

A significant portion of this manual's information has been copied verbatim from documents issued by the State of California Regional Water Quality Control Board - Los Angeles Region (Regional Board) and the Los Angeles County Department of Public Works (LACDPW), and modified to suit the needs of the City of Los Angeles. These documents include the National Pollutant Discharge Elimination System Permit (NPDES No. CAS004001, Board Order No. 01-182), the Standard Urban Stormwater Mitigation Plan (SUSMP) (Board Resolution No. R-00-02) issued by the Regional Board to the County of Los Angeles and its co-permittees, and the LACDPW Development Planning Manual for Stormwater Management (Manual for the Standard Urban Stormwater Mitigation Plan).

This 3rd edition is a revision to the 2nd edition to reflect the latest SUSMP requirement that take effect by March 10,2003.

This Development Best Management Practices Handbook, Part B Planning Activities, Third Edition was adopted by the City of Los Angeles, Board of Public Works on June 30, 2004 as authorized by Section 64.72 of the Los Angeles Municipal Code approved by Ordinance No. 173494.

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ACRONYMS AND ABBREVIATION

ACRONYMS AND ABBREVIATION

ASCE	American Society of Civil Engineers
BMP	best management practices
BOS	Bureau of Sanitation
CEQA	California Environmental Quality Act
CZARA	Coastal Zone Act Reauthorization Amendments of 1990
C&A	Covenant and Agreement
DCP	Los Angeles Department of City Planning
DPW	Los Angeles Department of Public Works
EAF	environmental assessment form
EIR	Environmental Impact Report
EPA	United States Environmental Protection Agency
GPL	California General Plan Law
HC	hydrocarbons
LADBS	Los Angeles Department of Building and Safety
MEP	Maximum Extent Practicable (statutory standard)
MND	Mitigated Negative Declaration
NPDES	National Pollutant Discharge Elimination System
O&G	oil and grease
O&M	operation and maintenance
RGO	retail gasoline outlets
RWQCB	Los Angeles Regional Water Quality Control Board
sf	square feet
SIC	Standard Industrial Classification
SWRCB	State Water Resources Control Board (California)
SUSMP	Standard Urban Stormwater Mitigation Plan
ULARA	Upper Los Angeles River Area
WEF	Water Environment Federation
WPD	Watershed Protection Division

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1.1 BACKGROUND

Urban runoff discharged from municipal storm drain systems has been identified by local, regional, and national research programs as one of the principal causes of water quality problems in most urban areas. Non-point source pollution, the diffuse pollution not traceable to a specific source, causes public health risk and safety concerns. Urban runoff potentially contains a host of pollutants such as trash and debris, bacteria and viruses, oil and grease, sediments, nutrients, metals, and toxic chemicals. These contaminants can adversely affect receiving and coastal waters, associated biota, and public health. While the impact of urban runoff pollution may not be immediately realized, the eventual effects can be dramatic. Urban runoff pollution is not only a problem during rainy seasons, but also year-round due to all types of urban water use.

Stormwater pollution affects human life and aquatic plant and animal life. Potentially harmful viruses and bacteria are now found in our coastal waters along with soil particles, solids/debris, litter, oil, grease, and chemical compounds. An epidemiological study (Haile, 1999) by the Santa Monica Bay Restoration Project, a project approved by Governor Pete Wilson and the United States Environmental Protection Agency (EPA), was conducted to investigate possible health effects of swimming in Santa Monica Bay. Study results indicated that individuals swimming near flowing storm drain outlets have a greater risk of developing various symptoms of illnesses compared to those swimming 400 yards away from the same drains (Haile, 1999). These pollutants also impact the natural aquatic habitat.

Oil and grease from parking lots, leaking petroleum or any hydrocarbon products, storage tanks, pesticides, cleaning solvents, and other toxic chemicals can contaminate stormwater and this contamination can be transported into water bodies and receiving waters. Fertilizer constituents from lawns and golf courses or leaking septic tanks can cause algal blooms and encourage microbial growth to create an increasing spiral of biological activity known as eutrophication. Disturbances of the soil from construction can allow silt to wash into storm channels and receiving waters making them muddy, turbid, and inhospitable to natural aquatic organisms. Many artificial surfaces of the urban environment such as galvanized metal, paint, or preserved wood containing metals contribute to pollution by run on or leaching by stormwater as the surfaces corrode, flake, dissolve, or decay. Heavy metals are toxic to aquatic organisms and may bio-accumulate.

Land development and construction activities significantly alter drainage patterns and contribute pollutants to urban runoff primarily through erosion and removal or change of existing natural vegetation. When homes, work places, recreational areas, roads, parking lots, and structures are built, as well as other land disturbances, the waterways become altered. Water, potentially loaded with pollutants, flows preferentially through the new pathways. As impervious surface increases, water that was once normally percolated into the soil now flows over the land surface. Sheet flow from rainstorms and other water use wash rapidly across the impervious landscape, scouring the surface of various kinds of urban pollutants. Accordingly, increase in impervious cover can increase the frequency and intensity of stormwater flows into a watershed. Pollutants associated with developments such as automotive fluids, cleaning solvents, toxic or hazardous chemicals, detergents, sediment, metals, pesticides, oil and grease, and food wastes deposited on impervious

surfaces become mobilized by stormwater runoff. The pollutants, unfiltered and unfettered, flow through the stormwater infrastructure and ultimately into the receiving waters.

1.2 USERS OF THE HANDBOOK

This handbook provides guidance for individuals involved in new development and redevelopment projects. The target audience for this handbook includes developers and their staff who are involved in site development, as well as the general public that may have an interest in stormwater pollution control.

1.3 HANDBOOK PURPOSE AND SCOPE

The purpose of this handbook is to assist developers in complying with the requirements of the Development Planning Program regulations of the City's Stormwater Program. This handbook summarizes the City's project review and permitting process, identifies stormwater mitigation measures, and references source and treatment control BMP information. This handbook also contains the necessary forms and worksheets required to be completed by the developer for approval.

1.4 LEGAL FRAMEWORK

With the growing concerns over urban runoff and stormwater pollution, local, state, and federal agencies devised plans to control and/or treat stormwater-related pollution before it reaches receiving waters. On July 5, 1996, the Los Angeles Regional Water Quality Control Board (Regional Board or RWQCB) adopted Order No. 96-054. This Order is the National Pollutant Discharge Elimination System Municipal Stormwater Permit (Permit) (NPDES No. CAS614001), issued to Los Angeles County and 84 permittee cities to reduce pollutants discharged from their municipal separate storm sewer systems (MS4) to the Maximum Extent Practicable (MEP) statutory standard.

The Permit is issued every five years. On December 13, 2001, the Regional Board adopted a new Permit (Order No. 01-182, NPDES Permit No. CAS004001). Under this Permit, the County of Los Angeles is designated as the Principal Permittee and the 84 cities, including the City of Los Angeles, as Permittees. The Permit consists of various stormwater management programs designed to reduce pollutants in stormwater and urban runoff. These programs are the Public Information and Participation Program, Industrial/Commercial Facilities Program, Illicit Connections and Illicit Discharges Elimination Program, Development Planning Program, Development Construction Program, Public Agency Activities Program, and the Monitoring and Reporting Program.

