CALIFORNIA URBAN WATER AGENCIES

BMP PERFORMANCE EVALUATION

EXECUTIVE SUMMARY

DRAFT FINAL

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June 16, 1997
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1. Introduction

Under the Memorandum of Understanding Regarding Urban Water Conservation in California (MOU) signatory water suppliers agreed to develop and implement comprehensive conservation Best Management Practices (BMPs) using sound economic criteria and design principles. The MOU identified 16 BMPs. For each BMP, the MOU establishes definitions and implementation schedules. Coverage requirements are specified for some BMP’s. The initial term of the MOU runs from 1991 to 2001. By the end of the initial term, signatory water suppliers are to have implemented or formally exempted themselves from implementing each of the 16 BMPs.

The MOU is now more than halfway through its initial ten-year term, and the majority signatory water suppliers have initiated implementation of most BMPs. The level of implementation has varied considerably across water suppliers, however, and the question of whether signatory water suppliers are fulfilling the terms of the MOU has been raised.

To address this question for its member agencies, California Urban Water Agencies retained M.Cubed to evaluate implementation progress on each of the 16 BMPs for each of its members. This executive summary presents the methods, results, and conclusions of this evaluation. Detailed evaluations for the eleven CUWA agencies evaluated are contained in the master report to be distributed at the June 27, 1997 CUWA Board Meeting.

2. Evaluation Criteria

Agency evaluations are based on the preponderance of evidence in the record. In addition to information from CUWCC Annual Reports, agencies were given the opportunity to submit any relevant information pertaining to BMP implementation. To guide agency data gathering efforts, a data request for BMP-specific information was developed and sent to each CUWA agency. Following initial data gathering and analysis, on-site interviews with agency staff were conducted to verify information and clarify outstanding issues. As discussed in subsequent sections of this summary, evaluation of each BMP addresses implementation requirements, schedules, customer targeting (where appropriate), customer incentives (where appropriate), and coverage requirements.
M.Cubed identified four principle criteria from which to evaluate BMP implementation by CUWA agencies, as follows:

(a) Is the BMP implementation approach at least as effective as the minimum standards set forth by the BMP definition?

(b) Was the BMP initiated in accordance with the implementation schedule set forth by Section B of Exhibit 1 of the MOU; and/or were schedule deviations (i) consistent with the provisions of Section 4.6 of the MOU, and (ii) substantiated by the agency?

(c) Given past implementation, current approach, and future trend, will the agency achieve the coverage requirements set forth by Section C of Exhibit 1 of the MOU by the end of the initial MOU term?

(d) Are agency exemptions (i) consistent with the provisions of Section 4.5 of the MOU, and (ii) substantiated annually by the agency?

Based on the answers to the foregoing questions, we characterized an agency’s BMP implementation progress as shown in Table ES - 1.

Table ES-1. BMP Implementation Progress Evaluation Categories

<table>
<thead>
<tr>
<th>Implementation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Implementing on Schedule</td>
<td>The agency’s implementation approach is considered to be at least as effective as the minimum standards set forth by the BMP definition. The agency initiated the BMP in accordance with its schedule and is on track to satisfy the coverage requirements by the end of the initial MOU term.</td>
</tr>
<tr>
<td>Implementing, Not on Schedule</td>
<td>The agency’s implementation approach is considered to be at least as effective as the minimum standards set forth by the BMP definition. The agency deviated from the implementation schedule, but is on track to satisfy the coverage requirements by the end of the initial MOU term.</td>
</tr>
<tr>
<td>Partially Implementing</td>
<td>The agency’s implementation approach either (i) is not considered to be at least as effective as the minimum standards set forth by the BMP definition; or (ii) is not on track to satisfy the coverage requirements by the end of the initial MOU term.</td>
</tr>
<tr>
<td>Not Implementing</td>
<td>The agency is not implementing the BMP, and has not substantiated an exemption consistent with the provisions of Section 4.5 of the MOU.</td>
</tr>
<tr>
<td>Exempted</td>
<td>The agency is not implementing the BMP, and has annually substantiated an exemption consistent with the provisions of Section 4.5 of the MOU.</td>
</tr>
</tbody>
</table>

The relevance of the above-discussed criterion to the implementation categories shown in the table is summarized in the following subsections.

2.1. **BMP Definitions**

There are 16 BMPs contained in Exhibit 1 of the MOU that signatory water suppliers agree to implement if cost-effective. Each of these BMPs can be thought of as addressing an essential element of a comprehensive urban water conservation program. Table ES-2 lists the 16 BMPs contained in Exhibit 1 of the MOU.

For purposes of evaluating implementation, it is important to recognize that BMP definitions are not prescriptive, but rather provide a minimum standard for conservation program implementation. The MOU states that “a single implementation method for a BMP would not be appropriate for all water suppliers...” but that “any implementation method used should be at least as effective as the methods described” by the BMP definitions.\(^1\) However, the burden-of-proof rests with a signatory water supplier to show that an alternative implementation approach is at least as effective as the approach being recommended by the BMP definition.

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\(^1\) MOU, page 12.
Table ES-2 List of BMPs Contained in Exhibit 1 of MOU

<table>
<thead>
<tr>
<th>BMP No.</th>
<th>BMP Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Residential Interior/Exterior Water Audits</td>
</tr>
<tr>
<td>2</td>
<td>Plumbing, New and Retrofit</td>
</tr>
<tr>
<td>3</td>
<td>Distribution System Water Audits</td>
</tr>
<tr>
<td>4</td>
<td>Metering with Commodity Rates</td>
</tr>
<tr>
<td>5</td>
<td>Large Landscape Water Audits</td>
</tr>
<tr>
<td>6</td>
<td>Landscape Requirements for New and Existing CI/MI Res. Dev.</td>
</tr>
<tr>
<td>7</td>
<td>Public Information</td>
</tr>
<tr>
<td>8</td>
<td>School Education</td>
</tr>
<tr>
<td>9</td>
<td>Commercial, Industrial, Institutional Water Conservation</td>
</tr>
<tr>
<td>10</td>
<td>New Commercial, Industrial, Institutional Water Use Review</td>
</tr>
<tr>
<td>11</td>
<td>Conservation Pricing</td>
</tr>
<tr>
<td>12</td>
<td>Landscape Water Conservation for Single Family Homes</td>
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<tr>
<td>13</td>
<td>Water Waste Prohibition</td>
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<tr>
<td>14</td>
<td>Water Conservation Coordinator</td>
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<tr>
<td>15</td>
<td>Financial Incentives</td>
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<tr>
<td>16</td>
<td>Ultra Low Flush Toilet Replacement</td>
</tr>
</tbody>
</table>

2.2. Implementation Schedules

The evaluation also considered whether an agency initiated the BMPs in accordance with the MOU implementation schedule, and whether an agency is on track to fully implement the BMPs by the end of the initial MOU term.

The MOU recognizes that it would be unrealistic to expect signatory water suppliers to begin implementing all 16 BMPs at once. For this reason implementation was staggered over the first three years of the initial MOU term. BMPs are classified by the MOU as first-year, second-year, and third-year BMPs, connoting the year in which implementation was to be underway in relation to the first year of the initial term of the MOU. The MOU was first signed on September 1, 1991, and for purposes of the MOU, a year runs from September 1 to August 31. Table ES-3 shows the dates by which BMP implementation is to be underway.

Table ES-3. BMP Implementation Schedules Contained in Exhibit 1 of the MOU

<table>
<thead>
<tr>
<th>First Year BMPs: to be implemented by August 31, 1992</th>
</tr>
</thead>
<tbody>
<tr>
<td>2a,b</td>
</tr>
<tr>
<td>3</td>
</tr>
<tr>
<td>7</td>
</tr>
<tr>
<td>8</td>
</tr>
<tr>
<td>13</td>
</tr>
</tbody>
</table>

ES - 4
The MOU also allows for deviation from this implementation schedule. Section 4.6 of the MOU enables signatory water suppliers to deviate from the schedules set forth in Exhibit 1 so long as they substantiate one or more of the following findings:

a) That after a good faith effort to implement the BMP within the time prescribed, implementation is not feasible pursuant to the schedule. However, implementation of this BMP is still required as soon as feasible within the initial term of this MOU as defined in Section 7.1

b) That implementation of one or more BMPs prior to other BMPs will have a more positive effect on conservation or water supplies than will adherence to the schedule.

c) That implementation of one or more Potential BMPs or other conservation measures prior to one or more BMPs will have a positive effect on conservation or water supplies than will adherence to the schedule.²

In regard to when full implementation should be realized, Section B of Exhibit 1 states that “BMPs will be implemented at a level of effort projected to achieve at least the coverages specified in Section C of this Exhibit within the initial ten year term of the MOU.”³ We interpret

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² MOU, page 7.
³ MOU, page 18. Emphasis added.
this to mean that while signatory water suppliers may reprioritize initiation of BMPs, they must be fully implemented or properly exempted by the end of the initial MOU term.

### 2.3. Coverage Requirements

Evaluation of implementation progress also depends on the level of conservation investment or program coverage envisioned by the MOU. Section C of Exhibit 1 contains the coverage requirements for the BMPs. Coverage requirement refers to the level of implementation expected for a BMP by the end of the initial term of the MOU. For example, the coverage requirement for residential audits (BMP 1) is that agencies will audit at least 70% of their top 20% of water users by August 31, 2001. It should be noted that not all BMPs have coverage requirements, but that many do. Table ES-4 presents the coverage requirements listed in Section C of Exhibit 1.

**Table ES-4. Coverage Requirements Specified by Section C of Exhibit 1 of MOU.**

<table>
<thead>
<tr>
<th>BMP No.</th>
<th>BMP Name</th>
<th>Coverage Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Residential Audits</td>
<td>70% of the top 20% of single-family and multi-family accounts to receive an audit by end of initial term.</td>
</tr>
<tr>
<td>2c.</td>
<td>Residential Plumbing Retrofit</td>
<td>75% of pre-1980 single-family accounts and 80% of pre-1980 multi-family accounts to be retrofitted with low-flow devices (other than ULFTs) by end of initial term.</td>
</tr>
<tr>
<td>4.</td>
<td>Metering w/ Commodity Rates</td>
<td>100% of customers metered by end of initial term.</td>
</tr>
<tr>
<td>5.</td>
<td>Large Landscape Audits</td>
<td>100% of sites 3 acres or more to have been offered an audit by end of initial term.</td>
</tr>
<tr>
<td>6.</td>
<td>Landscape Requirements for New and Existing CII/MF Res. Dev.</td>
<td>Ordinances to apply to 100% of new landscape areas by end of initial term.</td>
</tr>
<tr>
<td>9.</td>
<td>CII Water Conservation</td>
<td>70% of the top 20% of pre-1980 institutional accounts. No coverage requirements specified for commercial or industrial accounts.</td>
</tr>
<tr>
<td>16.</td>
<td>ULFT Replacement</td>
<td>Coverage Per Exhibit 6 of the MOU.</td>
</tr>
</tbody>
</table>

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4 We note that the coverage requirement for large landscape audits is somewhat ambiguous. While coverage requirements for other "audit" BMPs are expressed as a number of some target population that accept an audit, the coverage requirement for BMP 5 could be interpreted as either the number of 3+ acre sites offered an audit, or accepting an audit. We have interpreted it to say the number of 3+ acre sites offered an audit.

5 To assess implementation effectiveness, annual program savings were compared to savings that could be attributed to a retrofit-on-resale requirement for the service area. We base this analysis on the methodology presented in Exhibit 6 of the MOU. It is important to emphasize that savings targets using this methodology are net of any savings that would occur naturally due to expected toilet failure and replacement. In other words, the method fully accounts for natural replacement. It is equally important to note that on the agency side, any toilet replacements directly attributable to the agency’s program are counted, including replacements by program participants that would have replaced their toilet regardless of the program (e.g. program free-riders). In this regard, the evaluation favors agen-
There is room for interpreting what it means to be on-track to satisfy BMP coverage requirements by the end of the initial MOU term. The MOU states that BMPs are to be implemented at a level of effort projected to achieve at least the coverage requirements specified in Exhibit 1. It does not, however, speak to the timing of that effort.

With the exception of BMP 16, to assess whether or not an agency is on track to meet a coverage requirement we assume that either (i) a linear extrapolation of its implementation record to date would result in the coverage requirement being satisfied by 2001; or (ii) there is sufficient evidence that the program is being accelerated at a rate sufficient to result in the coverage requirement being satisfied by 2001.

For BMP 16, we rely on Exhibit 6 of the MOU to construct ULFT water savings targets, and measure implementation progress against these targets.

2.4. Exemptions

The fundamental premise behind the MOU is that investments in conservation programs with positive net present value are beneficial to agencies and their customers, and that it is sensible, given constrained budgets, to prioritize these investments in ways that maximize their effectiveness. The MOU’s cost-effectiveness exemption provisions, in combination with the MOU’s scheduling provisions, are the tools by which signatory water suppliers can identify and prioritize implementation of BMPs that will be most effective for their service areas.

Under Section 4.5 of the MOU, signatory water suppliers may exempt themselves from implementing any BMP whenever...
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"a full cost-benefit analysis, performed in accordance with the principles set forth in Exhibit 3, demonstrates that either the program (i) is not cost-effective overall when total program benefits and costs are considered; OR (ii) is not cost-effective to the individual water supplier even after the water supplier has made a good faith effort to share costs with other program beneficiaries."6

In addition to considerations of cost-effectiveness, signatory water suppliers may also exempt themselves from implementation of specific BMPs if either of the following findings applies:

a) Adequate funds are not and cannot reasonably be made available from sources accessible to the water supplier including funds from other entities. However, this exemption cannot be used if a new, less cost-effective water management option would be implemented instead of the BMP for which the water supplier is seeking this exemption.

b) Implementation of the BMP is (i) not within the legal authority of the water supplier; and (ii) the water supplier has made a good faith effort to work with other entities that have the legal authority to carry out the BMP; and (iii) the water supplier has made a good faith effort to work with other relevant entities to encourage the removal of institutional barriers to the implementation of BMPs within its service area.7

Section 4.5 of the MOU states that exemptions must be substantiated annually for as long as they are claimed. Thus, for purposes of evaluating BMP implementation, it is important to remark that the MOU does not allow for (i) unsubstantiated exemption claims; or (ii) one-time exemptions.

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6 MOU, page 7.
7 MOU, page 7.
2.5. Distinction Between Signatory Wholesalers and Retailers

BMP implementation requirements differ between wholesale and retail water suppliers. We interpret the MOU to say that signatory retail water suppliers agree to implement all BMPs for which exemptions are not annually substantiated, but that signatory wholesale water suppliers are not obligated to implement BMPs involving intervention at the retail customer level, except within their own retail service areas. This interpretation derives from Section 3.1 of the MOU, which states:

*No rights, obligations or authorities between wholesale suppliers, retail agencies, cities or other water suppliers are created or expanded by this MOU. Moreover, wholesale water suppliers are not obligated to implement BMPs at the retail customer level except within their own retail service area, if any.*

For purposes of evaluation, we classify the applicability of BMPs to wholesale signatory water suppliers. This classification is shown in Table ES-5.

*Table ES-5. Classification of BMP as they Apply to Signatory Wholesale Water Suppliers*

<table>
<thead>
<tr>
<th>BMP No.</th>
<th>BMP Name</th>
<th>Applies to Wholesaler</th>
<th>Wholesaler May Support</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Residential Interior/Exterior Water Audits</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>2</td>
<td>Plumbing, New and Retrofit</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>3</td>
<td>Distribution System Water Audits</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Metering with Commodity Rates</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>5</td>
<td>Large Landscape Water Audits</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>6</td>
<td>Landscape Requirements for New and Existing CII/MF Res. Dev.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Public Information</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>8</td>
<td>School Education</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>9</td>
<td>CII Water Conservation</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>10</td>
<td>New CII Water Use Review</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>11</td>
<td>Conservation Pricing</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>12</td>
<td>Landscape Water Conservation for SF Homes</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>13</td>
<td>Water Waste Prohibition</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>14</td>
<td>Water Conservation Coordinator</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Financial Incentives</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>16</td>
<td>Ultra Low Flush Toilet Replacement</td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>

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8 MOU, page 4.
As we interpret the MOU, signatory wholesale water suppliers are not obligated to implement BMPs 1, 2, 5, 6, 9, 10, 12, 13, and 16. Most signatory wholesale water suppliers, however, provide some level of implementation support to their retail agency customers for these BMPs. We were requested by CUWA to evaluate the level of support being provided by wholesale member agencies for these BMPs. To do this we characterized support levels as belonging to one of four categories, as described by Table ES-6.

**Table ES-6. Support Categories for BMPs Wholesale Water Suppliers Are Not Obligated to Implement**

<table>
<thead>
<tr>
<th>Extensive Support:</th>
<th>wholesale agency support includes one or more of the following: development, implementation, and operation of all or most of the BMP program for its retail agencies; funding all or most of BMP program costs for retail agencies.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard Support:</td>
<td>wholesale agency support includes one or more of the following: implementation of pilot BMP program; general assistance with development and implementation of the BMP program; provision of marketing and/or other program collateral used by BMP program (e.g. the provision of water conservation kits distributed during home water audits); provision of technical and staff assistance when requested; technical training and workshops in support of BMP program implementation.</td>
</tr>
<tr>
<td>Moderate Support:</td>
<td>wholesale agency support includes one or more of the following: limited and or very general assistance with development and implementation of the BMP program; very limited program funding assistance.</td>
</tr>
<tr>
<td>Negligible Support:</td>
<td>no in-kind or financial assistance; no technical assistance; little or no interaction with retail agency regarding BMP program design, implementation, and monitoring.</td>
</tr>
</tbody>
</table>

In some instances, wholesale water suppliers were found to have gone beyond supporting the implementation efforts of their retail agencies, and to be implementing a BMP on a region-wide basis on behalf of their retail agencies. In these cases, where retail implementation responsibility had been assumed by the regional wholesaler, we evaluate that wholesaler first as though it were not directly responsible for implementing the BMP using the evaluation categories of Table ES-6, and second as though it were directly responsible for implementing the BMP using the evaluation categories of Table ES-1. The first level of evaluation reflects a strict interpretation of the MOU which states that wholesale agencies are not obligated to implement BMPs requiring retail customer interventions. The second level of evaluation reflects CUWA’s desire to have regional programs operated by wholesale agencies assessed as though the regional wholesaler were directly responsible to BMP implementation.
3. Summary of Evaluation Results

Overall, we found CUWA agencies to be generally in compliance with the terms and conditions of the MOU, and to be implementing on schedule most of the BMPs. This is particularly the case for CUWA agencies evaluated as signatory wholesale water suppliers. Compliance with the MOU by CUWA agencies evaluated as signatory retail water suppliers is less even. We attribute this difference to the more extensive compliance requirements for retailers compared to wholesalers.

We found implementation was most uneven for BMPs involving audits, customer rebates, and device distribution. These are BMPs 1 (residential audits), 2 (residential device distribution), 5 (large landscape audits), 9 (CII audits), and 16 (ULFT replacement). Both investment levels and program implementation varied considerably across CUWA agencies for these BMPs. If an agency was found to be partially implementing one of these BMPs, generally it was because the program was not being implemented at a level sufficient to meet the BMP’s coverage requirement by the end of the initial term of the MOU.

Implementation of BMP 16 (ULFT replacement) was very uneven. In all but one instance, we found that agencies were either well over or substantially under their ULFT water savings targets. We did not, however, find evidence supporting the claim that CUWA agencies in southern California are implementing BMP 16, while CUWA agencies in northern California are not. Rather, we found compliance and non-compliance with this BMP in both regions. In terms of overall regional investment in ULFT programs, however, southern California is clearly outpacing northern California.9

Interestingly, we did not find any CUWA agency to be fully implementing BMP 10 (new CII use review), though several agencies have tried to implement the BMP. The problem appears to reside with the BMP definition. Agencies have found it difficult to intervene in the planning and permitting process so that new CII water uses can be effectively reviewed before the building permitting stage is near conclusion.

