EXHIBIT "16"

Financial and Economic Impacts of Storm Water Treatment Los Angeles County NPDES Permit Area

Prepared to:

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SECTION 1
EXECUTIVE SUMMARY

This report evaluates the potential financial and economic impacts of implementing an enhanced storm water treatment program in the Los Angeles National Pollutant Discharge Elimination System (NPDES) Permit area as part of the Caltrans District 7 Storm Water Facilities Retrofit Evaluation. The full storm water treatment system would require about $53.6 billion in capital improvement costs which includes land and $198.9 million in annual operations and maintenance costs. Land requirements for the estimated 480 treatment facilities would total about 13,950 acres. The evaluation methodology applies the EPA Municipal Screener approach and other selected economic indicators.

1.1 Preliminary Municipal Screener Impacts

The EPA publication, Economic Guidance for Water Standards Workbook, describes a methodology for measuring economic impacts. One test in the described methodology is called the Preliminary Municipal Screener. According to the Workbook:

> "This guidance is presented to assist States and applicants in understanding the economic factors that may be considered, and the types of tests that can be used to determine if a designated use cannot be attained, if a variance can be granted, or if degradation of high-quality water is warranted. To remove a designated use or obtain a variance, the State or discharger must demonstrate that attaining the designated use would result in substantial and widespread economic and social impacts."

The Municipal Screener test indicates whether a public entity will *not* incur any substantial economic impacts from the proposed pollution control program. This Screener is the estimated Total Annual Pollution Control Cost per Household as a percent of Median Household Income in the community deemed "affordable" by the United States Environmental Protection Agency (EPA). The test specifies that local pollution control costs between 1 percent and 2 percent of median household income constitute "Mid-Range" impacts and greater than 2 percent constitute "Large" impacts. The estimated cost for existing pollution controls plus the full storm water system is about $1,295 per household annually which results in impacts over 2 percent of median household income, therefore; this is judged to create a substantial economic impact. This total cost is comprised of the annual existing non-storm water pollution control cost of $554 per household plus the annual average storm water cost estimate of $741 per household.

1.2 Secondary Municipal Screener Impacts

The EPA standards workbook also specifies that a secondary test must be done if the Municipal Screener is not clearly less than 1 percent of median household income. The secondary test is intended to characterize the community's ability to obtain financing and to indicate the socioeconomic health of the community. As applied to the Los Angeles area, this test generates a score that is within EPA's Mid-Range level of economic impacts.

The Secondary Test utilizes five indicators to form a composite assessment of the community's economic health and the financial impact of the pollution control project. Besides providing guidance on how to calculate each indicator, the Workbook supplies criteria for scoring each as 1-weak, 2-mid-

range or 3-strong. For each of the five indicators the community is rated as weak, mid-range, or strong, based on various thresholds that apply to specific indicators. For example, overall net debt is used as an indicator of a community's ability to meet debt obligations and its capacity to finance infrastructure. For example, if the Overall Net Debt Per Capita is greater than $3,000, the community would have less capacity to fund additional infrastructure and would therefore be rated weak with a rating of 1. However, if the debt per capita is less than $1,000 it would be considered strong and assigned a rating of 3. The indicators are then averaged to derive the Secondary Score.

The results from the Preliminary Municipal Screener and the Secondary Screener are measured jointly to determine whether the community would be expected to incur substantial impacts due to the proposed pollution control project. As shown on Table 1-1, for the Los Angeles area based on the secondary screener analysis, the score falls within the 1.5 to 2.5 range. When combined with an annualized cost greater than 2 percent of median household income, the joint score results in estimated substantial impacts, according to EPA's Substantial Impacts Matrix, as indicated by the "X" in Table 1-1.

1.3 Widespread Impacts

Based on the EPA methodology and other economic indicators presented below, the economic impacts are judged to be both substantial and widespread for the full system storm water treatment costs. Other levels of treatment or funding sources may be considered to mitigate these impacts.

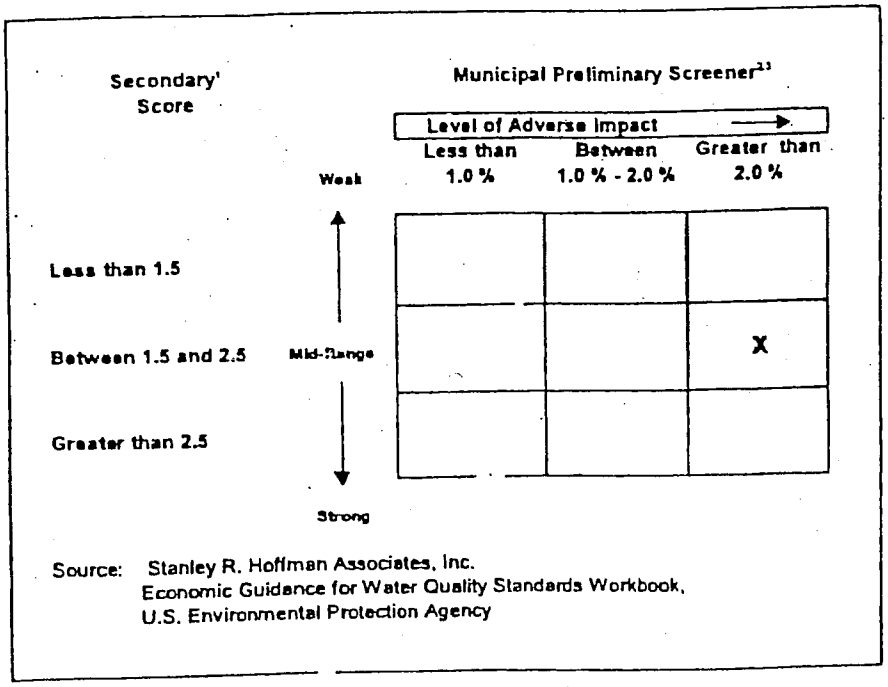
1.3.1 Property Tax Impacts

One measure of financial feasibility is the estimated impact on the property tax rate. The property tax rate for a single family unit is estimated to increase by 0.87 percentage points for the full system. When added to the median base property tax of 1.19 percent, this results in a total property tax of 2.06 percent, increasing the annual property tax bill by about 70 percent. Given the current economic climate in California, this estimated increase is clearly more than is likely to be absorbed by local single family households alone. For multi-family units, the estimated increase of 0.67 percentage points would also represent a potential sizable rental pass through.

1.3.2 Sales Tax Impacts

To compare the annualized storm water treatment costs to other economic indicators, a hypothetical increase of 6 percentage points above the present sales tax rate, to a level of about 12 percent, was estimated in lieu of increasing the property tax for the cost of full treatment. This impact is judged to be widespread and much higher than most households would consider acceptable.

Table 1-1
Financial and Economic Impacts of Storm Water Treatment
Assessment of Substantial Impacts Matrix
Los Angeles NPDES Area



Source: Stanley R. Hoffman Associates, Inc.
Economic Guidance for Water Quality Standards Workbook,
U.S. Environmental Protection Agency

1. The Secondary Score represents a weighted average based on a number of economic criteria described in the text.

2. The Municipal Preliminary Screener represents a percentage of median household income.

3. Shaded area denotes where substantial impacts are estimated to occur according to the EPA Preliminary and Secondary Municipal Screeners. The combined score for the Los Angeles NPDES area results in substantial impacts as shown in the figure by the "X."

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1.3.3 Land Requirement and Displacement Impacts

Treatment facilities for storm water runoff are land intensive. The land and land cost requirements for the full system are about 13,950 acres and 6.1 billion dollars, requiring multiple treatment plants. About 67 percent of this acreage would be required for treatment Level 1 and the rest for treatment Level 2. While marginal or vacant parcels would initially be sought, potential displacement of many households and businesses as well as relocation and land acquisition costs would be required.

1.3.4 Employment Impacts

The Los Angeles area economy has been recovering from the deep recession of the early 1990s when the total County economy lost more than 400,000 jobs. The County is currently on a recovery path. The additional costs per household and per business are likely to slow this recovery and cause some businesses to relocate or expand elsewhere. Again, while specific estimates of impacts are not made, the burden of additional costs of a substantial nature is viewed as widespread because the potential treatment plants would be distributed throughout the Los Angeles drainage areas. Since specific locations are not identified, these displacement impacts are not quantified as part of this study.

As was indicated earlier, the average household share of the financing burden would amount to about a 73 percent increase in annual property taxes. For many households, such an increase in property taxes would cause a significant reduction in their consumption and savings. Over time, landowners would also pass forward tax increases to renters as increased rents which would produce a reduction in consumption by renters. Such potentially widespread reduction in consumption among households would likely cause loss of retailing and other local serving jobs.

1.3.5 Impacts on Outstanding Local Debt

According to California Municipal Statistics, Inc., there is an estimated $11.6 billion of outstanding local public debt in Los Angeles County. The estimated cost of $53.6 billion for full storm water treatment would represent almost a fivefold increase in debt. Even the Secondary Municipal Screener level of $5.3 billion of estimated capital costs represents about 46 percent of existing unpaid local public debt.

1.4 Estimated Non-Storm Water Pollution Control Costs

According to the EPA guidelines, the Municipal Screener approach provides an estimate of what is deemed "affordable" for pollution control programs. The present study first examined the incremental financial and economic burden of storm water treatment in the Los Angeles County NPDES Permit Area. However, other public pollution control programs also require funding and must be considered in setting expenditure priorities. According to the EPA Municipal Screener, the estimated incremental cost of any new pollution control program should be added to the existing and future costs for other types of pollution control programs, such as air quality, wastewater treatment, and solid and toxic waste disposal.

In Section 10 of this report, estimates of existing and future non-storm water pollution controls are made which can be added to the incremental costs for storm water treatment by area to determine whether they exceed the 2 percent of median household income criteria prescribed by the EPA methodology. Two approaches were utilized to estimate the impacts of existing and future non-storm water pollution control costs in combination with estimated incremental storm water treatment costs: 1) analysis of estimated localized, direct costs in California; and 2) a literature review, including a 1990 comprehensive study by the EPA updated to 1998 dollars. Both methods result in estimated substantial impacts according to the EPA Municipal Screener methodology.

These additional annual pollution control costs per household were based on localized California costs of wastewater user fees, tire/oil disposal, automobile emissions testing and repairs, drinking water treatment and solid waste disposal. This amount was estimated to be about $554 annually per household for the Los Angeles area compared with $537 annually per household based on the nationwide EPA study.

1.5 Costs Limited by EPA Municipal Screeners

When the estimated amount of $703 per household at the Secondary Municipal Screener level of 1.6 percent of median household income level ($43,916), is reduced by the estimated cost of $554 for existing and future pollution controls, this results in a net amount of $149 per household for storm water treatment. If this annual amount of $149 is multiplied by the estimated 3,228,269 households in the Los Angeles County NPDES study area and is then capitalized using a 6 percent interest rate and a term of 20 years, this results in an estimated affordable capital cost of $5.3 billion. This represents about 9.9 percent of the estimated full storm water treatment cost of $53.6 billion.

SECTION 2
INTRODUCTION

2.1 Project Description and Purpose

This economic and financing analysis was prepared for the Los Angeles NPDES Permit Area as part of the Caltrans District 7 Storm Water Facilities Retrofit Evaluation. The analysis examines the economic and financial impacts that may arise for communities due to the increasing costs associated with successive levels of storm water treatment implementation. The project description and costs were defined by Brown and Caldwell. This included storm water treatment technologies designed to meet water quality standards and objectives for a one year return frequency 24 hour storm.

