



Vallejo Sanitation and Flood Control District

Stormwater Rate Equity Study Final Report

April 3, 2013

Hoag Consulting, LLC

Vallejo Sanitation and Flood Control District

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Prepared for:

Vallejo Sanitation and Flood Control District
450 Ryder Street
Vallejo, California 94590

Prepared by:

Hoag Consulting, LLC
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April 3, 2013

Kenneth Spray
Finance Director and Treasurer
Vallejo Sanitation and Flood Control District
450 Ryder Street
Vallejo, CA 94590

Dear Mr. Spray:

Subject: Stormwater Rate Equity Study -- Final Report

In accordance with our agreement dated December 4, 2012 for a Stormwater Rate Equity Study, I am pleased to submit this Final Report. The results of this study are intended to update the current District drainage fee with a fair and equitable fee structure based on the District's costs of service to its customers. The level of these fee-based revenues is targeted at the long-term costs of the District's stormwater services to the Vallejo community.

The current drainage fees are a flat rate of \$1.97 per month to each District wastewater account. Our cost of service analysis has indicated that these fees are unfair to many of the stormwater customers. The main source of the inequity stems from the proportionality of the District's costs of service with the land areas of the individual customer parcels (lots), despite the flat rate currently billed to all stormwater discharger regardless of their lot size.

We have evaluated five alternative fee structures to equitably and proportionally recover stormwater service costs. Each alternative is fair and has a legal nexus between the fee and the runoff and pollutant load from the different customers. The five alternatives vary in addressing community needs, especially with respect to level of detail versus ease of understanding and billing for services.

Based on the findings and conclusions discussed in the study, we recommend that the District maintain the current drainage fee of \$1.97 per month for single-family residential customers on standard-sized lots, while adjusting the fee for all other customers depending on their estimated stormwater loads. The proposed fee structure uses Equivalent Residential Billing Units (ERBUs) based on the area and type of lot discharging stormwater. While most District customers will not see any change to their fees, or may see modest fee reductions, some will have increases. An in-depth discussion of these recommendations is provided in Chapter 5 of the report.

Thank you very much for the opportunity to deliver this interesting and challenging study. Please contact us if you have any questions or need additional information, and we look forward to meeting with you to discuss the results.

Very truly yours,
HOAG CONSULTING, LLC

A handwritten signature in black ink, appearing to read "Grant Hoag". The signature is fluid and cursive, with the first name "Grant" being more prominent than the last name "Hoag".

Grant Hoag, P.E.
Principal

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List of Acronyms

APN - Assessor Parcel Number
Avg - Average
BMP - Best Management Practice
BC - Brown and Caldwell
Ccf - Hundred cubic feet (748.05 gallons)
CIP - Capital Improvement Program
City - City of Vallejo
Comm - Commercial
CPI - Consumer Price Index
District - Vallejo Sanitation and Flood Control District
DSC - Debt Service Coverage
ENRCCI - Engineering News Record (Magazine) Construction Cost Index
ERBU - Equivalent Residential Billing Unit
excd - excluding
FY - Fiscal Year (July 1 to June 30)
GIS - Geographic Information System
gpd - Gallons per day
HFC - Hundred cubic feet (748 gallons, see also Ccf)
Ind - Industrial
KSF - Thousand Square Feet
mgd - Million gallons per day
NPDES - National Pollutant Discharge Elimination System
O & M - Operation and Maintenance
RWQCB - Regional Water Quality Control Board (Santa Ana Regional Board)
SDMP - Storm Drainage Master Plan
SF - Square Feet or Square Foot
SWRCB - State Water Resources Control Board
TMDL - Total Mass Discharge Limit
USEPA - United States Environmental Protection Agency
VSFCD - Vallejo Sanitation and Flood Control District

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Ron Matheson, General Manager

Kenneth Spray, Finance Director and Treasurer

Rolf Ohlemutz, Director of Engineering

Dan Tafolla, Environmental Manager

Section 1

Introduction and Background

This report documents the Stormwater Rate Equity Study for the Vallejo Sanitation and Flood Control District (District). The purpose of this study is to identify fair and equitable stormwater drainage fees updating the current fees, and is based on the District's costs of service to each lot discharging stormwater runoff.

The District has identified the costs of capital projects and ongoing operations required to channel and discharge stormwater hydraulic loads from the community, and to prevent and to remediate stormwater-borne pollutants. The costs of the capital projects and budgeted activities are based on the District's required pollutant remediation and control activities under the current State Water Resources Control Board (SWRCB) Regional Board Stormwater Permit.

The current District rate structure is based on a flat monthly fee of \$1.97 billed to every City of Vallejo (City) utility customer receiving District wastewater services. This fee takes into account neither the volume of stormwater from each discharger, nor the pollutant loads carried by their runoff. To address this issue, the District has directed this analysis updating the 2004 storm drainage rate equity study with current information on each lot discharging stormwater. The following describes the methodology and criteria for developing the fees.

1.1 Fee Development Criteria

Stormwater fees should allocate costs to each stormwater discharge in proportion to its burden on the utility. As such, the following calculation criteria apply to the development of stormwater fees:

- **Sufficient** – Fees should generate the rate-based revenues needed to recover operation and maintenance (O&M) expenses and capital costs of the program.
- **Equitable** – The fee structure should fairly apportion the costs of providing service among different dischargers (i.e., single-family, residential high density, commercial, and others), such that each discharger class pays a fee proportional to their burden on the utility.
- **Implementable** – Data is available for calculating the charges, and billing does not impose an unreasonable administrative workload.
- **Practical** – The fee structure is easy to understand and acceptable to customers.
- **Compliant** – Fees are developed, authorized and implemented in compliance with applicable state and local regulations and permits, as interpreted by legal authorities.

1.2 Study Organization

This analysis is organized into five sections. This Section provides a general introduction of the District's drainage activities, fee calculation methodology, and a discussion of Proposition 218 issues. Section 2 develops several years of the fee-based revenue requirements based on the projected budget. Section 3 describes the cost of service analysis, development of unit rates, and cost allocations to each discharger class. In Section 4, fee and billing alternatives are described, and in Section 5 the optimum fee structure for billing stormwater services is recommended. Appendix A is an evaluation of the issues and the rate impacts of providing stormwater services without revenues from the tax-exempt parcels serving the community's public schools and parks. Appendix B contains general financial assumptions, plus a summary of the 2010 Census. Appendix C provides an evaluation and summary of the pollutant loading factors for each land use type in the District service area. Appendix D is a summary of the depreciation-related costs of the stormwater facilities. The technical analyses of this report are displayed with rounding to the appropriate figures, while the background technical calculations are without rounding and are interlinked among all tables in the analyses.

1.3 Calculating Stormwater Fees

The calculation steps required in developing stormwater fees are identifying program costs, characterizing dischargers that benefit from stormwater system use, allocating program costs to dischargers, developing a rate structure, and billing and collection. These steps are described below.

Program Costs

Costs are usually divided into two main categories: O&M and capital projects. O&M costs are divided into administration and support, engineering, field operations, environmental and regulatory permitting and enforcement, and facility operations. For development of stormwater fees, both the O&M and capital project costs are functionally categorized as either runoff (flow) or pollutant (quality) related. For example, flood control activities in the O&M budget are allocated solely based on flow-related loads. Capital projects are projects related to rehabilitating, replacing, and expanding infrastructure and do not recur annually.

Customer Characterization

Customers should be classified only enough to support the rational allocation of program costs, and to facilitate billing mechanisms. Discharger customers are usually classified as residential, commercial, industrial, agricultural, landscaped, institutional or undisturbed. Residential categories may be further subdivided into single and high density multi-family subclasses. Typical runoff and pollutant-related loading characteristics are developed for each discharger classification to a level of accuracy sufficient for regulatory defense.

Cost Allocations

O&M and capital-related costs that are allocated to runoff load and quality-related pollutants can then be spread to the dischargers on the basis of the loads estimated to be discharged by each class. In doing so, the costs will be allocated in proportion to the level of stormwater pollutant remediation services the District provides to each class.

Rate Structure

A rate structure refers to the various unit charges that, when billed to the users of the system, equals the total rate-based revenues. The rate structure complexity usually reflects the level of detail in the allocation of costs, which in turn is based on the level of equity desired. This desire for equity must be balanced by the need for fee simplicity.

Billing and Collection

A rate structure should be straightforward, and must not require more data attributes than the billing system can handle. As such, fee equity is limited by the available billing system and usable data attributes. A popular billing option for stormwater programs is fee-based charges on a County Assessor's parcel rolls, another common practice is direct billing of charges on water, sewer and trash utility billing statements.

1.4 General Assumptions

The general financial planning assumptions used in this projection are provided in Appendix B. For the projected study period the inflationary effects on operating costs is based on the San Francisco area Consumer Price Index. Inflationary effects on project costs are based on the multi-year historical average Engineering News Record construction cost index. These general background inflation rates are used to project the future system costs. Finally, medium term interest earning rates are used on year-end fund balances. In order to distribute the costs of funding urgently needed improvements to the drainage system, bond-funding of the capital improvement program is recommended. The District's bonding terms are described in Appendix B.

1.5 Proposition 218

Proposition 218, approved by the state's voters in November 1996, added California State Constitution Articles XIII C and D to the California Constitution. The most important sections to the development of stormwater fees are the definitions of certain words and requirements that limit the implementation of new fees.

The definitions of "fee" or "charge," "property ownership," and "property-related service," found in Article XIII D, Section 2, clarify what a fee is (in contrast to a tax or assessment) and who may be charged a fee. The definitions for these three terms are shown below.

- Section 2(e) "Fee" or "charge" means any levy other than an ad valorem tax, a special tax or an assessment, imposed by an agency upon a lot or upon a person as

an incident of property ownership, including user fees or charges for a property-related service.

- Section 2(g) “Property ownership” shall be deemed to include tenancies of real property where tenants are directly liable to pay the assessment, fee, or charge in question.
- Section 2(h) “Property-related service” means a public service having a direct relationship to property ownership.

Article XIII D, Section 6(c) provides that some fees need to be submitted for voter approval after July 1, 1997. This section states that “Except for fees or charges for sewer, water, and refuse collection services, no property related fee or charge shall be imposed or increased unless and until such fee or charge is submitted and approved by a majority vote of the property owners of the property subject to the fee or charge or, at the option of the agency, by a two-thirds vote of the electorate residing in the affected area.”

Note that there is no specific reference to full voter approval when part but not all of a fee structure is modified, thus affecting some but not all rate payers. This would occur if the District left unchanged the current fees for single-family lot accounts, but modified all other fee classes. In this case, only those customers affected by a fee change might receive a ballot. Thus, there is a legal question as to the requirement that all stormwater dischargers have the opportunity to vote, when existing fees are altered for only a few.

Another section, Article XIII D, Section 6(b), Requirements for Existing, New or Increased Fees and Charges, requires that a fee or charge shall not be extended, imposed, or increased unless it meets all of the following requirements:

- Revenues derived from the fee or charge shall not exceed the funds required to provide the property-related service.
- Revenues derived from the fee or charge shall not be used for any purpose other than that for which the fee or charge was imposed.
- The amount of a fee or charge imposed upon any lot or person as an incident of property ownership shall not exceed the proportional cost of the service attributable to the lot.

This section has significant applicability to this study, as it is reasonable to assume that stormwater fees based on the proportional cost of the service should be based on volume of stormwater runoff, and should also take into account the pollutant loads carried by the runoff. Moreover, these requirements may have an effect on the legality of implementing stormwater fee subsidies developed in Appendix A.

1.6 Legal Applicability of this Report

This report includes general summaries of the laws, regulations or court decisions of certain jurisdictions. However, it is not intended as a precise or thorough summary of pertinent legal issues. It should be noted that this report was not prepared or reviewed by an attorney, and it is not intended, and should not be relied upon, as legal advice. Its purpose is to assist in the recognition and analysis of public and financial policy issues. Questions concerning the interpretation or applicability of the legal authorities referenced herein should be referred to the District's legal counsel.

Section 2

Revenue Requirements

This section develops a multi-year projection of the District's stormwater-related costs and fee-based revenue requirements. Also presented are the assumptions used in the development of the annual revenue requirements, and the projected cash flows from the revenues and expenditures, and resulting fund balances. The operating budget for Fiscal Years (FY) 2012-13 and 2013-14, and capital improvement plan for FY 2012-13 through 2014-15 are provided by District staff, while the projected study period through FY 2016-17 is based on inflationary escalations of the operating costs, projected interest earnings on fund balances, and project expenditures in the storm drainage master plan.

2.1 Capital Improvement Program

Table 2-1 presents the expected capital improvement plan for the stormwater program. Projected annual capital expenditures vary from \$1.6 million to \$3.3 million, and average \$2.0 million per year. The largest expenditure is for the White Slough Project budgeted at \$4.8 million in FY 15-16. For this analysis that project is presumed to require multiple years for construction, with the first two years at \$1.4 million annually.

2.2 Fund Targets

The current capital program is to be funded from cash reserves, reducing the existing fund levels significantly over the projection period. Municipal utility financial policies call for cash reserves for working capital and project expenditure contingencies; the District has targeted a minimum reserve level of \$3 million. Other reserves may be required for operating contingencies, self-insurance, and asset rehabilitation and repair funds. This financial plan has been structured for revenue neutrality, to avoid any change in the current reserve levels over the projection period.