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9 This is true in both absolute levels and per capita levels of investment.
We also found several agencies to only be partially implementing BMP 13 (water waste prohibitions), which was somewhat unexpected. While all CUWA retail agencies have passed water waste ordinances, not all of these ordinances prohibit the full range of wasteful water uses described by the BMP.

3.1. Summary Tables

Summary tables showing evaluation results for the eleven CUWA agencies are presented below. These tables are organized according to whether the agency was evaluated as a signatory retail or wholesale water supplier.

3.1.1. Summary of Results for Signatory Retail Water Suppliers

Table ES-7 provides the summary of results for CUWA retail agencies. An agency marked with an “I” was found to be implementing the BMP. To ease reporting results, the table does not differentiate agencies found to be implementing on schedule from agencies implementing but not on schedule. In each case, the agency is marked as implementing the BMP. An agency marked with an “PI” was found to be partially implementing the BMP, while an agency marked with an “NI” was found not to be implementing the BMP. No agency was found to have made a valid exemption in accordance with the terms of the MOU for a BMP that was either partially implemented or not implemented at all.

Table ES-7. Summary of Evaluation Results for CUWA Signatory Retail Water Suppliers

<table>
<thead>
<tr>
<th>BMP No.</th>
<th>ACWD</th>
<th>CCWD</th>
<th>San Diego</th>
<th>EBMUD</th>
<th>LADWP</th>
<th>SFWD</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>PI</td>
<td>I</td>
<td>I</td>
<td>PI</td>
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<td>PI</td>
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<td>I</td>
</tr>
<tr>
<td>15</td>
<td>I</td>
<td>I</td>
<td>I</td>
<td>I</td>
<td>I</td>
<td>I</td>
</tr>
</tbody>
</table>

ES - 12
3.1.2. Summary of Results for Signatory Wholesale Water Suppliers

Table ES-8 provides the summary of results for BMPs applicable to CUWA agencies acting as signatory wholesale water suppliers. With the exception of SFPUC, CUWA wholesalers are generally in full compliance with the MOU. SFPUC’s limited compliance with the MOU as a signatory wholesaler is primarily attributable to its master water supply agreement with its retail agencies, which prescribes very specific cost recovery conditions, making it difficult to fund conservation at the wholesale level. It should be noted that many of SFPUC’s retail agencies are signatories to the MOU implementing BMPs.

Table ES-8. Summary of Evaluation Results for BMPs Implemented by CUWA Signatory Wholesale Water Suppliers

<table>
<thead>
<tr>
<th>BMP No</th>
<th>CCWD</th>
<th>CWB MWD</th>
<th>MWD OC</th>
<th>MWD SC</th>
<th>SCVWD</th>
<th>SDCWA</th>
<th>SFPUC</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>I</td>
<td>I</td>
<td>I</td>
<td>I</td>
<td>I</td>
<td>I</td>
<td>I</td>
</tr>
<tr>
<td>4</td>
<td>I</td>
<td>I</td>
<td>I</td>
<td>I</td>
<td>I</td>
<td>I</td>
<td>I</td>
</tr>
<tr>
<td>7</td>
<td>I</td>
<td>I</td>
<td>I</td>
<td>I</td>
<td>I</td>
<td>I</td>
<td>NI</td>
</tr>
<tr>
<td>8</td>
<td>I</td>
<td>I</td>
<td>I</td>
<td>I</td>
<td>I</td>
<td>I</td>
<td>NI</td>
</tr>
<tr>
<td>11</td>
<td>I</td>
<td>I</td>
<td>I</td>
<td>I</td>
<td>I</td>
<td>I</td>
<td>I</td>
</tr>
<tr>
<td>14</td>
<td>I</td>
<td>I</td>
<td>I</td>
<td>I</td>
<td>I</td>
<td>I</td>
<td>NI</td>
</tr>
<tr>
<td>15</td>
<td>I</td>
<td>I</td>
<td>I</td>
<td>I</td>
<td>I</td>
<td>I</td>
<td>NI</td>
</tr>
</tbody>
</table>

Table Key: 1 = Implementing; PI = Partially Implementing; NI = Not Implementing

Overall, we found CUWA wholesale water suppliers to be providing considerable levels of support to retail agencies implementing BMPs. Table ES-9 provides the summary of results for BMPs supported by CUWA agencies acting as signatory wholesale water suppliers. An agency marked with an “E” was found to be providing extensive support to its retail agencies. An agency marked with an “S” was found to be providing standard support, while an agency marked with an “M” was found to be providing moderate support. An agency marked with an “N” was found to be providing negligible support.

Table ES-9. Summary of Evaluation Results for BMPs supported by CUWA Signatory Wholesale Water Suppliers

| BMP No | CCWD | CWB MWD | MWD OC | MWD SC | SCVWD | SDCWA | SFPUC |

ES - 13
In addition to providing regional support, three CUWA wholesale agencies were found to be implementing three BMPs on regionally, on behalf of their retail agencies. At the request of CUWA, these agencies were evaluated as though they were directly responsible for implementing these BMPs. The results are shown in Table ES-10. It should be noted that under the MOU wholesale agencies are not actually directly responsible for implementing these BMPs.

<table>
<thead>
<tr>
<th>BMP No</th>
<th>MWD OC</th>
<th>SDCWA</th>
<th>SCVWD</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>Not Applicable</td>
<td>I</td>
<td>PI</td>
</tr>
<tr>
<td>9</td>
<td>I</td>
<td>I</td>
<td>PI</td>
</tr>
<tr>
<td>16</td>
<td>PI</td>
<td>I</td>
<td>PI</td>
</tr>
</tbody>
</table>

Table ES-10. Summary of Results for BMPs Being Implemented Regionally by CUWA Signatory Wholesale Water Suppliers

**4. Lessons Learned**

A variety of lessons can be drawn from the evaluation of BMP implementation by CUWA agencies. We have divided these lessons into two categories: (1) lessons relevant to MOU compliance; and (2) lessons relevant to a future MOU certification process.

**4.1. Lessons Relevant to MOU Compliance**

**Lesson #1:** Overall, CUWA agencies are mostly in compliance with the MOU. With the exception of SFPUC, which is operating under a master water supply agreement that governs its relationship with its retailers, CUWA wholesalers are in full compliance with the MOU.
CUWA retailers are mostly in compliance with the MOU, and could come into full compliance by accelerating investments in key BMPs, including BMPs 1, 2, and 16.

**Lesson #2:** While there appears to be potential scale and scope economies associated with implementing BMPs at a regional level through a regional wholesaler, coordinating with retail agencies to identify appropriate target populations and implementing programs sufficient to meet regional coverage requirements has proven problematic for some agencies. BMPs implemented at a regional level has produced uneven compliance.

**Lesson #3:** In terms of BMP implementation, BMP 16 (ULFT replacement) is probably the single largest obstacle to full MOU compliance by CUWA agencies. CUWA agencies were found to be either well ahead of their calculated water savings targets (for example, LADWP is more than 300% above target) or well behind (for example, calculated ULFT program savings for EBMUD are 17% of target). Agencies well behind their water savings targets will find it difficult if not impossible to meet the coverage requirement for this BMP by the end of the initial MOU term. Two agencies not meeting the BMP 16 water savings targets - EBMUD and ACWD - while indicating that BMP 16 is not cost-effective for their service areas, have not made any exemption submittals to the CUWCC to support these claims. These agencies will be able to come into compliance if they are able to substantiate their exemption claims.

**Lesson #4:** CUWA agencies that have substantially exceeded their ULFT savings targets should reassess the cost-effectiveness of continuing non-targeted (e.g. resale programs open to anyone who can demonstrate a replacement) ULFT rebate programs at their current scale. This is particularly true for rebate programs operated in regions with a retrofit-on-resale requirement. Non-targeted ULFT rebate programs appear to be prime candidates for program free-ridership, and may not be generating substantial net savings. Non-targeted rebates are most effective when consumers are likely to choose less expensive, less efficient alternatives (for example, a low-efficiency, low cost refrigerator rather than a more expensive, high-efficiency model). Since all toilets sold in California must be rated as 1.6 gpf, this is no longer the case for toilets.
4.2. Lessons Relevant to a Future Certification Program

Lesson #5: The current quality of CUWCC annual reports is not sufficient to support a rigorous evaluation and certification program. We found CUWCC annual reports prepared by CUWA agencies were frequently incomplete, and often had data inconsistencies across years. A supplemental data request, as well as interviews and agency follow-up, were necessary to complete reliable evaluations. By putting greater emphasis on timely, complete, and accurate reporting, and by developing more effective reporting tools for signatory agencies the problem will correct itself. The CUWCC is poised to develop a new reporting database and reporting tools upon completion of its BMP revisions effort, and the risk of losing certification should provide the necessary impetus for better agency reporting.

Lesson #6: The MOU exemption provisions have largely been ignored by CUWA agencies. To the extent that an agency chose not to implement a BMP on grounds of budget or cost-effectiveness, this was not substantiated in a manner consistent with the MOU. As with low-quality reporting, the risk of losing certification for unsubstantiated exemptions should make this a self-correcting problem.

Lesson #7: The line of responsibility drawn by the MOU for BMP implementation between retailer and wholesaler has become blurred. Through our evaluations it was evident that wholesalers and retailers did not always have a clear understanding of their respective roles and responsibilities vis-à-vis the MOU. Clarifying these roles will be a necessary prerequisite to an effective certification program.

Lesson #8: Maintaining consistency in the evaluations across agencies proved to be one of the biggest challenges for this project, and will likely be a significant issue for a CUWCC certification program. Because the MOU does not contain a standardized set of evaluation criteria, and because agencies can implement any given BMP in a variety of ways, there is an extra burden placed on the evaluator to maintain objectivity across evaluations. An agreed to set of evaluation criteria for each BMP will need to be developed prior to implementing a certification program to avoid too much analyst subjectivity entering the evaluations.
Lesson #9: General and/or vague BMP definitions, and the "at least as effective as" clause contained in many BMP definitions, while giving agencies additional implementation flexibility and discretion, also increase the level of subjectivity entering the evaluation. Agencies need to understand this tradeoff when developing a certification program, and strike a balance between implementation flexibility, on the one hand, and evaluation objectivity, on the other.

Lesson #10: Coverage requirements contained in Exhibit 1 of the MOU need to be reassessed prior to implementing a certification program. Several CUWA agencies were unaware of the coverage requirements contained in Section C, and most were unaware of the provision in Section B stating that "BMPs will be implemented at a level of effort projected to achieve at least the coverages specified in Section C of this Exhibit within the initial ten year term of the MOU." In light of this language, several agencies have expressed the concern that the coverage requirements either target the wrong customer groupings, are unachievable, or both. The CUWCC is currently reassessing BMP coverage requirements as part of its BMP revisions effort.
CALIFORNIA URBAN WATER AGENCIES

BMP PERFORMANCE EVALUATION

Final Report

Prepared by
David L. Mitchell
M.Cubed
Wendy Illingworth
Foster Associates, Inc.

July 1997
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July 1997
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1. Introduction

Under the Memorandum of Understanding Regarding Urban Water Conservation in California (MOU) signatory water suppliers agreed to develop and implement comprehensive conservation Best Management Practices (BMPs) using sound economic criteria and design principles. The MOU identified 16 BMPs. For each BMP, the MOU establishes definitions, implementation schedules, and coverage requirements. The initial term of the MOU runs from 1991 to 2001. By the end of the initial term, signatory water suppliers are to have implemented or formally exempted themselves from implementing each of the 16 BMPs.

The MOU is now more than half-way through its initial ten-year term, and the majority signatory water suppliers have initiated implementation of most BMPs. The level of implementation has varied considerably across water suppliers, however, and the question of whether signatory water suppliers are fulfilling the terms of the MOU has been raised.

To address this question for its member agencies, California Urban Water Agencies retained M.Cubed to evaluate implementation progress on each of the 16 BMPs for each of its members. This report presents the methods, results, and conclusions of this evaluation. Sections 2 through 4 provide a summary of our evaluation methods and overall results. Detailed CUWA agency evaluations are contained in sections 5 through 15.

2. Evaluation Criteria

Agency evaluations are based on the preponderance of evidence in the record. In addition to information from CUWCC Annual Reports, agencies were given the opportunity to submit any relevant information pertaining to BMP implementation. To guide agency data gathering efforts, a data request for BMP-specific information was developed and sent to each CUWA agency. Following initial data gathering and analysis, on-site interviews with agency staff were conducted to verify information and clarify outstanding issues. As discussed in subsequent sections of this report, evaluation of each BMP addresses implementation requirements, schedules, customer targeting (where appropriate), customer incentives (where appropriate), and coverage requirements.

M.Cubed identified four principle criterion from which to evaluate BMP implementation by CUWA agencies, as follows:

(a) Is the BMP implementation approach at least as effective as the minimum standards set forth by the BMP definition?

(b) Was the BMP initiated in accordance with the implementation schedule set forth by Section B of Exhibit 1 of the MOU; and/or were schedule deviations (i) consistent with the provisions of Section 4.6 of the MOU, and (ii) substantiated by the agency?

(c) Given past implementation, current approach, and future trend, will the agency achieve the coverage requirements set forth by Section C of Exhibit 1 of the MOU by the end of the initial MOU term?

(d) Are agency exemptions (i) consistent with the provisions of Section 4.5 of the MOU, and (ii) substantiated annually by the agency?

Based on the answers to the foregoing questions, we characterized an agency's BMP implementation progress as shown in Table 2-1.
Table 2-1. BMP Implementation Progress Evaluation Categories

<table>
<thead>
<tr>
<th>Implementation Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Implementing on Schedule</td>
<td>The agency’s implementation approach is considered to be at least as effective as the minimum standards set forth by the BMP definition. The agency initiated the BMP in accordance with its schedule and is on track to satisfy the coverage requirements by the end of the initial MOU term.</td>
</tr>
<tr>
<td>Implementing, Not on Schedule</td>
<td>The agency’s implementation approach is considered to be at least as effective as the minimum standards set forth by the BMP definition. The agency deviated from the implementation schedule, but is on track to satisfy the coverage requirements by the end of the initial MOU term.</td>
</tr>
<tr>
<td>Partially Implementing</td>
<td>The agency’s implementation approach either (i) is not considered to be at least as effective as the minimum standards set forth by the BMP definition; or (ii) is not on track to satisfy the coverage requirements by the end of the initial MOU term.</td>
</tr>
<tr>
<td>Not Implementing</td>
<td>The agency is not implementing the BMP, and has not substantiated an exemption consistent with the provisions of Section 4.5 of the MOU</td>
</tr>
<tr>
<td>Exempted</td>
<td>The agency is not implementing the BMP, and has annually substantiated an exemption consistent with the provisions of Section 4.5 of the MOU.</td>
</tr>
</tbody>
</table>

The relevance of the above discussed criterion to the implementation categories shown in the table is summarized in the following subsections.

2.1 BMP Definitions

There are 16 BMPs contained in Exhibit 1 of the MOU that signatory water suppliers agree to implement if cost-effective. Each of these BMPs can be thought of as addressing an essential element of a comprehensive urban water conservation program. Table 2-2 lists the 16 BMPs contained in Exhibit 1 of the MOU.

For purposes of evaluating implementation, it is important to recognize that BMP definitions are not prescriptive, but rather provide a minimum standard for conservation program implementation. The MOU states that “a single implementation method for a BMP would not be appropriate for all water suppliers...” but that “any implementation method used should be at least as effective as the methods described” by the BMP definitions. However, the burden-of-proof rests with a signatory water supplier to show that an alternative implementation approach is at least as effective as the approach being recommended by the BMP definition.

---

1 MOU, page 12.


Table 2-2 List of BMPs Contained in Exhibit 1 of MOU

<table>
<thead>
<tr>
<th>BMP No.</th>
<th>BMP Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Residential Interior/Exterior Water Audits</td>
</tr>
<tr>
<td>2</td>
<td>Plumbing, New and Retrofit</td>
</tr>
<tr>
<td>3</td>
<td>Distribution System Water Audits</td>
</tr>
<tr>
<td>4</td>
<td>Metering with Commodity Rates</td>
</tr>
<tr>
<td>5</td>
<td>Large Landscape Water Audits</td>
</tr>
<tr>
<td>6</td>
<td>Landscape Requirements for New and Existing CII/MF Res. Dev.</td>
</tr>
<tr>
<td>7</td>
<td>Public Information</td>
</tr>
<tr>
<td>8</td>
<td>School Education</td>
</tr>
<tr>
<td>9</td>
<td>Commercial, Industrial, Institutional Water Conservation</td>
</tr>
<tr>
<td>10</td>
<td>New Commercial, Industrial, Institutional Water Use Review</td>
</tr>
<tr>
<td>11</td>
<td>Conservation Pricing</td>
</tr>
<tr>
<td>12</td>
<td>Landscape Water Conservation for Single Family Homes</td>
</tr>
<tr>
<td>13</td>
<td>Water Waste Prohibition</td>
</tr>
<tr>
<td>14</td>
<td>Water Conservation Coordinator</td>
</tr>
<tr>
<td>15</td>
<td>Financial Incentives</td>
</tr>
<tr>
<td>16</td>
<td>Ultra Low Flush Toilet Replacement</td>
</tr>
</tbody>
</table>

2.2 Implementation Schedules

The evaluation also considered whether an agency initiated the BMPs in accordance with the MOU implementation schedule, and whether an agency is on track to fully implement the BMPs by the end of the initial MOU term.

The MOU recognizes that it would be unrealistic to expect signatory water suppliers to begin implementing all 16 BMPs at once. For this reason implementation was staggered over the first three years of the initial MOU term. BMPs are classified by the MOU as first-year, second-year, and third-year BMPs, connoting the year in which implementation was to be underway in relation to the first year of the initial term of the MOU. The MOU was first signed on September 1, 1991, and for purposes of the MOU, a year runs from September 1 to August 31. Table 2-3 shows the dates by which BMP implementation is to be underway.

The MOU also allows for deviation from this implementation schedule. Section 4.6 of the MOU enables signatory water suppliers to deviate from the schedules set forth in Exhibit 1 so long as they substantiate one or more of the following findings:

a) That after a good faith effort to implement the BMP within the time prescribed, implementation is not feasible pursuant to the schedule. However, implementation of this BMP is still required as soon as feasible within the initial term of this MOU as defined in Section 7.1

b) That implementation of one or more BMPs prior to other BMPs will have a more positive effect on conservation or water supplies than will adherence to the schedule.
c) That implementation of one or more Potential BMPs or other conservation measures prior to one or more BMPs will have a positive effect on conservation or water supplies than will adherence to the schedule.²

<table>
<thead>
<tr>
<th>Table 2-3. BMP Implementation Schedules Contained in Exhibit 1 of the MOU</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>First Year BMPs: to be implemented by August 31, 1992</strong></td>
</tr>
<tr>
<td>2a,b</td>
</tr>
<tr>
<td>3</td>
</tr>
<tr>
<td>7</td>
</tr>
<tr>
<td>8</td>
</tr>
<tr>
<td>13</td>
</tr>
<tr>
<td>14</td>
</tr>
<tr>
<td><strong>Second Year BMPs: to be implemented by August 31, 1993</strong></td>
</tr>
<tr>
<td>2c</td>
</tr>
<tr>
<td>4</td>
</tr>
<tr>
<td>6</td>
</tr>
<tr>
<td>11</td>
</tr>
<tr>
<td>12</td>
</tr>
<tr>
<td>16</td>
</tr>
<tr>
<td><strong>Third Year BMPs: to be implemented by August 31, 1994</strong></td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>5</td>
</tr>
<tr>
<td>9</td>
</tr>
<tr>
<td>10</td>
</tr>
<tr>
<td>11</td>
</tr>
<tr>
<td>15</td>
</tr>
</tbody>
</table>

In regard to when full implementation should be realized, Section B of Exhibit 1 states that "BMPs will be implemented at a level of effort projected to achieve at least the coverages specified in Section C of this Exhibit within the initial ten year term of the MOU."³ We interpret this to mean that while signatory water suppliers may reprioritize initiation of BMPs, they must be fully implemented or properly exempted by the end of the initial MOU term.

