly
 - Clean or dispose of any equipment used to clean up the spill properly
- Large non-hazardous spills
 - Use absorbent materials for general clean up of liquids
 - Use brooms, shovels or street sweepers for the general clean up of dry materials
 - If water is used, it must be collected and properly disposed of. The wash water can not be allowed to enter the storm drain.
 - Dispose of any waste materials properly
 - Clean or dispose of any equipment used to clean up the spill properly
- For hazardous or very large spills, a private cleanup company or Hazmat team may need to be contacted to assess the situation and conduct the cleanup and disposal of the materials.
- Chemical cleanups of material can be achieved with the use of absorbents, gels, and foams. Remove the adsorbent materials promptly and dispose of according to regulations.
- If the spilled material is hazardous, then the used cleanup materials are also hazardous and must be sent to a certified laundry (rags) or disposed of as hazardous waste.

Reporting

- Report any spills immediately to the identified key municipal spill response personnel.

Spill Prevention, Control & Cleanup SC-11

- Report spills in accordance with applicable reporting laws. Spills that pose an immediate threat to human health or the environment must be reported immediately to the Office of Emergency Service (OES)
- Spills that pose an immediate threat to human health or the environment may also need to be reported within 24 hours to the Regional Water Quality Control Board.
- Federal regulations require that any oil spill into a water body or onto an adjoining shoreline be reported to the National Response Center (NRC) at 800-424-8802 (24 hour)
- After the spill has been contained and cleaned up, a detailed report about the incident should be generated and kept on file (see the section on Reporting below). The incident may also be used in briefing staff about proper procedures

Other Considerations

- A Spill Prevention Control and Countermeasure Plan (SPCC) is required for facilities that are subject to the oil pollution regulations specified in Part 112 of Title 40 of the Code of Federal Regulations or if they have a storage capacity of 10,000 gallons or more of petroleum. (Health and Safety Code 6.67)
- State regulations also exist for storage of hazardous materials (Health & Safety Code Chapter 6.95), including the preparation of area and business plans for emergency response to the releases or threatened releases.
- Consider requiring smaller secondary containment areas (less than 200 sq. ft.) to be connected to the sanitary sewer, if permitted to do so, prohibiting any hard connections to the storm drain.

Requirements

Costs

- Will vary depending on the size of the facility and the necessary controls.
- Prevention of leaks and spills is inexpensive. Treatment and/or disposal of wastes, contaminated soil and water is very expensive

Maintenance

- This BMP has no major administrative or staffing requirements. However, extra time is needed to properly handle and dispose of spills, which results in increased labor costs

Supplemental Information

Further Detail of the BMP

Reporting

Record keeping and internal reporting represent good operating practices because they can increase the efficiency of the response and containment of a spill. A good record keeping system helps the municipality minimize incident recurrence, correctly respond with appropriate containment and cleanup activities, and comply with legal requirements.

SC-11 Spill Prevention, Control & Cleanup

A record keeping and reporting system should be set up for documenting spills, leaks, and other discharges, including discharges of hazardous substances in reportable quantities. Incident records describe the quality and quantity of non-stormwater discharges to the storm drain.

These records should contain the following information:

- Date and time of the incident
- Weather conditions
- Duration of the spill/leak/discharge
- Cause of the spill/leak/discharge
- Response procedures implemented
- Persons notified
- Environmental problems associated with the spill/leak/discharge

Separate record keeping systems should be established to document housekeeping and preventive maintenance inspections, and training activities. All housekeeping and preventive maintenance inspections should be documented. Inspection documentation should contain the following information:

- The date and time the inspection was performed
- Name of the inspector
- Items inspected
- Problems noted
- Corrective action required
- Date corrective action was taken

Other means to document and record inspection results are field notes, timed and dated photographs, videotapes, and drawings and maps.

Examples

The City of Palo Alto includes spill prevention and control as a major element of its highly effective program for municipal vehicle maintenance shops.

References and Resources

King County Stormwater Pollution Control Manual - <http://dnr.metrokc.gov/wlr/dss/spcm.htm>

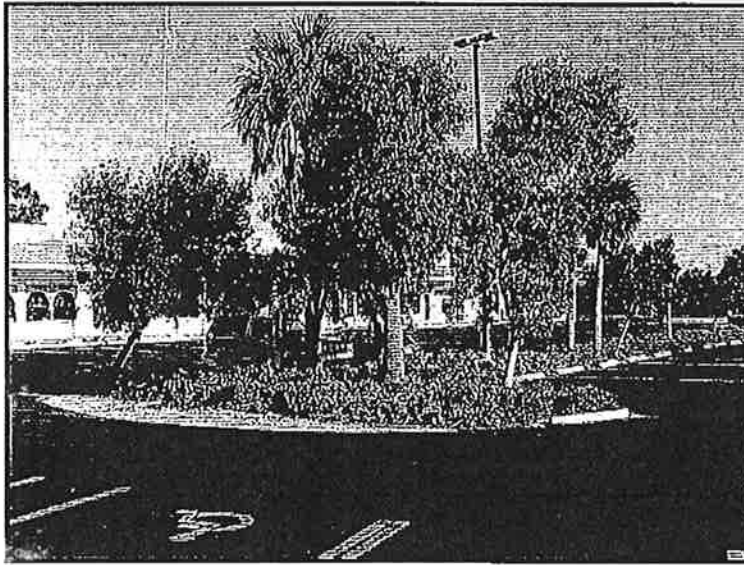
Orange County Stormwater Program
http://www.ocwatersheds.com/stormwater/swp_introduction.asp

Spill Prevention, Control & Cleanup SC-11

San Diego Stormwater Co-permittees Jurisdictional Urban Runoff Management Program
(URMP)

<http://www.projectcleanwater.org/pdf/Model%20Program%20Municipal%20Facilities.pdf>

Parking/Storage Area Maintenance SC-43



Description

Parking lots and storage areas can contribute a number of substances, such as trash, suspended solids, hydrocarbons, oil and grease, and heavy metals that can enter receiving waters through stormwater runoff or non-stormwater discharges. The protocols in this fact sheet are intended to prevent or reduce the discharge of pollutants from parking/storage areas and include using good housekeeping practices, following appropriate cleaning BMPs, and training employees.

Approach

The goal of this program is to ensure stormwater pollution prevention practices are considered when conducting activities on or around parking areas and storage areas to reduce potential for pollutant discharge to receiving waters. Successful implementation depends on effective training of employees on applicable BMPs and general pollution prevention strategies and objectives.

Pollution Prevention

- Encourage alternative designs and maintenance strategies for impervious parking lots. (See New Development and Redevelopment BMP Handbook)
- Keep accurate maintenance logs to evaluate BMP implementation.

Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution

Targeted Constituents

Sediment	✓
Nutrients	
Trash	✓
Metals	✓
Bacteria	
Oil and Grease	✓
Organics	✓



SC-43 Parking/Storage Area Maintenance

Suggested Protocols

General

- Keep the parking and storage areas clean and orderly. Remove debris in a timely fashion.
- Allow sheet runoff to flow into biofilters (vegetated strip and swale) and/or infiltration devices.
- Utilize sand filters or oleophilic collectors for oily waste in low quantities.
- Arrange rooftop drains to prevent drainage directly onto paved surfaces.
- Design lot to include semi-permeable hardscape.
- Discharge soapy water remaining in mop or wash buckets to the sanitary sewer through a sink, toilet, clean-out, or wash area with drain.

Controlling Litter

- Post "No Littering" signs and enforce anti-litter laws.
- Provide an adequate number of litter receptacles.
- Clean out and cover litter receptacles frequently to prevent spillage.
- Provide trash receptacles in parking lots to discourage litter.
- Routinely sweep, shovel, and dispose of litter in the trash.

Surface Cleaning

- Use dry cleaning methods (e.g., sweeping, vacuuming) to prevent the discharge of pollutants into the stormwater conveyance system if possible.
- Establish frequency of public parking lot sweeping based on usage and field observations of waste accumulation.
- Sweep all parking lots at least once before the onset of the wet season.
- Follow the procedures below if water is used to clean surfaces:
 - Block the storm drain or contain runoff.
 - Collect and pump wash water to the sanitary sewer or discharge to a pervious surface. Do not allow wash water to enter storm drains.
 - Dispose of parking lot sweeping debris and dirt at a landfill.
- Follow the procedures below when cleaning heavy oily deposits:
 - Clean oily spots with absorbent materials.
 - Use a screen or filter fabric over inlet, then wash surfaces.

Parking/Storage Area Maintenance SC-43

- Do not allow discharges to the storm drain.
- Vacuum/pump discharges to a tank or discharge to sanitary sewer.
- Appropriately dispose of spilled materials and absorbents.

Surface Repair

- Preheat, transfer or load hot bituminous material away from storm drain inlets.
- Apply concrete, asphalt, and seal coat during dry weather to prevent contamination from contacting stormwater runoff.
- Cover and seal nearby storm drain inlets where applicable (with waterproof material or mesh) and manholes before applying seal coat, slurry seal, etc. Leave covers in place until job is complete and all water from emulsified oil sealants has drained or evaporated. Clean any debris from these covered manholes and drains for proper disposal.
- Use only as much water as necessary for dust control, to avoid runoff.
- Catch drips from paving equipment that is not in use with pans or absorbent material placed under the machines. Dispose of collected material and absorbents properly.

Inspection

- Have designated personnel conduct inspections of parking facilities and stormwater conveyance systems associated with parking facilities on a regular basis.
- Inspect cleaning equipment/sweepers for leaks on a regular basis.

Training

- Provide regular training to field employees and/or contractors regarding cleaning of paved areas and proper operation of equipment.
- Train employees and contractors in proper techniques for spill containment and cleanup.

Spill Response and Prevention

- Keep your Spill Prevention Control and Countermeasure (SPCC) Plan up-to-date.
- Place a stockpile of spill cleanup materials where it will be readily accessible or at a central location.
- Clean up fluid spills immediately with absorbent rags or material.
- Dispose of spilled material and absorbents properly.

Other Considerations

Limitations related to sweeping activities at large parking facilities may include high equipment costs, the need for sweeper operator training, and the inability of current sweeper technology to remove oil and grease.

SC-43 Parking/Storage Area Maintenance

Requirements

Costs

Cleaning/sweeping costs can be quite large. Construction and maintenance of stormwater structural controls can be quite expensive as well.

Maintenance

- Sweep parking lot regularly to minimize cleaning with water.
- Clean out oil/water/sand separators regularly, especially after heavy storms.
- Clean parking facilities regularly to prevent accumulated wastes and pollutants from being discharged into conveyance systems during rainy conditions.

Supplemental Information

Further Detail of the BMP

Surface Repair

Apply concrete, asphalt, and seal coat during dry weather to prevent contamination from contacting stormwater runoff. Where applicable, cover and seal nearby storm drain inlets (with waterproof material or mesh) and manholes before applying seal coat, slurry seal, etc. Leave covers in place until job is complete and all water from emulsified oil sealants has drained or evaporated. Clean any debris from these covered manholes and drains for proper disposal. Only use only as much water as is necessary for dust control to avoid runoff.

References and Resources

California's Nonpoint Source Program Plan <http://www.swrcb.ca.gov/nps/index.html>

Clark County Storm Water Pollution Control Manual
<http://www.co.clark.wa.us/pubworks/bmpman.pdf>

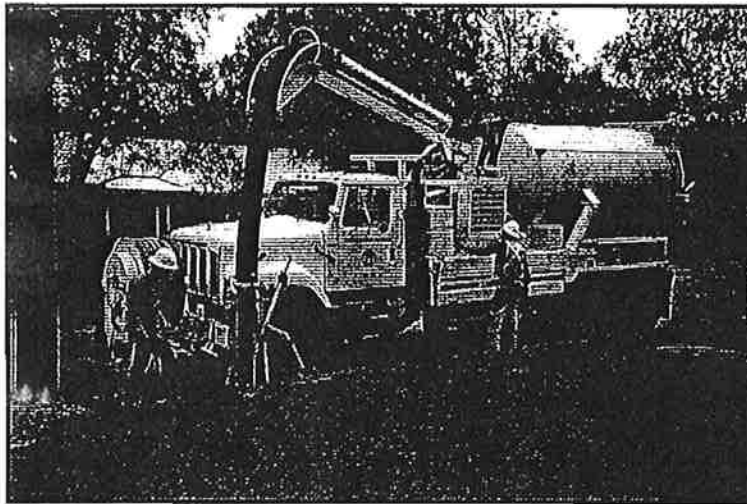
King County Storm Water Pollution Control Manual <http://dnr.metrokc.gov/wlr/dss/spcm.htm>

Pollution from Surface Cleaning Folder. 1996. Bay Area Stormwater Management Agencies Association (BASMAA). <http://www.basmaa.org/>

Oregon Association of Clean Water Agencies. Oregon Municipal Stormwater Toolbox for Maintenance Practices. June 1998.

Santa Clara Valley Urban Runoff Pollution Prevention Program <http://www.scvurppp.org>

The Storm Water Managers Resource Center <http://www.stormwatercenter.net/>



Description

As a consequence of its function, the stormwater conveyance system collects and transports urban runoff and stormwater that may contain certain pollutants. The protocols in this fact sheet are intended to reduce pollutants reaching receiving waters through proper conveyance system operation and maintenance.

Approach

Pollution Prevention

Maintain catch basins, stormwater inlets, and other stormwater conveyance structures on a regular basis to remove pollutants, reduce high pollutant concentrations during the first flush of storms, prevent clogging of the downstream conveyance system, restore catch basins' sediment trapping capacity, and ensure the system functions properly hydraulically to avoid flooding.

Suggested Protocols

Catch Basins/Inlet Structures

- Staff should regularly inspect facilities to ensure compliance with the following:
 - Immediate repair of any deterioration threatening structural integrity.
 - Cleaning before the sump is 40% full. Catch basins should be cleaned as frequently as needed to meet this standard.
 - Stenciling of catch basins and inlets (see SC34 Waste Handling and Disposal).

Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize

Targeted Constituents

Sediment	✓
Nutrients	
Trash	✓
Metals	
Bacteria	✓
Oil and Grease	
Organics	



SC-44 Drainage System Maintenance

- Clean catch basins, storm drain inlets, and other conveyance structures before the wet season to remove sediments and debris accumulated during the summer.
- Conduct inspections more frequently during the wet season for problem areas where sediment or trash accumulates more often. Clean and repair as needed.
- Keep accurate logs of the number of catch basins cleaned.
- Store wastes collected from cleaning activities of the drainage system in appropriate containers or temporary storage sites in a manner that prevents discharge to the storm drain.
- Dewater the wastes if necessary with outflow into the sanitary sewer if permitted. Water should be treated with an appropriate filtering device prior to discharge to the sanitary sewer. If discharge to the sanitary sewer is not allowed, water should be pumped or vacuumed to a tank and properly disposed. Do not dewater near a storm drain or stream.

Storm Drain Conveyance System

- Locate reaches of storm drain with deposit problems and develop a flushing schedule that keeps the pipe clear of excessive buildup.
- Collect and pump flushed effluent to the sanitary sewer for treatment whenever possible.

Pump Stations

- Clean all storm drain pump stations prior to the wet season to remove silt and trash.
- Do not allow discharge to reach the storm drain system when cleaning a storm drain pump station or other facility.
- Conduct routine maintenance at each pump station.
- Inspect, clean, and repair as necessary all outlet structures prior to the wet season.

Open Channel

- Modify storm channel characteristics to improve channel hydraulics, increase pollutant removals, and enhance channel/creek aesthetic and habitat value.
- Conduct channel modification/improvement in accordance with existing laws. Any person, government agency, or public utility proposing an activity that will change the natural (emphasis added) state of any river, stream, or lake in California, must enter into a Stream or Lake Alteration Agreement with the Department of Fish and Game. The developer-applicant should also contact local governments (city, county, special districts), other state agencies (SWRCB, RWQCB, Department of Forestry, Department of Water Resources), and Federal Corps of Engineers and USFWS.

Illicit Connections and Discharges

- Look for evidence of illegal discharges or illicit connections during routine maintenance of conveyance system and drainage structures:
 - Is there evidence of spills such as paints, discoloring, etc?

- Are there any odors associated with the drainage system?
- Record locations of apparent illegal discharges/illicit connections?
- Track flows back to potential dischargers and conduct aboveground inspections. This can be done through visual inspection of upgradient manholes or alternate techniques including zinc chloride smoke testing, fluorometric dye testing, physical inspection testing, or television camera inspection.
- Eliminate the discharge once the origin of flow is established.
- Stencil or demarcate storm drains, where applicable, to prevent illegal disposal of pollutants. Storm drain inlets should have messages such as “Dump No Waste Drains to Stream” stenciled next to them to warn against ignorant or intentional dumping of pollutants into the storm drainage system.
- Refer to fact sheet SC-10 Non-Stormwater Discharges.

Illegal Dumping

- Inspect and clean up hot spots and other storm drainage areas regularly where illegal dumping and disposal occurs.
- Establish a system for tracking incidents. The system should be designed to identify the following:
 - Illegal dumping hot spots
 - Types and quantities (in some cases) of wastes
 - Patterns in time of occurrence (time of day/night, month, or year)
 - Mode of dumping (abandoned containers, “midnight dumping” from moving vehicles, direct dumping of materials, accidents/spills)
 - Responsible parties
- Post “No Dumping” signs in problem areas with a phone number for reporting dumping and disposal. Signs should also indicate fines and penalties for illegal dumping.
- Refer to fact sheet SC-10 Non-Stormwater Discharges.

Training

- Train crews in proper maintenance activities, including record keeping and disposal.
- Allow only properly trained individuals to handle hazardous materials/wastes.
- Have staff involved in detection and removal of illicit connections trained in the following:
 - OSHA-required Health and Safety Training (29 CFR 1910.120) plus annual refresher training (as needed).

- OSHA Confined Space Entry training (Cal-OSHA Confined Space, Title 8 and Federal OSHA 29 CFR 1910.146).
- Procedural training (field screening, sampling, smoke/dye testing, TV inspection).

Spill Response and Prevention

- Investigate all reports of spills, leaks, and/or illegal dumping promptly.
- Clean up all spills and leaks using “dry” methods (with absorbent materials and/or rags) or dig up, remove, and properly dispose of contaminated soil.
- Refer to fact sheet SC-11 Spill Prevention, Control, and Cleanup.

