

CITY OF CARPINTERIA

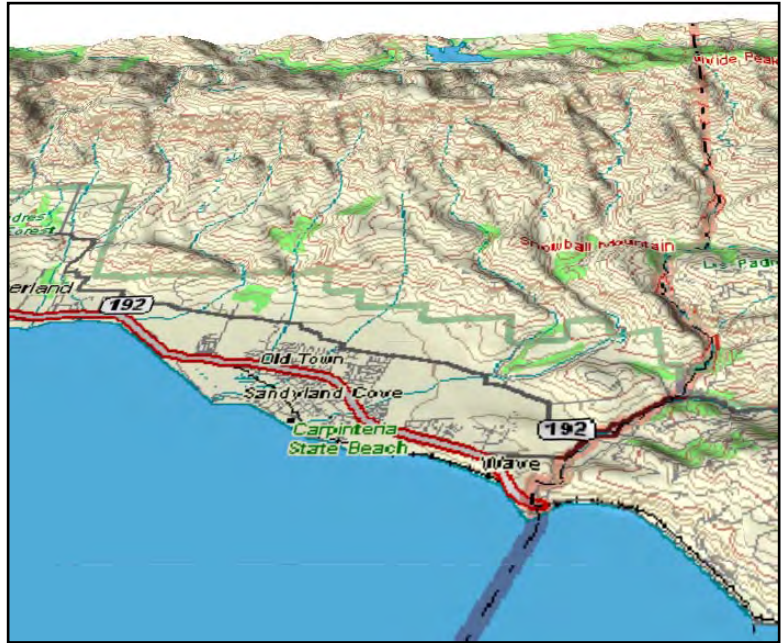
CREEKS PRESERVATION PROGRAM

FINAL DOCUMENT

Volume Two

Appendices

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VOLUME TWO - APPENDICES

APPENDIX A: STREAM SURVEY METHODOLOGY AND FIELD AND LABORATORY DATA FORMS

APPENDIX B: DRAFT STORM WATER MANAGEMENT PLAN

APPENDIX C: LISTS OF EXOTIC PEST PLANTS

APPENDIX D: ACRONYMS, ABBREVIATIONS, AND DEFINITIONS

APPENDIX E: CITY OF CARPINTERIA WATER QUALITY PROTECTION REGULATIONS

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APPENDIX A
STREAM SURVEY METHODOLOGY AND
FIELD AND LABORATORY DATA FORMS

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APPENDIX A STREAM SURVEY METHODOLOGY AND FIELD AND LABORATORY DATA FORMS

The following identifies the methods and equipment that were used to conduct surveys of local creeks at the selected study reaches. The surveys included fieldwork to assess creek habitats and collect data, and laboratory work to analyze water samples and benthic macroinvertebrate samples that were collected in the field.

FIELD SURVEYS

Field surveys were conducted to assess physical and biological conditions at selected study reaches along local creeks, and collect data and samples. Methods and equipment that were used at each study reach are described in Table A-1.

Table A-1. Field Survey Tasks and Equipment

Methods	Equipment
1. General observations were recorded, including creek study reach, date, time, current weather, stream flow status, physical habitat characteristics, plant and animal species observed, and level/sources of human disturbance.	1. Field notebook, data sheets, pencil.
2. A 100-meter long study reach was delineated. The widths of the creek (wetted perimeter, channel bottom, and bank full) and riparian corridor were measured at three points along the 100 meter reach.	2. Stakes, 100-m cloth measuring tape, compass, Field notebook, data sheets, and pencil.
3. The study reach was sketched and photographed. Survey points and important features (e.g., creek bed and bank boundaries, riparian vegetation, adjacent land uses, stream modifications, riffle/pool locations, boulders, falls, gravel bars, woody debris, etc.) were noted and photographed. A representative creek cross-section was also sketched.	3. Field notebook, pencil, and camera.
4. Three water samples were taken for laboratory analysis of suspended solids and nutrients (PO ₄ , NO ₂ , NO ₃ , and NH ₄). Samples were placed on ice in a small cooler in the field. Sampling sites were noted on the study reach sketch.	4. 20-ml sample vials (nutrient samples), 500-ml sample bottles (suspended sediment samples), labels, sharpie pen, small ice chest, pencil, field notebook.
5. Three readings of temperature, pH, dissolved oxygen, and conductivity were taken directly from the creek and recorded. The sampling locations were noted on the study reach sketch.	5. HYDAC pH/conductivity meter, Yellow Springs Instruments dissolved oxygen/temperature meter, field notebook, and pencil.

Table A-1. (Continued)

Methods	Equipment
<p>6. A composite benthic macroinvertebrate sample was collected at each study reach using methods described in <i>Rapid Bioassessment Protocols for Use in Streams and Wadeable Rivers: Periphyton, Benthic Macroinvertebrates and Fish, Second Edition</i> (Barbour, M.T., J. Gerritsen, B.D. Snyder, and J.B. Stribling, USEPA, 1999). Per this protocol, the composite samples consisted of individual samples collected from 20 different locations in the study reach. The sub-sampling locations were selected based on the diversity and relative coverage area of microhabitats (e.g., riffles, pools, falls, etc.) found in the study reach. Each sub-sample was collected by disrupting approximately 0.1 square meter of stream bottom by foot for approximately 20 seconds in front of a D-net. In areas with swift current (e.g., riffles), dislodged benthic organisms were simply swept downstream into the net. In areas without swift current (e.g., pools), the net was swept through the water three times while the stream bottom was being disturbed. Deep and hard to reach areas were sampled by jabbing the net (three times) along an approximately 0.1 square meter area of the stream bottom. Each composite sample was assumed to represent approximately two square meters of stream bottom (i.e., the sum of 20, 0.1 square meter sub-samples). After the composite sample was collected, it was sieved (250 μm mesh), scooped into a plastic container, and preserved in 70% ethanol solution. The microhabitats sampled, and the number of sub-samples within each microhabitat were noted.</p>	<p>6. D-net with 250-μm mesh, watch, 250 and 1,000-μm sieves, spoon, forceps, funnel, beakers, 500-ml bottles, labels, sharpie pen, ethanol, pencil, field notebook.</p>
<p>7. Stream discharge (Q) was estimated at a selected cross section of the study reach. This was accomplished by measuring wetted perimeter width, and depth and current (i.e., velocity) at three to five equally spaced points across the measured width. The product of these measurements was used to estimate Q.</p>	<p>7. Current meter, measuring tape, measuring stick, field notebook, and pencil.</p>
<p>8. A semi-quantitative stream habitat assessment was conducted using the protocol described in <i>Rapid Bioassessment Protocols for Use in Streams and Wadeable Rivers: Periphyton, Benthic Macroinvertebrates and Fish, Second Edition</i> (Barbour, M.T., J. Gerritsen, B.D. Snyder, and J.B. Stribling, USEPA, 1999). This required a visual-based assessment of the following habitat components: stream substrate/cover, sediment embeddedness, stream velocity/depth regime, sediment deposition, channel flow status, human alteration, channel sinuosity, habitat complexity/variability, bank stability, vegetative protection, and riparian vegetation composition and width. Scores were assigned (out of 200 possible points) to the habitat present at each study reach based on these components. Scoring criteria provided in the EPA protocol were used as a guide.</p>	<p>8. Habitat assessment sheets, field notebook, pencil.</p>

LABORATORY WORK

Laboratory work was conducted to analyze water samples and benthic macroinvertebrate samples collected during the field surveys. Laboratory work is described in Table A-2.

Table A-2. Laboratory Tasks and Equipment

Task	Equipment
<p>1. Each water sample collected for analysis of suspended solids was transferred to a graduated cylinder to determine volume, and then passed through pre-weighed 45 μm fiberglass filters using a hand-pumped filtering apparatus. Filters were place in a drying oven at 80° C (176° F) for 24 hours, and then re-weighed. Suspended solid concentrations were determined based on the volume of water in each sample, and the net increase in weight of each filter (due to trapped solids from the water sample).</p> <p>Water samples collected for analysis of nutrients were frozen upon returning from the field, and delivered to the UCSB Marine Sciences Laboratory. Concentrations of NO₂, NO₃, NH₄, and PO₄ were determined at the UCSB lab.</p>	<p>1. Pre-weighed 45-μm fiberglass filters, beaker, hand-pump filtering apparatus, drying oven, balance scale.</p>
<p>2. Benthic macroinvertebrate samples were sieved in the laboratory, and placed in a flat plastic tray. The tray was marked with a grid pattern of 25 equally sized squares (five by five). The entire sample was spread out evenly across the 25 squares. The sample was sorted through one square at a time under a dissecting microscope until a total of 300 macroinvertebrates were pulled out. The proportion of the sample evaluated (i.e., number of square sampled out of 25) was noted, and total macroinvertebrate densities for the approximately two square meter sample area were estimated. The 300 sorted macroinvertebrates were identified (most to the genus level) with the aid of taxonomic keys. Sorted macroinvertebrates and unsorted portions of the samples were bottled separately in 70% ethanol for storage.</p>	<p>2. 250-μm sieve, flat plastic tray (with grid), forceps, dissecting microscope, petri dish, invertebrate identification keys, 70% ethanol, plastic storage vials and bottles.</p>

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APPENDIX B
DRAFT STORM WATER MANAGEMENT PLAN

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CITY OF CARPINTERIA DRAFT STORM WATER MANAGEMENT PLAN

INTRODUCTION

This Storm Water Management Plan (SWMP) has been prepared by the City of Carpinteria to satisfy the requirements established by EPA's Final Phase II NPDES regulations, which were published in the Federal Register on December 8, 1999. Per the Phase II NPDES requirements, small municipalities such as the City of Carpinteria must obtain a NPDES municipal storm water permit by March 2003. The State of California Regional Water Quality Control Board, Central Coast Region (CCRWQCB) will be responsible for administering the NPDES permit program locally. The City will submit this SWMP as part of the permit requirements.

The objectives of this SWMP are to: (1) Reduce the discharge of storm water pollutants in the City to the maximum degree feasible; (2) Protect water quality, and; (3) Meet applicable water quality standards for local water bodies. Best Management Practices (BMPs) are the vehicles by which SWMP objectives will be achieved. BMPs are practical actions that can be taken to reduce water pollution. BMPs established in this SWMP are organized into the following six minimum control measures stipulated in the Phase II NPDES regulations:

- Public Education and Outreach
- Public Participation and Involvement
- Illicit Discharge Detection and Elimination
- Construction Site Runoff Control
- Post-Construction Runoff Control
- Pollution Prevention and Good Housekeeping in Municipal Operations

In addition, this SWMP contains another element: Fostering Partnerships for Watershed and Regionally Based Storm Water Management.

Per the Phase II regulations, BMPs established in the SWMP must be fully implemented by the City by the end of the first permit term, which usually covers a period of five years. Implementation of the SWMP will be administered by the City, under the direction of the Public Works Director. The following describes the SWMP elements and supporting BMPs.

ELEMENT 1: PUBLIC EDUCATION AND OUTREACH

The goal of the Public Education and Outreach Program is to facilitate greater public awareness of the sensitivity of local surface waters, their beneficial uses, the detrimental effects of polluted storm water and illicit discharges, and measures that can be taken to reduce storm water pollution. The City will accomplish this by preparing educational materials and making them available to the public through a variety of outreach efforts. Educational efforts will focus

on storm water issues of local concern, which include pollution from sediments, nutrients, bacteria, petroleum hydrocarbons, metals, pesticides, herbicides, trash and debris. Specific BMPs to be implemented as part of the Public Education and Outreach Program are provided below.

- BMP 1-1** The City will develop brochures and fact sheets that discuss storm water issues, and make them available to the general public. The brochures and fact sheets will be made available at City offices, local libraries, local schools, and on the City's website, and will be distributed periodically with mass mailings such as water bills. Storm water education and outreach material developed by the City will be available in English and Spanish.
- BMP 1-2** In order to facilitate awareness, signs will be placed in highly visible locations to mark local creeks and their tributaries. The City will also stencil messages such as "Do Not Dump: Drains Directly to Creek/Ocean" at strategically placed locations along City storm drains (e.g., at catch basins, along open channels).
- BMP 1-3** The City will work with the Carpinteria Unified School District to promote awareness of storm water issues at local schools. Potential ways of accomplishing this include organizing guided field trips to local creeks, beaches, and the Carpinteria Salt Marsh, providing guest lecturers at school assemblies and classrooms, and the discussing storm water issues in science courses.
- BMP 1-4** The City will provide educational displays on storm water issues at local events such as public meetings, youth sporting events, hazardous waste collection events, festivals, etc. Whenever possible, City staff will be present at such events to discuss storm water issues with interested members of the public.
- BMP 1-5** The City will make further efforts to reach groups that are especially important in the context of water quality management, including owners/operators of agricultural fields and greenhouses, businesses and residences adjacent to local creeks and major storm drains, and industrial facilities. Outreach may consist of door-knocking, phone calls, mailings, and holding meetings to alert these groups of water quality issues specific to their activities, and methods that can be implemented to minimize storm water pollution impacts.
- BMP 1-6** The City will compile a collection of references relating to storm water issues, and will make them available to the public through the local library.

ELEMENT 2: PUBLIC PARTICIPATION AND INVOLVEMENT

The goal of this element is to facilitate public participation and involvement in the development, implementation, and periodic review of the SWMP, as well as volunteer efforts. The benefits of this include improving public knowledge of local storm water issues, receiving public input on potential solutions, gaining public support for and compliance with the SWMP, and developing a volunteer workforce to help implement the SWMP and related efforts.

Facilitating public participation and involvement will be accomplished by implementing the BMPs provided below.

BMP 2-1 The City will advertise public meetings held before the initial adoption of the Creeks Preservation Program and SWMP, and during their periodic review in ensuing years. The City will seek public comments and input during such meetings and public review periods. All public noticing requirements established by State law will be met.

BMP 2-2 The City will organize and advertise at least one major public creek clean up event per year.