### 2.3 Coverage Requirements

Evaluation of implementation progress also depends on the level of conservation investment or program coverage envisioned by the MOU. Section C of Exhibit 1 contains the coverage requirements for the BMPs. Coverage requirement refers to the level of implementation expected for a BMP by the end of the initial term of the MOU. For example, the coverage requirement for residential audits (BMP 1) is that agencies will audit at least 70% of their top 20% of water users by August 31, 2001. It should be noted that not all BMPs have coverage requirements, but that many do. Table 2-4 presents the coverage requirements listed in Section C of Exhibit 1.

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² MOU, page 7.
³ MOU, page 18. Emphasis added.
There is room for interpreting what it means to be on-track to satisfy BMP coverage requirements by the end of the initial MOU term. The MOU states that BMPs are to be implemented at a level of effort projected to achieve at least the coverage requirements specified in Exhibit 1. It does not, however, speak to the timing of that effort.

With the exception of BMP 16, to assess whether or not an agency is on track to meet a coverage requirement we assume that either (i) a linear extrapolation of its implementation record to date would result in the coverage requirement being satisfied by 2001; or (ii) there is sufficient evidence that the program is being accelerated at a rate sufficient to result in the coverage requirement being satisfied by 2001.

For BMP 16, we rely on Exhibit 6 of the MOU to construct ULFT water savings targets, and measure implementation progress against these targets.

---

4 We note that the coverage requirement for large landscape audits is somewhat ambiguous. While coverage requirements for other "audit" BMPs are expressed as a number of some target population that accept an audit, the coverage requirement for BMP 5 could be interpreted as either the number of 3+ acre sites offered an audit, or accepting an audit. We have interpreted it to say the number of 3+ acre sites offered an audit.

5 To assess implementation effectiveness, annual program savings were compared to savings that could be attributed to a retrofit-on-resale requirement for the service area. We base this analysis on the methodology presented in Exhibit 6 of the MOU. It is important to emphasize that savings targets using this methodology are net of any savings that would occur naturally due to expected toilet failure and replacement. In other words, the method fully accounts for natural replacement. It is equally important to note that on the agency side, any toilet replacements directly attributable to the agency's program are counted, including replacements by program participants that would have replaced their toilet regardless of the program (e.g., program free-riders). In this regard, the evaluation favors agencies, since it nets out natural replacement from the targets, but not from meeting the targets. The spreadsheet model used to calculate program savings and targets was distributed to each evaluated agency. Prior to finalizing this evaluation, the model was submitted to A & N Technical Services, who authored Exhibit 6, for review and validation. The model was deemed by A & N Technical Services to be consistent with Exhibit 6 requirements.
2.4 Exemptions

The fundamental premise behind the MOU is that investments in conservation programs with positive net present value are beneficial to agencies and their customers, and that it is sensible, given constrained budgets, to prioritize these investments in ways that maximize their effectiveness. The MOU’s cost-effectiveness exemption provisions, in combination with the MOU’s scheduling provisions, are the tools by which signatory water suppliers can identify and prioritize implementation of BMPs that will be most effective for their service areas.

Under Section 4.5 of the MOU, signatory water suppliers may exempt themselves from implementing any BMP whenever

"a full cost-benefit analysis, performed in accordance with the principles set forth in Exhibit 3, demonstrates that either the program (i) is not cost-effective overall when total program benefits and costs are considered; OR (ii) is not cost-effective to the individual water supplier even after the water supplier has made a good faith effort to share costs with other program beneficiaries."

In addition to considerations of cost-effectiveness, signatory water suppliers may also exempt themselves from implementation of specific BMPs if either of the following findings applies:

a) **Adequate funds are not and cannot reasonably be made available from sources accessible to the water supplier including funds from other entities. However, this exemption cannot be used if a new, less cost-effective water management option would be implemented instead of the BMP for which the water supplier is seeking this exemption.**

b) **Implementation of the BMP is (i) not within the legal authority of the water supplier; and (ii) the water supplier has made a good faith effort to work with other entities that have the legal authority to carry out the BMP; and (iii) the water supplier has made a good faith effort to work with other relevant entities to encourage the removal of institutional barriers to the implementation of BMPs within its service area.**

Section 4.5 of the MOU states that exemptions must be substantiated annually for as long as they are claimed. Thus, for purposes of evaluating BMP implementation, it is important to remark that the MOU does not allow for (i) unsubstantiated exemption claims; or (ii) one-time exemptions.

2.5 Distinction Between Wholesalers and Retailers

BMP implementation requirements differ between wholesale and retail water suppliers. We interpret the MOU to say that signatory retail water suppliers agree to implement all BMPs for which exemptions are not annually substantiated, but that signatory wholesale water suppliers are not obligated to implement BMPs involving intervention at the retail customer level, except within their own retail service areas. This interpretation derives from Section 3.1 of the MOU, which states:

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6 MOU, page 7.
7 MOU, page 7.
No rights, obligations or authorities between wholesale suppliers, retail agencies, cities or other water suppliers are created or expanded by this MOU. Moreover, wholesale water suppliers are not obligated to implement BMPs at the retail customer level except within their own retail service area, if any. 

For purposes of evaluation, we classify the applicability of BMPs to wholesale signatory water suppliers. This classification is shown in Table 2-5.

Table 2-5. Classification of BMP as they Apply to Signatory Wholesale Water Suppliers

<table>
<thead>
<tr>
<th>BMP No.</th>
<th>BMP Name</th>
<th>Applies to Wholesaler</th>
<th>Wholesaler May Support</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Residential Interior/Exterior Water Audits</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Plumbing, New and Retrofit</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Distribution System Water Audits</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Metering with Commodity Rates</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Large Landscape Water Audits</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Landscape Requirements for New and Existing CII/MF Res. Dev.</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Public Information</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>School Education</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>CII Water Conservation</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>New CII Water Use Review</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Conservation Pricing</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Landscape Water Conservation for SF Homes</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Water Waste Prohibition</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Water Conservation Coordinator</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Financial Incentives</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Ultra Low Flush Toilet Replacement</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

As we interpret the MOU, signatory wholesale water suppliers are not obligated to implement BMPs 1, 2, 5, 6, 9, 10, 12, 13, and 16. Most signatory wholesale water suppliers, however, provide some level of implementation support to their retail agency customers for these BMPs. We were requested by CUWA to evaluate the level of support being provided by wholesale member agencies for these BMPs. To do this we characterized support levels as belonging to one of four categories, as described by Table 2-6.

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MOU, page 4.
Table 2-6. Support Categories for BMPs Wholesale Water Suppliers Are Not Obligated to Implement

<table>
<thead>
<tr>
<th>Support Level</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extensive Support:</td>
<td>Wholesale agency support includes one or more of the following: development, implementation, and operation of all or most of the BMP program for its retail agencies; funding all or most of BMP program costs for retail agencies.</td>
</tr>
<tr>
<td>Standard Support:</td>
<td>Wholesale agency support includes one or more of the following: implementation of pilot BMP program; general assistance with development and implementation of the BMP program; provision of marketing and/or other program collateral used by BMP program (e.g. the provision of water conservation kits distributed during home water audits); provision of technical and staff assistance when requested; technical training and workshops in support of BMP program implementation.</td>
</tr>
<tr>
<td>Moderate Support:</td>
<td>Wholesale agency support includes one or more of the following: limited and or very general assistance with development and implementation of the BMP program; very limited program funding assistance.</td>
</tr>
<tr>
<td>Negligible Support:</td>
<td>No in-kind or financial assistance; no technical assistance; little or no interaction with retail agency regarding BMP program design, implementation, and monitoring.</td>
</tr>
</tbody>
</table>

In some instances, wholesale water suppliers were found to have gone beyond supporting the implementation efforts of their retail agencies, and to be implementing a BMP on a region-wide basis on behalf of their retail agencies. In these cases, where retail implementation responsibility had been assumed by the regional wholesaler, we evaluate that wholesaler first as though it were not directly responsible for implementing the BMP using the evaluation categories of Table 2-6, and second as though it were directly responsible for implementing the BMP using the evaluation categories of Table 2-1. The first level of evaluation reflects a strict interpretation of the MOU which states that wholesale agencies are not obligated to implement BMPs requiring retail customer interventions. The second level of evaluation reflects CUWA’s desire to have regional programs operated by wholesale agencies assessed as though the regional wholesaler were directly responsible to BMP implementation.

3. Summary of Evaluation Results

Overall, we found CUWA agencies to be generally in compliance with the terms and conditions of the MOU, and to be implementing on schedule most of the BMPs. This is particularly the case for CUWA agencies evaluated as signatory wholesale water suppliers. Compliance with the MOU by CUWA agencies evaluated as signatory retail water suppliers is less even. We attribute this difference to the more extensive compliance requirements for retailers compared to wholesalers.

We found implementation was most uneven for BMPs involving audits, customer rebates, and device distribution. These are BMPs 1 (residential audits), 2 (residential device distribution), 5 (large landscape audits), 9 (CII audits), and 16 (ULFT replacement). Both investment levels and program implementation varied considerably across CUWA agencies for these BMPs. If an agency was found to be partially implementing one of these BMPs, generally it was because the program was not being implemented at a level sufficient to meet the BMP’s coverage requirement by the end of the initial term of the MOU.

Implementation of BMP 16 (ULFT replacement) was very uneven. In all but one instance, we found that agencies were either well over or substantially under their ULFT water savings targets. We did not, however, find evidence supporting the claim that CUWA agencies in southern California are implementing BMP 16, while CUWA agencies in northern California are not. Rather, we found compliance and non-compliance with this BMP in both regions. In terms of
overall regional investment in ULFT programs, however, southern California is clearly outpacing northern California.9

Interestingly, we did not find any CUWA agency to be fully implementing BMP 10 (new CII use review), though several agencies have tried to implement the BMP. The problem appears to reside with the BMP definition. Agencies have found it difficult to intervene in the planning and permitting process so that new CII water uses can be effectively reviewed before the building permitting stage is near conclusion.

We also found several agencies to only be partially implementing BMP 13 (water waste prohibitions), which was somewhat unexpected. While all CUWA retail agencies have passed water waste ordinances, not all of these ordinances prohibit the full range of wasteful water uses described by the BMP.

3.1 Summary Tables

Summary tables showing evaluation results for the eleven CUWA agencies are presented below. These tables are organized according to whether the agency was evaluated as a signatory retail or wholesale water supplier.

3.1.1 Summary of Results for Signatory Retail Water Suppliers

Table 3-1 provides the summary of results for CUWA retail agencies. An agency marked with an “I” was found to be implementing the BMP. To ease reporting results, the table does not differentiate agencies found to be implementing on schedule from agencies implementing but not on schedule. In each case, the agency is marked as implementing the BMP. An agency marked with an “PI” was found to be partially implementing the BMP, while an agency marked with an “NI” was found not to be implementing the BMP. No agency was found to have made a valid exemption in accordance with the terms of the MOU for a BMP that was either partially implemented or not implemented at all.

Table 3-1. Summary of Evaluation Results for CUWA Signatory Retail Water Suppliers

<table>
<thead>
<tr>
<th>BMP No.</th>
<th>ACWD</th>
<th>CCWD</th>
<th>San Diego</th>
<th>EBMUD</th>
<th>LADWP</th>
<th>SFWD</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>PI</td>
<td>I</td>
<td>I</td>
<td>PI</td>
<td>I</td>
<td>PI</td>
</tr>
<tr>
<td>2</td>
<td>PI</td>
<td>I</td>
<td>I</td>
<td>PI</td>
<td>I</td>
<td>I</td>
</tr>
<tr>
<td>3</td>
<td>I</td>
<td>I</td>
<td>I</td>
<td>I</td>
<td>I</td>
<td>I</td>
</tr>
<tr>
<td>4</td>
<td>I</td>
<td>I</td>
<td>I</td>
<td>I</td>
<td>I</td>
<td>I</td>
</tr>
<tr>
<td>5</td>
<td>PI</td>
<td>I</td>
<td>I</td>
<td>I</td>
<td>I</td>
<td>I</td>
</tr>
<tr>
<td>6</td>
<td>I</td>
<td>I</td>
<td>I</td>
<td>I</td>
<td>I</td>
<td>I</td>
</tr>
<tr>
<td>7</td>
<td>I</td>
<td>I</td>
<td>I</td>
<td>I</td>
<td>I</td>
<td>I</td>
</tr>
<tr>
<td>8</td>
<td>I</td>
<td>I</td>
<td>I</td>
<td>I</td>
<td>I</td>
<td>I</td>
</tr>
<tr>
<td>9</td>
<td>PI</td>
<td>I</td>
<td>I</td>
<td>I</td>
<td>I</td>
<td>I</td>
</tr>
<tr>
<td>10</td>
<td>PI</td>
<td>PI</td>
<td>PI</td>
<td>PI</td>
<td>PI</td>
<td>PI</td>
</tr>
<tr>
<td>11</td>
<td>I</td>
<td>I</td>
<td>I</td>
<td>I</td>
<td>I</td>
<td>I</td>
</tr>
<tr>
<td>12</td>
<td>I</td>
<td>I</td>
<td>I</td>
<td>I</td>
<td>I</td>
<td>I</td>
</tr>
<tr>
<td>13</td>
<td>PI</td>
<td>I</td>
<td>PI</td>
<td>PI</td>
<td>PI</td>
<td>PI</td>
</tr>
<tr>
<td>14</td>
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<td>I</td>
<td>I</td>
<td>I</td>
</tr>
<tr>
<td>15</td>
<td>I</td>
<td>I</td>
<td>I</td>
<td>I</td>
<td>I</td>
<td>I</td>
</tr>
<tr>
<td>16</td>
<td>NI</td>
<td>I</td>
<td>PI</td>
<td>I</td>
<td>I</td>
<td>PI</td>
</tr>
</tbody>
</table>

Table Key: I = Implementing; PI = Partially Implementing; NI = Not Implementing

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9 This is true in both absolute levels and per capita levels of investment.
3.1.2 Summary of Results for Signatory Wholesale Water Suppliers

Table 3-2 provides the summary of results for BMPs applicable to CUWA agencies acting as signatory wholesale water suppliers. With the exception of SFPUC, CUWA wholesalers are generally in full compliance with the MOU. SFPUC’s limited compliance with the MOU as a signatory wholesaler is primarily attributable to its master water supply agreement with its retail agencies, which prescribes very specific cost recovery conditions, making it difficult to fund conservation at the wholesale level. It should be noted that many of SFPUC’s retail agencies are signatories to the MOU implementing BMPs.

Table 3-2. Summary of Evaluation Results for BMPs Implemented by CUWA Signatory Wholesale Water Suppliers

<table>
<thead>
<tr>
<th>BMP No</th>
<th>CCWD</th>
<th>CWB MWD</th>
<th>MWD OC</th>
<th>MWD SC</th>
<th>SCVWD</th>
<th>SDCWA</th>
<th>SFPUC</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>I</td>
<td>I</td>
<td>I</td>
<td>I</td>
<td>I</td>
<td>I</td>
<td>I</td>
</tr>
<tr>
<td>4</td>
<td>I</td>
<td>I</td>
<td>I</td>
<td>I</td>
<td>I</td>
<td>I</td>
<td>I</td>
</tr>
<tr>
<td>7</td>
<td>I</td>
<td>I</td>
<td>I</td>
<td>I</td>
<td>I</td>
<td>I</td>
<td>NI</td>
</tr>
<tr>
<td>8</td>
<td>I</td>
<td>PI</td>
<td>I</td>
<td>I</td>
<td>I</td>
<td>I</td>
<td>NI</td>
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<tr>
<td>11</td>
<td>I</td>
<td>I</td>
<td>I</td>
<td>I</td>
<td>I</td>
<td>I</td>
<td>I</td>
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<tr>
<td>14</td>
<td>I</td>
<td>I</td>
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<td>I</td>
<td>I</td>
<td>I</td>
<td>NI</td>
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<tr>
<td>15</td>
<td>I</td>
<td>I</td>
<td>I</td>
<td>I</td>
<td>I</td>
<td>I</td>
<td>NI</td>
</tr>
</tbody>
</table>

Table Key: I = Implementing; PI = Partially Implementing; NI = Not Implementing

Overall, we found CUWA wholesale water suppliers to be providing considerable levels of support to retail agencies implementing BMPs. Table 3-3 provides the summary of results for BMPs supported by CUWA agencies acting as signatory wholesale water suppliers. An agency marked with an “E” was found to be providing extensive support to its retail agencies. An agency marked with an “S” was found to be providing standard support, while an agency marked with an “M” was found to be providing moderate support. An agency marked with an “N” was found to be providing negligible support.

Table 3-3. Summary of Evaluation Results for BMPs supported by CUWA Signatory Wholesale Water Suppliers

<table>
<thead>
<tr>
<th>BMP No</th>
<th>CCWD</th>
<th>CWB MWD</th>
<th>MWD OC</th>
<th>MWD SC</th>
<th>SCVWD</th>
<th>SDCWA</th>
<th>SFPUC</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>E</td>
<td>S</td>
<td>E</td>
<td>N</td>
</tr>
<tr>
<td>2</td>
<td>S</td>
<td>M</td>
<td>E</td>
<td>E</td>
<td>E</td>
<td>E</td>
<td>N</td>
</tr>
<tr>
<td>5</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>E</td>
<td>E</td>
<td>E</td>
<td>N</td>
</tr>
<tr>
<td>6</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>E</td>
<td>S</td>
<td>S</td>
<td>N</td>
</tr>
<tr>
<td>9</td>
<td>S</td>
<td>E</td>
<td>E</td>
<td>E</td>
<td>E</td>
<td>E</td>
<td>N</td>
</tr>
<tr>
<td>10</td>
<td>S</td>
<td>N</td>
<td>N</td>
<td>M</td>
<td>N</td>
<td>S</td>
<td>N</td>
</tr>
<tr>
<td>12</td>
<td>S</td>
<td>E</td>
<td>E</td>
<td>E</td>
<td>E</td>
<td>E</td>
<td>N</td>
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<tr>
<td>13</td>
<td>S</td>
<td>M</td>
<td>E</td>
<td>M</td>
<td>N</td>
<td>M</td>
<td>N</td>
</tr>
<tr>
<td>16</td>
<td>S</td>
<td>E</td>
<td>E</td>
<td>E</td>
<td>E</td>
<td>E</td>
<td>N</td>
</tr>
</tbody>
</table>

Table Key: N = Negligible Support; M = Moderate Support; S = Standard Support; E = Extensive Support

In addition to providing regional support, three CUWA wholesale agencies were found to be implementing three BMPs on regionally, on behalf of their retail agencies. At the request of CUWA, these agencies were evaluated as though they were directly responsible for implementing
these BMPs. The results are shown in Table 3-4. It should be noted that under the MOU wholesale agencies are not actually directly responsible for implementing these BMPs.

Table 3-4. Summary of Results for BMPs Being Implemented Regionally by CUWA Signatory Wholesale Water Suppliers

<table>
<thead>
<tr>
<th>BMP No</th>
<th>MWD OC</th>
<th>SDCWA</th>
<th>SCVWD</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>Not Applicable</td>
<td>I</td>
<td>PI</td>
</tr>
<tr>
<td>9</td>
<td>I</td>
<td>I</td>
<td>PI</td>
</tr>
<tr>
<td>16</td>
<td>PI</td>
<td>I</td>
<td>PI</td>
</tr>
</tbody>
</table>

Table Key: I = Implementing; PI = Partially Implementing; NI = Not Implementing

4. Lessons Learned

A variety of lessons can be drawn from the evaluation of BMP implementation by CUWA agencies. We have divided these lessons into two categories: (1) lessons relevant to MOU compliance; and (2) lessons relevant to a future MOU certification process.