2.3 Operating Costs

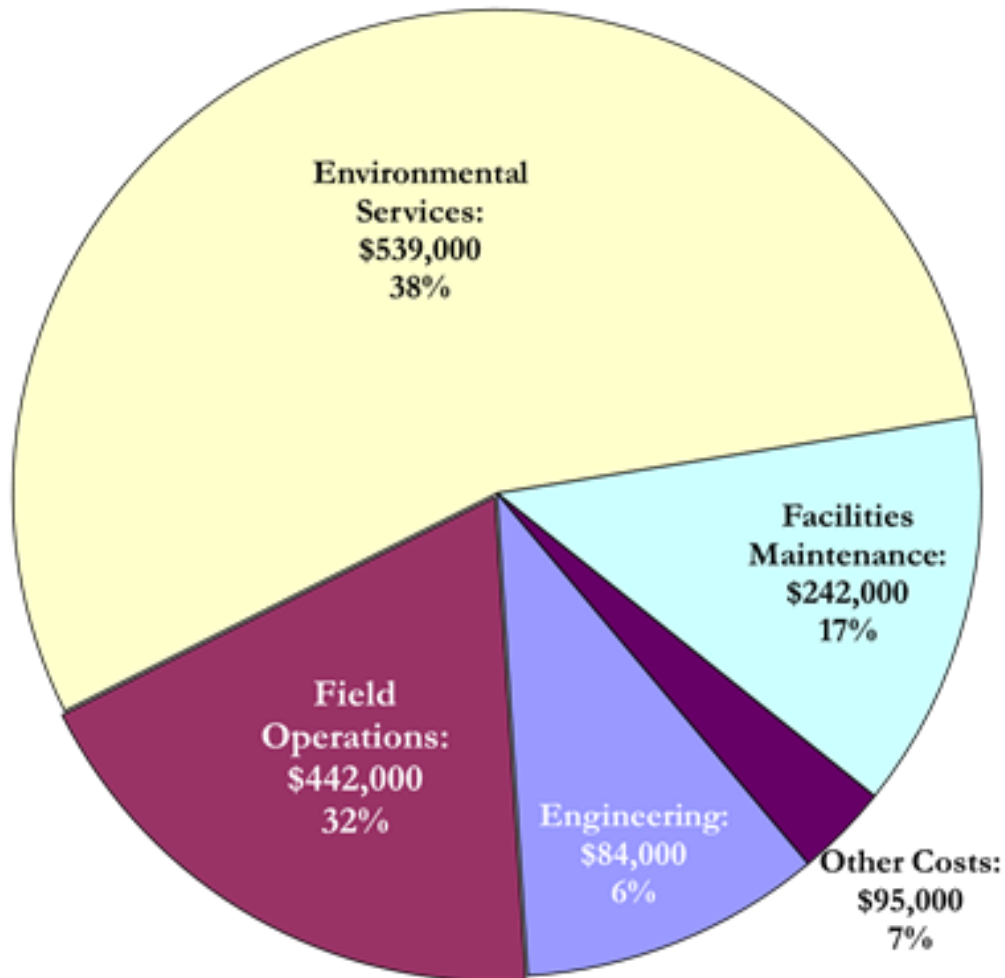
Table 2-2 provides the District's operating budget. As shown, this table includes the current bi-annual (two year) budget ending in FY 2012-13, and the projection through FY 2016-17. The expenditure details include the District's eight main stormwater accounting classifications, with administration and finance activities combined. Also provided is the capital expenditure program developed in the prior table.

As illustrated in Figure 2-1 on the following page, the operating activities include:

- Other costs such as administration, finance and funds for City street sweeping services;
- engineering;
- field operations;

- environmental services; and
- facilities maintenance

Figure 2-1 Operating Cost Allocations



Environmental services are in large part defined by the District's National Pollutant Discharge Elimination System (NPDES) requirement, and include monitoring, permitting, inspection and enforcement. The budget detail is used to categorize the District's stormwater activities and costs. Salaries and benefits and materials and services cost categories have been separated in Table 2-2 to support the anticipated inflationary escalations for the projected years. As provided in Appendix B-1, all inflationary escalations are set at one percent annually. The District's management,

administration and overhead labor cost is split between the wastewater and stormwater utilities on a 90/10 percent ratio.

As shown in the table, inflationary escalations lift the annual operating budget over five years from \$1.1 million in FY 2011-12 to \$1.2 million in FY 2016-17. Including capital expenditures, the total annual expenditures average \$2.9 million per year. Note that depreciation, which is not shown in the operating costs, is a non-cash expense, and is used in this analysis not for cash flow calculations or fee estimates, but rather for determination of cost of service analysis in the following section.

2.4 Fee Based Revenue Requirements

As shown in Table 2-3, the current fee-based revenues of \$1.1 million per year are based on a unit rate of \$1.97 per month, and a customer base consisting of 48,300 billing units (accounts). The current fee has been in place since 1997, and is, in part, a result of the District's previous reliance on the City's utility billing services for District service charges.

As provided in Table 2-3, the number of billable customers and billing units will be significantly higher in the future. Specifically, when the District implements an in-house billing system capable of identifying and equitably billing all stormwater dischargers, then the number of billing units is projected to increase from 48,300 to approximately 84,000. A single billing unit is defined herein as the burden placed on the District from the stormwater runoff volume and pollutant load from a standard single-family residential lot. This analysis uses an Equivalent Residential Billing Unit (ERBU) to represent this burden.

As a result of the increase in billing units, the annual fee-based revenues are projected to increase from the current \$1.1 million to \$1.8 million, effective the first full year of updated billing in FY 2013-14. With the new, more equitable billing system, the ERBU rate is left unchanged at \$1.97 per month. Also, a conservative safety factor is used on the new billing system, and is set at 20 percent of the calculated ERBUs (8,400 billing units). With this safety factor, an estimated 8,200 calculated billing units will not generate fee revenues during the projection period of this study.

The projected FY 2013-14 increase in revenues is developed in the following section. The increase is due to the new (unsewered) lots to be billed for the first time and the additional ERBUs charged too many of the larger dischargers of stormwater who currently are charged \$1.97 per month. The increase in the number of customers is based on adding stormwater discharge lots to the District's customer base, which supplements the City's current customer database of wastewater dischargers. Moreover, the fee structures described in the following sections are based on charges calculated from estimates of the runoff volume and pollutant loads from each lot. For some current customers this will result in higher fees, while for most customers the fee will remain unchanged or even drop.

Table 2-4 provides a projection of annual revenues, expenditures and fund balances based on the findings of the prior tables. It is based on a multi-year calculation of the sources and uses of funds. Non-operating revenues, including interest earnings on annual fund balances at an earnings rate of two percent, connections fees, and contracted service revenues are also incorporated into the projection.

FY 2012-13 is used as the base year for development of cost of service findings, including the unit rates of service. The base year stormwater utility capital improvement program costs are being funded solely from the stormwater utility fund balance, which as of the beginning of FY 2011-12 were \$24 million. By the end of the projection period the fund level is projected to decline slightly to \$23 million. By that time, the stormwater enterprise will be operating on an essentially revenue neutral basis, with net operating expenditures after operating expenses, interest earnings and contractual service revenues equal to the annual capital project expenditures.

**Table 2-1
Project Capital Improvement Program**

Project	Total Project Expenditures	Budget FY 2011-12	Budget FY 2012-13	Projection FY 2013-14	FY 2014-15	FY 2015-16	FY 2016-17
Budgeted Recurring Capital Projects							
Recurring Replacements	\$157,493	\$59,743	\$19,550	\$19,550	\$19,550	\$19,550	\$19,550
Recurring Minor Projects	\$699,000	\$154,000	\$109,000	\$109,000	\$109,000	\$109,000	\$109,000
Capital Improvement Plan Projects							
White Slough Project (b)	\$3,000,000	\$50,000	\$50,000	\$50,000	\$50,000	\$1,400,000	\$1,400,000
Fairgrounds Channel Phase 2	\$450,000			\$450,000			
Fairgrounds Drive storm drain	\$75,000	\$75,000					
Rindler Creek erosion	\$500,000			\$500,000			
Donner Pass Road phase I	\$500,000				\$500,000		
Amador / Florida sd improvements	\$2,600,000			\$1,600,000	\$1,000,000		
Skibbereen / Monteith	\$500,000			\$500,000			
Lake Dalwigk flood control	\$1,500,000	\$1,500,000					
Twin 54" sd access manhole	\$10,000	\$10,000					
BW Williams access road	\$75,000	\$75,000					
Total Program (2012 dollars)		\$1,923,743	\$178,550	\$3,228,550	\$1,678,550	\$1,528,550	\$1,528,550
Plus Inflationary Escalation to Determine "then-current" CIP expenditures				1%	2%	3%	4%
Total Capital Project Cost (then-current dollars)		\$1,923,743	\$178,550	\$3,260,836	\$1,712,289	\$1,574,867	\$1,590,615

Source: Adopted Bi-Annual Budget for FY 12 and beyond. CIP: Capital Improvement Program

b. The White Slough Project CIP cost of \$4.8 million in FY 15-16 is reduced to \$1.4 million per year for the first two years.

**Table 2-2
Operating Budget**

Description	Annual Escalation	Budget FY 2011-12	Budget FY 2012-13	Projection FY 2013-14	FY 2014-15	FY 2015-16	FY 2016-17
Administration & Finance (3101 & 3103)							
1. Salaries & Benefits	1.0%	\$0	\$0	\$0	\$0	\$0	\$0
2a Mats & Svcs (Street Sweeping, a)	1.0%	\$135,000	\$135,000	\$136,350	\$137,714	\$139,091	\$140,482
2b Materials & Services (Bank svcs)	1.0%	\$76,100	\$76,900	\$77,669	\$78,446	\$79,230	\$80,022
Subtotal		\$211,100	\$211,900	\$214,019	\$216,159	\$218,321	\$220,504
Engineering (3104)							
1. Salaries & Benefits	1.0%	\$90,554	\$93,749	\$94,686	\$95,633	\$96,590	\$97,556
2. Materials & Services	1.0%	\$0	\$0	\$0	\$0	\$0	\$0
Subtotal		\$90,554	\$93,749	\$94,686	\$95,633	\$96,590	\$97,556
Field Operations (3105)							
1. Salaries & Benefits	1.0%	\$79,020	\$81,792	\$82,610	\$83,436	\$84,270	\$85,113
2. Materials & Services (b)	1.0%	\$91,000	\$91,000	\$91,910	\$92,829	\$93,757	\$94,695
Subtotal		\$170,020	\$172,792	\$174,520	\$176,265	\$178,028	\$179,808
Environmental Services (3108)							
1. Salaries & Benefits	1.0%	\$249,986	\$258,814	\$261,402	\$264,016	\$266,656	\$269,323
2. Materials & Services	1.0%	\$248,467	\$251,776	\$254,294	\$256,837	\$259,405	\$261,999
Subtotal		\$498,453	\$510,590	\$515,696	\$520,853	\$526,061	\$531,322
Facilities Maintenance (3109, pump stations)							
1. Salaries & Benefits	1.0%	\$57,425	\$60,500	\$61,105	\$61,716	\$62,333	\$62,957
2. Materials & Services	1.0%	\$63,500	\$63,500	\$64,135	\$64,776	\$65,424	\$66,078
Subtotal		\$120,925	\$124,000	\$125,240	\$126,492	\$127,757	\$129,035
Subtotal Operating Budget		\$1,091,052	\$1,113,031	\$1,124,161	\$1,135,403	\$1,146,757	\$1,158,225
Insurance	1.0%	\$24,443	\$29,153	\$29,445	\$29,739	\$30,036	\$30,337
CIP Project Cash Expenditures		\$1,923,743	\$178,550	\$3,260,836	\$1,712,289	\$1,574,867	\$1,590,615
Total Stormwater Expenditures		\$3,039,238	\$1,320,734	\$4,414,441	\$2,877,431	\$2,751,660	\$2,779,177
Non-capital Expenditure Categories							
1. Salaries & Benefits (a)		\$476,985	\$494,855	\$499,804	\$504,802	\$509,850	\$514,948
2. Materials & Services		\$614,067	\$618,176	\$624,358	\$630,601	\$636,907	\$643,276
8. Insurance		\$24,443	\$29,153	\$29,445	\$29,739	\$30,036	\$30,337
		\$1,115,495	\$1,142,184	\$1,153,606	\$1,165,142	\$1,176,793	\$1,188,561

Source: District Adopted Bi-Annual Budget

a. The Administration & Finance services budget includes \$135,000 for transfers to the City for street sweeping.

b. Weed control is 100 percent dedicated to storm water. All other allocations are 90 percent wastewater and 10 percent stormwater, as shown here.

Table 2-3
Fee-based Revenues

Description	Budget FY	Budget FY	Projection			
	2011-12	2012-13	FY 2013-14	FY 2014-15	FY 2015-16	FY 2016-17
Current Fee Structure						
Current Monthly Fee (\$/month-billing unit)	\$1.97	\$1.97				
Current Annual Fee (\$/year-billing unit)	\$23.64	\$23.64				
Current Customers (Accounts)						
Residential Dwelling Billing Units	45,876	45,876				
Commercial Billing Units	2,523	2,523				
Total Billing Units	48,399	48,399				
Adjustment in Billing Units	-75	-370				
Total Budgeted (active) Billing Units	48,324	48,029				
Annual Fee-based Service Charges	\$1,142,380	\$1,135,406				
Projected Equitable Fee Structure						
Monthly Projected Fee (\$/month-ERBU)			\$1.97	\$1.97	\$1.97	\$1.97
Total Annual Fee (\$/year-ERBU)			\$23.64	\$23.64	\$23.64	\$23.64
Change in Annual Fee			0%	0%	0%	0%
Projected Billable Discharge Units						
Residential ERBUs			40,038	40,038	40,038	40,038
Non-residential ERBUs			44,426	44,426	44,426	44,426
Total			84,465	84,465	84,465	84,465
Less Unbillable New Units (a)	Unbillable Rate:	20%	-8,381	-8,381	-8,381	-8,381
Total Billable ERBUs			76,084	76,084	76,084	76,084
Annual Fee-based revenues			\$1,798,623	\$1,798,623	\$1,798,623	\$1,798,623
Change in Total Rate-based Revenues			58%	0%	0%	0%

ERBU: Equivalent Residential Billing Unit represents the drainage loads (flow and pollutants) from a single family residential lot.

a. The unbillable new discharge units represent adjustments to estimated drainage loads from unique dischargers and reductions for unbillable accounts.