The requirement to implement the Permit is based on federal and state statutes, including Section 402(p) of the Clean Water Act, Section 6217 of the Coastal Zone Act Reauthorization Amendments (CZARA) of 1990, and the California Water Code. The Federal Clean Water Act amendments of 1987 established a framework for regulating stormwater discharges from municipal, industrial, and construction activities under the NPDES program. The primary objectives of the stormwater program requirements are to:

- Effectively prohibit non-stormwater discharges, and
- Reduce the discharge of pollutants from stormwater conveyance systems to the MEP statutory standard.

The Federal Clean Water Act is the principal vehicle for control of stormwater pollution. Other programs dealing with stormwater pollution include the State of California General Plan Law (GPL) for Municipalities and the California Environmental Quality Act (CEQA). Under the Federal Clean Water Act, each municipality throughout the nation is issued a NPDES stormwater permit. The primary goal of the permits is to stop polluted discharges from entering the storm drain system and local receiving and coastal waters.

In California, the NPDES stormwater permitting program is administered by the State Water Resources Control Board (SWRCB) through its nine Regional Boards. Based on the Permit issued by the Los Angeles Regional Board, the County and its co-permittees are required to develop and implement a number of stormwater management programs. One of these programs, the Development Planning Program, focuses on preventing pollutants that could be generated from new development and redevelopment projects from reaching stormwater conveyance systems and receiving waters.

Also, the California GPL and CEQA provide a basis for municipalities to review and comment on all projects within their jurisdiction. Under the GPL, municipalities are required to develop policies and regulations that guide development within the municipality. Each development project is reviewed for conformance with these policies. Under CEQA, projects are also subject to review and comment for potential adverse environmental impacts, including impacts from stormwater discharges.

1.5 DEVELOPMENT PLANNING PROGRAM

Under this program, project applicants submitting design plans to the City for review and approval may be required to include a stormwater mitigation plan. The main elements of the Development Planning Program are the Standard Urban Stormwater Mitigation Plan (SUSMP) and Site Specific Mitigation Plan. This handbook provides guidance for compliance with the SUSMP and Site Specific Mitigation Plan requirements.

Standard Urban Stormwater Mitigation Plan (SUSMP)

The Permit cites the categories of new development and redevelopment projects that require stormwater mitigation measures and outlines the necessary Best Management Practices (BMPs) applicable to each category. The following project categories require a SUSMP:

1. Single-family hillside residential developments *

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- * Single-family hillside residential developments with less than one acre of impervious surface area are excluded from the numerical Structural and Treatment Control BMP design standard requirements

2. Housing developments (including single-family homes, multi-family homes, condominiums, and apartments) of ten or more units
3. Industrial/Commercial¹ developments of one acre or more of impervious surface area
4. Automotive service facilities (SIC 5013, 5014, 5541, 7532-7534, and 7536-7539) **
5. Retail gasoline outlets **
6. Restaurants (SIC 5812) **
7. Parking lots with 5,000 square feet or more of surface area, including accessory driveways, or with 25 or more parking spaces
8. Projects located in, adjacent to, or discharging directly to a designated Environmentally Sensitive Area (ESA)

Site Specific Mitigation

New development and/or redevelopment projects not requiring a SUSMP but which may potentially have adverse impacts on stormwater quality must incorporate a Site Specific Mitigation plan to mitigate stormwater pollution. Such projects may have, but are not limited to, one or more of the following characteristics:

1. Vehicle or equipment fueling areas
2. Vehicle or equipment maintenance areas, including washing and repair
3. Commercial or industrial waste handling or storage
4. Outdoor handling or storage of hazardous materials

** Projects in these categories with less than 5,000 square feet of impervious surface area are excluded from the numerical Structural and Treatment Control BMP design standard requirements

¹ Commercial Development: any development that is not heavy industrial or residential. The category includes, but is not limited to: hospitals, laboratories and other medical facilities, educational institutions, recreational facilities, plant nurseries, car wash facilities, mini-malls and other business complexes, shopping malls, hotels, office buildings, public warehouses and other light industrial complexes.

Industrial/Commercial Facility: any facility involved and/or used in the production, manufacture, storage, transportation, distribution, exchange or sale of goods and/or commodities, and any facility involved and/or used in providing professional and non-professional services. This category of facilities includes, but is not limited to, any facility defined by the Standard Industrial Classifications (SIC).

5. Outdoor manufacturing areas
6. Outdoor food handling or processing
7. Outdoor animal care, confinement, or slaughter
8. Outdoor horticulture activities
9. Major transportation projects

Projects with one or more of the above characteristics or any project that is subject to the Site Specific Mitigation requirement will be required to incorporate appropriate stormwater mitigation measures or apply SUSMP to satisfy stormwater requirements.

Redevelopment

Redevelopment means any land-disturbing activity that results in the creation, addition, or replacement of 5,000 square feet or more of impervious surface area on an already developed site. Redevelopment includes, but is not limited to: the expansion of a building footprint; addition or replacement of a structure; replacement of impervious surface area when replacement is not part of a routine maintenance activity; and land-disturbing activities related to structural or impervious surfaces. It does not include routine maintenance activities that are conducted to maintain original line and grade, hydraulic capacity, or original purpose of facility, nor does it include emergency construction activities required to immediately protect public health and safety. Existing “non-hillside” single-family structures are exempt from the redevelopment requirements.

Where redevelopment results in an alteration to more than fifty percent of the impervious surfaces of a previously existing development, and the existing development was not already designed and built in accordance with stormwater quality control requirements, the entire project must be mitigated. Where redevelopment results in an alteration to less than fifty percent of the impervious surfaces of a previously existing development, and the existing development was not already designed and built in accordance with stormwater quality control requirements, only the alteration must be mitigated, and not the entire development.

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2.1 PLAN APPROVAL PROCESS

The requirement to incorporate stormwater pollution control measures into the design plans of new development and redevelopment projects to mitigate stormwater quality impacts is implemented through the City's plan review and approval process. During the review process, the plans will be reviewed for compliance with the City's General Plans, zoning ordinances, and other applicable local ordinances and codes, including stormwater requirements. Plans and specifications will be reviewed to ensure that the appropriate BMPs are incorporated to address stormwater pollution prevention goals. The reviewer will also determine if project designs need to be modified to address stormwater pollution prevention objectives.

New Development and redevelopment projects are mainly processed through the Department of City Planning (DCP) and the Department of Building and Safety (LADBS):

- **Entitlement** approvals are processed by DCP. These projects require discretionary action.
- **Building/Grading Permit** approvals are processed by LADBS.