4.1 Lessons Relevant to MOU Compliance

Lesson #1: Overall, CUWA agencies are mostly in compliance with the MOU. With the exception of SFPUC, which is operating under a master water supply agreement that governs its relationship with its retailers, CUWA wholesalers are in full compliance with the MOU. CUWA retailers are mostly in compliance with the MOU, and could come into full compliance by accelerating investments in key BMPs, including BMPs 1, 2, and 16.

Lesson #2: While there appears to be potential scale and scope economies associated with implementing BMPs at a regional level through a regional wholesaler, coordinating with retail agencies to identify appropriate target populations and implementing programs sufficient to meet regional coverage requirements has proven problematic for some agencies. BMPs implemented at a regional level has produced uneven compliance.

Lesson #3: In terms of BMP implementation, BMP 16 (ULFT replacement) is probably the single largest obstacle to full MOU compliance by CUWA agencies. CUWA agencies were found to be either well ahead of their calculated water savings targets (for example, LADWP is more than 300% above target) or well behind (for example, calculated ULFT program savings for EBMUD are 17% of target). Agencies well behind their water savings targets will find it difficult if not impossible to meet the coverage requirement for this BMP by the end of the initial MOU term. Two agencies not meeting the BMP 16 water savings targets -- EBMUD and ACWA -- while indicating that BMP 16 is not cost-effective for their service areas, have not made any exemption submittals to the CUWCC to support these claims. These agencies will be able to come into compliance if they are able to substantiate their exemption claims.

Lesson #4: CUWA agencies that have substantially exceeded their ULFT savings targets may wish to reassess the cost-effectiveness of continuing non-targeted ULFT rebate programs at their current scale, since they are somewhat vulnerable to free-ridership. This lesson should not be interpreted as suggesting that the large scale ULFT programs we evaluated were inappropriate to regional program goals, but rather as reemphasizing the importance of program targeting to mitigate against possible program free-ridership and the consequent reduction in program effectiveness.
4.2 Lessons Relevant to a Future Certification Program

Lesson #5: The current quality of CUWCC annual reports is not sufficient to support a rigorous evaluation and certification program. We found CUWCC annual reports prepared by CUWA agencies were frequently incomplete, and often had data inconsistencies across years. A supplemental data request, as well as interviews and agency follow-up, were necessary to complete reliable evaluations. By putting greater emphasis on timely, complete, and accurate reporting, and by developing more effective reporting tools for signatory agencies the problem will correct itself. The CUWCC is poised to develop a new reporting database and reporting tools upon completion of its BMP revisions effort, and the risk of losing certification should provide the necessary impetus for better agency reporting.

Lesson #6: The MOU exemption provisions have largely been ignored by CUWA agencies. To the extent that an agency chose not to implement a BMP on grounds of budget or cost-effectiveness, this was not substantiated in a manner consistent with the MOU. As with low-quality reporting, the risk of losing certification for unsubstantiated exemptions should make this a self-correcting problem.

Lesson #7: The line of responsibility drawn by the MOU for BMP implementation between retailer and wholesaler has become blurred. Through our evaluations it was evident that wholesalers and retailers did not always have a clear understanding of their respective roles and responsibilities vis-à-vis the MOU. Clarifying these roles will be a necessary prerequisite to an effective certification program.

Lesson #8: Maintaining consistency in the evaluations across agencies proved to be one of the biggest challenges for this project, and will likely be a significant issue for a CUWCC certification program. Because the MOU does not contain a standardized set of evaluation criteria, and because agencies can implement any given BMP in a variety of ways, there is an extra burden placed on the evaluator to maintain objectivity across evaluations. An agreed to set of evaluation criteria for each BMP will need to be developed prior to implementing a certification program to avoid too much analyst subjectivity entering the evaluations.

Lesson #9: General and/or vague BMP definitions, and the “at least as effective as” clause contained in many BMP definitions, while giving agencies additional implementation flexibility and discretion, also increase the level of subjectivity entering the evaluation. Agencies need to understand this tradeoff when developing a certification program, and strike a balance between implementation flexibility, on the one hand, and evaluation objectivity, on the other.

Lesson #10: Coverage requirements contained in Exhibit 1 of the MOU need to be reassessed prior to implementing a certification program. Several CUWA agencies were unaware of the coverage requirements contained in Section C, and most were unaware of the provision in Section B stating that “BMPs will be implemented at a level of effort projected to achieve at least the coverages specified in Section C of this Exhibit within the initial ten year term of the MOU.” In light of this language, several agencies have expressed the concern that the coverage requirements either target the wrong customer groupings, are unachievable, or both. The CUWCC is currently reassessing BMP coverage requirements as part of its BMP revisions effort.
5. Evaluation for Alameda County Water District

Overall, Alameda County Water District was found to be in partial compliance with the MOU. In particular, it was found to be only partially implementing several key BMPs, including BMPs 1, 2, 5, and 9, and was found to be neither implementing nor exempted from implementing BMP 16. We note, however, that the district's conservation program is in transition while it completes an Integrated Resources Plan that will establish conservation objectives through 2030. In particular, the district is in the midst of reassessing BMPs 5, 9, and 16. The district's IRP calls for an additional 15% demand reduction to be realized by 2030. Thus, it is likely that the district's conservation program will be given new focus and attention in coming years.

A summary of the evaluation results for Alameda County Water District is presented in Table 5-1. Evaluation summaries and notes for each BMP are presented in the subsections that follow.

Table 5-1. Summary of BMP Evaluation Results for Alameda County Water District

<table>
<thead>
<tr>
<th>BMP No.</th>
<th>BMP Name</th>
<th>Implementing on Schedule</th>
<th>Implementing Not on Schedule</th>
<th>Partially Implementing</th>
<th>Not Implementing</th>
<th>Exempted</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Res. Audits</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>2c</td>
<td>Plumbing Retro.</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Dist. System</td>
<td>X</td>
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</tr>
<tr>
<td>4</td>
<td>Metering</td>
<td>X</td>
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<tr>
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<td>7</td>
<td>Public Info.</td>
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<tr>
<td>9</td>
<td>CII Conservation</td>
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<tr>
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<td>CI Use Review</td>
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<td>X</td>
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<td>11</td>
<td>Pricing</td>
<td>X</td>
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<td>12</td>
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<td>15</td>
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<tr>
<td>16</td>
<td>ULFT Replacement</td>
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<td></td>
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<td>X</td>
</tr>
</tbody>
</table>

5.1 Residential Water Audits (BMP 1)

Evaluation Grade

Partially Implementing

BMP Requirements

Identification of top 20 percent of water users; directly contact and offer audits to target customers; offer audits on a repeating cycle; provide customer incentives to implement measures. Programs to be underway by August 31, 1994. Coverage requirement: 70% of target customers to receive an audit by end of initial MOU term.

Evaluation Notes

BMP Schedule: Alameda County Water District initiated this BMP in accordance with its schedule for single-family residential accounts but not for multi-family residential accounts. Agency initiated single-family residential audit program in 1994. Since 1995, the district has
contracted with Volt Viewtech to perform single-family residential water audits. The district has not initiated a program to audit multi-family residential accounts. Based on annual audit rates to date, the district is not on track to meet the coverage requirements for this BMP by the end of the initial MOU term.

**Customer Targeting:** The district is targeting single-family residential accounts for audits in accordance with the BMP. The district has directly contacted all of its top 20% single-family residential customers at least once since 1994. Approximately 60% of these customers have been contacted twice. The district offers customers a credit on their next bill if they accept an audit. The district is not targeting multi-family residential accounts per the BMP.

**Program Description:** The district’s residential audit consists of the following actions: measure lot size, measure landscape area (and % turf), check turf type, soil probe check, root zone measurement, sprinkler system check, irrigation catch cup analysis, check for leaking hoses, whole house leak detection, check for indoor leaks, measure showerhead and faucet flow rates, and distribute a water conservation kit. Following the audit, a written report is provided to the customer with a summary of the customer’s water use, recommendations for improved water use, and an optimized irrigation schedule.

**Customer Incentives:** The district provides customers with free water conservation kits. The district offers a very modest financial incentive to get customers to accept water audits (1,500 gallons free on next bill = 2 billing units @ $1.299/unit = $2.60).

**Program Results:** According to the district’s 95/96 annual report to the CUWCC, 778 single-family connections (1.2% of single-family connections; 6% of target connections) and zero multi-family connections (0.0% of multi-family connections; 0.0% of target connections) have been audited through June of 1996.

### 5.2 Plumbing, New and Retrofit (BMP 2c)

**Evaluation Grade**

Partially Implementing

**BMP Requirements**

Identification of pre-1980 single- and multi-family homes; deliver retrofit kits, including low-flow showerheads, and toilet displacement devices to unretrofitted homes; offer to install the devices; follow-up with customers at least three times. Program underway by August 31, 1993. Coverage requirement: 75% of pre-1980 single-family accounts and 80% of pre-1980 multi-family accounts to be retrofitted with low-flow devices (other than ULFTs) by end of initial term.

**Evaluation Notes**

**BMP Schedule:** Alameda County Water District initiated this BMP in accordance with the MOU schedule. Based on an analysis of inventory, it estimates that a total of 8,200 kits have been distributed since 1991. Kit distribution is not targeted or tracked by the district, so it is not possible to determine the distribution of kits between pre- and post-1980 construction, and between single- and multi-family residences. If we adopt the assumption that all distributed kits get installed in pre-1980 residences, then at its current rate of distribution, the district would not be on track to meet the coverage requirement for this BMP. Based on district records, the district would need to retrofit 44,037 pre-1980 single- and multi-family residences by the end of the initial MOU term to meet the coverage requirement. If the district replicates its distribution rate for the last five years, it would distribute approximately 16,400 kits. A doubling of the rate for the last five years would distribute 24,600 kits. To meet the coverage requirement, the district would need to increase its average annual rate of distribution four-fold over the next five years. District records do not indicate any district intentions to accelerate its retrofit program by this amount, and we
therefore conclude that the district will be unable to meet the coverage requirement by the end of the initial MOU term.

**Customer Targeting:** The agency is not targeting customers for retrofit in accordance with the BMP. The district distributes devices two ways: through residential audits; and via public events. Distribution through audits results in devices being installed only in residences needing them. Public event distribution, on the other hand, will retrofit pre-1980 homes only by chance, and may result in delivery of devices to households with no need for them or residing outside the agencies service area.

**Program Description:** The agency has delivered two types of plumbing retrofit kits since 1991. The kit currently being delivered includes a low-flow showerhead, toilet tank displacement device, toilet tank leak detectors, and toilet tank fill cycle diverter. The agency delivers kits upon customer request, at community and city events (approximately 12 events per year), and to customers receiving residential water audits.

The agency does not offer to directly install the devices included in the kits it delivers, nor does it follow-up with customers receiving retrofit kits, as per the BMP. We therefore do not consider the district’s distribution program to be at least as effective as the minimum standard established by the BMP.

**Program Results:** Based on an analysis of inventory, the agency estimates that it has delivered 8,200 retrofit kits since 1991. As noted above, it is not possible to determine what percent of these kits were delivered to pre-1980 homes, or to homes within the agency’s service area. An analysis of data collected through the residential water audit program, however, by Maddaus Water Management indicated that approximately 50% of homes within the agency’s service area still have high-flow showerheads, and that the agency would benefit from some type of conservation program focused on their replacement.

### 5.3 Distribution System Water Audits (BMP 3)

**Evaluation Grade**
Implementing on Schedule

**BMP Requirements**
Distribution system to be inspected at least once every three years, using a methodology similar to that described in an AWWA manual; advising customers where leaks appear to exist on their side of the meter and making cost-effective repairs.

**Evaluation Notes**

**BMP Schedule:** Alameda County Water District is implementing this BMP in accordance with the MOU schedule. Agency has operated a formal leak detection and distribution system audit program since prior to becoming a signatory to the MOU in 1991. The district audits its system and surveys approximately 20% of its distribution mains annually.

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10 Letter from Maddaus Water Management to Alameda County Water District dated August 17, 1996. In this letter Maddaus Water Management estimated that between 33-65 percent of District homes have low-flow showerheads installed, with 50 percent being a likely value.

Note: It is beyond the scope of this study to evaluate the accuracy of study results cited herein. The citation is made to note that the agency has made a good faith effort to evaluate the effectiveness of its BMP implementation program.
Evaluation of BMP Implementation for Alameda County Water District

Program Description: The district's audit procedure follows the methodology presented in the American Water Works Association's "Manual of Water Supply Practices, Water Audits and Leak Detection." The district's program expedites the repair of observed leaks by isolating their location, and discovers hidden leaks through field surveys of water mains. The district reports unaccounted for water losses each year in its annual operations report. The district distributes a customer brochure explaining how to read a water meter and to check for leaks on the customers side of the system.

Program Results: Total water losses equal approximately 9% of district water supply, which is within industry standards for a well-operated system.

5.4 Metering with Commodity Rates (BMP 4)

Evaluation Grade
Implementing on Schedule

BMP Requirements
Metering all new connections, and billing using rates that include a volume charge; retrofitting all unmetered existing connections and billing using rates that include a volume charge.

Evaluation Notes
BMP Schedule: Alameda County Water District is implementing this BMP in accordance with the MOU schedule. The district has been metering all retail M&I potable water supply connections since prior to 1993. The district has been billing all retail M&I connections by volume of use since prior to 1993.

Program Description: The district meters and bills by volume of use all retail M&I potable water supply connections.

5.5 Large Landscape Audits (BMP 5)

Evaluation Grade
Partially Implementing

BMP Requirements
Agencies are required to identify customers with at least 3 acres of landscaping, contacting them by mail; offering audits; offering incentives to effect customer implementation; providing follow-up audits at least once every five years; providing multilingual training and information. Coverage requirement: audits offered to 100% of landscape sites 3 acres or more by end of initial MOU term.

Evaluation Notes
BMP Schedule: Agency initiated implementation of this BMP in accordance with the MOU schedule. However, the district is not on track to meet the coverage requirement for this BMP by the end of the initial MOU term. The district does not currently have in place landscape audit capabilities, and is not on track to offer audits to 100% of landscape sites 3 acres or more by 2001.

Customer Targeting: Agency identified its largest municipal landscape water users in 1992. Agency continues to analyze water use trends by dedicated landscape irrigation accounts to guide landscape conservation program design.
Program Description: Through analysis of water use records, the district identified its largest municipal landscape water users to be the cities of Newark, Fremont, and Union City (representing approximately 10% of the district's irrigation accounts). In 1993, the district paid for the training of the cities' landscaping staff to attend the Landscape Irrigation Water Auditor training program at Cal Poly San Luis Obispo, thus allowing the landscaping staff for these cities to perform their own water audits on a continual basis.\textsuperscript{11}

The district established an ET\textsubscript{o}-based landscape water allotment program for dedicated landscape accounts during the drought, but has since discontinued it. This program required self-surveys by participating customers. However, there are currently no mechanisms in place to monitor usage or ensure compliance. The district does not currently have a program in place to audit large landscapes.

District training efforts include paying for the training of landscape staff for Newark, Fremont, and Union City and one workshop in 1996 for its top CII customers, including dedicated irrigation accounts. Landscape irrigation was discussed extensively at this workshop, and participants were given materials to perform a survey of their landscape irrigation program.

Customer Incentives: The district paid for the training of the landscaping staff of the cities of Fremont, Newark, and Union City to attend the Landscape Irrigation Water Auditor training program at Cal Poly San Luis Obispo. No other customer incentives are provided.

5.6 Landscape Water Conservation Requirement (BMP 6)

Evaluation Grade

Implementing on Schedule

BMP Requirements

Enacting and implementing landscape water conservation ordinances, or cooperating with government/industry to develop and implement ordinances. Ordinances must be at least as effective as the Model Ordinance. Coverage requirement: 100% of new landscapes subject to ordinances by end of initial MOU term.

Evaluation Notes

BMP Schedule: Alameda County Water District is implementing this BMP in accordance with the MOU schedule. As a special district, the district does not have the authority to adopt landscape ordinances within its service area. The district worked cooperatively with cities in its service area to develop a model landscape ordinance similar to the "Model Water Conservation Landscape Ordinance". All cities within the district's service have adopted landscape conservation ordinances.

Program Description: Three cities within the agency's service area -- Union City, Fremont, and Newark -- are required to adopt landscape ordinances under AB 325. Union City adopted the model ordinance developed by ACWD, Fremont adopted the state model ordinance, and Newark has adopted its own ordinance. All are similar to the state model ordinance, though the district is currently working with Newark to modify its ordinance to improve its effectiveness.

\textsuperscript{11} In 1994, the City of Fremont received one of nine statewide water conservation awards, and the Cities of Newark and Union City both received honorable mention awards for their improved landscape water use efficiency.
5.7 Public Information (BMP 7)

Evaluation Grade
Implementing on Schedule

BMP Requirements
Implement public information programs to educate customers about water use and to promote water conservation. Program could include providing speakers to community groups and media; advertising; using bill inserts; providing water use information on customer bills comparing current and previous year use; working cooperatively with other groups promoting water conservation. No coverage requirement specified by Exhibit 1.

Evaluation Notes
BMP Schedule: Agency is implementing this BMP in accordance with the MOU schedule. Agency has maintained an active public information program promoting water conservation since prior to 1991.

Program Description: Agency’s public information program includes press releases, bill inserts, showing previous water use on customer bills, water conservation brochures, lawn watering guides, demonstration gardens, speakers bureau, internet home page, and booths at public events. The district actively promotes all of its conservation programs.

5.8 School Education (BMP 8)

Evaluation Grade
Implementing on Schedule

BMP Requirements
Implement school education programs within service area. Programs to include provision of educational materials and instruction assistance. No coverage requirement specified by Exhibit 1.

Evaluation Notes
BMP Schedule: Alameda County Water District is implementing this BMP in accordance with the MOU schedule. The district has maintained an active school education program promoting water conservation since prior to 1991.

Program Description: The district’s school education program includes the following:

Classroom instruction: the agency provides trained staff to teach water supply and conservation programs at the local school districts in its service area. Programs have been targeted for K-12, and are taught as special classes or at special school assemblies.

Education resource material: the agency provides resource material for teachers about water supply and water conservation. This material includes stickers, magnets, games, maps, posters, rulers, videos, brochures, and pamphlets. All educational material is provided to schools and teachers upon request.

Tours: the district offers tours of its facilities to local schools. Tours include visits to the agency’s water treatment and groundwater recharge facilities, and are led by agency staff.

Other: the district provides educational material on its home page. In addition, the district participates in Water Awareness Week activities with local school districts, and has participated in local science fairs and student plays.
In 1996, the district developed a detailed, 100+ page, School Water Education Master Plan, establishing goals, objectives, and implementation recommendations for a water education program directed at the students within its service area.\(^\text{12}\)

5.9 CII Water Conservation (BMP 9)

Evaluation Grade

Partially Implementing

BMP Requirements

Identification of top 10% of commercial customers, top 10% of industrial customers, and top 20% of institutional customers. Directly contacting target customers and offering water audit. Providing incentives to encourage customer implementation of recommended measures. Offering follow-up audits at least once every five years if necessary. No coverage requirement specified by Exhibit 1 for commercial and industrial customers; coverage requirement for institutional accounts: 70% of top 20% of pre-1980 institutional accounts.

Evaluation Notes

BMP Schedule: Alameda County Water District is not implementing this BMP in accordance with the MOU schedule. The district indicates that is has identified top CII water accounts, but has not directly contacted and offered them an audit in accordance with the BMP schedule. In its 1992/93 report, the district indicated that CII Water Conservation Program was in development. Approximately 20 audits of commercial accounts were conducted by district's operations manager in that year. In its 1993/94 annual report to the CUWCC, the district indicated that it did not offer or perform any CII audits. In its 1994/95 annual report to the CUWCC, the district indicated that it did not offer or perform any CII audits. In its 1995/96 annual report to the CUWCC, the district indicated that it offered audits to commercial customers, but not to industrial or institutional customers. The commercial audits were not conducted by the district, but rather were self-audits based on workshop material developed by the district. The agency does not currently have in place a program to conduct CII audits, nor is it on track to meet the coverage requirement for institutional accounts by the end of the initial MOU term.