Table 2-4
Revenues and Expenditures

Description	Base Year			FY 2014-15	FY 2015-16	FY 2016-17
	Budget FY 2011-12	(Budget) FY 2012-13	Projection FY 2013-14			
Budget Expenditures						
O&M Budget Projection						
Administration & Finance	\$211,100	\$211,900	\$214,019	\$216,159	\$218,321	\$220,504
Engineering	\$90,554	\$93,749	\$94,686	\$95,633	\$96,590	\$97,556
Field Operations	\$170,020	\$172,792	\$174,520	\$176,265	\$178,028	\$179,808
Environmental Services	\$498,453	\$510,590	\$515,696	\$520,853	\$526,061	\$531,322
Facilities Maintenance	\$120,925	\$124,000	\$125,240	\$126,492	\$127,757	\$129,035
Insurance	\$24,443	\$29,153	\$29,445	\$29,739	\$30,036	\$30,337
Transfers to Cap Program (d)	\$1,923,743	\$178,550	\$3,260,836	\$1,712,289	\$1,574,867	\$1,590,615
Total Budget	\$3,039,238	\$1,320,734	\$4,414,441	\$2,877,431	\$2,751,660	\$2,779,177
Op Budget Excd CIP & Net of Int & Other Revenues	\$149,689	\$189,999	\$181,084	\$220,486	\$229,820	\$236,710
Fee-based Revenues	\$1,142,380	\$1,135,406	\$1,798,623	\$1,798,623	\$1,798,623	\$1,798,623
Drainage Program Funding Sources (a)						
Beginning fund balance	\$24,040,287	\$23,359,235	\$24,376,091	\$22,982,795	\$23,098,643	\$23,342,579
Receipts from revenues						
Connection Fees (b)	\$250,000	\$250,000	\$250,000	\$250,000	\$250,000	\$250,000
Other revenues	\$485,000	\$485,000	\$485,000	\$485,000	\$485,000	\$485,000
Int earnings on funds (c)	\$480,806	\$467,185	\$487,522	\$459,656	\$461,973	\$466,852
Fee-based revenues	\$1,142,380	\$1,135,406	\$1,798,623	\$1,798,623	\$1,798,623	\$1,798,623
Subtotal	\$2,358,186	\$2,337,590	\$3,021,145	\$2,993,279	\$2,995,596	\$3,000,475
Less expenditures	(\$3,039,238)	(\$1,320,734)	(\$4,414,441)	(\$2,877,431)	(\$2,751,660)	(\$2,779,177)
Ending Fund Balance	\$23,359,235	\$24,376,091	\$22,982,795	\$23,098,643	\$23,342,579	\$23,563,877
Change in fund balance	(\$681,052)	\$1,016,856	(\$1,393,297)	\$115,848	\$243,936	\$221,298

a. Source: District budget summary for FY 2011-12 & 2012-13, except where noted. Following year interest earnings and service charges are calculated independently.

b. Connection fees in the projection years are based on budget year levels, for stormwater.

c. FY12 and 13 show budgeted values, subsequent years are calculated using 2%.

d. Transfers to (receipt from) the capital program include net revenues, unrestricted and restricted reserves. Receipts from the capital program are held in a restricted reserve and transferred back to the capital program in the following year.

Section 3

Cost of Service Analysis

The purpose of this section is to develop an equitable means of allocating the stormwater utility costs among the different dischargers. This is done by determining the stormwater pollutant and runoff burden placed on the District by the different land usages, and then allocating the stormwater costs associated with that burden to the different land types. Unlike the fee-based revenue calculations of Section 2, the costs in Section 3 are based on long-term average cost of utility service based on using non-cash based depreciation expenses to represent average annual capital costs.

3.1 Calculation of Loads

The stormwater load discharged by a lot represents its proportionate share of the burden on the stormwater system. This load is a tangible measure of the burden from each lot on the stormwater utility's service costs. Estimates of loads from each land use classification (discharge type) are required to equitably bill for services. The total billable stormwater volume is based on the sum of the runoff from each lot within the District's service area. Calculating this runoff uses a basic water resource planning concept: $Q = CIA$. Specifically, the runoff volume (Q) from a lot equals the runoff coefficient (C) times standard rainfall intensity (I) across the drainage area (A). To estimate the relative load from a single lot, this concept can be used by multiplying the total area of the lot type by the runoff coefficients. Moreover, the concept also can be expanded for use with pollutant loads.

Runoff Loadings

As described above, hydraulic (volumetric) runoff burdens can be estimated using lot size and the coefficients cross-referenced to land use. Alternatively, the use of impermeable area for each lot is used to estimate runoff. Many stormwater utilities develop impermeability estimates for different land use types using statistically significant sampling. This sampling is typically from aerial photography, an expensive process that measures the actual roofline, drive and walkway areas of specific lots. Since development of impermeable characteristics can be difficult and expensive for every lot in a drainage area, this method might be best applied only to very large commercial/industrial lots requiring special attention in line with their higher discharges. For the remainder of the lots, the use of runoff coefficients is recommended to estimate discharger-specific runoff loads for utility billing purposes.

Pollutant Loadings

The steps used to estimate pollutants discharged from different lot types are as follows:

- Identify the pollutants of concern in the stormwater program, based on pollutant remediation activities as specified in the NPDES stormwater permit. Typical programs address stormwater-borne sediments, trash, toxics and hydrocarbons.

- Develop pollutant coefficients for each land use based on the quantity of pollutant discharged per unit of area.
- Allocate pollutant loads to each lot, based on the lot's total area and the applicable pollutant coefficient.

Unit Costs of Service

To allocate program costs among the user classifications, it is also necessary to estimate the unit costs of service. To do this, the stormwater activity costs associated with hydraulic runoff and pollutant loadings are divided by the total runoff and pollutant loads from all dischargers, resulting in the unit costs of the stormwater service for use in developing a fee structure. In the development of unit costs, the actual volume of runoff and pounds of pollutants are less important than the proportion discharged from each land use classification. In this study, estimated runoff and pollutant loads for development of unit costs are defined not in gallons or pounds, but rather in the average discharges from a standard single-family residential lot, and in a thousand square feet (KSF) of land area.

Customer Classifications

The different discharger types for stormwater utility services have been identified using the land use classifications from the County Assessor's Office data. As such, this section assigns stormwater-related pollutant quality and runoff coefficients to different land use classes grouped together into similar classifications for the purposes of equitable utility billing. Moreover, due to the diverse range of single-family lots sizes, that land use type has been divided into two groups, representing standard and large single-family lots.

3.2 Cost Allocations

Table 3-1 allocates the District's stormwater base year budget for FY 2012-13 between runoff (hydrologic) and pollutant (quality-related) activities. As shown, 43 percent of costs are pollutant-related, while the remaining costs are associated with runoff-related stormwater characteristics. While the full O&M budget is used in the analysis, the projected Capital Improvement Program (CIP) expenditures in the base year are replaced with the estimated depreciation for that year. This substitution better represents the average level of annual capital-related costs of the utility for the purposes of the cost of service analysis.

Table 3-1 also identifies program activities directly applicable to residential versus commercial and industrial land use classes, as opposed to those activities generally applicable to all land uses. This information is used in allocating specific costs directly to these classes. This direct allocation is based on the portion of the stormwater activities serving only residential dischargers, such as the residential hazardous waste roundup services, or inspection activities focused on commercial/industrial dischargers. As shown, 72 percent of costs fund general stormwater program activities applicable to all the lots, while 8 percent of the costs are solely applicable to

residential dischargers, and 20 percent are solely applicable to commercial and industrial dischargers.

3.3 Parcel-based Customers

For purposes of developing stormwater discharger classes based on the land uses, the District prepared information on parcel characteristics within the service area boundaries, as defined in the Secured Parcel Rolls as the District's tax rate area. The County records, totaling approximately 41,000 records within the District's tax rate area, contained an Assessor's parcel number, ownership, site address, land use, area and other parcel level information useful to the development of a property-related stormwater fee. This data was cross-referenced by the District's records in the Sungard customer information system. Ninety three percent of the data from both sources were consistent, and the minor differences were used to estimate the correct land uses. Updated stormwater charges must ultimately be based on County or customer-provided data attributes for each individual District account to be used for billing. Table 3-2 provides a tabulated summary of the data. The data used for this analysis is evaluated by customer classification, and is defensible for calculation of charges but does not provide account-level customer attributes required for individual account billings.

3.4 Lot Classifications and Characteristics

The Assessor's land use codes and other parcel characteristics were analyzed by the District in an effort to aggregate land uses with similar stormwater characteristics. The results of the consolidation are shown in Table 3-2. In addition, the single-family parcels were divided into two classes, based on lot area.

The analysis identified approximately 40,100 lots totaling 11,700 acres with 45,900 dwelling units. An additional 873 parcels with 5,003 acres were identified in the District service area, but are not billable. These unbillable areas include city streets and any CalTrans properties, tidal areas, lots without data on ownership or type, and certain governmental parcels.

The single-family residential lots are divided between lots up to 0.24 acres (10,450 square feet (SF), representing a 50 foot by 209 foot area), and lots larger than 0.24 acres. The shift point between a "standard" and large single-family residential lot size is selected to segregate the typical and homogeneous residential lots within the District from the larger single-family lots. The range of single-family residential lot sizes is shown in Figure 3-1 on the following page.

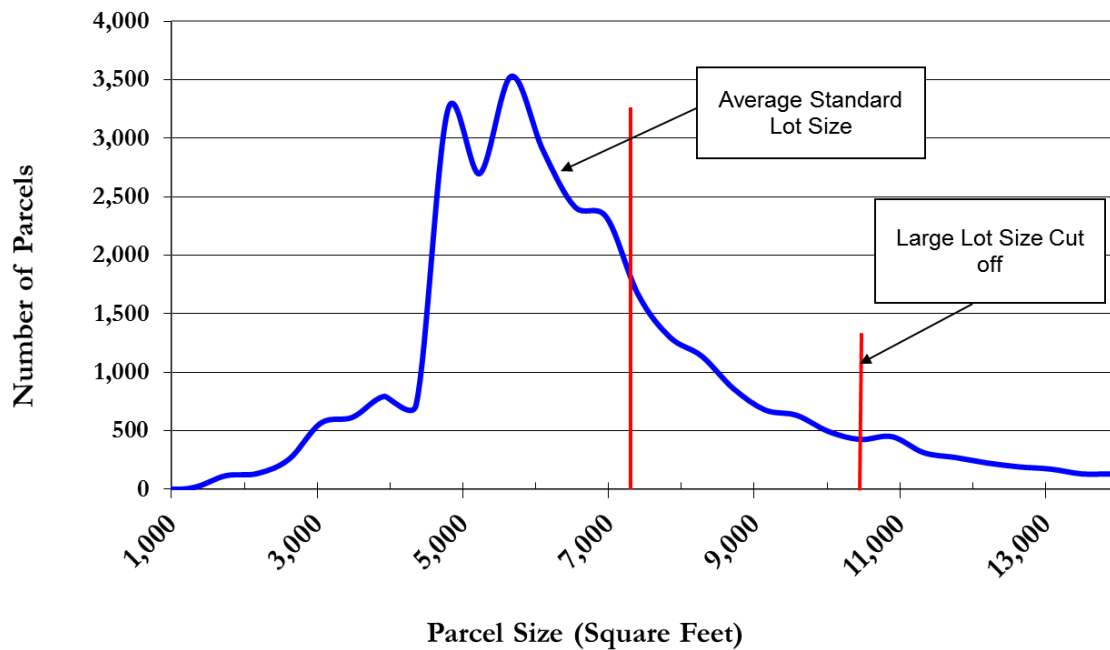


Figure 3-1 Single-family Lot Sizes

Table 3-2 also provides the distribution of the District’s lots based on land use. For the purpose of analyzing land use-based customers, the 26 different billable land uses are consolidated into 10 billing classifications. These are:

- | | | |
|-----------------------------|-----------------|------------------|
| 1. Single-family Standard | 5. Commercial | 8. Institutional |
| 2. Single-family Large | 6. Industrial | 9. Undisturbed |
| 3. Residential High Density | 7. Agricultural | 10. Landscaped |
| 4. Mobile homes | | |

As shown, placing land uses and lot sizes into consolidated classifications simplifies the development of a cost of service analysis. For example, non-residential land use types are consolidated into six classes representing land uses with similar stormwater loading coefficients. In contrast, the existing single-family residential class has been divided into two subclasses. This division is necessitated by the broad range of large residential lot sizes and the differing proportions of impermeable, landscaped, and unimproved areas on each large lot. The residential high density classification includes multi-family dwelling apartment buildings and condominium complexes. Other non-residential parcel classes with complete ownership information are commercial, industrial, agricultural, undisturbed lands and landscaped. The numbers of lots and land areas by these classifications is illustrated in Figure 3-2 on the following page.