BMP 2-3 The City will promote the formation of volunteer groups in the community whose aim is to help deal with storm water issues. Examples include Adopt-a-Creek and Adopt-a-Storm Drain groups, which strive to keep storm drains and creeks free of trash and debris, and make general observations on their overall condition. The City will assist in the formation and maintenance of such groups as much as possible. Forms of City assistance may include arranging access to creeks and storm drains, provision of trash collection, transport, and disposal equipment and facilities, advertising of events, and recruitment of volunteers.

BMP 2-4 The City will encourage citizens, businesses, local schools, environmental organizations, etc. to participate in storm water programs, including storm drain stenciling, water quality monitoring, creek and storm drain clean ups, etc. Several forms of advertising may be used to foster public participation in storm water programs, including local newspapers, community newsletters, local radio and television, announcements at public events and meetings, mailings, telephone calls, and door-to-door visits. Effort will be made to reach a wide range of community groups, including non-English speaking groups.

BMP 2-5 The City will establish a Storm Water Phone Line that citizens can call to report a wide range of concerns related to storm water issues, including implementation of the SWMP, illegal dumping, illicit discharges, erosion from local construction sites, etc. The Storm Water Phone Line will be advertised at storm water events and meetings, and in educational materials distributed by the City.

ELEMENT 3: ILLICIT DISCHARGE DETECTION AND ELIMINATION

The goal of this element is to gain a thorough awareness of the City's storm water system, determine the types and sources of illicit discharges entering the system, and establish the legal, technical, and educational means needed to eliminate these discharges. Illicit discharges are unpermitted waste discharges from non-storm water sources, including mistakenly or deliberately discharged sanitary sewer effluent, motor oil, grease, paint, chemicals, etc. Illicit discharges can release high levels of pollutants to water bodies, including heavy metals, toxics, oil and grease, solvents, nutrients, viruses, and bacteria to receiving waters. Pollution from illicit discharges can significantly degrade receiving water quality and

threaten aquatic wildlife and human health. BMPs that will be implemented to detect and eliminate illicit discharges are provided below.

BMP 3-1 The City will continue to facilitate proper disposal of commonly dumped wastes such as motor oil, antifreeze, paint, chemicals, etc. through implementation of its Hazardous Waste Collection Program. This program includes an annual collection day, at which the City accepts limited quantities of hazardous wastes from individuals at no cost. The City insures that collected waste is properly disposed of. Hazardous waste collection efforts such as this will be advertised in public education and outreach efforts to be implemented as part of the SWMP.

BMP 3-2 An ordinance will be drafted and added to the Carpinteria Municipal Code that prohibits illicit discharges into the storm water system, with appropriate enforcement procedures, actions, and penalties to the extent allowable under applicable laws.

BMP 3-3 A map of the City's storm water system will be prepared. The map will show all major storm water conveyance infrastructure (e.g., channels, ditches, pipes), storm drain outlets, and water bodies that receive discharge from the City's storm water system (i.e., local creeks, Carpinteria Salt Marsh, and the ocean). This map will be used as a basis by which to investigate pollution inputs to the storm drain system, including illicit discharges.

BMP 3-4 An Illicit Discharge Detection and Elimination Plan will be implemented. The measures listed below will be implemented as part of this plan.

- The City will work with other stakeholders such as Project Clean Water to continue water-sampling programs to identify local creeks and storm drains with high pollution concentrations. Ideally, systematic sampling programs will be conducted throughout local watersheds and storm drain infrastructure to identify major sources of pollution. Ideally, water sampling will be conducted during both dry weather conditions and periods of peak storm flows, and samples will be evaluated for a wide variety of pollutants such as metals, oil and grease, nutrients, sediments, bacteria, pesticides, herbicides, etc.
- The results of the water sampling programs will be used to identify storm drains that convey highly polluted runoff, and are likely to convey illicit discharges. As funding permits, sources of illicit discharges (i.e., individual businesses, residences, etc.) will be determined by sampling storm drains from specific facilities.
- Once sources of illicit discharges are identified, offending parties will be notified that they are in violation of the City ordinance, and directed to correct the problem. The City will attempt to educate violators and work with them to eliminate illicit discharges. Legal action will be taken if necessary.
- All actions taken to identify and eliminate illicit discharges will be documented. This documentation will be used in further investigations, and to track progress.

ELEMENT 4: CONSTRUCTION SITE RUNOFF CONTROL

The goal of this element is to minimize water quality impacts from construction projects, particularly due to sediments that are eroded from construction sites and conveyed to receiving waters. Sediment runoff rates from construction sites are typically 10 to 20 times greater than those from agricultural lands, and 1,000 to 2,000 times greater than those from forested lands. In a short period of time, a construction site can contribute more sediment to streams and other receiving waters than what would naturally occur over several decades. Deposited sediments can fill in streams and bays, destroying biological habitat and causing flooding. Increased turbidity in the water column can harm aquatic organisms. Construction sites are also common sources of other types of pollution, including nutrients, pesticides, oil and grease, concrete washout, and debris. In order to minimize water quality impacts from construction sites, the City will enforce the BMPs listed below.

BMP 4-1 The City will continue to enforce the Excavation and Grading Ordinance (Carpinteria Municipal Code, Title 8, Chapter 8.36) for construction projects that involve grading. Under the terms of this ordinance, a grading permit must be obtained from the City engineer prior to commencement of grading activities. The City engineer reviews the site plans for the project, and requires the implementation of soil and slope stability measures (including erosion control) as necessary to protect life and property. The ordinance also requires that regular inspections are made during construction to ensure the integrity of engineered cuts and fills.

BMP 4-2 As part of the development review process, the City will continue to assess potential water quality impacts from construction projects. For construction projects that would disturb an area of one acre or greater, the City will require that a Storm Water Pollution Prevention Plan (SWPPP) is prepared. The Public Works Director may also require the preparation of a SWPPP for construction sites of less than one acre if they are situated in a sensitive area (i.e., adjacent to a creek).

SWPPPs describe the construction site and surrounding areas, identify potential water quality impacts, and list specific BMPs that will be implemented to minimize construction-related water quality impacts. BMPs provided in "Attachment A, Example BMPs for Construction Projects" are to be included in SWPPPs where applicable. Attachment A is not to be considered an exhaustive list of BMPs; if more effective measures are feasible, they are to be implemented.

The SWPPP is to be reviewed and approved by the Public Works Director prior to the issuance of development permits, grading permits, and building permits for the project. Prior to the commencement of construction activities, the Public Works Director will conduct a final inspection of the construction site to ensure that BMPs are in place. In addition, the Public Works Director will have the authority to inspect the site during construction. If the Public Works Director finds that BMPs are not being properly implemented, he or she will have the authority to suspend operations at the site until appropriate adjustments are made.

ELEMENT 5: POST-CONSTRUCTION RUNOFF CONTROL

The goal of this element is to minimize water quality impacts associated with post-construction storm water discharges from existing development, new development and redevelopment. Runoff from developed areas is known to carry a wide range of pollutants, including oil and grease, pesticides, solvents, heavy metals, and nutrients. Also, impervious surfaces associated with developed areas (i.e., pavement) reduce or eliminate percolation of rainwater through soil and vegetation, thus increasing the amount of surface runoff. These effects can degrade the quality of receiving waters, and result in scouring and erosion of drainage channels and banks, and downstream flooding. In order to minimize these types of water quality impacts, the City will implement the BMPs listed below. BMPs that apply to new development and redevelopment will be implemented for all projects affecting an area of one acre or greater.

BMP 5-1 The City will actively encourage (i.e., through the Public Education and Outreach) existing developments to minimize storm water pollution impacts by (1) reducing their use of harmful substances (i.e., fertilizers, pesticides, petroleum hydrocarbons, detergents, industrial chemicals, etc.), and (2) keeping storm water pollutants from entering sensitive receiving waters. The latter may be accomplished using a variety of techniques including erosion control, storm water detainment, and devices such as filters and skimmers at drainage inlets. Another effective method of facilitating pollutant trapping and filtering is the provision of vegetated drainage channels and buffers, including restoration of degraded creek banks and adjacent areas with native vegetation. The City will offer to assist proponents of such efforts in design, implementation, and funding whenever possible. This may include exploring a wide range of funding options, including Federal and State grants and contributions from environmental groups and concerned citizens.

BMP 5-2 As part of the development review process, the City will continue to assess potential water quality impacts from new development and redevelopment projects. This will include review of site plans by the Public Works Director. Prior to the issuance of development permits, grading permits, and building permits, the Public Works Director will verify that appropriate BMPs have been incorporated into the project design such that long-term water quality impacts will be minimized to the greatest degree feasible. At a minimum, the measures listed below will be included into the design of each new development project and redevelopment project affecting an area of one acre or greater.

- Creeks and adjacent wetlands and riparian vegetation will be preserved by adjacent developments per the requirements of policies and implementation measures established in the Carpinteria Creeks Preservation Program.
- Natural drainage patterns and runoff rates will be preserved to the greatest degree feasible by minimizing changes to natural topography, and minimizing the area of impervious surfaces created by the project.

- Erosion will be minimized by constructing cut and fill areas in accordance with the requirements of the Excavation and Grading Ordinance, stabilizing and landscaping areas of bare soil, and directing surface water runoff away from hillsides and other areas that could be easily eroded.
- Developments that will cause changes in surface water runoff rates (i.e., due to altered topography, creation of impervious surfaces) will provide detention basins or ponds that release storm water runoff from the site at pre-development flow rates. Controlled release of storm water will prevent increases in downstream stream scouring that would otherwise result. This will also allow capture of suspended sediments eroded from the site that would otherwise be transported downstream.
- Wherever feasible, alternative drainage features such as vegetated swales, retention ponds, and created wetlands will be provided as part of future developments. These types of drainage features trap sediments and provide biological filtration of storm water pollutants.
- Aggregate filters and surface oil skimmers will be provided at all catch basins and storm drain inlets. These features will be designed and maintained to achieve adequate storm water conveyance, and optimal removal of pollutants.
- In order to facilitate awareness of storm water quality issues, project proponents will provide stenciling and signage to mark catch basins, storm drains, and creeks within and adjacent to new development and redevelopment sites. These efforts will be consistent with those that will be carried out by the City in existing developed areas.
- Proponents of new development and redevelopment projects will distribute storm water educational materials developed by the City to tenants and buyers.
- Refuse containers will be provided in public areas such as parks, clubhouses, etc. to minimize littering and the transport of trash and debris to drainage features.

This is not to be considered an exhaustive list of BMPs; additional measures are to be implemented where necessary to minimize water quality impacts. Long-term implementation of required BMPs (i.e., maintenance of detention basins, vegetation, etc.) will be required as a condition of project approval.

BMP 5-3 Immediately following the completion of construction and prior to the issuance of occupancy permits, the Public Works Director or his/her designee will conduct an inspection of the development site to ensure that required BMPs are in place. If the required BMPs are not in place, the Public Works Director will have the authority to delay the issuance of occupancy permits until appropriate adjustments are made.

BMP 5-4 The City will enforce the requirement for long-term implementation of BMPs for new development and redevelopment projects. This will be accomplished by requiring

property owners to conduct yearly inspection and maintenance of new storm drains, detention basins, filters, and other drainage facilities. Drainage facilities will be maintained and cleaned as needed to provide optimal storm water detention and removal of sediments and other pollutants. An annual report documenting inspection and maintenance will be required of each new development. The annual reports will be submitted to the Public Works Director for review and approval. If the inspection and maintenance outlined in the report is insufficient to provide optimal storm water detention and removal of sediments and other pollutants, the Public Works Director will require the property owners to take corrective action.

ELEMENT 6: POLLUTION PREVENTION AND GOOD HOUSEKEEPING IN MUNICIPAL OPERATIONS

The goal of this program element is to minimize storm water pollution from the operation of municipal facilities including offices, equipment yards vehicles, parks and open space areas, and storm drain infrastructure. Like other types of development, municipal facilities can increase storm water runoff rates, and introduce a wide range of pollutants to receiving waters. In addition, the local storm drain system acts as a sink for sediments, trash, and debris. The City has a responsibility to set a good example for businesses, residences, and other public agencies by in minimizing water quality impacts. In order to achieve this, the City will implement the BMPs listed below.

BMP 6-1 The City will implement storm water BMPs required in Element 4 for construction projects and Element 5 for new development/redevelopment projects as they apply to existing City operations, and future City projects.

BMP 6-2 The City will conduct yearly inspections of all City-owned storm drain facilities. The inspections will be made as soon as possible following the rainy season. The City will maintain its storm drain facilities as needed to provide optimal storm water detention and removal of sediments and other pollutants. This measure will be implemented in coordination with the Santa Barbara County Flood Control District, which is responsible for the maintenance of numerous storm water system components within the City limits.

BMP 6-3 The City will ensure that excess sediments, waste, and debris are removed regularly from its storm drains drain facilities. Wherever possible, removed sediments will be used for beach nourishment. The suitability of removed sediments for beach nourishment will be determined through communications with BEACON. This measure will be implemented in coordination with the Santa Barbara County Flood Control District, which is responsible for the maintenance of numerous storm water system components within the City limits.

BMP 6-4 The City will ensure the preservation of existing riparian vegetation and the revegetation of denuded areas along local creeks in accordance with policies and implementation measures established to support Objective 2 of the Carpinteria

Creeks Preservation Program. Riparian vegetation is effective in stabilizing creek banks, thereby reducing erosion and sediment transport into local creeks.

BMP 6-5 The City will develop and implement an inspection and monitoring program to ensure that municipal BMPs are being implemented.

BMP 6-6 The City will develop a training program to teach City staff how to implement and monitor BMPs to reduce water quality impacts from municipal operations such as park maintenance, equipment and vehicle maintenance and operation, new construction, and storm water system maintenance.

BMP 6-7 The City examine the costs and benefits of installing storm water skimming and filtration devices at existing catch basins and storm drain inlets throughout the City.

BMP 6-8 The City will continue its street sweeping program throughout the City.

