## Final Report

## STORMWATER COST ALLOCATION STUDY

### Prepared for the



# City of Portland Bureau of Environmental Services

#### Prepared by

Management Consulting Division



Seattle, Washington

August 23, 2000

## **Stormwater Cost Allocation Study**

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#### Introduction

The Bureau of Environmental Services (BES) operates the City of Portland's (City's) stormwater utility (Utility). The Utility provides a variety of stormwater management functions and is financed primarily through charges to ratepayers, based on the impervious area of certain private properties. Under BES's current rate-making methodology, not all of the impervious area within the City is charged a stormwater fee. Streets and rights-of-way are among the properties that are not billed. The cost of managing stormwater from non-billed properties is recovered from billed property owners.

In early 1999, two City Council members proposed a package of utility rate reform initiatives, designed to:

- increase water conservation,
- reduce burdens on residential rate payers, and
- > provide discounts to ratepayers who manage stormwater on-site.

They also proposed that the stormwater rate be segregated into two components:

- > a transportation component, recognizing the costs to the Utility in managing stormwater from public streets and rights-of-way, and
- > a property runoff component, reflecting the costs the Utility incurs in managing runoff from private properties.

The purpose of this segregation is two-fold. First, the segregation would provide information to customers concerning the nature of costs comprised in the stormwater fee. Secondly, it would provide a cost-based approach for establishing a credit program, whereby a property owner could eliminate all or a portion of the property runoff component if certain criteria for establishment and maintenance of on-site facilities are met.

Based on direction from the full City Council, BES staff developed an estimate of the stormwater management costs associated with public rights-of-way and offered several alternative methods for charging for stormwater management services. The City Council directed BES to prepare stormwater rates based on the existing impervious area method and to develop a stormwater discount program. They further directed BES to engage the services of a consultant to undertake an independent analysis of the relative costs of managing stormwater from private property as compared to public rights-of-way, including an estimate of the cost savings to the stormwater utility that result from on-site stormwater management. Black & Veatch was selected to provide such an independent analysis, and this final report summarizes the conclusions of our study.

## Alternative Methodologies for Allocating Costs to Streets and Public Rights-of-Way

The Utility is responsible for managing both the quantity and quality of stormwater runoff from all properties within the City. However, not all properties within the City pay a stormwater fee. Only private properties with impervious service pay stormwater fees. Streets and public rights-of-way, as well as other properties, such as those with no impervious surface, do not pay fees. The cost of managing runoff from non-billed properties is recovered indirectly through the fees that billed properties pay.

Black & Veatch evaluated alternative methodologies for identifying the approximate costs associated with managing stormwater from private properties and streets/rights-of-way. The following sub-sections describe the assumptions used in our analysis, the methodologies employed, and estimated allocation of costs that result.

#### **Assumptions**

The following general assumptions were employed in conducting our analyses.

- ➤ Our evaluation and calculation of estimated costs is based on BES's draft 2001 rate model and existing policies with regard to the assessment of charges to individual properties.
- ➤ No changes were made to the allocation of costs to other BES service parameters (e.g., sanitary flow, sanitary BOD, etc.). Only costs allocated to "Basic IA" were evaluated further in this study.
- ➤ In order to ensure a fair allocation of costs to related streets/rights-of-way, all properties within the City were included in the analysis (including non-billed properties such as open space).
- Amount of impervious area by customer type was provided to us by BES staff, and is consistent with the quantities used in BES' rate analysis.

### Alternative 1: Allocate Costs Based on Runoff Only

Currently, BES recovers all stormwater-related costs based on billable impervious area. Under Alternative 1, BES would continue to allocate all costs based on impervious area. However, the impervious area of streets/public rights-of-way would be included in the calculation of unit costs in order to estimate costs associated with streets versus billed properties. Since streets/public rights-of-way are exempt from the stormwater fee, such costs would then be allocated back to billed properties in order to calculate the storm-drainage fee.

The result of this approach is shown in Table 1.