Other Considerations (Limitations and Regulations)

- Clean-up activities may create a slight disturbance for local aquatic species. Access to items and material on private property may be limited. Trade-offs may exist between channel hydraulics and water quality/riparian habitat. If storm channels or basins are recognized as wetlands, many activities, including maintenance, may be subject to regulation and permitting.
- Storm drain flushing is most effective in small diameter pipes (36-inch diameter pipe or less, depending on water supply and sediment collection capacity). Other considerations associated with storm drain flushing may include the availability of a water source, finding a downstream area to collect sediments, liquid/sediment disposal, and prohibition against disposal of flushed effluent to sanitary sewer in some areas.
- Regulations may include adoption of substantial penalties for illegal dumping and disposal.
- Local municipal codes may include sections prohibiting discharge of soil, debris, refuse, hazardous wastes, and other pollutants into the storm drain system.

Requirements***Costs***

- An aggressive catch basin cleaning program could require a significant capital and O&M budget.
- The elimination of illegal dumping is dependent on the availability, convenience, and cost of alternative means of disposal. The primary cost is for staff time. Cost depends on how aggressively a program is implemented. Other cost considerations for an illegal dumping program include:
 - Purchase and installation of signs.
 - Rental of vehicle(s) to haul illegally-disposed items and material to landfills.
 - Rental of heavy equipment to remove larger items (e.g., car bodies) from channels.
 - Purchase of landfill space to dispose of illegally-dumped items and material.

- Methods used for illicit connection detection (smoke testing, dye testing, visual inspection, and flow monitoring) can be costly and time-consuming. Site-specific factors, such as the level of impervious area, the density and ages of buildings, and type of land use will determine the level of investigation necessary.

Maintenance

- Two-person teams may be required to clean catch basins with vacuor trucks.
- Teams of at least two people plus administrative personnel are required to identify illicit discharges, depending on the complexity of the storm sewer system.
- Arrangements must be made for proper disposal of collected wastes.
- Technical staff are required to detect and investigate illegal dumping violations.

Supplemental Information

Further Detail of the BMP

Storm Drain Flushing

Flushing is a common maintenance activity used to improve pipe hydraulics and to remove pollutants in storm drainage systems. Flushing may be designed to hydraulically convey accumulated material to strategic locations, such as an open channel, another point where flushing will be initiated, or the sanitary sewer and the treatment facilities, thus preventing resuspension and overflow of a portion of the solids during storm events. Flushing prevents “plug flow” discharges of concentrated pollutant loadings and sediments. Deposits can hinder the designed conveyance capacity of the storm drain system and potentially cause backwater conditions in severe cases of clogging.

Storm drain flushing usually takes place along segments of pipe with grades that are too flat to maintain adequate velocity to keep particles in suspension. An upstream manhole is selected to place an inflatable device that temporarily plugs the pipe. Further upstream, water is pumped into the line to create a flushing wave. When the upstream reach of pipe is sufficiently full to cause a flushing wave, the inflated device is rapidly deflated with the assistance of a vacuum pump, thereby releasing the backed up water and resulting in the cleaning of the storm drain segment.

To further reduce impacts of stormwater pollution, a second inflatable device placed well downstream may be used to recollect the water after the force of the flushing wave has dissipated. A pump may then be used to transfer the water and accumulated material to the sanitary sewer for treatment. In some cases, an interceptor structure may be more practical or required to recollect the flushed waters.

It has been found that cleansing efficiency of periodic flush waves is dependent upon flush volume, flush discharge rate, sewer slope, sewer length, sewer flow rate, sewer diameter, and population density. As a rule of thumb, the length of line to be flushed should not exceed 700 feet. At this maximum recommended length, the percent removal efficiency ranges between 65-75% for organics and 55-65% for dry weather grit/inorganic material. The percent removal efficiency drops rapidly beyond that. Water is commonly supplied by a water truck, but fire hydrants can also supply water. To make the best use of water, it is recommended that reclaimed water be used or that fire hydrant line flushing coincide with storm sewer flushing.

SC-44 Drainage System Maintenance

References and Resources

California's Nonpoint Source Program Plan <http://www.swrcb.ca.gov/nps/index.html>

Clark County Storm Water Pollution Control Manual
<http://www.co.clark.wa.us/pubworks/bmpman.pdf>

Ferguson, B.K. 1991. Urban Stream Reclamation, p. 324-322, Journal of Soil and Water Conservation.

King County Storm Water Pollution Control Manual <http://dnr.metrokc.gov/wlr/dss/spcm.htm>

Oregon Association of Clean Water Agencies. Oregon Municipal Stormwater Toolbox for Maintenance Practices. June 1998.

Santa Clara Valley Urban Runoff Pollution Prevention Program <http://www.scvurppp.org>

The Storm Water Managers Resource Center <http://www.stormwatercenter.net>

United States Environmental Protection Agency (USEPA). 2002. Pollution Prevention/Good Housekeeping for Municipal Operations Storm Drain System Cleaning. On line:
http://www.epa.gov/npdes/menuofbmps/poll_16.htm

General Categories of Pollutants of Concern

- **Pathogens** – Pathogens (bacteria and viruses) are ubiquitous microorganisms that thrive under certain environmental conditions. Their proliferation is typically caused by the transport of animal or human fecal wastes from the watershed. Water, containing excessive bacteria and viruses can alter the aquatic habitat and create a harmful environment for humans and aquatic life. Also, the decomposition of excess organic waste causes increased growth of undesirable organisms in the water.
- **Metals** – The primary source of metal pollution in Urban Runoff is typically commercially available metals and metal products. Metals of concern include cadmium, chromium, copper, lead, mercury, and zinc. Lead and chromium have been used as corrosion inhibitors in primer coatings and cooling tower systems. Metals are also raw material components in non-metal products such as fuels, adhesives, paints, and other coatings. At low concentrations naturally occurring in soil, metals may not be toxic. However, at higher concentrations, certain metals can be toxic to aquatic life. Humans can be impacted from contaminated groundwater resources, and bioaccumulation of metals in fish and shellfish. Environmental concerns, regarding the potential for release of metals to the environment, have already led to restricted metal usage in certain applications.
- **Nutrients** – Nutrients are inorganic substances, such as nitrogen and phosphorus. They commonly exist in the form of mineral salts that are either dissolved or suspended in water. Primary sources of nutrients in Urban Runoff are fertilizers and eroded soils. Excessive discharge of nutrients to water bodies and streams can cause excessive aquatic algae and plant growth. Such excessive production, referred to as cultural eutrophication, may lead to excessive decay of organic matter in the water body, loss of oxygen in the water, release of toxins in sediment, and the eventual death of aquatic organisms.
- **Pesticides** – Pesticides (including herbicides) are chemical compounds commonly used to control nuisance growth or prevalence of organisms. Excessive or improper application of a pesticide may result in runoff containing toxic levels of its active ingredient.
- **Organic Compounds** – Organic compounds are carbon-based. Commercially available or naturally occurring organic compounds are found in pesticides, solvents, and hydrocarbons. Organic compounds can, at certain concentrations, indirectly or directly constitute a hazard to life or health. When rinsing off objects, toxic levels of solvents and cleaning compounds can be discharged to the MS4. Dirt, grease, and grime retained in the cleaning fluid or rinse water may also adsorb levels of organic compounds that are harmful or hazardous to aquatic life.
- **Sediments** – Sediments are soils or other surficial materials eroded and then transported or deposited by the action of wind, water, ice, or gravity. Sediments can increase turbidity, clog fish gills, reduce spawning habitat, lower young aquatic organisms survival rates, smother bottom dwelling organisms, and suppress aquatic vegetation growth.
- **Trash and Debris** – Trash (such as paper, plastic, polystyrene packing foam, and aluminum materials) and biodegradable organic matter (such as leaves, grass cuttings, and food waste) are general waste products on the landscape. The presence of trash and debris may have a significant impact on the recreational value of a water body and aquatic habitat. Excess organic matter can create a high biochemical oxygen demand in a stream and thereby lower its water quality. In addition, in areas where stagnant water exists, the presence of excess organic matter can promote septic conditions resulting in the growth of undesirable organisms and the release of odorous and hazardous compounds such as hydrogen sulfide.
- **Oxygen-Demanding Substances** – This category includes biodegradable organic material as well as chemicals that react with dissolved oxygen in water to form other compounds. Proteins,

carbohydrates, and fats are examples of biodegradable organic compounds. Compounds such as ammonia and hydrogen sulfide are examples of oxygen-demanding compounds. The oxygen demand of a substance can lead to depletion of dissolved oxygen in a water body and possibly the development of septic conditions.

- **Oil and Grease** – Oil and grease are characterized as high-molecular weight organic compounds. Primary sources of oil and grease are petroleum hydrocarbon products, motor products from leaking vehicles, esters, oils, fats, waxes, and high molecular-weight fatty acids. Introduction of these pollutants to the water bodies are very possible due to the wide uses and applications of some of these products in municipal, residential, commercial, industrial, and construction areas. Elevated oil and grease content can decrease the aesthetic value of the water body, as well as the water quality.

Potential Pollutants Generated by Land Use Type

(Excerpted, with minor revision, from the San Bernardino Water Quality Management Plan dated April 14, 2004)

Type of Development (Land Use)	Sediment/Turbidity	Nutrients	Organic Compounds	Trash & Debris	Oxygen Demanding Substances	Bacteria & Viruses	Oil & Grease	Pesticides	Metals
Detached Residential Development	P	P	N	P	P	P	P	P	N
Attached Residential Development	P	P	N	P	P ⁽¹⁾	P	P ⁽²⁾	P	N
Commercial/ Industrial Development	P ⁽¹⁾	P ⁽¹⁾	P ⁽²⁾	P	P ⁽¹⁾	P ⁽³⁾	P	P ⁽¹⁾	P
Automotive Repair Shops	N	N	P ^(4,5)	P	N	N	P	N	P
Restaurants	N	N	N	P	P	P	P	N	N
Hillside Development	P	P	N	P	P	P	P	P	N
Parking Lots	P ⁽¹⁾	P ⁽¹⁾	P ⁽¹⁾	P	P ⁽¹⁾	P ⁽⁶⁾	P	P ⁽¹⁾	P
Streets, Highways & Freeways	P	P ⁽¹⁾	P ⁽⁴⁾	P	P ⁽¹⁾	P ⁽⁶⁾	P	P ⁽¹⁾	P

Abbreviations:

P = Potential N = Not potential

Notes:

- (1) A potential pollutant if landscaping or open area exists on the Project site.
- (2) A potential pollutant if the project includes uncovered parking areas.
- (3) A potential pollutant if land use involves animal waste.
- (4) Specifically, petroleum hydrocarbons.
- (5) Specifically, solvents.
- (6) Bacterial indicators are routinely detected in pavement runoff.

4.5.1 Site Design BMPs

Site Design BMPs are intended to create a hydrologically functional project design that attempts to mimic the natural hydrologic regime. Mimicking a site's natural hydrologic regime can be pursued by:

- Reducing imperviousness, conserving natural resources and areas, maintaining and using natural drainage courses in the MS4, and minimizing clearing and grading.
- Providing runoff storage measures dispersed uniformly throughout a site's landscape with the use of a variety of detention, retention, and runoff practices.
- Implementing on-lot hydrologically functional landscape design and management practices.

These same practices, because they reduce the volume and usually the rate of runoff, also have the benefit of reducing the amount of storm water that must be treated before being discharged or to be treated in regional facilities. These design principles offer an innovative approach to urban storm water management by uniformly or strategically integrating storm water controls throughout the urban landscape. Resources for applying these principles include Start at the Source (Bay Area Storm Water Management Agencies Association, 1999)¹⁴, and Low Impact Development Design Strategies, An Integrated Design Approach (Prince George's County, Maryland; Department of Environmental Resources, 1999)¹⁵.

Site Design Concept 1: Minimize Urban Runoff, Minimize Impervious Footprint, and Conserve Natural Areas

Site Design BMPs to minimize Urban Runoff, minimize impervious footprint and conserve natural areas must be incorporated where applicable as determined by the Co-Permittee during the site planning and approval process consistent with applicable General Plan policies, other development standards and regulations and with any Site Design BMPs included in an applicable regional or watershed program. Examples include:

- Maximize the permeable area. This can be achieved in various ways, including, but not limited to increasing building floor area ratio (number of stories above or below ground) and developing land use regulations seeking to limit impervious surfaces. Decreasing the project's footprint can substantially reduce the project's impacts to water quality and hydrologic conditions, provided that the undeveloped area remains open space. Runoff from developed areas may be reduced by using alternative materials or surfaces with a lower Runoff Coefficient (C factor). The C factor is a representation of the ability of a surface to produce runoff. Surfaces that provide higher runoff volumes are represented by higher C factors. By incorporating more pervious, lower C factor surfaces into a development, lower volumes of runoff will be produced. Lower volumes and rates of runoff translate directly to lowering treatment requirements.
- Conserve natural areas. This can be achieved by concentrating or clustering development on the least environmentally sensitive portions of a site while leaving the remaining land in a natural, undisturbed condition. The Co-Permittees and Project applicants should refer to Multiple Species Habitat Conservation Plans or other natural resource plans, as appropriate to assist in identifying sensitive portions of the site. Sensitive areas include, but are not limited to, areas necessary to maintain the viability of wildlife corridors, occupied habitat of sensitive species and all wetlands, and coastal scrub and other upland communities.
- Construct walkways, trails, patios, overflow parking lots, alleys, driveways, low-traffic streets and other low-traffic areas with open-jointed paving materials or permeable surfaces, such as pervious concrete, porous asphalt, unit pavers, and granular materials.

¹⁴ <http://www.oaklandpw.com/creeks/bmps.html>

¹⁵ <http://www.epa.gov/owow/nps/lid/lidnatl.pdf>

- Construct streets, sidewalks and parking lot aisles to the minimum widths necessary, provided that public safety and a walk able environment for pedestrians are not compromised.¹⁶
- Incorporate landscaped buffer areas between sidewalks and streets.
- Reduce widths of street where off-street parking is available.¹⁷
- Maximize canopy interception and water conservation by preserving existing native trees and shrubs, and planting additional native or drought tolerant trees and large shrubs.
- Minimize the use of impervious surfaces, such as decorative concrete, in the landscape design.
- Use natural drainage systems.
- Where soils conditions are suitable, use perforated pipe or gravel filtration pits for low flow infiltration.¹⁸
- Construct onsite ponding areas or retention facilities to increase opportunities for infiltration consistent with vector control objectives.
- Other comparable and equally effective site design concepts as approved by the Co-Permittee.

Site Design Concept 2: Minimize Directly Connected Impervious Areas (DCIAs)

Site Design BMPs to minimize DCIAs must be incorporated where applicable, during the site planning and approval process consistent with applicable development standards and regulations and with any Site Design BMPs included in an applicable regional or watershed program. Examples include:

- Residential and commercial sites must be designed to contain and infiltrate roof runoff, or direct roof runoff to vegetative swales or buffer areas, where feasible.
- Where landscaping is proposed, drain impervious sidewalks, walkways, trails, and patios into adjacent landscaping
- Increase the use of vegetated drainage swales in lieu of underground piping or imperviously lined swales
- Use one or more of the following (for further guidance, see Start at the Source [1999]):
 - Rural swale system: street sheet flows to vegetated swale or gravel shoulder, curbs at street corners, culverts under driveways and street crossings
 - Urban curb/swale system: street slopes to curb; periodic swale inlets drain to vegetated swale/biofilter
 - Dual drainage system: First flush captured in street catch basins and discharged to adjacent vegetated swale or gravel shoulder, high flows connect directly to MS4s
 - Other design concepts that are comparable and equally effective as approved by the Co-Permittee.
- Use one or more of the following features for design of driveways and private residential parking areas:
 - Design driveways with shared access, flared (single lane at street) or wheel strips (paving only under tires); or, drain into landscaping prior to discharging to the MS4

¹⁶ Sidewalk widths must still comply with Americans with Disabilities Act regulations and other life safety requirements.

¹⁷ However, street widths must still comply with life safety requirements for fire and emergency vehicle access in addition to waste collection and facility maintenance needs.

¹⁸ However, projects must still comply with hillside grading ordinances that limit or restrict infiltration of runoff.

- Uncovered temporary or guest parking on private residential lots may be paved with a permeable surface; or, designed to drain into landscaping prior to discharging to the MS4
- Other design concepts that are comparable and equally effective as approved by the Co-Permittee.
- Use one or more of the following design concepts for the design of parking areas:
 - Where landscaping is proposed in parking areas, incorporate landscape areas into the drainage design
 - Overflow parking (parking stalls provided in excess of the Co-Permittee's minimum parking requirements) may be constructed with permeable paving
 - Other comparable and equally effective design concepts as approved by the Co-Permittee.
- Other comparable and equally effective design characteristics as approved by the Co-Permittee.

4.5.2 Source Control BMPs

The following Source Control BMPs must be addressed in each project-specific WQMP unless they do not apply given project features as determined by the Co-Permittee. If any of the following Source Control BMPs are not included in the project-specific WQMP, adequate justification must be provided before the project-specific WQMP will be approved.

4.5.2.1 Non-Structural Source Control BMPs

Education/Training for Property Owners, Operators, Tenants, Occupants, or Employees

For Projects with an HOA/POA of less than fifty (50) dwelling units and for Projects with no HOA/POA, practical informational materials to promote the prevention of Urban Runoff pollution will be provided by the project proponent to the first residents/occupants/tenants. These materials shall include general housekeeping practices that contribute to the protection of Urban Runoff quality and BMPs that eliminate or reduce pollution during subsequent property improvements. These materials or a resource list for obtaining these materials will be made available through the Co-Permittee or can be found at <http://www.floodcontrol.co.riverside.ca.us/YouCanHelp.asp>. However, the Co-Permittee may elect to recover printing costs for such materials. The project applicant shall request these materials at least 30 days prior to the intended distribution date and shall then be responsible for timely distribution at the time of occupancy.

For Projects with an HOA/POA of more than fifty (50) dwelling units, conditions of approval will require the HOA/POA to annually provide environmental awareness education materials to all members. These materials shall include general housekeeping practices that contribute to the protection of Urban Runoff quality and BMPs that eliminate or reduce pollution during subsequent property improvements. These materials or a resource list for obtaining these materials will be available through the Co-Permittee. However, the Co-Permittee may elect to recover printing costs for such materials. The HOA/POA shall request these materials (in writing) at least 30 days prior to the intended distribution date.