ELEMENT 7: FOSTERING PARTNERSHIPS FOR WATERSHED AND REGIONALLY BASED STORM WATER MANAGEMENT

The goal of this program element is for the City to facilitate the formation of partnerships with other groups and individuals to deal with storm water issues on the watershed and regional levels. Because a given stream is affected by all of the physical and biological factors within its watershed, the watershed is the fundamental unit for management. This point is lost when multiple entities within a given watershed or region manage water quality issues without cooperating with each other. The situation can result in a wide disparity in goals, efforts, and success amongst jurisdictions, and inefficiency due to duplication of efforts (i.e., developing separate public education materials, implementing separate water quality monitoring programs, etc.). Cooperation amongst managing entities in unified watershed and regional management and restoration efforts allows common goals to be set, and greater consistency, effectiveness, and efficiency in implementing programs. In order to facilitate the formation of partnerships with other entities, the City will implement the BMP listed below.

BMP 7-1 The City will actively seek to forage partnerships with other groups and individuals to address storm water issues at the watershed and regional levels. This will be achieved by directly contacting other involved agencies and groups, and holding meetings at which cooperation can be discussed. Potential partners that the City will contact include the Central Coast Regional Water Quality Control Board (CCRWQCB), National Forest Service, County of Santa Barbara, Project Clean Water, City of Santa Barbara, University of California Reserve System, Carpinteria Unified School District, local environmental groups, and the Carpinteria Chamber of Commerce. Specific efforts that the City will seek to engage in with partners include public education and outreach, research (e.g., water quality monitoring), and pollution control BMPs.

SWMP IMPLEMENTATION AND REPORTING

As indicated previously, the SWMP will be implemented under the direction of the Public Works Director. The following table provides the timing goals for implementing each BMP in the SWMP. The implementation schedule will begin when the City obtains its initial NPDES Municipal Storm Water Permit from the CCRWQCB.

Implementation Schedule for Storm Water Management Plan BMPs

Program Element	BMP	Year			
		1	2	3	4
Element 1: Public Outreach and Education	1-1: Development and distribution of educational brochures and fact sheets	FI	FI	FI	FI
	1-2: Signs and stenciling	BW	FI	FI	FI
	1-3: School education program	BW	FI	FI	FI
	1-4: Educational displays at public events	BW	FI	FI	FI
	1-5: Additional outreach to especially important groups	BW	FI	FI	FI
	1-6: Compile and make available storm water reference collection	BW	FI	FI	FI
Element 2: Public Participation and Involvement	2-1: Public notification and participation during SWMP development.	FI	FI	FI	FI
	2-2: Annual creek clean up events	FI	FI	FI	FI
	2-3: Promote volunteer groups	FI	FI	FI	FI
	2-4: Encourage public participation in storm water programs	FI	FI	FI	FI
	2-5: Storm water phone line	FI	FI	FI	FI
Element 3: Illicit Discharge Detection and Elimination	3-1: Hazardous waste collection efforts	FI	FI	FI	FI
	3-2: Illicit discharges ordinance	BW	FI	FI	FI
	3-3: Storm water system map	BW	FI	FI	FI
	3-4: Illicit Discharge Detection and Elimination Plan	--	BW	FI	FI
Element 4: Construction Site Runoff Control	4-1: Continued enforcement of Excavation and Grading Ordinance	FI	FI	FI	FI
	4-2: Require SWPPPs for construction projects	FI	FI	FI	FI
Element 5: Post-Construction Runoff Control	5-1: Encourage storm water BMPs for existing development	BW	FI	FI	FI
	5-2: Require post-construction BMPs for new development and redevelopment	FI	FI	FI	FI
	5-3: Inspection of development sites for BMP installation.	FI	FI	FI	FI
	5-4: Long-term enforcement of BMPs.	BW	FI	FI	FI

Program Element	BMP	Year			
		1	2	3	4
Element 6: Pollution Prevention/Good Housekeeping in Municipal Operations	6-1: BMPs implemented in City operations and new projects.	FI	FI	FI	FI
	6-2 and 6-3: Storm water system maintenance	BW	FI	FI	FI
	6-4: Preservation of riparian vegetation	FI	FI	FI	FI
	6-5: BMP inspection and monitoring program	FI	FI	FI	FI
	6-6: City staff training program	FI	FI	FI	FI
	6-7: Cost-benefit study for storm drain filters and skimmers	--	BW	FI	--
	6-8: Cost-benefit study for street sweeping	--	BW	FI	--
Element 7: Fostering Partnerships for Storm Water Management	7-1: Forge partnerships to address storm water issues at the watershed and regional levels.	BW	FI	FI	FI

Abbreviations: BW = Begin Work IP = In Progress FI = Fully Implemented

Per the Phase II NPDES regulations, the City will be required to prepare SWMP monitoring reports annually, and submit them to CCRWQCB. The monitoring reports must include the following information:

- The status of compliance with permit conditions, including an assessment of the effectiveness of each BMP in the SWMP, and progress made towards the implementation of each BMP.
- The results of studies completed that relate to storm water management (e.g., biological surveys, water quality monitoring, illicit discharge detection, etc.).
- A summary of actions that will be implemented during the next reporting cycle.
- Any changes to BMPs in the SWMP, and a discussion of the reasons why changes will be made.

As indicated above, the annual reporting process will require the City to review the performance of each BMP in the SWMP on an annual basis. The reporting process will be used by the City as an opportunity to evaluate the overall effectiveness of the SWMP, and to determine what additions or revisions (if any) are needed to most effectively protect the quality of local surface waters.

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ATTACHMENT A: BEST MANAGEMENT PRACTICES FOR CONSTRUCTION PROJECTS

The following Best Management Practices are to be incorporated where applicable into Storm Water Pollution Prevention Plans for construction activities that would disturb an area of one acre or more. These measures should also be incorporated into construction projects that would affect less than one acre of land if such sites are located in a sensitive area such as within or adjacent to a creek.

1. To the greatest degree feasible, construction activities will be conducted during the dry season (i.e., May to October).
2. Disturbance of soils and vegetation will be minimized to the greatest extent possible. Where construction activities would occur adjacent to natural vegetation, the work area will be clearly flagged to identify its limits. Disturbance of soil or vegetation will not occur beyond these limits.
3. Topsoil from excavations will be stored separately from deeper strata. When back-filling, the deeper strata will be replaced first, with the topsoil being used to fill the upper depths of the excavation. This will promote more rapid and complete recolonization of the disturbed area by vegetation.
4. Gravel pads will be installed at all access points to minimize the tracking of sediments on to roads.
5. Roadways in the vicinity of construction access points will be swept as necessary to prevent the accumulation of sediments.
6. Access roads, parking areas, and areas where bare soil is exposed by construction activities will be watered at least twice daily to minimize wind erosion. Whenever average wind speed exceeds 15 mph, watering of exposed soils will be conducted at an increased frequency.
7. Soil piles will be watered or covered as needed to prevent wind and water erosion of the soil.
8. Clearing and grading activities will cease during periods of high winds (greater than 20 miles per hour, averaged over one hour).
9. To minimize dust generation from construction vehicles, vehicle speeds at the construction site will be limited to 15 mph or less.
10. Trucks transporting fill material to and from the site will be covered from the point of origin.
11. Soil piles, debris, and construction materials (e.g., uncured concrete, fuels, paints, building supplies, etc.) will be stored in designated areas where they could not enter surface waters or storm drains due to spillage or erosion.

12. Earth berms, silt fencing, and/or hay bails will be provided and maintained around areas of exposed soils. These barriers will be placed such that on-site soils are not eroded and transported to downstream areas, and no net increase in storm water runoff from the work site occurs. Temporary de-silting/detention basins may also be required to accomplish these objectives.
13. In the event that surface water flow is encountered during construction activities, it will be diverted to prevent working in flowing water. This will include constructing a barrier and pumping water over land to a location downstream of the work area. Non-erosive materials such as sand bags will be used to construct the barrier.
14. If de-watering and/or surface water diversion are required, diverted flows will be directed through a filtration device (e.g., clarifier, sediment basin) prior to release into downstream areas. The filtration device will be maintained as needed to provide optimal sediment trapping performance. Rock, sandbags, or other suitable materials will be placed at the outlet of the filtration device to prevent soil scouring, and reduce flow from the outlet to non-erosive velocities.
15. If de-watering operations are required in areas that may be contaminated, ground water from the extraction site will be sampled at a certified laboratory. Should the ground water sample exceed water quality standards set by the Central Coast Regional Water Quality Control Board (CCRWQCB), all extracted ground water will be treated before being discharged to surface waters, ground waters, or the local sewer system. Clean up levels and treatment methodology will be approved by CCRWQCB.
16. All fueling of vessels, vehicles, and heavy equipment will occur in designated areas that are located away from surface water bodies and storm drains. Designated areas will include spill containment devices (e.g., drain pans, containment booms) and absorbent materials to clean up any spills that may occur.
17. Vehicles, vessels, and equipment will be maintained properly to prevent leakage of hydrocarbons and other fluids, and will be examined for leaks on a daily basis. All maintenance will occur in designated areas that are located away from surface water bodies and storm drains. Designated maintenance areas will include spill containment devices (e.g., drain pans, containment booms) and absorbent materials to clean up spills.
18. Any accidental spill of hydrocarbons or other fluids that may occur at the construction site will be cleaned immediately. Spill containment devices (e.g., drain pans, containment booms) and absorbent materials will be maintained on the work site for this purpose. CCRWQCB will be notified immediately in the event of an accidental spill to ensure proper clean up and disposal of waste.
19. Trucks, equipment, tools, and other objects in contact with wet concrete or concrete aggregate will be washed out in a designated area located away from surface waters and storm drains. Washings from these areas will be controlled such that concrete wastes are not conveyed to surface waters and storm drains.

20. When washing concrete to remove fine particles and expose aggregate, runoff water will be drained to a bermed or level area to avoid conveyance to surface waters and storm drains.
21. Excess concrete will be removed from the construction site. Sweepings of exposed aggregate concrete will be returned to the aggregate base stock pile or disposed of in the trash. Excess concrete will not be allowed to enter surface waters and storm drains.
22. Waste and debris generated by construction projects will be stored in designated waste collection areas and containers located away from surface waters and storm drains, and will be disposed of regularly.
23. Convenient, portable sanitary/septic facilities will be provided during construction projects. These facilities will be well-maintained and serviced, and wastes will be treated and disposed of in accordance with State and local requirements.
24. Mulching and revegetation of disturbed areas will be conducted as soon as possible following final grading. In the event that new plants do not become established before the beginning of the next rainy season (i.e., November), temporary runoff and erosion control barriers (i.e., earth berms, silt fences, hay bails, de-silting/detention basins) will be maintained through the rainy season (i.e., until May).
25. Fertilizers, herbicides, and pesticides will be used only if necessary in vegetation removal and/or revegetation efforts, especially where such activities would occur near storm drains and natural drainage courses. In cases where the use of these materials is necessary, they will be applied in a manner that minimizes the potential for transport into surface waters. For example, a herbicide such as Roundup will be applied directly to plant stalks and roots rather than by aerial spraying.
26. Prior to commencing construction projects, crew members will be trained how to implement and comply with the selected BMPs.
27. The contractor will inspect the site regularly to ensure that required BMPs are being implemented at all times, and that the BMPs are effectively minimizing water quality impacts. All inspections will be summarized in written monitoring records, which will be maintained by the contractor for a minimum of three years. If the contractor finds that the selected BMPs are not effective in minimizing water quality impacts, the he or she will immediately inform the Public Works Director, who will meet with the contractor at the site to devise alternative BMPs.

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APPENDIX C
LISTS OF EXOTIC PEST PLANTS

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Invasive Plant Inventory Revision Completed PAFs



Cape ivy in Berkeley hills (B. Case)

These Plant Assessment Forms (PAFs) include draft scores and documentation for plants reviewed for the updated California Invasive Plant Inventory (a.k.a. the Cal-IPC weed list). The meaning of each score can be found in the [Cal-IPC List Criteria](#) (pdf file). These rankings should be considered preliminary until final comments have been received. To view a summary of scores, documentation levels, and Jepson regions invaded for all reviewed species, see the following spreadsheets:

- [Invasive Plant Inventory Spreadsheet \(Excel\)](#)
- [Invasive Plant Inventory Spreadsheet \(pdf\)](#)

If you can provide additional information on any species or have other comments regarding the scores, contact Cal-IPC project manager Elizabeth Brusati (edbrusati@cal-ipc.org) by SEPTEMBER 1, 2005. To help us track comments, please include:

- The plant species name
- The number of the question your comment addresses (1.1, 1.2, etc.)
- Specific details for the information you are adding or the score that you think is incorrect

The final draft will be presented at the October 2005 Cal-IPC Symposium and published in late 2005.

Plants are categorized as High, Medium, or Low based on a combination of their documented impacts, potential for spread, and the range of habitats they tolerate. **Please be aware that the rankings represent state-wide impacts.** Lower-rated species are invasive but may occur in a limited number of regions or habitats within California. For information on plants of concern in your area, see information provided by local [Weed Management Areas](#). Photographs for many species are available through The Nature Conservancy's [Invasive Species Initiative](#) webpage.

A [glossary](#) (pdf) of some of the terms used in the PAFs is available through [The Weed Workers' Handbook](#).

High: These species have severe ecological impacts on ecosystems, plant and animal communities, and vegetational structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal and establishment. These species are usually widely distributed ecologically, both among and within ecosystems.