Department of City Planning Process

The Permit requirements are incorporated into the CEQA process. As indicated in the Permit and outlined in Section 1.3 of this handbook, certain project categories are considered by regulation to be potentially harmful to stormwater quality. These projects are considered to have a "significant impact" on the environment.

The GPL and CEQA provide a basis for municipalities to review and comment on all projects within their jurisdiction. Under the GPL, municipalities are required to develop policies and regulations that guide developments within their municipalities. Each development project is then reviewed for conformance with these policies. Under CEQA, projects are also subject to review for any adverse impacts the projects may have on the environment, including those impacts from stormwater discharges. These project types (e.g., zone variances, conditional use permits, plan amendments, site plan reviews, etc.) are considered discretionary review projects requiring review by an elected or appointed decision-making body. Mitigation measures for stormwater quality impacts will be incorporated into the project during environmental and project reviews. The project will be reviewed to ensure that the required BMPs are included. Planning approvals for discretionary projects will not be granted until stormwater mitigation measures are incorporated into the project plans.

All applications for DCP's discretionary decisions are required to be accompanied by an environmental clearance (e.g., Categorical Exemption, Negative Declaration, Mitigated Negative Declaration, or Environmental Impact Report). When an applicant files an application for a discretionary project, DCP staff at the public counter will determine whether the project qualifies for an exemption from CEQA. If the project is not exempt and could possibly have a significant impact, the applicant files an Environmental Assessment Form (EAF).

The DCP Environmental Review Section prepares the Initial Study and Checklist. DCP will indicate if the project will impact water absorption rates, drainage patterns, urban runoff or other water quality issues. If no significant effect upon the environment is found, a Negative Declaration will be issued for the project. If mitigation measures are needed, a Mitigated Negative Declaration (MND) is issued for the project, or an Environmental Impact Report (EIR) is required. Stormwater mitigation measures (as shown in Appendix C) will be added to the MND or the EIR for the decision-maker to impose as conditions.

The project applicant must incorporate stormwater pollution control measures into the design plans and submit these plans to the Department of Public Works, Bureau of Sanitation, Watershed Protection Division (WPD) for review and approval. See Appendix I for contact information. Upon satisfaction that all SUSMP requirements have been met, WPD staff will stamp the plan approved. Following approval by DCP, building/grading permits are obtained from LADBS.

Department of Building and Safety Process

Applicants must submit design plans to LADBS personnel for review and approval prior to issuance of building/grading permits. LADBS personnel determine if the project requires stormwater mitigation measures and refer applicable projects to WPD for review and approval. LADBS issues the applicant a “Clearance Worksheet” that identifies all of the outstanding approvals from City agencies (see Appendix E). A building/grading permit will be issued once all corrections have been completed and clearances are obtained, including for stormwater requirements.

The flow chart in Figure 2-1 illustrates the steps in the review and approval process of new development and redevelopment project plans requiring stormwater mitigation measures. Outlined below are some guidelines for project applicants to follow in submitting design plans for review and approval.

Step One - Submit design plans

The project applicant submits the design plans to LADBS. During the plan review process, LADBS will refer projects needing discretionary action to DCP for additional processing.

Step Two - Define the project category

The plan check engineer will review the design plans and determine if the project falls under any of the SUSMP categories or meets any of the characteristics identified under Site Specific Mitigation. If the project falls into any one of the SUSMP categories or characteristics cited under Site Specific Mitigation, the plan check engineer will refer the applicant to WPD.

Step Three - Identify appropriate BMPs

Identify, evaluate, and incorporate into the plan documents the appropriate BMP(s) for the project categories listed in Section 3.1 (SUSMP) or Section 3.2 (Site Specific Mitigation) of this handbook, whichever is applicable.

To assist the project applicant in this process, Appendix D contains prescriptive methods detailing BMPs to be incorporated into the design plans for certain project categories. The advantage of the prescriptive methods is they are designed as pre-approved “boiler plates.”

Use of prescriptive methods for qualifying project categories will dramatically reduce plan preparation and review time.

Approval for development projects and building/grading permits will not be granted/issued until appropriate and applicable stormwater BMPs are incorporated into the project design plans. Also, a plumbing permit from LADBS will be required for certain treatment control BMPs such as grease traps, sump pumps, and clarifiers. If an infiltration BMP is chosen for treatment control, a soils report to address the feasibility of infiltration will be required to be submitted with the plan for review and approval.

Step Four – Submit SUSMP/site specific mitigation plans to WPD

The following is a list of the minimum submittal requirement for all projects:

- Two sets of grading and/or site plans (may need plumbing, architectural, and landscape plans). WPD keeps one set of plans.
- Plans must be wet-stamped and signed by an engineer or architect.
- Plans must include at least the following:
 - Location of all BMPs on plans, including elevations and drainage patterns.
 - Detailed drawings of all BMPs, including model, size, and capacity
 - Stenciling note and/or detail
 - Trash enclosure location and details
 - Landscaping areas
- Flow calculations identifying flow rate or volume of stormwater runoff that must be treated (see Appendix H). Submit the manufacturer's product specifications to verify that the selected BMP model can adequately handle the design flow rate.
- Covenant & Agreement Form with an Operation & Maintenance Plan (see Appendix E)

Step Five – WPD Approval

Once all SUSMP/site specific mitigation requirements have been met, WPD staff will stamp the plans approved, sign the applicant's clearance worksheet, and clear the project in the LADBS plan check tracking system, known as the Plan Check and Inspection System (PCIS).

2.2 INSPECTION PROCESS

To ensure that all the stormwater related BMPs are constructed and/or installed in accordance with the approved SUSMP/Site Specific Mitigation Plan, for complex projects, the City may require a Stormwater Observation Report (SOR) be submitted to the City prior to the issuance of the Certificate of Occupancy (see Appendix E). The SOR shall be prepared, signed, and stamped by a California-licensed engineer or architect responsible for the approved SUSMP/Site Specific Mitigation Plan, certifying that:

He/she is the engineer or architect responsible for the approved SUSMP/Site Specific Mitigation Plan, and

He/she or the designated staff under his/her responsible charge has performed the required site visits at each significant construction stage and at completion to verify that the BMPs

shown on the approved plan have been constructed and installed in accordance with the approved SUSMP/Site Specific Mitigation Plan.

The Certificate of Occupancy will be issued after all required clearances are obtained; the project has been determined, through the normal inspection process, to be built in accordance with the approved plan, including the construction and/or installation of appropriate stormwater-related BMPs; and the project has been determined to comply with all applicable codes, ordinances, and other laws.

2.3 BMP MAINTENANCE COVENANT AND AGREEMENT

A Covenant and Agreement (C&A) document shall be submitted, along with the design plans showing the project's stormwater measures, during the plan review and approval process, and must be signed by the legal owner of the property. The C&A shall also be recorded with the County Recorder. The City will withhold the grading and/or building permit for the development application until this requirement is satisfied. A sample form of the C&A is provided in Appendix E.