For Projects where people will be employed or contracted to perform activities that may impact Urban Runoff, BMP training and education programs must be provided to all new employees within 6 months of hire date and annually thereafter. Employee training materials may be derived from educational materials available through the Co-Permittee or from other resources such as "Stormwater Best Management Practices Handbook for Industrial and Commercial" (CASQA, 2003). The most recent editions of the CASQA handbooks can be downloaded at www.cabmphandbooks.com. The project-specific WQMP must describe the frequency of employee training and indicate the party responsible for conducting the training.

Activity Restrictions

At the discretion of the Co-Permittee, if an HOA/POA is formed, the developer shall prepare CC&Rs for the purpose of Receiving Water quality protection. Alternatively, use restrictions may be developed by a building operator through lease terms, etc. These restrictions must be included in the project-specific WQMP. Examples of activity restrictions are:

- Prohibiting the blowing, sweeping, or hosing of debris (leaf litter, grass clippings, litter, etc.) into streets, storm drain inlets, or other conveyances.
- Require dumpster lids to be closed at all times.
- Prohibit vehicle washing, maintenance, or repair on the premises or restrict those activities to designated areas (such as repair within maintenance bays and vehicle washing on properly designed wash racks).

Irrigation System and Landscape Maintenance

Maintenance of irrigation systems and landscaping shall be consistent with the Co-Permittee's water conservation ordinance, which can be accessed through the Co-Permittee's website or obtained through the Co-Permittee's planning/permitting counter. Fertilizer and pesticide usage shall be consistent with the instructions contained on product labels and with regulations administered by California's Department of Pesticide Regulation. Additionally, landscape maintenance must address replacement of dead vegetation, repair of erosion rills, proper disposal of green waste, etc. Irrigation system maintenance must address periodic testing and observation of the irrigation system to detect overspray, broken sprinkler heads, and other system failures. The project-specific WQMP should describe the anticipated frequency of irrigation system and landscape maintenance activities and identify the responsible party.

Common Area Litter Control

For industrial/commercial Projects and for Projects with HOAs/POAs, the project-specific WQMP must address litter control for common areas. Litter control must address whether or not trash receptacles will be provided in common areas, emptying of trash receptacles, the frequency with which trash receptacles will be emptied, patrolling common areas and perimeter fences or walls to collect litter, noting trash disposal violations by tenants/home owners or businesses and reporting such observations to the owner, operator, manager, or HOA/POA for investigation, and identification of the party responsible for litter control.

Street Sweeping Private Streets and Parking Lots

For industrial/commercial Projects and for other Projects with HOAs/POAs, the frequency of sweeping privately owned streets shall be described in the project-specific WQMP. The frequency shall be no less than the frequency of street sweeping by the Co-Permittee on public streets. For Projects with parking lots, the parking lots shall be swept at least quarterly, including just prior to the start of the rainy season (October 1st). The project-specific WQMP should identify the anticipated sweeping frequency, source of funding and the party responsible for conducting the periodic sweeping.

Drainage Facility Inspection and Maintenance

For industrial/commercial Projects and for Projects with HOAs/POAs, the frequency for cleaning privately owned drainage facilities (catch basins, open channels and storm drain inlets) shall be described in the project-specific WQMP. The frequency shall be no less than the frequency of drainage facility cleaning conducted by the Co-Permittee. At a minimum, routine maintenance of privately owned drainage facilities should take place in the late summer or early fall prior to the start of the rainy season (October 1st). The drainage facilities must be cleaned if accumulated sediment/debris fills 25% or more of the sediment/debris storage capacity. Privately owned drainage facilities shall be inspected annually and

the cleaning frequency shall be assessed. The project-specific WQMP should identify the party responsible for conducting the drainage facility inspection and maintenance.

4.5.2.2 Structural Source Control BMPs

MS4 Stenciling and Signage

The following requirements must be addressed in a project-specific WQMP and/or shall be denoted on Project plan sheets:

- Provide stenciling or labeling of all storm drain inlets and catch basins, constructed or modified, within the project area with prohibitive language (such as: "NO DUMPING ONLY RAIN IN THE DRAIN") and/or graphical icons to discourage illegal dumping.
- Post signs and prohibitive language and/or graphical icons, which prohibit illegal dumping at public access points along channels and creeks within the project area.
- Identify the party responsible for maintaining the legibility of stencils and signs.

The stencils contain a brief statement that prohibits dumping into the MS4. Graphical icons, either illustrating anti-dumping symbols or images of Receiving Water fauna, are effective supplements to the text message. Stencils and signs alert the public to the destination of pollutants discharged into Urban Runoff.

Landscape and Irrigation System Design

A project-specific WQMP must describe how the following concepts have been incorporated into project design features:

- Employing rain shutoff devices to prevent irrigation during and after precipitation events.
- 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 due to broken sprinkler heads or lines.
- The timing and application methods of irrigation water shall be designed to minimize the runoff of excess irrigation water into the MS4.
- Other comparable, equally effective, methods to reduce irrigation water runoff.
- Preparation and implementation of a landscape plan consistent with the Co-Permittee's water conservation ordinance, which may include the use of water sensors, programmable irrigation times (for short cycles), etc.
- Preparation and implementation of a landscape plan that:
 - Utilizes plants with low irrigation requirements (for example, native or drought tolerant species)
 - Groups plants with similar water requirements in order to reduce excess irrigation runoff and promote surface infiltration.
 - Use mulches (such as wood chips or shredded wood products) in planter areas without ground cover to minimize sediment in runoff.
 - Install appropriate plant materials for the location, in accordance with amount of sunlight and climate, and use native plant material where possible and/or as recommended by the landscape architect.
 - Maintaining or creating a vegetative barrier along the property boundary and interior watercourses, to act as a pollutant filter, where appropriate and feasible.

- Choose plants that minimize or eliminate the use of fertilizer or pesticides to sustain growth.

Protection of Slopes and Channels

Project plans shall include Source Control BMPs to decrease the potential for erosion of slopes and/or channels, consistent with local codes and ordinances and with the approval of all agencies with jurisdiction, e.g., the U.S. Army Corps of Engineers, the Regional Boards and the California Department of Fish and Game. The following design principles shall be considered, and incorporated and implemented where determined applicable and feasible by the Co-Permittee:

- Convey runoff safely from the tops of slopes.
- Avoid disturbing steep or unstable slopes and natural channels.
- Install permanent stabilization BMPs on disturbed slopes as quickly as possible.
- Plant slopes with native or drought tolerant vegetation. Hillside areas that are disturbed shall be landscaped with deep-rooted, drought tolerant plant species selected for erosion control.
- Control and treat flows in landscaping and/or other controls prior to reaching existing natural drainage systems.
- Install permanent stabilization BMPs in channel crossings as quickly as possible, and ensure that increases in runoff velocity and frequency caused by the project do not erode the channel.
- Install energy dissipaters at the outlets of new MS4s, culverts, conduits, or channels that enter unlined channels in accordance with applicable specifications to minimize erosion. Energy dissipaters shall be installed in such a way as to minimize impacts to Receiving Waters.
- Onsite conveyance channels should be lined, where appropriate, to reduce erosion caused by increased flow velocity due to increases in tributary impervious area. The first choice for linings should be grass or some other vegetative surface, since these materials not only reduce runoff velocities, but also provide water quality benefits from filtration and infiltration. If velocities in the channel are large enough to erode grass or other vegetative linings, riprap, concrete soil cement or geo-grid stabilization may be substituted or used in combination with grass or other vegetation stabilization.
- Other comparable and equally effective site design options as approved by the Co-Permittee.

Provide Community Car Wash Racks

In multi-family Projects where car washing or rinsing is not specifically prohibited via CC&Rs or other acceptable means, and in Projects having a common parking area where car washing or rinsing is not specifically prohibited via CC&Rs or other acceptable means, a designated car washing and rinsing area that does not drain directly to a MS4 shall be provided for common usage. Wash and rinse waters from this area must either be directed to the sanitary sewer (with prior approval of the sewerage agency), to an engineered filtration system, or an equally effective alternative prior to discharging to the MS4.

Properly Design Fueling Areas

Fuel dispensing areas shall include the following design features:

1. At a minimum, the fuel dispensing area must extend 6.5 feet (2.0 meters) from the corner of each fuel dispenser; or the length at which the hose and nozzle assembly may be operated plus 1 foot (0.3 meter), whichever is less.
2. The fuel dispensing area shall be paved with Portland cement concrete (or equivalent smooth impervious surface). The use of asphalt concrete is prohibited.

3. The fuel dispensing area shall have an appropriate slope (2% - 4%) to prevent ponding, and must be separated from the rest of the site by a grade break that prevents run-on of stormwater and to eliminate stormwater flow through the concrete fueling area.
4. An overhanging roof structure or canopy shall be provided. The cover's minimum dimensions must be equal to or greater than the area within the grade break or the fuel dispensing area. The cover must not drain onto the fuel dispensing area and facility downspouts (roof drains) must be routed to prevent drainage across the fueling area. The fueling area shall drain to an appropriate Treatment Control BMP prior to discharging to the MS4.
5. The fuel dispensing area must be designed to prohibit spills from draining to the street, MS4, or offsite.

Properly Design Air/Water Supply Area Drainage

Areas used for air/water supply must be graded and constructed so as to contain spilled material for cleanup.

Properly Design Trash Storage Areas

All trash container areas shall meet the following requirements:

1. Paved with an impervious surface, designed not to allow run-on from adjoining areas, designed to divert drainage from adjoining roofs and pavements diverted around the area, screened or walled to prevent off-site transport of trash.
2. Trash dumpsters (containers) shall be leak proof and have attached covers or lids.
3. Connection of trash area drains to the MS4 is prohibited.
4. Trash compactors shall be roofed and set on a concrete pad. The pad shall be a minimum of one foot larger all around than the trash compactor and sloped to drain to a sanitary sewer line.

Properly Design and Maintain Loading Docks

The design of loading/unloading dock areas shall include the following:

- Cover loading dock areas, or design drainage to preclude run-on and runoff.
- Direct connections to the MS4 from below-grade loading docks (truck wells) or similar structures are prohibited. Urban Runoff from a below-grade loading dock may only be discharged to the MS4 when designed to use a Treatment Control BMP applicable to the use.

Loading docks shall be kept in a clean and orderly condition through a regular program of sweeping and litter control and immediate cleanup of spills and broken containers. Cleanup procedures should minimize or eliminate the use of water. If washdown water is used, it must be properly disposed (containment, collection, and disposal to sanitary sewer) and not discharged to the MS4. The project-specific WQMP shall describe the frequency for implementing loading dock housekeeping measures and the party responsible.

Properly Design Maintenance Bays

Maintenance bays shall include the following:

- Repair/maintenance bays shall be indoors, or, designed to preclude run-on and runoff.
- Design a repair/maintenance bay drainage system to capture all wash water, leaks and spills. Provide impermeable berms, drop inlets, trench catch basins, or overflow containment structures around repair bays to prevent spilled materials and washdown waters from entering the MS4. Connect drains to a sump for collection and disposal. Discharge from the repair/maintenance bays to the MS4 is prohibited.

Properly Design Vehicle and Equipment Wash Areas

The discharge of wash waters to the MS4 is prohibited. Therefore, Projects that include areas for washing/steam cleaning of vehicles or equipment shall include the following design features:

- Wash areas shall be contained and covered with a roof or overhang or adequate surplus storage to contain and utilize all precipitation.
- Provide a wash rack or wash racks connected to the sanitary sewer in accordance with sewerage agency guidelines and prior approval. The sewerage agency may require discharge monitoring. If the facility recycles wash water and is not connected to the sanitary sewer, wastes must be properly contained and disposed.
- Design an equipment wash area drainage system to capture all wash water. Provide impermeable berms, drop inlets, trench catch basins, or overflow containment structures around equipment wash areas to prevent wash waters from entering the MS4. Connect drains to a sump for collection and disposal.
- Surface runoff and roof drains shall be directed away from wash racks unless approved by the sanitary sewerage agency.

Properly Design Outdoor Material Storage Areas

Where plans propose outdoor storage containers for oils, fuels, solvents, coolants, wastes, and other chemicals, the areas where these materials are to be used or stored must be protected by secondary containment structures such as a low containment berm, dike, or curb, designed to the satisfaction of the Co-Permittee. Materials or products that are stored outside and that have the potential to cause pollutant discharges shall be protected from rainfall, runoff, run-on, and wind erosion by design and use of a:

- cabinet, shed, or similar structure that prevents contact with runoff or spillage to the MS4;
- paved storage area and sufficiently impervious to contain leaks and spills; and/or
- roof or awning to minimize direct precipitation and collection of stormwater within the secondary containment area. Stormwater that collects within a secondary containment structure must not be discharged to the street or the MS4.

Properly Design Outdoor Work Areas or Processing Areas

Where vehicle or equipment repair/maintenance occurs, impermeable berms, trench drains, or containment structures shall be provided around the areas to eliminate or reduce spilled materials and wash-down waters from entering the street or the MS4. Surface runoff or roof drains shall be directed away from these contained work areas. Sidewalls and canopies may be used to meet this requirement.

Outdoor process equipment operations, such as rock grinding or crushing, painting or coating, grinding or sanding, degreasing or parts cleaning, landfills, waste piles, and wastewater and solid waste handling, treatment, and disposal, and other operations shall adhere to the following requirements.

- Cover or enclose areas that would be the sources of pollutants or slope the area toward a sump.
- Grade or berm area to prevent run-on from surrounding areas.
- Storm drain inlets connected to the MS4 are prohibited within these outdoor work or process areas.
- Where wet material processing occurs (e.g. electroplating), secondary containment structures (not double wall containers) shall be provided to hold spills resulting from accidents or leaking tanks or equipment.
- Salvage yards and recycle facilities must direct all runoff to appropriate Treatment Control BMP(s).

Appendix C

Supporting Detail Related to Hydraulic Conditions of Concern

Not Applicable.

Appendix D

Educational Materials

The Permit (cont.)

How can sites be designed to reduce pollution after construction is completed?

After construction is complete, a site's long-term impact on stormwater quality also needs to be considered. Preventing stormwater pollution starts with good site design. Local governments should encourage land developers to use site designs that minimize stormwater runoff volume and contamination. Low-impact development (LID) is a design approach that encourages more permeable surfaces, such as pervious concrete or pervious asphalt, and encourages more green spaces, such as trees, lawns, and grass. LID emphasizes dealing with stormwater close to where it falls, using management techniques such as infiltration and pollution prevention rather than construction of large collection, conveyance, and storage systems. This approach provides significant protection to surface water bodies and helps to reduce the size and frequency of flood events. Coupled with Smart Growth approaches—which look at growth and development on a broader scale—your community could reap water quality and quantity benefits at both the local and watershed scale.

Local Programs Relationships

Due to the large number of active construction sites, our success in addressing complex and challenging stormwater impacts to our nation's waters depends on allocation cooperation among all levels of government, including local (county, parish, municipal, city, town, district), state, and federal authorities.

Approximately 6,000 local governments across the country operate municipal stormwater sewer systems (MSWS) that are required to develop programs to reduce the discharge of pollutants, including sediment, to the MSWS and, ultimately, to local waterbodies. Local governments are required to review and approve erosion and sediment control plans and to conduct inspections of construction sites to ensure compliance with local requirements.

How do federal NPDES requirements relate to local requirements?

Local governments have their own requirements for construction site erosion control, sediment control, and grading requirements. Construction site operators are encouraged to use materials, such as erosion and sediment control plans, that meet both local and NPDES requirements. Operators should also understand that operators with local requirements that are more stringent than NPDES requirements are not required to meet the less stringent federal requirements. For more information on local programs, visit www.epa.gov/nrpdes/stormwater.

Qualifying local programs

If a community has a strong erosion and sediment control program, EPA may designate it as a Qualifying Local Program. In these cases, construction site operators would follow the local requirements. A qualifying local erosion and sediment control program must have equivalent provisions to EPA's NPDES program, including requirements for:

- Appropriate erosion and sediment control BMPs
- Control of other construction site wastes
- Development and implementation of a SWPPP
- Review of the erosion and sediment control portion of the SWPPP
- Inspection of construction activities
- Other NPDES requirements applicable to the municipality

Municipal stormwater managers are encouraged to work with their EPA Regional Office to learn more about how to be designated as a Qualifying Local Program. You can find your EPA Regional Stormwater Coordinator at www.epa.gov/nrpdes/stormwater.



Construction Stormwater Resources

Environmental Protection Agency (EPA) Stormwater Website
EPA's website contains links to information such as the Construction General Permit (CGP), frequently asked questions, downloadable publications that you may easily redistribute, and SWPPP guidance and training information at www.epa.gov/nrpdes/stormwater/construction

Construction Industry Compliance Assistance Center
This is a free environmental compliance assistance website for contractors, builders, and developers. It was developed with EPA grant funds and construction industry trade organization guidance. It features concise explanations about stormwater and other environmental requirements, links to state permitting authorities, and links to some of the best practice manuals, manuals and technical guidance, and regional guidance. EPA's Stormwater Construction and Development Guide is available at www.cicacenter.org/stormwater

Stormwater Manager's Resource Center
The Stormwater Manager's Resource Center (SMRC) is designed specifically for stormwater practitioners, local government officials, and others who need technical assistance on stormwater management issues. Created and maintained by the Center for Watershed Protection, the SMRC is available at www.stormwatercenter.org

Also visit the Center for Watershed Protection's main website at www.cwpp.org

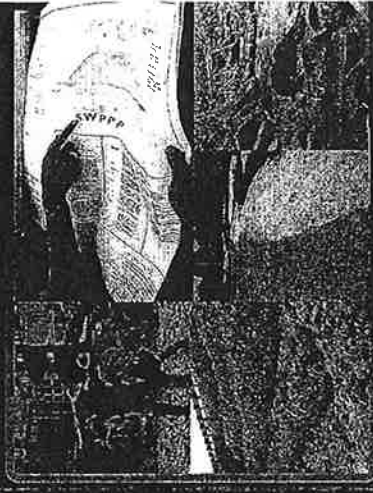
EPA's Low Impact Development Website
The EPA's LID website provides information and links to information about Low Impact Development ideas and techniques at www.epa.gov/owow/lid/

Smart Growth
EPA's Smart Growth Website contains guidance documents, tools, and resources for understanding and applying smart growth ideas to urban planning at www.epa.gov/smartgrowth

The Smart Growth Network is a partnership organization dedicated to increasing public awareness of how smart growth can improve community quality of life. The network provides information, resources, and tools to help local governments and other stakeholders make informed decisions, and look and ideas and to advance smart growth. Visit www.smartgrowth.org



Getting the Word Out... The Role of Local Governments in Implementing the NPDES Stormwater Program for Construction Sites



Background

What are the problems and solutions associated with stormwater runoff?