Plants Rated High

- [Aegilops triuncialis](#) (Barbed goatgrass)
- [Alternanthera philoxeroides](#) (Alligatorweed)
- [Ammophila arenaria](#) (European beachgrass)
- [Arundo donax](#) (Giant reed)
- [Bromus rubens](#) (Red brome)
- [Bromus tectorum](#) (Cheat grass)
- [Carpobrotus edulis](#) (iceplant)
- [Centaurea maculosa](#) (Spotted knapweed)
- [Centaurea solstitialis](#) (Yellow starthistle)
- [Cortaderia jubata](#) (Jubata grass)
- [Cortaderia selloana](#) (Pampas grass)
- [Cytisus scoparius](#) (Scotch broom)
- [Delairea odorata](#) (Cape ivy)
- [Egeria densa](#) (Brazilian waterweed)
- [Ehrharta calycina](#) (Veldt grass)
- [Eichhornia crassipes](#) (Water hyacinth)
- [Euphorbia esula](#) (Leafy spurge)
- [Genista monspessulana](#) (French broom)
- [Hedera helix](#) (English ivy)
- [Hydrilla verticillata](#) (Hydrilla)
- [Lepidium latifolium](#) (Perennial pepperweed)
- [Lolium multiflorum](#) (Italian ryegrass)
- [Ludwigia hexapetala](#) (Creeping water primrose)
- [Ludwigia peploides](#) (Creeping water primrose)
- [Lythrum salicaria](#) (Purple loosestrife)
- [Myriophyllum aquaticum](#) (Parrotfeather)
- [Myriophyllum spicatum](#) (Spike watermilfoil)
- [Onopordum acanthium](#) (Scotch thistle)
- [Rubus armeniacus/Rubus discolor](#) (Himalayan blackberry)
- [Salvinia molesta](#) (Giant salvinia)
- [Sesbania punicea](#) (Red sesbania)
- [Spartina alterniflora](#) hybrids (smooth cordgrass)
- [Spartium junceum](#) (Spanish broom)
- [Taeniatherum caput-medusae](#) (Medusahead)
- [Tamarix ramosissima](#) (Saltcedar)
- [Ulex europaeus](#) (Gorse)

Medium: These species have substantial and apparent - but generally not severe - ecological impacts on ecosystems, plant and animal communities, and vegetational structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal, though establishment is generally dependent upon ecological disturbance. Ecological amplitude and distribution may range from limited to widespread.

Plants Rated Medium

- Acroptilon repens (Russian knapweed)
- Ageratina adenophora (Eupatory)
- Ailanthus altissima (Tree-of-heaven)
- Alhagi maurorum (Camel thorn)
- Anthoxanthrum odoratum (Sweet vernal grass)
- Arctotheca calendula fertile (Fertile capeweed)
- Arctotheca calendula infertile (Capeweed)
- Asparagus asparagoides (Bridal creeper)
- Asphodelus fistulosus (Onion weed)
- Atriplex semibaccata (Australian saltbush)
- Avena barbata (Slender wild oat)
- Avena fatua (Wild oat)
- Brachypodium sylvaticum (False brome)
- Brassica tournefortii (Sahara mustard)
- Bromus diandrus (Ripgut grass)
- Cakile maritima (Sea rocket)
- Cardaria chalepensis (Lens-podded hoary cress)
- Cardaria draba (Heart-podded hoary cress)
- Carduus nutans (Musk thistle)
- Carduus pycnocephalus (Italian thistle)
- Carpobrotus chilensis (Iceplant)
- Carthamnus lanatus (Woolly distaff thistle)
- Centaurea calcitrapa (Purple starthistle)
- Centaurea melitensis (Tocalote)
- Centaurea virgata ssp. squarrosa (Squarrose knapweed)
- Centaurea x pratensis (Meadow knapweed)
- Chondrilla juncea (skeleton weed)
- Chrysanthemum coronarium (garland chrysanthemum)
- Cirsium arvense (Canada thistle)
- Cirsium vulgare (Bull thistle)
- Conium maculatum (Poison hemlock)
- Cotoneaster franchetii (Cotoneaster)
- Cotoneaster lacteus (Cotoneaster)
- Cotoneaster pannosa (Cotoneaster)
- Crupina vulgaris (Bearded creeper)
- Cupressus macrocarpa (Monterey cypress)
- Cynara cardunculus (Artichoke thistle)
- Cynodon dactylon (Bermuda grass)
- Cynoglossum officinale (Common houndstongue)
- Cynosurus echinatus (Annual dogtail)
- Cytisus striatus (Portugese broom)
- Descurainia sophia (Flixweed)
- Digitalis purpurea (Foxglove)
- Dipsacus fullonum (Wild teasel)
- Dipsacus sativus (Fuller's teasel)
- Dittrichia graveolens (stinkweed)
- Ehrharta erecta (Veldt grass)
- Ehrharta longiflora (Veldt grass)
- Elaeagnus angustifolia (Russian olive)
- Emex spinosa (Devil's thorn)
- Erechtites minima, E. glomerata (Australian fireweed)
- Eucalyptus globulus (Blue gum eucalyptus)
- Euphorbia terracina (carnation spurge)
- Festuca arundinacea (Tall fescue)
- Ficus carica (Edible fig)

- Foeniculum vulgare (Fennel)
- Geranium dissectum (Cutleaf geranium)
- Geranium molle (Dove geranium)
- Halogeton glomeratus (Halogeton)
- Hirschfeldia incana (Mediterranean mustard)
- Holcus lanatus (Common velvet grass)
- Hordeum marinum, H. murinum (Mediterranean barley, foxtail)
- Hypericum canariense (Canary Island St. John's wort)
- Hypericum perforatum (Klamathweed)
- Hypochaeris radicata (Rough cat's ear)
- Ilex aquifolium (English holly)
- Isatis tinctoria (Dyer's woad)
- Kochia scoparia (Kochia)
- Leucanthemum vulgare (Ox-eye daisy)
- Linaria genistifolia (Dalmatian toadflax)
- Lythrum hyssopifolium (Hyssop loosestrife)
- Mentha pulegium (Pennyroyal)
- Mesembryanthemum crystallinum (crystalline iceplant)
- Myoporum laetum (Myoporum)
- Nicotiana glauca (Tree tobacco)
- Oxalis pes-caprae (Bermuda buttercup)
- Pennisetum setaceum (Fountain grass)
- Phalaris aquatica (Harding grass)
- Polygonum cuspidatum (Japanese knotweed)
- Polygonum sachalinense (Giant knotweed)
- Potamogeton crispus (Curly-leaved pondweed)
- Rumex acetosella (Sheep sorrel)
- Sapium sebiferum (Chinese tallow tree)
- Sisymbrium irio (London rocket)
- Spartina anglica (English cordgrass)
- Spartina densiflora (Dense-flowered cordgrass)
- Stipa capensis (cape ricegrass)
- Tanacetum vulgare (Common tansy)
- Trifolium hirtum (Rose clover)
- Vinca major (Periwinkle)
- Vulpia myuros (Rat-tail fescue)
- Washingtonia robusta (Washington palm)

Low: These species are invasive but their ecological impacts are minor. Their reproductive biology and other attributes result in low to moderate rates of invasion. Ecological amplitude and distribution are generally limited, but these species may be locally persistent and problematic.

Plants Rated Low

- Acacia melanoxylon (Blackwood acacia)
- Agrostis avenacea (Pacific bentgrass)
- Agrostis stolonifera (Carpet bent)
- Aira caryophyllea (Silver European hair grass)
- Bassia hyssopifolia (Bassia)
- Bellardia trixago (Bellardia)
- Bellis perennis (English daisy)
- Brassica rapa (Birdsrape mustard)
- Briza maxima (Rattlesnake grass)
- Bromus hordeaceus (Soft brome)

- Cardaria pubescens (Hairy whitetop)
- Carduus acanthoides (Plumeless thistle)
- Carduus tenuifolius (Slenderflower thistle)
- Cistus ladanifer (Gum cistus)
- Conicosia pugioniformis (Narrow-leaved iceplant)
- Convolvulus arvensis (field bindweed)
- Cotula coronopifolia (Common brassbuttons)
- Crataegus monogyna (Hawthorn)
- Dactylis glomerata (Orchard grass)
- Echium candicans (Pride-of-Madeira)
- Erigeron karvinskianus (Mexican daisy)
- Erodium botrys (Longbeak stork's bill)
- Erodium brachycarpum (Shortfruit stork's bill)
- Erodium cicutarium (Filaree)
- Eucalyptus camaldulensis (red gum)
- Euphorbia oblongata (Eggleaf spurge)
- Geranium retrorsum (New Zealand geranium)
- Geranium robertianum (Robert geranium)
- Gleditsia triacanthos (honey locust)
- Helichrysum petiolare (Licorice plant)
- Hypochaeris glabra (Smooth catsear)
- Iris pseudacorus (Yellow water iris)
- Ligustrum lucidum (Glossy privet)
- Lotus corniculatus (Bird's-foot-trefoil)
- Malephora crocea (Red-flowered iceplant)
- Marrubium vulgare (Horehound)
- Medicago polymorpha (Burr medic)
- Myosotis latifolia (Common forget-me-not)
- Nymphaea odorata (fragrant waterlily)
- Olea europaea (Olive)
- Ononis alopecuroides (Foftail restharrow)
- Pennisetum clandestinum (Kikuyugrass)
- Phoenix canariensis (Canary Isl. date palm)
- Picris echioides (Bristly ox-tongue)
- Piptatherum miliaceum (Smilo grass)
- Pittosporum undulatum (Victorian box)
- Plantago lanceolata (Buckhorn plantain)
- Poa pratensis (Kentucky bluegrass)
- Polypogon monspeliensis (Rabbitfoot polypogon)
- Pyracantha spp. (Pyracantha)
- Ranunculus repens (Creeping buttercup)
- Raphanus sativus (Wild radish)
- Ricinus communis (castor bean)
- Robinia pseudoacacia (black locust)
- Rumex crispus (Curly dock)
- Salsola paulensii (Barbwire Russian thistle)
- Salvia aethiopis (Mediterranean sage)
- Saponaria officinalis (Bouncing bet)
- Schinus molle (Peruvian pepper tree)
- Schinus terebinthifolius (Brazilian pepper tree)
- Schismus spp. (Mediterranean grass)
- Senecio jacobaea (Tansy ragwort)
- Silybum marianum (Blessed milk thistle)
- Sinapis arvensis (Wild mustard)
- Sonchus asper (Spiny sowthistle)
- Spartina patens (Salt-meadow cord grass)
- Tamarix aphylla (athel)
- Ulmus pumila (Siberian elm)

- Undaria pinnatifida (Japanese kelp)
- Verbascum thapsus (Woolly mullein)
- Vicia villosa (vetch)
- Vulpia bromoides (squirrel tail fescue)
- Watsonia meriana (Bulbil watsonia)
- Zantadeschia aethiopica (Calla lily)

Red Alert: This is an additional designation for some species in either the high or medium category whose current ecological amplitude and distribution are limited. The designation alerts managers to species that are capable of rapidly invading unexploited ecosystems, based on initial, localized observations, and on observed ecological behavior in similar ecosystems elsewhere.

Red Alert Species

- Alternanthera philoxeroides (Alligatorweed)
- Arctotheca calendula fertile (Fertile capeweed)
- Asphodelus fistulosus (Onion weed)
- Asparagus asparagoides (Bridal creeper)
- Atriplex semibaccata (Australian saltbush)
- Brachypodium sylvaticum (False brome)
- Cardaria chalepensis (Lens-podded hoary cress)
- Carthamnus lanatus (Woolly distaff thistle)
- Centaurea x pratensis (Meadow knapweed)
- Dittrichia graveolens (stinkweed)
- Ehrharta longiflora (Veldt grass)
- Eichhornia crassipes (Water hyacinth)
- Emex spinosa (Devil's thorn)
- Euphorbia esula (Leafy spurge)
- Euphorbia terracina (carnation spurge)
- Hydrilla verticillata (Hydrilla)
- Hypericum canariense (Canary Island St. John's wort)
- Ilex aquifolium (English holly)
- Ludwigia hexapetala (Creeping water primrose)
- Mesembryanthemum crystallinum (crystalline iceplant)
- Myriophyllum aquaticum (Parrotfeather)
- Polygonum cuspidatum (Japanese knotweed)
- Polygonum sachalinense (Giant knotweed)
- Sapium sebiferum (Chinese tallow tree)
- Salvinia molesta (Giant salvinia)
- Spartina alterniflora hybrids (smooth cordgrass)
- Sesbania punicea (Red sesbania)
- Spartina anglica (English cordgrass)
- Spartina densiflora (Dense-flowered cordgrass)
- Stipa capensis (cape ricegrass)
- Washingtonia robusta (Washington palm)

Considered But Not Listed: In general, this designation is for species for which information is currently inadequate to respond with certainty to the minimum number of criteria questions (i.e., too many "U" responses), or for which the sum effects of ecological impacts, invasiveness, and ecological amplitude and distribution fall below the

threshold for ranking (i.e. the overall rank falls below Low). Many such species are widespread but are not known to have substantial ecological impacts (though such evidence may appear in the future). All species receiving a "D" score for ecological impact (Section 1), regardless of what other section scores they receive, are by default placed into this category.

Considered But Not Listed

- Acacia paradoxa (kangaroothorn)
- Aeschynomene rudus (Rough jointvetch)
- Aira praecox (European hairgrass)
- Allium triquetrum (Three-cornered leek)
- Anthemis cotula (Mayweed)
- Berberis darwinii (Darwin barberry)
- Buddleja davidii (butterfly bush)
- Cestrum parqui (Willow jessamine)
- Chorispora tenella (Blue mustard)
- Crocasmia x crocomiiflora (Montbretia)
- Daucus carota (Queen Anne's Lace)
- Dimorphotheca sinuata (African daisy)
- Erodium moschatum (Filaree)
- Euphorbia lathyris (Caper spurge)
- Fumaria officinalis (Drug fumitory)
- Lactuca serriola (Prickly lettuce)
- Leptospermum laevigatum (Australian tea tree)
- Maytenus boaria (Mayten)
- Melilotus officinalis (Yellow sweetclover)
- Nerium oleander (Oleander)
- Nothoscordum gracile (False garlic)
- Oxalis corniculata (Gardener's oxalis)
- Parkinsonia aculeata (Mexican palo verde)
- Pistachia chinensis (Chinese pistache)
- Plantago coronopus (Cutleaf plantain)
- Solanum eleagnifolium (Silverleaf nightshade)
- Sonchus asper (Spiny sowthistle)
- Taraxacum officinale (Common dandelion)
- Tragopogon dubius (Yellow salsify)
- Tropaeolum majus (Garden nasturtium)
- Verbena litoralis (Tall vervain)

Inconclusive - *Phragmites australis* (Common reed) was not listed because global genetic issues make it unclear which strains are non-native in California. It is unclear whether this species was historically present in all regions of California.