2.2 Project Area

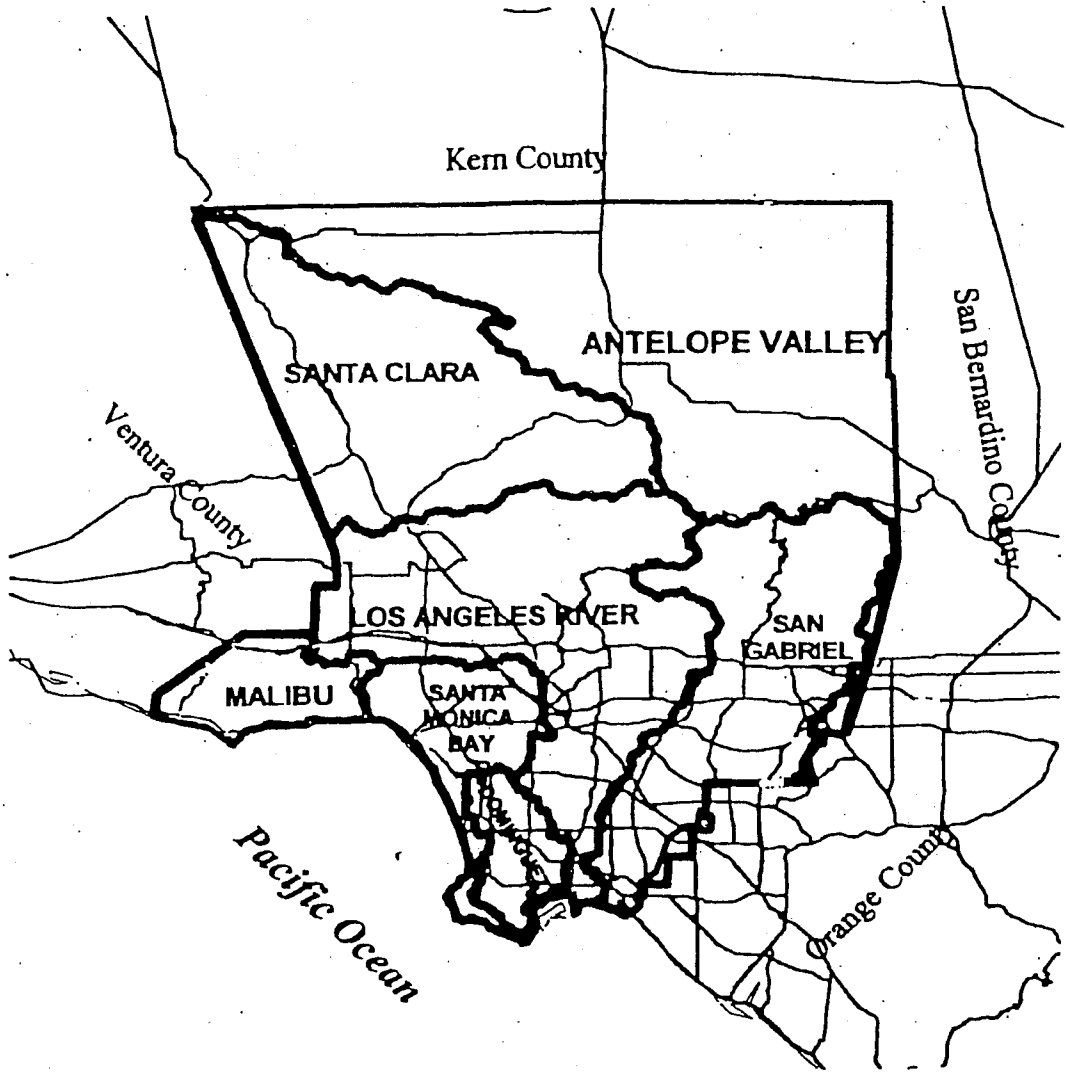
The study area was limited to the Caltrans District 7 areas that drain to the Pacific Ocean in Los Angeles County as shown on Figure 2-1. The Los Angeles NPDES Permit Area includes those areas within Los Angeles County and within the watershed defined by the Santa Susana Mountains, Simi Hills and San Gabriel Mountains. Los Angeles County areas not represented in the study include Avalon, Lancaster, Palmdale and unincorporated areas near these cities. The Los Angeles County NPDES Permit Area is divided into six drainage basins and consists of approximately 1,702,404 acres of land. A relatively small portion of the Santa Ana River Basin is aggregated with the San Gabriel River Basin. The drainage basins that cover this area include the following:

- Dominguez Channel
- Los Angeles River
- Malibu
- San Gabriel River
- Santa Clara River
- Santa Monica Bay

Land-use and acreage for this area were categorized into several classifications and formed the foundation for analysis along with basic demographic and financial data. Of the total acreage, almost 60 percent is open space, which represents the largest land use of the total NPDES area. The next most dominant land use is residential at about 22 percent. The remaining acreage covers other uses such as public, commercial and industrial.

Figure 2-1

Drainage Basins in LA County NPDES Permit Area



Stanley R. Hoffman and Associates, 1998

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2.3 Data Sources

To determine the impact on households, businesses and communities, data was analyzed based on several economic indicators. Examples of these indicators include the ability to pay as measured by the ratio of per household annualized storm water pollution costs to median household income, or the ability of local land uses to carry new debt. The following is a summary of the data sources used in preparing this analysis:

- Population, housing and employment data from the Southern California Association of Governments (SCAG), Regional Statistical Area Projections from 1994 to 2020.
- Land use acreages were provided through the SCAG Geographical Information System (GIS) Land Use database.
- City and County Summary Report of Population and Housing, Department of Finance (DOF). 1994 to 1998.
- Consumer Price Index (CPI) for Los Angeles, Anaheim, and Riverside areas, U.S. Bureau of Labor Statistics Data.
- Taxable Sales in California during 1996, California State Board of Equalization, and updated to 1998 using the CPI.
- The 1997-1998 Assessment Roll Release, Los Angeles County Assessor.

Basic demographic variables including median household income and housing value from the 1990 United States Census were updated to 1998 using the Consumer Price Index.

2.4 Organization of the Report

Sections organize the report in the following manner:

Section 3 – Environmental Protection Agency (EPA) Economic Guidelines: This section includes the project's key economic criteria based on EPA's guidelines.

Section 4 – Costs of Storm Water Retrofit: The estimated costs of storm water treatment retrofit for specified treatment levels for both capital and annual operations and maintenance cost is shown.

Section 5 – Los Angeles NPDES Permit Area Land Uses: A description of the study area land uses and their relationship to the analysis variables of population, housing and income.

Section 6 – Financing Approaches: Financing approaches to be considered are identified. Key issues include funding ability, practical means of implementation and political feasibility.

Section 7 – Financial Capacity of Local Jurisdictions: This includes the analysis of the ability of local communities to carry substantial new debt.

Section 8 – Assessment of Market Conditions: An assessment of the market conditions under which some combination of financing strategies may be implemented is presented.

Section 9 – Financial Spread of Costs: Presents the allocation of estimated capital and operations and maintenance costs of storm water retrofit among private sector land uses.

Section 10 - Estimated Non-Storm Water Pollution Control Costs: This section presents the estimated costs of other pollution control programs using two approaches. These include costs related to air quality regulations, drinking water treatment, solid waste disposal and wastewater treatment.

Section 11 – Evaluation of Financial Impacts: An evaluation of the financial impacts of implementing the costs of storm water treatment according to EPA's economic guidelines.

SECTION 3
ENVIRONMENTAL PROTECTION AGENCY (EPA) ECONOMIC GUIDELINES

The approach used to evaluate the economic impacts of the storm water runoff collection and treatment facilities under consideration is based upon the approach and methods presented by EPA's Economic Guidance for Water Quality Standards Workbook and summarized in Figure 3-1. This analysis has focused on incremental costs for existing storm water treatment for residential and non-residential land uses. The Workbook provides guidance to assist interested parties in determining whether attaining a specified water quality standard would result in "substantial and widespread economic and social impacts." The Workbook guidance "is not an exhaustive description of appropriate economic impact analyses," but it does describe "the types of information and analyses that should be considered."

The Workbook calls for a financial analysis to determine "if the capital and the operating and maintenance costs of pollution control will have a substantial impact." For public entities, the Workbook notes, "the households in the community will bear the cost either through an increase in user fees, an increase in taxes or a combination of both." Therefore, "the burden to households resulting from total annual pollution control costs must be estimated. In addition, the financial impact analysis must consider the community's ability to obtain financing and the general economic health of the community."

Demonstrating that substantial economic impacts would occur from implementing pollution control "is not sufficient reason to modify...or grant a variance from water quality standards" according to the Workbook. Rather, the analysis must also include consideration of whether or not "compliance would create widespread socioeconomic impacts on the affected community." Financial impacts are those "that could cause far reaching and serious impacts to the community." While the Workbook states that "there are no correct economic ratios or tests per se to evaluate socioeconomic impacts," it does say that each community must evaluate its own unique circumstances. The guidelines suggest the types of factors that should be considered, including changes in median household income, unemployment, and overall debt burden.

3.1 Step-by-Step Methodology

As shown on Figure 3-1, the Workbook identifies a five-step analysis to determine if the costs of a proposed project will likely result in substantial impacts.

1. Verify Project Costs and Calculate the Annual Cost of the Pollution Control[1]
2. Calculate Total Annualized Pollution Control Cost per Household
3. Calculate and Evaluate the Municipal Preliminary Screener Score
4. Apply the Secondary Test
5. Assess where the community falls in The Substantial Impacts Matrix

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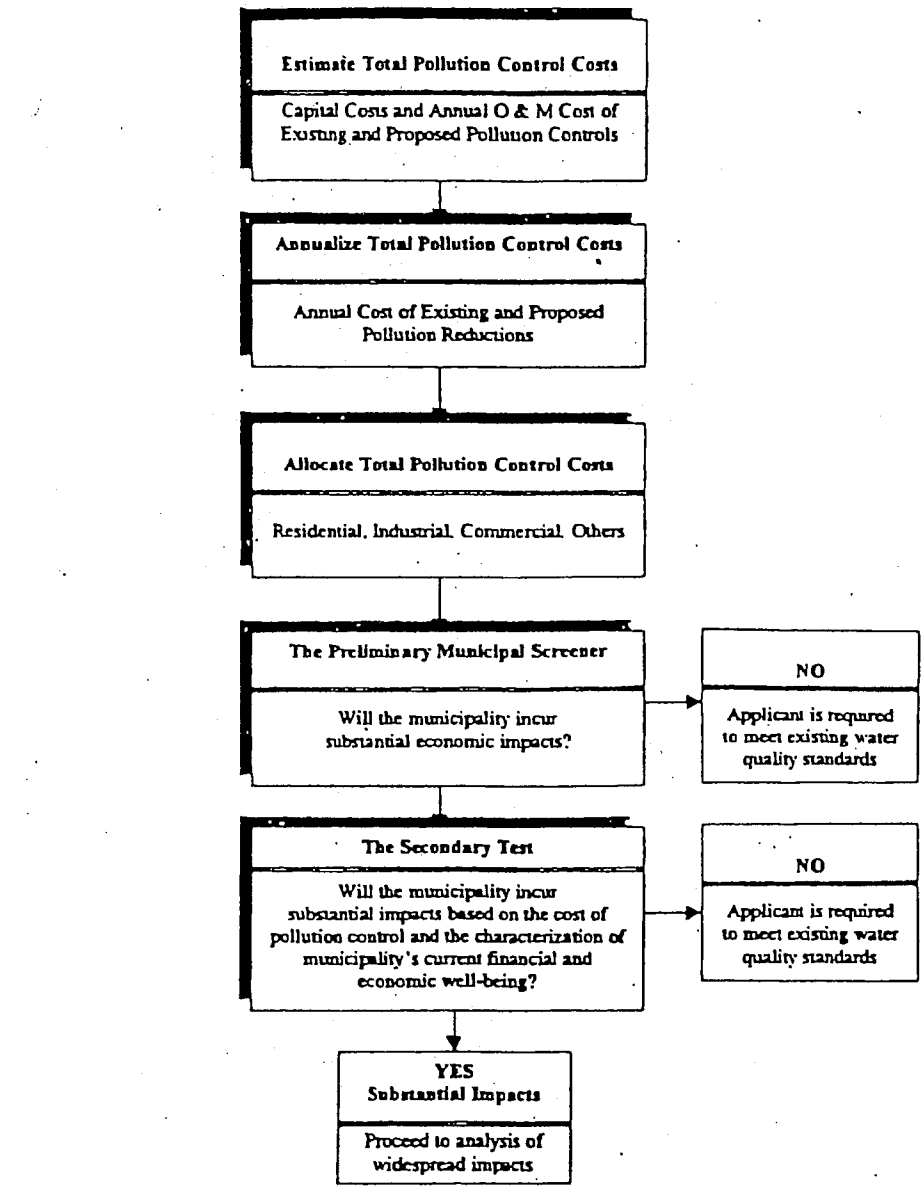
[1] The project costs were prepared by Brown and Caldwell and independently assessed by other reviewers.

Figure 3-1
EPA Economic Guidelines
Measuring Substantial Impacts (Public Entities)



Source: Stanley R. Hoffman Associates, Inc.
EPA Economic Guidance For Water Quality Standards
Note: Some text has been modified for presentation purposes.

The *Municipal Preliminary Screener* (Step 3) is the estimated Total Annual Pollution Control Cost per Household as a percent of Median Household Income in the community. The Screener indicates whether a public entity will *not* incur any substantial economic impacts because of the proposed pollution control program. The Workbook identifies less than 1% as "Little Impact," 1% to 2% as "Mid-Range Impact" and greater than 2% as Large Impact. If the Preliminary Screener results in either a Mid-Range or Large Impact, then the analysis is to proceed to the Secondary Test.