Customer Targeting: The district does not currently have an active CII audit program in place, and therefore does not target accounts for audits. However, it has targeted and worked with its six largest CII accounts, and has realized substantial water savings from these efforts.

Program Description: The district does not have a formal program to target customers, offer audits, conduct audits, and follow-up with customers. However, the district has provided technical assistance to its largest industrial customers (New United Motor Manufacturing, Borden Packaging and Industrial Products, and Glacier Ice Company) in developing and implementing water conservation programs. ACWD also provided financial assistance to its three largest institutional customers to pay for landscape irrigation training for City employees. The district estimates a combined water savings achieved by these six CII customers of over 300 million gallons per year, or over 7% of the total CII water consumption in ACWD's service area. The city of Fremont and the NUMMI plant were recognized for their outstanding conservation achievements, receiving two of nine statewide awards given by the Association of California Water Agencies.

\(^{12}\) Jahn, Frank L. (1996), "Alameda County Water District School Education Master Plan."

Note: It is beyond the scope of this study to evaluate the accuracy of study results cited herein. The citation is made to note that the agency has made a good faith effort to evaluate the effectiveness of its BMP implementation program.
In addition, the district developed and conducted a CII workshop in 1995. The top 20% of CII customers were invited to this workshop. Approximately 10% of the 240 customers invited attended the workshop. The workshop covered a variety of CII conservation topics, and included instructions and forms for conducting self-surveys. A follow-up survey of workshop participants found that none of the sampled participants (about 50% of total participants) had completed the self-survey forms. Therefore, this approach does not appear to be an effective alternative to on-site audits conducted by agency staff or consultants.

The district has developed and distributed water conservation guides to all of its CII customers. These guides are tailored to specific industries and provide information on leak detection and repair, conservation, and recommendations for water savings devices and measures.

**Customer Incentives:** The district does not have an incentive program in place.

**Program Results:** The table below shows audit program results for the district through June 30, 1996. As noted above, the district estimates a combined water savings achieved by its six largest CII customers of over 300 million gallons per year, or over 7% of the total CII water consumption in ACWD’s service area.

<table>
<thead>
<tr>
<th>Report Year</th>
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<th>Industrial</th>
<th>Institutional</th>
<th>Surveys Completed</th>
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</tr>
<tr>
<td>95/96</td>
<td>22*</td>
<td>0</td>
<td>0</td>
<td>0**</td>
</tr>
</tbody>
</table>

Number of Accounts in Service Area: 2400+ 800+ 900+

* 22 customers attending a district workshop were given material to conduct self-audits.
** A survey of 50% of the workshop participants revealed that none had performed the self-audit.

5.10 New Commercial/Industrial Water Use Review (BMP 10)

**Evaluation Grade**

Partially Implementing

**BMP Requirements**

A program to assure the review of proposed water uses for new commercial and industrial water service and making recommendations for improved water use efficiency before completion of the building permit process. No coverage requirement is specified for this BMP by Exhibit 1.

**Evaluation Notes**

**BMP Schedule:** Alameda County Water District initiated implementation of this BMP in accordance with the MOU schedule. While the district does not directly review new uses, the cities of Newark, Fremont, and Union City review all submitted plans and check for water use efficiency. This plan checking program has been in effect since prior to 1991. The district also has been reviewing copies of landscape irrigation designs and programs for new CII accounts with dedicated landscape meters since 1994.
5.11 Conservation Pricing (BMP 11)

Evaluation Grade
Implementing on Schedule

BMP Requirements
Requires eliminating non-conservation pricing and adopting conservation pricing. This is defined as no fixed rate or declining block pricing, and no high fixed costs coupled with low commodity charges. Where the agency also provides sewer services, these rate structures should also apply. No coverage requirement is specified for this BMP by Exhibit 1.

Evaluation Notes

BMP Schedule: Alameda County Water District is implementing this BMP in accordance with the MOU schedule. The district has billed water consumption using a combination of service charges and volumetric charges based on metered use since prior to December 31, 1993.

Program Description: The district uses uniform volume rates with charges based on metered usage. Rates are designed to recover the agency’s cost of service. The consumption charge for typical residential and commercial customers constitute approximately 86% and 88%, respectively, showing that the agency does not employ high fixed charges coupled with low commodity charges. Therefore, the rate structure is in conformance with the BMP’s definition of a conservation rate structure.

5.12 Residential Landscape Conservation (BMP 12)

Evaluation Grade
Implementing on Schedule

BMP Requirements
Requires provision of guidelines, information and incentives for more efficient landscape at new or existing single family homes; and enacting and implementing landscape water conservation ordinances. No coverage requirement is specified for this BMP by Exhibit 1.

Evaluation Notes

BMP Schedule: Alameda County Water District is implementing this BMP in accordance with the MOU schedule.

Program Description: The district provides guidelines and information, including brochures, new home information packet, and watering guidelines. The district provides weekly guidelines to its customers for landscape irrigation. This information is printed every week in local newspapers.

The district operates a demonstration garden, which includes a demonstration irrigation system, and has supplied the Fremont library with the software program, PlantMaster, as a resource to district customers for designing and maintaining drought tolerant landscapes. The district offers free home water audits, which include a landscape irrigation element.

Cities within agency’s service area have adopted landscape water conservation ordinances based on a model ordinance developed by the agency.

5.13 Water Waste Prohibition (BMP 13)

Evaluation Grade
BMP Requirements

Enacting and enforcing measures to prohibit gutter flooding, single pass cooling systems in new connections, nonrecirculating systems in all new conveyor car wash and commercial laundry systems, and nonrecirculating decorative water fountains. Including water softener checks in home water audits and providing customers with information about DIR and exchange-type water softeners in their educational efforts.

Evaluation Notes

BMP Schedule: Alameda County Water District is implementing this BMP in accordance with its schedule. The district adopted Ordinance 30 -- An Ordinance of Alameda County Water District Regulating the Nonessential Use of Water, and Providing for the Conservation of the Water Supply of the District -- in 1991.

Program Description: The district ordinance prohibits the following during water shortages: gutter flooding, washing of hard surfaces, using potable water to fill or maintain decorative fountains, using potable water to fill new swimming pools, flushing sewers, hydrants, or washing streets, except in cases of emergency, installing landscapes during a drought emergency, serving water to restaurant customers, unless requested by the customer, using potable water for construction purposes unless nonpotable water in unavailable.

The agency district does not prohibit the following: single pass cooling systems in new connections; non-recirculating systems in new carwashes and laundries, and non-recirculating systems in new fountains.

The district includes water softener checks in its home water surveys.

5.14 Water Conservation Coordinator (BMP 14)

Evaluation Grade

Implementing on Schedule

BMP Requirements

Designation of a water conservation coordinator responsible for preparing agency conservation plan, managing its implementation, and evaluating program results. No coverage requirement is specified for this BMP by Exhibit 1.

Evaluation Notes

BMP Schedule: Alameda County Water District is implementing this BMP in accordance with its schedule. The district established and staffed the position of Water Conservation Coordinator from 1991 through 1996. The district does not currently staff the position Water Conservation Coordinator, but does have for staff members assigned to conservation program activities (see below).

Program Description: 1991-1996: Conservation Coordinator was a full-time position. Coordinator dedicated 100% of their time to the agency’s conservation program. Presently the district has four staff members directly involved in its water conservation programs. These are as follows: Water Resources Planning Manager (20% FTE): Program Management; Water Resources Specialist (65% FTE): Program development, implementation, and evaluation; Water Education Specialist (100% FTE): Water education and public information program design and implementation; Planning Intern (75% FTE): Program support and technical analysis.
5.15 Financial Incentives (BMP 15)

Evaluation Grade
Implementing on Schedule

BMP Requirements:
Financial incentives are to be offered to retail customers. No coverage requirement is specified for this BMP by Exhibit 1.

Evaluation Notes
BMP Schedule: Alameda County Water District is implementing this BMP in accordance with the MOU schedule.

Program Description: The district offers or has offered the following financial incentives to facilitate implementation of conservation programs. Penalty Rates: during water shortages, the agency implements penalty water rates for water used over a base consumption allowance. Water Bill Rebates for Residential Audit Participants: The agency offers a very modest financial incentive to get customers to accept water audits (1,500 gallons free on next bill = 2 billing units @ $1.299/unit = $2.60). High Efficiency Washer Rebate Program: The agency is participating with PG&E in a rebate program for high efficiency washing machines. To date, the agency has provided 25 $75 rebates. The agency has budgeted for 100 rebates in 1997.

5.16 Ultra Low Flush Toilet Replacement (BMP 16)

Evaluation Grade
Not Implementing

BMP Requirements
Implementing programs to replace existing high-water-using toilets with ultra-low-flush toilets. Programs to be as effective as offering $100 rebates for toilets, or requiring replacement at time of resale, or replacement at time of change of service. Identifying all non-residential customers and ranking them by water use by December 31, 1995, and retrofitting toilets for at least 1% of their non-residential customers by June 30, 1998. Coverage requirement: per Exhibit 6 of the MOU, agency program must result in water savings equivalent to a retrofit on resale requirement for the service area.

Evaluation Notes
BMP Schedule: ACWD is not implementing this BMP in accordance with its schedule. Residential ULFT retrofit programs are to be underway by August 31, 1992, according to the MOU schedule. The agency indicated in its 1992/93 report that it was in the planning stages of a ULFT replacement program. The agency did not provide any information regarding a ULFT replacement program or an exemption submittal in its 1993/94 annual report to the CUWCC. The agency did not provide any information regarding a ULFT replacement program or an exemption submittal in its 1994/95 annual report to the CUWCC. In its 1995/96 report, the agency indicated that it was developing a pilot rebate program for 1996/97, with budgeted funds for up to 1,000 rebates.

Program Description: The agency has not implemented a ULFT replacement program for its service area and has not submitted an exemption to the CUWCC documenting its reason for not doing so. In 1993, the agency conducted a review of alternative ULFT program approaches and conducted a preliminary cost-effectiveness analysis for its service area. That analysis indicated a
ULFT program would not be cost-effective for its service area. However, the analysis was never submitted to the CUWCC by the agency to justify an exemption from the BMP.

More recently, the agency has begun to re-examine the cost-effectiveness of ULFT rebate programs in its service area. The agency's preliminary analyses indicate that a wide-spread ULFT program would still not be cost-effective for its service area. This analysis appears to follow CUWCC cost-effectiveness guidelines, and may in the future serve as a basis for an exemption from BMP 16. However, to date the agency has not submitted to the CUWCC any cost-effectiveness analyses to support an exemption for this BMP and therefore is found not to be implementing the BMP.
6. Evaluation for Contra Costa Water District

Overall, we found Contra Costa Water District to be in full compliance with the MOU, both as a retail and wholesale signatory water supplier.

6.1 Evaluation as a Signatory Retail Water Supplier

A summary of the evaluation results for Contra Costa Water District as a signatory retail water supplier is presented in Table 6-1. Evaluation summaries and notes for each BMP are presented in the subsections that follow.

Table 6-1. Summary of BMP Evaluation Results for Contra Costa Water District

<table>
<thead>
<tr>
<th>BMP No.</th>
<th>BMP Name</th>
<th>Implementing on Schedule</th>
<th>Implementing Not on Schedule</th>
<th>Partially Implementing</th>
<th>Not Implementing</th>
<th>Exempted</th>
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<td>Res. Audits</td>
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</tr>
<tr>
<td>5</td>
<td>Large Landscape</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>New Landscape</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Public Info.</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>School Education</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>CII Conservation</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>CI Use Review</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Pricing</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Res. Landscape</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Water Waste</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Coordinator</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Financial Incentives</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>ULFT Replacement</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

6.1.1 Residential Water Audits (BMP 1)

Evaluation Grade

Implementing on Schedule

BMP Requirements

Identification of top 20 percent of water users; directly contact and offer audits to target customers; offer audits on a repeating cycle; provide customer incentives to implement measures. Programs to be underway by August 31, 1994. Coverage requirement: 70% of target customers to receive an audit by end of initial MOU term.

Evaluation Notes

BMP Schedule: Contra Costa Water District is on schedule for this BMP. It has operated its residential water audit program continuously since 1988.

Customer Targeting: Contra Costa Water District has directly contacted the top 20% of single-family and multi-family customers through targeted mailings. Contra Costa Water District also uses
bill inserts, brochures, and direct referral by customer service to advertise its residential water audit program. The program is open to all residential customers.

Program Description: A trained auditor spends approximately one hour at each customer’s home. Auditor checks for leaks in toilets and faucets, measures shower flow and installs a low-flow showerhead if necessary, and provides faucet aerators if needed. Lawn audits are performed for customers with landscaping. Irrigation systems are analyzed for leaks and personalized watering schedules are developed. Irrigation timer programming is reviewed.

Customer Incentives: Contra Costa Water District provides customers with free low-flow showerheads, aerators, and other water saving devices. Contra Costa Water District does not offer financial incentives in connection with its residential audit program.

Program Results: Contra Costa Water District has audited 8,500 single-family connections (17.4% of single-family connections) and 286 multi-family connections (11.8% of multi-family connections with a total of 13,847 multi-family units) through June of 1996. At current program levels, the district is on track to meet the coverage requirement by the end of the initial MOU term.

Contra Costa Water District had its residential home water audit program independently evaluated in 1994 by WATERTECH Software and Consulting. The evaluation estimated household water savings ranging between 6% and 24%, with a mean water savings of 16%. Program cost estimates ranged from $118 to $195 per acre-foot of water saved.

6.1.2 Plumbing, New and Retrofit (BMP 2)

Evaluation Grade

Implementing on Schedule

BMP Requirements

Identification of pre-1980 single- and multi-family homes; deliver retrofit kits, including low-flow showerheads, and toilet displacement devices to unretrofitted homes; offer to install the devices; follow-up with customers at least three times. Program underway by August 31, 1993. Coverage requirement: 75% of pre-1980 single-family accounts and 80% of pre-1980 multi-family accounts to be retrofitted with low-flow devices (other than ULFTs) by end of initial term.

Evaluation Notes

BMP Schedule

Contra Costa Water District initiated its current program in 1993, though it distributed conservation kits under a different program prior to this. As of June 30, 1996, the district’s program has distributed retrofit kits to 12,139 single family homes and 9,500 multi-family units. Distribution is not targeted to pre-1980 residential construction, and the number of residential units constructed prior to 1980 that have been retrofitted is unknown. Contra Costa Water District relies primarily on mass distribution at public events. It is therefore not possible for the district to determine if it is on schedule to meet the coverage requirements for this BMP.

If we adopt the assumption that all distributed devices are installed within the service area in unretrofitted homes, then based on an extrapolation of historic distribution rates, the district would be on schedule to meet the coverage requirements for this BMP. However, field evaluations of device distribution programs suggests the 100% installation rate assumption is not warranted. If

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Note: It is beyond the scope of this study to evaluate the accuracy of study results cited herein. The citation is made to note that the agency has made a good faith effort to evaluate the effectiveness of its BMP implementation program.
instead we adopt the more plausible assumption that 70% of distributed devices are installed in unretrofitted homes within the service area, then Contra Costa Water District would still meet its coverage requirement for single-family homes, but would be slightly under its requirement for multi-family homes.\textsuperscript{14} This is shown in the table below. We believe the district can meet the coverage requirement through a slight acceleration of the program, and therefore consider it to be implementing this BMP on schedule, and in a manner consistent with the BMP's coverage requirement.

<table>
<thead>
<tr>
<th>Year</th>
<th>Households Retrofitted**</th>
<th>Cumulative Retrofits</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Single-Family</td>
<td>Multi-Family</td>
</tr>
<tr>
<td>Prior to 1993</td>
<td>639</td>
<td>5,250</td>
</tr>
<tr>
<td>1993</td>
<td>525</td>
<td>350</td>
</tr>
<tr>
<td>1994</td>
<td>1,750</td>
<td>315</td>
</tr>
<tr>
<td>1995</td>
<td>1,750</td>
<td>350</td>
</tr>
<tr>
<td>1996</td>
<td>1,750</td>
<td>350</td>
</tr>
<tr>
<td>1997</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1998</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1999</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2001</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Coverage Requirement for Year 2001: 13,500, 9,600

\textsuperscript{**} Actual number of pre-1980 households retrofitted is unknown. Assumes 70% of distributed devices installed.

\textit{Italics represent linear extrapolation based on historic retrofit rates.}

\textbf{Customer Targeting:} Contra Costa Water District relies primarily on mass distribution at public events. In addition to distributing showerheads, the district also distributes faucet aerators, hose nozzles, toilet leak detection tablets, toilet tank displacement devices and buckets. The district believes this extra effort generates more water efficiency than just handing out showerheads. A door to door kit delivery was tried in 1992 as a pilot program. The time and resources it required did not appear to make sense for the installation of a showerhead. There was still no way to insure installation if the customer did not respond. When added together, for a kit delivery of 1,000 kits it required at least 10 staff days to determine the specific 1980 residences in a neighborhood, ready kits for delivery, and to deliver the kits. In addition, printing and postage for the three follow up letters was expensive, approximately $1.00 each for mailing costs. This program proved to be much more time consuming and labor intense than regular audits. Following this pilot, the district then moved to a kit distribution method at farmers markets.

\textbf{Program Description:} Contra Costa Water District distributes plumbing fixture retrofit kits, buckets, hose nozzles and landscape information at Farmer's markets within the local service area. Recipients give their names and addresses and are given an offer for installation of the devices if needed. A follow-up letter offering installation is later mailed. Bill stuffers are used to offer customers audits and device installation.

\textsuperscript{14} Field studies suggest a 70% installation rate is still on the high side. Studies of Irvine Ranch Water District and Westchester in the LA Basin indicate an installation rate of 50% - 60%.
Program Results: Contra Costa Water District has distributed retrofit kits to 12,139 single family homes and 9,500 multi-family units since 1990. Since 1992, the Contra Costa Water District has distributed 5,750 low-flow showerheads, 2,500 faucet aerators, 4,700 tank displacement devices, 6,000 dye tabs, 6,100 hose nozzles and 6,100 buckets.

Program water savings and cost-effectiveness have not been evaluated by the Contra Costa Water District.

6.1.3 Distribution System Water Audits (BMP 3)

Evaluation Grade
Implementing on Schedule

BMP Requirements
Distribution system to be inspected at least once every three years, using a methodology similar to that described in an AWWA manual; advising customers where leaks appear to exist on their side of the meter and making cost-effective repairs.

Evaluation Notes

BMP Schedule: Contra Costa Water District is on schedule for this BMP. The district implemented a formal leak detection program in 1993, completed a full system audit in 1995, and is on schedule to complete the next full system audit in 1998. Contra Costa Water District surveys more than 1/3 of its mains per year.

Program Description: Contra Costa Water District’s audit procedure follows the methodology presented in the American Water Works Association’s “Manual of Water Supply Practices, Water Audits and Leak Detection.” The district’s program expedites the repair of observed leaks by isolating their location, and discovers hidden leaks through field surveys of water mains. The program is fully documented in an interoffice memo to the Operations and Engineering Committee dated June 20, 1995.

Program Results: Total water losses equal approximately 8% of district water supply, which is within industry standards for a well-operated system. Using AWWA methodology, the district estimates an annual recoverable leakage of 494 million gallons, valued at $457,000. The annual cost of the program in 1995 was $76,000. The Contra Costa Water District considers the program to be highly cost-effective.

6.1.4 Metering with Commodity Rates (BMP 4)

Evaluation Grade
Implementing on Schedule

BMP Requirements
Metering all new connections, and billing using rates that include a volume charge; retrofitting all unmetered existing connections and billing using rates that include a volume charge.

Evaluation Notes

BMP Schedule: Contra Costa Water District is on schedule for this BMP. Contra Costa Water District has been metering all retail M&I potable water supply connections since prior to 1993. Contra Costa Water District has been billing all retail M&I connections by volume of use since prior to 1993.
Program Description: Contra Costa Water District meters and bills by volume of use all retail M&I potable water supply connections. While most of the district's non-potable water supply connections are unmetered, these constitute less than one percent of total connections.