Why should we be concerned about stormwater runoff?

Runoff from roofs and storm sewers is the most significant source of water pollution. Rainwater, snowmelt, and other pollutants are carried into storm drains and then, unfiltered, into nearby waterways. Most stormwater drainage systems provide no treatment, preventing nonpoint runoff from being filtered out. Municipal drinking water systems may face higher costs if they must treat water contaminated by stormwater runoff. Impervious impervious stormwater runoff is also a major source of sediment, which can clog waterways, reduce water quality, and increase the risk of flooding.

How does runoff degrade rivers, lakes and coastal waters?

Runoff from roofs and storm sewers is the most significant source of water pollution. Rainwater, snowmelt, and other pollutants are carried into storm drains and then, unfiltered, into nearby waterways. Most stormwater drainage systems provide no treatment, preventing nonpoint runoff from being filtered out. Municipal drinking water systems may face higher costs if they must treat water contaminated by stormwater runoff. Impervious impervious stormwater runoff is also a major source of sediment, which can clog waterways, reduce water quality, and increase the risk of flooding.

What can be done to reduce these pollutants from construction activities?

If construction sites are not properly managed, large amounts of soil will be washed away during rainstorms. In recent years, runoff and soil erosion should be controlled by using techniques called Best Management Practices (BMPs).

- Minimizing land clearing to preserve natural vegetation and other natural features
- Managing clearing and grading in phases to minimize the amount of bare soil exposed at any given time
- Building and maintaining proper site entrances to prevent sediment from being tracked onto streets and, ultimately, washed into storm drains
- Staking steep slopes
- Installing sediment trapping devices and parawater controls, like silt fences and siltation basins
- Staking areas as soon as possible after earth-disturbing activities

Other BMPs involve good housekeeping measures, like picking up site debris, cleaning vehicles in designated washing areas, and educating construction workers about the stormwater protection and pollution prevention techniques. Correctly using BMPs during construction minimizes water quality by greatly reducing the amount of pollutants entering the site. Using a single control measure is not enough, however; many techniques, for best effect, should be used in combination.

To get more detailed information, visit U.S. Environmental Protection Agency (EPA)'s website (www.epa.gov/npdes/permits/bmp) on a regular basis.

The Issue

How can you help?

What's the issue?

Under the Clean Water Act, new regulations require many construction sites in your community to obtain National Pollutant Discharge Elimination System (NPDES) permit coverage for stormwater runoff. These permits require operators of these sites to take steps to prevent sediment, silt, debris, and other pollutants from washing off into nearby streams, rivers, lakes, and coastal waters.

Many involved in the construction industry are unaware of these new requirements or don't understand them. Local governments are uniquely positioned to play an important role by providing information to people in the construction industry who might need NPDES permit coverage.

You can help by distributing the U.S. Environmental Protection Agency (EPA)'s brochure entitled *Does Your Construction Site Need a Stormwater Permit?* to build awareness who may need to apply for coverage under EPA's Construction General Permit (www.epa.gov/npdes/stormwater).

Your municipality is in a state where EPA is the permitting authority (many states approve the NPDES permitting program under delegated authority). Therefore, you should be able to find a permit in your area that meets the requirements described below must obtain permit coverage from EPA.

The guide provides local government officials with background information on EPA's stormwater permitting program, including information on how to obtain and guidance documents, contact lists, and outreach materials, visit www.epa.gov/npdes/stormwater.

What activities need stormwater permit coverage?

- Generally, operators of construction sites disturbing one or more acres of land will need NPDES permit coverage for their stormwater discharges.
- Operators of smaller sites that are part of a larger, common plan of development that disturbs a total of more than one acre of land will also generally need NPDES permit coverage. For example, a contractor building a single house or a contractor building a five-unit apartment building would likely need NPDES permit coverage.

Who needs coverage under a stormwater permit?

The operator of a construction site is responsible for obtaining NPDES stormwater permit coverage. EPA's Construction General Permit defines operator as any party that has:

- Operational control over the construction plans and specifications and/or
- Day-to-day operational control of the site.

The term operator may include owners, general contractors, or independent subcontractors who are not the permit holder. For more information, visit www.epa.gov/npdes/permits/bmp or call EPA's NPDES permit hotline at 1-800-424-6343. For more information, visit www.epa.gov/npdes/permits/bmp and see Section 3 and Appendix A of EPA's CGP.

Local governments will also need to apply for NPDES permit coverage when their own projects disturb more than one acre (for example, construction of a new municipal building, park, etc.).

The Permit

What do construction site operators need to do?

Obtain, read, and understand the U.S. Environmental Protection Agency (EPA)'s Construction General Permit.

Develop a SWPPP
A stormwater pollution prevention plan (SWPPP) is a written document that lists the potential sources of stormwater pollution, describes practices that will be used to prevent pollution, and provides information on how to monitor and maintain the SWPPP. EPA does not require a SWPPP for construction sites that are not subject to the SWPPP, for example, they may be kept on file for public use upon request.

The operator(s) must do the following:

- Gather basic information about the site, such as:
 - Site description (including a map of existing site conditions, with street names, roads, the name and location of nearby receiving water, and other site features that should be protected, etc.)
 - Description of planned activity (including a map of where these activities are to take place, the nature of the activity, etc.)
 - Ensure the protection of endangered species and critical habitat (operators should consult with local agencies with respect to these requirements)
- Select a SWPPP to use or develop a SWPPP that meets the requirements of the permit (operators should consult with local agencies with respect to these requirements)
- Assign a SWPPP manager (the SWPPP manager should be assigned to ensure the SWPPP is followed and maintained.)

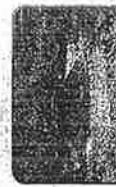
Operators may find that many local requirements, if existing, apply to all construction sites. EPA's SWPPP is designed to be used in conjunction with local requirements to ensure that all construction sites are properly managed and protected.

Implement and monitor the SWPPP. The operator must regularly inspect BMPs to ensure their proper functioning and, if needed, correct any problems. Inspection and maintenance of BMPs should be documented in the SWPPP along with updates to plans, drawings, and photographs.

For more information on how to develop a SWPPP, construction site operators can visit EPA's website (www.epa.gov/npdes/stormwater/bmp).

Compliance with local requirements

Operators must also be aware of local requirements. The operator(s) should submit a Notice of Intent (NOI) to the local authority having jurisdiction (LAHJ) which may be a state or local government. The NOI should be submitted to the LAHJ at least 30 days before construction begins. The NOI should be submitted to the LAHJ at least 30 days before construction begins. The NOI should be submitted to the LAHJ at least 30 days before construction begins. The NOI should be submitted to the LAHJ at least 30 days before construction begins.



What does "permit coverage" mean?
It means you have a permit to discharge stormwater from your construction site into a water body. This permit is required for construction sites that disturb one or more acres of land. The permit is issued by the EPA or a state that has been delegated authority to issue permits. The permit is required for construction sites that disturb one or more acres of land. The permit is issued by the EPA or a state that has been delegated authority to issue permits.

Permitting Authority
EPA is the permitting authority for construction sites that disturb one or more acres of land. EPA is the permitting authority for construction sites that disturb one or more acres of land. EPA is the permitting authority for construction sites that disturb one or more acres of land.



Appendix E

Soils Report

Soils Report not included due to infiltration BMPs are not utilized.

Appendix F

Treatment Control BMP Sizing Calculations and Design Details

Flow Based BMPs

General

Flow based BMPs are sized to treat flows up to the design flow rate, which will remove pollutants to the MEP. This handbook bases the design flow rate on a uniform rainfall intensity of 0.2 inches per hour, as recommended by the California BMP Handbook. The flow rate is also dependent on the type of soil and percentage of impervious area in the development.

Uniform Intensity Approach

The Uniform Intensity Approach is where the Design Rainfall Intensity, I is specified as:

$$I = 0.2 \text{ in/hr}$$

That Intensity is then plugged into the Rational Equation to find the BMP design flow rate (Q).

$$Q_{\text{BMP}} = CIA$$

Where

- A = Tributary Area to the BMP
- C = Runoff Coefficient, based upon a Rainfall Intensity = 0.2 in/hr
- I = Design Rainfall intensity, 0.2 in/hr

A step-by-step procedure for calculating the design flow rate is presented on Worksheet 2. Table 4 shows runoff coefficient values pertaining to the type of soils and percent imperviousness.

Table 4. Runoff Coefficients for an Intensity = 0.2 in/hr for Urban Soil Types*

Impervious %	A Soil RI =32	B Soil RI =56	C Soil RI =69	D Soil RI =75
0 (Natural)	0.06	0.14	0.23	0.28
5	0.10	0.18	0.26	0.31
10	0.14	0.22	0.29	0.34
15	0.19	0.26	0.33	0.37
20 (1-Acre)	0.23	0.30	0.36	0.40
25	0.27	0.33	0.39	0.43
30	0.31	0.37	0.43	0.47
35	0.35	0.41	0.46	0.50
40 (1/2-Acre)	0.40	0.45	0.50	0.53
45	0.44	0.48	0.53	0.56
50 (1/4-Acre)	0.48	0.52	0.56	0.59
55	0.52	0.56	0.60	0.62
60	0.56	0.60	0.63	0.65
65 (Condominiums)	0.61	0.64	0.66	0.68
70	0.65	0.67	0.70	0.71
75 (Mobilehomes)	0.69	0.71	0.73	0.74
80 (Apartments)	0.73	0.75	0.77	0.78
85	0.77	0.79	0.80	0.81
90 (Commercial)	0.82	0.82	0.83	0.84
95	0.86	0.86	0.87	0.87
100	0.90	0.90	0.90	0.90

*Complete District's standards can be found in the Riverside County Flood Control Hydrology Manual

Design Procedure Form for Design Flow Uniform Intensity Design Flow		AREA 'B'
Designer:	<u>JOHN</u>	
Company:	<u>PENCO ENG.</u>	
Date:	<u>1/13/10</u>	
Project:	<u>RCRMC</u>	
Location:	<u>MORENO VALLEY</u>	
1. Determine Impervious Percentage a. Determine total tributary area b. Determine Impervious %	$A_{total} = \underline{23.80} \text{ acres} \quad (1)$ $i = \underline{95} \% \quad (2)$	
2. Determine Runoff Coefficient Values Use Table 4 and impervious % found in step 1 a. A Soil Runoff Coefficient b. B Soil Runoff Coefficient c. C Soil Runoff Coefficient d. D Soil Runoff Coefficient	$C_a = \underline{\hspace{2cm}} \quad (3)$ $C_b = \underline{0.86} \quad (4)$ $C_c = \underline{\hspace{2cm}} \quad (5)$ $C_d = \underline{\hspace{2cm}} \quad (6)$	
3. Determine the Area decimal fraction of each soil type in tributary area a. Area of A Soil / (1) = b. Area of B Soil / (1) = c. Area of C Soil / (1) = d. Area of D Soil / (1) =	$A_a = \underline{\hspace{2cm}} \quad (7)$ $A_b = \underline{1.00} \quad (8)$ $A_c = \underline{\hspace{2cm}} \quad (9)$ $A_d = \underline{\hspace{2cm}} \quad (10)$	
4. Determine Runoff Coefficient a. $C = (3) \times (7) + (4) \times (8) + (5) \times (9) + (6) \times (10) =$	$C = \underline{0.86} \quad (11)$	
5. Determine BMP Design flow a. $Q_{BMP} = C \times I \times A = (11) \times 0.2 \times (1)$	$Q_{BMP} = \underline{4.09} \frac{ft^3}{s} \quad (12)$	

SUNTREE TECHNOLOGIES MODEL NO. NSBB-10-14-96-RCH-Q1

PATENTED

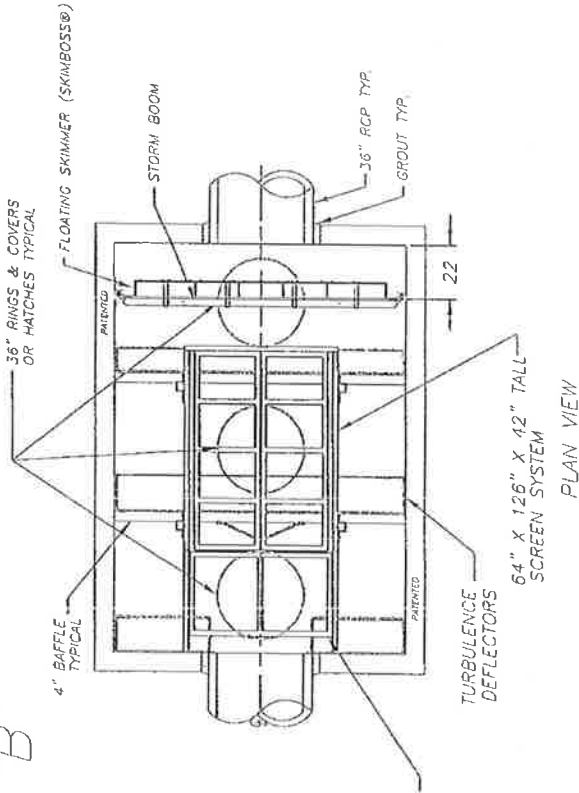
AREA "B"

FLOW & BY-PASS SPECIFICATIONS FOR BIOMASS SEPARATING SCREEN SYSTEM, SEDIMENT COLLECTION CHAMBERS, AND SKIMMER SPECIFICATIONS

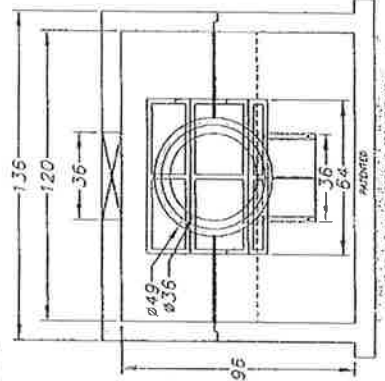
- 1. Pipe inflow area (Drawn as 36" RCP) _____ 7.06 sq.ft.
- SCREEN SPECIFICATIONS:
- 2. Open orifice area in screen system _____ 68.47 sq.ft.
- 3. Open orifice area in screen system with 50% blockage _____ 34.23 sq.ft.
- 4. Open orifice area in screen system with 75% blockage _____ 17.12 sq.ft.
- 5. Minimum by-pass through screen system below the top surface of the pipe _____ 11.77 sq.ft.
- 6. Minimum by-pass around screen system below the top surface of the pipe _____ 13.75 sq.ft.
- 7. Screen system storage volume _____ 153.06 cu.ft.
- SEDIMENT STORAGE:
- 8. Volume of first sediment chamber _____ 150 cu.ft.
- 9. Volume of second sediment chamber _____ 147.2 cu.ft.
- 10. Volume of third sediment chamber _____ 147.2 cu.ft.
- 11. Total sediment volume _____ 444.4 cu.ft.
- SKIMMER SPECIFICATIONS:
- 12. Flow area under skimmer _____ 12.87 sq.ft.
- 13. Area of pipe in line with skimmer _____ 6.50 sq.ft.
- 14. Area between the skimmer and the outflow pipe parallel with the surface of the pipe _____ 17.27 sq.ft.

EXCLUSIVE WESTERN STATES DISTRIBUTOR:
 BIO CLEAN ENVIRONMENTAL SERVICE
 P.O. BOX 869, OCEANSIDE, CA. 92049
 TEL. 760-433-7640 FAX: 760-433-3176
 Email: info@biocleanenvironmental.net

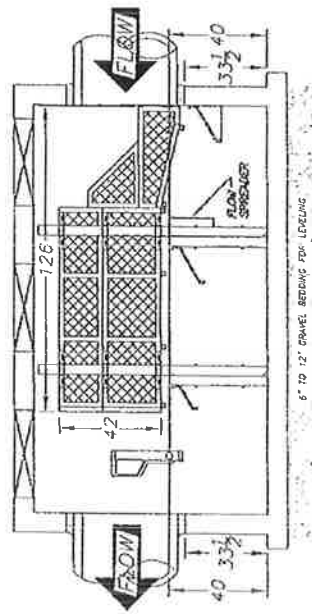
- INSTALLATION NOTES:
1. INFLOW AND OUTFLOW PIPES ARE TO BE FLUSH WITH THE INSIDE OF THE CONCRETE STRUCTURE. (CAN NOT INTRUDE BEYOND FLUSH)
 2. INVERT OF OUTFLOW PIPE SHOULD BE FLUSH WITH THE TOP OF THE Baffles.
 3. Baffles SHOULD BE SEALED WITH GROUT.
 4. THE BOTTOM OF THE INFLOW PIPE SHOULD BE 8" BELOW THE INVERT OF THE OUTFLOW PIPE.
 5. INVERT OF THE INFLOW PIPE SHOULD NOT BE BELOW THE INVERT OF THE OUTFLOW PIPE.