Table 1
Allocation of Costs Based on Impervious Area Only
Alternative 1

Customer Classification	Allocated Cost Of Service	% of Total
Billed Property	\$18,393,827	57.67%
Streets/Rights-of-Way	13,499,387	42.33%
Total "Basic"	\$31,893,214	100.00%

As shown, using this approach, Streets/Rights-of-Way are allocated \$13,499,387, or approximately 42 percent, of total costs allocated to the "basic" stormwater fee (excludes costs allocated only to the commercial/industrial customer class). This approach provides the following advantages and disadvantages:

#### Advantages:

- ➤ Easy to understand allocation of costs based on runoff using impervious area as basis for calculating contributions.
- Available data approach requires only the additional knowledge of the total quantity of impervious area for streets/rights-of-way.
- ➤ Consistency builds on assumptions used in establishing rates under current rate methodology.
- ➤ Rate Stability absent a credit program this approach would result in minor to negligible changes in the stormwater fee, since the parameter(s) being used to allocate costs are identical to that used under the current methodology.

#### Disadvantages:

- ➤ Not all properties are represented using this approach, properties with no impervious area would remain exempt from any cost allocation. The costs of serving non-billed property are recovered by billed properties.
- ➤ Equity this methodology does not take into consideration the "type" (quality) of runoff from properties, only the "amount" (quantity).
- ➤ Relationship to proposed credit program this methodology does not take into consideration the value on-site facilities have in controlling not only the amount of runoff from a property, but also the quality of that runoff as it enters receiving streams/bodies of water.

## Alternative 2: Allocate Costs Based on Both Runoff and Pollution Parameters

Since the implementation of the National Pollution Discharge Elimination System (NPDES) permitting requirements, cities such as Portland have incurred increasing costs due in large part to the implementation of programs to address quality-related issues as they relate to stormwater runoff. As the number of programs has increased, so has the need to substantially increase stormwater fees. Most utilities across the country have continued to use impervious area, or some other parameter defined to estimate the amount of runoff from properties, as the criteria for establishing rates. However, impervious area (runoff) is only one factor that now "causes" stormwater utilities to incur costs. There is a need to also evaluate the impact pollutants have on utility costs. Alternative 2 has been developed to provide additional information concerning the allocation of both quantity- and quality-related costs.

#### **Assumptions**

In addition to the assumptions discussed earlier in this report, the following assumptions were used in the development of Alternative 2.

Runoff Coefficients assumed: Impervious Area = 97%
Pervious Area = 20%

- ➤ BES currently combines commercial and industrial customers for purposes of rate design. In order to determine the contribution of commercial and industrial properties with respect to Quality-related costs, it is necessary to separate the class into two separate customer classes in order to apply appropriate pollutant loadings. An assumed split of 80% commercial and 20% industrial was used for this purpose.
- Amount of pervious area for private properties was estimated based on impervious area as provided (see above) and gross area per the City's geographic information system (GIS). For streets/rights-of-way, Portland Department of Transportation data was used since GIS data was incomplete.
- Average rainfall assumed to be 44.23 inches, based on ten-year average ending 1998 (reference: BES Treatment Plant data).

#### Allocation of Costs to "Quantity" and "Quality" Parameters

The first step in completing a more detailed allocation of costs is to identify those costs that are incurred as a result of the amount, or quantity of runoff, and those that are incurred as a result of the Utility's need to manage the type, or quality of runoff. As stated in "Assumptions," above, costs allocated to "Basic IA" under the existing methodology were evaluated further in allocating costs between "Quantity" and "Quality." A review of the allocation of all costs within BES is beyond the scope of this project. Table 2 summarizes the factors used in allocating costs to the service parameters.

Table 2
Allocation of Costs to Service Parameters
Alternative 2

REVENUE REQUIREMENT	QUANTITY	QUALITY
Environmental monitoring and compliance costs <sup>(a)</sup>	10%	90%
WPCL Sampling/Analysis		100%
Regulatory planning and evaluation	10%	90%
Rates and contracts	50%	50%
System planning (b)	72%	28%
Construction Services (b)	72%	28%
Design Services (b)	72%	28%
Engineering Services (b)	72%	28%
Revegetation		100%
Treatment Plant Investigations/Maintenance		100%
Headworks and Effluent	100%	
Sewer Cleaning & Inspection	50%	50%
Drainage Cleaning & Inspection	50%	50%
Collection System O&M – All Other (b) (c)	72%	28%
Bureau Indirect Costs (d)	42.3%	57.7%
Group Indirect Costs (d)	36.1%	63.9%

- (a) All except WPCL Sampling/Analysis.
- (b) Based on split of current plant inventory.
- (c) All except Sewer Cleaning & Inspection and Drainage Cleaning & Inspection.
- (d) Allocated using BES' current methodologies for allocating such costs.