3.2 The Secondary Test

The Secondary Test includes five to six indicators:

Initial Indicators Considered	Final Indicators Used
1. Bond Rating	1. Bond Rating
2. Overall net debt as percent of full market value of taxable property	2. Overall net debt per capita
3. Unemployment	3. Unemployment
4. Median Household Income	4. Median Household Income
5. Property tax collection rate	5. Property tax collection rate
6. Property tax revenues as a percent of full market value of taxable properties	6. Not applied

In states with property tax limitations such as California, the Workbook notes that two of the indicators may not be appropriate: Indicator #2 - Overall Net Debt as Percent of Full Market Value of Taxable Property; and Indicator #6 - Property Tax Revenue as a Percent of Full Market Value of Taxable Properties. The Workbook recommends that Overall Net Debt Per Capita be used in place of Indicator #2 - Overall Net Debt as Percent of Full Market Value of Taxable Property. Also, the Workbook recommends that for states where indicator #6 has no appropriate substitute, it can be dropped and the other five factors assigned equal weight.

The final five indicators are used to form a composite assessment of the community's economic health and the financial impact of the required project. In addition to guidance on how to calculate each indicator, the Workbook provides criteria for scoring each indicator as 1-weak, 2-mid-range or 3-strong. For each of the five indicators the community is rated as weak, mid-range, or strong, based on various thresholds that apply to that specific indicator. For example, overall net debt is used as an indicator of a community's ability to meet debt obligations and its capacity to fund infrastructure. If the Overall Net Debt Per Capita is greater than $3,000, the community would be rated weak in its capacity to fund additional infrastructure and assigned a rating of 1; however, if the debt per capita is less than $1,000 it would have relatively more funding capacity and would be assigned a rating of 3. The indicators are then averaged to derive the Secondary Score.

The results from the first two tests (Preliminary Municipal Screener and Secondary Test) are regarded jointly in the Assessment of Substantial Impacts Matrix to ascertain whether the

community would be expected to incur substantial impacts due to the proposed pollution control project.

3.3 Evaluating Widespread Impacts

The final test is the consideration of *Widespread Impacts*. This test must be done even if substantial impacts are likely to be determined based on earlier tests. This analysis will include both the quantitative indicators and a discussion of potential financial and economic ramifications throughout the community.

SECTION 4
COSTS OF STORM WATER RETROFIT

A cost analysis was prepared by Brown and Caldwell to determine the cost of treating storm water runoff to meet water quality objectives for the Los Angeles NPDES Permit area. The capital costs for the designated drainage basins, as estimated by Brown and Caldwell, have been used for this analysis. These estimates are for a specified number of treatment plants per drainage basin projected to treat storm water from a design storm conforming to a one year return frequency with a duration of 24 hours. The costs have been specified and estimated for three treatment levels plus collection costs as defined below and will be assumed to be incurred in 1998, the first year. The operations and maintenance costs are ongoing costs that will be much less than the capital costs, and can typically be funded on an annual basis rather than through debt financing.

4.1 Storm Water Treatment Levels

The costs for this study have been organized into three levels of increasingly higher costs according to treatment level. Three treatment levels were defined in the Brown and Caldwell June 1998 report, Cost of Storm Water Treatment for Los Angeles County NPDES Permit Area, and were established using the water quality objectives set forth in the Los Angeles RWQCB (Regional Water Quality Control Board) Basin Plan. As stated in this report, the division points between treatment levels are basically the ability to remove sediment and trash; the ability to remove or kill bacteria; and the ability to remove metals. In addition to the three levels described below, there is a cost component of additional collection piping and distribution, which allows collection for treatment before the water runoff enters the major water courses. The three treatment levels include:

Level 1: Detention and Screening
This is the most commonly used storm water treatment technology and is used to remove floating debris and settle solids picked up by storm water. Level 1 is a conventional storm water treatment technology and represents a treatment technology that could be implemented for a large drainage area. The level 1 detention facilities were sized to capture the design storm and hold it for twenty-four to seventy-two hours to allow the solids to settle and clarify the water. Level 1 will decrease pollutant concentrations but cannot meet all the objectives for beneficial use.

Level 2: Filtration and Disinfection
This cost level is cumulative with the preceding level, adding filtration and disinfection costs to level 1 costs of detention and screening facilities. Storm water runoff often contains coliform, which are bacterial indicator organisms used to determine sanitary conditions. The levels of coliform in urban storm water will generally cause the receiving water to exceed levels considered safe for recreational contact. Most waters in California are designated to have a recreational beneficial use and the coliform objective linked to the beneficial use will be exceeded by inflow of storm water. Filtration and disinfection will kill bacterial organisms and allow the objectives for the recreational beneficial use to be met. High rate filtration and chlorination were added to the discharge from the detention basins in level 1. Dechlorination was also provided to protect organisms in the receiving water from the toxicity of any residual chlorination. The flow through treatment units have been designed to treat the captured storm water over a seventy-two hour period following the storm. Level 2 will allow storm water to meet the requirements for the recreational beneficial uses.

Level 3: Advanced Treatment

This level of advanced treatment adds a highly sophisticated treatment process to remove very small concentrations of toxic materials that are often found in urban runoff. Many of the waters in California are designated as potential drinking water sources. The objectives for the beneficial use designation of municipal water supply may require advanced treatment. Even more restrictive than the drinking water standards, are the standards for toxicity as it relates to sensitive species that could potentially exist in the receiving waters. Most waters have beneficial use designations that describe the aquatic environment and have objectives to protect these beneficial uses. Meeting these objectives with structural treatment units will require advanced treatment beyond what is normally expected of water treatment facilities. Reverse osmosis is included as the typical technology representing advanced toxic removal to achieve the required low concentrations. Storm water treated to level 3 is free of almost all pollutants and is suitable for all beneficial uses.

4.2 Capital Costs

The capital costs represent the costs of land and facilities. The costs of the facilities were developed from representative designs then scaled up for the individual watersheds and are based on flow rates. The number of treatment plants required is estimated at 480. For the purposes of this analysis, construction and land purchase is assumed to take place at the beginning of the project in the first year and the annualized cost is assumed to stay constant over the life of the project.

Table 4-1 shows the estimated 1998 total capital costs of $53.6 billion. As indicated, the total capital costs include $12.5 billion in collection of flow costs, which are 23 percent of the total costs. The largest share of the cost is for treatment level 2 at $20.5 billion, or 38 percent of the total.

4.3 Operations & Maintenance Costs

Operations and Maintenance costs include those costs required to operate and maintain the facilities on an annual basis. These include labor, routine materials and supplies, electric power and chemical costs for storm water treatment. Labor costs for operating the facilities are based on crews going to the treatment sites for 12 hours during each storm. Table 4-1 indicates that the annual operations and maintenance costs increase with each treatment level to an annual total of $198.9 million. The largest amount is for treatment level 3 at $82.2 million per year or 41 percent of the total.

Table 4-1
1998 Estimated Capital and Annual Operations and Maintenance Costs
Financing and Economic Impacts of Storm Water Treatment
Los Angeles County NPDES Permit Area

Treatment Level	Capital Costs (in millions of $)	% to Total Capital Costs	Annual O & M Costs (in millions of $)	% to Total O & M Costs
Collection of Flows	$12,486	23%	10.4	5%
Level 1	20,453	38%	57.1	29%
Level 2	6,150	11%	49.1	25%
Level 3	14,516	27%	82.2	41%
	$53,605	100%	198.9	100%

Source: Stanley R. Hoffman Associates, Inc.
Brown and Caldwell

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4.4 Land Requirements and Cost

Land cost requirements for 480 treatment units are estimated at $6.1 billion as shown in Table 4-2. This represents a total of 13,950 acres, split over treatment levels 1 and 2 at 67 percent and 33 percent respectively. Land costs for properties that might accommodate treatment facilities were estimated at an average of $435,600 per acre based on discussion with appraiser, John J. Bihary, Jr.

Table 4-2
Land Acreage and Land Cost Requirements:
Financing and Economic Impacts of Storm Water Treatment
Los Angeles County NPDES Permit Area

	Level 1	Level 2	Total
Land Requried (Acres)			
Los Angeles NPDES Permit Area	9,300	4,650	13,950
Land Cost @ $435,600/acre			
Los Angeles NPDES Permit Area	$4,051,080,000	$2,025,540,000	$6,076,620,000
Percentage by Level	67%	33%	100%

Note: Land costs for properties that might accommodate treatment facilities were estimated at an average of $435,600 per acre based on discussion with appraiser John J. Bihary, Jr.

Source: Stanley R. Hoffman Associates, Inc.
Brown and Caldwell

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SECTION 5
LOS ANGELES COUNTY NPDES PERMIT AREA: LAND USES

The land use classification used for this analysis was taken from the Southern California Association of Governments' (SCAG) 1994 land use classifications as shown on Table 5-1.

- Single family residential, including mobile homes
- Multi-family residential
- Commercial areas, including wholesale and retail trade and general services
- Public uses, including public facilities, educational, military, and transportation
- Light and heavy industrial uses
- Other urban areas not included under other categories
- Open spaces including parks and undeveloped lands
- Unknown, including acreage not elsewhere categorized and vacant land

5.1 Land Use Classification

The land use acreage breakdown from SCAG's Geographic Information System (GIS) database utilizes the following land-use classifications. The residential category includes single family, multi-family, mobile homes and trailer parks and mixed residential. Mixed residential refers to an area in which there are both single and multi-family uses but where no single use predominates. The commercial category includes general office use, retail stores and commercial services and mixed commercial and industrial. The public category includes public facilities, educational institutions, military and transportation uses. Light industrial includes manufacturing, assembly and industrial services but not manufacturing which consists of processing raw materials or discharging industrial waste products. The other urban category involves railroads, truck terminals, communication facilities, mixed urban uses and areas under construction. The Open space category consists of local and regional parks, golf courses, cemeteries, gardens and arboreta and other open space and recreation. The miscellaneous category entails unknown land use, which is acreage that cannot be classified elsewhere and vacant land. Agricultural land use and water, except beaches and harbor and marina facilities, were not included.

5.2 Design Flow

The design flow is the millions of gallons of runoff that would be generated by a representative design storm: a Los Angeles area rainstorm conforming to a one year return frequency with a duration of 24 hours. The runoff was developed by a coefficient of runoff that estimates the percentage of precipitation in the design storm that will become runoff based on the land use of the area and the imperviousness associated with that type of land use. Impervious areas are those areas where rainfall cannot be absorbed and thus surface runoff occurs. In areas of high urbanization, there are more areas such as roof surfaces on structures and paved surfaces that do not allow infiltration of storm water as compared to undeveloped open spaces. The imperviousness for each type of land use was based on the values reported by the Santa Monica Bay Restoration Project Report.

As shown in Table 5-1, residential use accounts for only 25.6 percent of the total land area but 33.6 percent of the total runoff. In contrast, open space accounts for 59.3 percent of total land uses but

Table 5-1
Land Uses and Design Flow
Financing and Economic Impacts of Storm Water Treatment
Los Angeles County NPDES Permit Area

Drainage Basin	Total Acres	Percent of Total Acres	Design Flow (mg)[1]	Percent of Design Flow
Single Family	378,494	22.2%	6,018	27.8%
Multi-Family	57,619	3.4%	1,192	5.5%
Commercial	59,427	3.5%	1,486	6.9%
Public	90,892	5.3%	2,079	9.6%
Industrial	75,391	4.4%	1,869	8.6%
Other Urban	18,618	1.1%	426	2.0%
Open	1,010,244	59.3%	8,514	39.3%
Miscellaneous	11,719	0.7%	99	0.5%
Total	1,702,404	100%	21,683	100%

[1] (mg): millions of gallons

Source: Stanley R. Hoffman Associates, Inc.
Brown and Caldwell

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only 39.3 percent of the total runoff flows. This illustrates the relationship of imperviousness to urbanization described above. Runoff is critical in determining costs because of the size of the facilities required to capture and treat storm water, and the concentrations of constituents of concern in the water. The Santa Monica Bay Restoration Project Report indicated that significant concentrations are coming from residential areas.