Maintenance is crucial for proper and continuous operation, effectiveness, and efficiency of a structural or treatment control BMP. The cost of long-term maintenance should be evaluated during the BMP selection process. By signing a maintenance C&A, the legal property owner affirms he/she will perform regular and long-term maintenance of all BMPs installed on-site. For residential properties where the structural or treatment control BMPs are located within a common area and will be maintained by a homeowner's association, language regarding the responsibility for maintenance must be included in the project's conditions, covenants and restrictions (CC&Rs). The C&A is bound to the property and transfers to the new owner with any subsequent sale of the property. Attached to the C&A will be an Operation and Maintenance (O&M) Plan (see Appendix E for a sample) describing the BMP operation and maintenance procedures, employee training program and duties, operating schedule, maintenance frequency, routine service schedule, and other activities. A Maintenance Log shall be maintained at the facility to document all of the activities mentioned above. These documents may be inspected by the City of Los Angeles at any time and shall be made available to the City upon request.

2.4 MUNICIPAL PROJECTS

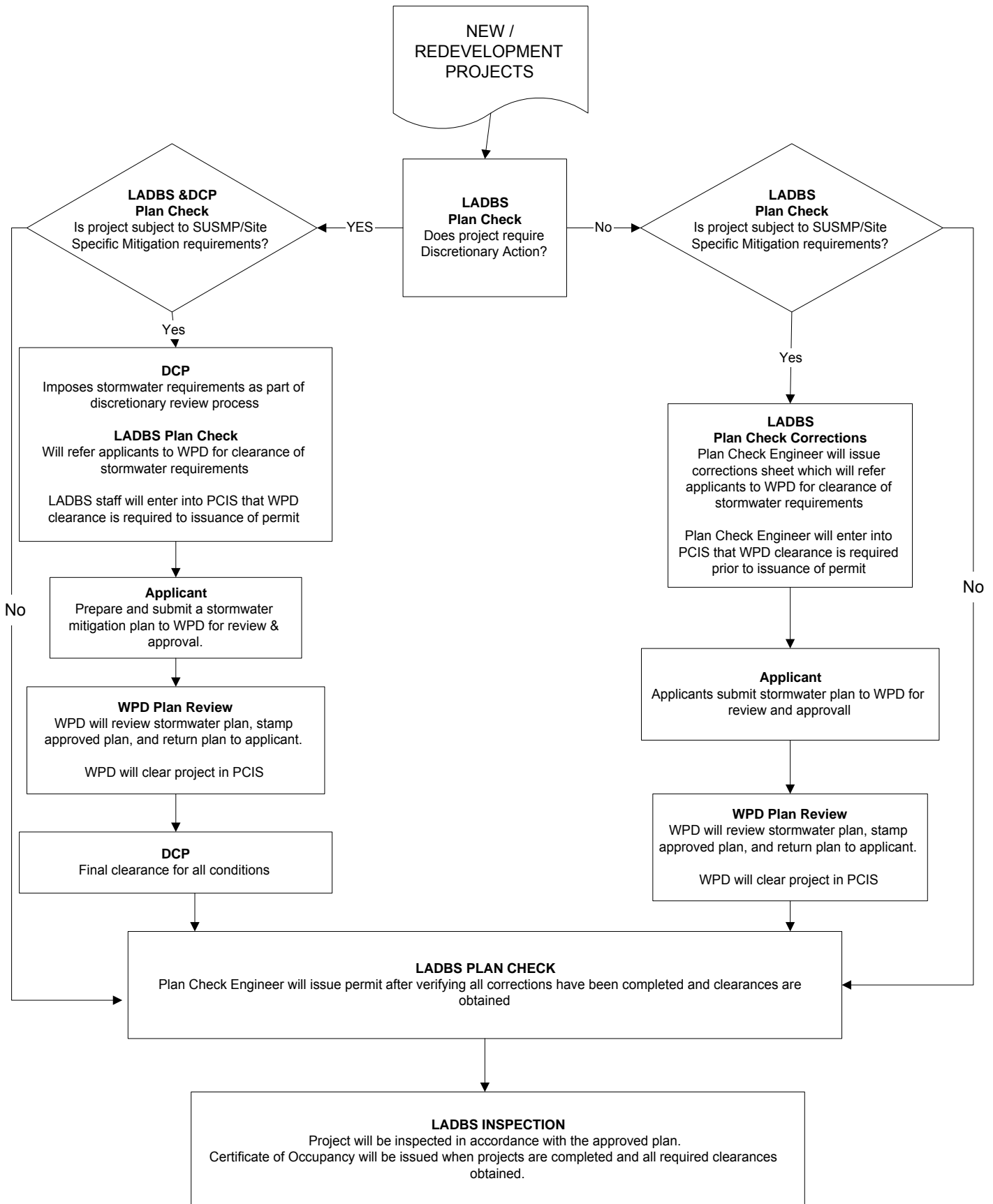
Stormwater mitigation measures are required for all projects subject to the SUSMP or Site Specific Mitigation. City projects that will be processed through DCP and/or LADBS will be subject to the review and approval process described in Section 2.1 and Figure 2-1. For other City projects that do not undergo the plan review and approval process with DCP and/or LADBS, the public agency may use this handbook to incorporate the required stormwater mitigation measures into their projects.

2.5 OTHER PUBLIC AGENCY PROJECTS

Public agency projects other than from the City of Los Angeles, such as from Caltrans, the Metropolitan Transit Authority, etc., that are subject to the SUSMP or Site Specific Mitigation

and require a permit from the City of Los Angeles are required to implement stormwater mitigation measures. Examples of such projects include the Alameda Corridor, Metro Rail stations, airport runways, and busways. Such projects must incorporate stormwater BMPs into their design plans and specifications, which must be submitted to WPD for review and approval.

**Figure 2-1
Plan Review and Approval Process Flow Chart**



3.1 STANDARD URBAN STORMWATER MITIGATION PLAN (SUSMP)

The SUSMP was adopted by the Regional Board on March 8, 2000 under Resolution No. R-00-02, and was further amended by the SWRCB on October 5, 2000 under State Water Board Order WQ 2000-11. The SUSMP was developed as part of the municipal stormwater program to address stormwater pollution from new development and redevelopment projects. The final SUSMP (Appendix B) identified eight project categories that require post-construction stormwater mitigation measures. For each project category, a collection of required source control BMPs was identified. In addition, the SUSMP also provided a listing of suggested treatment control BMPs and specified design standards for those treatment controls BMPs. Project applicants will be required to incorporate stormwater mitigation measures into their design plans and submit the plans to the City for review and approval. The design plans will be subjected to a review process as indicated in Section 2, prior to the issuance of approvals for building and/or grading permits.