While some flexibility exists when identifying the portion of costs associated with "Quantity" and "Quality" parameters, the above allocations provide a reasonable basis for allocating costs. Based on the above assumptions, the result is an allocation of "Basic IA" costs (i.e., excluding Commercial/Industrial direct assign costs) of \$16,645,017 to Quantity and \$15,248,197 to Quality.

#### Allocation of Quantity-related Costs to Customer Classes

Under Alternative 2, Quantity-related costs continue to be allocated based on the amount of impervious area within the system. As in Alternative 1, the total area for streets/rights-of-way impervious area is included, along with the impervious area of billed properties, in the calculation of unit Quantity-related costs.

#### Allocation of Quality-related Costs to Customer Classes

In general, the use of a property is not a major factor in determining the amount of runoff entering the Utility's system. The primary factor with regard to estimating runoff is the amount of impervious area on the property. However, the amount of pollutants contained

within the runoff can vary substantially depending on the use of the property (e.g., residential, industrial). To better reflect the costs that different types of properties cause the Utility to incur, we developed allocation factors based on a number of pollutants commonly found in runoff. These factors were then used to allocate costs to all customer classes (single family residential, multifamily residential, commercial, industrial, undeveloped, streets/rights-of-way). Costs allocated to undeveloped properties were allocated back to other billed (SF residential, MF residential, commercial, and industrial) properties.

In developing quality-based allocation factors for different types of properties, we evaluated alternative sources of monitoring information. Based on this review, we utilized the median pollutant loadings from "Analysis of Oregon Urban Runoff Water Quality Monitoring Data Collected From 1990 to 1996", prepared for The Oregon Association of Clean Water Agencies (ACWA) by Woodward-Clyde Consultants in June 1997. The report summarized an evaluation of stormwater water quality data for all Oregon communities that were included in Phase I of the Part II NPDES municipal permit program, including the City of Portland. Because the results of monitoring efforts can vary greatly depending on the properties surrounding the monitoring site, it is important to utilize data from the largest sample possible, and to utilize data from sites that reflect, to the extent possible, runoff from a single customer class. Therefore, median values from the ACWA report were used in this study since the number of monitoring sites from Portland were limited. Table 3 summarizes the basic data used to allocate costs to customer classes.

Table 3
Basic Data - Alternative 2

					Units of Service Basic Data (a)						
Customer Classification	Area (d)	Impervious Area	Tota Area (e)	Runoff Coefficient	Total Suspended Solids	5-day Biochemical Oxygen Demand	Total Phosphorus	Total Kjeldahl Nitrogen	Total Zinc	Total Lead	Total Copper
•	1,000 s.f.	acres	acres		mg/l	mg/l	mg/l	mg/l	mg/l	mg/I	mg/l
Billed Property											
SF Residential	341,367	7,837	26,136	43%	43.200	5.800	0.150	0.840	0.069	0.010	0.010
Multi-Family (b)	52,049	1,195	2,809	53%	55.600	7.400	0.210	1.000	0.115	0.026	0.022
Commercial	204,002	4,683	12,387	49%	55.600	7.400	0.210	1.000	0.115	0.026	0.022
Industrial	51,001	1,171	3,354	47%	93.200	18.000	0.380	1.530	0.251	0.021	0.032
Total Billed Property	648,419	14,886	44,686	_							
Non-Billed Property											
Streets/Row	475,881	10,925	16,193	72%	132.400	8,900	0.330	1.510	0.197	0.043	0.028
Vacant (c)	0	0	5,762	20%	24,700	3,700	0.160	0.690	0.012	0.002	0.004
Other (c)	0	0	17,646	20%	24.700	3.700	0.160	0.690	0.012	0.002	0.00
Total Non-Billed Property	475,881	10,925	39,601	_							
Total System	1,124,300	25,811	84,287	_							

mg/l = milligrams per liter.

- (a) Reference: "Analysis of Oregon Urban Runoff Water Quality Monitoring Data Collected from 1990-1996", Oregon Association of Clean Water Agencies, June 1997.
- (b) Multi-family concentrations assumed to be consistent with commercial concentrations.
- (c) Assumed to be open space.
- (d) Reference: BES rate model. Streets/ROW per Portland Department of Transportation. Assumed to be zero for vacant/other. Assumed split of Commercial (80%) and Industrial (20%).
- (e) Reference: City's GIS.