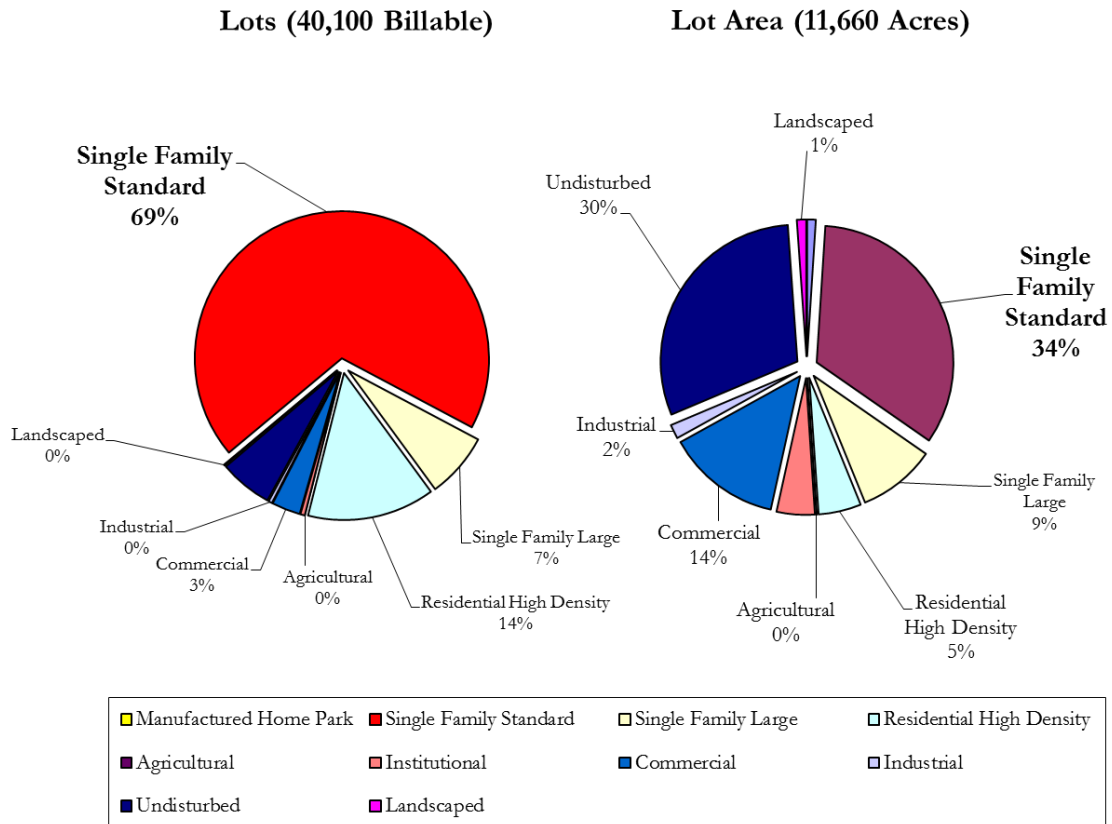


Figure 3-2 Lots and Areas by Classification

Public schools in the institutional class and developed public parks in the landscaped class are available from existing District utility customer databases. However, these tax-exempt lots may lack parcel owner, information, and in some cases may have incorrect land use classifications. See Appendix A for the impact of excluding these lot types from stormwater service billing.

Table 3-3 assigns runoff and quality coefficients to each discharger class. These loading coefficients are cross-referenced with land use types, enabling stormwater program activity costs to be allocated among the different land use types.

3.5 Runoff and Pollution Loading Coefficients

As shown in Table 3-3, information gathered from the District was used to develop runoff coefficients (based on averaged runoff values) for each land use classification.

In addition, the runoff for large residential lots is estimated to have a runoff coefficient equaling that of a combination of single-family, landscaped and undisturbed areas. The residential high density lots are all estimated to have the same high-density urban runoff coefficient. Landscaped areas are primarily irrigated turf, and assumed to have a relatively high 0.5 runoff coefficient, which represents the saturated soil condition from year-round irrigation.

Industrial, commercial, and institutional dischargers are assigned the highest runoff coefficient of 0.95 per unit area. Agricultural land is assigned the lowest runoff coefficient of 0.15. Standard single-family residential lots have a runoff coefficient of 0.70.

Urban stormwater pollution programs are activity driven, and lack direct cross-referencing with particular pollutant loads other than those identified as pollutants of concern in the NPDES permits. However, certain program activities prevent, abate and remediate specific pollutants carried in stormwater runoff. This allows pollutant-related activity costs to be allocated among the different pollutants of concern. Studies regarding the pollutant loads in runoff from differing land use types have provided the technical foundation for allocating the pollutant loads to specific land uses. Thus, like hydraulic loading coefficients, pollutant coefficients cross-referenced with land use types can be developed.

The combination of the two allocations links specific pollutants to specific land uses, and permits pollutant-related costs to be allocated among the different land use types. These quality coefficients by land use type are partially identified in Modeling Stormwater Mass Emissions to the Southern California Bight, Ackerman and Schiff, *Journal of Environmental Engineering*, April 2003. The study was developed from the Southern California Coastal Water Research Project. District staff concluded that the findings developed in the Ackerman study were sufficiently relevant for District lands to be applicable.

Calculations of the pollutant coefficients are provided in Appendix C. Four basic pollutants of concern are used to determine the loadings from each land use type:

- Trash and Solids
- Sediments
- Toxics
- Hydrocarbons

Trash and solid loads are predominately associated with residential, commercial and industrial detritus sediments, like topsoil, and are measured from suspended and settleable solids. Toxics are typically heavy metals, such as copper in brake dust, cadmium, mercury and lead. Hydrocarbons represent the oil and grease loads in runoff flows.

Pollutant load factors have a range of coefficients similar to runoff. However, these coefficients are based on a single-family residential lot having a unitary coefficient of

1.0. As such, other land use types vary from 0.03 units for undisturbed land to 2.78 units for industrial lots.

Using the general cost allocations between runoff and pollutant factors, and the loading factors of each land use, the averaged share of program costs can be allocated to each land use classification. As shown in Table 3-3, the allocations are based on the loading coefficients, and the total lot area of each land use classification, weighted by the stormwater utility costs. The result is that 40 percent of the costs are allocated to single-family standard lots, 7 percent to the larger single-family lots, and 10 percent to undisturbed lots. Note that this allocation does not apply to the 28 percent of utility costs that are directly allocated to specific discharge classes, including residential, commercial and industrial dischargers. These directly allocated costs are addressed in Table 3-4.

Table 3-4 combines the general costs of the utility from the allocations developed in Table 3-3 with the specific costs of each land use class developed previously in Table 3-1. The total equals the base year costs allocated among the billable land use classifications. As provided in Table 3-4, the result is that 33 percent of the cost is allocated to the standard single-family class, 35 percent to commercial lots, and 5 percent to industrial lots.

3.6 Lot Sizes for Residential Dwellings

Table 3-5 lists the different classifications of residential lots within the District, along with the number of dwelling units and the average area for each dwelling unit. As shown, the data indicates that there are approximately 45,900 dwellings on 36,100 lots (with separate owners) in the District.

3.7 Residential Loading Factors

To simplify the fee development process, we have created a standard unit of stormwater loading. This standard unit is based on the stormwater flow and pollutant load from a standard single-family residential lot, and is defined as having 1.0 equivalent residential billing unit (ERBUs). ERBUs are used for development of stormwater fee alternatives in Section 4. In Table 3-6, the number of standard single-family residential ERBUs is set equal to the 27,621 single-family standard lots of that class. The use of ERBUs is consistent with utility ratemaking practices developed by the American Water Works Association for water utility services, and the Water Environment Federation for wastewater utilities.

Calculations in Table 3-6 extrapolate from the standard residential single-family share of ERBUs to the District-wide total loading for runoff and quality (pollutant) allocations, which derives 84,465 total ERBUs in the District. As shown, 57 percent of the District's stormwater-related costs are for collecting, channeling and disposing of runoff, while 43 percent are for preventing or mitigating, pollutant loads in the runoff. It is important to note that with the single-family standard lot discharging

proportionally more runoff than pollutant loads, compared to the other classes, the total number of District-wide pollutant ERBUs is greater than the runoff ERBUs.

In Table 3-7, the number of ERBUs per thousand square feet (KSF) and per acre is developed for each land use class. These values are used to calculate one of several stormwater fee alternatives in Section 4. As shown, the combined stormwater hydraulic and pollutant loads are 7 ERBUs per acre for standard residential single-family lots, which roughly equals the average housing density of this residential class. In contrast, there are 20 ERBUs per acre for industrial land, or three times the loading of residential lots. Also, there are approximately 5 ERBUs per acre for landscaped areas, reflecting the high loads found on those often over-fertilized and over-irrigated lots.

3.8 Comparison of Current versus Equitable Cost Allocations

The current drainage fees are \$1.97 per month to each District account. As a result, the District's current utility service revenues are not based on equitable allocations using the actual loads, but instead are divided equally among all wastewater accounts as a flat fee. Table 3-8 contrasts the equitable cost allocations previously provided in Table 3-4 with the current fee allocations. The inequities illustrated in this comparison are based on the need to bill for stormwater services based on the size and type of each lot, rather than using a flat fee added to each of bill.

As shown, undisturbed lots are currently unbilled, but should be paying 6 percent of the total District costs of stormwater services. Commercial, institutional and industrial lots, although billed under the current charge system, should be together paying for 46 percent of the District's stormwater services, but are actually contributing only 5 percent of the fee revenues. In contrast, community residents fund 95 percent of the District's stormwater service revenues, while only 47 percent of the costs can be equitably billed to these dischargers. Residential high density lots in particular are paying 52 percent more than their equitable rate. The analysis also shows that the 2,900 largest single-family lots serviced by the District should be 41 percent more than their current \$1.97 per month.

**Table 3-1
Runoff and Pollutant Cost Allocations**

Stormwater Activity	Activity		Specific Allocations by Class			Base Year Costs (a)
	Runoff	Pollutant	Residential Parcels	Comm. & Ind. Parcels	All Parcels	
Admin Transfer (Street Sweep, b)	0%	100%	60%	40%	0%	\$135,000
Admin & Finance (Other, b)	57%	43%	0%	0%	100%	\$76,900
Engineering	57%	43%	0%	0%	100%	\$93,749
Field Operations	90%	10%	0%	0%	100%	\$172,792
Environmental Services (c)	0%	100%	20%	80%	0%	\$510,590
Facilities Maintenance	80%	20%	0%	0%	100%	\$124,000
Insurance	57%	43%	0%	0%	100%	\$29,153
Annual Capital Depreciation (d)	80%	20%	0%	0%	100%	\$1,200,000
Total program	57%	43%	8%	20%	72%	\$2,342,184

Drainage Program Allocations						
Runoff (hydrologic) Share			0%	0%	100%	57%
Pollutant (strength) Share			18%	46%	36%	43%
Total			8%	20%	72%	100%
Runoff (hydrologic) Share	\$0	\$0	\$1,328,600	\$1,328,600		
Pollutant (strength) Share	\$183,118	\$462,472	\$367,994	\$1,013,584		
Total	\$183,118	\$462,472	\$1,696,594	\$2,342,184		

a. Base year operating costs are from the FY 2012-13 budget. The capital element is represented with annual depreciation.

b. The Administration budget is \$135,000 for transfers to the City for street sweeping.

c. The Environmental Services budget includes \$96,000 - \$99,000 for permits, licenses, and assessments

Fac. Maint. Is for cleaning of channels and drainage inlets are for hydraulic relief to support runoff flows.

d. Depreciation is used for cost of service evaluations to represent the cost associated with facilities using estimated annual replacement costs.

**Table 3-2
Parcel Classifications and Characteristics**

Parcel Land Use Types			No. of Parcels	Parcel Areas		Dwelling Units
Code	Description	Classification		(Acres)	(Square Feet)	
Single Family Lots						
1000	Lots up to 0.24 Acres (10,450 Sq. Ft.)	Single Family Std	27,621	3,941	171,687,820	27,621
1000	Lots over 0.24 acres (50 by 209 ft)	Single Family Large	2,880	1,078	46,936,771	3,180
Residential Multi-family Apartments & Single Family Condominiums						
1500/2100	Varies	Resid High Density	5,615	590	25,720,002	13,905
Residential Other Classification						
2700	Manufactured Home Park	Resid High Density	16	119	5,189,303	1,170
Total All Residential Uses			36,132	5,729	249,533,896	45,876
Agricultural						
5000	Agricultural	Agricultural	1	6	245,678	
Institutional						
8200/9800	Public School (c)	Commercial	47	377	16,428,654	
8100	Religious Facility	Commercial	145	150	6,541,841	
Total Institutional Properties			192	527	22,970,495	
Commercial Properties						
3300	Mixed Use Commercial & Resident	Commercial	5	0	19,166	
3500	Commercial Sales and Service	Commercial	1,143	1,450	63,157,208	
3800	Hotel, motel	Commercial	31	28	1,231,441	
3400	Gas station	Commercial	60	24	1,043,698	
8300	Hospital	Commercial	14	53	2,322,619	
8700	Clubs and Lodges	Commercial	13	15	639,025	
3100	Marina	Commercial	1	12	531,868	
Total Commercial Properties			1,262	1,582	68,925,859	
Industrial Properties						
4400	Manufacturing/Warehousing (d)	Industrial	161	197	8,576,964	
Vacant/Undeveloped/Undisturbed						
2000	Vacant MFD	Vacant/Undeveloped	96	66	2,884,108	
1100	Vacant residential	Vacant/Undeveloped	620	487	21,223,739	
3000	Vacant commercial	Vacant/Undeveloped	225	533	23,213,995	
9700	Taxable Below Minimum Value (a)	Commercial	1,271	1,209	52,678,850	
4000	Vacant industrial	Vacant/Undeveloped	115	58	2,538,241	
6100	Marshland	Vacant/Undeveloped	6	90	3,906,896	
6400	Range and Watershed	Vacant/Undeveloped	11	1,097	47,765,718	
Total Vacant/Undisturbed			2,344	3,540	154,211,548	
Landscaped						
9800	Public Parks - Developed	Landscaped	21	49	2,123,260	
8400	Cemetery	Landscaped	14	83	3,614,173	
Total Landscaped			35	132	5,737,433	
Total Billable			40,127	11,713	510,201,873	
Areas within District Not Billable - Government, Park & Miscellaneous Parcels						
9800	Government, Park & Miscellaneous (b)	na	873	5,003	217,949,265	
Grand Total District Area			41,000	16,716	728,151,138	