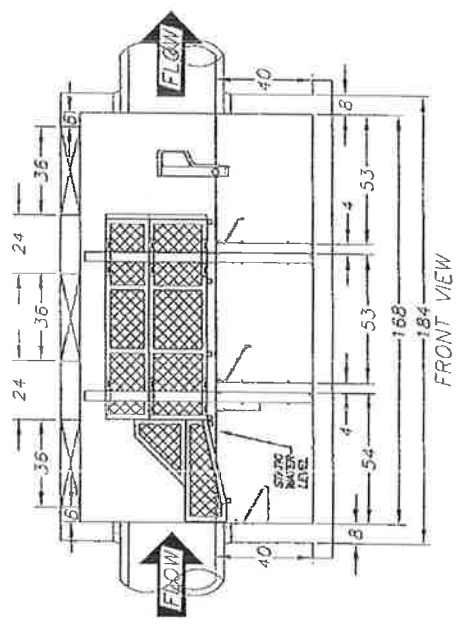
64" X 126" X 42" TALL SCREEN SYSTEM PLAN VIEW



LEFT END VIEW



REAR VIEW



FRONT VIEW

- NOTES:
1. CONCRETE 28 DAY COMPRESSIVE STRENGTH FC=5000 PSI
 2. REINFORCING: ASTM A-615 GRADE 60
 3. SUPPORTS AN H20 LOADING AS INDICATED BY AASHTO.
 4. JOINT SEALANT: BUTYL RUBBER SS-S-00210
 5. ALL WALLS ARE 8" THICK, TOP IS 8" THICK AND BOTTOM IS 6" THICK.
 6. TREATMENT DESIGN FLOW FOR 90% REMOVAL EFFICIENCY OF TSS IS 35 CFS.
 7. O FLOW IS 66 CFS.
 8. INFLOW AND OUTFLOW PIPES ARE TO BE FLUSH WITH THE INSIDE SURFACE OF THE CONCRETE STRUCTURE. (CAN NOT INTRUDE BEYOND FLUSH)

SUNTREE TECHNOLOGIES, INC. 798 CLEARLAKE RD SUITE #2 CORAL GABLES, FL 33134		PROJECT: RIVERSIDE COUNTY HOSPITAL
SUNTREE NUTRIENT SEPARATING BAFFLE BOX		DRAWING NO.: 4-01-15-10-01
DATE: 01/15/10 SCALE: SF = 72		FILE NAME: NSBB-10-14-96-RCH-Q1
DRAFTER: T.H.Z. UNITS: INCHES		REVISIONS:
		DATE:
		DATE:

Suntree Technologies, Inc.
 798 Clearlake Road, Coral Gables, Florida 33134
 PH: 305-577-7552 Fax: 305-437-7554

Hydrodynamic, Volume, & Physical Specifications Of The Suntree Nutrient Separating Baffle Box
Model Number: NSBB-10-14-96-RCH-Q1

1. The stormwater treatment structure will not be positioned in an off line treatment configuration. It will be sized so that the entire flow of a 36" pipe will always receive treatment by passing it through the inside of the stormwater treatment structure.
2. For flows of 35 cfs a removal efficiency of at least 80% for TSS will be achieved, and flows of up to 66 cfs will be able to pass through the stormwater treatment structure for treatment.
3. The stormwater treatment structure will be able to store captured solid debris such as leaves and litter in a dry state between rain events. The volume of dry storage will be approximately 153.06 cubic feet.
4. The stormwater treatment structure will have the capacity to store approximately 444.4 cubic feet of captured sediment.
5. The skimmer will be the Suntree SkimBoss system. As the water level in the vault changes, the Suntree floating skimmer will automatically move vertically, floating on the changing water level as needed to prevent water flow from topping the skimmer. On each end of the skimmer a track system is attached to the wall to hold the skimmer in place and provide for vertical movement. Wheels are attached to the ends of the skimmer and fit into the tracks and act to reduce the frictional forces between the skimmer and the tracks so that the skimmer can easily move vertically with the changing water elevations. There are 2 types of wheels that turn perpendicular to each other which are used to deal with the frictional forces. The centering wheels roll against the sides of the vault walls and work to reduce the frictional force of the vault walls. The load wheels reduce the friction produced from the water flow pushing the skimmer against the track in the direction of water flow. The body of the skimmer will be rigid and made of laminated fiberglass. The buoyancy of the skimmer comes from 2 components. The primary buoyancy component are the floats on the upstream side of the skimmer. These floats are located along the top of the skimmer and account for majority of the buoyancy. Another buoyancy component will be PVC structural foam laminated within the fiberglass layers of the body of the skimmer. The body of the skimmer is shaped so that the floats fit within the shape of the skimmer which combine to form a relatively flat surface on the upstream side. The floats are attached to the body of the skimmer within a cavity along the top of the skimmer. The floats are spaced off from the surface of the skimmer body so water can flow completely around on all sides of the float. The space between the float and the body of the skimmer is what allows the skimmer to be buoyant relative to the water level on the upstream side of the skimmer. On the face of each end of the skimmer a rubber seal prevents the passage of oils or other floating chemicals. A hydrocarbon absorption boom is positioned along the face of the skimmer to absorb hydrocarbons. The hydrocarbon absorption boom is held in position by brackets that allow for the vertical movement of the boom along the face of the skimmer. The boom will float on the water surface and rise up and down with the changing water levels.
6. The nutrient separating screen system shall be positioned approximately 3.5" above the static water level within the baffle box. Adjacent to the inflow, the screen system will have openings on both sides that have a combined cross sectional area that exceeds the cross sectional area of the pipe. These openings will act as an internal bypass for water flow in the event that the screen system becomes full of debris.
7. The nutrient separating screen system shall have a minimum of 6" of vertical adjustment. The adjustment method shall be a system with brackets that are attached to the sides of the screen system that will slide vertically along 4" x 4" aluminum square poles. Two stainless steel bolts on each bracket can be tightened to lock the screen system in place, or loosened to allow for vertical adjustment of the screen system. The square poles are anchored to the baffle wall by stainless steel bolts.
8. The nutrient separating screen system shall have a minimum of 3" of horizontal adjustment in the direction of the length of the concrete structure. The brackets that clamp the vertical adjustment poles to the side of the screen system can be repositioned to allow of horizontal adjustment.
9. The nutrient separating screen system shall have a bottom section adjacent to the inflow which is hinged and can be opened for cleaning. This bottom section will function as a screened ramp to direct debris into the main body of the screened system. The sides of the screen system adjacent to the inflow will be made with stainless steel screen and transition in vertical height from a minimum of 8" above the inflow invert to the height of the main body of the screen system. The lower sides of the screen system adjacent to the inflow will provide bypass for water flow around the main body of the screen system if necessary. The cross sectional area of the bypass around the screen system will be equal to or exceed the cross sectional area of the inflow pipe.
10. The nutrient separating screen system shall give access from above grade to the lower sediment collection chambers by the following method. The bottom of the screen system will contain hinged screened doors that can be opened in such a way as to allow adequate access for a vacuum truck to remove everything in all the lower collection chambers.
11. The screen system structure will be a welded aluminum framework spanned by stainless steel screen, be generally rectangular in shape, and be formed to make a bottom, 2 long sides, and 1 end; the top and 1 end will remain open. The screen system will consist of panel sections that are held together with stainless steel bolts. When the panel sections are unbolted and separated from each other they will be able to pass through an access hatch or round manhole in the top of the baffle box for removal purposes. The aluminum frame work along the sides and end will be made of mostly 3" x 3" x 1/4" aluminum angle beam. The screen used to span the aluminum frame is described as follows: For the body of the screen system, flattened expanded stainless steel sheet 1/2" No. 16 F; Open area = 60%; Grade = 304 Stainless Steel. For the riser section of the screen system, flattened expanded stainless steel sheet 3/4" #13 F; open area = 75%; Grade 304 Stainless Steel. The screen will be attached to the screen system frame by sandwiching the screen to the aluminum frame between a series of 2" x 3/16" aluminum bars and welded in place.
12. A turbulence deflector will be attached near the top of each of the baffles and adjacent to the inflow with stainless steel bolts and stainless steel fender washers. The turbulence deflectors will be made from laminated fiberglass and measure a minimum of 3/8" in thickness. The turbulence deflectors attached to the baffles will form a horizontal ledge that measures 18" from the downstream side of the first baffle and 12" from the downstream side of the second baffle, and span the full width of the baffle box. Adjacent to the inflow will be a set of 2 turbulence deflectors that each measure 15" wide x 38" long. An 18" flow spreader will be attached to the face of the first baffle with stainless steel bolts, nuts, and washers.
13. The structure of the box will be precast concrete. The concrete will be 28 day compressive strength $f_c = 5,000$ psi. Steel reinforcing will be ASTM A - 615 Grade 60. Structure will support an H2O loading as indicated by AASHTO. The joint between the concrete sections will ship lap and the joint sealed with Rom-Nek or equal butyl rubber joint sealant. Two baffles will separate the bottom of the structure into 3 chambers for the settling and collection of sediment. The baffles will be sealed with non-shrink grout to form 3 water tight chambers.
14. For access into the Nutrient Separating Baffle Box, Three 36" Round Openings will be cast into the top of the vault.
15. The inflow and outflow pipes will not intrude beyond flush with the inside surface of the Nutrient Separating Baffle Box. The space between the pipe holes in the ends of the Nutrient Separating Baffle Box and the outside surface of the pipe will be filled with non-shrink grout to form a water proof seal. The invert of the outflow pipe will be even with the tops of the baffles.

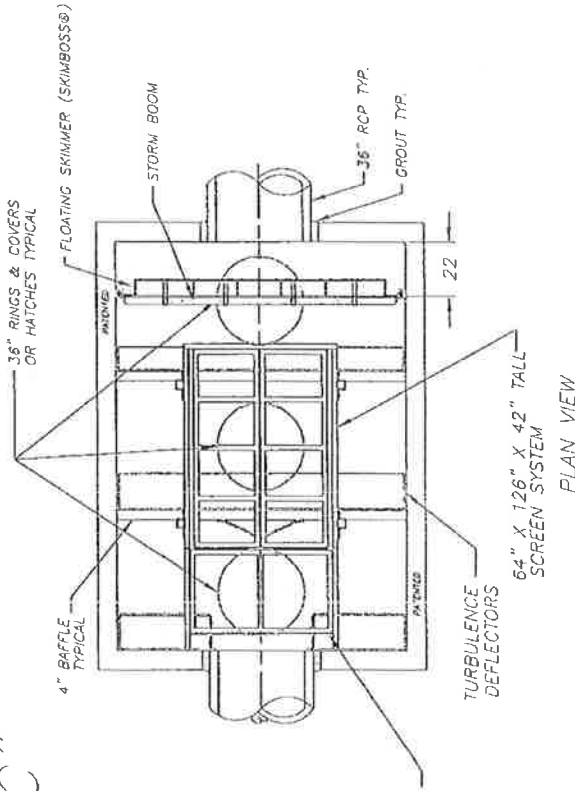
AREA "C"

FLOW & BY-PASS SPECIFICATIONS FOR BIOMASS SEPARATING SCREEN SYSTEM SEDIMENT COLLECTION CHAMBERS, AND SKIMMER SPECIFICATIONS

- 1. Pipe inflow area (Drawn as 36" RCP) _____ 7.06 sq.ft.
- SCREEN SPECIFICATIONS:
- 2. Open on-face area in screen system _____ 62.47 sq.ft.
- 3. Open on-face area in screen system _____ 34.23 sq.ft.
- with 50% blockage _____
- 4. Open on-face area in screen system _____ 17.12 sq.ft.
- with 75% blockage _____
- 5. Minimum by-pass through screen system _____ 11.77 sq.ft.
- below the top surface of the pipe _____
- 6. Minimum by-pass around screen system _____ 13.75 sq.ft.
- below the top surface of the pipe _____
- 7. Screen system storage volume _____ 153.06 cu.ft.
- SEDIMENT STORAGE:
- 8. Volume of first sediment chamber _____ 150 cu.ft.
- 9. Volume of second sediment chamber _____ 147.2 cu.ft.
- 10. Volume of third sediment chamber _____ 147.2 cu.ft.
- 11. Total sediment volume _____ 444.4 cu.ft.
- SKIMMER SPECIFICATIONS:
- 12. Flow area under skimmer _____ 12.67 sq.ft.
- 13. Area of pipe in line with skimmer _____ 6.50 sq.ft.
- 14. Area between the skimmer and the outflow _____ 17.27 sq.ft.
- pipe parallel with the surface of the pipe _____

EXCLUSIVE WESTERN STATES DISTRIBUTOR
 BIO CLEAN ENVIRONMENTAL SERVICE
 P.O. BOX 869, OCEANSIDE, CA. 92049
 TEL: 760-433-7640 FAX: 760-433-3176
 Email: info@biocleanenvironmental.net

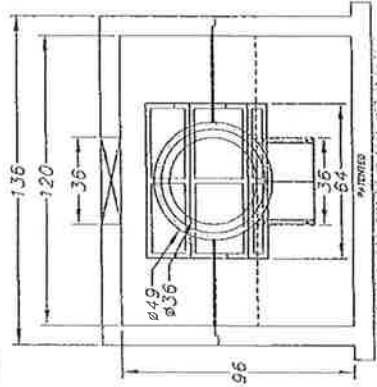
Suntree Technologies Inc.
 798 Caroline Road, Geeta, Florida 32922
 PH: 351-637-7552 Fax: 351-637-7554



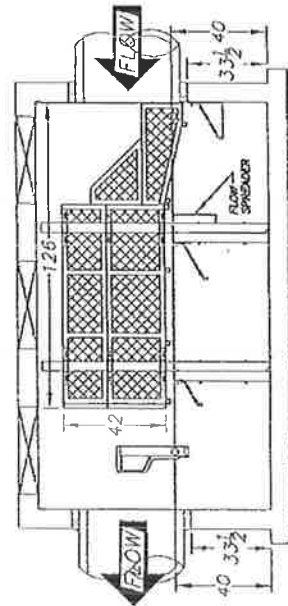
PLAN VIEW

SCREENED BOTTOMS HINGED

- INSTALLATION NOTES:
1. INFLOW AND OUTFLOW PIPES ARE TO BE FLUSH WITH THE INSIDE SURFACE OF THE CONCRETE STRUCTURE. (CAN NOT INTRUDE BEYOND FLUSH)
 2. INVERT OF OUTFLOW PIPE SHOULD BE EVEN WITH THE TOP OF THE BAFFLES.
 3. BAFFLES SHOULD BE SEALED WITH GROUT.
 4. THE BOTTOM OF THE SKIMMER SHOULD BE 8" BELOW THE INVERT OF THE OUTFLOW PIPE.
 5. INVERT OF THE INFLOW PIPE SHOULD NOT BE BELOW THE INVERT OF THE OUTFLOW PIPE.

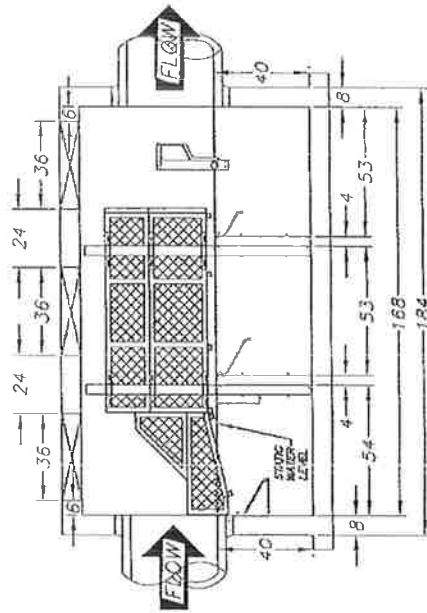


LEFT END VIEW



REAR VIEW

- NOTES:
1. CONCRETE 28 DAY COMPRESSIVE STRENGTH FC=5000 PSI
 2. REINFORCING: ASTM A-615 GRADE 60
 3. SUPPORTS AN H2O LOADING AS INDICATED BY AASHTO.
 4. JOINT SEALANT: BUTYL RUBBER ES-S-00210



FRONT VIEW

5. ALL WALLS ARE 8" THICK, TOP IS 8" THICK AND BOTTOM IS 8" THICK.
6. TREATMENT DESIGN FLOW FOR 90% REMOVAL EFFICIENCY OF TSS IS 35 CFS.
7. 0 FLOW IS 56 CFS.
8. INFLOW AND OUTFLOW PIPES ARE TO BE FLUSH WITH THE INSIDE SURFACE OF THE CONCRETE STRUCTURE. (CAN NOT INTRUDE BEYOND FLUSH)

SUNTREE TECHNOLOGIES INC.		PROJECT: RIVERSIDE COUNTY HOSPITAL
798 CAROLINE ROAD, GEETA, FLORIDA 32922		DRAWING # 4-01-15-10-02
SUNTREE NUTRIENT SEPARATING BAFFLE BOX		FILE NAME: NSBB-10-14-96-RCH-02
MODEL NO. NSBB-10-14-96-RCH-02		REVISION:
DATE: 01/15/10 SCALE: 1/8" = 1'-0"		DATE:
DRAFTER: T.H.2. UNITS = INCHES		SCALE:
		DATE:

Hydrodynamic, Volume, & Physical Specifications Of The Suntime Nutrient Separating Baffle Box
Model Number: NSBB-10-14-96-RCH-Q2