5.3 Variables for Land Use Analysis

The purpose of this study is to determine the potential economic and financial impact on entities within the Los Angeles Area NPDES Permit area because of storm water retrofit costs. The above discussion of land use and runoff indicates that a highly urbanized area will generate more runoff and a higher concentration of potential constituents of concern than less urbanized areas. Therefore, the costs for storm water management will be higher for communities in these areas. To determine the potential impact over various land uses, the following data was utilized:

- Population, housing, and employment statistics from the Southern California Association of Governments (SCAG)
- Household annual median and average income projections based on U.S. Census data, updated using the Consumer Price Index (CPI)
- Single and multi-family housing units and current population estimates from the California Department of Finance (DOF) to determine density and persons per household ratios

5.3.1 Population, Housing and Employment

The 1994–1998 population, housing, and employment data from SCAG were tabulated for all the census tracts within the designated drainage areas as shown on Table 5-2. An estimate for 1998 was made based on the predicted average annual change from 1994 to 2000. The 1998 total population for the drainage basins of about 9.3 million is 97 percent of the total Los Angeles County population estimate of 9.6 million for 1998 based on DOF and is projected to increase annually at an average of about 1 percent from 1998 to 2020.

5.3.2 Household Income

Estimates for 1998 for median household income were made based on 1990 United States Census data obtained from the 1989 survey, and updated using the 1989 to 1998 change in the CPI of 26.0 percent as shown on Table 5-3. Household income is used as an indicator with the EPA Municipal Screener described earlier in Section 3 to determine storm water facilities retrofit costs for single family and other land uses. The estimated 1998 median income for Los Angeles County is $43,916.

Table 5-2
Population, Housing, and Employment Estimates: SCAG 1994
Financing and Economic Impacts of Storm Water Treatment
Los Angeles County NPDES Permit Area

Basin/Area	1994	1998	2000	2010	2015	2020	1998 to 2020 Numerical Change	1998 to 2020 Percent Change	1998 to 2020 Average Annual Change
Population									
Dominguez	463,471	480,066	488,585	507,821	520,829	536,254	56,188	11.7%	0.5%
LA River	5,648,189	5,835,830	5,931,976	6,484,652	6,844,356	7,241,690	1,405,859	24.1%	1.0%
Malibu	73,433	77,607	79,782	92,349	98,087	105,865	28,258	36.4%	1.4%
San Gabriel	1,807,417	1,877,491	1,913,541	2,038,014	2,111,267	2,206,523	329,031	17.5%	0.7%
Santa Clara	163,411	203,921	227,800	355,558	425,876	508,649	304,728	149.4%	4.2%
Santa Monica Bay	777,445	784,835	788,556	798,228	804,657	811,703	26,868	3.4%	0.2%
Total	8,933,366	9,259,760	9,430,239	10,276,622	10,805,071	11,410,683	2,150,933	23.2%	1.0%
Households									
Dominguez	163,898	165,311	166,022	173,961	178,550	186,052	20,741	12.5%	0.5%
LA River	1,830,537	1,844,185	1,851,047	2,029,715	2,136,038	2,299,713	455,528	24.7%	1.0%
Malibu	27,063	27,225	27,306	31,742	34,236	37,512	10,287	37.8%	1.5%
San Gabriel	558,897	563,438	566,723	599,800	621,527	660,322	96,883	17.2%	0.7%
Santa Clara	62,279	66,650	68,971	97,105	126,301	160,606	93,956	165.9%	4.5%
Santa Monica Bay	570,266	571,461	572,059	578,772	582,798	588,494	17,033	3.0%	0.1%
Total	3,202,940	3,228,269	3,241,127	3,511,095	3,678,450	3,922,698	694,429	21.5%	0.9%
Employment									
Dominguez	302,572	319,728	328,667	365,853	382,749	403,893	84,165	26.3%	1.1%
LA River	2,465,071	2,612,887	2,690,087	3,018,081	3,140,993	3,276,112	663,224	25.4%	1.0%
Malibu	34,894	41,554	45,346	50,003	52,371	54,937	13,383	32.2%	1.3%
San Gabriel	611,803	655,842	679,037	807,746	855,785	899,348	243,505	37.1%	1.4%
Santa Clara	53,398	65,018	71,744	103,185	125,256	146,877	81,859	125.9%	3.8%
Santa Monica Bay	700,022	708,656	713,013	746,530	761,289	780,819	72,163	10.2%	0.4%
Total	4,167,760	4,403,684	4,527,893	5,091,398	5,318,442	5,561,985	1,158,301	26.3%	1.1%

Source: Stanley R. Hoffman Associates, Inc.
Southern California Association of Governments, Regional Statistical Area Projections, 1994.

Table 5-3
1998 Estimated Median and Mean Household Income
Financing and Economic Impacts of Storm Water Treatment
Los Angeles County NPDES Permit Area

Jurisdiction	1998 Estimated Households	1989 Median HH Income	1998 Est. Median HH Income[1]	Estimated Total Household Income Based on Median
Los Angeles NPDES Permit Area	3,228,269	$34,965	$43,916	$141,772,790,536

1. 1998 median household income projected based on CPI inflation factor from 1989-1998: 1.26

Sources: Stanley R. Hoffman Associates, Inc.
United States Census 1990
Consumer Price Index, 1989 - 1998 Inflation Factor

1989 - 1998 CPI Inflation Factor: 1.26

2. Ratio of Median/Average Household Income: 0.740
(Based on Countywide Median Income)

Southern California Association of Governments, Regional Statistical Area Projections, 1994

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5.3.3Density

The 1994 land uses from the GIS data base and the 1994 housing units from the Department of Finance were used to determine density as to housing units per acre for single family and multi-family housing units as shown in Table 5-4. The Los Angeles River and Santa Monica Bay basins show the highest overall density at 8.35 and 9.30 units per acre. The Malibu basin has the lowest density at 2.71 units per acre. As shown in Table 5-4, the Los Angeles River and Santa Monica basins have the highest single and multi-family densities.

Table 5-4
Density by Drainage Basin: 1994
Financing and Economic Impacts of Storm Water Treatment
Los Angeles County NPDES Permit Area

Basin	Housing Units: Single Family	Housing Units: Multi Family	Housing Units: Total	Population	Persons Per Housing Unit	Single Family Acres	SF Units Per Acre	Multi Family MF Acres	MF Units Per Acre	Total Acres	Total Units per Acre
Dominguez	106,393	61,131	167,524	463,471	2.77	27,567.74	3.86	5,554.15	11.01	33,121.88	5.06
LA River	868,583	771,061	1,639,644	5,648,189	3.44	171,130.61	5.08	25,161.62	30.64	196,292.23	8.35
Malibu	23,029	4,657	27,686	73,433	2.65	9,659.32	2.38	556.34	8.37	10,215.66	2.71
San Gabriel	429,288	164,364	593,652	1,807,417	3.04	91,923.24	4.67	8,658.99	18.98	100,582.22	5.90
Santa Clara	45,306	14,686	59,992	163,411	2.72	18,259.89	2.48	1,341.79	10.95	19,601.67	3.06
Santa Monica Bay	299,055	366,520	665,575	777,445	1.17	55,721.53	5.37	15,820.51	23.17	71,542.04	9.30
Total	1,771,654	1,382,419	3,154,073	8,933,368	2.83	374,262.32	4.73	57,093.39	24.21	431,355.70	7.31

Source: Stanley R. Hoffman Associates, Inc.
Dept. of Finance: Official State Estimates of Pop. and Housing May 1994
Southern California Association of Governments Population Estimates 1994

SECTION 6
FINANCING APPROACHES

This section provides a brief overview of various sources and methods for financing the construction, operation and maintenance of the major storm water treatment facilities that would be required to meet water quality standards. While no financing strategy is recommended at this time, there is a range of financing approaches used in California. Typically, in California more than one financing approach is utilized for major projects, including a combination of local and outside sources.

6.1 Federal

The Federal government historically has played a leading role in financing various environmental enhancement programs. A Federal program to pay for all or a significant part of the costs of storm water runoff treatment facilities is currently not available nor expected in the near future. Currently, national attention is on balancing the Federal budget and on maintaining the long-term soundness of Social Security and Medicare, not on major new grant programs.

6.2 State

At the State level of government, a possible approach for financing part of the capital costs of storm water treatment would be through some form of State grants program or allocation of some state's current surplus after existing funding priorities have been completed. Such a grant program would require state legislative action and statewide voter approval since it would likely involve the issuance of general obligation bonds by the State. The State policy as established, both from the Department of Finance and the State Treasurer, is to keep the general fund debt ratio below 6 percent. In other words, the prudent maximum annual cost of servicing debt from the General Fund is by policy established at 6 percent.

Even if approved by the voters, it would be very unlikely to fund any sizable level of statewide storm water treatment costs. The State Department of Finance estimates that as of January 1, 1998, the total capacity for new general obligation bonds issuance over the next 10 years is $40 billion statewide. The $40 billion estimate does not include new bond measures taken to voters in 1998. For example, the November 1998 election ballot included a $9.2 billion school finance measure, which is the largest statewide General Obligation bond measure ever approved by California voters.

6.3 Local

The ability of local governments in California to finance public improvements has been increasingly circumscribed over the last 20 years. In June 1978, the voters of California amended the state constitution to limit the ability of local governments to impose property taxes. That amendment, commonly known as Proposition 13, added Article XIIIA to the state constitution that limits the maximum ad valorem tax on real property to one percent of the assessed value of that property. Proposition 13 also limited annual assessed value increases to 2 percent or the inflation rate, whichever is smaller, until a property is sold. Since the passage of Proposition 13, more than dozen other statewide propositions have been passed that further restrict how local revenues can be raised

or spent. In 1979, the voters passed Proposition 4, known as the Gann Initiative, which added Article XIIIB to the state constitution. This article limits the permitted growth in the rate of local government spending from general revenues to changes in population and inflation growth rates. Voter approval is required to increase spending limits. This vote must be reaffirmed every four years.

Proposition 46 in 1986 allowed local governments by a 2/3 majority vote to impose a property tax above the Proposition 13 one percent for the period required to finance new general obligation bonds. The proposition also restricted the use of general obligation bond proceeds to the purchase or improvement of real property.

While many other measures were passed during the late 1980's and early 1990's, the measure that has had the most widespread impact since Propositions 13 and 4, was passed in 1996 as Proposition 218. This measure adds Articles XIIIC and XIIID to the state constitution. The measure does the following:

1. Limits authority of local governments to impose taxes and property-related assessments, fees and charges. It requires that a majority of voters approve increases in general taxes and reiterates that two-thirds must approve a special tax.
2. Requires that assessments, fees, and charges must be submitted to property owners for approval or rejection, after notice and public hearing.
3. Limits the amount of an assessment on a property to the "special benefit" conferred on the property.
4. Limits fees and charges to the cost of providing the service and establishes that such fees and charges may not be imposed for general governmental services that are generally available to the public.

Within the restrictive context described above, the following are some financing mechanisms used by local governments to finance various public improvements in California:

- Community Facilities Districts
- Special Benefit Assessments
- General Obligation Bonds
- Local Option Sales Tax
- Fees and Charges
- Certificates of Participation, with lease payments from the General Fund
- Development impact fees
- Redevelopment Tax Increment Financing

Community Facility Districts. The Mello-Roos Community Facilities Act permits various local governments to establish a Community Facilities District to finance new facilities and/or to pay for operations and maintenance through the levying of a special tax. This Act plus Proposition 218 discussed earlier requires a two-thirds vote for approving the special tax in inhabited areas.

Special Benefit Assessments. Benefit assessments can be levied on real property by cities, counties and special districts to acquire, construct, operate and maintain public improvements that convey an

identifiable special benefit to the defined properties. As was discussed earlier, Proposition 218 establishes a strict requirement for formal landowner approval before such assessments can be put in place.

General Obligation Bonds (G.O. bonds). Cities, counties and certain other local government entities may issue G.O. Bonds to finance specific projects. Debt service for G.O. bonds is provided by an earmarked property tax above the one percent general property tax mandated by Proposition 13 (often called a "property tax override"). These overrides typically show up on the annual tax bill as "voted indebtedness." The proceeds from G.O. bonds can be used to finance the acquisition, construction and improvement of real property, but cannot be used to pay for equipment, supplies, operations or maintenance costs.

Local Option Sales Tax. Twenty-one counties impose a sales and use tax added onto the basic 6 percent rate. Los Angeles County imposes a sales tax of 8.25 percent. The local share of the basic sales tax is one percent. Local option sales taxes have been used for public safety, traffic, hospitals, education, earthquake recovery and other purposes. If such taxes are earmarked for a specific purpose or if a special district levies them, then they are deemed Special Taxes under Proposition 218 and require a two-thirds voter approval.

Fees and Charges. Local governments can levy various fees and charges to recover the cost of providing services. Under Proposition 218, many of these fees and charges that are "incident to property" are now also subject to landowner approval.