Conversion of Acreage to Square Footage:

43,560

Source: California CAD Solutions, Inc. 31 October 2012. County parcel data. Note that the County does not maintain data on tax-exempt parcels. Mare Island parcels with known parcel attributes are included.

a. The Code 9700 Taxable Below Minimum Value have zero improved values.

b. The Code 9800 Government & Misc parcels have no attributes to identify undeveloped lands vs. improved parklands.

c. Code 9800 parcels identified in the District customer data as school parcels are combined with Code 8200 school lots.

d. A Mare Island parcel of 464 acres is classified herein as commercial sales rather than the County-specified warehousing

Table 3-3
Runoff and Pollutant Load Coefficients

Drainage Class	No. of Parcels	Total Area		Runoff Load		Pollutant Load		Program Cost Weighted Allocations			
		Square Feet	Share	Coeff (a)	Share	Coeff (b)	Share	Runoff	Pollutant	Total	
Mobile home (c)	16	5,189,303	1%	0.80	1%	2.69	2%	1%	0.54%	1%	
Single Family Standard	27,621	171,687,820	34%	0.70	41%	1.00	30%	32%	7%	40%	
Single Family Large (d)	2,880	46,936,771	9%	0.45	7%	0.47	4%	6%	1%	7%	
Residential High Density	5,615	25,720,002	5%	0.80	7%	2.69	12%	5%	3%	7%	
Agricultural	1	245,678	0%	0.15	0%	2.47	0.1%	0.0%	0.0%	0.02%	
Institutional	192	22,970,495	5%	0.95	7%	2.69	11%	6%	2%	8%	
Commercial	1,262	68,925,859	14%	0.95	22%	2.69	33%	17%	7%	23%	
Industrial	161	8,576,964	2%	0.95	3%	3.06	5%	2%	1%	3%	
Undisturbed	2,344	154,211,548	30%	0.20	10%	0.03	1%	8%	0%	10%	
Landscaped	35	5,737,433	1%	0.50	1%	1.75	2%	1%	0%	1%	
Total Billable Discharges	40,127	510,201,873	100%		100%		100%	78%	22%	100%	
Implicit Impermeable Area		295,227,995				Pollutant Area (e)	566,330,851				
								Base Year Allocation Weighting Factor:	\$1,328,600	\$367,994	\$1,696,594
											Costs for Specific Land Use Classes: \$645,590
											FY 2012-13 Annual Cost of Services: \$2,342,184

- a. Source: SDMP, as developed from impervious percentages. Landscaped areas are primarily irrigated turf, and assumed to have a relatively high runoff coefficient, per the USDA Natural Resources Conservation Services. Agricultural runoff is estimated based on tilled soil absorption rates.
- b. The quality load coefficient reflects the estimated pollutant loads per unit area, as detailed in Appendix C.
- c. Mobile homes and residential high density lots are estimated to have the same quality loads.
- d. Single family large lots are over 0.24 Acres (10,450 Sq. Ft.). These lots have a combination of single family and undisturbed areas.
- e. Pollutant Area represents the square footage of area with a single family standard pollutant loading factor (coefficient) of 1.0.

Table 3-4
Costs Allocated Among Dischargers

Drainage Discharge Class	Program-related Activities				FY 2012-13	
	General Costs		Specific Costs (a)		Base Year Costs	Total Share
	Percent	Value	Percent	Value		
Mobile home	1%	\$27,759	1%	\$9,236	\$36,996	2%
Single Family Standard	40%	\$652,407	18%	\$113,518	\$765,925	33%
Single Family Large (b)	7%	\$109,387	2%	\$14,587	\$123,974	5%
Residential High Density	7%	\$137,585	7%	\$45,777	\$183,363	8%
Agricultural	0.02%	\$560	0%	\$0	\$560	0.02%
Institutional	8%	\$138,383	0%	\$0	\$138,383	6%
Commercial	23%	\$415,236	63%	\$405,212	\$820,449	35%
Industrial	3%	\$53,705	9%	\$57,260	\$110,965	5%
Undisturbed	10%	\$142,133	0%	\$0	\$142,133	6%
Landscaped	1%	\$19,438	0%	\$0	\$19,438	0.8%
Total	100%	\$1,696,594	100%	\$645,590	\$2,342,184	100%

a. Refer to Table 3-1 for allocations between general and specific costs, and activity costs.

b. Single family large lots are over 0.24 Acres (10,450 Sq. Ft.).

Table 3-5
Residential Lots and Dwellings

Residential Discharge Class	Parcels	Dwelling Units	Avg. Parcel Area (SF)
Mobile homes	16	1,170	4,435
Single Family Standard (a)	27,621	27,621	6,216
Single Family Large (c)	2,880	3,180	14,760
Residential High Density	5,615	13,905	1,850
Total	36,132	45,876	

Apartment Units per Parcel (b) 5.3

SF: Square Feet

- a. The Single Family Standard units are estimated to equal the number of lots.
- b. The MFD accounts have an estimated 5.3 dwellings per parcel.
- c. Single family large lots are over 0.24 Acres (10,450 Sq. Ft.). There are an estimated 300 additional dwellings on these larger lots.

Table 3-6
Equivalent Residential Billing Units (ERBUs)

Drainage Discharge Class	Activity-based Allocations			Equivalent Residential					
	Base Year Cost of Service (a)			Billing Units (ERBU)					
	Runoff	Pollutants	Total	Runoff	Pollutants	Weighted Average			
Mobile homes	\$18,683	\$18,313	\$36,996	954	1.4%	2,247	1.8%	1,334	1.6%
Single Family Standard	\$540,847	\$225,078	\$765,925	27,621	40.7%	27,621	22.2%	27,621	32.7%
Single Family Large (b)	\$95,052	\$28,922	\$123,974	4,854	7.2%	3,549	2.9%	4,471	5.3%
Residential Multi-family	\$92,597	\$90,766	\$183,363	4,729	7.0%	11,139	9.0%	6,612	7.8%
Agricultural	\$166	\$394	\$560	8	0.0%	48	0.0%	20	0.0%
Institutional	\$98,204	\$40,179	\$138,383	5,015	7.4%	4,931	4.0%	4,990	5.9%
Commercial	\$294,674	\$525,774	\$820,449	15,049	22.2%	64,522	51.9%	29,587	35.0%
Industrial	\$36,669	\$74,296	\$110,965	1,873	2.8%	9,117	7.3%	4,002	4.7%
Undisturbed	\$138,798	\$3,335	\$142,133	7,088	10.4%	409	0.3%	5,126	6.1%
Landscaped	\$12,910	\$6,528	\$19,438	659	1.0%	801	0.6%	701	0.8%
Total	\$1,328,600	\$1,013,584	\$2,342,184	67,851	100%	124,384	100%	84,465	100%
Proportion	57%	43%	100%						

a. Base year operating costs are based on the FY 2012-13 operating budget, plus depreciation.

ERBU: Equivalent Residential Billing Unit represents the drainage loads (flow and pollutants) from a standard single family residential lot.

b. Single family large lots are over 0.24 Acres (10,450 Sq. Ft.).

Table 3-7
Billing Units per Area

Drainage Discharge Class	Total ERBUs	Billable Area (1,000 SF)	ERBUs per KSF	ERBUs per Acre
Mobile homes	1,334	5,189	0.26	11.2
Single Family Standard	27,621	171,688	0.16	7.0
Single Family Large (a)	4,471	46,937	0.10	4.1
Residential High Density	6,612	25,720	0.26	11.2
Agricultural	20	246	0.08	3.6
Institutional	4,990	22,970	0.22	9.5
Commercial	29,587	68,926	0.43	18.7
Industrial	4,002	8,577	0.47	20.3
Undisturbed	5,126	154,212	0.03	1.4
Landscaped	701	5,737	0.12	5.3
Grand Total	84,465	510,202		

ERBU: Equivalent Residential Billing Unit represents the drainage loads (flow and pollutants) from a standard single family residential lot.

KSF: thousand square feet

a. Single family large lots are over 0.24 Acres (10,450 Sq. Ft.).

Table 3-8
Current Versus Equitable Charges

Drainage Discharge Class	Accounts	Current Billing		Equitable Billing Allocations (ERBU)		Rate Increase (Decrease) for Equity
		Dwellings	Percent	Units	Percent	
Residential						
Mobile home	1,170	1,170	2%	1,334	2%	14%
Single Family Standard	27,621	27,621	57%	27,621	33%	0%
Single Family Large (a)	3,180	3,180	7%	4,471	5%	41%
Residential High Density	13,905	13,905	29%	6,612	8%	-52%
Subtotal	45,876	45,876	95%	40,038	47%	
Agricultural (b)	-	-	0%	20	0%	Unbilled
Commercial/Industrial						
Institutional	192		0.4%	4,990	6%	Underbilled
Commercial	2,170		4.5%	29,587	35%	Underbilled
Industrial	161		0.3%	4,002	5%	Underbilled
Subtotal	2,523	2,523	5%	38,579	46%	
Undisturbed (b)	-	-	0%	5,126	6%	Unbilled
Landscaped (b)	-	-	0%	701	1%	Unbilled
Adjustment		(75)				
Total Units	48,399	48,324	100%	84,465	100%	

ERBU: Equivalent Residential Billing Unit represents the drainage loads (flow and pollutants) from a standard single family residential lot.

- a. The single family large unit fee inequity is for the most numerous lot size in that class. A single family lot with an area larger than 10,450 square feet is classified as a large single family lot for stormwater fee purposes. The number of accounts represent sewer service accounts to households.
- b. The agricultural, landscaped and undisturbed lots are currently unbilled.

Section 4

Fee Structure Alternatives

In this section several alternative fee structures are developed, based on the cost of service findings of Section 3. Unlike the full cost calculations of Section 3, the costs and unit rates of Section 4 use the operating revenue requirements of Section 2, which exclude both non-cash based depreciation expenses and capital costs funded from reserves. The fees identified in in this section are based on maintaining the current \$1.97 per month charge to residential single-family customers in standard lots (of up to 10,450 SF), while adjusting all other customer fees to be more equitable.

4.1 Billing Methodology Issues

In California, a community's perception and decision to accept a stormwater fee is a key factor in successfully updating fees. In addition to the issues of billing equity and perceived need for stormwater services, the following issues are part of that decision.

Billing Property-related Services

Stormwater service charges require lot area and land usage information, in addition to the other customer information more typically used for utility billing. This information has been developed by the District, and billing for stormwater services will continue to be a District function. As one alternative, stormwater accounts could be billed using area and land information from the County Assessor's Office, and the bills could be issued from that office, if they offer the option. In that case, no cross-referencing of Assessor and District data would be required for issuing bills. Note that the District has a policy of billing residential tenants of lots, whether they are the owner of record or not. As such, it is preferable that stormwater bills continue to be issued from the District's billing services group.

Flat Fees

Stormwater service charges not requiring lot area and land usage information, such as has been identified for single-family standard lots, can be most easily billed on existing utility bills as a separate line item. In this case, there is no need to use County Assessor information or billing services. With single-family standard lots representing the largest customer group, the administrative advantage of flat fees is significant.

Lots Not Receiving Basic Utility Services

For stormwater discharge customers billed solely on land use, such as undisturbed lots, billing using the Assessor's Office will simplify the billing calculation process when compared to the process of cross-referencing the lot-based data with records from another billing system. These areas typically have no other utility services, and also are not easily identified or billed. Parcel-based billing avoids this problem, as lots not currently billed for other District utility services are simply billed through the County Assessor's Office.

Tax-exempt Stormwater Dischargers

Some tax-exempt parcel records are not maintained by County Assessors. As such, tax-exempt lot customers, including school districts, certain churches, military bases, public parks, government and special district-owned land, may not be easily identified or billed. Billing these dischargers requires independent identification using GIS-based information, and annual billing using the District's utility service-based billing mechanism. Based on some interpretations of the implementing requirements of Proposition 218, for stormwater services to be charged equitably, all lots with drainage should be billed regardless of tax status, just as all buildings receiving sewer services must be billed.

Tax- versus Fee-based Billings

Stormwater fees placed on the County Assessor's Office parcel bills may appear as a tax to many property owners, rather than the proportional service-based fee it actually represents. Public perceptions of taxation could reduce support, and so billing on a utility bill may eliminate the impression of the service being a tax.

Billing Cutoff

It is appropriate to determine a minimum billing cutoff point based on the cost of issuing and collecting a charge for a lot. The objective is to avoid billing of lots when the administrative expense of billing is a significant portion of the total bill. For this reason, a billing cutoff of \$5 per year is recommended for any lot. With a rate of \$23.64 per ERBU in FY 2013-14, the \$5 represents 0.21 ERBUs, or 6,363 square feet of undisturbed lot area.

Billing Credits to Public Schools

Since the 1990's, stormwater discharges from the District have been regulated through a series of National Pollutant Discharge Elimination System permits issued by the San Francisco Regional Water Quality Control Board. There may be future opportunities for Vallejo schools to get billing credits by creating storm water detention facilities on larger school sites that reduce their total and especially their peak runoff flows to the District's storm drains.