Not Reviewed - The committee decided not to review these species because these plants escape into wildlands only in rare circumstances.

- Aeonium spp.
- Aptenia cordifolia (Red apple)
- Araujia sericofera (Bladderflower)
- Brassica oleraceus (Wild cabbage)
- Cercidium floridum (Blue palo verde)
- Chrysanthemum segetum (Corn chrysanthemum)
- Colutea arborescens (Bladder-senna)

- Coprosma repens (Mirror plant)
- Cupaniopsis anacardioides (Carrot weed)
- Enchylaena tomentosa (Ruby salt-bush)
- Grindelia squarrosa (Gum plant)
- Kniphofia uvaria (Red hot poker)
- Passiflora caerulea (Blue passionflower)
- Sollya heterophylla (Australian bluebell creeper)
- Ulmas parvifolia (Chinese elm)
- Zoysia spp.

Information related to the Invasive Plant Inventory 2005 Revision:

- Submit comments on ratings to Elizabeth Brusati, edbrusati@cal-ipc.org
- **Cal-IPC List Criteria** - Detailed explanation of the meanings of scores
- **Holland Report** - Definitions of ecotypes used in Section 3 (Distribution)
- **Invasive Plant Inventory Spreadsheet (Excel)**
- **Invasive Plant Inventory Spreadsheet (pdf)**
- **Jepson Manual: Higher Plants of California** (Jepson Herbarium, University of California-Berkeley) - Follow the link to the Jepson Online Interchange and find taxonomic descriptions and geographic ranges for California plants, as well as links to herbaria collections.
- **Pest Plant Form** - Use this form to submit plants that you think should be reviewed during the next list revision. The Invasive Plant Inventory committee will meet occasionally to consider additions and revisions to the list.

California Invasive Plant Council
 1442-A Walnut St., #462
 Berkeley, CA 94709
 (510) 843-3902
 fax (510) 217-3500
info@cal-ipc.org

D	Dmoj	Dson	GB	MP	SNE	Habitats of Concern	Scientific Name 2
						coniferous forest, chaparral, woodland, riparian	Acacia melanoxylon
							Acacia paradoxa
			1	1	1	scrub, grassland, riparian, pinyon-juniper woodland, forest	Acroptilon repens
						grassland, oak woodland	Aegilops triuncialis
						NOT REVIEWED	Aeonium spp.
						edges of ponds and rice fields, NOT LISTED	Aeschynomene rudis
						coastal canyons, coastal scrub, slopes	Ageratina adenophora
						vernal pools, coastal prairie, meadows, grasslands	Agrostis avenacea
						wetlands, riparian	Agrostis stolonifera
						riparian areas, grassland, oak woodland	Allanthus altissima
						grassland, oak woodland, vernal pools	Aira caryophyllea
						coastal dunes	Aira praecox
1	1	1					Albizia lophantha
1					1	grassland, meadows, riparian and desert scrub, Sonoran thorn woodland	Alhagi maurorum
						arid areas	Alhagi pseudalhagi
						coastal scrub, riparian woodland	Allium triquetrum
						freshwater aquatic systems, including marshes	Alternanthera philoxeroides
						coastal dunes	Ammophila arenaria
						coastal dunes, chaparral, woodlands	Anthemis cotula
						coastal prairie, coniferous forest	Anthoxanthum odoratum
						NOT LISTED	Aptenia cordifolia
						coastal prairie	Arctotheca calendula (fertile)
						coastal prairie	Arctotheca calendula (infertile)
1						riparian areas	Arundo donax
						riparian woodland	Asparagus asparagoides
						coastal dunes and prairie, grassland	Asphodelus fistulosus
						coastal grassland, scrub, "high marsh" of coastal salt marsh	Atriplex semibaccata
1	1			1	1	coastal scrub, grassland, oak woodland, forest	Avena barbata
1	1			1	1	coastal scrub, chaparral, grassland, woodland, forest	Avena fatua
						alkaline habitats	Bassia hyssopifolia
						grassland, esp. serpentine, where a threat to natives	Bellardia trixago
						damp grasslands	Bellis perennis
						forest (what kind?)	Berberis darwinii
						redwoods and mixed evergreen forest in Santa Cruz mtns.	Brachypodium sylvaticum
						DO NOT REVIEW	Brassica oleraceus
						coastal scrub, grassland, meadows, riparian	Brassica rapa
1					1	desert dunes, desert and coastal scrub	Brassica tournefortii
						grasslands	Briza maxima

1	1	1	scrub, grassland	Cynodon dactylon	
			woodland, forest, interior dunes	Cynoglossum officinale	
			oak woodland, grassland	Cynosurus echinatus	
			coastal scrub, oak woodland	Cytisus scoparius	
			often confused with C. scoparius; coastal scrub, grasslands	Cytisus striatus	
		1	grassland, broadleaved forest	Dactylis glomerata	
1	1	1		Daucus carota	
			coastal riparian areas, also south side San Gabriel mtns.	Delairea odorata	
			scrub, grassland, woodland	Descurainaea sophia	
			forest, woodland	Digitalis purpurea	
			chaparral, riparian, grassland, forest	Dimorphotheca sinuata	
			grassland, seep, riparian scrub	Dipsacus fullonum	
			grassland, seep, bogs	Dipsacus sativus	
			grassland, riparian scrub	Ditrichia graveolens	
			scrub, coastal prairie	Echium candicans	
		1	streams, ponds, sloughs, lakes, Sacramento-San Joaquin Delta	Egeria densa	
			sandy soils, esp. dunes; rapidly spreading on central coast	Ehrharta calycina	
			scrub, coastal dunes, grassland, woodland, forest	Ehrharta erecta	
			coastal scrub	Ehrharta longiflora	
			waterways; esp. troublesome Sacramento-San Joaquin Delta	Eichhornia crassipes	
1	1	1	interior riparian areas	Elaeagnus angustifolia	
			edges of beaches, other coastal habitats	Emex spinosa	
			DO NOT REVIEW	Enchylaena tomentosa	
			coastal woodland, scrub, NW forests, esp. redwoods	Erechtites glomerata, E. minima	
				Erica lusitânica	
			riparian and North Coast coniferous forests	Erigeron karvinskianus	
1	1	1	NATIVE TO PART OF STATE	Eriogonum fasciculatum	
				Erodium botrys	
				Erodium brachycarpum	
1	1	1	grassland, shrubland	Erodium cicutarium	
				Erodium moschatum	
				Eucalyptus camaldulensis	
			riparian areas, grassland, moist slopes	Eucalyptus globulus	
		1	forests, woodlands, juniper forest	Euphorbia esula	
				Euphorbia lathyris	
			meadows, woodlands	Euphorbia oblongata	
				Euphorbia terracina	
			coastal scrub, grassland	Festuca arundinacea	
			riparian woodland	Ficus carica	
			grassland (cultivated garden herb not invasive)	Foeniculum vulgare	
				Fumaria officinalis	
			coastal scrub, oak woodland, grassland	Genista monspessulana	
				Geranium dissectum	
				Geranium molle	
			coastal scrub and prairie, North Coast forest	Geranium retrosum	
			coniferous forest	Geranium robertianum	
			riparian woodland and forest	Gleditsia triacanthos	
			vernal pools	Glyceria declinata	

1	1				1	DO NOT REVIEW	Grindelia squarrosa
1	1				1	scrub, grassland, pinyon-juniper woodland	Halogeton glomeratus
						coastal forests, riparian areas	Hedera canariensis
						coastal forests, riparian areas	Hedera helix
						north coastal scrub	Helichrysum petiolare
	1					scrub, grassland, riparian areas	Hirschfeldia incana
	1	0			1	coastal grassland, wetlands	Holcus lanatus
1	1	1			1	grasslands?	Hordeum marinum, H. murinum
1	1	1				freshwater aquatic systems	Hydrilla verticillata
						coastal scrub and prairie	Hypericum canariense
						redwood forest, meadows, woodland; invasion may occur due to lag in control by	Hypericum perforatum
							Hypochoeris glabra
						coastal dunes, scrub, and prairie; woodland, forest	Hypochoeris radicata
						riparian areas	Ilex aquifolium
						riparian, wetland areas, esp. San Diego and Los Angeles Cos.	Iris pseudacorus
					1	Great Basin scrub and grassland, coniferous forest	Isatis tinctoria
						DO NOT REVIEW	Kniphofia uvaria
1	1	1			1		Kochia scoparia
1	1	1			1	grasslands, seasonal wetlands	Lactuca scariola
0						coastal, inland marshes, riparian areas, wetlands, grassland, potential to invade m	Lepidium latifolium
							Leptospermum laevigatum
						grassland, coastal scrub	Leucanthemum vulgare
						riparian areas	Ligustrum lucidum
						grasslands, forest clearings	Linaria genistifolia ssp. dalmatica
						WE HAVE NO LIT FOLDER FOR THIS	Liquidambar styraciflua
						grassland, oak woodland, pinyon-juniper woodland	Lolium multiflorum
					1	grassland, riparian areas, wetlands	Lotus corniculatus
	1					freshwater aquatic systems	Ludwigia peploides var.
						freshwater aquatic systems	Ludwigia uruguayensis (= L. hexapetala)
						native to south and central coast; invasive in north coast dunes	Lupinus arboreus
						grassland, wetlands, vernal pools	Lythrum hyssopifolium
					1	wetlands, marshes, riparian areas	Lythrum salicaria
						coastal bluff, coastal scrub	Malephora crocea
						grassland, scrub, riparian areas	Marrubium vulgare
	1					coastal scrub	Maytenus boaria
						grassland	Medicago polymorpha
					1	grasslands	Meibotus officinalis
						vernal pools, wetlands	Mentha pulegium
						coastal bluffs, dunes, scrubs, grasslands	Mesembryanthemum crystallinum
						coastal habitats, riparian areas	Myoporum laetum
						coniferous forest, riparian areas	Myosotis latifolia
						NO INFORMATION	Myosotis sylvestris
						freshwater aquatic systems	Myriophyllum aquaticum
						freshwater aquatic systems	Myriophyllum spicatum
						riparian areas, others?	Nerium oleander
1	1	1				coastal scrub, grassland, riparian woodland	Nicotiana glauca
						riparian woodland	Nothoscordum inodorum
						freshwater aquatic systems	Nymphaea odorata

*Invasive Plants of California's
Wildlands*

September 2000 Addendum

Species Name Index

Common, Scientific, and
Synonymous Names

A

<i>Ageratina adenophora</i>	29
<i>Ageratina occidentalis</i>	29
<i>Ageratina shastensis</i>	29
agrimony	29
ailanthus	32
<i>Ailanthus altissima</i>	32
<i>Ailanthus glandulosa</i>	32
<i>Alhagi camelorum</i>	37
<i>Alhagi maurorum</i>	37
<i>Alhagi persarum</i>	37
<i>Alhagi pseudalhagi</i>	37
<i>Ammophila arenaria</i>	42
<i>Ammophila breviligulata</i>	42
<i>Anabasis glomerata</i>	208
anacharis	161
<i>Anacharis densa</i>	161
Andes grass	124
<i>Anethum foeniculum</i>	198
anise	198
aniseed	198
annual veldt grass	164
<i>Aptenia cordifolia</i>	46
Arabian schismus	287
<i>Arctotheca calendula</i>	49
artichoke	139
artichoke thistle	139
<i>Arundo arenaria</i>	42
<i>Arundo donax</i>	53
<i>Arundo selloana</i>	128
Asian mustard	68
<i>Atriplex semibaccata</i>	59

Australian burnweed	179
Australian fireweed	179
Australian saltbush	59

B

baby sun rose	46
<i>Bartsia trixago</i>	65
bassia	62
<i>Bassia hyssopifolia</i>	62
beachgrass	42
bellardia	65
<i>Bellardia trixago</i>	65
bigleaf periwinkle	326
black locust	273
blackberry	277
blue gum	183
<i>Brassica tournefortii</i>	68
Brazilian elodea	161
Brazilian pepper tree	282
Brazilian water milfoil	249
Brazilian waterweed	161
bridal veil broom	262
broadleaved pepperweed	222
brome	72, 76

<i>Bromus madritensis</i>	72
<i>ssp. rubens</i>	72
<i>Bromus rubens</i>	76
<i>Bromus tectorum</i>	145, 150, 203, 266, 306
broom	112
bull thistle	179
burnweed	231
bush lupine	