Certificates of Participation (COPs). A COP is a form of lease purchase agreement that does not constitute indebtedness under the state constitution and does not require voter or landowner approval. The lease payments typically are made from the local government's general fund.

Development Impact Fees. These are fees charged to new development to pay for facilities required to serve the new development. State law, and Federal case law, establishes a rigorous set of tests that such fees must meet to be valid. In short, these fees can only be used to pay for those facilities or portions of facilities required to serve new development. They cannot be used to correct existing problems or cure existing capital or operating and maintenance deficiencies.

Redevelopment Tax Increment Financing. A city or county can establish a redevelopment agency to undertake the revitalization of an area that it finds to be "blighted." The redevelopment agency may incur indebtedness to finance improvements needed to accomplish the goals of its redevelopment plan. The property tax base in the redevelopment area is "frozen," and increments in property taxes after the tax base is frozen go into the redevelopment fund to be used for the financing of improvements. Voter approval is not required for tax increment financing. Such financing may be used only for facilities to support the needs of redevelopment. Further, it usually takes many years before significant property tax increment, derived from new development, is available for financing.

6.4 Funding Assumptions

For purposes of this analysis, it was assumed that the financing would be based on the issuance of bonds with a 20-year life as suggested in the EPA Workbook. The tax-exempt interest rate for such

bonds was assumed to be 6 percent. Based on municipal bond rates over the past 10 to 20 years provided by the California Debt Advisory Commission, this is judged to be a reasonable rate for planning purposes. Funding costs of such bonds were assumed to be 12.5 percent of the total issue amount. Funding costs include the cost of debt issuance, underwriters discount, reserve fund and other related costs. These assumptions allow the total capital costs to be annualized and combined with the annual operations and maintenance costs.

SECTION 7
FINANCIAL CAPACITY OF LOCAL JURISDICTIONS

7.1 Overall Net Debt per Capita

Financial capacity of local jurisdictions means the ability of the local community to incur additional debt to pay for public improvements and services, here storm water retrofit facilities and annual operations and maintenance. In California, after the passage of Proposition 13 in 1978 and more recently Proposition 218, significant restrictions have been placed on any increases in property taxes or property related fees and charges. Also, the revenue potential of local jurisdictions to assume additional debt has been further constrained by the effects of the recession in the early 1990s.

Net debt per capita is one indicator of financial capacity of local jurisdictions. Each community, depending upon its infrastructure needs and level of development, will have a different mix of debt instruments, such as general obligation, special assessment or Mello-Roos bonds. Also, besides each community's direct debt, there is overlapping debt from other special purpose districts such as schools, water and sewer, fire protection and flood control. In evaluating the impact of existing debt per capita and the addition of new debt on a community, the EPA has suggested the use of following ranges:

- Greater than $3,000: weak = 1
- $1,000 - $3,000: mid-range = 2
- Less than $1,000: strong = 3

The overall debt per capita estimate of $1,207 for Los Angeles County is used subsequently in the evaluation of local financial and economic impacts. This estimate is based on total outstanding and direct and overlapping debt of about $11.6 billion for Los Angeles County provided by California Municipal Statistics, Inc. This debt per capita is already within the mid-range of $1,000 to $3,000 per capita as prescribed by the EPA. When the total net debt for full treatment of $5,788 per capita ($53.6 billion divided by the study area population of 9,259,750) is added to this debt, it results in $6,995 of debt per capita. This is above the weak range limit of $3,000. The total new net debt represents a 480 percent increase over the existing net debt per capita.

7.2 Analysis of Sample Property Tax Bills

In contrast to the more global overall net debt analysis, a summary of sample local property tax bills for several single family residential units in Los Angeles NPDES area is presented on Table 7-1. Three properties from each basin are shown and the payments through the property tax bill are divided into three categories: 1) the basic 1 percent local property tax rate established by Proposition 13; 2) voter approved bonded indebtedness; and 3) direct assessments. The voter-approved portion includes City, County, MWD, Flood Control and Unified School District debt payments. The direct assessments include annual payments for many purposes, including flood control, storm water, fire/paramedics, parks, lighting maintenance, emergency 911 and mosquito abatement.

Table 7-1
1997 Summary of Sample Tax Bills for Single Family Homes
Financing and Economic Impacts of Storm Water Treatment
Los Angeles County NPDES Permit Area

Basin and Property		Assessed Value of Home	Voted Basic 1%	Voted Indebt.	Direct Assessments Flood	Direct Assessments Storm	Direct Assessments Other	Direct Assessments Total	Total Taxes	Total Taxes % of AV
Dominguez	Prop. 1	$112,731	$1,127.31	$27.84	$59.30	$0.00	$963.16	$1,022.46	$2,177.61	1.932%
	Prop. 2	516,241	5,162.41	141.42	73.95	0.00	1,043.59	1,117.54	6,421.37	1.244%
	Prop. 3	128,286	1,282.86	71.58	21.69	17.29	99.69	138.67	1,493.11	1.164%
LA River	Prop. 1	1,870,779	18,707.79	1,043.82	65.01	51.83	206.34	323.18	20,074.79	1.073%
	Prop. 2	106,259	1,062.59	59.29	62.80	50.56	113.19	226.55	1,348.43	1.269%
	Prop. 3	52,254	522.54	29.16	28.12	22.42	116.76	166.29	717.99	1.374%
Malibu	Prop. 1	5,275,000	52,750.00	1,138.40	2,732.42	0.00	1,388.96	4,121.38	58,009.78	1.100%
	Prop. 2	366,817	3,668.17	250.22	5.68	0.00	301.43	307.11	4,225.50	1.152%
	Prop. 3	304,000	3,040.00	55.20	15.19	0.00	100.63	115.82	3,211.02	1.056%
San Gabriel	Prop. 1	339,166	3,391.66	43.01	63.14	0.00	350.05	413.19	3,847.86	1.135%
	Prop. 2	235,271	2,352.71	29.83	35.42	0.00	124.79	160.21	2,542.75	1.081%
	Prop. 3	65,210	652.10	8.27	61.76	0.00	301.92	363.68	1,024.05	1.570%
Santa Clara	Prop. 1	500,947	5,009.47	362.92	56.74	0.00	568.93	625.67	5,998.06	1.197%
	Prop. 2	150,248	1,502.48	127.61	34.31	28.54	214.73	277.58	1,907.67	1.270%
	Prop. 3	78,592	785.92	66.75	53.09	44.16	219.18	316.43	1,169.10	1.488%
Santa Monica Bi	Prop. 1	950,000	9,500.00	335.81	36.77	0.00	35.38	72.15	9,907.96	1.043%
	Prop. 2	172,731	1,727.31	96.38	36.77	29.31	127.79	193.87	2,017.56	1.168%
	Prop. 3	$52,493	$524.93	$6.66	$32.84	$0.00	$131.19	$164.03	$695.62	1.325%
Median Property		$500,947	$5,009.47	$362.92	$56.74	$0.00	$568.93	$625.67	$5,998.06	1.197%

Source: Stanley R. Hoffman Associates, Inc.
Los Angeles County Assessor

The range of assessed value for these properties is broad, with a median of $500,947. The total taxes range from 1.043 percent to 1.932 percent of assessed value. Examining the median property, the total charges including the basic one-percent, voter-improved indebtedness, and direct assessments, account for about 1.197 percent of the total assessed value. A typical rule of thumb in municipal finance indicates that the upper limit for reasonable annual charges to a property should not exceed 2 percent.

7.3 EPA Municipal Preliminary Screener Approach

The U.S. Environmental Protection Agency (EPA) has prescribed a methodology, the Municipal Preliminary Screener, to establish whether a community is expected to incur "substantial" economic impacts due to the pollution control project costs. There are two tests with this Municipal Preliminary Screener to establish whether the community can clearly pay for the project without incurring any substantial impacts under the EPA guidelines. The screener is defined as follows:

$$\textit{Municipal Preliminary Screener} = \frac{\textit{Average Total Pollution Control Cost Per Household}}{\textit{Median Household Income}}$$

The EPA has established a lower threshold of below 1 percent of median household income as representing a cost that is not expected to impose a substantial economic hardship on households. A cost between 1 and 2 percent is considered a mid-range impact. If the cost is over 2 percent of median household income, then the project may create an unreasonable financial burden on many households within the community, according to the EPA methodology.

The estimates of 1, 1.5 and 2 percent of median household income are presented in Table 7-2 for the Los Angeles County area. They range from $439 per household to $878 per household annually. When this per household amount is multiplied by the estimated 3,228,269 households in the Los Angeles NPDES permit area; it generates a range of annual revenue potential of $1.4 to $2.8 billion. This revenue represents from about 29 to 58 percent of the total annualized cost for full storm water treatment.

The estimated cost for existing pollution controls plus the full storm water system is about $1,295 per household annually which results in impacts over 2 percent of median household income, therefore, this is judged to create a substantial economic impact. The total cost is comprised of the annualized average storm water cost estimate of $741 plus existing pollution control costs of $554 per household. Using the Preliminary Screener, the level of median household income required for the estimated total pollution control costs exceeds the 2 percent level indicating potentially a substantial economic hardship on households. The EPA guidelines now suggest proceeding to the Secondary Test.

Table 7-2
EPA Municipal Preliminary Screener Analysis
Financing and Economic Impacts of Storm Water Treatment
Los Angeles County NPDES Permit Area

Municipal Screener Categories[1]	Estimate
Households[2]	3,228,269
1998 Median Household Income	$43,916
1 Percent of Median HH Income	$439
1.5 Percent of Median HH Income	$659
2 Percent of Median HH Income	$878
Annual Revenue Potential @ 1 Percent	$1,417,726,614
Annual Revenue Potential @ 1.5 Percent	$2,126,589,921
Annual Revenue Potential @ 2 Percent	$2,835,453,228

1. EPA has suggested a Municipal Screener range of less than 1 percent for representing little impact, 1 to 2 percent for mid-range impact and over 2 percent for large impact.

2. Estimated households for Los Angeles NPDES Permit Area 1998.

Source: Stanley R. Hoffman Associates, Inc.
Los Angeles County Assessor

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7.4 The Secondary Test

According to the EPA, the Secondary Test builds upon the characterization of the financial burden identified in the Municipal Preliminary Screener. This test provides an indication of the community's ability to obtain financing and describes its socioeconomic health. According to the EPA Guidelines, the indicators describe precompliance debt and socioeconomic and financial management conditions in the community. In states, such as California, with statutory limits on property tax rates and where data on full market value of taxable property are not generally available, the indicator Overall Net Debt Per Capita can be substituted for other indicators that rely on full market value information. The following five indicators suggested by the EPA have been applied for the Secondary Test:

1. Debt Indicators
   - Bond Rating
   - Overall Net Debt Per Capita

2. Socioeconomic Indicators
   - Unemployment Rate
   - Median Household Income

3. Financial Management Indicators
   - Property Tax Collection Rate

The overall methodology, illustrated on Table 7-3, ranks each indicator on a scale from 1 to 3 and then calculates a simple average of the five indicators, where a score of 1 is Weak, 2 is Mid-Range and 3 is considered Strong. As shown in Table 7-3, the five indicators add to a total score of 11 and an average of 2.2 indicating that the Los Angeles NPDES Permit Area falls in the Mid-Range of the socioeconomic and financial management indicators. The Secondary Test shows a bond rating of Strong with ratings generally above BBB and a score of 3; an overall net debt per capita in the Mid-Range with a score of 2; an unemployment rate of 6.1 percent, or over 1.0 percent higher than the national rate of 4.7 percent, for a Weak ranking and a score of 1; a median household income of $43,916, which is roughly equivalent to the State median, for a mid-range ranking and a score of 2; and a generally Strong property tax collection rate for a score of 3. When this score of 2.2 is prorated across the 1 percent to 2 percent mid-range, it results in an estimated Secondary Test score of 1.6 percent and will be used later as part of the evaluation of substantial economic impacts.

Table 7-3
EPA Municipal Screener: The Secondary Test
Financing and Economic Impacts of Storm Water Treatment
Los Angeles County NPDES Permit Area

Indicator	Secondary Indicators[1]			Value	Score
	Weak	Mid-Range	Strong		
Bond Rating	Below BBB (S&P) Below Baa (Moody's)	BBB (S&P)	Above BBB (S&P) BAA (Moody's)	Above BBB	3
Overall Net Debt per Capita	Greater than $3,000	Between $1,000 & $3,000	Less than $1,000	$1,207	2
Unemployment	More than 1% above National Average	National Average (4.7%, March 1998)	More than 1%below National Average	6.1%	1
Median Household Income	More than 10% below State median	State Median ($44,640)	More than 10% above State median	$43,916	2
Property Tax Collection Rate	Less than 94%	94% - 98%	Greater than 98%	98.2%	3

Notes: 1) A Weak rating is assigned a score of 1 point; a Mid-Range rating is assigned a score of 2 points; and 3) a Strong rating is assigned a score of 3 points.