Listed below are the project categories subject to SUSMP requirements:

- Single-Family Hillside Residences *
- Housing developments (including, but not limited to, single-family homes, multi-family homes, condominiums, and apartments) of ten or more units
- Industrial/Commercial developments of one acre or more of impervious surface area
- Automotive service facilities (SIC 5013, 5014, 5541, 7532-7534, and 7536-7539) **
- Retail Gasoline Outlets **
- Restaurants (SIC 5812) **
- Parking Lots with 5,000 square feet or more of surface area, including accessory driveways, or with 25 or more parking spaces, and potentially exposed to stormwater runoff
- Projects located in, directly adjacent to, or discharging directly to a designated ESA

* Single-family hillside residential developments with less than one acre of impervious surface area are excluded from the numerical Structural and Treatment Control BMP design standard requirements

** Projects in these categories with less than 5,000 square feet of impervious surface area are excluded from the numerical Structural and Treatment Control BMP design standard requirements

Table 3-1 provides a matrix that identifies potential source control BMPs and suggested treatment control BMPs. Detailed descriptions of treatment control BMPs can be found in Appendix G. The application of those BMP should comply with code requirements or specification and to check with LADBS prior to use. The project applicant can select from Table 3-1 or propose one or more appropriate and applicable treatment control BMPs that could treat or control stormwater pollution to the MEP standards. Sample calculations on water quality volumes and BMP design, as well as BMP design calculation sheets, are provided in Appendix H. The BMP design calculation sheets can be downloaded from WPD's website: go to www.lastormwater.org, click on "Publications," then click on "Part B Manual."

3.2 SITE SPECIFIC MITIGATION

New development and redevelopment projects not requiring a SUSMP but which may potentially have adverse impacts on stormwater quality must incorporate a site specific plan to mitigate stormwater pollution. Such projects may have, but are not limited to, one or more of the following characteristics:

- Vehicle or equipment fueling areas
- Vehicle or equipment maintenance areas, including washing and repair
- Commercial or industrial waste handling or storage
- Outdoor handling or storage of hazardous materials
- Outdoor manufacturing areas
- Outdoor food handling or processing
- Outdoor animal care, confinement, or slaughter
- Outdoor horticulture activities
- Major transportation projects

Project applicants will be required to submit to the City a design plan that incorporates appropriate stormwater mitigation measures and details the source and treatment control BMP(s), and must also submit the O&M plan for the treatment control BMPs. The design plans will be subject to the review and approval process described in Section 2, prior to the issuance of building or grading permits.

Table 3-2 identifies the types of pollutants that can potentially be generated by each respective project characteristic. Table 3-3 provides a matrix that identifies potential source control BMPs and suggested treatment control BMPs. Descriptions of selected source control and treatment control BMPs can be found in Appendix G. The project applicant can select from Table 3-3 or propose one or more appropriate treatment control BMPs that could treat or control stormwater pollution to the MEP standards. Sample calculations on water quality volumes and BMP design, as well as a BMP design calculation sheet, are provided in Appendix H. The BMP design calculation sheets can be downloaded from WPD's website: go to www.lastormwater.org, click on "Publications," then click on "Part B Manual."

3.3 PRESCRIPTIVE METHODS

To assist in the preparation of the design plan and facilitate the plan approval process, prescriptive methods have been developed for some of the project categories listed in Section 3.1. The prescriptive methods outline the specific BMPs to be incorporated into the design plans. Detailed descriptions of the prescriptive methods are included in Appendix D of this handbook. Project applicants are encouraged to review the prescriptive methods

thoroughly to determine the applicability to their projects and incorporate the recommended BMPs into the design plans prior to submitting them to the City for review and approval.

3.4 BMP MATRICES

The BMP matrices list the project categories prescribed in the SUSMP (Table 3-1) and those which are subject to the site specific mitigation requirements (Tables 3-2 and 3-3). Based on the pollutants that are anticipated to be generated when the development projects are completed and in use, applicable, required, or suggested treatment and source control BMPs are correspondingly listed for each project category. The project applicant shall be responsible for determining, evaluating, and selecting the appropriate and applicable measures to treat the targeted pollutants to the MEP standard. One or a combination of two or more suggested treatment control BMPs can be selected as deemed applicable. Required BMPs for some SUSMP project categories are also indicated in the prescriptive methods in Appendix D.

BMP references and vendor information can be found in Appendix F. Source and treatment control BMP fact sheets are included in Appendix G. Sample calculations on water quality volumes and BMP design, as well as a BMP design calculation sheet, are provided in Appendix H. The BMP design calculation sheets can be downloaded from WPD's website: go to www.lastormwater.org, click on "Publications," then click on "Part B Manual."

3.5 BMP RESTRICTIONS

Infiltration and retention BMPs have certain limitations that are discussed here. This information supplements the individual limitations that are discussed in the BMP reference materials listed in Appendix F and in the SUSMP document in Appendix B.

Infiltration BMPs

Limitations in the use of infiltration BMPs exist due to the potential for groundwater and soil contamination, settlement, and slope instability. The factors that influence the potential for contamination include pollutant mobility, pollutant abundance in stormwater, and pollutant solubility. The San Fernando Valley groundwater basin is a significant source of drinking water for the cities of Los Angeles, Burbank, and Glendale. Infiltration BMPs should be implemented in a manner that protects this drinking water source from contamination. Soil contamination occurs when hazardous substances mix with the soil and can be harmful to animals, plants, and humans. Slope instability and settlement are commonly caused by saturation and/or seepage forces within soil or bedrock.

Infiltration BMPs must **not** be used if any one of the following site conditions exists:

- Groundwater table/depth beneath the site is less than 10 feet below ground surface.
- Site soil lithology consists primarily of clay and/or silt resulting in low infiltration rates.

- Project is located in an industrial area that has a General Industrial Activities Storm Water Permit (GIASP) or in an area of industrial activity, including but not limited to, those categorized in the State of California NPDES General Permit for Discharge of Stormwater Associated with Industrial Activities (SWRCB, 1997).
- Project receives or has a potential to receive stormwater from areas subject to high vehicular traffic activity (25,000 or greater average daily traffic [ADT] on main roadway or 15,000 or more ADT on any intersecting roadway).
- Project is located in a hillside area, or an area subjected to slides and unstable soils.

If the developer pursues an infiltration BMP, at a minimum, the following information must be provided:

- Percolation tests or other data to confirm infiltration rate and capacity of the soil
- Design and location of the infiltration devices, highlighting distance from adjoining buildings and property lines
- Depth to groundwater
- Proposed land use
- Infiltration under certain conditions may be a violation of Chapter 70 of the City of Los Angeles Building Code. If so, a Modification of the Building Ordinance must be obtained from the Department of Building and Safety. Applicants must address the affects of infiltration on the stability of the surrounding slopes and settlement of the surrounding soil.
- For projects located within the San Fernando Valley groundwater basin, provide a Phase I Environmental Site Assessment (ESA) Records Check, signed by a licensed professional, that includes the following:
 - Historic land use (50 + years), including storage or processing of toxic materials (see County Hall of Records “Chain of Title”)
 - Location of existing and removed underground tanks (see RWQCB)
 - History of leaks or spills of toxic materials
 - Existing soil and groundwater contamination (see RWQCB)
 - Distance to nearest drinking water production well (contact Upper Los Angeles River Area [ULARA] Watermaster)

Retention BMPs

Retention systems release runoff slowly to reduce downstream peak flows to their pre-development levels, and allow fine sediments to settle. Limitations in the use of retention BMPs may exist due to a conflict with established water rights. Cisterns, tanks, ponds, and other retention-type BMPs that are designed with the intent to capture and consumptively

use stormwater runoff will be reviewed on a case-by-case basis. For projects located in the Upper L.A. River Area (refer to [Figure 3-1](#)), questions regarding water rights should be directed to the ULARA Watermaster.