C

California thistle	106
camels thorn	37
camelthorn	37
camel-thorn	37

Canada thistle	106
canary broom	203
candlewick plant	321
cane	53
cape dandelion	49
cape gold	49
Cape ivy	154
capeweed	49
<i>Cardaria chalepensis</i>	80
<i>Cardaria draba</i>	80
<i>Cardaria pubescens</i>	80
cardoon	139
<i>Carduus acanthoides</i>	86
<i>Carduus lanceolatus</i>	112
<i>Carduus nutans</i>	86
<i>Carduus pycnocephalus</i>	86
<i>Carduus tenuiflorus</i>	86
<i>Carduus vulgaris</i>	112
<i>Carpobrotus edulis</i>	90
carrot fern	120
Caspian manna	37
castor bean	269
catweed	29
<i>Centaurea calcitrapa</i>	94
<i>Centaurea melitensis</i>	98
<i>Centaurea solstitialis</i>	101
cheat	76
cheatgrass	76
cheatgrass brome	76
chess	72, 76
Christmasberry	282
Christmas-berry tree	282
<i>Chrysanthemum leucanthemum</i>	227
<i>Cirsium arvense</i>	106
<i>Cirsium lanatum</i>	106
<i>Cirsium lanceolatum</i>	112
<i>Cirsium vulgare</i>	112
coastal burnweed	179
coastal bush lupine	231
<i>Cochlearia draba</i>	80
common broom	145
common cordgrass	299

common eucalyptus	183
common fig	193
common gorse	317
common iceplant	244
common mullein	321
common water hyacinth	171
compact brome	72
conicosia	116
<i>Conicosia pugioniformis</i>	116
<i>Conium maculatum</i>	120
cordgrass	295, 299, 301
corn thistle	106
cortaderia	124
<i>Cortaderia argentea</i>	128
<i>Cortaderia atacamensis</i>	124
<i>Cortaderia jubata</i>	124, 128
<i>Cortaderia selloana</i>	124, 128
cotoneaster	133
<i>Cotoneaster</i>	133
<i>Cotoneaster buxifolius</i>	133
<i>Crataegus douglasii</i>	136
<i>Crataegus monogyna</i>	136
<i>Crataegus suksdorfii</i>	136
creeping thistle	106
crimson fountaingrass	258
Crofton weed	29
<i>Cryophytum crystallinum</i>	244
crystalline iceplant	244
cutleaf burnweed	179
cutleaf fireweed	179
<i>Cynara cardunculus</i>	139
<i>Cynara scolymus</i>	139
<i>Cytisus canariensis</i>	203
<i>Cytisus monspessulanus</i>	203
<i>Cytisus racemosus</i>	203
<i>Cytisus scoparius</i>	145, 150
<i>Cytisus striatus</i>	150

South African capeweed	49	tall white top	222	watermilfoil	249, 254
Spanish broom	72	tamarisk	312	waterweed	161
Spanish broom	303	<i>Tamarix chinensis</i>	312	weaver's broom	303
<i>Spartina alterniflora</i>	295, 299, 301, 303	<i>Tamarix gallica</i>	312	white top	80, 222
	295, 299,	<i>Tamarix parviflora</i>	312	white weed	80
<i>Spartina anglica</i>	301, 303	<i>Tamarix pentandra</i>	312	whitethorn	136
	295,	<i>Tamarix ramosissima</i>	312	white-top	80
<i>Spartina densiflora</i>	299, 303	<i>Tamarix tetrandra</i>	312	wild artichoke	139
	295, 299,	tansy ragwort	291	wild oats	76
	301, 303	Tasmanian blue gum	183	wolf's milk	188
<i>Spartina foliosa</i>	295,	<i>Teline</i>	203	wooly mullein	321
	299,	<i>monspessulana</i>	86, 94, 106,		
	301, 303	thistle	112, 139	Y	
<i>Spartina gracilis</i>	295, 299,	thorn orache	62	yellow bush lupine	231
	301, 303	<i>Tithymalus esula</i>	188	yellow starthistle	98
<i>Spartina patens</i>	295, 299,	tocolote	98		
	301, 303	<i>Toxicodendron</i>	32		
<i>Spartina anglica</i>	301	<i>altissimum</i>	32		
<i>Spartium junceum</i>	303	tree-of-heaven	32		
<i>Spartium</i>	262				
<i>monosperma</i>	145	U			
<i>Spartium scoparium</i>	112	<i>Ulex europæus</i>	317		
spear thistle	254	Uruguayan pampas grass	128		
spike watermilfoil	287				
split grass	120	V			
spotted hemlock	188	<i>Vallisneria verticillata</i>	218		
spurge	94	veldt grass	164		
St. Barnaby's thistle	98	velvet plant	321		
star thistle	94, 101	<i>Verbascum blattaria</i>	321		
starthistle	29	<i>Verbascum</i>	321		
sticky agrimony	29	<i>speciosum</i>	321		
sticky eupatorium	291	<i>Verbascum thapsus</i>	321		
sticky snakeroot	198	<i>Verbascum virgatum</i>	321		
stinking willie	198	<i>Vinca major</i>	326		
sweet anise	198				
sweet fennel	198				
T		W			
<i>Taeniatherum</i>	309	water hyacinth	171		
<i>caput-medusae</i>		water thyme	218		

APPENDIX D
ACRONYMS, ABBREVIATIONS, AND DEFINITIONS

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APPENDIX D ACRONYMS, ABBREVIATIONS, AND DEFINITIONS

BMP	Best Management Practices
CCA	California Coastal Act
CCC	California Coastal Commission
CDFG	California Department of Fish and Game
CEQA	California Environmental Quality Act
CVWD	Carpinteria Valley Water District
CWA	Clean Water Act
DO	Dissolved oxygen
EIR	Environmental Impact Report
EHS	Santa Barbara County Environmental Health Services Division
EPA	United States Environmental Protection Agency
ESHA	Environmentally Sensitive Habitat Area
FEMA	Federal Emergency Management Agency
GP/LCP	General Plan/Local Coastal Plan
LCP	Local Coastal Program/Plan
NDDB	Natural Diversity Data Base
NEPA	National Environmental Policy Act
NFIP	National Flood Insurance Program
NPDES	National Pollutant Discharge Elimination System
RWQCB	Regional Water Quality Control Boards
SBCFCD	Santa Barbara County Flood Control District
SWRCB	State Water Resources Control Board
TMD	Total Maximum Daily Load
USGS	United States Geologic Survey

DEFINITIONS

Alluvial - Soils deposited by stream action.

Aquifer - An underground, water-bearing layer of earth, porous rock, sand, or gravel, through which water can seep or be held in natural storage. Aquifers generally hold sufficient water to be used as a water supply.

Buffer zone - An area of land separating two distinct land uses that acts to soften or mitigate the effects of one land use on the other.

California Environmental Quality Act (CEQA) - A State law requiring State and local agencies to regulate activities with consideration for environmental protection. If a proposed activity has the potential for a significant adverse environmental impact, an Environmental Impact Report (EIR) must be prepared and certified as to its adequacy before taking action on the proposed project. General Plans require the preparation of a “program EIR.”

Channelization - The straightening and/or deepening of a watercourse for purposes of storm-runoff control or ease of navigation. Channelization often includes lining of stream banks with a retaining material such as concrete.

Detention basin - A basin formed by damming a waterway to retard flood runoff and minimize the effect of sudden floods.

Endangered species - An animal or plant species whose prospects for survival and reproduction are in immediate jeopardy for one or more causes.

Endemic - Plants or animals that are native to a particular region.

Environmental Impact Report (EIR) - A report required of general plans by the California Environmental Quality Act and which assesses all the environmental characteristics of an area and determines what effects or impacts will result if the area is altered or disturbed by a proposed action. (See “California Environmental Quality Act”).

Environmentally Sensitive Habitat Area (ESHA) - Any area in which plant or animal life or their habitats are either rare or especially valuable because of their special nature or role in an ecosystem and which could be easily disturbed or degraded by human activities and development (as defined in the California Coastal Act).

Estuary - An area of mixed freshwater and sea water, typically at the mouth of a river or stream. Organisms living in an estuary are adapted to a wide range of salinities.

Fault - A fracture in the earth’s crust forming a boundary between rock masses that have shifted.

General Plan (GP) - A compendium of a city’s or a county’s policies regarding its long-term development, in the form of maps and accompanying text. The General Plan is a legal document required of each local agency by the State of California Government Code Section 65301 and adopted by the City Council or Board of Supervisors. In California, the General Plan has seven mandatory elements (Circulation, Conservation, Housing, Land Use, Noise, Open Space, Safety and Seismic Safety) and may include any number of optional elements (such as Air Quality, Economic Development, Hazardous Waste, and Parks and Recreation). The General Plan may also be called a “City Plan,” “Comprehensive Plan,” or Master Plan.”

Groundwater - Water under the earth's surface, often confined to aquifers capable of supplying wells and springs.

Groundwater recharge - The natural process of infiltration and percolation of rainwater from land areas or streams through permeable soils into water-holding rocks that provide underground storage ("aquifers").

Impaired waters - (As defined by CWA) Those waters that do not meet water quality objectives established by the Federal and State governments.

Loam - A soil composed of clay, sand, and some organic matter.

National Pollutant Discharge Elimination System (NPDES) - A system of regulations under the Clean Water Act whose goal is to reduce the level of pollutants in the waters of the United States.

Reach - A continuous, uninterrupted extent or stretch of stream, creek, or river.

Riparian - The biological community adjacent to perennial and intermittent streams. Riparian areas are delineated by the existence of plant species normally found near freshwater.

Setback - The horizontal distance between a property line and a structure or other feature.

Stormwater - Surplus surface water generated by rainfall that does not seep into the earth but flows overland to flowing or stagnant bodies of water.

Total Maximum Daily Loads (TMDLs) - The maximum amount of pollutants that a water body can receive and still meet water quality standards.

Watershed - The total area above a given point on a watercourse that contributes water to its flow; the entire region drained by a waterway or watercourse that drains into a lake, reservoir, or other waterbody.

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APPENDIX E
CITY OF CARPINTERIA WATER QUALITY PROTECTION
REGULATIONS

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CITY OF CARPINTERIA WATER QUALITY PROTECTION REGULATIONS

0 PURPOSE AND INTENT

The purpose of this Water Quality Protection Regulations is to protect and enhance coastal waters within the City of Carpinteria in accordance with the policies of the City's Local Coastal Plan (OSC-1 IM 10, OSC-6e, OSC-6f , OSC-6 IM 31, OSC-6 IM 32, OSC-6 IM 33, OSC-10c, OSC-10 IM53, OSC-10 IM54) Sections 30230, 30231, 30232 and 30240 of the California Coastal Act, and the City's Phase II NPDES permit requirements. To implement the certified Land Use Plan (LUP), application submittal requirements, development standards, and other measures are provided to ensure that permitted development shall be sited and designed to conserve natural drainage features and vegetation, minimize the introduction of pollutants into coastal waters to the maximum extent practicable, limit the discharge of stormwater runoff, and protect the overall quality of coastal waters and resources.

The intent of this Water Quality Protection Regulations is to address the following principles:

All development shall be evaluated by the Planning Director or his/her designee during the Coastal Development Permit (CDP) review process for potential adverse impacts to water quality and shall be designed to minimize the introduction of pollutants that may result in water quality impacts. Applicants shall incorporate Site Design, Source Control and, where required, Treatment Control Best Management Practices (BMPs) in order to minimize polluted runoff and water quality impacts resulting from the development. Site Design BMPs reduce the need for Source and/or Treatment Control BMPs, and Source Control BMPs may reduce the amount of Treatment Control BMPs needed for a development. Therefore, BMPs should be incorporated into the project design in the following progression:

- Site Design BMPs
- Source Control BMPs
- Treatment Control BMPs

Projects should be designed to control post-development peak storm water runoff discharge rates so that they do not exceed the estimated pre-development rate, unless there is no potential for the increased peak storm water discharge rate to result in increased downstream erosion. This objective can be accomplished through the creation of a hydrologically functional project design that strives to mimic the existing natural hydrologic regime and by achieving the following goals:

- Maintain and use existing natural drainage courses and vegetation

- Conserve natural resources and areas by clustering development on the least environmentally sensitive portions of a site while leaving the remaining land in a natural, undisturbed condition
- Minimize the amount of directly connected impervious surface and total area of impervious surface
- Incorporate or connect to existing on-site retention and infiltration measures
- Direct rooftop runoff to permeable areas rather than driveways or impervious surfaces to reduce the amount of storm water leaving the site
- Minimize clearing and grading
- Limit clearing and grading of native vegetation at a site to the minimum amount needed to build lots, allow access, and provide fire protection
- Maximize trees and other vegetation at each site by planting additional vegetation, clustering tree areas, and promoting the use of native and/or drought tolerant plants
- Promote natural vegetation by using parking lot islands and other landscaped areas
- Preserve riparian areas and wetlands

Incorporating these goals and principles into the project design will help to minimize the introduction of pollutants to the site and decrease the amount of polluted runoff leaving the site, resulting in the overall objective of water quality protection. Sections 3 and 4 of this Water Quality Protection Regulations, an element of the Carpinteria Implementation Plan (IP), describe the requirements and process for implementing BMPs into development and provide examples of types of BMPs to incorporate.

0 APPLICABILITY

All properties within the City of Carpinteria are located within the coastal zone as defined in the California Coastal Act and are subject to the policies, standards and provisions contained in the certified LCP that may apply. Where any standard provided in this Water Quality Protection Regulations conflicts with any other policy or standard contained in the City's General Plan, Zoning Code or other City-adopted plan, resolution or ordinance not included in the certified Carpinteria LCP, and it is not possible for the development to comply with both the Carpinteria LCP and other plans, resolutions or ordinances, the policies, standards or provisions of the LCP shall take precedence.

0 APPLICATION SUBMITTAL REQUIREMENTS

The following information shall be submitted with an application for a Coastal Development Permit for all projects requiring the development and implementation of an Erosion and Sediment Control Plan (Section 3.1), Site Design and Source Control Measures (Section 3.2), or a Water Quality Management Plan (Section 3.3), according to the requirements listed below.

0.0 Construction Phase Requirements: (eg. Erosion and Sediment Control Plan)

An Erosion and Sediment Control Plan shall be required for all development that requires a grading or building permit.

The Erosion and Sediment Control plan shall include a site specific erosion control plan that includes controls on grading (i.e. timing and amounts), best management practices for staging, storage, and disposal of construction and excavated materials, design specifications for sedimentation basins, and landscaping/re-vegetation of graded or disturbed areas. The plans shall also include a site- specific polluted runoff control plan that demonstrates how runoff will be conveyed from impermeable surfaces into permeable areas of the property in a non-erosive manner, and demonstrate how development will treat or infiltrate stormwater prior to conveyance off site during construction.

0.0 Post Construction Phase Requirements: Site Design and Source Control Measures

Site Design and Source Control Measures shall be required for all development and shall detail how stormwater and polluted runoff will be managed or mitigated. These measures shall require the implementation of appropriate Site Design and Source Control BMPs from Section 5 and Appendix A to minimize post-construction polluted runoff and impacts to water quality. The applicant shall also specify any Treatment Control or Structural BMPs that they elect to include in the development to minimize post-construction polluted runoff, and include the operation and maintenance plans for these BMPs.