1. The stormwater treatment structure will not be positioned in an off line treatment configuration. It will be sized so that the entire flow of a 36" pipe will always receive treatment by passing it through the inside of the stormwater treatment structure.
2. For flows of 35 cfs a removal efficiency of at least 80% for TSS will be achieved, and flows of up to 56 cfs will be able to pass through the stormwater treatment structure for treatment.
3. The stormwater treatment structure will be able to store captured solid debris such as leaves and litter in a dry state between rain events. The volume of dry storage will be approximately 153.06 cubic feet.
4. The stormwater treatment structure will have the capacity to store approximately 444.4 cubic feet of captured sediment.
5. The skimmer will be the Suntime SkimBoss system. As the water level in the vault changes, the Suntime floating skimmer will automatically move vertically, floating on the changing water level as needed to prevent water flow from lopping the skimmer. On each end of the skimmer a track system is attached to the wall to hold the skimmer in place and provide for vertical movement. Wheels are attached to the ends of the skimmer and fit into the tracks and act to reduce the frictional forces between the skimmer and the tracks so that the skimmer can easily move vertically with the changing water elevations. There are 2 types of wheels that turn perpendicular to each other which are used to deal with the frictional forces. The centering wheels roll against the sides of the vault walls and work to reduce the frictional force of the vault walls. The load wheels reduce the friction produced from the water flow pushing the skimmer against the track in the direction of water flow. The body of the skimmer will be rigid and made of laminated fiberglass. The buoyancy of the skimmer comes from 2 components. The primary buoyancy component are the floats on the upstream side of the skimmer. These floats are located along the top of the skimmer and account for majority of the buoyancy. Another buoyancy component will be PVC structural foam laminated within the fiberglass layers of the body of the skimmer. The body of the skimmer is shaped so that the floats fit within the shape of the skimmer which combine to form a relatively flat surface on the upstream side. The floats are attached to the body of the skimmer within a cavity along the top of the skimmer. The floats are spaced off from the surface of the skimmer body so water can flow completely around on all sides of the float. The space between the float and the body of the skimmer is what allows the skimmer to be buoyant relative to the water level on the upstream side of the skimmer. On the face of each end of the skimmer a rubber seal prevents the passage of oils or other floating chemicals. A hydrocarbon absorption boom is positioned along the face of the skimmer to absorb hydrocarbons. The hydrocarbon absorption boom is held in position by brackets that allow for the vertical movement of the boom along the face of the skimmer. The boom will float on the water surface and rise up and down with the changing water levels.
6. The nutrient separating screen system shall be positioned approximately 3.5" above the static water level within the baffle box. Adjacent to the inflow, the screen system will have openings on both sides that have a combined cross sectional area that exceeds the cross sectional area of the pipe. These openings will act as an internal bypass for water flow in the event that the screen system becomes full of debris.
7. The nutrient separating screen system shall have a minimum of 6" of vertical adjustment. The adjustment method shall be a system with brackets that are attached to the sides of the screen system that will slide vertically along 4" x 4" aluminum square poles. Two stainless steel bolts on each bracket can be tightened to lock the screen system in place, or loosened to allow for vertical adjustment of the screen system. The square poles are anchored to the baffle wall by stainless steel bolts.
8. The nutrient separating screen system shall have a minimum of 3" of horizontal adjustment in the direction of the length of the concrete structure. The brackets that clamp the vertical adjustment poles to the side of the screen system can be repositioned to allow of horizontal adjustment.
9. The nutrient separating screen system shall have a bottom section adjacent to the inflow which is hinged and can be opened for cleaning. This bottom section will function as a screened ramp to direct debris into the main body of the screened system. The sides of the screen system adjacent to the inflow will be made with stainless steel screen and transition in vertical height from a minimum of 8" above the inflow invert to the height of the main body of the screen system. The lower sides of the screen system adjacent to the inflow will provide bypass for water flow around the main body of the screen system if necessary. The cross sectional area of the bypass around the screen system will be equal to or exceed the cross sectional area of the inflow pipe.
10. The nutrient separating screen system shall give access from above grade to the lower sediment collection chambers by the following method. The bottom of the screen system will contain hinged screened doors that can be opened in such a way as to allow adequate access for a vacuum truck to remove everything in all the lower collection chambers.
11. The screen system structure will be a welded aluminum framework spanned by stainless steel screen, be generally rectangular in shape, and be formed to make a bottom, 2 long sides, and 1 end; the top and 1 end will remain open. The screen system will consist of panel sections that are held together with stainless steel bolts. When the panel sections are unbolted and separated from each other they will be able to pass through an access hatch or round manhole in the top of the baffle box for removal purposes. The aluminum frame work along the sides and end will be made of mostly 3" x 3" x 1/4" aluminum angle beam. The screen used to span the aluminum frame is described as follows: For the body of the screen system, flattened expanded stainless steel sheet 1/2" No. 16 F; Open area = 60%; Grade = 304 Stainless Steel. For the riser section of the screen system, flattened expanded stainless steel sheet 3/4" #13 F; open area = 75%; Grade 304 Stainless Steel. The screen will be attached to the screen system frame by sandwiching the screen to the aluminum frame between a series of 2" x 3/16" aluminum bars and welded in place.
12. A turbulence deflector will be attached near the top of each of the baffles and adjacent to the inflow with stainless steel bolts and stainless steel fender washers. The turbulence deflectors will be made from laminated fiberglass and measure a minimum of 3/8" in thickness. The turbulence deflectors attached to the baffles will form a horizontal ledge that measures 18" from the downstream side of the first baffle and 12" from the downstream side of the second baffle, and span the full width of the baffle box. Adjacent to the inflow will be a set of 2 turbulence deflectors that each measure 15" wide x 38" long. An 18" flow spreader will be attached to the face of the first baffle with stainless steel bolts, nuts, and washers.
13. The structure of the box will be precast concrete. The concrete will be 28 day compressive strength $f_c = 5,000$ psi. Steel reinforcing will be ASTM A - 615 Grade 60. Structure will support an H20 loading as indicated by AASHTO. The joint between the concrete sections will ship top and the joint sealed with Rom-Nek or equal butyl rubber joint sealant. Two baffles will separate the bottom of the structure into 3 chambers for the settling and collection of sediment. The baffles will be sealed with non-shrink grout to form 3 water tight chambers.
14. For access into the Nutrient Separating Baffle Box, Three 36" Round Openings will be cast into the top of the vault.
15. The inflow and outflow pipes will not intrude beyond flush with the inside surface of the Nutrient Separating Baffle Box. The space between the pipe holes in the ends of the Nutrient Separating Baffle Box and the outside surface of the pipe will be filled with non-shrink grout to form a water proof seal. The invert of the outflow pipe will be even with the tops of the baffles.

SUNTREE TECHNOLOGIES MODEL NUMBER: NSBB-5-10-84-RCH-Q3

AREA "D"

PATENTED
AND PATENTS PENDING

FLOW & BY-PASS SPECIFICATIONS FOR BIOMASS SEPARATING SCREEN SYSTEM, SEDIMENT COLLECTION CHAMBERS, AND SKIMMER SPECIFICATIONS

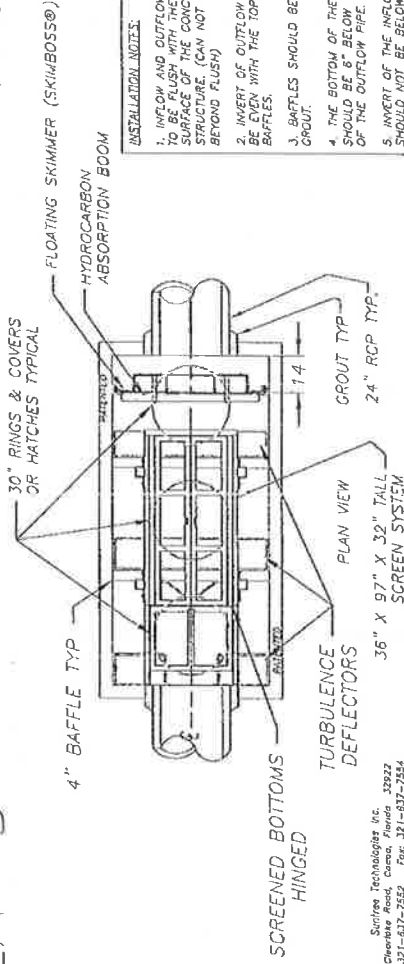
1. Pipe inflow area (Down as 24" RCP) — 3.14 sq.ft.
2. Open orifice area in screen system — 30.11 sq.ft.
3. Open orifice area in screen system with 50% blockage — 15.05 sq.ft.
4. Open orifice area in screen system with 75% blockage — 7.53 sq.ft.
5. Minimum by-pass through screen system below the top surface of the pipe — 4.43 sq.ft.
6. Minimum by-pass around screen system below the top surface of the pipe — 4.24 sq.ft.
7. Screen system storage volume — 50.61 cu.ft.

SEDIMENT STORAGE:

8. Volume of first sediment chamber — 50 cu.ft.
9. Volume of second sediment chamber — 48.75 cu.ft.
10. Volume of third sediment chamber — 48.75 cu.ft.
11. Total sediment volume — 147.5 cu.ft.

SKIMMER SPECIFICATIONS:

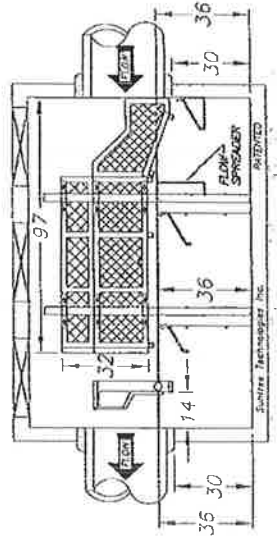
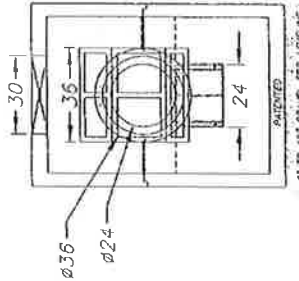
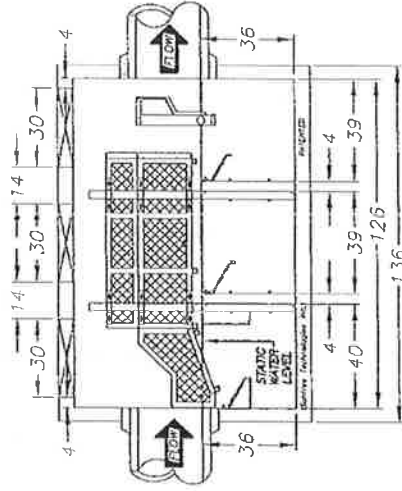
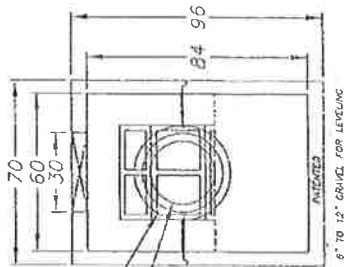
12. Flow area under skimmer — 5.83 sq.ft.
13. Area of pipe in line with skimmer — 3.14 sq.ft.
14. Area between the skimmer and the outflow pipe parallel with the surface of the pipe — 7.32 sq.ft.



Suntree Technologies, Inc. 32923
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Cocoa, FL 32922
PH: 321-837-2555 FAX: 321-837-2554

INSTALLATION NOTES:

1. INFLOW AND OUTFLOW PIPES ARE TO BE FLUSH WITH THE INSIDE SURFACE OF THE CONCRETE STRUCTURE. (CAN NOT INTRUDE BEYOND FLUSH)
2. INVERT OF OUTFLOW PIPE SHOULD BE EVEN WITH THE TOP OF THE BAFFLES.
3. BAFFLES SHOULD BE SEALED WITH GROUT.
4. THE BOTTOM OF THE SKIMMER SHOULD BE 8" BELOW THE INVERT OF THE OUTFLOW PIPE.
5. INVERT OF THE INFLOW PIPE SHOULD NOT BE BELOW THE INVERT OF THE OUTFLOW PIPE.



Notes:

1. CONCRETE 28 DAY COMPRESSIVE STRENGTH 1e-5,000 PSI.
2. REINFORCING: ASTM A-615, GRADE 60.
3. SUPPORTS AN H2O LOADING AS INDICATED BY FASTHO.
4. JOINT SEALANT: BUTYL RUBBER SS-S-00210
5. ALL WALLS ARE 5" THICK. TOP, AND BOTTOM ARE 6" THICK.
6. INFLOW AND OUTFLOW PIPES ARE TO BE FLUSH WITH THE INSIDE SURFACE OF THE CONCRETE STRUCTURE. (CAN NOT INTRUDE BEYOND FLUSH)
7. HINGED LIDS FOR THE SCREEN SYSTEM ARE AVAILABLE UPON REQUEST.
8. BAFFLES WILL BE SEALED WITH GROUT TO FORM THREE WATER TIGHT CHAMBERS.

TREATMENT DESIGN FLOW

15 cfs
Q FLOW
18 cfs

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PROJECT:	AMERSIDE COUNTY HOSPITAL
DRAWING #:	04-01-15-10-Q3
FILE NUMBER:	NSBB-5-10-84-RCH-Q3
REVISIONS:	
DATE:	
NO. OF SHEETS:	
DRAFTER:	T.H.2. UNITS = INCHES
SCALE:	1/15/10 SCALE: SF = 72
MODEL NO.:	NSBB-5-10-84-Q3
SUNTREE NUTRIENT SEPARATING BAFFLE BOX	
SUNTREE TECHNOLOGIES, INC.	
798 CLEARLAKE RD. SUITE #2	
COCOA, FL 32922	

Hydrodynamic, Volume, & Physical Specifications Of The Suntree Nutrient Separating Baffle Box
Model Number: NSBB-5-10-84-RCH-Q3

1. The stormwater treatment structure will not be positioned in an off line treatment configuration. It will be sized so that the entire flow of a 24" pipe will always receive treatment by passing it through the inside of the stormwater treatment structure.
2. For flows of 15 cfs a removal efficiency of at least 80% for TSS will be achieved, and flows of up to 18 cfs will be able to pass through the stormwater treatment structure for treatment.
3. The stormwater treatment structure will be able to store captured solid debris such as leaves and litter in a dry state between rain events. The volume of dry storage will be approximately 50.61 cubic feet.
4. The stormwater treatment structure will have the capacity to store approximately 147.5 cubic feet of captured sediment.
5. The skimmer will be the Suntree SkimBoss system. As the water level in the vault changes, the Suntree floating skimmer will automatically move vertically, floating on the changing water level as needed to prevent water flow from topping the skimmer. On each end of the skimmer a track system is attached to the wall to hold the skimmer in place and provide for vertical movement. Wheels are attached to the ends of the skimmer and fit into the tracks and act to reduce the frictional forces between the skimmer and the tracks so that the skimmer can easily move vertically with the changing water elevations. There are 2 types of wheels that turn perpendicular to each other which are used to deal with the frictional forces. The centering wheels roll against the sides of the vault walls and work to reduce the frictional force of the vault walls. The load wheels reduce the friction produced from the water flow pushing the skimmer against the track in the direction of water flow. The body of the skimmer will be rigid and made of laminated fiberglass. The buoyancy of the skimmer comes from 2 components. The primary buoyancy component are the floats on the upstream side of the skimmer. These floats are located along the top of the skimmer and account for majority of the buoyancy. Another buoyancy component will be PVC structural foam laminated within the fiberglass layers of the body of the skimmer. The body of the skimmer is shaped so that the floats fit within the shape of the skimmer which combine to form a relatively flat surface on the upstream side. The floats are attached to the body of the skimmer within a cavity along the top of the skimmer. The floats are spaced off from the surface of the skimmer body so water can flow completely around on all sides of the float. The space between the float and the body of the skimmer is what allows the skimmer to buoyant relative to the water level on the upstream side of the skimmer. On the face of each end of the skimmer a rubber seal prevents the passage of oils or other floating chemicals. A hydrocarbon absorption boom is positioned along the face of the skimmer to absorb hydrocarbons. The hydrocarbon absorption boom is held in position by brackets that allow for the vertical movement of the boom along the face of the skimmer. The boom will float on the water surface and rise up and down with the changing water levels.
6. The nutrient separating screen system shall be positioned approximately 3.5" above the static water level within the baffle box. Adjacent to the inflow, the screen system will have openings on both sides that have a combined cross sectional area that exceeds the cross sectional area of the pipe. These openings will act as an internal bypass for water flow in the event that the screen system becomes full of debris.
7. The nutrient separating screen system shall have a minimum of 6" of vertical adjustment. The adjustment method shall be a system with brackets that are attached to the sides of the screen system that will slide vertically along 3" x 3" aluminum square poles. Two stainless steel bolts on each bracket can be tightened to lock the screen system in place, or loosened to allow for vertical adjustment of the screen system. The square poles are anchored to the baffle wall by stainless steel bolts.
8. The nutrient separating screen system shall have a minimum of 3" of horizontal adjustment in the direction of the length of the concrete structure. The brackets that clamp the vertical adjustment poles to the side of the screen system can be repositioned to allow of horizontal adjustment.
9. The nutrient separating screen system shall have a bottom section adjacent to the inflow which is hinged and can be opened for cleaning. This bottom section will function as a screened ramp to direct debris into the main body of the screened system. The sides of the screen system adjacent to the inflow will be made with stainless steel screen and transition in vertical height from a minimum of 8" above the inflow invert to the height of the main body of the screen system. The lower sides of the screen system adjacent to the inflow will provide bypass for water flow around the main body of the screen system if necessary. The cross sectional area of the bypass around the screen system will be equal to or exceed the cross sectional area of the inflow pipe.
10. The nutrient separating screen system shall give access from above grade to the lower sediment collection chambers by the following method. The bottom of the screen system will contain hinged screened doors that can be opened in such a way as to allow adequate access for a vacuum truck to remove everything in all the lower collection chambers.
11. The screen system structure will be a welded aluminum framework spanned by stainless steel screen, be generally rectangular in shape, and be formed to make a bottom, 2 long sides, and 1 end; the top and 1 end will remain open. The screen system will consist of panel sections that are held together with stainless steel bolts. When the panel sections are unbolted and separated from each other they will be able to pass through an access hatch or round manhole in the top of the baffle box for removal purposes. The aluminum frame work will be made of mostly 2" x 2" x 1/4" aluminum angle beam. The screen used to span the aluminum frame is described as follows: For the body of the screen system, flattened expanded stainless steel sheet 1/2" No. 16 F; Open area = 60%; Grade = 304 Stainless Steel. For the riser section of the screen system, flattened expanded stainless steel sheet 3/4" #13 F; open area = 75%; Grade 304 Stainless Steel. The screen will be attached to the screen system frame by sandwiching the screen to the aluminum frame between a series of 1 1/4" x 3/16" aluminum bars and welded in place.
12. A turbulence deflector will be attached near the top of each of the baffles and adjacent to the inflow with stainless steel bolts and stainless steel fender washers. The turbulence deflectors will be made from laminated fiberglass and measure a minimum of 3/8" in thickness. The turbulence deflectors attached to the baffles will form a horizontal ledge that measures 12" from the downstream side of the first baffle and 10" from the downstream side of the second baffle, and span the full width of the baffle box. Adjacent to the inflow will be a set of 2 turbulence deflectors that each measure 12" wide x 19" long. An 18" flow spreader will be attached to the face of the first baffle with stainless steel bolts, nuts, and washers.
13. The structure of the box will be precast concrete. The concrete will be 28 day compressive strength $f_c = 5,000$ psi. Steel reinforcing will be ASTM A - 615 Grade 60. Structure will support an H2O loading as indicated by AASHTO. The joint between the concrete sections will ship lap and the joint sealed with Rom-Nek or equal butyl rubber joint sealant. Two baffles will separate the bottom of the structure into 3 chambers for the settling and collection of sediment. The baffles will be sealed with non-shrink grout to form 3 water tight chambers.
14. For access into the Nutrient Separating Baffle Box, Three 30" Round Openings will be cast into the top of the vault.
15. The inflow and outflow pipes will not intrude beyond flush with the inside surface of the Nutrient Separating Baffle Box. The space between the pipe holes in the ends of the Nutrient Separating Baffle Box and the outside surface of the pipe will be filled with non-shrink grout to form a water proof seal. The invert of the outflow pipe will be even with the tops of the baffles.