3.6 BMP OPERATION AND MAINTENANCE (O&M) REQUIREMENTS

Proper O&M is an important element of a stormwater mitigation plan to ensure BMPs remove pollution effectively. Routine maintenance or service also contributes to the efficiency and continuous operation of a system. It is required that an O&M plan be developed and implemented as described in Section 2.2. The O&M plan can be developed by the project applicant or according to the BMP manufacturer's operating manual. Instructions on the proper O&M of the BMPs shall be provided to the developer, owner, or responsible entities (homeowners' associations, employees, tenants, or subdivision managers) to ensure adequate and appropriate upkeep of the system. The O&M manual shall be kept on site for inspection. Maintenance of the BMP is the responsibility of the owner and/or operator of the facility.

A legible log shall be kept on site to record the implementation of the stormwater pollution abatement control measures. The record must contain the following information: (i) type of maintenance activities or source-control practices; (ii) date the activities are completed; and (iii) the name of the operator performing the activities. During transfer of ownership/operation of the facility, the current owner must notify the new owner/operator of the BMPs and the associated maintenance activities that also transfer to the new owner/operator of the property.

Example maintenance requirements of selected BMPs are listed in Table 3-4 and a generic O&M plan for catch basin inserts can be found in Appendix E. Detailed BMP maintenance requirements are described in the individual BMP references specified in Appendix F of this handbook and/or in the manufacturers' operating manuals.

**TABLE 3-1
BMP MATRIX FOR SUSMP PROJECT CATEGORIES**

PROJECT CATEGORY	ANTICIPATED POLLUTANT GENERATED	SUSMP PROVISIONS AND REQUIREMENTS															
		SOURCE CONTROL BMPs ^(a)													TREATMENT CONTROL BMPs ^{(b) (c)}		
		Peak Stormwater Runoff Discharge Rates	Conserve Natural Areas	Minimize Stormwater Pollutants of Concern	Protect Slopes & Channels	Provide Storm Drain System Stenciling & Signage	Properly Design Outdoor Material Storage Areas	Properly Design Trash Storage Areas	Provide Proof of Ongoing BMP Maintenance	Properly Design Loading/Unloading Dock Areas	Properly Design Repair/Maintenance Bays	Properly Design Vehicle/Equipment/Accessory Wash Areas	Properly Design Fueling Area	Properly Design Parking Area	Properly Design to Limit Oil Contamination and Perform Maintenance	Design Standards for Treatment Control BMP ^{(a) (b)}	Catch Basin Insert, Catch Basin Screens, Infiltration Trench*, Infiltration Basin*, Extended/Dry Retention Basin*, Wet Ponds*, Dry Well*, Cisterns*, Vegetated Swales & Strips*, Constructed Wetlands*, Bioretention Facility*, Continuous Separation Systems, Vortex/Hydrodynamic Systems, Media Filtration, On-Line Filtration Systems, Clarifiers, Oil/Water Separators, Primary Wastewater Treatment, Off-Line Storage, Rain Diversion System, Porous Pavements, End-of-Pipe Systems
Stand-alone Restaurants	O&G, trash, sediment, debris, solvents	Prescriptive Method ^(d)															
Automotive Repair Shops	O&G, solvents, petroleum HC, sediment, metals	Prescriptive Method ^(d)															
Retail Gasoline Outlets	O&G, sediment, petroleum HC, metals	Prescriptive Method ^(d)															
Parking Lots (up to 20,000 sf)	O&G, trash, metals, debris, sediment	Prescriptive Method ^(d)															
Parking Lots (≥ 5,000 sf or 25 spaces and more)	O&G, trash, metals, debris, sediment	R	R	R	R	R	R	R	R					R		R	S

BMPs – Best Management Practices
 HC – Hydrocarbons
 O&G – Oil & Grease
 R – Required if applicable
 sf – square feet
 * Case by case basis for use in San Fernando Valley Watershed.

S – Select one or more applicable and appropriate treatment control BMPs from this list.
 SUSMP – Standard Urban Stormwater Mitigation Plan
 (a) Refer to Appendix B for detailed information.
 (b) Refer to Appendix G for design standards to be used for treatment control BMPs.
 (c) Plumbing permits will be required for BMPs such as grease traps, sump pumps, and clarifiers.
 (d) Refer to Appendix D for detailed information

**TABLE 3-1 (cont.)
BMP MATRIX FOR SUSMP PROJECT CATEGORIES**

PROJECT CATEGORY	ANTICIPATED POLLUTANT GENERATED	SUSMP PROVISIONS AND REQUIREMENTS															
		SOURCE CONTROL BMPs ^(a)													TREATMENT CONTROL BMPs ^{(b) (c)}		
		Peak Stormwater Runoff Discharge Rates	Conserve Natural Areas	Minimize Stormwater Pollutants of Concern	Protect Slopes & Channels	Provide Storm Drain System Stenciling & Signage	Properly Design Outdoor Material Storage Areas	Properly Design Trash Storage Areas	Provide Proof of Ongoing BMP Maintenance	Properly Design Loading/Unloading Dock Areas	Properly Design Repair/Maintenance Bays	Properly Design Vehicle/Equipment/Accessory Wash Areas	Properly Design Fueling Area	Properly Design Parking Area	Properly Design to Limit Oil Contamination and Perform Maintenance	Design Standards for Treatment Control BMP ^{(a) (b)}	
Industrial/Commercial Developments (1 acre or more)	Organics, trash, debris, O&G, nutrients, metals, sediment	R	R	R	R	R	R	R	R	R	R	R				R	S
Home Subdivisions (10 or more units)	Nutrients, trash, debris, metals, pesticides, O&G, sediment	R	R	R	R	R	R	R	R							R	S
Single-Family Hillside Residences (≥ 1 acre)	Nutrients, trash, debris, metals, pesticides, O&G, sediment	R	R	R	R	R	R	R	R							R	S
Single-Family Hillside Residences (< 1 acre)	Nutrients, trash, debris, metals, pesticides, O&G, sediment		R	R	R												
Projects located in, adjacent to or discharging directly to an ESA	Organics, trash, debris, O&G, nutrients, metals, sediment	R	R	R	R	R	R	R	R							R	S