SUM	11
AVERAGE	2.2

Source: Stanley R. Hoffman Associates, Inc.
EPA Economic Guidance for Water Quality Standards Workbook

SECTION 8
ASSESSMENT OF MARKET CONDITIONS

The purpose of assessing market conditions is to determine the potential ability of the various land uses to absorb new taxes, assessments, fees or charges. Two measures used in this section for this purpose are the assessed valuation of property and the amount of taxable sales generated by a community. In addition to household income, these are both indicators of local financial strength and the ability to accommodate additional debt. Assessed value along with the property tax rate determines how much property tax revenue is generated each year. The maximum basic rate of property taxation is limited in California by Proposition 13 to 1 percent. The taxes available for financing debt exceeding the one-percent level now must be approved by a two-thirds vote of the local electorate.

8.1 Assessed Value Trends for Los Angeles County and the Los Angeles NPDES Permit Area

The recession in the early 1990s in California had a dramatic dampening effect on the rate of increase in assessed property valuation in Los Angeles County. This, in turn, constrained property tax revenues for many local jurisdictions.. Table 8-1 shows the average annual growth of assessed value from 1989 to 1998 according to the Metropolitan Water District (MWD) for areas in Southern California in their jurisdiction, including Los Angeles County. This indicates an average annual percentage change in total assessed valuation from 1989 to 1998 of 4.7 percent. This growth rate has slowed considerably since 1993.

The assessed valuation from the 1996-1997 annual Los Angeles County Tax Roll was used to analyze the local ability of jurisdictions in the Los Angeles NPDES Permit Area to finance additional costs through property tax revenues. Assessed value and market value per acre of private sector land uses were estimated for use in the analysis. Table 8-2 summarizes assessed valuation for the County with estimates ranging from about $632,900 per acre for single family units to $1.2 million per acre for commercial/industrial land.

When the total estimated assessed valuation of about $457.3 billion for all three categories is averaged over approximately 564,654 acres of residential and commercial/industrial in the Los Angeles NPDES area, this results in an estimated assessed valuation of about $809,915 per acre.

8.2 Taxable Sales Trends

Taxable sales for Los Angeles County can indicate a local jurisdiction's ability to generate additional revenues. Since the passage of Proposition 13, the sales tax has become the preferred source of local government funding for ongoing operations and maintenance. However, some local jurisdictions have traded a share of their sales tax to fund public infrastructure that has attracted revenue generating commercial land uses.

Table 8-1
Assessed Valuation Trends: Metropolitan Water District
Financing and Economic Impacts of Storm Water Treatment
Los Angeles County NPDES Permit Area

Year	Total Assessed Valuation ($000)	% Growth
1989	596,900,000	
1990	671,600,000	12.5
1991	750,900,000	11.8
1992	820,824,301	9.3
1993	865,027,289	5.4
1994	882,326,828	2.0
1995	887,860,083	0.6
1996	879,101,879	-1.0
1997	879,272,307	0.0
1998	893,911,433	1.7
Average Growth 1989-1998		4.7

Source: Stanley R. Hoffman Associates, Inc.
Moody's Investors Service, Metropolitan Water District
of Southern California
General Obligation Bond Rating, February 1998

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Table 8-2
Assessed Value for Los Angeles County NPDES Permit Area
Financing and Economic Impacts of Storm Water Treatment

	Single Family	Multi-Family	Commercial/Ind.
Assessed Value Per Acre Los Angeles County	$632,917	$1,063,242	$1,198,244
Los Angeles NPDES Area Assessed Value/Acre	$632,918	$1,063,250	$1,198,380
Total Acres	374,262	57,093	133,299
Estimated Total AV	$236,876,984,488	$60,704,111,495	$159,742,834,395
Estimated AV/Unit[1]	$133,809	$43,918	N/A

1. Units per Acre: Single Family 4.73
   Units per Acre: Multi Family 24.21

Source: Stanley R. Hoffman Associates, Inc.
Los Angeles County Assessor 1996-1997 Roll Release

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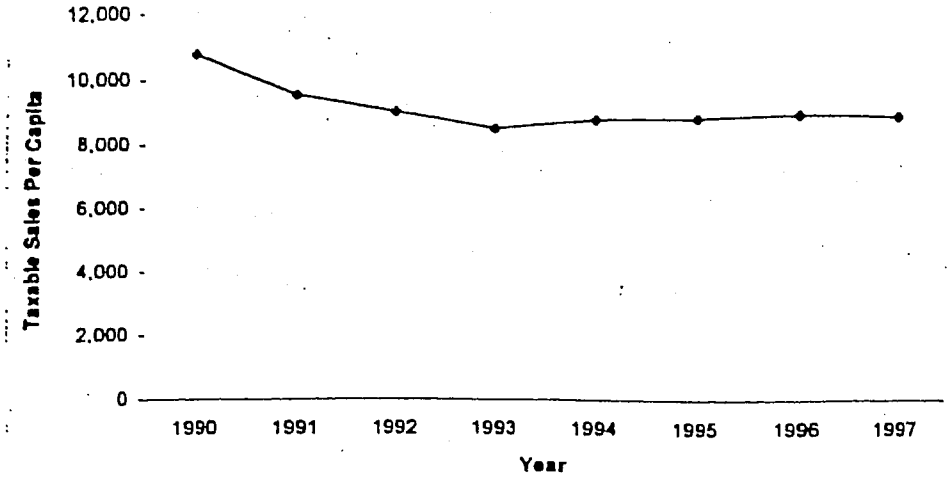
From 1990 to 1997, taxable retail sales for Los Angeles County, according to the California Board of Equalization, declined from $94.7 billion to an estimated $84.7 billion in 1998 inflation-adjusted dollars. This was a decline of approximately $10 billion in taxable sales. Per capita taxable sales are shown in Figure 8-1. The overall decline of per capita taxable sales for the 1990 to 1997 period is 17 percent, declining from $10,802 in 1990 to an estimated $8,925 in 1997. However, since 1993, real per capita taxable sales have been stable and even showed slight increases.

Estimated 1998 taxable sales for the Los Angeles NPDES Permit Area are shown in Table 8-3. The per capita range for communities in this area is quite large, with a low of $8,559 in the Los Angeles River Drainage Basin and a high of $13,336 for the Dominguez Drainage Basin. This indicates a large disparity in both locational selection of shopping and in the income levels of the population as well. The overall taxable sales per capita is $9,050 dollars for the Los Angeles County NPDES area.

Figure 8-1
LOS ANGELES COUNTY PER CAPITA TAXABLE SALES
FINANCING & ECONOMIC IMPACTS OF STORM WATER TREATMENT
(In Constant 1998 Dollars)



Source: Stanley R. Hoffman Associates, Inc.
California State Board of Equalization

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Table 8-3
1998 Estimated Taxable Sales
Financing and Economic Impacts of Storm Water Treatment
Los Angeles County NPDES Permit Area

Jurisdiction	1998 Estimated Population[1]	1998 Taxable Sales Per Capita[2]	1998 Total Estimated Taxable Sales	1998 Est. Sales Tax at 1%
Dominguez	480,066	$13,336	$6,402,371,405	$64,023,714
Los Angeles River	5,835,830	8,559	49,950,619,719	499,506,197
Malibu	77,607	9,771	758,265,402	7,582,654
San Gabriel	1,877,491	9,205	17,282,511,179	172,825,112
Santa Clarita	203,921	10,788	2,199,944,611	21,999,446
Santa Monica Bay	784,835	9,179	7,204,283,006	72,042,830
Total	9,259,750	$9,050	$83,797,995,321	$837,979,953

1. Pop. projected based on 1994 - 2000 SCAG projections
2. Consumer Price Index Factor 1996-98: 1.03

Sources: Stanley R. Hoffman Associates, Inc.
California State Board of Equalization: Taxable Sales in California 1996
Southern California Association of Governments, Regional Statistical Area Projections, 1994
Consumer Price Index: U.S. Bureau of Labor Statistics

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SECTION 9
FINANCIAL SPREAD OF COSTS

This section analyzes the potential financing of the 1998 estimated storm water treatment costs for the Los Angeles County NPDES Permit Area under the following two scenarios:

1. Full Storm Water Retrofit Treatment
   - $53.6 billion capital costs: $198.9 million annual operations and maintenance

2. Debt capacity limited by EPA Preliminary & Secondary Screeners
   - $5.3 billion capital: $20.0 million annual operations and maintenance

The first scenario presents the financing of the full system including collection costs and all three levels of treatment. The second scenario reflects the EPA Preliminary and Secondary Municipal Screeners. This combines the revenue potential based on 1.6 percent of median household income to reflect the estimated average Secondary Test screener score, as discussed in Section 7.4, reduced by estimated existing non-storm water pollution control costs of $554 per household.

The financial analysis of the first scenario spreads capital and operations and maintenance costs to both residential and non-residential land uses. The spread is based on the proportionate share of flow from each type of privately owned land use. For example, single family residential land use generates an estimated 38.2 percent of the runoff flow while the commercial and industrial categories generate an estimated 21.3 percent of the flow. The capital costs spread by land use are then annualized assuming bond interest of 6.0 percent, a term of 20 years and estimated bond issuance costs of an additional 12.5 percent above the construction costs.

These annualized capital costs are then converted to a cost per unit basis for single or multi-family land uses or to a cost per acre basis for commercial, industrial and other urban land uses. It is further estimated that the "Open" land use includes about 55 percent privately owned open space. This estimate was based on a geographic information system entitled "GOVOWNERSHIP." It shows groupings of land ownership and was originally digitized by the Forest and Rangeland Resources Assessment Program of the California Department of Forestry. The annualized capital costs are added to the annual operations and maintenance costs to estimate a total annual cost per unit or acre.

The model can analyze the financial implications of outside funding, such as from the State or Federal levels, possible sales tax subventions or redevelopment agency contributions. However, these sources of funds are considered both limited and uncertain. Currently, there are no funding programs for storm water costs of this magnitude.

The basic assumption is that successful implementation is primarily a local responsibility and will require major financial commitments from local sources. In presenting the analysis, a residential land use category has been used for illustration. Each scenario will be discussed in detail, but in summary, the estimated annual storm water treatment cost for each scenario is as follows:

	Cost Per Residential Unit	Cost Per Single Family Unit	Cost Per Per Household
Scenario 1:	$741	$1,024	$1,509
Scenario 2:	$ 73	$ 101	$ 149

9.1 Scenario 1 – Full Storm Water Retrofit Treatment

Scenario 1, Table 9-1, presents the analysis for the full treatment costs of $53.6 billion, including $12.5 billion for storm water collection costs. The annual operations and maintenance costs are $198.9 million. The spread of costs to private sector land uses is based on the distribution of storm water runoff flow from the engineering analysis prepared by Brown and Caldwell.

Using this flow analysis and the single family dwelling unit for illustration, the total allocated capital cost was estimated at $10,062 per single family unit. This was annualized to about $987 and when added to the allocated share of annual operations and maintenance costs of about $37, resulted in $1,024 per single family unit for the full system costs. Based on the average assessed value per single family unit of $117,860 this would be an estimated increase in the property tax rate of 0.87 percentage points.

When the cost of $1,024 per single family unit is weighted with the cost of $309 per multi-family unit, this results in a per residential unit cost estimate of $741. Correspondingly, the cost is $1,509 when allocated on a per household basis. This estimate represents all costs allocated to households with no spread of costs to non-residential land uses. This is for the cost of full storm water treatment before accounting for existing pollution control costs of $554 per household.

9.2 Scenario 2 – Debt Capacity Limited by EPA Secondary Municipal Screener

Scenario 2 summary analysis is presented in Table 9-1 reflecting the Preliminary and Secondary Municipal Screener. For this analysis, it is estimated that the income potential is 1.6 percent of median household income ($703) based on the Secondary Screener. When the estimated amount of $703 per household at the Secondary Municipal Screener level of 1.6 percent of median household income level ($43,916) is reduced by the estimated cost of $554 for non-storm water pollution controls, this results in a net amount of $149 per household available for storm water treatment. If this annual amount of $149 is multiplied by the estimated 3,228,269 households in the Los Angeles County NPDES Permit area and is then capitalized using a 6 percent interest rate and a term of 20 years, this results in an estimated affordable capital cost of $5.3 billion. This represents about 9.9 percent of the estimated full storm water treatment cost of $53.6 billion. On a comparative basis, this yields an estimated cost of $73 per residential unit or $101 per single family unit.