ENVIRO-SAFE HIGH CAPACITY GRATE INLET SKIMMER
 CALIFORNIA CURB SHELF BASKET WATER CLEANSING SYSTEM
 SAN DIEGO REGIONAL STANDARD CURB INLET

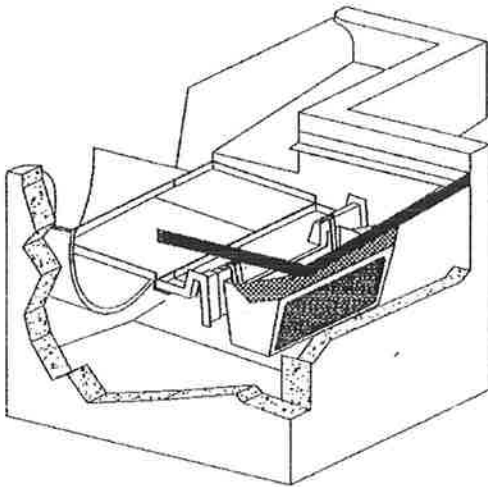


FIGURE 1
 DETAIL OF PARTS

REMOVABLE BASKET CATCHES EVERYTHING
 AND MAY BE REMOVED THROUGH MANHOLE
 WITHOUT ENTRY.

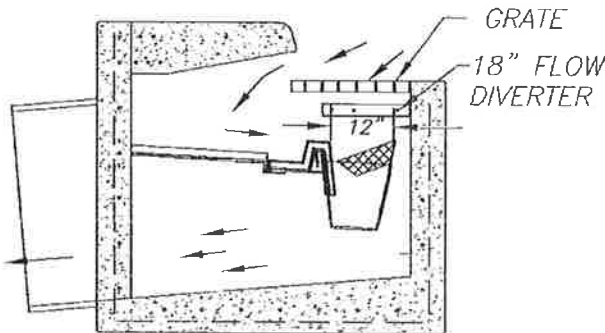


FIGURE 3
 DETAIL OF PROCESS

BOX MANUFACTURED FROM
 MARINE GRADE FIBERGLASS & GEL
 COATED FOR UV PROTECTION

5 YEAR MANUFACTURERS WARRANTY

PATENTED

ALL FILTER SCREENS ARE STAINLESS STEEL

SUNTREE QUALITY PRODUCTS ARE BUILT FOR EASY CLEANING AND ARE
 DESIGNED TO BE PERMANENT INFRASTRUCTURE AND SHOULD
 LAST FOR DECADES.

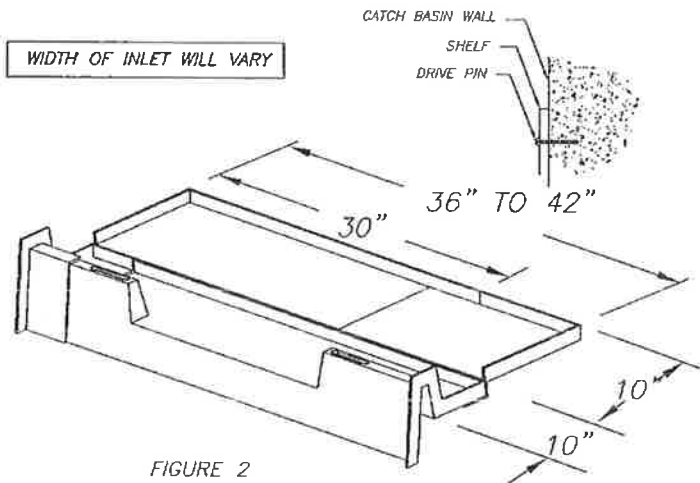


FIGURE 2
 DETAIL OF INSTALLATION

FLOW RATES per 3 FT. Basket

$$Q = 50 * c_d * A * \sqrt{2 * g * h}$$

$c_d = \text{Coefficient of Discharge} = .67$

	50	A (ft ²)	h (ft)	Q (ft ³ /s)
Coarse Screen	.62	.84	0.146	1.06
Med Screen	.56	1.36	0.75	3.53
Fine Screen	.68	1.02	1.167	4.01
TOTAL				8.6

The above flow rates are based on unobstructed screens.

NOTES:

1. SHELF SYSTEM PROVIDES FOR ENTIRE COVERAGE OF INLET OPENING SO TO DIVERT ALL FLOW TO BASKET.
2. SHELF SYSTEM MANUFACTURED FROM MARINE GRADE FIBERGLASS, GEL COATED FOR UV PROTECTION.
3. SHELF SYSTEM ATTACHED TO THE CATCH BASIN WITH NON-CORROSIVE HARDWARE.
4. FILTRATION BASKET STRUCTURE MANUFACTURED OF MARINE GRADE FIBERGLASS, GEL COATED FOR UV PROTECTION.
5. FILTRATION BASKET FINE SCREEN AND COARSE CONTAINMENT SCREEN MANUFACTURED FROM STAINLESS STEEL.
6. FILTRATION BASKET HOLDS BOOM OF ABSORBENT MEDIA TO CAPTURE HYDROCARBONS. BOOM IS EASILY REPLACED WITHOUT REMOVING MOUNTING HARDWARE.
7. FILTRATION BASKET LOCATION IS DIRECTLY UNDER MANHOLE FOR EASY MAINTENANCE.

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 Email: info@biocleanenvironmental.net

SUNTREE TECHNOLOGIES 798 CLEARLAKE RD. SUITE #2 COCOA FL. 32922 TEL. 321-637-7552 FAX 321-637-7554		PROJECT	
CURB INLET BASKET SYSTEM		REVISION#	DATE
DATE: 04/12/04	SCALE: SF = 15	REVISION#	DATE
DRAFTER: N.R.B.	UNITS = INCHES	REVISION#	DATE

Appendix G

AGREEMENTS – CC&RS, COVENANT AND AGREEMENTS AND/OR OTHER
MECHANISMS FOR ENSURING ONGOING OPERATION,
MAINTENANCE, FUNDING AND TRANSFER OF REQUIREMENTS FOR
THIS PROJECT-SPECIFIC WQMP

SPECIFICATIONS

Nutrient Separating Baffle Box

I. Specifications

Track Record: The Nutrient Separating Baffle Box is manufactured by a company whom is regularly engaged in the engineering design and production of treatment systems for stormwater. The Nutrient Separating Baffle Box has been installed and in use as designed in field locations for a duration of over 10 years.

Coverage: The nutrient separating baffle box is of inline design and has the ability to treat the entire storm event. One hundred percent of low and high flows are treated. Thus, no bypass system is required.

Non-Corrosive Materials: Aluminum will be 6061-T6. The screen used to span the aluminum frame is described as follows: Flattened expanded stainless steel sheet ¼ No. 13; Open area = 75%; Grade = 304 Stainless Steel. The screen will be attached to the screen system frame by sandwiching the screen to the aluminum frame between a series of 1 ¼" x 1 ¼" x 3/16" aluminum angle beams and welded in place. A turbulence deflector will be attached near the top of each of the baffles with ½" stainless steel through bolts and stainless steel fender washers. The turbulence deflectors will be made of laminated fiberglass.

Durability: The structure of the box will be precast concrete. The concrete will be 28 day compressive strength $f_c = 5,000$ psi. Steel reinforcing will be ASTM A – C857. Structure will support an H2O loading as indicted by AASHTO. The joint between the concrete sections will ship lap and joint sealed with ram-nek. Filter (excluding oil absorbent media) and support structures are of proven durability, with an expected service life of 15 to 20 years. The filter and mounting structures are of sufficient strength to support water, sediment, and debris loads when the filter is full, with no slippage, breaking, or tearing. All filters are warranted for a minimum of five (5) years.

Oil Absorbent Media: A skimmer and boom system will be positioned near the outflow end of the structure between the second baffle and the end wall of the concrete structure. The skimmer will consist of a steel reinforced concrete structure via keyways in the walls of the structure. The bottom of the skimmer will be positioned so that it is 6" below the static water level. Two storm booms type 4 will float in front of the skimmer and serve to capture hydrocarbons. The storm boom will be contained in an aluminum framed stainless steel screened basket with a hinged lid. The storm boom basket will be attached to the concrete skimmer with stainless steel fasteners.

Overflow Protection: The design of the Nutrient Separating Baffle Box allows the system to treat one-hundred percent of the flow at any level; therefore, no overflow protection is necessary.

Filter Bypass: Water will not bypass the Nutrient Separating Baffle Box at any flow rate.

Pollutant Removal Efficiency: The Nutrient Separating Baffle Box is capable of removing over 90% of the net annual total suspended solids (TSS) load based on a 380-micron particle size. Annual TSS removal efficiency models are based on documented removal efficiency performance from full-scale laboratory tests. Annual TSS removal efficiency models can be considered valid since they are corroborated by independent third party field-testing. Field-testing included influent composite samples from three or more storms at one location. The Nutrient Separating Baffle Box separates solids (e.g. floatable organic matter and trash) from static water within the system.

POLLUTANT	NSBB
Trash & Litter	90 to 95%
Oil & Grease	54% to 96%
Sediments/TSS	95%
Organics	90%
Total Nitrogen	47 to 71.65%
Total Phosphorus	53 to 60%
Total Metals	22 to 66%

Non-Scouring: During heavy storm events the filter water turbulence deflection shield prevents washout of debris and floatables in the filter basket. The system will not re-suspend solids at design flows.

II. Installation

Installation: The Nutrient Separating Baffle Box is constructed according to the sizes shown on the drawings and as specified herein. Install at elevations and locations shown on drawings or as otherwise directed by engineer. Place the pre-cast base unit on a granular subbase of minimum thickness of six inches (152mm) after compaction or of greater thickness and compaction if specified elsewhere. The granular subbase shall be checked for level at all four corners after it is set. If the slope from any corner to any other corner exceeds 0.5%, the base section shall be removed and the granular subbase material re-leveled.

Installation Notes:

1. The Nutrient Separating Baffle Box shall be installed pursuant to the manufacturer's recommendations and the details on this sheet.
2. Attachments to inlet walls shall be made of non-corrosive hardware.
3. Filtration basket fine screen and coarse containment screen shall be manufactured of stainless steel.
4. Prior to setting subsequent sections place bitumen sealant in conformance with ASTM C 990 along the construction joint in the section that is already in place.
5. Any holes made in the concrete sections for handling or other purposes shall be plugged with a non-shrink grout or by using grout in combination with concrete plugs.
6. Where holes must be cut in the pre-cast sections to accommodate pipes, do all cutting before setting the sections in place to prevent any subsequent jarring, which may loosen the mortar joints. The contractor shall make all pipe connections.

III. Maintenance

Maintenance: The Nutrient Separating Baffle Box is designed to allow for the use of vacuum removal of captured materials in the filter screens and sediment chambers, serviceable by centrifugal compressor vacuum units without causing damage to the filter or during normal cleaning and maintenance. Filters can be cleaned and vacuumed from the standard manhole access.

Maintenance Notes:

1. Bio Clean Environmental Services, Inc. recommends the Nutrient Separating Baffle Box be inspected a minimum of once every six months. The cleaning and debris removal maintenance a minimum of once year and replacement of hydrocarbon booms once a year. The procedure is easily done with the use of any standard vacuum truck.
2. Following maintenance and/or inspection, the maintenance operator shall prepare a maintenance/inspection record. The record shall include any maintenance activities performed, amount and description of debris collected, and condition of filter.
3. The owner shall retain the maintenance/inspection record for a minimum of five years from the date of maintenance. These records shall be made available to the governing municipality for inspection upon request at any time.
4. Any person performing maintenance activities must have completed a minimum of OSHA 24-hour hazardous waste worker (hazwoper) training.
5. Remove access manholes lid to gain access to filter screens and sediment chambers. Where possible the maintenance should be performed from the ground surface. Note: entry into an underground stormwater vault such as an inlet vault requires certification in confined space training.
6. Remove all trash, debris, and organics from the Nutrient Separating Screen with the vacuum hose.
7. The Nutrient Separating Screen has 3 hinged panels which will open into an upright position. This will expose the baffles. Using a vacuum hose, remove the sediment in the baffle chambers.
8. Evaluation of the hydrocarbon boom shall be performed at each cleaning. If the boom is filled with hydrocarbons and oils it should be replaced. Place new booms properly in media cage.
9. Transport all debris, trash, organics and sediments to approved facility for disposal in accordance with local and state requirements.
10. The hydrocarbon boom is classified as hazardous material and will have to be picked up and disposed of as hazardous waste. Hazardous material can only be handled by a certified hazardous waste trained person (minimum 24-hour hazwoper).



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Bio Clean R-GISB Media Filter with Shelf System

I. Specifications

Coverage: The Bio Clean R-GISB Media Filter with Shelf System provides full coverage of inlets such that all catch basin influent, at rated flows, is conveyed to the filter. The filter will retain all windblown and swept debris entering the drain.

Shelf System: The R-GISB Media Filter is located in the catch basin directly beneath a manhole opening for direct service/access from the manhole. The filter provides a shelf system made of UV protected marine grade fiberglass to direct water flow from the curb inlet to the filter, which is located directly under the manhole.

Non-Corrosive Materials: All components of the filter system, including mounting hardware, fasteners, support brackets, filtration material, and support frame are constructed of non-corrosive materials (316 stainless steel, and UV/marine grade fiberglass). Fasteners are stainless steel. Primary filter mesh is 316 stainless steel welded screens. Filtration basket screens for coarse, medium and fine filtration is ¾" x 1 ¾" expanded, 10 x 10 mesh, and 35 x 35 mesh with optional 50 x 50 mesh and 200 x 200 mesh, respectively. No polypropylene, monofilament netting or fabrics shall be used in the products.

Durability: The R-GISB Media Filter (excluding oil absorbent media) and support structures are of proven durability, with an expected service life of 10 to 15 years. The filter and mounting structures are of sufficient strength to support water, sediment, and debris loads when the filter is full, with no slippage, breaking, or tearing. All filters are warranted for a minimum of five (5) years.

Oil Absorbent Media: The R-GISB Media Filter is fitted with an absorbent media on the top perimeter for removal of petroleum hydrocarbons from influent, and so placed in the filter assembly to treat influent at rated flow. Absorbent media is easily replaceable in the filter, without the necessity of removing fixed mounting brackets or mounting hardware.

Advanced Filtration Media: The R-GISB is fitted with a combination of advanced filter media to target finer particulates and dissolved pollutants. This filter uses expanded shale for pretreatment followed by a layer of BioMediaGREEN approximately 3 inches thick. This material has the ability to remove dissolved metals, dissolved nutrients, the finest TSS, hydrocarbons and bacteria. Following are the independent third party tested removal efficiencies of this material.

BioMediaGREEN

POLLUTANT	Removal Efficiencies
Oil & Grease (mg/L)	90%
TPH (mg/L)	99%
TSS (mg/L)	85%
Turbidity (NTU)	99%
Total Phosphorus (mg/L)	69.6%
Dissolved Metals (mg/L)	75.6%

Sil-Co-Sil 106. Mean particle diameter = 19 microns

Overflow Protection: The R-GISB Media Filter with Shelf System is designed so that it does not inhibit storm flows entering the curb inlet, or obstruct flow through the catch basin during peak storm flows.

Filter Bypass: Water will not bypass the filter at low flows, nor bypass through attachment and inlet contact surfaces at low flows.

Historic Pollutant Removal Efficiency: The R-GISB has been around since 1994. It was originally designed to capture high levels of trash and litter, grass and foliage, sediments, hydrocarbons, nutrients, metals, grease and oil. The below removal efficiencies are averages of several third party independent test performed on the filter since 1994. These tests did not include the BioMediaGREEN or expanded shale. Thus the removal efficiencies of the MEDIA FILTER TYPE are much higher, as show above. This table provides further support of the longevity and effectiveness of this system.

R-GISB

POLLUTANT	Removal Efficiencies
Trash & Litter	90 to 95%
Oil & Grease	54 to 96%
Sediments/TSS	93.54%
Organics	79.3%
Total Nitrogen	65 to 96%
Total Phosphorus	71 to 96%

Non-Scouring: During heavy storm flows or other flows that bypass the filter, the filter screen design prevents washout of debris and floatables in the filter basket.

Filter Removal: The R-GISB Media Filter is readily removable from the mounting/support frame for maintenance or replacement. Removal and replacement of filter screens is accomplished without the necessity of removing mounting bolts, support frames, etc., but by lift out through the manhole.

II. Installation

Installation: The R-GISB Media Filter will be securely installed in the catch basin or curb inlet opening, with contact surfaces sufficiently joined together so that no filter bypass can occur at low flow. All anchoring devices and fasteners are installed within the interior of the drain inlet. The R-GISB Media Filter is located in the catch basin directly beneath a manhole opening for direct service/access from the manhole. The filter system provides a shelf system to direct water flow from the inlet to the filter, which is located under the manhole.

Installation Notes:

1. Bio Clean Environmental Services, Inc notes the Bio Clean R-GISB Media Filter with Shelf System shall be installed pursuant to the manufacturer's recommendations and the details on this sheet.
2. The patented shelf system shall provide coverage of entire inlet opening, including inlet wing(s) where applicable, to direct all flow to basket(s).
3. Attachments to inlet walls shall be made of non-corrosive hardware.
4. Shelf system shall be installed so that the R-GISB Media Filter is located under manhole access.

III. Maintenance

Maintenance: The R-GISB Media Filter is designed to allow for the use of vacuum removal of captured materials in the filter basket, serviceable by centrifugal compressor vacuum units without causing damage to the filter or any part of the mounting and attachment hardware during normal cleaning and maintenance. R-GISB Media Filter can be cleaned and vacuumed from the manhole-opening. Entering the catch basin to clean the filters is not necessary. **All filters not accessible from the manhole will be rejected**

Maintenance Notes:

1. Bio Clean Environmental Services, Inc. recommends cleaning and maintenance of the Bio Clean R-GISB Media Filter with Shelf System a minimum of two times per year or following a significant rain event that would potentially accumulate a large amount of debris to the system. The hydrocarbon boom should be replaced a minimum of twice per year or at each service as needed. The advanced filtration media should be replaced a minimum of once per year. Varies upon loading.
2. Any person performing maintenance activities that require entering the catch basin or handle a toxic substance have completed the proper training as required by OSHA.
3. Remove manhole lid to gain access to R-GISB Media Filter with Shelf System. The R-GISB Media Filter should be located directly under the manhole lid. Under normal conditions, cleaning and maintenance of the R-GISB Media Filter with Shelf System will be performed from above ground surface.
4. Special Note: entry into an underground manhole, catch basin and stormwater vault requires training in an approved Confined Space Entry Program.
5. Remove all trash, debris, organics, and sediments collected by the R-GISB Media Filter with Shelf System. Removal of the trash and debris can be done manually or with the use of a vactor truck. Manual removal of

debris may be done by lifting the R-GISB Media Filter from the shelf and pulling the R-GISB Media Filter from the catch basin and dumping out the collected debris.