* see legend from previous page

Table 3-2
PROJECT CHARACTERISTICS SUBJECT TO SITE SPECIFIC MITIGATION REQUIREMENT

PROJECT CATEGORIES	POTENTIAL POLLUTION GENERATED
Vehicle or equipment fueling areas (example: truck stops, transportation facilities, vehicle rental and storage, etc.)	oil & grease, petroleum hydrocarbons, organics, sediment, metals, trash & debris, toxic chemicals
Vehicle or equipment maintenance areas, including washing and repair (example: stand-alone car wash, service yards, transportation facilities, vehicle rental and storage, etc.)	surfactants, oil & grease, petroleum hydrocarbons, organics, sediment, metals, trash & debris, toxic chemicals
Commercial or industrial waste handling or storage (example: hazardous waste treatment, storage, or disposal facilities recycling facilities, etc.)	sediment, trash & debris, metals, organics, inorganics, toxic chemicals, nutrients, oil & grease
Outdoor handling or storage of hazardous materials (example: transfer stations, recycling facilities, auto-wrecking yards, oil/gas mining facilities, etc.)	toxic chemicals, organics, inorganics, metals, oil & grease, trash & debris
Outdoor manufacturing areas (example: concrete batching plant, scrap metal processing and storage, oil/gas mining facilities, etc.)	organics, inorganics, toxic chemicals, metals, oil & grease, trash & debris, sediment
Outdoor food handling or processing (example: Loading Dock area, outdoor food court / food serving area, etc)	oil & grease, solvents, sediment, metals, trash & debris, bacteria & viruses
Outdoor animal care, confinement, or slaughter (example: animal shelter, animal pound, commercial kennel, horse stable, etc.)	bacteria & viruses, trash & debris, sediment, organic waste
Outdoor horticulture activities (example: greenhouses, flower/botanical gardens, etc.)	vegetative debris, nutrients, trash, sediment, metals, organics, pesticides, green waste
Major Transportation Projects Including projects by the outside public agencies such as, Caltrans, DOTs MTA projects. Examples of such projects include but not limited to: Alameda Corridor, Airport, Busways, The Green Line Station, etc)	Debris, trash, sediment, organic waste, oil & grease, <i>bacteria & viruses</i> , toxic chemicals, hydrocarbons, green waste, metals.

**TABLE 3-3
BMP MATRIX FOR PROJECT CHARACTERISTICS REQUIRING SITE SPECIFIC MITIGATION**

PROJECT CATEGORY	ANTICIPATED POLLUTANT GENERATED	BEST MANAGEMENT PRACTICES														TREATMENT CONTROL (a) (b)
		SOURCE CONTROL (a)														
		Housekeeping Practices	Public Education/Participation	Employee Training	Conserve Natural Areas/Vegetation Controls	Protect Slopes & Channels	Provide Storm Drain System Stenciling & Signage	Trash Storage Areas	Outdoor Material Handling and Storage Areas	Loading/Unloading Dock Areas	Waste Handling & Disposal	Vehicle Fleet Management	Repair/Maintenance Bays	Parking Area	Provide Proof of Ongoing BMP Maintenance	
Vehicle or equipment fueling areas	oil & grease, petroleum hydrocarbons, organics, sediment, metals, trash & debris, toxic chemicals	√	√	√	√	√	√	√	√	√	√	√	√	√	√	X
Vehicle or equipment maintenance areas, including washing and repair	surfactants, oil & grease, petroleum hydrocarbons, organics, sediment, metals, trash & debris, toxic chemicals	√	√	√	√	√	√	√	√	√	√	√	√	√	√	X
Commercial or industrial waste handling or storage	sediment, trash & debris, metals, organics, inorganics, toxic chemicals, nutrients, oil & grease	√	√	√	√	√	√	√	√	√	√	√	√	√	√	X

BMPs – Best Management Practices

O&G – Oil & Grease

√ – Potential BMPs to satisfy Permit requirements.

* Case by case for use in San Fernando Valley Watershed.

X – Select one or more applicable treatment control BMPs from this list to satisfy mitigation conditions.

(a) Refer to Appendix G for detailed information and design standards to be used for treatment control BMPs.

(b) Plumbing permit will be required for BMPs such as grease traps, sump pumps, and clarifiers

**TABLE 3-3 (cont.)
BMP MATRIX FOR PROJECT CHARACTERISTICS REQUIRING SITE SPECIFIC MITIGATION**

PROJECT CATEGORY	ANTICIPATED POLLUTANT GENERATED	BEST MANAGEMENT PRACTICES															TREATMENT CONTROL (a) (b)	
		SOURCE CONTROL (a)														TREATMENT CONTROL (a) (b)		
		Housekeeping Practices	Public Education/Participation	Employee Training	Conserve Natural Areas/Vegetation Controls	Protect Slopes & Channels	Provide Storm Drain System Stenciling & Signage	Trash Storage Areas	Outdoor Material Handling and Storage Areas	Loading/Unloading Dock Areas	Waste Handling & Disposal	Vehicle Fleet Management	Repair/Maintenance Bays	Parking Area	Provide Proof of Ongoing BMP Maintenance			
Outdoor handling or storage of hazardous materials	toxic chemicals, organics, inorganics, metals, oil & grease, trash & debris	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	X
Outdoor manufacturing areas	organics, inorganics, toxic chemicals, metals, oil & grease, trash & debris, sediment	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	X
Outdoor food handling or processing	oil & grease, solvents, sediment, metals, trash & debris, bacteria & viruses	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	X
Outdoor animal care, confinement, or slaughter	bacteria & viruses, trash & debris, sediment, organic waste	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	X

BMPs – Best Management Practices
O&G – Oil & Grease
√ – Potential BMPs to satisfy Permit requirements.
* Case by case for use in San Fernando Valley Watershed.

X – Select one or more applicable treatment control BMPs from this list to satisfy mitigation conditions.
(a) Refer to Appendix G for detailed information and design standards to be used for treatment control BMPs.
(b) Plumbing permit will be required for BMPs such as grease traps, sump pumps, and clarifiers

**TABLE 3-3 (cont.)
BMP MATRIX FOR PROJECT CHARACTERISTICS REQUIRING SITE SPECIFIC MITIGATION**

PROJECT CATEGORY	ANTICIPATED POLLUTANT GENERATED	BEST MANAGEMENT PRACTICES														TREATMENT CONTROL (a) (b)
		SOURCE CONTROL (a)													Design Standards for Treatment Control BMP (a)	
		Housekeeping Practices	Public Education/Participation	Employee Training	Conserve Natural Areas/Vegetation Controls	Protect Slopes & Channels	Provide Storm Drain System Stenciling & Signage	Trash Storage Areas	Outdoor Material Handling and Storage Areas	Loading/Unloading Dock Areas	Waste Handling & Disposal	Vehicle Fleet Management	Repair/Maintenance Bays	Parking Area		
Outdoor horticulture activities	vegetative debris, nutrients, trash, sediment, metals, organics, pesticides, green waste	√	√	√	√	√	√	√	√	√	√		√	√	√	X
Major transportation projects	debris, trash, sediment, organic waste, oil & grease, bacteria & viruses, toxic chemicals, hydrocarbons, green waste, metals.		√	√	√	√	√			√	√	√	√	√	√	X

BMPs – Best Management Practices
O&G – Oil & Grease
√ – Potential BMPs to satisfy Permit requirements.
* Case by case for use in San Fernando Valley Watershed.