In order to establish Quality-based allocation factors, we utilized the pollutant loadings indicated above, as well as specific Utility information, including customer data and rainfall, in order to calculate estimates of total pollutants entering the system for each customer class. The total pollutant loadings then served as units of service for purposes of allocating Quality-related costs to each customer classes. Total pollutant loadings, by class, were estimated based an empirical methodology termed the Simple Method Formula<sup>1</sup>, as shown in the formula below:

$$L = (A) [(P) (P_i) (R_v) / 12] (C) (6.24 \times 10^{-5})$$

where:

A = total area (square feet)

P = rainfall depth (inches)

 $P_i$  = factor that corrects P for storms that produce no runoff (assumed = 0.90)

 $R_v = \text{runoff coefficient (fraction of rainfall that is converted into runoff)}$ 

12 = conversion factor

C = estimated concentration of the pollutant in urban runoff (mg/l)

 $6.24 \times 10^{-5} = conversion factor$ 

Based on the above formula, data summarized in Table 3, and assumptions stated earlier in this report, estimated total pollutant loadings were measured for each customer class, as presented in Table 4 below.

Table 4
Calculated Pollutant Loadings - Alternative 2

	Calculated Pollutants							
		5-day						
	Total	Biochemical		Total				
	Suspended	Oxygen	Total	Kjeldahl	Total	Total	Total	
	Solids	Demand	Phosphorus	Nitrogen	Zinc	Lead	Copper	Total
<b>Customer Classification</b>	lbs	lbs	lbs	lbs	lbs	lbs	lbs	ibs
Billed Property								
SF Residential	4,384,878	588,710	15,225	85,262	7,004	1,015	1,015	5,083,109
Multi-Family	742,640	98,841	2,805	13,357	1,536	347	294	859,820
Commercial	3,048,491	405,734	11,514	54,829	6,305	1,426	1,206	3,529,506
Industrial	1,320,896	255,109	5,386	21,684	3,557	298	454	1,607,382
Total Billed Property	9,496,905	1,348,394	34,930	175,132	18,402	3,085	2,969	11,079,817
Non-Billed Property								
Streets/Row	13,903,232	934,583	34,653	158,564	20,687	4,515	2,940	15,059,175
Vacant	256,549	38,430	1,662	7,167	125	21	42	303,995
Other	785,676	117,692	5,089	21,948	382	64	127	930,978
Total Non-Billed Property	14,945,457	1,090,706	41,404	187,679	21,193	4,600	3,109	16,294,148
Total System	24,442,362	2,439,100	76,334	362,810	39,596	7,685	6,078	27,373,964

As previously stated, the resulting calculation of pollutant loadings was used to allocate costs to customer classes. Pollutant loadings calculated based on Vacant and Other property categories were spread back to billed property customer classes based on

<sup>&</sup>lt;sup>1</sup> "Controlling Urban Runoff: A Practical Manual for Planning and Designing Urban BMPs," prepared for Washington Metropolitan Water Resources Planning Board. Thomas R. Schueler, July 1987.

impervious area. The resulting allocation of costs by customer class is shown in Table 5 below.

Table 5
Allocated Cost of Service by Customer Class - Alternative 2

Customer Classification	Quantity	Quality	Total
Single Family Residential	\$5,053,871	\$3,193,622	\$8,247,493
Multifamily Residential	770,573	534,168	1,304,741
Commercial/Industrial	3,775,264	3,131,953	6,907,217
Streets/Rights-of-Way	7,045,308	8,388,455	15,433,763
Total "Basic IA"	\$16,645,017	\$15,248,197	\$31,893,214

The above allocations result in an average unit cost of \$14.80 per 1,000 square feet of impervious area for Quantity and \$0.56 per pound, or \$13.56 per 1,000 square feet of impervious area for Quality.

Summarizing further, Table 6 presents the resulting allocation of costs between private property and streets/rights-of-way.