The following information shall be included in the description of Site Design and Source Control Measures:

- Site design and source control BMPs that will be implemented to minimize post-construction polluted runoff (see Section 4.1)
- Drainage improvements (e.g., locations of infiltration basins)
- Potential flow paths where erosion may occur after construction
- Methods to accommodate onsite percolation, revegetation of disturbed portions of the site, address onsite and/or offsite impacts and construction of any necessary improvements
- Stormwater pollution prevention measures including all construction elements and Best Management Practices (BMPs) to address the following goals in connection with both construction and long-term operation of the site:
 - . Maximize on-site retention and infiltration measures including directing rooftop runoff to permeable areas rather than driveways
 - . Maximize, to the extent practicable, the percentage of permeable surfaces and limit directly connected impervious areas in order to allow more percolation of runoff into the ground

0.0 Post Construction Phase Requirements: Water Quality Management Plan

A Water Quality Management Plan (WQMP) shall be required for all development that either fails to adequately address water quality impacts using Site Design and Source Control Measures or is in a category of development identified below. In addition to the Site Design and Source Control Measures required for all development, the WQMP shall include Treatment Control (or Structural) BMPs identified in Appendix A to minimize post-construction polluted runoff and impacts to water quality. The WQMP shall also include the operation and maintenance plans for these BMPs.

0.0.0. Special Categories of Development

A WQMP shall be required for projects that fall into one or more of the following categories of development:

- Hillside residential development
- Housing developments of ten units or more
- Industrial/commercial development
- Restaurants
- Retail gasoline outlets /Automotive service facilities
- Parking lots (5,000 square feet or more of impervious surface area or with 25 or more parking spaces)/ Outdoor storage areas
- Projects that discharge to an ESA or coastal water¹
- Redevelopment projects that result in the creation or addition or replacement of 5,000 square feet or more of impervious surface on an already developed site

0.0.0. Contents of a Water Quality Management Plan

The WQMP shall be certified by a California Registered Civil Engineer and approved by the City's Department of Public Works, City Engineer. The following information shall be included in a WQMP:

- Site design, source control and treatment control BMPs that will be implemented to minimize post-construction polluted runoff (see Section 4.1)
- Pre-development peak runoff rate and average volume
- Expected post-development peak runoff rate and average volume from the site with all proposed non-structural and structural BMPs
- Drainage improvements (e.g., locations of diversions/conveyances for upstream runoff)
- Potential flow paths where erosion may occur after construction

¹ Environmentally Sensitive Areas: All development and redevelopment located within or directly adjacent to or discharging directly to an environmentally sensitive area (where discharges from the development or redevelopment will enter receiving waters within the environmentally sensitive area). "Directly adjacent" means situated within 200 feet of the environmentally sensitive area. "Discharging directly to" means outflow from a drainage conveyance system that is composed entirely of flows from the subject development or redevelopment site, and not commingled with flows from adjacent lands

- Methods to accommodate onsite percolation, revegetation of disturbed portions of the site, address onsite and/or offsite impacts and construction of any necessary improvements
- Measures to treat, infiltrate, and/or filter runoff from impervious surfaces (e.g., roads, driveways, parking structures, building pads, roofs, patios, etc.) on the subject parcel(s) and to discharge the runoff in a manner that avoids erosion, gulying on or downslope of the subject parcel, the need for upgrades to municipal stormdrain systems, discharge of pollutants (e.g., oil, heavy metals, toxics) to coastal waters, or other potentially adverse impacts. Such measures may include, but are not limited to, the use of structures (alone or in combination) such as biofilters and grasses waterways, on-site desilting basins, detention ponds, dry wells, etc.
- Information describing how the BMPs (or suites of BMPs) have been designed to infiltrate and/or treat the amount of storm water runoff produced by all storms up to and including the 85th percentile, 24-hour storm event for volume-based BMPs, and/or the 85th percentile, 1-hour storm event, with an appropriate safety factor (i.e., 2 or greater), for flow-based BMPs. The term “treatment” includes physical, biological and chemical processes such as filtration, the use of bio-swales, detention and retention ponds and adsorption media. The actual type of treatment should be linked to the pollutants generated by the development as indicated in Appendix B.
- A long-term plan and schedule for the monitoring and maintenance of all drainage-control devices. All structural BMPs shall be inspected, cleaned, and repaired when necessary prior to September 30th of each year. Owners of these devices shall be responsible for insuring that they continue to function properly and additional inspections should occur after storms as needed throughout the rainy season. Repairs, modifications, or installation of additional BMPs, as needed, shall be carried out prior to the next rainy season.

The Public Works Director, the City Engineer, or his/her designee, who reviews drainage plans shall determine if the post-development BMPs require efficacy monitoring and, if so, the applicant shall submit a monitoring program for review and approval by the Public Works Director, the City Engineer, or his/her designee.

0.0 CEQA

Provisions of this section shall be complementary to, and shall not replace, any applicable requirements for storm water mitigation required under the California Environmental Quality Act.

0.0 Water Quality Checklist

A water quality checklist or other type of review tool will be developed by the City and used to supplement the CEQA checklist in the permit review process to assess potential water quality impacts and appropriate mitigation measures.

0 DEVELOPMENT STANDARDS

0.0 BMP Requirements and Implementation

All development shall be evaluated for potential adverse impacts to water quality and the applicant shall incorporate Site Design, Source Control and, where required, Treatment Control BMPs, in order to minimize polluted runoff and water quality impacts resulting from the development. Site Design and Source Control Measures are required for all development, as specified in Section 3.2, and a WQMP requires the implementation of Site Design, Source Control and Treatment Control BMPs, as specified in Section 3.3. In order to maximize the reduction of water quality impacts, BMPs should be incorporated into the project design in the following progression: (1) Site Design BMPs, (2) Source Control BMPs, and (3) Treatment Control BMPs. Examples of these BMPs may be found in Section 5 and Appendix A.

0.0.0. Types of BMPs

Non-structural BMPs are preventative actions that involve management and source controls such as protecting and restoring sensitive areas such as wetlands and riparian corridors, maintaining and/or increasing open space, providing buffers along sensitive water bodies, minimizing impervious surfaces and directly connected impervious areas, and minimizing disturbance of soils and vegetation. Structural BMPs include: storage practices such as wet ponds and extended-detention outlet structures; filtration practices such as grassed swales, sand filters and filter strips; and infiltration practices such as infiltration basins and infiltration trenches. In many cases combinations of non-structural and structural measures will be required to reduce water quality impacts.

Additional guidance on best management practices is available from the State, the EPA and from other sources such as Bay Area Stormwater Management Agencies Association (BASMAA) “Starting at the Source”. Stormwater technologies are constantly being improved, and staff and developers should be responsive to any changes, developments or improvements in control technologies.

0.0.0. BMP Selection Process

In selecting BMPs to incorporate into the project design, the applicant should first identify the pollutants of concern that are anticipated to be generated as a result of the development. Table 1 in Appendix B should be used as a guide in identifying these pollutants of concern. In addition, pollutants generated by the development that exhibit one or more of the following characteristics shall be considered primary pollutants of concern:

- The pollutant is anticipated to be generated by the project and is also listed as a pollutant causing impairment of a receiving water of the project
- Current loadings or historical deposits of the pollutant are impairing the beneficial uses of a receiving water

- Elevated levels of the pollutant are found in water or sediments of a receiving water and/or have the potential to be toxic to or bioaccumulate in organisms therein
- Inputs of the pollutant are at a level high enough to be considered potentially toxic

The City of Carpinteria has two waterbodies designated as impaired according to the 303(d) list adopted by USEPA in July 2003. Carpinteria Creek is listed as impaired for pathogens, and Carpinteria Marsh is listed as impaired for nutrients, organic enrichment/low dissolved oxygen, priority organics and sedimentation/siltation. Applicants shall use these above designations of impairment and any future designations of impairment, as updated through the 303(d) listing process, to assess primary pollutants of concern for their project, as described above.

Site Design and Source Control BMPs are required based on pollutants commonly associated with the project type, as identified in Table 1. Table 2 in Appendix B should be used as guidance to determine the specific area for each project where Site Design and Source Control BMPs are required to be implemented. BMPs that minimize the identified pollutants of concern may be selected from the examples in Section 5 and Appendix A, targeting primary pollutants of concern first. In the event that the implementation of a BMP listed in Section 5 or Appendix A is determined to be infeasible at any site, the implementation of other BMPs that will achieve the equivalent reduction of pollutants shall be required.

Treatment Control BMPs should be selected using the matrix in Table 3 in Appendix B as guidance to determine the removal efficiency of the BMP for the pollutants of concern for that project. Treatment Control BMPs that maximize pollutant removal for the identified primary pollutants of concern should receive priority for BMP selection, followed by BMPs that maximize pollutant removal for all other pollutants of concern identified for the project. The most effective combination of BMPs for polluted runoff control that results in the most efficient reduction of pollutants shall be implemented. The applicant may select from the list of BMPs in Appendix A. In the event that the implementation of a BMP listed in Appendix A is determined to be infeasible at any site, the implementation of other BMPs that will achieve the equivalent reduction of pollutants shall be required.

0.0.0. Sizing of Treatment Control BMPs

Where post-construction treatment controls are required, the BMPs (or suites of BMPs) shall be designed to infiltrate and/or treat the amount of storm water runoff produced by all storms up to and including the 85th percentile, 24-hour storm event² for volume-based BMPs, and/or the 85th percentile, 1-hour storm event, with an appropriate safety factor (i.e., 2 or greater), for flow-based BMPs.

² Considering the long-run records of local storm events in a 24-hour period, the 85th percentile event would be larger than or equal to 85% of the storms. The 85th percentile storm can be determined by reviewing local precipitation data or relying on estimates by other regulatory agencies. For example, the Los Angeles Regional Water Quality Control Board has determined that 0.75 inch is an adequate estimate of the 85th percentile, 24-hour storm event for typical municipal land uses within its jurisdiction.

The term “treatment” includes physical, biological and chemical processes such as filtration, the use of bio-swales, detention and retention ponds and adsorption media. The actual type of treatment should be suited to the pollutants generated by the development as indicated in Appendix B.

0.0.0. BMP Maintenance and Conditions of Transfer

All applicants shall provide binding maintenance requirements for Structural and Treatment Control BMPs, including but not limited to legal agreements, covenants, CEQA mitigation requirements, and conditional use permits. Verification at a minimum shall include:

- The developer’s signed statement accepting responsibility for maintenance until the responsibility is legally transferred; and either
 - A signed statement from the public entity assuming responsibility for Structural and Treatment Control BMP maintenance and that it meets all local agency design standards; or
 - Written conditions in the sales or lease agreement, which require the recipient to assume responsibility for maintenance and conduct a maintenance inspection at least once a year; or
 - Written text in project conditions, covenants, and restrictions (CCRs) for residential properties assigning maintenance responsibilities to the Home Owners Association for maintenance of the Structural and Treatment Control BMPs; or
 - Any other legally enforceable agreement that assigns responsibility for the maintenance of post-construction Structural and Treatment Control BMPs

0.0 Development on Hillside

Soils shall be stabilized and infiltration practices incorporated during the development of roads, bridges, culverts and outfalls to prevent stream bank or hillside erosion. For all development on or adjacent to hillsides, project plans shall include the following BMPs to decrease the potential of slopes and/or channels from eroding and impacting storm water runoff:

- Convey runoff safely from the tops of slopes and stabilize disturbed slopes
- Utilize existing natural drainage systems to the maximum extent feasible
- Control and minimize excess flow to natural drainage systems to the maximum extent feasible
- Stabilize permanent channel crossings using “soft engineering” practices when possible
- Vegetate slopes with native or drought tolerant vegetation
- Install energy dissipaters, such as riprap, at the outlets of new storm drains, culverts, conduits, or channels that enter unlined channels in accordance with applicable specifications to minimize erosion

Additional measures to prevent downstream erosion, such as cisterns, infiltration pits and/or contour drainage outlets that disperse water back to sheet flow, shall be implemented for projects discharging onto slopes greater than 10 percent.

New development on hillsides, on sites with low permeability soil conditions, or areas where saturated soils can lead to geologic instability should incorporate BMPs that do not rely on or increase infiltration.

0.0 Cumulative Impacts

Because of the city's designation under the Phase II NPDES regulations, all discretionary projects (except those that do not result in a physical change to the environment) within the urbanized area whose contributions are cumulatively considerable shall implement one or more best management practices to reduce their contribution to the cumulative impact.

0 DEVELOPMENT-SPECIFIC DESIGN STANDARDS

0.0 Commercial Development

Commercial development shall be designed to control the runoff of pollutants from structures, parking and loading areas. The following measures shall be implemented to minimize the impacts of commercial development on water quality.

Properly Design Loading/Unloading Dock Areas

Loading/unloading dock areas have the potential for material spills to be quickly transported to the storm water conveyance system. To minimize this potential, the following design criteria are required:

- Cover loading dock areas or design drainage to minimize run-on and runoff of storm water.
- Direct connections to storm drains from depressed loading docks (truck wells) are prohibited.

Properly Design Repair/Maintenance Bays

Oil and grease, solvents, car battery acid, coolant, and gasoline from repair and maintenance bays can negatively impact storm water if allowed to come into contact with storm water runoff. Therefore, design plans for repair bays shall include the following:

- Repair/ maintenance bays shall be indoors or designed in such a way that doesn't allow storm water runoff or contact with storm water runoff.
- Design a repair/maintenance bay drainage system to capture all washwater, leaks, and spills. Connect drains to a sump for collection and disposal. Direct connection of the repair/maintenance bays to the storm drain system is prohibited. Obtain an Industrial Waste Discharge Permit if required.