X – Select one or more applicable treatment control BMPs from this list to satisfy mitigation conditions.
(a) Refer to Appendix G for detailed information and design standards to be used for treatment control BMPs.
(b) Plumbing permit will be required for BMPs such as grease traps, sump pumps, and clarifiers

**Table 3-4
EXAMPLE MAINTENANCE REQUIREMENTS OF SELECTED BMPs**

BMP	Maintenance
Wet Detention Basins/Ponds	Inspect after the first rain event during the first few months after construction, and annually thereafter. Inspect, clean, and remove litter and floating materials after each rain event. Provide supplement water supply during dry season. Inspect condition of aquatic life, if any.
Vegetated Swales and Strips	Trim vegetation regularly to avoid woody growth and increase of vegetation density. Excessive vegetation may hinder infiltration.
Dry Ponds	Inspect regularly during rain season and remove trash, litter, debris, and other solid materials that hinder infiltration. Re-vegetate any eroded areas.
Infiltration Trenches	Inspect infiltration trench surface if evidence of clogging exists. Clear and remove litter and debris from the trench surface after each rain event. If an observation well is installed, measure groundwater depth before and after rain season.
Catch Basin Inserts	Inspect before rain season starts, remove trash and debris, inspect filter media and replace before start of rain season or as necessary. Service or replace defective system parts. Inspect after the first rain event and perform similar steps as above. After rain season, remove trash, debris, or oil accumulation from the insert manifold.
Media Filtration	Replace filter media/material at the beginning of rain season or as necessary when saturated with pollutants.
Pervious Pavement	Prevent soil from being washed onto pavement and keep landscape areas well maintained Inspect pavement at least twice per year. Inspect outlets annually. Vacuum/Pressure wash clogged surfaces.
Continuous Separation Systems	Inspect system for clogging before rain season starts and remove trash, debris, and other solids. Service or replace defective system parts. Inspect after the first rain event and perform similar steps as above. After rain season, remove trash, debris, or oil accumulation from the system.

BMP – best management practices

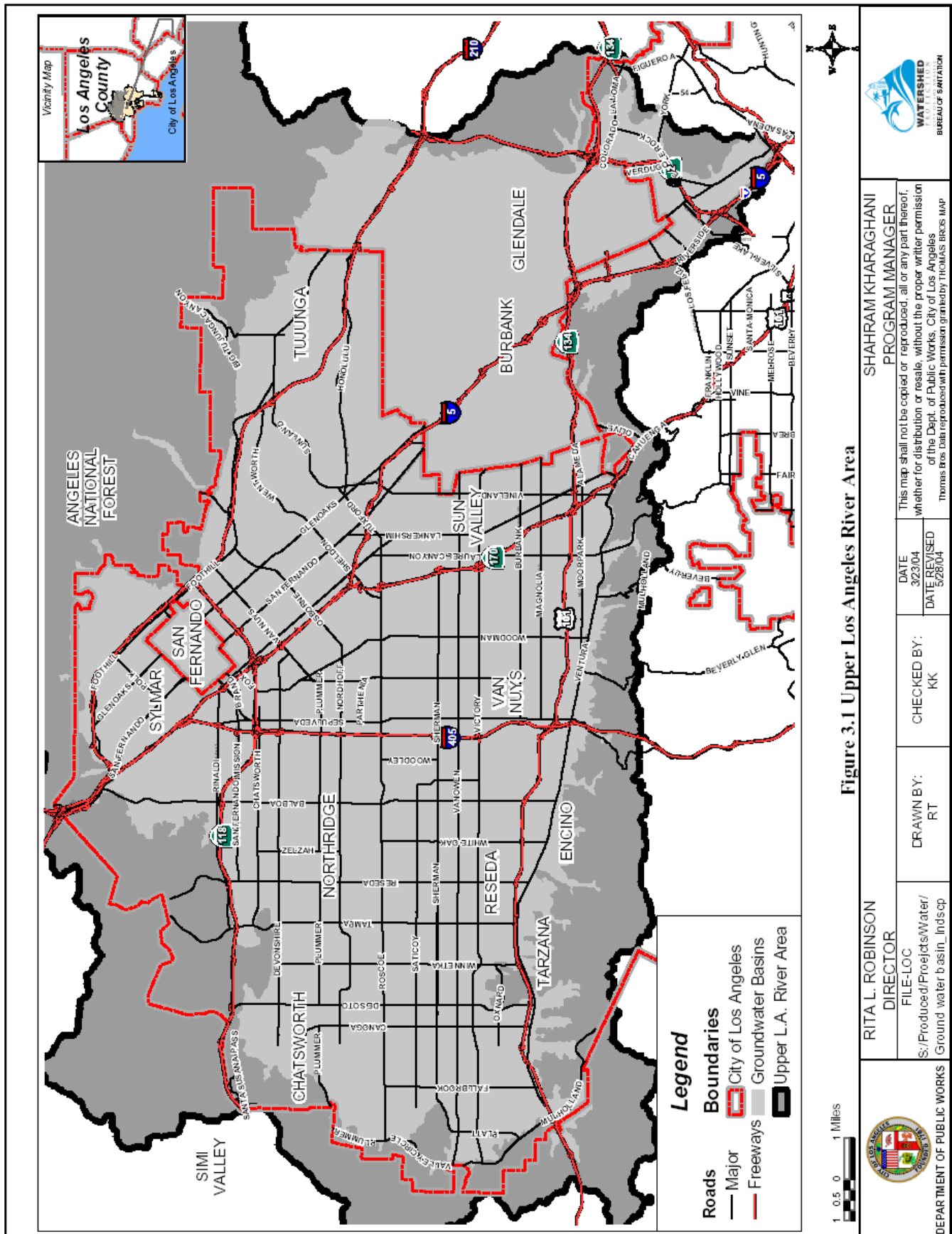


Figure 3.1 Upper Los Angeles River Area

 BUREAU OF SANITATION			
RITA L. ROBINSON DIRECTOR FILE-LOC S:/Produce/Projects/Water/ Ground water basin_incls.cpl	SHAHRAM KHARAGHANI PROGRAM MANAGER This map shall not be copied or reproduced, all or any part thereof, whether for distribution or resale, without the proper written permission of the Dept. of Public Works, City of Los Angeles Thomas Bros. Data reproduced with permission granted by THOMAS BROS. MAP	DATE 3/23/04 DATE REVISED 5/28/04	CHECKED BY: KK DRAWN BY: RT
 DEPARTMENT OF PUBLIC WORKS			

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