Table 6
Allocation of Costs - Alternative 2

Customer Classification	Allocated Cost Of Service	% of Total
Billed Property	\$16,459,451	51.61%
Streets/Rights-of-Way	15,433,763	48.39%
Total "Basic"	\$31,893,214	100.00%

As shown, using this approach, Streets/Rights-of-Way are allocated \$15,433,763, or approximately 48.4 percent, of total costs allocated to the "Basic IA" stormwater fee (excludes costs allocated only to the commercial/industrial customer class). This approach provides the following advantages and disadvantages:

#### Advantages:

- Equity Provides for better recognition of how/why certain costs are incurred by reflecting both runoff and quality parameters.
- Equity Provides a cost-based method for assessing fees to properties not currently assessed a stormwater fee.
- Easy to Understand While the Alternative 2 methodology is more detailed than Alternative 1, the number of parameters is still manageable, and because the parameters are clear, it is relatively easy to explain.

- ➤ Rate Stability Since all costs continue to be recovered from all billed properties based on impervious surface, revenue stability should be high (absent the potential impact of a credit program).
- > Provides the flexibility to develop quality-based rates in the future (e.g., different fees for different customer classes, based on quality of runoff).

#### Disadvantages:

Data Availability – The methodology relies on the calculation of allocation factors based on existing and previous monitoring efforts by the City and others. Since data collected will depend on the nature of the monitoring site selected, it is important to utilize median values for a number of sites and to use only sites with single customer types reflected. Also, gross property area, in addition to impervious area, is required. This information, however, is readily available from the City's GIS.

#### Alternative 3: Applicability of Stormwater Credit

One of the purposes of identifying the proportionate share of costs between private property and streets/rights-of-way is to provide a cost-based approach for calculating a credit for properties where an on-site system meeting certain criteria is constructed and maintained on the property. Either Alternative 1 or 2 can be used as a basis for establishing such a stormwater credit program. However, there are many direct and indirect costs incurred by the Utility that are fixed in nature, and are incurred whether or not individual properties control runoff and/or pollutants from the property. Such indirect costs include such activities as administration, human resources, training, and business management, among others. In addition, there are certain direct costs that are incurred regardless of the quantity and quality of runoff. These include:

- > Rates & Contracts
- > GIS
- > Regulatory Planning
- > Watersheds
- > ESA

All properties within the City benefit from the successful completion of these activities, regardless of whether or not the property has runoff from the site.

If either Alternative 1 or Alternative 2 were used directly, a portion of these costs would be credited along with all other costs allocated to "private property," causing remaining customers to potentially subsidize customers in the credit program.

System total costs for the above "direct" activities, based on the 2001 draft rate model and the allocation of costs based on Alternative 2, total \$3,036,669, or 9.52 percent of total costs allocated to "Basic IA." Total system costs ("Basic IA") for allocated "indirect" activities total \$6,517,262, or 20.43 percent. More specifically, the sum of these costs comprises about 29.95 percent of the total allocated costs of service ("Basic IA"). In other words, approximately 30 percent of costs allocated to Private Property would be ineligible for a credit. The remaining 70 percent would be eligible for a credit.

Based on this analysis, and using Alternative 2, the following breakdown would apply:

Table 7
Identification of Costs – Eligible for Credit

Private Property – Basic, Eligible	\$11,529,845	36.15%
Private Property – Basic, Ineligible	\$4,929,606	15.46%
Streets/Rights-of-Way	\$15,433,763	48.39%
Total Basic Stormwater	\$31,893,214	100.00%

Therefore, under this scenario, up to 36.15 percent of a customer's total cost could be credited.

#### **Advantages:**

- > Same as Alternative 2
- ➤ Reduces impact to non-credit customers while still providing cost-basis for credit calculation.

#### **Disadvantages:**

- > Same as Alternative 2
- ➤ Because amount of credit is smaller, incentive for customers to construct and maintain optional on-site detention facilities could be reduced.

## **Comparison with Other Utilities**

The information used in this report is intended to be used by BES to establish a maximum level, or "limit" to a potential reduction in rates that a private property owner can achieve under the Clean River Incentives Program. Such credit programs for on-site facilities can be beneficial in providing incentives to customers and/or recognize the impact requirements based on NPDES have on customers. However, the Utility has many fixed costs that need to be recovered regardless of such on-site facilities, at least in the near-term, and therefore, there is a need to balance the desire to provide maximum credit possible while ensuring that non-credit program customers are no adversely impacted.

In 1998-99, Black & Veatch undertook a nationwide survey of stormwater utilities to identify trends in many aspects of stormwater utility financial management. Based on the responses to our request for information, we developed a detailed database that includes over 120 utilities nationwide. Eighteen (18) of the responding utilities serve populations greater than 300,000 people. In conducting this study, we compared the range of potential credits under Alternatives 1, 2, and 3 with practices of these utilities.