Properly Design Vehicle/Equipment Wash Areas

The activity of vehicle/equipment washing/steam cleaning has the potential to contribute metals, oil and grease, solvents, phosphates, and suspended solids to the storm water conveyance system. Include in the project plans an area for washing/steam cleaning of vehicles and equipment. This area shall be:

- Self-contained and/or covered, equipped with a clarifier, or other pretreatment facility, and
- Properly connected to a sanitary sewer or other appropriately permitted disposal facility.

Properly Design Parking Areas

Parking lots contain pollutants such as heavy metals, oil and grease, and polycyclic aromatic hydrocarbons that are deposited on parking lot surfaces by motor vehicles. These pollutants are directly transported to surface waters. To minimize the offsite transport of pollutants, the following design criteria are required:

- Reduce impervious surface land coverage of parking areas.
- Infiltrate runoff before it reaches storm drain system.
- Treat runoff before it reaches storm drain system.

Parking lots may also accumulate oil, grease, and water insoluble hydrocarbons from vehicle drippings and engine system leaks. To minimize impacts to water quality, the following measures are required:

- Treat to remove oil and petroleum hydrocarbons at parking lots that are heavily used (e.g. lots with 25 or more parking spaces, performing arts parking lots, shopping malls, or grocery stores).
- Ensure adequate operation and maintenance of treatment systems particularly sludge and oil removal, and system fouling and plugging prevention control.

0.0 Restaurants

Restaurants shall be designed to minimize runoff of oil and grease, solvents, phosphates, and suspended solids to the storm drain system. The following measures shall be implemented to minimize the impacts of restaurants on water quality.

Properly Design Equipment/Accessory Wash Areas

The activity of outdoor equipment/accessory washing/steam cleaning has the potential to contribute metals, oil and grease, solvents, phosphates, and suspended solids to the storm water conveyance system. Include in the project plans an area for the washing/steam cleaning of equipment and accessories. This area shall be:

- Self-contained, equipped with a grease trap, and properly connected to a sanitary sewer.
- If the wash area is to be located outdoors, it shall be covered, paved, have secondary containment and be connected to the sanitary sewer or other appropriately permitted disposal facility.
- Any outdoor storage of solid or liquid waste (i.e., oil and grease) shall comply with the requirements of Sections 5.4 and 5.5.

0.0 Gasoline Stations, Car Washes and Automotive Repair Facilities

Gasoline stations and automotive repair facilities shall be designed to minimize runoff of oil and grease, solvents, car battery acid, coolant and gasoline to stormwater system. The following measures shall be implemented to minimize the impacts of gasoline stations, and automotive repair facilities on water quality.

Properly Design Fueling Areas

Fueling areas have the potential to contribute oil and grease, solvents, car battery acid, coolant, and gasoline to the storm water conveyance system. Therefore, design plans for fueling areas shall include the following:

- The fuel dispensing area shall be covered with an overhanging roof structure or canopy. The canopy's minimum dimensions shall be equal to or greater than the area within the grade break. The canopy shall not drain onto the fuel dispensing area, and the canopy downspouts shall be routed to prevent drainage across the fueling area. As an alternative, the site shall be served by an oil/water separator or other source or treatment control BMP's that will achieve equivalent mitigation.
- The fuel dispensing area shall be paved with Portland cement concrete (or equivalent smooth impervious surface), and the use of asphalt concrete shall be prohibited.
- The fuel dispensing area shall have a 2% to 4% slope to prevent ponding, and shall be separated from the rest of the site by a grade break that prevents run-on of storm water to the extent practicable.
- At a minimum, the concrete fuel dispensing area shall 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.

Properly Design Repair/Maintenance Bays

Oils and grease, solvents, car battery acid, coolant, and gasoline from the repair/maintenance bays can negatively impact storm water if allowed to come into contact with storm water runoff. Therefore, design plans for repair bays shall include the following:

- Repair/maintenance bays shall be indoors or designed in such a way that doesn't allow storm water run-on or contact with storm water runoff.
- Design a repair/maintenance bay drainage system to capture all wash-water, leaks, and spills. Connect drains to a sump for collection and disposal. Direct connection

of the repair/maintenance bays to the storm drain system is prohibited. Obtain an Industrial Waste Discharge Permit if required.

Properly Design Vehicle/Equipment Wash Areas

The activity of vehicle/equipment washing/steam cleaning has the potential to contribute metals, oil and grease, solvents, phosphates, and suspended solids to the storm water conveyance system. Include in the project plans an area for washing/steam cleaning of vehicles and equipment. This area shall be:

- Self-contained and/or covered, equipped with a clarifier, or other pretreatment facility, and properly connected to a sanitary sewer or other appropriately permitted disposal facility.

Properly Design Loading/Unloading Dock Areas

Loading/unloading dock areas have the potential for material spills to be quickly transported to the storm water conveyance system. To minimize this potential, the following design criteria are required:

- Cover loading dock areas or design drainage to minimize run-on and runoff of storm water.
- Direct connections to storm drains from depressed loading docks (truck wells) are prohibited.

0.0 Outdoor Material Storage Areas

Outdoor material storage areas refer to storage areas or storage facilities used solely for the storage of materials. Improper storage of materials outdoors may provide an opportunity for toxic compounds, oil and grease, heavy metals, nutrients, suspended solids, and other pollutants to enter the storm water conveyance system. Outdoor material storage areas shall be designed to prevent stormwater contamination from stored materials. Where proposed project plans include outdoor areas for storage of materials that may contribute pollutants to the storm water conveyance system, the following measures are required:

- Materials with the potential to contaminate storm water shall be: (1) placed in an enclosure such as a cabinet, shed or similar structure that prevents contact with runoff or spillage to the storm water conveyance system; or (2) protected by secondary containment structures such as berms, dikes or curbs.
- The storage areas shall be paved and sufficiently impervious to contain leaks and spills.
- The storage area shall have a roof or awning to minimize collection of storm water within the secondary containment area.

0.0 Trash Storage Areas

A trash storage area refers to an area where a trash receptacle or receptacles are located for use as a repository for solid wastes. Loose trash and debris can be easily transported

by the forces of water or wind into nearby storm drain inlets, channels, and/or creeks. Trash storage areas shall be designed to prevent stormwater contamination by loose trash and debris. All trash container areas shall meet the following requirements (individual family residences are exempt from these requirements):

- Trash container areas shall have drainage from adjoining roofs and pavement diverted around the area(s).
- Trash container areas shall be screened or walled to prevent off-site transport of trash.

0.0 Single Family Residential

To mitigate the increased runoff rates from Single Family Residences due to new impervious surfaces, new residential projects and additions, as well as remodel projects that need an Erosion and Sediment Control Plan, shall include design elements that accommodate onsite percolation, retention or collection of storm water runoff such that the peak runoff rate after development either meets the 85th percentile storm event criterion or does not exceed predevelopment runoff levels to the maximum extent practicable. BMPs (including those outlined in the California Storm Water Best Management Practice Handbooks) that may achieve this objective fit into these categories:

- Minimizing Impervious Areas
- Increase Rainfall Infiltration
- Minimize Directly Connected Impervious Areas (DCIAs)

Appendix A

STORM WATER BEST MANAGEMENT PRACTICES

The following are a list of BMPs that may be used to minimize or prevent the introduction of pollutants of concern that may result in significant impacts to receiving waters. Other BMPs approved by the City as being equally or more effective in pollutant reduction than comparable BMPs identified below are acceptable. All BMPs shall comply with local zoning and building codes and other applicable regulations.

Site Design BMPs

Minimizing Impervious Areas

- Reduce sidewalk widths where it is practicable
- Incorporate landscaped buffer areas between sidewalks and streets.
- Design residential streets for the minimum required pavement widths
- Minimize the number of residential street cul-de-sacs and incorporate landscaped areas to reduce their impervious cover.
- Use open space development that incorporates smaller lot sizes
- Increase building density while decreasing the building footprint
- Reduce overall lot imperviousness by promoting alternative driveway surfaces and shared driveways that connect two or more homes together
- Reduce overall imperviousness associated with parking lots by providing compact car spaces, minimizing stall dimensions, incorporating efficient parking lanes, and using pervious materials in spillover parking areas

Increase Rainfall Infiltration

- Use permeable materials for private sidewalks, driveways, parking lots, and interior roadway surfaces (examples: hybrid lots, parking groves, permeable overflow parking, etc.)
- Direct rooftop runoff to pervious areas such as yards, open channels, or vegetated areas, and avoid routing rooftop runoff to the roadway or the urban runoff conveyance system

Maximize Rainfall Interception

- Maximizing canopy interception and water conservation by preserving existing native trees and shrubs, and planting additional native or drought tolerant trees and large shrubs

Minimize Directly Connected Impervious Areas (DCIAs)

- Draining rooftops into adjacent landscaping prior to discharging to the storm drain
- Draining parking lots into landscape areas co-designed as biofiltration areas
- Draining roads, sidewalks, and impervious trails into adjacent landscaping

Slope and Channel Protection

- Use of existing natural drainage systems to the maximum extent feasible
- Stabilized permanent channel crossings
- Planting native or drought tolerant vegetation on slopes
- Energy dissipaters, such as riprap, at the outlets of new storm drains, culverts, conduits, or channels that enter unlined channels

Maximize Rainfall Interception

- Cisterns
- Foundation planting

Increase Rainfall Infiltration

- Dry wells

Source Control BMPs

- Storm drain system stenciling and signage
- Regular street and parking lot sweeping
- Outdoor material and trash storage area designed to reduce or control rainfall runoff
- Efficient irrigation system

Treatment Control BMPs

Biofilters

- Grass swale
- Grass strip
- Wetland vegetation swale
- Bioretention

Detention Basins

- Extended/dry detention basin with grass lining
- Extended/dry detention basin with impervious lining

Infiltration Basins

- Infiltration basin
- Infiltration trench
- Porous asphalt
- Porous concrete
- Porous modular concrete block

Wet Ponds and Wetlands

- Wet pond (permanent pool)
- Constructed wetland

Drainage Inserts

- Oil/Water separator
- Catch basin insert
- Storm drain inserts
- Catch basin screens

Filtration Systems

- Media filtration
- Sand filtration

Hydrodynamic Separation Systems

- Swirl Concentrator
- Cyclone Separator

Appendix B

BMP IMPLEMENTATION TABLES

Table 1. Anticipated and Potential Pollutants Generated by Land Use Type

<i>Priority Project Categories</i>	<i>General Pollutant Categories</i>								
	Sediments	Nutrients	Heavy Metals	Organic Compounds	Trash & Debris	Oxygen Demanding Substances	Oil & Grease	Bacteria & Viruses	Pesticides
Detached Residential Development	X	X			X	X	X	X	X
Attached Residential Development	X	X			X	P ⁽¹⁾	P ⁽²⁾	P	X
Commercial Development >100,000 ft ²	P ⁽¹⁾	P ⁽¹⁾		P ⁽²⁾	X	P ⁽⁵⁾	X	P ⁽³⁾	P ⁽⁵⁾
Automotive service facilities			X	X ⁽⁴⁾⁽⁵⁾	X		X		
Retail Gasoline Outlets			X	X ⁽⁴⁾⁽⁵⁾	X		X		
Restaurants					X	X	X	X	
Hillside development	X	X			X	X	X		X
Parking Lots	P ⁽¹⁾	P ⁽¹⁾	X		X	P ⁽¹⁾	X		P ⁽¹⁾
Streets, Highways & Freeways	X	P ⁽¹⁾	X	X ⁽⁴⁾	X	P ⁽⁵⁾	X		

X = anticipated
P = potential
(1) A potential pollutant if landscaping exists on-site
(2) A potential pollutant if the project includes uncovered parking areas
(3) A potential pollutant if land use involves food or animal waste products
(4) Including petroleum hydrocarbons
(5) Including solvents

Table 2. Site Design and Source Control BMP Selection Matrix

<i>Priority Project Categories</i>	<i>Specific Areas for Implementation of Site Design and Source Control BMPs</i>													
	Private Roads	Residential Driveways & Guest Parking	Loading/Unloading Dock Areas	Repair/Maintenance Bays	Vehicle Wash Areas	Outdoor Processing Areas	Equipment Wash Areas	Parking Areas	Roadways	Fueling Areas	Hillside Landscaping	Outdoor Material Storage Areas	Trash Storage Areas	Pools and Spas
Detached Residential Development	R	R									R			R
Attached Residential Development	R												R	R
Commercial Development >100,000 ft ²			R	R	R	R						R	R	
Automotive service facilities			R	R	R		R			R		R	R	
Retail Gasoline Outlets			R	R	R		R			R		R	R	
Restaurants			R				R					R	R	
Hillside development	R										R			
Parking Lots								R					R	
Streets, Highways & Freeways									R					
R = Required – minimize pollutants of concern by selecting appropriate Site Design and Source Control BMPs														

Table 3. Treatment Control BMP Selection Matrix⁽¹⁾

<i>Pollutant of Concern</i>	<i>Treatment Control BMP Categories</i>						
	Biofilters	Detention Basins	Infiltration Basins ⁽²⁾	Wet Ponds or Wetlands	Drainage Inserts	Filtration	Hydrodynamic Separator Systems ⁽³⁾
Sediment	M	H	H	H	L	H	M
Nutrients	L	M	M	M	L	M	L
Heavy Metals	M	M	M	H	L	H	L
Organic Compounds	U	U	U	U	L	M	L
Trash & Debris	L	H	U	U	M	H	M
Oxygen Demanding Substances	L	M	M	M	L	M	L
Bacteria	U	U	H	U	L	M	L
Oil & Grease	M	M	U	U	L	H	L
Pesticides	U	U	U	U	L	U	L

(0) The City is encouraged to periodically assess the performance characteristics of many of these BMPs to update this table.
(0) Including trenches and porous pavement
(0) Also known as hydrodynamic devices and baffle boxes

L: Low removal efficiency
M: Medium removal efficiency
H: High removal efficiency
U: Unknown removal efficiency

Sources: *Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters* (1993), *National Stormwater Best Management Practices Database* (2001), and *Guide for BMP Selection in Urban Developed Areas* (2001).

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