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Table 9-1
Detailed Financial Analysis
Financial and Economic Impacts of Storm Water Treatment
Los Angeles County NPDES Area

	2 single fam	3 multi-fam	4 commercial	5 public	6 industrial	7 other urban	8 open	9 misc	10 total
acres	[illegible]	57,611	33,477	90,893	75,391	18,618	1,010,744	11,719	1,707,404
percent allocated	100.00%	100.00%	100.00%	0.00%	100.00%	100.00%	35.00%	100.00%	
allocation acres	370,494	57,610	50,437	0	75,391	18,618	355,634	11,719	1,156,907
percent of total	32.77%	[illegible]	5.14%	0.00%	6.52%	1.61%	48.03%	1.01%	1
avg density du/acre	5.37	23.77	1.00	1.00	1.00	1.00	1.00	1.00	
res du/other acres	2,027,511	1,335,032	50,437	90,893	75,391	18,618	1,010,744	11,719	4,633,617
tot AV year 1987 in billions	[illegible]	[illegible]	[illegible]	0.00	[illegible]	0.00	0.00	0.00	[illegible]
impervious factor	0.42	0.60	0.92	0.8	0.91	0.8	0	0.65	
acres impervious	158,962	30,101	54,073	72,714	68,600	14,894	0	7,617	416,657
runoff factor	0.42	0.60	0.92	0.8	0.91	0.8	0	0.65	
runoff 1.4" storm mg	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
allocations flow mg	6017.93373	1107.42781	1485.5150	0	1869.1565	476.40065353	4687.09671	99.369001	21,604
acre feet per storm	18,474	3,667	4,561	0	5,738	1,309	14,378	305	48,432
design flow mgd	7,331	1,471	1,793	0	3,243	517	5,619	119	18,920
percent of flow (1)	38.75%	7.56%	9.47%	0.00%	11.85%	2.70%	29.59%	0.61%	100.00%

SECTION 10
ESTIMATED NON-STORM WATER POLLUTION CONTROL COSTS

So far his report has only examined the incremental costs of storm water treatment and has not included the costs of other non-storm water pollution control programs. In this section, estimates of existing and future non-storm water pollution control costs per household were added to the estimated incremental costs for storm water treatment in the Los Angeles County NPDES permit area. The estimated costs to households of other pollution control measures cover the following:

- Air Quality Regulations
- Drinking Water Treatment
- Solid Waste Disposal
- Wastewater Treatment

The analysis in this section represents a preliminary examination of this issue, as a comprehensive study would require a major commitment of resources. When estimating existing or future pollution control costs, there is a wide range of pollution programs for consideration which would require extensive research. In developing the estimated initial costs, two approaches were utilized: 1) analysis of estimated localized, direct costs in California; and 2) a literature review including a 1990 comprehensive study by the EPA updated to 1998 dollars. Because of the widespread effects of pollution controls on the economy and the difficulty of calculating the full effects as they ripple through it, these two approaches likely underestimate the total level of pollution control costs.

10.1 Summary

According to the EPA Municipal Screener, the estimated incremental cost of any new pollution control program should be added to the existing pollution control costs. Therefore, the per household cost estimates of existing pollution control made in this study are added to the incremental costs for storm water treatment by area to determine whether they exceed the 2 percent of median household income criteria prescribed by the EPA municipal screener methodology. The approaches used to estimate the impacts of existing and future pollution control costs in combination with estimated incremental storm water treatment costs are described in this section and summarized below:

1) Localized estimate: $554 annually per household
2) EPA nationwide study estimate: $537 annually per household

10.2 Localized Estimates for Existing Non-Storm Water Pollution Control Costs

Estimates were made for the additional annual pollution control costs per household unit based on localized costs for the Los Angeles area of wastewater user fees, tire/oil disposal, automobile emissions and repairs, drinking water treatment and solid waste disposal. This amount was estimated to be about $554 annually per household for the Los Angeles area as shown on Table 10-1.

Data was compiled using several sources in order to determine the existing residential costs of non-storm water pollution control programs in the Los Angeles area. These costs are analyzed by three

Table 10-1
Financial and Economic Impacts of Storm Water Treatment
Estimated Annual Localized Non-Storm Water Pollution Control Costs Per Household
Los Angeles Area

Description of Localized Cost	Estimated Annual Cost
Annual Wastewater User Charge[1]	$194
Other Localized Pollution Control Costs	
Automobile Tire/Oil Disposal[2]	$8
Average Emissions Costs[3]	$74
Drinking Water[4]	$144
Solid Waste	$134
Total Other Costs	$360
Total Estimated Localized Pollution Costs	**$554**

[1] This estimate is based on the California Environmental Agency's, Wastewater User Charge Survey Report, Fiscal Year 1997-98

[2] Based on oil disposal costs of $5 and tire disposal costs of $3 per year.

[3] Based on average emissions cost calculations as shown below:

Annual Median smog inspection fee	$14.00
Annual Median smog certificate	$5.00
Annual Average emissions repairs	$55.00
	$74.00

[4] Estimated Water treatment cost based on Metropolitan Water District (MWD) jurisdictions as shown on Table 10-3 has been applied as an average cost to the Los Angeles area.

Sources: Stanley R. Hoffman Associates, Inc.
EPA, Environmental Investments, 1990; US Census Bureau
Wastewater user Charge Survey Report, Fiscal Year 1997-98, California Environmental Protection Agency
Metropolitan Water District of Southern California, 1998

Notes:
Calculations are based on the following estimates:

			Per Household Annual Estimated Charges
Tires changed @ 50,000 miles or 2 tires/yr.at $1.50 each			$3.00
Oil changed @ $1.00	4.86	times per yr.	$5.00
Annual Median smog inspection fee			$14.00
Annual Median smog certificate			$5.00
Annual Average emissions repairs			$55.00
Per Capita Vehicle Miles Travelled			8,635
Annual VMT per household			17,270

primary environmental media: air, land and water. The detailed annual cost estimates per residential unit for each of these categories, as shown on Table 10-1, include annual wasterwater user charges plus other costs. The estimated other localized pollution costs include: tire/oil disposal fees, smog check and related emissions repairs, drinking water treatment and solid waste disposal and are about $360 per household for the Southern California area.

These total costs are then added to the estimated annual wastewater user charge to arrive at a total estimated annual localized pollution control cost per household. When this total localized amount of $554 is added to the incremental cost of storm water treatment, it represents the total amount that a household is estimated to pay for pollution control on an annual basis if the full storm water treatment system was implemented.

The cost estimates for the air category include costs related to meeting the requirements for automobile smog check, smog certificate, and related emissions repairs every two years. These costs were derived based on estimates received from the California Bureau of Automotive Repairs (BAR) and then annualized on a per household basis. Smog activity is reviewed statewide each month by BAR. Table 10-2 summarizes the emissions related repair costs from July 1997 through March 1998 plus other smog control related costs. The annualized amount was calculated based on the California regulation that automobiles must pass smog certification every two years.

The land category includes costs related to solid waste disposal, as well as those for automobile oil and waste tires. The estimates for solid waste in dollars per household were presented in the EPA study. The costs for tire and oil disposal were derived based on estimates provided by the Integrated Waste Management Board of California. The calculations used in the analysis are referenced on Table 10-1.

The water category includes those costs related to the treatment of drinking water and user fees for wastewater. The costs for the treatment of drinking water were calculated based on the Southern California Metropolitan Water District's (MWD) price schedule for areas within their jurisdiction. A summary of these water treatment costs is shown on Table 10-3. The estimated annual wastewater costs were based on the California Environmental Protection Agency's report, Wastewater User Charge Survey Report, Fiscal Year 1997-98.

10.3 Pollution Control Cost Estimates Based on EPA Study

This approach utilizes a 1990 study by the EPA, Environmental Investments: The Cost of a Clean Environment, which estimates the direct costs of public and private pollution control activities in the United States. Although this report was prepared in 1990, it represents an extensive analysis of environmental costs by economic sector and environmental medium. The study also includes a projection to the year 2000 of what EPA estimated at the time to be the cost of full compliance with existing regulations. According to the report, overall there is expected to be a significant increase in the real costs of pollution control on local government which will require significant additional capital investments and increases in rates charged to customers for expanded environmental services.

Table 10-2
Financial and Economic Impacts of Storm Water Treatment
Statewide Summary of Emissions Related Repair Costs Per Vehicle
Los Angeles Area

	Month	Number of Vehicles	Average Cost Per Vehicle	Annualized Average Cost[1]
Vehicle Repair Costs	Mar-98	31,803	$117	
	Feb-98	33,791	111	
	Jan-98	37,464	111	
	Dec-97	34,447	105	
	Nov-97	35,490	106	
	Oct-97	41,312	105	
	Sep-97	39,881	110	
	Aug-97	41,376	107	
	Jul-97	43,316	$109	
		338,880	$109	$55
Annual Average Estimated Inspection Fee				$14
Annual Average Estimated Smog Certificate Fee				$5
Total Annual Average Estimated Emissions				$74

Source: Stanley R. Hoffman Associates, Inc.
California State Bureau of Automotive Repairs

[1] A Smog check is assumed to be conducted once every two years

Note: includes only costs related to repairs required to pass smog check certification. As of March 1998, repair costs are no longer reported to the BAR. Costs are likely to increase because of the new requirements to control NO_x

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Table 10-3
Financial and Economic Impacts of Storm Water Treatment
Water Treatment Costs
Los Angeles Area

Estimated Existing Water Treatment Costs	MWD Service Area 1998 $
Water Rates ($ Per acre foot)	
Basic Treated Water	$431
Basic Untreated Water	$349
Cost of Water Treatment	$82
Estimated Future Water Treatment Costs	
Treatment costs ($ Per acre foot)	
Oxidation Retrofit Program[1]	$25
Other Treatment Technologies[2]	$180
Estimated Annual Cost Per Acre foot	$287
Estimated Annual Per Household Costs	
Annual Water Usage ($ Per acre foot)	0.50
Estimated Water Treatment Cost	$144

Notes:
1. This program is currently underway by MWD and will include ozone treatment of water at $50 per acre foot. It is assumed that 50 % of the area would incur this cost, or an average of $25 per acre foot.

2. Advanced technologies for ground water treatment are more expensive and average about $360 per acre foot. It is assumed that 50 % of the MWD service area would incur this cost, or $180 per acre foot.

Source: Stanley R. Hoffman Associates, Inc.
Metropolitan Water District of Southern California, 1998.

R0006123

10.3.1 Overall Costs of Environmental Protection

Based on the EPA study, the estimated future annual cost of pollution controls per household in 1998 dollars would be about $537. These costs are shown in detail on Tables 10-4 and 10-5 and would likely be higher if the effects of more recent pollution control legislation were included. The estimated costs include pollution abatement, control and prevention expenditures. Only the direct costs associated with implementing control measures and compliance activities are included in the analysis.

The report presents data on environmental pollution control costs from 1972 through 1987 and projects those costs for each year through 2000 under various assumptions related to full compliance with existing regulations. The report presents the results in a variety of ways including by type of cost (capital, operating, etc.), by medium (land, air, water), by program and by economic sector which directly bears the cost of the control (public versus private). The report is based upon surveys of spending conducted by the Department of Commerce, EPA Regulatory Impact Analyses and an earlier EPA study. The Municipal Sector Study: Impacts of Environmental Regulations on Municipalities (September 1988).

The EPA study found that in the year 2000, total annualized costs for all pollution control activities in the nation would likely be in the range of $171 billion to $185 billion (in constant 1990 dollars). These costs would represent 2.6 to 2.8 percent of Gross National Product.

The largest share of pollution control costs – 61 percent – is directly borne by the private sector. The second largest share – 23 percent – is directly borne by local governments. Local government costs relate mostly to wastewater, drinking water, sewage sludge and solid waste. According to the report, "...it is projected that over the next several years real pollution control burdens on municipalities will increase dramatically and result in large increases in the fees charged to consumers for locally-provided environmental services."

10.3.2 Estimated Costs per Household

While the EPA report provides a comprehensive analysis of pollution control costs and does estimate which sector initially bears the costs, it does not attempt to estimate how much of these costs are ultimately passed on to households, businesses, and other entities. However, the Municipal Sector Study found that households in smaller communities will pay an average of 0.7 percent of their incomes for environmental services while those in larger communities will pay on average 0.5 percent.

Tables 10-4 and 10-5 show selected annualized cost estimates for mobile source and other selected pollution control programs. This is derived from the EPA report, when combined, results in an estimated cost of $537 per household. The cost estimates in Table 10-4 were projected by the EPA as local government's share in the year 2000. This assumes full compliance with national standards for water quality point sources, drinking water and solid waste.