4.2 Fee Structure Concepts

The allocated costs and discharger characteristics developed in the prior section are the basis for alternative fee structures. The two criteria to consider in creating an appropriate and effective structure are:

- Capabilities of the billing system(s), including level of detail and accuracy of data used in developing the unit fees; and
- Public policy and community goals on stormwater utility fees, especially with respect to level of equity versus ease of understanding and avoiding customer rate shock.

All fee alternatives use the cost of service-based findings and unit fees. However, the following methodologies are available to recover the costs while emphasizing different philosophies.

Lot Size and Load Coefficient Fees

This basic alternative develops unique bills for each lot, based on lot size and land use type. In this alternative, the unit fees for the runoff and pollutant loads are combined, multiplied by the lot size, and billed to the discharger. The advantage of this method is that it is simple and is consistent with the findings of the cost of service calculations. The disadvantage is that for very large, high runoff or unusual lots, this standard coefficient-based fee may not be reflective of the stormwater burden imposed by that lot on the utility. For this reason, an alternative fee structure based on impervious area may be appropriate for certain special dischargers.

Impervious Area Fees

The second fee alternative uses impervious areas rather than runoff coefficients. Very large lots and land with very high runoff values (typically commercial and industrial) may include some dischargers with unusual circumstances. If so, then inequitable stormwater charges can result when calculated using the standardized runoff coefficient methodology. As an alternative to runoff coefficients, impervious areas can be used to estimate more definitive stormwater runoff volumes. In contrast, the pollutant loading coefficients and calculations in this study are based on gross area, as available from County records. Thus, the disadvantage of this structure is the high cost of determining impervious areas for each lot, so its application can be limited to specific lots with unusual or large areas.

Simplified Fees

Fee structures may be simplified in this third alternative when warranted by the cost of service findings and community needs. The simplifications might include:

- Consolidation of the land use classifications into simplified billing classes;
- Replacing variable fees based on unique lot areas for residential dischargers with a flat fee based on the average lot size; and

- Integrating the pollutant and runoff coefficients together by customer class.

These simplifications can be done equitably if supported by the cost of service findings. For example, if it is possible to average and consolidate the land use classifications into simplified billing classes without a material loss of billing equity, then for ease of customer understanding, administrative convenience and practicality it may be appropriate to do so. As a general rule of thumb, qualified by the accuracy of the data, stormwater bills are equitable when they are plus or minus 10 to 20 percent of the cost of service findings. In a similar fashion, a review of the single-family lot sizes may indicate that a significant majority of these dischargers do not vary materially from an average or standard size. If true, then it may be possible to use flat fee bills for all single-family lots of a specific type. As these lot types can represent a significant portion of a community, an enormous simplification of the billing process is possible when warranted by homogenous lot sizes.

4.3 Basic Fee Units

Table 4-1 develops the basic unit fees per ERBU. These fees are divided between the runoff and quality (pollutant) components, and are projected for FY 2013-14. As shown, using a basic unit fee of \$1.97 (\$23.64 per ERBU-year), the annual fee-based revenues net to \$1.8 million. Most revenues will continue to be collected from the single-family lots, followed by commercial and institutional dischargers. This basic fee consists of \$16.45 per ERBU for runoff loads and \$7.19 per ERBU for pollutant loads. Table 4-1 also allocates the annual fee-based revenue requirements, developed previously in Table 2-2, with each discharger classification, which is determined by dividing the annual revenue requirements by the ERBUs for the runoff- and quality-related components. Based on the recommended \$5 per year (0.21 ERBUs) billing cutoff for any lot, an undisturbed lot of less than 6,450 square feet, and an industrial lot with less than 460 square feet, should not be billed.

4.4 Fee Alternatives

The following describes five “a la carte” fee structure options for billing stormwater costs. Some options can stand-alone (i.e. all customers are addressed in the option) while others must be combined with a second option or part of a second option to create a complete rate structure to cover all customers. Each is fair, and is based on the discharger, and the charges billed. However, each represents a differing philosophy and approach to utility revenue development.

Method 1 – Area-Based Fees

Table 4-2 provides area-based load factors, based on ERBUs. A lot-specific fee is determined by multiplying the load factor (based on ERBUs per KSF) by the area of the lot. This value is then multiplied by the billing rate per ERBU effective for that year to determine a bill. For example, a single family parcel would be charged 0.16 ERBUs per KSF, while a commercial lot would be charged 0.26 ERBUs per KSF.

The fees developed in this option are uniquely calculated for each lot based on the size and type of the lot. The advantage of this method is that the land use-based loading factor, like the lot size, is fixed and never changes. Another benefit of this alternative is that only one value (the unit rate of the ERBU) changes from year to year depending on the total program revenue requirements of that year. The disadvantage is that the loading factor unit, defined as ERBUs per thousand square feet for each land use type, is conceptually difficult to understand, which will block community understanding and acceptance. This method can stand-alone or a portion of it could be combined with another method to create a complete fee structure.

Method 2 - Flat Residential Fees

Method 2 is applicable only to the residential class lots; therefore, it must be combined with another method or portion of a method to account for non-residential customers. The objective of this method is to simplify the residential fees as much as possible. It is based on the concept that a flat unvarying stormwater bill is appropriate within a class of uniform dischargers, like residential single-family lots.

As shown in Table 4-3, with Method 2 the monthly single-family flat fees per lot are \$1.97 for standard single-family standard lots and \$3.06 for large single-family lots. If the two classes of single-family lots are left together, the average fee is \$2.07 per month. Note that combining the two subgroups increases the lower fee by 6 percent, but decreases the higher fee by 44 percent (on average). Based on the Section 4 analysis of single-family large lots, the range of areas for the 2,880 lots is significant, so equity is enhanced if flat fees are not used for this group, and the larger single-family lots are segregated from the standard lots.

Also shown in this table are unit fees for residential high density and mobile home lots, at \$0.94 and \$2.25, respectively. Combined, these high density dwellings average \$1.04 per month per dwelling unit. Based on Assessor's Office data, the relatively few dwellings in the mobile home category have runoff loads equivalent to single-family standard lots. However, data for mobile home parks is frequently inaccurate, and these tenants are better classified with other renters. For administrative convenience, the mobile homes can be combined with the other high density residents.

The advantage of Method 2 is that it is easy to understand and to apply, and equitable for homogenously sized lots, especially if the residential groups are reduced to single-family lots and residential high density. However, disadvantages are:

- Stormwater loads have a causal relationship to the number of dwelling units per lot, so the fee equity is less than perfect. Specifically, residential lot stormwater loads vary based on lot area, while the bills based on dwelling units are fixed.
- This option cannot be applied to non-residential lots; therefore, it must be combined with another option to create a complete rate structure.

Based on Section 3 findings, stormwater service billing equity can be achieved with flat rates applied to single-family standard lots and all residential high density tenants. The single-family large lots should be billed at the higher average rate of that residential subgroup.

Methods 3 and 4 – Runoff and Pollutant Fees

The two alternatives presented in Table 4-4 provide rates per unit area (1,000 square feet). Method 3's unit rates are based on separate runoff and pollutant-related revenue requirements for each land use classification, divided by the total area of each. Based on this methodology, a standard single-family discharger pays \$2.69 plus \$1.12 (Method 3), or \$3.80 total (Method 4) per thousand square feet of lot area. The advantage of Method 3 is that it uses an easily understood concept of unit rates per area, and provides a high level of detail on the runoff and pollutant-related basis of the charge. The primary disadvantage of the method is that few stormwater customers require this level of detail in their billing documentation. The advantage of Method 4 is that it is simple to use and understand, and is similar to sewer utility bills with the different unit rates for different discharger types.

The two-tier calculation method (as described in Method 1) is also provided for both the large single-family lots. As shown, the stormwater fee is based on a rate of \$2.25 per thousand square feet of single family large lot size. This rate is lower than standard single-family lots, based on the concept that large lots have more landscaped and undisturbed areas than smaller residential lots, and thus have proportionally lower loading coefficients.

Also provided in the table is a base year unit runoff fee of \$3.84 per 1,000 square feet of impermeable area and unit pollutant fee of \$1.53 per 1,000 square feet of single-family standard area (area with a 1.0 pollutant coefficient). These unit fees are used to determine appropriate stormwater fees for unique lots independently evaluated by the District. Both methods 3 and 4 are stand-alone methods since all customers are represented.

Method 5 – Billing Classifications

This final method is for simplifying non-residential dischargers into three basic groupings. This simplification is based on the three groups used for the District's non-residential sewer utility dischargers. Group I includes relatively light runoff loads, Group II includes medium runoff load dischargers, and Group III is for the heaviest runoff and pollutant dischargers. The unit rates can be contrasted to the rates shown in Method 4. As shown, the annual unit rates per thousand square feet are \$0.79, \$4.66 and \$10.25 for Groups I, II, and III, respectively. This method must be combined with the residential portion of another method to achieve a complete fee structure.

4.5 Combination of Methods

The following combinations are just some of the possibilities for a complete fee structure that represents all customers in the District.

- Method 1- area-based fees
- Method 2 - flat residential fees plus Method 1 for non-residential lots
- Method 3 - individual runoff and pollutant fees
- Method 4 - combined fee from the runoff and pollutant elements
- Method 2 for residential lots plus Method 3 - individual runoff and pollutant fees for non-residential lots
- Method 2 for residential lots plus Method 4- combined fee from the runoff and pollutant elements for non-residential lots
- Method 2 for residential lots plus Method 5 - billing classifications for non-residential lots
- Method 5 for non-residential lots plus Method 1 for residential lots
- Method 5 for non-residential lots plus Method 3 for residential lots
- Method 5 for non-residential lots plus Method 4 for residential lots

Table 4-1
Projected Unit Fees

Description	Equivalent Residential Parcel Units (ERBU, a)			FY 2013-14 Annual Fee-based Revenues (a)		
	Runoff	Pollutants	Total	Runoff	Pollutants	Total
Allocations				57%	43%	100%
Revenues & ERBUs	67,851	124,384	84,465	\$1,132,648	\$864,093	\$1,996,741
Unit fee (\$/ERBU-Year)	67,851	124,384	84,465	\$16.69	\$6.95	\$23.64
Projected ERBU and fee-based revenues detailed by customer classification (FY 2013-14)						
Residential Mobile home	954	2,247	1,334	\$15,927	\$15,612	\$31,539
Single Family Standard	27,621	27,621	27,621	\$461,079	\$191,882	\$652,960
Single Family Large (b)	4,854	3,549	4,471	\$81,033	\$24,656	\$105,689
Residential High Density	4,729	11,139	6,612	\$78,940	\$77,379	\$156,319
Agricultural	8	48	20	\$141	\$336	\$477
Institutional	5,015	4,931	4,990	\$83,720	\$34,253	\$117,973
Commercial	15,049	64,522	29,587	\$251,214	\$448,229	\$699,443
Industrial	1,873	9,117	4,002	\$31,260	\$63,338	\$94,599
Undisturbed	7,088	409	5,126	\$118,327	\$2,843	\$121,170
Landscaped	659	801	701	\$11,006	\$5,565	\$16,571
Subtotal FY 2013-14	67,851	124,384	84,465	\$1,132,648	\$864,093	\$1,996,741
Less Unbillable New Charges (est., c)						(\$198,118)
Total projected Fee-based revenues						\$1,798,623

Minimum Annual Bill for Area-based Fees	Billing Cutoff Point	ERBUs	ERBUs per KSF	Min. Billable Area (Sq. Ft.)
	Minimum Annual Bill for Area-based Fees	\$5.00	0.21	
Single Family Standard			0.16	1,315
Agricultural			0.08	2,574
Institutional			0.22	974
Commercial			0.43	493
Industrial			0.47	453
Undisturbed			0.03	6,363
Landscaped			0.12	1,731

ERBU: Equivalent Residential Billing Unit represents the drainage loads (flow and pollutants) from a single family residential lot.

- The fee-based revenues include unbillable accounts that are excluded from the projected revenues shown in Chapter 2.
- Single family large lots are over 0.24 Acres (10,450 Sq. Ft.).
- The unbillable new charges represent an adjustment to the future revenues based on a conservative projection on new accounts and updated bills.

Table 4-2
Fee Alternative 1 -- Fees per ERBU

Drainage Discharge Classification	ERBUs per Thousand Square Feet
Residential Mobile home lot	0.26
Single Family Standard	0.16
Single Family Large (a)	0.10
Residential High Density	0.26
Agricultural	0.08
Institutional	0.22
Commercial	0.43
Industrial	0.47
Undisturbed	0.03
Landscaped	0.12
<hr/>	
FY 2013-14 Unit Rate (\$ per ERBU)	Fee
Monthly	\$ 1.97
Annual	\$ 23.64

ERBU: Equivalent Residential Billing Unit represents the drainage loads (flow and pollutants) from a single family residential lot.

a. Any single family lot with an area larger than 10,450 square feet is classified as a large single family lot for stormwater fee purposes.

Table 4-3
Fee Alternative 2 -- Flat Residential Fees

Drainage Discharge Classification	FY 2013-14 Revenue	Units	Flat Fee (\$ per Dwelling Unit)	
			Annual	Monthly
Single Family		Lots		
Standard Lot Size (up to 10,450 Sq. ft.)	\$652,960	27,621	\$23.64	\$1.97
Single Family Large Lot (a)	\$105,689	2,880	\$36.70	\$3.06
Average Single Family Residential	\$758,650	30,501	\$24.87	\$2.07
Residential High Density		Dwellings (a)		
Mobile homes (rate per dwelling unit)	\$31,539	1,170	\$26.96	\$2.25
Residential High Density (rate per dwelling unit)	\$156,319	13,905	\$11.24	\$0.94
Average Residential High Density	\$187,858	15,075	\$12.46	\$1.04

This alternative does not apply to non-residential parcel billing, and does not bill based on lot size.

This alternative must be combined with at least one of the other alternatives.