6.1.5 Large Landscape Audits (BMP 5)

Evaluation Grade

Implementing on Schedule

BMP Requirements

Agencies are required to identify customers with at least 3 acres of landscaping, contacting them by mail; offering audits; offering incentives to effect customer implementation; providing follow-up audits at least once every five years; providing multilingual training and information. Coverage requirement: audits offered to 100% of landscape sites 3 acres or more by end of initial MOU term.

Evaluation Notes

BMP Schedule: Contra Costa Water District is on schedule for this BMP. It initiated a large landscape water audit program prior to August 31, 1994, and has operated it continuously since program inception. The district is on track to meet the coverage requirement for this BMP by the end of the initial MOU term.

Customer Targeting: Contra Costa Water District has tried to estimate the number of large landscapes of 3+ acres in its service area, but has found it difficult to target these customers. It also suspects that most sites with 3 or more acres of landscaping have independent sources of water (well or canal). The district does directly contact and offer audits to all customers with dedicated landscape meters. Contra Costa Water District also monitors account water usage and directly contacts accounts with high consumption or sharp increases in consumption. In addition, the district provides landscape audits to all customers that request them. The district's targeting methods are at least as effective as those described by the BMP.

Program Description: Audits are conducted by qualified district staff. Water use history is reviewed and summarized, irrigation systems are tested, an irrigation schedule is developed, and a water budget is developed. A report is developed and sent to both the landscape manager and the property manager/owner. In addition to providing audit results and recommended savings measures, the report shows potential conservation savings both in terms of water volume and dollars.

The district provides irrigation workshops on average two times per year. These are conducted in English only.

Customer Incentives: In 1994, Contra Costa Water District initiated the CCWD Irrigation Equipment Upgrade Test Program. Contra Costa Water District implemented this program to provide financial assistance to landscape irrigation customers upgrading three types of irrigation equipment:

1) The program offered up to 100% of the material cost of rain sensors with a maximum $50 rebate per sensor.

2) The program offered a rebate up to $2,200 or the total materials cost of a central command system, whichever was less.

3) The program offered a rebate of $1,000 per site or 50% of the material cost of a drip irrigation system that replaced an existing spray system, whichever was less.
To receive a rebate, the customer must first have a water audit. 43 sites have received rebates since program inception. Funding of this program, however, is very modest. The district allocates approximately $5,000 per year to the program.

Program Results: The table below summarizes the number of large landscape audits offered and completed by the district through June 30, 1996. Contra Costa Water District is on target to meet the coverage requirement for this BMP.

<table>
<thead>
<tr>
<th>Report Year</th>
<th>Surveys Offered</th>
<th>Surveys Completed</th>
<th>Cumulative Surveys Completed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prior to 92</td>
<td>not reported</td>
<td>200</td>
<td>200</td>
</tr>
<tr>
<td>92/93</td>
<td>75</td>
<td>50</td>
<td>250</td>
</tr>
<tr>
<td>93/94</td>
<td>858</td>
<td>62</td>
<td>312</td>
</tr>
<tr>
<td>94/95</td>
<td>all irrigation customers</td>
<td>113</td>
<td>425</td>
</tr>
<tr>
<td>95/96</td>
<td>all irrigation customers</td>
<td>111</td>
<td>536</td>
</tr>
</tbody>
</table>

Estimated number of 3+ acre landscapes in service area: 170
Source: CUWCC Retail Annual Reports

Contra Costa Water District had its landscape water audit program independently evaluated in 1993. The study found attributed an average water savings of 7% to the audit program, but also noted that there was considerable variation across customers. The estimated payback period for audit costs was less than one year.

6.1.6 Landscape Water Conservation Requirement (BMP 6)

Evaluation Grade

Implementing on Schedule

BMP Requirements

Enacting and implementing landscape water conservation ordinances, or cooperating with government/industry to develop and implement ordinances. Ordinances must be at least as effective as the Model Ordinance. Coverage requirement: 100% of new landscapes subject to ordinances by end of initial MOU term.

Evaluation Notes

BMP Schedule: Agency is on schedule for this BMP. As a special district, Contra Costa Water District does not have the authority to adopt landscape ordinances within its service area. The district adopted a model landscape ordinance based on the “Model Water Conservation Landscape Ordinance” in August, 1992, ahead of the BMP schedule. The agency forwarded the model

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Contra Costa Water District Landscape Water Audit Evaluation (June 1993), Prepared by John Whitcomb, Ph.D.

Note: It is beyond the scope of this study to evaluate the accuracy of study results cited herein. The citation is made to note that the agency has made a good faith effort to evaluate the effectiveness of its BMP implementation program.
ordinance to all cities within its service area, which were to consider its adoption. The district worked with cities within its service area, and all cities have adopted landscapes ordinances.

Program Description: All cities within the Agency’s service area have adopted a landscape water conservation ordinance.

6.1.7 Public Information (BMP 7)

Evaluation Grade

Implementing on Schedule

BMP Requirements

Implement public information programs to educate customers about water use and to promote water conservation. Program could include providing speakers to community groups and media; advertising; using bill inserts; providing water use information on customer bills comparing current and previous year use; working cooperatively with other groups promoting water conservation. No coverage requirement specified by Exhibit 1.

Evaluation Notes

BMP Schedule: Contra Costa Water District is on schedule for this BMP. Contra Costa Water District has maintained an active public information program promoting water conservation since the late 1980s.

Program Description: Contra Costa Water District’s public information program includes paid advertising, bill inserts, showing previous water use on customer bills, water conservation brochures, lawn watering guides, demonstration gardens, speakers bureau, and booths at public events. The agency has recently initiated a landscaping contest in cooperation with regional newspapers to publicize water efficient landscaping designs and practices. All district conservation programs are actively publicized.

6.1.8 School Education (BMP 8)

Evaluation Grade

Implementing on Schedule

BMP Requirements

Implement school education programs within service area. Programs to include provision of educational materials and instruction assistance. No coverage requirement specified by Exhibit 1.

Evaluation Notes

BMP Schedule: Contra Costa Water District is on schedule for this BMP. Contra Costa Water District has maintained an active school education program promoting water conservation since the late 1980s.

Program Description: Contra Costa Water District’s school education program includes participating in school assemblies promoting water conservation; distribution of educational materials, including books, maps, posters, and videos; science fairs, professional plays, tours, and water awareness month activities; teacher training and grants. The program targets grades K-8.

The district dedicates one staff person 75% time to coordinating school outreach programs. The district also uses docents for classroom presentations and tours. The district contracts with Lawrence Hall of Science for an annual theater production, and provides boat tours of the Delta to 5th graders.
6.1.9 CII Water Conservation (BMP 9)

Evaluation Grade

Implementing on Schedule

BMP Requirements

Identification of top 10% of commercial customers, top 10% of industrial customers, and top 20% of institutional customers. Directly contacting target customers and offering water audit. Providing incentives to encourage implementation of recommended measures. Offering follow-up audits at least once every five years if necessary. No coverage requirement specified by Exhibit 1 for commercial and industrial customers; coverage requirement for institutional accounts: 70% of top 20% of pre-1980 institutional accounts.

Evaluation Notes:

BMP Schedule: The District's CII program began in 1991 when the top 20% of CII users were identified and 75 CII audits were completed.

Customer Targeting: The district has identified its top 10% of commercial and industrial accounts, and its top 20% of institutional accounts. Target accounts are directly contacted via phone and mail. The District has 2,600 commercial accounts, therefore the total number of targeted CII customers to be contacted during the term of the MOU is 260. The total number of audits to be completed is not specified in the MOU. In 1992/93, 49 CII audits were completed. A contracted CCWD employee was responsible for completing these audits. District annual reports indicate that 426 commercial audits had completed as of the 1996 report, though district staff indicate that only 226 CII audits have been completed. Taking the lower of these values, the district has achieved an 85% audit coverage factor of the 260 commercial accounts that are required to be targeted by the MOU. The district’s 10 large industrial customers are major industries which generally use 1,000 AF or more per year, and employ full-time water managers. In the late 1980’s they aggressively re-tooled operations. Thus they reduced their water usage 10% during the 1991 drought. CCWD staff continues to work with industrial customer's water conservation staff in non-formal water management collaboration. The district does not believe audits are not an appropriate approach for this group. Most of these customers are on the Delta and therefore are subjected to very strict discharge requirements. This also makes water conservation a priority for them.

Program Description: Audits are conducted by qualified district staff. Facility water uses are reviewed and water saving recommendations are developed. A written report is sent to customer providing audit results, water saving recommendations, and eligibility information for CII customer incentive program. The audit program focuses on cooling tower operations and retrofits, which constitute a significant amount of commercial water use in the district’s service area.

Customer Incentives: The district operates a customer rebate program similar to its rebate program for large landscapes. Customers must first be audited to be eligible for an audit. Like the landscape rebate program, the CII rebate program is only modestly funded at about $5,000 per year.

Program Results: The table below shows the number of audits offered and completed as of June 30, 1996. The agency is on track to meet the coverage requirement specified by Exhibit 1 for institutional audits. Exhibit 1 does not specify coverage requirements for commercial and industrial accounts.
Evaluation of BMP Implementation for Contra Costa Water District

<table>
<thead>
<tr>
<th>Report Year</th>
<th>Commercial</th>
<th>Industrial</th>
<th>Institutional</th>
<th>Commercial</th>
<th>Industrial</th>
<th>Institutional</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prior to 92</td>
<td>Top 20%</td>
<td>0</td>
<td>0</td>
<td>75</td>
<td>0</td>
<td>10</td>
</tr>
<tr>
<td>92/93</td>
<td>Top 20%</td>
<td>0</td>
<td>as requested</td>
<td>49</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>93/94</td>
<td>812</td>
<td>0</td>
<td>as requested</td>
<td>82</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>94/95</td>
<td>315</td>
<td>8</td>
<td>as requested</td>
<td>110</td>
<td>3</td>
<td>8</td>
</tr>
<tr>
<td>95/96</td>
<td>315</td>
<td>2</td>
<td>23</td>
<td>110</td>
<td>2</td>
<td>6</td>
</tr>
</tbody>
</table>

Number of Accounts in Service Area: 2600+ <10 200+

Source: CUWCC Retail Annual Reports

6.1.10 New Commercial/Industrial Water Use Review (BMP 10)

Evaluation Grade

Partially Implementing

BMP Requirements

A program to assure the review of proposed water uses for new commercial and industrial water service and making recommendations for improved water use efficiency before completion of the building permit process. No coverage requirement is specified for this BMP by Exhibit 1.

Evaluation Notes

BMP Schedule: Contra Costa Water District has initiated a new use review program in accordance with the MOU schedule. The district established a program through its Planning/Conservation Branch to review new water uses for commercial and industrial projects requiring EIS/EIRs in 1989.

Program Description: The agency has established a program to review new commercial and industrial uses for projects requiring Environmental Impact Statements. It does not have a program in place to review new uses not requiring Environmental Impact Statements. Thus, the program is not considered to be at least as effective as assuring the review of proposed water uses for all new commercial and industrial water service.

6.1.11 Conservation Pricing (BMP 11)

Evaluation Grade

Implementing on Schedule

BMP Requirements

Requires eliminating non-conservation pricing and adopting conservation pricing. This is defined as no fixed rate or declining block pricing, and no high fixed costs coupled with low commodity charges. Where the agency also provides sewer services, these rate structures should also apply. No coverage requirement is specified for this BMP by Exhibit 1.

Evaluation Notes

BMP Schedule: Contra Costa Water District is on schedule for this BMP. The district has billed water consumption using a combination of service charges and volumetric charges based on metered use since prior to August 31, 1993.
**Program Description:** The district employs a uniform volume rate in combination with a service charge. The structure does not result in a disproportionate share of the bill being collected through the service charge. Therefore, the rate structure is in conformance with the BMP's definition of a conservation rate structure.

### 6.1.12 Residential Landscape Conservation (BMP 12)

**Evaluation Grade**
Implementing on Schedule

**BMP Requirements:**
Requires provision of guidelines, information and incentives for more efficient landscape at new or existing single family homes; and enacting and implementing landscape water conservation ordinances. No coverage requirement is specified for this BMP by Exhibit 1.

**Evaluation Notes**

**BMP Schedule:** Contra Costa Water District has initiated this BMP in accordance with the MOU schedule.

**Program Description:** Contra Costa Water District provides guidelines and information, including brochures, new home information packet, and watering guidelines. Agency operates demonstration gardens, participates in garden and home shows, and has an awards/recognition program. Agency offers free home water audits, which include a landscape irrigation element. Cities within agency’s service area have adopted landscape water conservation ordinances based on a model ordinance developed by the agency.

**Customer Incentives:** Free water audits are available to any residential customer in the district.

### 6.1.13 Water Waste Prohibition (BMP 13)

**Evaluation Grade**
Implementing on Schedule

**BMP Requirements**
Enacting and enforcing measures to prohibit gutter flooding, single pass cooling systems in new connections, nonrecirculating systems in all new conveyor car wash and commercial laundry systems, and nonrecirculating decorative water fountains. Including water softener checks in home water audits and providing customers with information about DIR and exchange-type water softeners in their educational efforts.

**Evaluation Notes**

**BMP Schedule:** The district is on schedule for this BMP.

**Program Description:** Agency prohibits gutter flooding; single pass cooling systems; non-recirculating carwashes, laundries, and fountains; and hosing of hard surfaces. Prohibitions apply at all times during the year.

### 6.1.14 Water Conservation Coordinator (BMP 14)

**Evaluation Grade**
Implementing on Schedule

**BMP Requirements**
Designation of a water conservation coordinator responsible for preparing agency conservation plan, managing its implementation, and evaluating program results. No coverage requirement is specified for this BMP by Exhibit 1.

Evaluation Notes

BMP Schedule: Agency is on schedule for this BMP. Agency established and staffed the position of Water Conservation Coordinator April 1, 1991.

Program Description: Conservation Coordinator is a full-time position. Coordinator dedicates 100% of their time to the agency’s conservation program. Coordinator manages a conservation program staff.

6.1.15 Financial Incentives (BMP 15)

Evaluation Grade
Implementing on Schedule

BMP Requirements:
Financial incentives are to be offered to retail customers. No coverage requirement is specified for this BMP by Exhibit 1.

Evaluation Notes

BMP Schedule: Agency has initiated this BMP in accordance with the MOU schedule.

Program Description: Agency provides a variety of customer financial incentives, including $75 rebates towards purchase of ULFT; rebates and grants for purchase of water saving irrigation equipment; and rebates and grants for commercial/industrial retrofits.

6.1.16 Ultra Low Flush Toilet Replacement (BMP 16)

Evaluation Grade
Implementing on Schedule

BMP Requirements
Implementing programs to replace existing high-water-using toilets with ultra-low-flush toilets. Programs to be as effective as offering $100 rebates for toilets, or requiring replacement at time of resale, or replacement at time of change of service. Identifying all non-residential customers and ranking them by water use by December 31, 1995, and retrofitting toilets for at least 1% of their non-residential customers by June 30, 1998. Coverage requirement: per Exhibit 6 of the MOU, agency program must result in water savings equivalent to a retrofit on resale requirement for the service area.

Evaluation Notes

BMP Schedule: The agency initiated its replacement program in accordance with the MOU schedule. While the agency is not currently on track to satisfy the coverage requirements for this BMP by the end of the initial MOU term (estimated program savings through FY 1996 are 78% of the necessary target water savings through FY 1996)\(^\text{16}\), it is accelerating its program to distribute

\(^{16}\) This is calculated as the sum of annual cumulative program savings from each year of program operation divided by the sum of annual cumulative water savings targets starting from August 31, 1993. This is the total volume of water saved by the program divided by the total volume of water targeted to be saved.
4,000 toilets per year through 2020. If the district sustains this rate of distribution, it will exceed the Exhibit 6 calculated coverage requirements for 2001.

**Program Description:** The agency’s ULFT replacement program consists of a rebate program initiated in 1993/94. Rebates are set to $75 per toilet. The program is extensively advertised by the agency, is open to all single- and multi-family agency customers, and has been fully subscribed in each year of its operation. The agency also participated with Southern California Water Company in a pilot direct install program for low-income multi-family residences in 1994/95 and 1995/96.

**Program Results:** Program results are shown in the table below. As of FY 1996, a total of 6,131 single-family and 2,356 multi-family toilet replacements have been attributed to the program.

Program water savings depend on annual water savings per toilet, which, in turn, depend on household density, number of toilets per household, whether the retrofit was partial or complete, and the mix of pre- and post-1980 housing units receiving retrofits. Exhibit 6 provides water savings lookup tables (derived from empirical program evaluations) that take these factors into account, and, for purposes of the MOU, are to be used for calculating water savings attributable to ULFT programs. Based on these tables, the cumulative annual water savings (AF/yr) attributed to the agency’s program as of June 30, 1996, is 273 AF/yr.

To assess implementation effectiveness, annual program savings were compared to savings that could be attributed to a retrofit-on-resale requirement for the service area. We base this analysis on the methodology presented in Exhibit 6 of the MOU.\(^7\) It is important to emphasize that savings targets using this methodology are net of any savings that would occur naturally due to expected toilet failure and replacement. In other words, the method fully accounts for natural replacement. It is equally important to note that on the agency side, any toilet replacements directly attributable to the agency’s program are counted, including replacements by program participants that would have replaced their toilet regardless of the program (e.g. program free-riders). In this regard, the evaluation favors agencies, since it nets out natural replacement from the targets, but not from meeting the targets.

The results of this evaluation are shown in the proceeding table. A copy of the spreadsheet model and data used to generate this table are included with this report.

---

\(^7\) The spreadsheet model used to calculate program savings and targets is included with this report. Prior to finalizing this evaluation, the model was submitted to A & N Technical Services, who authored Exhibit 6, for review and validation. The model was deemed by A & N Technical Services to be consistent with Exhibit 6 requirements.
### Application of BMP Retrospective

**Evaluation of BMP Implementation for Contra Costa Water District**

#### BMP 16. ULFT Retrosuits

**CCWD Program Results through FY 1996**

**Using Exhibit 6-based Water Savings Estimates**

<table>
<thead>
<tr>
<th>Fiscal Year</th>
<th>ULFT Program Toilet Replacements 1/</th>
<th>Cumulative ULFT Program Savings 2/ (AF/Yr)</th>
<th>Exhibit 6-Based Cumulative Target 3/ (AF/Yr)</th>
<th>Difference Between Program &amp; Target Savings (AF/Yr)</th>
<th>Cumulative Balance 4/ (AF)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1991/92</td>
<td>0 Single-Family (no. of toilets)</td>
<td>0 Multi-Family (no. of toilets)</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1992/93</td>
<td>0</td>
<td>0</td>
<td>85</td>
<td>27</td>
<td>(27)</td>
</tr>
<tr>
<td>1993/94</td>
<td>3,000</td>
<td>0</td>
<td>134</td>
<td>(49)</td>
<td>(76)</td>
</tr>
<tr>
<td>1994/95</td>
<td>1,755</td>
<td>1,217</td>
<td>227</td>
<td>(41)</td>
<td>(118)</td>
</tr>
<tr>
<td>1995/96</td>
<td>1,376</td>
<td>1,139</td>
<td>309</td>
<td>(36)</td>
<td>(154)</td>
</tr>
<tr>
<td>1996/97</td>
<td></td>
<td></td>
<td>381</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1997/98</td>
<td></td>
<td></td>
<td>444</td>
<td></td>
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<td>1999/00</td>
<td></td>
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<td>545</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2000/01</td>
<td></td>
<td></td>
<td>585</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Graph

![Graph showing cumulative savings and targets over fiscal years](image)

- **Agency Cumulative Annual Savings**
- **Cumulative Annual Targets**

**Notes:**

1/ Total number of single- and multi-family toilet replacements credited to the agency's ULFT program.