Of the 18 utilities, all but two have applied for and received a Phase I NPDES permit. One of the utilities primarily serves a combined sewer area, and therefore has not been required to apply for a stormwater NPDES permit. The other utility indicated that it would be applying for a permit under Phase II.

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Only eight (8) of the 18 utilities allow any kind of credit for private, on-site facilities. For these eight utilities, the range of potential credit varies widely, from a reported "small" to 100 percent. Most utilities, however, reported either a potential range for a credit, depending on criteria met, and/or a maximum credit less than 100 percent. While information concerning participation in credit programs was limited, those who provided such information indicated that very few customers participate in the program. Lack of public information concerning the programs is likely a primary cause for low participation. In addition, the monthly rates for the eight utilities with credits are low in comparison to Portland's rates. For residential customers, fees ranged from \$1.21/month to \$7.09/month. The level of potential credit, due to the level of total fees, could reduce customers' incentive to implement on-site facilities.

#### Value of On-Site Facilities

The second issue addressed as part of this study relates to the value to the Utility of on-site detention facilities. The following section summarizes our review of the issue, alternatives for evaluating the value of facilities, and our conclusions.

As part of BES's stormwater management requirements, it requires new and redeveloped property to construct and maintain on-site facilities that are designed to mitigate the total and/or peak rate of flow as well as the quality of runoff from the property. The purpose of these requirements is to allow development to occur while ensuring that properties "downstream" are not affected by increased amounts of runoff, and to ensure that increased pollutants due to such runoff does not impair receiving waters. To help mitigate the costs to private property owners of such facilities, BES is considering the implementation of a credit program, whereby customers with such facilities could be eligible for a reduction in their total stormwater management fee. It is our understanding that City Council members, as well as others, are interested in understanding the value of such facilities to the Utility.

When evaluating the value of such facilities, it is important to understand what is meant by the term "value." The value of on-site facilities to the Utility is not the actual cost of the facilities (incurred by the private property owner). In addition, it will be different than the value of such facilities to the private property owner (e.g., reduction in fees over the life of the facility, ability to develop property/increase in property value). For the Utility, the value of such facilities relates to the reduction in costs (both operating and capital, as appropriate) that the Utility incurs as a result of such facilities being constructed.

#### Variables to Address in Assessing Value

Many variables need to be considered when evaluating the potential value to the Utility of on-site facilities, including the type of facility constructed, the size of the facility, and the location of the facility within the City.

#### Type of facilities

Detention ponds, retention basins, landscape swales, eco-roofs, roof gardens, landscape planters, porous pavement, and so forth, are examples of the wide variety of facilities that are allowed by the Utility (depending on circumstances). Each type of facility provides varying degrees of pollution reduction, total flow reduction, and reduction in peak rates of flow. The value to the Utility of each will vary depending on how well the facility meets the Utility's objectives for managing stormwater.

#### Size of facilities

The size of the facility constructed will also have an impact on the value to the Utility. Particularly in situations where the facility has been oversized to address other private property runoff, the value of such facilities to the Utility will be greater than if the facility is sized only to handle the runoff from the individual property.

#### Location of facilities

Topography and geology play an important role in determining the value of specific facilities. Within the limits of the City of Portland, there are some areas, such as the combined sewer areas, where reducing the quantity of runoff reaching the hard-piped system could represent a significant cash savings to the City in terms of additional stormwater conveyance capacity that would not have to be constructed. In other areas, such as the Columbia Southshore (drainage districts), or those areas served by effective sumps and drywells, the quantity of runoff is not an issue, but the quality of the runoff that reaches receiving waters is a major concern. The value to the Utility of on-site facilities will therefore also depend on the location in which the facility is being constructed.

#### Approaches for Estimating the Value of On-Site Facilities

Because of the issues discussed above, it is very difficult to provide a single answer to the question of what the value of such facilities are to the Utility. There are, however, two basic methodologies that can be employed to gain a better understanding in general of the value of such facilities. The calculation of the estimated value of on-site facilities would need to be individually assessed in order to obtain a more precise understanding of individual facilities.