Table 10-4
Financial and Economic Impacts of Storm Water Treatment
Annualized Environmental Control Costs in the Year 2000
Selected Programs - Local Government Portion[1]

Area	In Millions of 1986 Dollars[2]	In Millions of 1998 Dollars	Cost per Household in 1998 Dollars
Water Quality-Point Sources	$16,589	$23,888	$232
Drinking Water	5,079	7,314	71
Solid Waste	9,681	13,941	135
Total Water & Solid Waste	31,349	45,143	438
Total Households (thousands)			103,058
Estimated Costs per household			$438

1. Air quality regulation costs for local governments were not included as part of this study

2. CPI LA-Ana-Riv:All Items - All Urban Consumers
   Change 1986-1998 1.44

Source: Stanley R. Hoffman Associates, Inc.
EPA, Environmental Investments, 1990; US Census Bureau

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Table 10-5
Financial and Economic Impacts of Storm Water Treatment
Annualized Environmental Control Costs in the Year 2000
Mobile Sources Air Pollution

Area	In Millions of 1986 Dollars[1]	In Millions of 1998 Dollars	Cost per Household in 1998 Dollars
Capital Costs	$10,786	$15,532	$151
Operating Costs	$3,354	$4,830	$47
Total	$14,140	$20,362	$198
Estimated Household Allocation[2]	$7,070	$10,181	$99
Total Households (thousands)			103,058
Estimated Costs per household			$99

[1] CPI LA-Ana-Riv:All Items - All Urban Consumers
Change 1986-1998 1.44

[2] Assumed allocation to households at 50%

Source: Stanley R. Hoffman Associates, Inc.
EPA, Environmental Investments, 1990; US Census Bureau

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Table 10-5 presents estimated air pollution control costs for mobile sources. The EPA study annualized the estimated capital costs using a 7 percent annual amortization rate for capital expenditures and combined them with annual operations and maintenance costs. The first data column shows the cost estimates in 1986 dollars. The second data column converts the cost estimates to 1998 dollars using an adjustment based on the Consumer Price Index. The third column shows the cost per household based on the Census Bureau's forecast of households for 2000 (Series 2) of approximately 103.1 million.

Cost estimates are presented for the three programs with the largest local government financial responsibility. In order to avoid double counting with the incremental storm water treatment cost estimates, EPA estimated non-point source water quality control costs were not included in the table. No attempt was made by EPA to estimate either how much of these costs would be passed back to the consumers of municipally provided environmental services in the form of periodic fees or how much of such fees would be borne by households, businesses and other entities. Such user fees are common for wastewater treatment, drinking water supply and solid waste collection and disposal. Conversely, no attempt was made to include the costs of private providers of the same services. Some drinking water and solid waste collection and disposal services, for example, are provided by private companies who charge user fees in the same manner as municipal providers.

The total annual local cost for local government programs in the year 2000 is projected at about $45.1 billion as shown on Table 10-4. This would be the equivalent of $438 per household based on the Census Bureau's projection of 103.058 million households. The total annual cost of mobile source air pollution controls is shown on Table 10-5 and is projected to be $10.18 billion. Assuming one half of this is for commercial vehicles and the other half is for vehicles owned by households, then the average annual cost per household is estimated at $99. This is considered a conservative assumption since slightly less than one third of the total registered vehicles in California are commercial. When these two estimates are combined, a total cost per household of $537 results.

SECTION 11
EVALUATION OF FINANCIAL IMPACTS

This section discusses the findings of potential financial and economic impacts on the Los Angeles NPDES Permit Area. The EPA Municipal Screener methodology and other selected socioeconomic indicators are used in this evaluation. A set of summary indicators are presented in Table 11-1 for the two scenarios: 1) Full retrofit treatment; 2) Retrofit expenditures limited by the Preliminary and Secondary Screener. The cost of full storm water treatment is first evaluated followed by an evaluation of costs as limited by the Secondary Screener test.

11.1 Widespread Impacts

The financial and economic inpacts are first evaluated for the cost of full storm water retrofit treatment. Based on the EPA methodology and other economic indicators presented below, the economic impacts are judged to be both substantial and widespread for the full system storm water treatment costs as summarized on Table 11-2.

11.1.1 Property Tax Impacts

One measure of financial feasibility is the estimated impact on the property tax rate. The property tax rate for a single-family unit is estimated to increase by about 0.87 percentage points for the full system as shown previously on Table 9-1. When added to the median base property tax of 1.19 percent, this results in a total property tax of 2.06 percent, an increase of about 73 percent in the annual property tax bill. Given the current economic climate in California, this estimated total rate of 2.06 percent is clearly more than is likely to be absorbed by local single family households alone. For multi-family units, the estimated increase of 0.67 percentage points would also represent a sizable increase if translated into a potential rental pass through.

11.1.2 Sales Tax Impacts

To compare the annualized storm water treatment costs to other economic indicators, a hypothetical increase in the sales current tax rate of 8.25 percent was estimated in lieu of increasing the property tax for the cost of full treatment. For the cost of full treatment, the sales tax increase was estimated at about 6.0 percentage points. This impact, on top of the current rate, is judged to be both widespread and probably far higher than most households would consider acceptable.

11.1.3 Land Requirement and Displacement Impacts

Treatment facilities for storm water runoff are land intensive. The land acreage and cost requirements for the full system are about 13,950 acres and $6.1 billion, requiring multiple treatment plants per drainage basin. The land cost estimate was included in the full treatment costs of $53.6 billion. About 67 percent of this acreage would be required for treatment Level 1 with the remaining 33 percent for treatment Level 2. While marginal or vacant parcels would be initially sought, this still would require potential displacement of many households and businesses in addition to relocation and land costs.

Table 11-1
Summary of Evaluation Indicators
Financing and Economic Impacts of Storm Water Treatment
Los Angeles County NPDES Permit Area

Indicators	Full Retrofit Treatment		Limited by EPA screener: preliminary & secondary	
Capital Cost	53,605	millions $	5,280	millions $
Annual O&M cost	199	millions $/yr	20	millions $/yr
Total Annual Cost	4,872	millions $/yr	480	millions $/yr
Allocated cost per SFD	$1,024	dollars	$101	dollars
Allocated cost / acre Com/Ind	8,577	dollars	845	dollars
If funded only by Sales Tax increase	5.95%	percent	0.59%	percent
Percent of current outstanding debt	477%	percent	47%	percent
Cost per household	$1,509	dollars	$149	dollars

Source: Stanley R. Hoffman Associates, Inc.
Don Owen & Associates

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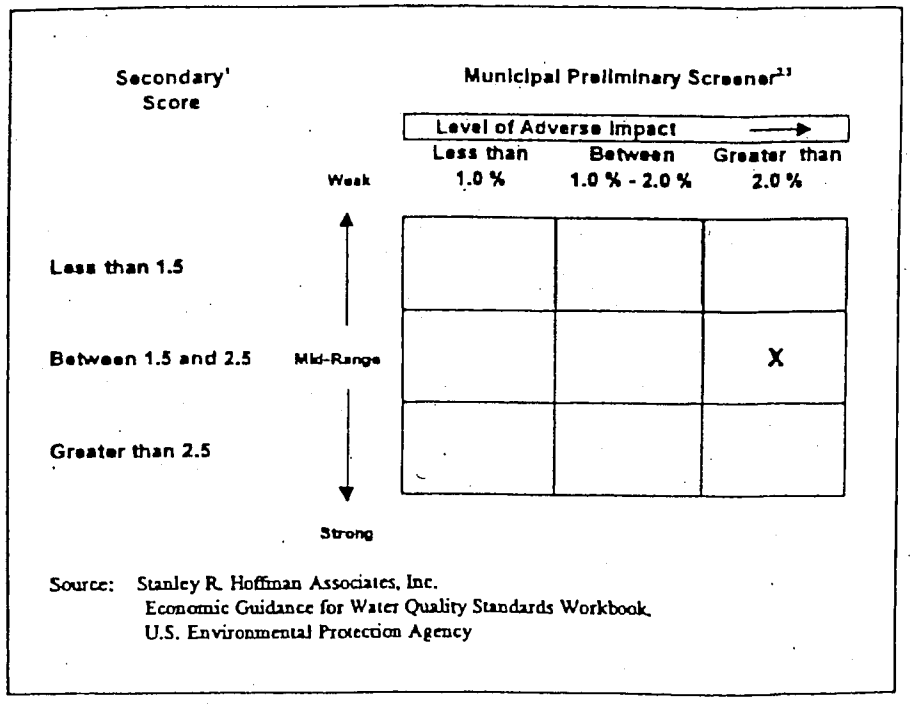
Table 11-2
Financial and Economic Impacts of Storm Water Treatment
Assessment of Substantial Impacts Matrix
Los Angeles NPDES Area



Source: Stanley R. Hoffman Associates, Inc.
Economic Guidance for Water Quality Standards Workbook,
U.S. Environmental Protection Agency

1. The Secondary Score represents a weighted average based on a number of economic criteria described in the text.

2. The Municipal Preliminary Screener represents a percentage of median household income.

3. Shaded area denotes where substantial impacts are estimated to occur according to the EPA Preliminary and Secondary Municipal Screeners. The combined score for the Los Angeles NPDES area results in substantial impacts as shown in the figure by the "X."

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11.1.4 Employment Impacts

The Los Angeles area economy has been recovering from the deep recession of the early 1990s when the total County economy lost more than 400,000 jobs. The County is currently on a recovery path. The additional costs per household and per business would likely slow economic growth and cause some businesses to relocate or expand elsewhere. Again, while specific estimates of impacts are not made, the burden of additional costs of a substantial nature is viewed as widespread because the potential treatment plants would be distributed throughout the Los Angeles drainage areas. Since specific locations are not identified, these displacement impacts are not quantified as part of this study.

Employment trends for Los Angeles County are summarized in Table 11-3 based on estimated projections from 1994 to 2000 from the Southern California Association of Governments (SCAG). According to these projections, the overall County employment is growing at an average annual rate of about 1.4 percent.

As was indicated earlier, the average household share of the financing burden would amount to about a 73 percent increase of annual property taxes for a single family unit. For many households, this increase would cause a significant reduction in their consumption and savings potential. Over time, landowners would pass forward these tax increases in the form of higher rents which would result in consumption reduction. Such potential widespread reduced consumption among households would likely cause loss of retail and other local serving jobs.

Based on the EPA methodology and the other economic indicators presented, the economic impacts are judged to be both substantial and widespread for the full system storm water treatment costs.

11.1.5 Impacts on Outstanding Local Debt

According to California Municipal Statistics, Inc., there is an estimated $11.6 billion of outstanding local public debt in Los Angeles County. The estimated cost of $53.6 billion for full storm water treatment represents almost a fivefold increase in existing debt. This level of debt increase would be not only considered extremely large but would foreclose capital funding for other non-storm water projects.

11.2 Costs Limited by EPA Screeners

When the estimated costs of storm water treatment are limited by the EPA Preliminary and Secondary Municipal Screeners, this results in an estimated fundable capital cost of about $5.3 billion. This is based on a cost of $149 per household calculated by taking the estimated Secondary Screener amount of 1.6 percent of median household income ($43,916) or $703 per household and reducing it by the estimated existing and future non-storm water pollution control costs of $554 per household. While this amount is estimated to be affordable based on the EPA Preliminary and Secondary Screener methodology, it is likely that it would still be considered too high if directly charged to most households on an annual basis over the bond period of 20 years or longer.

Table 11-3
Financial and Economic Impacts of Storm Water Treatment
Employment Trends for Los Angeles County NPDES Permit Area: 1994 - 2000

Basin/Area	1994	1998	2000	1994 to 2000 Numerical Change	1994 to 2000 Percent Change	1994 to 2000 Average Annual Change
Dominguez	302,572	319,728	328,667	26,095	8.6%	1.4%
LA River	2,465,071	2,612,887	2,690,087	225,016	9.1%	1.5%
Malibu	34,894	41,554	45,346	10,452	30.0%	4.5%
San Gabriel	611,803	655,842	679,037	67,234	11.0%	1.8%
Santa Clara	53,398	65,018	71,744	18,346	34.4%	5.0%
Santa Monica Bay	700,022	708,656	713,013	12,991	1.9%	0.3%
Total	4,167,760	4,403,684	4,527,893	360,133	8.6%	1.4%

Sources: Stanley R. Hoffman Associates, Inc
Southern California Association of Governments, Regional Statistical Area Projections, 1994.

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