2/ The estimated cumulative annual water savings (AF/yr) associated with the credited toilet replacements. All savings are credited, including savings that would have occurred to natural replacement (i.e., program free-ridership). Savings estimates derived from Exhibit 6.

3/ The agency's cumulative annual savings targets (AF/yr) equivalent to a retrofit-on-resale requirement. Target calculated using Exhibit 6 methodology and data on housing resale rates for agency's county. Targets are net of natural replacement; they only include savings directly attributable to a hypothetical retrofit-on-resale requirement.

4/ A running total of the difference between credited program savings and target savings. Negative quantities indicate the agency has not, on balance, met the targets at that point in time. Positive quantities indicate the agency has, on balance, exceeded the targets at that point in time.
6.2 Evaluation of BMPs Applying to Wholesale Suppliers

A summary of the evaluation results of the wholesale operations of the Contra Costa Water District is presented in Table 6-2. Evaluation summaries and notes for each BMP are presented in the subsections that follow. In general, we found Contra Costa Water District to be in full compliance with the MOU requirements as they relate to signatory wholesale water suppliers.

Table 6-2. Summary of Wholesale BMP Evaluation for Contra Costa Water District

<table>
<thead>
<tr>
<th>BMP No.</th>
<th>BMP Name</th>
<th>Implementing on Schedule</th>
<th>Implementing Not on Schedule</th>
<th>Partially Implementing</th>
<th>Not Implementing</th>
<th>Exempted</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Dist. System</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Metering</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Public Info.</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>School Education</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Pricing</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Coordinator</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Financial Incentives</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

6.2.1 Distribution System Water Audits (BMP 3)

**Evaluation Grade**
Implementing on Schedule

**BMP Requirements**

Distribution system to be inspected at least once every three years, using a methodology similar to that described in an AWWA manual; advising customers where leaks appear to exist on their side of the meter and making cost-effective repairs.

**Evaluation Notes**

BMP Schedule: CCWD has operated a transmission system inspection and leak repair program since the early 1990s.

Program Description: The program inspects transmission lines on a repeating basis; leaks are repaired when detected. (See Section 5.1.3 for program details)

6.2.2 Metering with Commodity Rates (BMP 4)

**Evaluation Grade**
Implementing on Schedule

**BMP Requirements**

Metering all new connections, and billing using rates that include a volume charge; retrofitting all unmetered existing connections and billing using rates that include a volume charge.

**Evaluation Notes**

BMP Schedule: CCWD is implementing this BMP in accordance with the MOU schedule.

Program Description: All wholesale deliveries are metered and billed according to volume of use.
6.2.3 Public Information (BMP 7)

Evaluation Grade

Implementing on Schedule

BMP Requirements

Implement public information programs to educate customers about water use and to promote water conservation. Program could include providing speakers to community groups and media; advertising; using bill inserts; providing water use information on customer bills comparing current and previous year use; working cooperatively with other groups promoting water conservation. No coverage requirement specified by Exhibit 1.

Evaluation Notes

CCWD has an extensive public information program that it extends to its wholesale service area. CCWD also makes its marketing and program collateral available to its wholesale customers' conservation programs. (See Section 5.1.7 for a description of the program).

6.2.4 School Education (BMP 8)

Evaluation Grade

Implementing on Schedule

BMP Requirements

Implement school education programs within service area. Programs to include provision of educational materials and instruction assistance. No coverage requirement specified by Exhibit 1.

Evaluation Notes

CCWD's school education program targets schools in both its retail and wholesale service areas. (See Section 5.1.8 for program description.)

6.2.5 Conservation Pricing (BMP 11)

Evaluation Grade

Implementing on Schedule

BMP Requirements

Requires eliminating non-conservation pricing and adopting conservation pricing. This is defined as no fixed rate or declining block pricing, and no high fixed costs coupled with low commodity charges. Where the agency also provides sewer services, these rate structures should also apply. No coverage requirement is specified for this BMP by Exhibit 1.

Evaluation Notes

All wholesale customers are billed by volume of use. The district does not employ decreasing-block rates nor derives an excessive amount of revenue from fixed charges to wholesale customers.

6.2.6 Water Conservation Coordinator (BMP 14)

Evaluation Grade

Implementing on Schedule
BMP Requirements

Designation of a water conservation coordinator responsible for preparing agency conservation plan, managing its implementation, and evaluating program results. No coverage requirement is specified for this BMP by Exhibit 1.

Evaluation Notes

CCWD’s conservation coordinator oversees both retail programs and wholesale customer outreach. (See Section 5.1.14 for program description.)

6.2.7 Financial Incentives (BMP 15)

Evaluation Grade

Implementing on Schedule

BMP Requirements:

Financial incentives are to be offered to retail agencies to support conservation programs. No coverage requirement is specified for this BMP by Exhibit 1.

Evaluation Notes

CCWD’s cost-sharing and rebate programs -- landscape and ULFT -- are open to all wholesale customers. In addition, the district has entered into several joint ventures to distribute toilets with at least one of its retail agencies. The district also provides technical support and conservation program design assistance to its wholesale customers.

6.3 Evaluation of BMPs Not Applying Directly to Wholesalers

As discussed in section 2.5, signatory wholesale water suppliers are not obligated under the MOU to implement BMPs 1, 2, 5, 6, 9, 10, 12, 13, and 16. Most signatory wholesale water suppliers, however, provide some level of implementation support to their retail agency customers for these BMPs. This section presents the evaluation results for the Contra Costa Water District for these BMPs.

Table 6-3 summarizes the level of support provided to its wholesale customers by CCWD for BMPs 1, 2, 5, 6, 9, 10, 12, 13, and 16. CCWD’s conservation program is focused mostly on its retail service area. However, most of its programs are open to both retail and wholesale customers. Overall, the district provides a standard level of support to its wholesale customers. The subsections that follow provide the summary descriptions of district activities supporting this classification.
Table 6-3  CCWD Summary of Support Levels for BMPs Not Applying Directly to Signatory Wholesale Water Suppliers

<table>
<thead>
<tr>
<th>BMP No.</th>
<th>BMP Name</th>
<th>Extensive Support</th>
<th>Standard Support</th>
<th>Moderate Support</th>
<th>Negligible Support</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Res. Audits</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Plumbing Retro.</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Landscape Audits</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Landscape Req.</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>CII Conservation</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>CI Use Review</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Landscape SF Res.</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Water Waste Proh.</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>ULFT Replacement</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

6.3.1 Residential Water Audits (BMP 1)
Support Level
Standard Support

BMP Requirements
Identification of top 20 percent of water users; directly contact and offer audits to target customers; offer audits on a repeating cycle; provide customer incentives to implement measures. Programs to be underway by August 31, 1994. Coverage requirement: 70% of target customers to receive an audit by end of initial MOU term.

Evaluation Notes
The district's residential audit program is open to all residential customers within its retail and wholesale service areas. While the program is not specifically targeted at residences within the wholesale service area, these customers may receive audits upon request. In addition, the district has done several mailings to residences within its wholesale service area to offer audits. These, however, are not a routine part of the program. Overall, the district provides Standard support for this BMP.

6.3.2 Plumbing, New and Retrofit (BMP 2)
Support Level
Standard Support

BMP Requirements
Identification of pre-1980 single- and multi-family homes; deliver retrofit kits, including low-flow showerheads, and toilet displacement devices to unretrofitted homes; offer to install the devices; follow-up with customers at least three times. Program underway by August 31, 1993. Coverage requirement: 75% of pre-1980 single-family accounts and 80% of pre-1980 multi-family accounts to be retrofitted with low-flow devices (other than ULFTs) by end of initial term.

Evaluation Notes
CCWD distributes devices at community public events. These devices are available to any resident within the district's retail and wholesale service areas.
6.3.3 Large Landscape Audits (BMP 5)

Support Level
Standard Support

BMP Requirements

Agencies are required to identify customers with at least 3 acres of landscaping, contacting them by mail; offering audits; offering incentives to effect customer implementation; providing follow-up audits at least once every five years; providing multilingual training and information. Coverage requirement: audits performed for 100% of landscape sites 3 acres or more by end of initial MOU term.

Evaluation Notes

The district's large landscape program is open to all customers within its retail and wholesale service areas. In addition, the district has conducted several landscape seminars for wholesale agency staff and customers. Overall, the district provides a basic level of support for this BMP.

6.3.4 Landscape Water Conservation Requirement (BMP 6)

Support Level
Standard Support

BMP Requirements

Enacting and implementing landscape water conservation ordinances, or cooperating with government/industry to develop and implement ordinances. Ordinances must be at least as effective as the Model Ordinance. Coverage requirement: 100% of new landscapes subject to ordinances by end of initial MOU term.

Evaluation Notes

The district worked with cities within its wholesale service area to develop and enact landscape ordinances consistent with AB 325. (See Section 4.6 for program description.)

6.3.5 CII Water Conservation (BMP 9)

Support Level
Standard Support

BMP Requirements

Identification of top 10% of commercial customers, top 10% of industrial customers, and top 20% of institutional customers. Directly contacting target customers and offering water audit. Providing incentives to encourage customer implementation of recommended measures. Offering follow-up audits at least once every five years if necessary. No coverage requirement specified by Exhibit 1 for commercial and industrial customers; coverage requirement for institutional accounts: 70% of top 20% of pre-1980 institutional accounts.

Evaluation Notes

CCWD's CII audit program is open to all retail and wholesale CII customers. (See Section 5.1.9 for program description.) In addition, the district has conducted several cooling tower seminars for wholesale agency staff and customers.
6.3.6 New Commercial/Industrial Water Use Review (BMP 10)

Support Level
Negligible Support

BMP Requirements
A program to assure the review of proposed water uses for new commercial and industrial water service and making recommendations for improved water use efficiency before completion of the building permit process. No coverage requirement is specified for this BMP by Exhibit 1.

Evaluation Notes
The district has no formal program to support wholesale customer implementation of this BMP.

6.3.7 Residential Landscape Conservation (BMP 12)

Support Level
Standard

BMP Requirements
Requires provision of guidelines, information and incentives for more efficient landscape at new or existing single family homes; and enacting and implementing landscape water conservation ordinances. No coverage requirement is specified for this BMP by Exhibit 1.

Evaluation Notes
CCWD’s residential audit program is available to both retail and wholesale customers. The district participates in regional garden and home shows, and community events. In addition, residential and landscape conservation program materials made available to all wholesale customers. The district operates demonstration gardens throughout its service area.

6.3.8 Water Waste Prohibition (BMP 13)

Support Level
Negligible Support

BMP Requirements
Enacting and enforcing measures to prohibit gutter flooding, single pass cooling systems in new connections, nonrecirculating systems in all new conveyor car wash and commercial laundry systems, and nonrecirculating decorative water fountains. Including water softener checks in home water audits and providing customers with information about DIR and exchange-type water softeners in their educational efforts.

Evaluation Notes
CCWD has no formal program to provide support to its wholesale customers for this BMP.

6.3.9 Ultra Low Flush Toilet Replacement (BMP 16)

Support Level
Standard Support

BMP Requirements
Implementing programs to replace existing high-water-using toilets with ultra-low-flush toilets. Programs to be as effective as offering $100 rebates for toilets, or requiring replacement at time of resale, or replacement at time of change of service. Identifying all non-residential customers and ranking them by water use by December 31, 1995, and retrofitting toilets for at least 1% of their non-residential customers by June 30, 1998. Coverage requirement: per Exhibit 6 of the MOU, agency program must result in water savings equivalent to a retrofit on resale requirement for the service area.

**Evaluation Notes**

CCWD’s toilet rebate program is open to both its retail and wholesale customers. (See Section 5.1.16 for a description of the program.) In addition, the district has entered several joint ventures to distribute toilets with at least one of its wholesale agencies.
7. Evaluation of City of San Diego

In general, we find the City of San Diego to be implementing the BMPs on schedule and in accordance with the terms of the MOU. In many instances the level of effort exceeds that which is called for by the MOU. This is particularly the case for BMP 16. With respect to BMP 13, the city's water waste ordinance does not prohibit certain uses specified by the BMP definition, and hence reflects only partial implementation. As for BMP 10, we did not find any CUWA agency to be fully implementing this BMP. A summary of the evaluation results for the City of San Diego as a retail signatory water supplier is presented in Table 7-1. Evaluation summaries and notes for each BMP are presented in the subsections that follow.

Table 7-1. Summary of BMP Evaluation Results for City of San Diego

<table>
<thead>
<tr>
<th>BMP No.</th>
<th>BMP Name</th>
<th>Implementing on Schedule</th>
<th>Implementing Not on Schedule</th>
<th>Partially Implementing</th>
<th>Not Implementing</th>
<th>Exempted</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Res. Audits</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Plumbing Retro.</td>
<td>X</td>
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<td></td>
</tr>
<tr>
<td>3</td>
<td>Dist. System</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Metering</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Large Landscape</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>New Landscape</td>
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<td>7</td>
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<td>8</td>
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<tr>
<td>15</td>
<td>Financial Incentives</td>
<td>X</td>
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</tr>
<tr>
<td>16</td>
<td>ULFT Replacement</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

7.1 Residential Water Audits (BMP 1)

Evaluation Grade

Implementing on Schedule

BMP Requirements

Identification of top 20 percent of water users; directly contact and offer audits to target customers; offer audits on a repeating cycle; provide customer incentives to implement measures. Programs to be underway by August 31, 1994. Coverage requirement: 70% of target customers to receive an audit by end of initial MOU term.

Evaluation Notes

BMP Schedule: The City of San Diego initiated implementation of this BMP in 1992, two years earlier than required. It is on track to meet the coverage requirements for single-family audits, but not multi-family audits. Recently, the city has worked to accelerate the audit rate for multi-family residences, and if successful, will be able to meet the coverage requirements.
Customer Targeting: Target customers were identified and contacted repeatedly. Targeting has now been widened to include more customers than those identified by the BMP in an effort to increase acceptance rates. Both single family and multifamily customers have been targeted, but the multifamily group has been less successfully recruited. The city conducts ongoing "sweeps" of customers by zip code. Customers within a given zip code are contacted by mail or telephone and offered an audit. Callers rotate around the city, so customers are contacted on a repeating basis. In addition, there is a message on bills, and callers to the conservation hotline are also told about the program. Auditors also distribute brochures in the field if they have time between appointments. Brochures are available at various locations (city offices, electric utility, events) advertising the service, and was publicized on TV (3 channels have done features) and in an article in the Union Tribune newspaper. The city estimates a 35% acceptance rate for the program. The city also targets new homeowners for audits. These are identified with data from the recorder's office. Two packets go out, one for resale, another for new homes. These letters offer an audit, with emphasis on installing landscape for new homes.

Program Description: The auditors install toilet dams, check for leaks, provide faucet aerators and install low-flow showerheads where required. They also check irrigation, and suggest changes that can reduce water use.

Customer Incentives: Customers are offered installation of free water saving devices (low-flow showerheads, toilet dams) where required. They are also provided with discount coupons for water-efficient landscape products.

Program Results: At current program levels, the city is on track to meet the coverage requirement for single-family residences, and slightly off track for multi-family residences. As of June 30, 1996, the city had completed 12,838 audits of single-family residences (47% of the number of target connections), and 1,227 audits of multi-family units (31% of the number of target units). Audit rates have been increasing over time for single-family residences, and the city is taking measures to increase audit rates for multi-family accounts, as well.

The city estimates an average daily water savings of 13% for audited residences. The estimate is based on engineering calculations, and has not been verified empirically. The city believes this estimate is conservative.  

7.2 Plumbing, New and Retrofit (BMP 2)

Evaluation Grade
Implementing on Schedule

BMP Requirements
Identification of pre-1980 single- and multi-family homes; deliver retrofit kits, including low-flow showerheads, and toilet displacement devices to unretrofitted homes; offer to install the devices; follow-up with customers at least three times. Program underway by August 31, 1993. Coverage requirement: 75% of pre-1980 single-family accounts and 80% of pre-1980 multi-family accounts to be retrofitted with low-flow devices (other than ULFTs) by end of initial term.

Evaluation Notes

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18 We note, however, that most academic studies have found that engineering estimates tend to overstate, rather than understate, actual program savings. For more on this, the reader is referred to Nadel, S., M. Reid, and D. Walcott, Eds., Regulatory Incentives for Demand-Side Management (1992), American Council for an Energy-Efficiency Economy.
**BMP Schedule:** City of San Diego initiated implementation of this BMP in accordance with the MOU schedule, and is on track to meet the BMP coverage requirements by the end of the initial MOU term. In 1992, the city passed a local ordinance requiring retrofits on resale or bathroom remodeling. The city estimates that 80% of its single-family homes are retrofitted with low-flow showerheads.

**Customer targeting:** Target homes were identified through census tract data to identify areas containing pre-1980 homes. The program was also very visible and advertised, and non-targeted households invited to contact the retrofit canvasser if they saw him/her in the area, or to call the conservation hot line.

**Program Description:** City staff installed 1,300 showerheads in 1991/1992. The city has distributed an additional 147,000 conservation kits through canvassing (SF door-to-door delivery), pick up or mail out. Distribution has been done in three "phases", with each phase targeting one third of the households estimated to be constructed prior to 1981. In its 1992/1993 BMP report, the City claimed that all target households retrofitted. It distributed an additional 29,162 kits to single family and 11,338 to multifamily in 1994/1995.

**Customer Incentives:** Customers who handed in old showerheads were given free showerheads, aerators, etc., when necessary, and a 10-quart bucket. This was an attempt to ensure retrofits were actually installed. However, no tracking was done of the number of old showerheads returned.

**Program Results:** Through 1996, the city estimates it has delivered nearly 200,000 kits to single family homes and 130,000 kits to multi-family homes. If we assume that 70% of these kits get installed, then as shown in the table below, the city is on track to meet the coverage requirements for this BMP. A recent survey by the city indicated 80 percent of single family homes are retrofitted, but that multifamily homes still need to be targeted.

<table>
<thead>
<tr>
<th>Year</th>
<th>Households Retrofitted**</th>
<th>Cumulative Retrofits</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Single-Family</td>
<td>Multi-Family</td>
<td>Single-Family</td>
</tr>
<tr>
<td>Prior to 94</td>
<td>70,000</td>
<td>12,559</td>
<td>70,000</td>
</tr>
<tr>
<td>1994</td>
<td>32,900</td>
<td>70,000</td>
<td>102,900</td>
</tr>
<tr>
<td>1995*</td>
<td>29,162</td>
<td>11,338</td>
<td>132,062</td>
</tr>
<tr>
<td>1996</td>
<td>20,413</td>
<td>7,972</td>
<td>152,475</td>
</tr>
<tr>
<td>1997</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1998</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1999</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2001</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Coverage Requirement for Year 2001: 110,250 89,612

* Unknown number of devices distributed.
**Actual number of pre-1980 households retrofitted is unknown. Assumes 70% of distributed devices installed.

### 7.3 Distribution System Water Audits (BMP 3)

**Evaluation Grade**

Implementing on Schedule
BMP Requirements

Distribution system to be inspected at least once every three years, using a methodology similar to that described in an AWWA manual; advising customers where leaks appear to exist on their side of the meter and making cost-effective repairs.

Evaluation Notes

BMP Schedule: The City of San Diego is implementing this BMP in accordance with the MOU schedule. The city has had a 2-person leak detection team since 1987 engaged in full-time leak detection and repair; a second team was added in 1993, and both are in the field all of the time.

Program Description: Production and loss data are reviewed on a monthly basis. Because shallow water mains and impermeable soil makes main leaks easy to detect, the program is mostly reactive. Field personnel are trained to look for leaks. The city also has an active program to replace outdated water mains.

Program Results: Total water losses equal approximately 7% of city water supply, which is within industry standards for a well-operated system.

7.4 Metering with Commodity Rates (BMP 4)

Evaluation Grade
Implementing on Schedule

BMP Requirements

Metering all new connections, and billing using rates that include a volume charge; retrofitting all unmetered existing connections and billing using rates that include a volume charge.

Evaluation Notes

BMP Schedule: The City of San Diego is implementing this BMP in accordance with the MOU schedule. The city has been metering and billing by volume of use all retail M&I connections since prior to 1993.