#### Average Utility Cost

Based on our analysis of Utility revenue requirements, the cost of managing runoff is approximately \$14.80 per 1,000 square feet per year (excluding costs directly assigned to commercial/industrial class). The cost of managing the quality of stormwater runoff is approximately \$0.56 per pound per year of pollutant removed (excluding C/I direct assign). Therefore, one could calculate the approximate long-term value of such facilities based on assumed levels of runoff managed and quantities of pollutants removed. These costs reflect the average unit costs of service, including both direct and indirect costs, based on the existing total costs of service.

#### **Avoided Cost**

Another common method used in evaluating the value of facilities is to evaluate the extent to which such facilities allow the utility to "avoid" incurring other costs, such as capital costs required to increase the size of the system or install regional facilities. If one looks at each on-site facility individually, the costs that the Utility could avoid in the short-run are most likely very small in relation to the costs to the Utility due to the credit program (reduction in fees and increased expenses to administer). Any cost savings that the Utility achieves could vary greatly depending on the amount of excess capacity existing in the system in the area to be served. However, together, on-site facilities are an integral part of the Utility's Stormwater Comprehensive Plan, and provide a value to the system by allowing the Utility to avoid construction of costly regional facilities or increased capacity over the long-term. Therefore, the true value of on-site facilities needs to be evaluated over the life of the facility.

#### Administrative Cost

One consideration that is often omitted from an evaluation such as this is the cost of administering a program such as a comprehensive credit program. While on-site facilities are routinely required for new development and redevelopment that meets specific criteria, the additional duties of administering a comprehensive credit program results in an increase in many administrative costs. Such costs that will be incurred include, but are not necessarily limited to:

- > Application processing, including a verification of the validity of applications, adjustments to the billing system, customer assistance, etc.
- > Increased time/effort in establishing fees and credits
- > Inspection of facilities to ensure proper maintenance is being accomplished.

Such costs should be deducted from the "value" calculated under any methodology. Even when evaluating the value of facilities over the long-run, it is quite unlikely that the value to the Utility will exceed the amount of the credit provided to the private property owner over the same time period.

#### Conclusions

Based on our review of BES' current cost allocation methodology and City policy objectives with regard to rate design and the proposed credit program, we recommend that the City consider implementing Alternative 3 as described in this report. Implementation of Alternative 3 would provide a cost-based approach to calculating an appropriate credit to private property owners with on-site facilities, while ensuring that owners of such properties retain responsibility for recovery of costs that they, along with all other property owners, for which they are responsible (e.g., street-related costs and certain direct and indirect costs). In addition, Alternative 3 provides a cost-based approach to calculating equitable fees for any properties not currently billed.

In addition to providing a cost-based approach for calculating a credit, the implementation of Alternative 3 would help to minimize the potentially significant

impact implementation of the credit program could have on other customers. This is because most of the Utility's costs are relatively fixed in the near-term, and reductions in revenue due to implementation of the credit program would have to be recovered from remaining customers. Implementation of Alternative 3 helps to ensure that the impact to remaining customers does not include impact due to the shifting of costs that should more appropriately be recovered by properties in the credit program.

While the primary purpose of this report is to provide guidance in establishing a "limit" for a potential rate reduction under the Clean River Incentives Program, Alternative 3 provides a flexible methodology that could be further enhanced in the future if City policy objectives concerning rate design change. First, a specific Quality-based unit rate could be developed by customer class or based on some other allocation criteria using the methodology described in Alternative 2 and used in Alternative 3. Also, while the methodologies described in this report allocate street-related costs back to customer classes based on allocated costs, it is possible to develop specific allocation procedures to use in allocating street-related costs to customer classes, by evaluating further the impact property use has on the need for streets (e.g., vehicle trips). Such a methodology could become quite complicated, and be more costly to implement and maintain, but would provide a cost-based approach for recovering street-related costs. In addition, the recommended methodology would allow the City to either directly recover the costs allocated to streets from the Portland Department of Transportation or recover the costs from another revenue source if desired.

The City, by evaluating the impact of pollution and streets on Utility costs, and implementing a methodology to allow customer education and better identification of such costs, is demonstrating leadership in stormwater financial management. While many stormwater utilities across the country recognize the impact quality-related programs have on their system, and the impact runoff from streets has in contributing to total system costs, few have developed cost allocation and/or rate methodologies that allow them to communicate such information to customers or develop rates that reflect the differences in costs between customer classes.

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