6. Any debris located on the shelf system can be either removed from the shelf or can be pushed into the R-GISB Media Filter and retrieved from R-GISB Media Filter.
7. Evaluation of the hydrocarbon boom shall be performed at each cleaning. If the boom is filled with hydrocarbons and oils it should be replaced. Removed boom by cutting plastic ties and remove boom. Attach new boom to basket with plastic ties through pre-drilled holes in basket.
8. Place manhole lid back on manhole opening.
9. Transport all debris, trash, organics and sediments to approved facility for disposal in accordance with local and state requirements. The hydrocarbon boom with adsorbed hydrocarbons is considered hazardous waste and need to be handled and disposed of as hazardous material. Please refer to state and local regulations for the proper disposal of used motor oil/filters.
10. Following maintenance and/or inspection, the maintenance operator shall prepare a maintenance/inspection record. The record shall include any maintenance activities performed, amount and description of debris collected, and condition of filter. The owner shall retain the maintenance/inspection record for a minimum of five years from the date of maintenance. These records shall be made available to the governing municipality for inspection upon request at any time.
11. Any toxic substance or item found in the filter is considered as hazardous material can only be handled by a certified hazardous waste trained person (minimum 24-hour hazwoper).



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BIO CLEAN R-GISB Media Filter with Shelf System
ENVIRONMENTAL SERVICES, INC.

Maintenance Schedule

R-GISB Media Filter	Cleaning Required	Est. Cleaning Time
Year 1	1) Vacuum Out Accumulated Debris & Sediment from R-GISB (3-6 Month Intervals) 2) Replace BioSorb Hydrocarbon Boom (6-12 Month Intervals) 3) Replace BioMediaGREEN + Perlite Filter Media (6-12 month Intervals)	18 Minutes 5 Minutes 20 minutes
Year 2	1) Vacuum Out Accumulated Debris & Sediment from R-GISB (3-6 Month Intervals) 2) Replace BioSorb Hydrocarbon Boom (6-12 Month Intervals) 3) Replace BioMediaGREEN + Perlite Filter Media (6-12 month Intervals)	18 Minutes 5 Minutes 20 minutes
Year 3	1) Vacuum Out Accumulated Debris & Sediment from R-GISB (3-6 Month Intervals) 2) Replace BioSorb Hydrocarbon Boom (6-12 Month Intervals) 3) Replace BioMediaGREEN + Perlite Filter Media (6-12 month Intervals)	18 Minutes 5 Minutes 20 minutes
Year 4	1) Vacuum Out Accumulated Debris & Sediment from R-GISB (3-6 Month Intervals) 2) Replace BioSorb Hydrocarbon Boom (6-12 Month Intervals) 3) Replace BioMediaGREEN + Perlite Filter Media (6-12 month Intervals)	18 Minutes 5 Minutes 20 minutes
Year 5	1) Vacuum Out Accumulated Debris & Sediment from R-GISB (3-6 Month Intervals) 2) Replace BioSorb Hydrocarbon Boom (6-12 Month Intervals) 3) Replace BioMediaGREEN + Perlite Filter Media (6-12 month Intervals)	18 Minutes 5 Minutes 20 minutes
Year 6	1) Vacuum Out Accumulated Debris & Sediment from R-GISB (3-6 Month Intervals) 2) Replace BioSorb Hydrocarbon Boom (6-12 Month Intervals) 3) Replace BioMediaGREEN + Perlite Filter Media (6-12 month Intervals)	18 Minutes 5 Minutes 20 minutes
Year 7	1) Vacuum Out Accumulated Debris & Sediment from R-GISB (3-6 Month Intervals) 2) Replace BioSorb Hydrocarbon Boom (6-12 Month Intervals) 3) Replace BioMediaGREEN + Perlite Filter Media (6-12 month Intervals)	18 Minutes 5 Minutes 20 minutes
Year 8	1) Vacuum Out Accumulated Debris & Sediment from R-GISB (3-6 Month Intervals) 2) Replace BioSorb Hydrocarbon Boom (6-12 Month Intervals) 3) Replace BioMediaGREEN + Perlite Filter Media (6-12 month Intervals)	18 Minutes 5 Minutes 20 minutes
Year 9	1) Vacuum Out Accumulated Debris & Sediment from R-GISB (3-6 Month Intervals) 2) Replace BioSorb Hydrocarbon Boom (6-12 Month Intervals) 3) Replace BioMediaGREEN + Perlite Filter Media (6-12 month Intervals)	18 Minutes 5 Minutes 20 minutes
Year 10	1) Vacuum Out Accumulated Debris & Sediment from R-GISB (3-6 Month Intervals) 2) Replace BioSorb Hydrocarbon Boom (6-12 Month Intervals) 3) Replace BioMediaGREEN + Perlite Filter Media (6-12 month Intervals)	18 Minutes 5 Minutes 20 minutes
Procedure 1 Vacuum Out Accumulated Debris & Sediment from R-GISB	<p>Bio Clean Environmental Services, Inc. recommends the R-GISB Media Filter with Shelf System be inspected and cleaned every 3 to 6 months. Replacement of hydrocarbon boom, BioMediaGREEN, and perlite is recommended every 6 to 12 months. The procedure is easily done with the use of any standard vacuum truck.</p> <p>1) Identify catch basin. Set up traffic control if required and cone off the working area.</p> <p>2) Remove grate, hatch or manhole lid. Visually, inspect the filter to assess loading and condition of filter components. Because of the shelf system the R-GISB (filter basket) is located directly under the manhole. No entry is required to clean the system. <small>Note: entry into an underground stormwater vault such as catch basins requires certification in confined space training. If the basin is less than 4 feet are not classified as confined space (applies on in some area based upon local regulations).</small></p> <p>3) Reach into catch basin and remove the deflector shield located on the top portion of the filter basket. The deflector shield holds the hydrocarbon boom in place and is easily removable. Removing this allows for easy access to the accumulated debris inside the basket.</p> <p>4) Remove all trash, debris, organics, and sediments collected by the filter basket either manually by hand or with the use of a vacuum truck. If the basket is full debris and sediments the shelf system (trough and weir) may accumulate debris and sediments as a secondary storage mechanism. If this occurs use a broom or pressure washer to push the accumulated debris into the basket and then repeat cleaning of the filter basket.</p> <p>5) If hydrocarbon boom, perlite and BioMediaGREEN are in good condition then replace the deflector shield back into filter basket. Replace grate, hatch, or manhole lid in proper position. Service is complete. If hydrocarbon boom and/or BioMediaGREEN/perlite are saturated or clogged see procedure 2 for hydrocarbon boom replacement and procedure 3 for BioMediaGREEN/perlite replacement.</p>	18 Minutes

<p style="text-align: center;">Procedure 2 Replace BioSorb Hydrocarbon Boom</p>	<p>Bio Clean Environmental Services, Inc. recommends the replacement of hydrocarbon boom every 6 to 12 months. Replacement will require a new hydrocarbon boom, a pair of scissors to cut off zip ties, and new zip ties to secure boom in place.</p> <ol style="list-style-type: none"> 1) Follow steps 1, 2, and 3 in procedure 1. 2) Evaluate hydrocarbon boom. If the boom is filled with hydrocarbons and oils it should be replaced. 3) To remove cut off zip ties which hold the hydrocarbon boom in place on the deflector shield. The boom lies horizontally around the perimeter of the deflector shield. Properly dispose of old boom. (The hydrocarbon boom may be classified as hazardous material and will have to be picked up and disposed of as hazardous waste). 3) Attach new boom to deflector shield with plastic zip ties through pre-drilled holes in deflector shield. Place the deflector shield back into the filler basket. 4) Refer to step 5 in procedure 1. 	<p style="text-align: center;">5 Minutes</p>
<p style="text-align: center;">Procedure 3 Replace BioMediaGREEN + Perlite Filter Media</p>	<p>Bio Clean Environmental Services, Inc. recommends the replacement of BioMediaGREEN and perlite every 6 to 12 months. Replacement will require new blocks of BioMediaGREEN and manufacture specified perlite. Quantities required can be provided by the manufacture. A serrated knife at least 10 inches long may be required to cut the BioMediaGREEN to the appropriate shape and size.</p> <ol style="list-style-type: none"> 1) Follow steps 1, 2, 3 and 4 in procedure 1. 2) Evaluate perlite (top layer) and BioMediaGREEN. If the media appears very dark in color or clogged it will need to be replaced. 3) To replace the filter media first use the basket handle to lift the entire filter basket out of manhole. All baskets are easily removable. Place filter basket on ground to start media replacement process. 4) Reach into basket and lift the removable screen inside the bottom of the filter basket. The removable screen holds the filter media in place. This will expose the media. 5) By hand or with a vacuum truck remove the perlite. Under the perlite is the BioMediaGREEN. Remove BioMediaGREEN filter blocks. They are tightly fitted and may require to be removed by hand. Under the BioMediaGREEN is the under drain media, BioSorb. This media will not need to be replaced. (The BioMediaGREEN and perlite may be classified as hazardous material and will have to be picked up and disposed of as hazardous waste). 6) Use the serrated knife to cut the BioMediaGREEN filter blocks to the appropriate size. Install the new BioMediaGREEN filter blocks. The BioMediaGREEN must fit snug into the filter without large gaps. 7) Pour the new perlite on top of the BioMediaGREEN. Fill to a level equal to the edge of where the removable screen sets. 8) Replace removable screen and secure into place. 9) Replace filter basket back into the catch basin and secure back into position. 4) Refer to step 5 in procedure 1. 	<p style="text-align: center;">20 Minutes</p>

Appendix H

PHASE 1 ENVIRONMENTAL SITE ASSESSMENT – SUMMARY OF SITE REMEDIATION CONDUCTED AND USE RESTRICTIONS

(NOT APPLICABLE)

APPENDIX C

MITIGATION MONITORING AND REPORTING PROGRAM

APPENDIX C

Mitigation Monitoring and Reporting Program: Addendum to Final Initial Study/Mitigated Negative Declaration

Pursuant to Section 21081.6 of the Public Resources Code and the *CEQA Guidelines* Section 15097, a public agency is required to adopt a monitoring and reporting program for assessing and ensuring compliance with any required mitigation measures applied to a proposed development. As stated in the Public Resources Code:

"...the public agency shall adopt a program for monitoring or reporting on the revisions which it has required in the project and the measures it has imposed to mitigate or avoid significant environmental effects."

Section 21081.6 provides general guidelines for implementing mitigation monitoring programs and indicates that specific reporting and/or monitoring requirements, to be enforced during project implementation, shall be defined prior to final certification of the document. The public agency may delegate reporting or monitoring responsibilities to another public agency or a private entity, which accept delegations. The lead agency, however, remains responsible for ensuring that implementation of the mitigation measures occur in accordance with the program.

The mitigation monitoring table below lists mitigation measures required of the Revised Project in order to reduce potential significant impacts. These measures may also be included as conditions of approval for the Revised Project. These measures correspond to those outlined in Section VI. *Environmental Issues Assessment* of this Addendum to the Final IS/MND. To ensure that the mitigation measures are properly implemented, a monitoring program has been devised which identifies the timing and responsibility for monitoring each measure.

This Mitigation Monitoring and Reporting Program (MMRP) for this Addendum to the Final IS/MND is set up as a Compliance Report, with space for confirming the correct mitigation measures have been implemented. In order to sufficiently track and document the status of mitigation measures, the matrix below has been prepared with the following components:

- Mitigation measures;
- Monitoring Phase:
 - Pre-construction, including the design phase;
 - Construction; and/or
 - Occupancy (post-construction).

- Enforcement agency/Responsible agency;
- Verification of Compliance (for use during the reporting/monitoring).

Information pertaining to compliance with mitigation measures or any necessary modifications and refinements will be documented in the verification of compliance portion of the matrix. The mitigation matrix follows this section.

**TABLE C-1
MITIGATION MONITORING AND REPORTING PROGRAM COMPLIANCE REPORT**

Mitigation Measure	Monitoring Phase	Enforcement Agency & Responsible Agency	Initials	Date	Remarks
Air Quality					
<p>Mitigation Measure AIR-1: Any construction activities that are capable of generating fugitive dust shall implement dust control measures to reduce the amount of particulate matter entrained in the ambient air. If these dust factors generate, SCAQMD District Rule 403 requires that the construction crew apply soil stabilizers to inactive construction areas. Exposed surfaces shall have water applied twice daily or as appropriate to weather conditions or apply soil stabilizers. Covering of stockpiles and any earth moving activities shall be pre-watered to the depth of proposed cuts and re-apply water as necessary to maintain soils in a damp condition and to ensure that visible emissions do not exceed 100 feet in any direction. All trucks hauling dirt, sand, soil or other loose material shall be covered or watered prior to leaving the site to prevent dust from impacting surrounding areas. Adjacent streets to the project site will be swept at the end of the day if visible soil material carries over to adjacent roads. Other acceptable Best Available Control Measures (BACM) include, but are not limited to, gravel, rumble plates, and if necessary, temporary wheel washers.</p>	Construction	The construction foreman shall verify compliance with this measure.			
Biological Resources					
<p>Mitigation Measure BIO-1: Conduct a preconstruction survey for burrowing owl. The following measures shall be implemented prior to ground disturbing activities: A preconstruction survey shall be conducted by a qualified biologist within and adjacent to ruderal habitat within 30 days of the on-set of construction. If preconstruction surveys are undertaken during the breeding season (February 1st through August 31st) and an active nest is located, a 500-foot buffer shall be placed around the nest. Orange-mesh construction fencing shall be installed to delineate the buffer area surrounding the nest and shall remain in place through the duration of the breeding</p>	Pre-Construction	The County of Riverside shall verify compliance with this measure.			

Mitigation Measure	Monitoring Phase	Enforcement Agency & Responsible Agency	Initials	Date	Verification of Compliance	Remarks
<p>season or until the nest is no longer occupied as determined by a qualified biologist.</p> <p>If preconstruction surveys are conducted during the non-breeding season (September 1st through January 31st), owls may be relocated to adjacent suitable habitat. Prior to the relocation of any owls, a burrowing owl relocation plan shall be prepared by a qualified biologist and approved by the CDFG. This plan must include methods for removing the owls, assessment and location of suitable sites for relocating owls, and a coordination plan with CDFG and USFWS.</p>	Pre-Construction	The County of Riverside shall verify compliance with this measure.				
<p>Mitigation Measure BIO-2:</p> <p>To avoid impacts to nesting birds, should ground disturbing construction activities take place during the breeding season (February 1st through August 31st):</p> <p>The County shall retain a qualified biologist to conduct nest surveys in potential nesting habitat within and adjacent to the project site within 30 days prior to construction or site preparation activities. Surveys shall include examination of trees, shrubs, and the ground within grassland for nesting birds, as several bird species known to occur in the area are shrub or ground nesters.</p> <p>If active nests are found, clearing and construction activities within a buffer distance determined by CDFG or the qualified biologist, shall be postponed or halted until the nest is vacated and juveniles have fledged, as determined by the biologist, and there is no evidence of a second attempt at nesting during the same year.</p> <p>Limits of construction to avoid an active nest shall be established in the field with flagging, fencing, or other appropriate barriers; and construction personnel shall be instructed on the sensitivity of nest areas. The biologist shall serve as a construction monitor during those periods when construction activities will occur near active nest areas to ensure that no inadvertent impacts to these nests will occur. The results of the survey, and any avoidance measures taken, shall be submitted to the County of Riverside within 30 days of completion of the preconstruction surveys and construction monitoring to document compliance with applicable state and federal laws pertaining to the protection of native birds.</p>						

Mitigation Measure	Monitoring Phase	Verification of Compliance		
		Enforcement Agency & Responsible Agency	Initials	Date
Remarks				
<p>Cultural Resources</p> <p>Mitigation Measure CUL-1: Any accidental discovery of cultural resources during construction shall be evaluated by a qualified archaeologist, defined as an archaeologist meeting the Secretary of the Interior's Qualification Standards for professional archaeology. If the find is determined to be potentially significant, the archaeologist, in consultation with the County and appropriate Native American group(s), shall develop a treatment plan. All work in the immediate vicinity of the unanticipated discovery shall cease until the qualified archaeologist has evaluated the discovery, or the treatment plan has been implemented.</p>	Construction	The construction foreman shall verify compliance with this measure.		
<p>Mitigation Measure CUL-2: If human remains are unearthed during construction activities, State Health and Safety Code Section 7050.5 requires that no further disturbance shall occur until the County Coroner has made the necessary findings as to origin and disposition pursuant to PRC Section 5097.98, if the remains are determined to be of Native American descent, the coroner has 24 hours to notify the Native American Heritage Commission (NAHC). The NAHC shall then identify the person(s) thought to be the Most Likely Descendent of the deceased Native American, who shall then help determine what course of action shall be taken in dealing with the remains.</p>	Construction	The construction foreman shall verify compliance with this measure.		
<p>Mitigation Measure CUL-3: In the event any unique paleontological resource is encountered during excavation, construction shall be halted in the area of discovery. The County Economic Development Agency would be notified and a qualified paleontologist monitor would inspect the findings within 24 hours of the discovery. If a paleontological resource is discovered the paleontologist would then salvage, recorded, and curate the resource.</p>	Construction	The County of Riverside shall verify compliance with this measure.		
<p>Noise</p> <p>Mitigation Measure NOI-1: The construction contractor shall ensure that all construction equipment, fixed or mobile, are properly</p>	Construction	The County of Riverside shall verify		

Mitigation Measure	Monitoring Phase	Enforcement Agency & Responsible Agency	Initials	Date	Verification of Compliance	Remarks
<p>operating (tuned-up) and mufflers are working adequately.</p> <p>The construction contractor shall ensure that all construction equipment is located such that emitted noise is directed away from sensitive noise receivers.</p> <p>The construction contractor shall ensure that stockpiling and vehicle staging areas are located as far as practical from noise-sensitive receptors during construction activities.</p>		<p>compliance with this measure.</p>				



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