- a. Any single family lot with an area larger than 10,450 square feet (0.24 acres) is classified as a large single family lot for stormwater fee purposes.

Table 4-4

Fee Alternatives 3 and 4 -- Runoff, Pollutant and Combined Fees per Area

Drainage Discharge Class	FY 2013-14 Revenue Requirement			Total Area (1,000 Square Feet)	Alternative 3 Unit Rates (\$ per 1,000 Sq. Ft.-Yr.)			Alt. 4 Combined
	Runoff	Pollutants	Total		Runoff	Pollutants	Combined	
Mobile home	\$15,927	\$15,612	\$31,539	5,189	\$3.07	\$3.01	\$6.08	
Single Family	\$461,079	\$191,882	\$652,960	171,688	\$2.69	\$1.12	\$3.80	
Single Family Large (a)	\$81,033	\$24,656	\$105,689	46,937	\$1.73	\$0.53	\$2.25	
Residential High Density	\$78,940	\$77,379	\$156,319	25,720	\$3.07	\$3.01	\$6.08	
Agricultural	\$141	\$336	\$477	246	\$0.58	\$1.37	\$1.94	
Institutional	\$83,720	\$34,253	\$117,973	22,970	\$3.64	\$1.49	\$5.14	
Commercial	\$251,214	\$448,229	\$699,443	68,926	\$3.64	\$6.50	\$10.15	
Industrial	\$31,260	\$63,338	\$94,599	8,577	\$3.64	\$7.38	\$11.03	
Undisturbed	\$118,327	\$2,843	\$121,170	154,212	\$0.77	\$0.02	\$0.79	
Landscaped	\$11,006	\$5,565	\$16,571	5,737	\$1.92	\$0.97	\$2.89	
Total	\$1,132,648	\$864,093	\$1,996,741	510,202				
Total Billable Area	295,228	566,331	(1,000 Sq. Ft. of Impermeable or Pollutant Area)					
Special Lot Unit Rate	\$3.84	\$1.53	(\$ per Applicable 1,000 Square Feet)					
	Per Impermeable Surface Ksf Area	Per Std Pollutant Ksf Area (b)						

Unit rates are annual charges.

- a. Any single family lot with an area larger than 10,450 square feet is classified as a large single family lot for stormwater fee purposes.
- b. Pollutant Area represents the square footage of area with a single family standard pollutant loading factor (coefficient) of 1.0. Multiply the unit rate by the appropriate pollutant coefficient and the actual land area to determine the total annual charge.

Table 4-5

Fee Alternative 5 -- Simplified Non-Residential Customer Classifications

Drainage Discharge Class	FY 2013-14 Revenues	Total Accounts	ERBUs	Thousand Square Feet	Fees per 1,000 Sq. Ft.	
					Annual	Monthly
Non-Res Group I Light Runoff Loads	\$121,170	2,344	5,126	154,212	\$0.79	\$0.07
Non-Res Group II Medium Runoff Loads	\$135,022	228	5,712	28,954	\$4.66	\$0.39
Non-Res Group III Heavy Runoff Loads	\$794,041	1,423	33,589	77,503	\$10.25	\$0.85

ERBU: Equivalent Residential Billing Unit represents the drainage loads (flow and pollutants) from a single family residential lot.

Group I Light Runoff Loads: Undisturbed

Group II Medium Loads: Agricultural, Landscaped, and Institutional

Group III Heavy Loads: Commercial and Industrial

This alternative must be combined with at least one other alternative.

Section 5

Recommended Fees

Based on the analysis of this study, and discussions with District staff, we recommend that the District stormwater program fees be based on a combination of Method 2 – Flat Residential Fees, Method 4 – combined fee from the runoff and pollutant elements for special lots, and Method 5 – Billing Classifications for non-residential lots, with a standard fee of \$23.64 per ERBU enacted in FY 2013-14.

5.1 Recommended Fees

The recommended fee structure, as shown in Table 5-1, uses the Method 2 flat fee for all three residential types: standard single family residential (fee per dwelling), single family large lot (fee per lot), and residential high density (fee per dwelling). These groupings have relatively homogenous lot sizes, and a flat fee can be equitably charged to each.

For all remaining (non-residential) lots, the three area-based fee groups identified in Method 5 are recommended. As shown, these FY 2013-14 fees per land use type range from \$0.79 annually per thousand square feet of light runoff load area to \$10.25 for heavy runoff load areas. No annual bill below \$5 is to be issued for any non-residential lot; the minimum lot size cutoff is provided for each billing classification.

Also identified in the recommend fee structure are the unit rates for special lots with unusual runoff (from Method 4). These unit rates are to be used by the District Engineer for developing stormwater fees for unique lots not conforming to the typical lots used to develop this recommended fee structure. For these lots, the Engineer can determine the hydraulic loading fee by multiplying the runoff fee times the effective impermeable area of the lot. The pollutant fee is calculated by multiplying the pollutant base fee by the effective pollutant coefficient for that lot (a single-family standard coefficient is 1.0) times the actual land area. Credits can then be deducted from the combined total fee for any voluntary on-site stormwater load remediation facilities, including grassy swales and detention basins.

Table 5-2 cross-references the County Assessor's Office land use codes with the recommended fee group classifications.

5.2 Comparison with Current Bills

Table 5-3 lists the monthly bills for different lots, which include both flat fees and variable (area-based) fees. For approximately 27,600 standard single-family lots, a flat monthly fee of \$1.97 is projected as unchanged in FY 2013-14. For the 5,600 residential high density accounts, the recommended per dwelling fee is reduced by 47 percent. As such, the average residential property owner with three apartments will see a drop in monthly charges, from \$5.91 to \$3.12.

For the remaining lots within the District fee increases of varying amounts should be expected. There are 2,900 large single-family residential lots; the recommended area-based fees for these parcels will increase to \$3.06 per month from the current \$1.97.

Table 5-3 also provides examples of recommended bills for the three non-residential fee groups, with the projected bills based on the average lot size in each classification. As shown, the typical Group I unimproved lot is currently unbilled. With an average area of approximately 1.5 acres, the recommended bill will be \$4.31 per month. Group II dischargers have medium runoff loads. The average lot has almost three acres, and will have a recommended monthly fee of \$49. Group III dischargers have heavy runoff loads. The average lot has 1 ¼ acres, and will have a monthly fee of \$47. Table 5-4 provides a range of lot sizes for the standard and large single-family lots.

5.3 Fee Protest Procedures

A stormwater billing ordinance should include protocols for fee disputes and requests for runoff mitigation credits. In particular, a significantly increased fee requires a clear and accessible dispute option for dischargers seeking relief from perceived or actual inequities. Protests typically arise when a parcel owner feels the runoff units of the land use classification do not accurately represent the actual conditions of the land, and a review of the bill is needed. The stormwater fee protest protocol would require any discharger seeking a review of their bill to submit a plan of their property with a validated calculation of impervious area. Benefits of this procedure are that:

- It creates a mechanism for fee challenges,
- It is more exact than the runoff-based method, and
- It requires a challenger to substantiate a claim.

As such, frivolous challenges are minimized, while valid claims are equitably addressed.

Protests based on the validity of the hydraulic runoff and quality-related pollutant coefficients cannot be addressed at an account level, as changing the coefficients for one but not all other lots in a land use classification is inequitable. Instead, development of unique impermeability area values for certain lots are required. Moreover, the inclusion of certain land use classes into stormwater billing classifications, shown in Table 5-2, could be subject to adjustment if warranted by new information. Finally, if on-site facilities exist for runoff or pollutant remediation (beyond those facilities required for new construction), then an adjustment of the pollutant load coefficient may be appropriate. It is a common practice to contact the top dischargers of each billing class to verify the appropriateness of the proposed bills, and to provide them with a heads-up to the increases.

5.4 Mitigation Credits

To increase the District's flexibility in equitably billing dischargers on unique lots providing on-site stormwater pollution controls, a mitigation credit protocol can be added to the fee structure. Mitigation credits apply to lots that have on-site, man-made stormwater pollution and/or runoff management facilities. A mitigation credit is justified in that a lot with an on-site voluntarily built stormwater facility will generate less volume and/or less pollutant loads than that lot before the facility is built. These mitigation credits would be of interest to large lot owners, in order to reduce their fee under the proposed billing structure.

Currently any new property development is required to provide stormwater retention and/or pollutant remediation facilities. However, these facilities are to mitigate the impact of new and increased loads from new development. The District is controlling existing stormwater loads with control activities supported by all dischargers communitywide. As such, no credit should be offered to new lots simply complying with District requirements.

The extensive use of flat fees precludes the possibility of credits, as flat fees are simple for the reason that they do not recognize load variations within a class. A credit for a discharger paying a flat fee will contradict the principal behind the flat fee basis, and open the billing method to broad conceptual challenges. Moreover, as a discharger on a flat fee is not likely to build any cost effective mitigation facilities, flat fees should be used only on smaller lots with lower loads. For this reason, credits are not recommended of any dischargers under a flat fee, including single-family standard lots. Calculation of credit values should be based on the unit rates for differing discharge loads developed in Table 3-3.

**Table 5-1
Recommended Fees**

Drainage Discharge Class	Current Fee/Bill	Projection			
		FY 2013-14	FY 2014-15	FY 2015-16	FY 2016-17
Basic Unit Rates					
\$ per Year - ERBU	\$23.64	\$23.64	\$23.64	\$23.64	\$23.64
Base Fees per Dwelling Unit		Fee per Dwelling Unit (\$ per year)			
Residential High Density	\$23.64	\$12.46	\$12.46	\$12.46	\$12.46
Single Family Standard (a)	\$23.64	\$23.64	\$23.64	\$23.64	\$23.64
Single Family Large Lot (a)	\$23.64	\$36.70	\$36.70	\$36.70	\$36.70
Area-based Fees (b)		Fee per Thousand Square Feet (\$ per year)			
Non-Res Group I Light Runoff Loads		\$0.79	\$0.79	\$0.79	\$0.79
Non-Res Group II Medium Runoff Loads		\$4.66	\$4.66	\$4.66	\$4.66
Non-Res Group III Heavy Runoff Loads		\$10.25	\$10.25	\$10.25	\$10.25
Group IV Special (Two-part Rate per 1,000 Square Feet)					
Runoff Fee per Impermeable 1,000 Sq. Ft.		\$3.84	\$3.84	\$3.84	\$3.84
Pollutant Base Fee per 1,000 Sq. Ft. (c)		\$1.53	\$1.53	\$1.53	\$1.53
Minimum Bills (b)					
	Minimum Annual Bill	ERBUs	ERBUs per KSF	Min. Billable Area (Sq. Ft.)	
Minimum Annual Bill	\$5.00	0.21			
Group I Light Runoff Loads			0.03	6,363	
Group II Medium Runoff Loads			0.20	1,072	
Group III Heavy Runoff Loads			0.43	488	

ERBU: Equivalent Residential Billing Unit represents the drainage loads (flow and pollutants) from a single family residential lot. KSF: Thousand square feet.

a. Any single family lot with an area larger than 10,450 square feet is classified as a Single Family Large Lot for stormwater fee purposes.

b. The minimum annual bill for ERBUs of 0.13 and greater is as shown in the table. ERBUs below 0.13 will not be billed.

c. Multiply the pollutant base fee by the appropriate pollutant coefficient (single family standard coefficient is 1.0) and the actual land area to determine the annual pollutant charge.

Table 5-2
Recommended Lot Classifications

County Assessor's Parcel Classification		Recommended	ERBUs per Acre	
Land Use Code	Description	Drainage Classification	Calculated	
1000	Lots up to 0.24 Acres (10,450 Sq. Ft.)	Single Family Standard	7.0	
1000	Lots over 0.24 Acres (50 by 209 ft)	Single Family Large	4.1	
1100	Vacant SFD (undeveloped land)	Group I Light Runoff Loads	1.4	
1500	Single Family Condominiums	Residential High Density	11.2	
2000	Vacant MFD (undeveloped land)	Group I Light Runoff Loads	1.4	
2100	Improved Multiple Residential	Residential High Density	11.2	
2700	Mobile Home Park	Residential High Density	11.2	
3000	Vacant commercial (undeveloped land)	Group I Light Runoff Loads	1.4	
3100	Marina, docks	Group III Heavy Runoff Loads		
3300	Mixed Use Commercial & Resident	Group III Heavy Runoff Loads		
3400	Service station	Group III Heavy Runoff Loads		
3500	Commercial Sales and Service	Group III Heavy Runoff Loads	18.7	
3800	Hotel, motel	Group III Heavy Runoff Loads		
4000	Vacant industrial (undeveloped land)	Group I Light Runoff Loads	1.4	
4400	Manufacturing/Warehousing	Group III Heavy Runoff Loads	20.3	
5000	General	Group II Medium Runoff Loads		
6100	Marshland	Group I Light Runoff Loads		
6400	Range and Watershed	Group I Light Runoff Loads	1.4	
8100	Church	Group II Medium Runoff Loads		
8200	Public School - Developed	Group II Medium Runoff Loads		
8200	Public School - Undeveloped	Group I Medium Runoff Loads		
8300	Hospital	Group III Heavy Runoff Loads		
8400	Cemetery	Group II Medium Runoff Loads		
8700	Clubs and Lodges	Group III Heavy Runoff Loads		
9700	Taxable Below Minimum Value	Not Billable		
9800	Public Parks - Landscaped	Group II Medium Runoff Loads	5.3	
9800	Public School - Developed	Group II Medium Runoff Loads		
9800	Undeveloped	Group I Light Runoff Loads	1.4	
9800	Govern & Misc (excd schools/parks)	Not Billable		
9999	Newly Created Lots	Not Applicable		

			Calculated	Classified
1100	Vacant SFD	Group I Light Runoff Loads	1.4	1.4
2000	Vacant MFD	Group I Light Runoff Loads	1.4	1.4
3000	Vacant commercial	Group I Light Runoff Loads	1.4	1.4
4000	Vacant industrial	Group I Light Runoff Loads	1.4	1.4
6100	Marshland	Group I Light Runoff Loads		1.4
6400	Range and Watershed	Group I Light Runoff Loads	1.4	1.4
9800	Undeveloped	Group I Light Runoff Loads	1.4	1.4
5000	General	Group II Medium Runoff Loads		8.6
8100	Church	Group II Medium Runoff Loads	9.5	8.6
8200/9800	Public School	Group II Medium Runoff Loads	9.5	8.6
8400	Cemetery	Group II Medium Runoff Loads	5.3	8.6
9800	Public Parks - Landscaped	Group II Medium Runoff Loads	5.3	8.6
3100	Marina, docks	Group III Heavy Runoff Loads		18.9
3300	Mixed Use Commercial & Resident	Group III Heavy Runoff Loads		18.9
3400	Service station	Group III Heavy Runoff Loads		18.9
3500	Commercial Sales and Service	Group III Heavy Runoff Loads	18.7	18.9
3800	Hotel, motel	Group III Heavy Runoff Loads		18.9
4400	Manufacturing/Warehousing	Group III Heavy Runoff Loads	20.3	18.9
8300	Hospital	Group III Heavy Runoff Loads		18.9
8700	Clubs and Lodges	Group III Heavy Runoff Loads		18.9
9999	Newly Created Lots	Not Applicable		na
9700	Taxable Below Minimum Value	Not Billable		na
9800	Govern & Misc (excd schools/parks)	Not Billable		na
1500	Single Family Condominiums	Residential High Density	11.2	11.2
2100	Improved Multiple Residential	Residential High Density	11.2	11.2
2700	Mobile Home Park	Residential High Density	11.2	11.2
1000	Lots over 0.24 acres (50 by 209 ft)	Single Family Large	4.1	4.1
1000	Lots up to 0.24 Acres (10,450 Sq. Ft.)	Single Family Standard	7.0	7.0

Table 5-3
Current Versus Proposed Bill Comparison

Classification	Accounts	Current Bill (\$ per Month)	Fee Basis	FY 2013-14 Bill (\$ per Month)	Change
Residential Rates					Percent
Residential High Density (a)	5,631	\$5.91	3 Dwellings	\$3.12	-47%
Single Family Standard	27,621	\$1.97	1 Dwelling	\$1.97	0%
Single Family Large (b)	2,880	\$1.97	1 Lot	\$3.06	55%
Non-residential Rates					Average Bill (\$/month)
			Lot Size (1,000 Sq. Ft.)	Fee (\$/1,000 Sq. Ft.)	
Non-Res Group I Light Runoff Loads	2,344	unbilled	65.8	\$0.07	\$4.31
Non-Res Group II Medium Runoff Loads	228	\$1.97	127.0	\$0.39	\$49.35
Non-Res Group III Heavy Runoff Loads	1,423	\$1.97	54.5	\$0.85	\$46.50

- a. There are an average of 2.8 dwelling units per water meter based account.
- b. The average Single Family Large lot is 14,800 square feet. Any single family lot with an area larger than 10,450 square feet is classified as a large single family lot for stormwater fee purposes. These lots will have a base fee equivalent to non-large lot Single Family customers, plus a fee per 1,000 Sq. Ft. rate over 10,450 Sq. Ft.

Table 5-4
Proposed Single Family Bills

<u>Lot Size Category</u>		<u>Number of Lots</u>	<u>Avg. SF per Lot</u>	<u>Annual Bill</u>
<u>Square Feet</u>	<u>Acres</u>			
Single Family Standard Lot (a)				<u>Flat Fee</u>
0 to 5,000	0 to .11	6,600		
5,001-6,100	.11 to .14	9,100		
Typical Lot Size			7,168	\$23.64
6,101-7,500	.14 to .17	6,400		
7,501-10,450	.17 to .24	5,521		
Subtotal		27,621		
Single Family Large Lot (b)				<u>Tiered Fee</u>
10,451-12,100	.24 to .28	1,279		
12,101-15,000	.28 to .34	800		
Average Large Lot			14,760	\$36.70
15,001+	.34 +	801		
Subtotal		2,880		
Grand Total		30,501		

SF: Square Feet. One acre equals 43,560 square feet.

a. A typical single family lot has a lot area of up to 0.24 acres (10,450 square feet), or 50 by 209 feet.

b. Single family large lots are over 0.24 Acres (10,450 Sq. Ft.). There are an estimated 300 additional dwellings on these larger lots.

Appendix A
School and Parks Fee Subsidy

Appendix A

School & Park Fee Subsidy from Residential Customers

Parcel Land Use Types		No. of Parcels (a)	Parcel Areas		Proposed Fee Class	Annual Fee (\$/ksf, a)	Annual FY 2013- 14
Code	Description		Acres	Square Feet			
8200/9800	Public Schools	47	377	16,428,654	Runoff Loads	\$4.66	\$76,613
9800	Public School - Vacant	115	58	2,538,241	Loads	\$0.79	\$1,994
Subtotal		162	435	18,966,895			\$78,608
9800	Public Parks	21	49	2,123,260	Group II Medium Runoff Loads	\$4.66	\$9,902
Grand Total Schools and Parks Fees		183	484	21,090,155			\$88,509
Total Residential Single and Multi-Family Lot ERBUs							40,038
						Monthly	Annual
Residential Customer Surcharge for Parks & Schools (\$ per ERBU)						\$0.16	\$1.96

ERPU: Equivalent Residential Parcel Unit represents the drainage loads (flow and pollutants) from a single family residential lot; APN: Assessor's Parcel Number

a. Fee per Thousand Square Feet (\$ per year)

Appendix B
Financial Assumptions and 2010 Census
Data

Appendix B-1

Assumptions Used in Financial Calculations

Description	Value
Projected O&M cost inflationary (a)	1.0%
Projected project cost inflation (b)	1.0%
Reserve funds interest earnings (a)	2.0%
Annual growth in billable parcel areas (a)	0.0%

(a) The projected inflationary rates are based on VSFCD salary increases.

(b) Projected annual project cost inflation is based on the 2-year historical average ENR Construction Cost Index.

Appendix B-2
2010 Census Data on Household Population

City of Vallejo Housing Units	Total Occupants	Dwelling Units	PPH	Ratio to SF Std.
Large SF Dwellings (a)	11,215	3,180	3.5	115%
Single Family Detached Dwellings				
1, detached	75,323	24,701	3.0	
1, attached	4,680	1,338	3.5	
Total	80,003	26,039	3.1	100%
SF Dwellings in District (est)		30,801		
Multi-family Residential and Condos Dwellings				
2	3,143	1,299	2.4	
3 or 4	6,196	2,360	2.6	
5 to 9	3,532	2,114	1.7	
10 to 19	2,688	1,736	1.5	
20 or more	5,393	2,252	2.4	
Total	20,952	9,761	2.1	70%
MF Dwellings in District (est)		13,905		
Mobile homes	2,265	1,170	1.9	63%
Total	103,220	36,970	2.8	
Total Dwellings in District (est)		45,876		

District service area extends beyond the City Census area.

PPH: Persons per household

a. The number large dwelling lots is estimated, and the persons per household is estimated at 20 percent higher than the SFD detached PPH.

Appendix C

Stormwater Pollutant Coefficients

Appendix C-1
Stormwater Budget Pollutant Allocation Parameters

Stormwater Budget Activities	Base Year Costs Allocated to Pollutants	Weighted Average Allocation	Hydro- carbons (oil/grease)	Solids (Trash)	Sediment Loads	Toxics (metals/ synthetic organics)	Total Allocation
Street Sweeping	\$135,000	0%	0%	50%	50%	0%	100%
Administration & Finance	\$33,067	100%					100%
Engineering	\$40,312	0%	25%	25%	25%	25%	100%
Field Operations	\$17,279	0%	10%	40%	40%	10%	100%
Environmental Services	\$510,590	0%	15%	40%	20%	25%	100%
Facilities Maintenance	\$24,800	0%		100%			100%
Others & Insurance	\$12,536	100%					100%
Annual Capital Depreciation	\$240,000	0%		100%			100%
Total	\$1,013,584	\$45,603	\$88,394	\$553,526	\$186,608	\$139,453	
Total Allocations		4%	9%	55%	18%	14%	100%
Targeted Pollutant Allocations		0%	9%	57%	19%	14%	100%

The program activities and allocations are based on the best professional judgment of the pollutant remediation for each activity by VSFCDC management, 2012

Appendix C-2

Pollutant Loading Factors by Land Use Type

Land Use	Nutrient Sources			Suspended Solids (Sediments)	Toxics							
	Phosphate	Ammonia	Nitrate		Lead	Cadmium	Chromium	Nickel	Mercury	Zinc	Copper	
Pollutant Loadings (kg/sq km-year)												
Residential	76	57	219	7,340	0.53	0.27	0.15	0.20	0.006	9.27	2.15	
Commercial	103	94	275	11,900	0.77	0.05	0.25	0.40	0.005	33.60	4.39	
Industrial	83	75	287	18,800	1.30	0.10	0.55	0.86	0.014	43.50	6.30	
Agriculture (row crops)	21	50	271	56,400	1.61	0.16	3.85	2.89	0.004	8.28	5.64	
Undisturbed	14	2	51	717	0.02	0.00	0.02	0.02	0.002	0.08	0.13	
Pollutant Load Coefficients (Units per Area)												
				Sediment Average								Toxic Average
Residential	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Commercial	135%	167%	126%	162%	145%	20%	167%	200%	83%	362%	204%	169%
Industrial	109%	132%	131%	256%	245%	37%	367%	430%	233%	469%	293%	296%
Agriculture (row crops)	27%	88%	124%	768%	304%	59%	2567%	1445%	67%	89%	262%	685%
Undisturbed	18%	3%	23%	10%	4%	1%	13%	12%	33%	1%	6%	10%

Source: Modeling Storm Water Mass Emissions to the Southern California Bight, Ackerman and Schiff, Journal of Environmental Engineering, April 2003, Table 7 Flux of Storm Water Runoff Constituents.

Appendix C-3
Pollutant Load Coefficients by Land Use

Land Use	Average Area per DU	Average persons per DU	Average Pop. Density	Hydro-carbons (a)	Solids/ Refuse (a)	Sediment Loads	Toxics	Weighted Average Pollutants
Residential SF Standard	1.0	3.1	1.0	1.0	1.0	1.0	1.0	1.0
Residential Large Parcel (b)	2.4	3.5	0.5	0.5	0.4	0.5	0.6	0.5
High-density Residential (c)	0.3	2.1	2.3	2.3	3.4	1.6	1.7	2.7
Commercial				2.3	3.4	1.6	1.7	2.7
Industrial				2.3	3.4	2.6	3.0	3.1
Landscaped (d)					1.0	1.0	6.8	1.8
Agriculture row crops						7.7	6.8	2.5
Undisturbed						0.1	0.1	0.0
Drainage Program Pollutant Costs				0.1	0.6	0.2	0.1	1.0

(a) The allocations are based on the best professional judgment. Qualitative information indicates that most hydrocarbons and refuse are from improperly disposed waste from households, so the residential coefficients are based on dwelling units per acre.

(b) The large residential area is based on the equal combination of residential standard and undisturbed area loads using areas and population densities per dwelling unit. There are 20 percent more residents in a single family dwelling unit on a large parcel, compared to a standard single family home.

(c) The high-density residential loads are estimated to be similar to commercial loads except for hydrocarbons and solids. There are 28 percent fewer residents in a multi-family dwelling unit, compared to a standard single family dwelling unit.

(d) The landscaped area is based on agricultural loading except for solids and sediments, which are estimated to be the same as single family parcel loads.

Appendix D
Stormwater Fixed Asset Depreciation

Appendix D

Stormwater Fixed Asset Depreciation

Description	Original Cost	Beg Accum. Depr.	Current Yr Depreciation	End Accum. Depr
Asset 4861212801 - SW Land & Improvements	\$691,271	\$15,847	\$3,689	\$19,537
Asset 4861212801 - SW Bldgs & Improvements	\$502,439	\$305,246	\$7,589	\$312,835
Asset 4861212802 - SW Pump Stations	\$11,492,026	\$5,505,897	\$263,982	\$5,769,879
Asset 4861212803 - SW Plant & Facilities	\$5,015,462	\$2,009,058	\$112,588	\$2,121,646
Asset 4861212804 - SW Collection System	\$13,100,484	\$4,108,214	\$271,868	\$4,380,082
Asset 4861212901 - SW Machinery & Equipment	\$1,124,457	\$713,849	\$63,351	\$777,200
Grand totals for all accounts: (490 assets)	\$31,926,139	\$12,658,109	\$723,068	\$13,381,178
Asset 4861212805 - SW Contributed Capital Collection	\$17,976,989	\$7,602,298	\$368,486	\$7,970,784
Average Years of Depeciation			21	
Percent System Depreciated			44%	
Annual Depreciation based on estimated Replacement Cost			\$1,200,000	

Current year depreciation is based on book value; current replacement cost depreciation is approximately 70 percent higher.

Note: The summary-level fixed assets and depreciation used in this analysis is from the FY 2010-11 CAFR.

Assets disposed with Status Codes of "A" or "T" not included totals. Codes that may appear next to the date acquired include: A - Addition, D - Disposal, T - Traded, I - Inactive Method: 1 - BOOK Std Conv Applied Range: 4861212801 - SW: BLDGS & IMPROVEMENTS - 4861212901 - SW: MACHINERY & EQUIPMENT