7.5 Large Landscape Audits (BMP 5)

Evaluation Grade
Implementing on Schedule

BMP Requirements

Agencies are required to identify customers with at least 3 acres of landscaping, contacting them by mail; offering audits; offering incentives to effect customer implementation; providing follow-up audits at least once every five years; providing multilingual training and information. Coverage requirement: audits offered to 100% of landscape sites 3 acres or more by end of initial MOU term.

Evaluation Notes

BMP Schedule: The city initiated implementation of a large landscape program in accordance with the MOU schedule. The city completes on average 75 audits per year. It is not possible to determine if the city is on track to meet the coverage requirement for this BMP because it has not identified the number of landscapes of 3+ acres in its service area. However, it estimates there are approximately 5,600 sites in its service area with dedicated irrigation accounts. We calculate that if less than 15% of these sites are 3+ acres, then the city would be on track to meet the BMP
coverage requirement by the end of the initial MOU term. Thus, the city’s current level of effort would enable it to audit approximately 15% of its irrigation sites over the term of the MOU. While it is not possible to determine if this meets the BMP’s coverage requirement, this level of effort is at least consistent with the coverage requirements for BMP 2 and 9 (which express coverage as a percentage of total accounts).

Customer Targeting: The city does not specifically target landscape sites of 3+ acres, and has not identified the number of such sites. Instead it offers free audits to all large landscapes, and specifically targets its largest municipal landscapes for audits. To date, the city has completed 447 large landscape audits.

Program Description: The City has a public facilities irrigation assistance program, under which the City’s water department pays for upgrading irrigation technologies in city parks and landscapes. To date, it has spent $1.4 million on irrigation system upgrades. The City also employs a landscape expert paid for by the water department, who is responsible for efficient water use in city landscapes.

The city participates in the Protector del Agua programs -- Spanish language training programs coordinated by SDCWA.

7.6 Landscape Water Conservation Requirement (BMP 6)

Evaluation Grade
Implementing on Schedule

BMP Requirements

Enacting and implementing landscape water conservation ordinances, or cooperating with government/industry to develop and implement ordinances. Ordinances must be at least as effective as the Model Ordinance. Coverage requirement: 100% of new landscapes subject to ordinances by end of initial MOU term.

Evaluation Notes

BMP Schedule: An ordinance incorporating a prescriptive approach was adopted by the Planning Department in 1986. A technical manual was approved in 1990, establishing minimum performance standards for landscape design of all city approved public and private development projects.

Project Description: City Development Services reviews plans for conformity with technical manual and Ordinance, and plans are not approved if not in conformity with these standards.

7.7 Public Information (BMP 7)

Evaluation Grade
Implementing on Schedule

BMP Requirements

Implement public information programs to educate customers about water use and to promote water conservation. Program could include providing speakers to community groups and media; advertising; using bill inserts; providing water use information on customer bills comparing current and previous year use; working cooperatively with other groups promoting water conservation. No coverage requirement specified by Exhibit 1.

Evaluation Notes
BMP Schedule: The City of San Diego is implementing this BMP in accordance with the MOU Schedule. The city's public information program was in place prior to 1991.

Program Description: The city's program includes fliers and brochures, participation in speakers' bureau; 24 hour conservation hot line, booths at public events such as Earth Day, fairs in Balboa Park and at colleges, such as UCSD. It also sponsors tours of water treatment facilities; billboards; distribution of conservation materials provided by SDCWA and MWD advertising, bill inserts, lawn watering guides, demonstration gardens, and special events. In addition, the consumer's bill shows previous use. In partnership with SDG&E, the City has developed a City building to demonstrate energy and water efficiency.

The City maintains an extensive mailing list of people who have provided their names and addresses; people in surveys, who sign up in booths, etc., and mail them a copy of Water Conservation News, a biannual publication. The City provided $12,000 to the Wild Animal Park for a xeriscape garden in conjunction with training programs held there by the Xeriscape Council. The City also distributes informational materials through public libraries and recreation centers. They also offer videos and Water Awareness Month activities.

7.8 School Education (BMP 8)

Evaluation Grade
Implementing on Schedule

BMP Requirements
Implement school education programs within service area. Programs to include provision of educational materials and instruction assistance. No coverage requirement specified by Exhibit 1.

Evaluation Notes
BMP Schedule: The City of San Diego is implementing this BMP in accordance with the MOU schedule. The County Water Authority has maintained an active school education program on behalf of the City since prior to 1991.

Program Description: In addition to the school program run by SDCWA (see SDCWA evaluation for details), the City sponsored a children's water conservation poster competition in 1991. In 1994 the school Water Hunt program distributed 10,000 kits to children that completed a self home water audit.

7.9 CII Water Conservation (BMP 9)

Evaluation Grade
Implementing on Schedule

BMP Requirements
Identification of top 10% of commercial customers, top 10% of industrial customers, and top 20% of institutional customers. Directly contacting target customers and offering water audit. Providing incentives to encourage customer implementation of recommended measures. Offering follow-up audits at least once every five years if necessary. No coverage requirement specified by Exhibit I for commercial and industrial customers; coverage requirement for institutional accounts: 70% of top 20% of pre-1980 institutional accounts.

Evaluation Notes:
BMP Schedule: The City of San Diego initiated this BMP in accordance with the MOU schedule. The city participates in the County Water Authority’s regional CII program, which was begun in 1994. It is not possible, however, to determine if the city is on-track to meet the coverage requirement for institutional audits because it does not distinguish between commercial and institutional accounts. The city also operates its own program geared to smaller accounts not targeted by the County Water Authority’s program. This program was in full operation by 1995/96. The city appears to have made several good-faith efforts to initiate the program earlier, however. For example, they started to initiate a program with San Diego Gas & Electric, but with the advent of restructuring the electric utility lost interest.

### BMP 9. CII Audits Completed as of June 30, 1996

<table>
<thead>
<tr>
<th>Report Year</th>
<th>Commercial</th>
<th>Industrial</th>
<th>Institutional*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prior to 92</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>92/93</td>
<td>2</td>
<td>1</td>
<td>0</td>
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<tr>
<td>93/94</td>
<td>0</td>
<td>0</td>
<td>Retrofits</td>
</tr>
<tr>
<td>94/95</td>
<td>49</td>
<td>0</td>
<td>Retrofits</td>
</tr>
<tr>
<td>95/96</td>
<td>399</td>
<td>73</td>
<td>Retrofits</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Surveys Completed</th>
<th>Commercial</th>
<th>Industrial</th>
<th>Institutional*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>0</td>
<td>0</td>
<td>Retrofits</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>0</td>
<td>Retrofits</td>
</tr>
<tr>
<td></td>
<td>78</td>
<td>13</td>
<td>Retrofits</td>
</tr>
</tbody>
</table>

Number of Accounts in Service Area: 14,939 616 1,900

* Program focuses on plumbing and irrigation system retrofits rather than audits.
Source: CUWCC Retail Annual Reports

Customer Targeting: The County Water Authority’s program targets the top 10% of water users in the region. The city’s program is targeted at smaller accounts that do not qualify for the County Water Authority’s program.

Program Description: The city provides audits for those customers who do not meet the requirements for the County audit program. The city’s program is run by its staff mechanical engineer. Facility water uses are reviewed and water saving recommendations are developed. A written report is sent to customer providing audit results and water saving recommendations. The city completed 78 commercial and 13 industrial audits in 1995/96. Breakout data from the County Water Authority’s program were not available.

Customer Incentives: To date, the city has not employed customer incentives in connection with its commercial/industrial program. In the future, it will be participating in Metropolitan Water District’s CII retrofit rebate program. This is also the case for the County Water Authority Program.

7.10 New Commercial/Industrial Water Use Review (BMP 10)

Evaluation Grade
Partially Implementing

BMP Requirements
A program to assure the review of proposed water uses for new commercial and industrial water service and making recommendations for improved water use efficiency before completion of the building permit process. No coverage requirement is specified for this BMP by Exhibit 1.

Evaluation Notes
BMP Schedule: The city is implementing this BMP in accordance with the MOU schedule.
Program Description: New use reviews are conducted by the city's Development Services Department. The department reviews plans to assure compliance with plumbing ordinances. The program does not review commercial or industrial process water uses or configurations, other than basic plumbing fixtures, and is not geared to making recommendations for plan modifications. Therefore, this program is not considered to be as effective as a program reviewing all proposed water uses for new CI accounts and making recommendations for improved water use efficiency. None the less, the city's program goes beyond those of most water agencies.

7.11 Conservation Pricing (BMP 11)

Evaluation Grade
Implementing on Schedule

BMP Requirements

Requires eliminating non-conservation pricing and adopting conservation pricing. This is defined as no fixed rate or declining block pricing, and no high fixed costs coupled with low commodity charges. Where the agency also provides sewer services, these rate structures should also apply. No coverage requirement is specified for this BMP by Exhibit 1.

Evaluation Notes

BMP Schedule: The city is implementing this BMP in accordance with the MOU schedule. The district has billed water consumption using a combination of service charges and volumetric charges based on metered use since prior to August 31, 1993.

Program Description: The city has lifeline (increasing block) rates for single family customers. Residential, multifamily and commercial sewer rates are based on water usage. All customers are served under non-decreasing volumetric water rates.

7.12 Residential Landscape Conservation (BMP 12)

Evaluation Grade
Implementing on Schedule

BMP Requirements:

Requires provision of guidelines, information and incentives for more efficient landscape at new or existing single family homes; and enacting and implementing landscape water conservation ordinances. No coverage requirement is specified for this BMP by Exhibit 1.

Evaluation Notes

BMP Schedule: The City of San Diego has initiated this BMP in accordance with the MOU schedule.

Program Description: The city distributes information on landscape materials and makes presentations to homeowners associations in new areas. Landscape architects on staff assist local residents and design demonstration gardens. The city has a new homeowner program that contacts households within a few weeks after they move in to a new home. Homeowners expressing interest get information kit, native plant seeds and discount coupons. There are two packets, one designed for purchasers of existing houses, the other targeted at homeowners of newly-constructed residences.
The home audit program checks irrigation systems and recommends irrigation schedules, provides soil polymers, xeriscape information, discount coupons for water-efficient plants from local nurseries and hose end nozzles, if required.

7.13 Water Waste Prohibition (BMP 13)

Evaluation Grade
Partially Implementing

BMP Requirements

Enacting and enforcing measures to prohibit gutter flooding, single pass cooling systems in new connections, nonrecirculating systems in all new conveyor car wash and commercial laundry systems, and nonrecirculating decorative water fountains. Including water softener checks in home water audits and providing customers with information about DIR and exchange-type water softeners in their educational efforts.

Evaluation Notes

BMP Schedule: The city is implementing this BMP in accordance with the MOU schedule.

Program Description: The city has an adopted ordinance prohibiting unreasonable water uses. Prohibited uses vary with water supply conditions, but generally include gutter flooding, customer leaks, and hosing of hard surfaces. In dry years more uses are banned, including midday irrigation, and water served in restaurants. The ordinance does not prohibit nonrecirculating systems in new conveyor car wash and commercial laundry systems, and therefore is not considered as effective as the BMP requirements.

The City has a 24-hour hotline for reporting leaks or waste, and employees respond to these complaints. The City's audits include questions about water softeners.

7.14 Water Conservation Coordinator (BMP 14)

Evaluation Grade
Implementing on Schedule

BMP Requirements

Designation of a water conservation coordinator responsible for preparing agency conservation plan, managing its implementation, and evaluating program results. No coverage requirement is specified for this BMP by Exhibit 1.

Evaluation Notes

BMP Schedule: The city is implementing the BMP in accordance with the MOU schedule. The position of Water Conservation Coordinator was established in 1985.

Program Description: In 1992, the city's conservation group staffed 12 full-time employees. In 1993 this was increased to 17, and is now reported to have 28 budgeted positions. These are not necessarily all full-time positions.

7.15 Financial Incentives (BMP 15)

Evaluation Grade
Implementing on Schedule

**BMP Requirements:**

Financial incentives are to be offered to retail customers. No coverage requirement is specified for this BMP by Exhibit 1.

**Evaluation Notes**

**BMP Schedule:** The city is implementing this BMP in accordance with the MOU schedule. The city has offered various customer financial incentives since 1991.

**Program Description:** The City’s ULFT program began in 1991, with rebates of up to $75. The City has also contributed $350,000 per year for four years to support public agencies’ efforts to upgrade irrigation systems. It also provides discount coupons for water-efficient plants as an incentive for water audits.

### 7.16 Ultra Low Flush Toilet Replacement (BMP 16)

**Evaluation Grade**

Implementing on Schedule

**BMP Requirements**

Implementing programs to replace existing high-water-using toilets with ultra-low-flush toilets. Programs to be as effective as offering $100 rebates for toilets, or requiring replacement at time of resale, or replacement at time of change of service. Identifying all non-residential customers and ranking them by water use by December 31, 1995, and retrofitting toilets for at least 1% of their non-residential customers by June 30, 1998. Coverage requirement: per Exhibit 6 of the MOU, agency program must result in water savings equivalent to a retrofit on resale requirement for the service area.

**Evaluation Notes**

**BMP Schedule:** The City of San Diego is implementing this BMP in accordance with the MOU schedule. It initiated its program in 1991, and has exceeded Exhibit-6-based targets in each program year.

**Program Description:** The City has an extensive rebate program that applies to all classes of customers, with rebates of up to $75 per toilet. This is not sufficient for small commercial customers, because building permit costs for replacing toilets are over $50. The wholesale agency is providing retrofits for institutional customers. A growing facet of the program includes a large number of free toilet replacements associated with low-income housing. The City is above targets in all years.

**Program Results:** Program results are shown in the table below. As of FY 1996, a total of 122,850 single-family and 40,897 multi-family toilet replacements have been attributed to the program. The city has also replaced several thousand toilets for commercial and public facilities.

Program water savings depend on annual water savings per toilet, which, in turn, depend on household density, number of toilets per household, whether the retrofit was partial or complete, and the mix of pre- and post-1980 housing units receiving retrofits. Exhibit 6 provides water savings lookup tables (derived from empirical program evaluations) that take these factors into account, and, for purposes of the MOU, are to be used for calculating water savings attributable to ULFT programs. Based on these tables, the cumulative annual water savings (AF/yr) attributed to the agency’s residential program as of June 30, 1996, is 5,974 AF/yr.
To assess implementation effectiveness, annual program savings were compared to savings that could be attributed to a retrofit-on-resale requirement for the service area. We base this analysis on the methodology presented in Exhibit 6 of the MOU.\textsuperscript{19} It is important to emphasize that savings targets using this methodology are net of any savings that would occur naturally due to expected toilet failure and replacement. In other words, the method fully accounts for natural replacement. It is equally important to note that on the agency side, any toilet replacements directly attributable to the agency's program are counted, including replacements by program participants that would have replaced their toilet regardless of the program (e.g. program free-riders). In this regard, the evaluation favors agencies, since it nets out natural replacement from the targets, but not from meeting the targets.

The results of this evaluation are shown in the proceeding table. A copy of the spreadsheet model and data used to generate this table are included with this report.

\textsuperscript{19} The spreadsheet model used to calculate program savings and targets is included with this report. Prior to finalizing this evaluation, the model was submitted to A & N Technical Services, who authored Exhibit 6, for review and validation. The model was deemed by A & N Technical Services to be consistent with Exhibit 6 requirements.
### BMP 16. ULFT Retrosits
Program Results through FY 1996
Using Exhibit 6-based Water Savings Estimates

<table>
<thead>
<tr>
<th>Fiscal Year</th>
<th>ULFT Program Toilet Replacements 1/</th>
<th>Cumulative ULFT Program Savings 2/ (AF/Yr)</th>
<th>Exhibit 6-Based Cumulative Target 3/ (AF/Yr)</th>
<th>Difference Between Program &amp; Target Savings (AF/Yr)</th>
<th>Cumulative Balance 4/ (AF)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1991/92</td>
<td>22,630 (Single-Family) 0 (Multi-Family)</td>
<td>736</td>
<td>0</td>
<td>0</td>
<td>736</td>
</tr>
<tr>
<td>1992/93</td>
<td>14,217 (Single-Family) 3,963 (Multi-Family)</td>
<td>1,391</td>
<td>179</td>
<td>1,121</td>
<td>1,948</td>
</tr>
<tr>
<td>1993/94</td>
<td>24,235 (Single-Family) 8,805 (Multi-Family)</td>
<td>2,934</td>
<td>871</td>
<td>2,063</td>
<td>4,011</td>
</tr>
<tr>
<td>1994/95</td>
<td>28,800 (Single-Family) 12,004 (Multi-Family)</td>
<td>4,451</td>
<td>1,463</td>
<td>2,983</td>
<td>6,994</td>
</tr>
<tr>
<td>1995/96</td>
<td>22,851 (Single-Family) 16,125 (Multi-Family)</td>
<td>5,974</td>
<td>1,981</td>
<td>3,993</td>
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<td>1996/97</td>
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<td>2000/01</td>
<td>3,582</td>
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</tr>
</tbody>
</table>

![Cumulative Savings Graph](chart.png)

#### Notes:
1/ Total number of single- and multi-family toilet replacements credited to the agency's ULFT program.
2/ The estimated cumulative annual water savings (AF/yr) associated with the credited toilet replacements. All savings are credited, including savings that would have occurred do to natural replacement (i.e. program free-ridership). Savings estimates derived from Exhibit 6.
3/ The agency's cumulative annual savings targets (af/yr) equivalent to a retrofit-on-resale requirement. Target calculated using Exhibit 6 methodology and data on housing resale rates for agency's county. Targets are net of natural replacement; they only include savings directly attributable to a hypothetical retrofit-on-resale requirement.
4/ A running total of the difference between credited program savings and target savings. Negative quantities indicate the agency has not, on balance, met the targets at that point in time. Positive quantities indicate the agency has, on balance, exceeded the targets at that point in time.
8. Evaluation of Central & West Basin Water Districts

8.1 Evaluation of BMPs Applying to Wholesale Suppliers

A summary of the evaluation results for Central & West Basin Water Districts is presented in Table 8-1. Evaluation summaries and notes for each BMP are presented in the subsections that follow. In general, we found Central and West Basin Water Districts to be in full compliance with the MOU requirements as they relate to signatory wholesale water suppliers.

<table>
<thead>
<tr>
<th>BMP No.</th>
<th>BMP Name</th>
<th>Implementing on Schedule</th>
<th>Implementing Not on Schedule</th>
<th>Partially Implementing</th>
<th>Not Implementing</th>
<th>Exempted</th>
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<tr>
<td>3</td>
<td>Dist. System</td>
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<td>4</td>
<td>Metering</td>
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<td>8</td>
<td>School Education</td>
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</tr>
</tbody>
</table>

8.1.1 Distribution System Water Audits (BMP 3)

Evaluation Grade

Implementing on Schedule

BMP Requirements

Distribution system to be inspected at least once every three years, using a methodology similar to that described in an AWWA manual; advising customers where leaks appear to exist on their side of the meter and making cost-effective repairs.

Evaluation Notes

BMP Schedule: The districts have no pipelines except for the recycled water distribution lines. These are monitored continuously by telemetry and monthly paper audits. Meters are checked for accuracy quarterly. The current leak monitoring program was instituted when the recycling distribution system began operation.

Program Description: Central and West Basin own only the pipelines associated with recycled water. These are maintained by the member agencies under contract with Central and West Basin. Because of liability concerns with recycled water, leak detection is a priority. Operating staff have telemetry on the entire system to give instantaneous warning of major problems. They also do a monthly water balance and meter true-up quarterly.

The Districts are working to encourage their member agencies to improve leak detection. They conducted a paper audit for 11 member agencies (checking deliveries against sales to identify unaccounted-for water). This has been presented to the Board, but has not been well-received. Operating personnel appear to see it as unwarranted interference. In 1991, a member agency (Southern California Water Company) began a two-year program to detect leaks on its system. In 1994-1995 they proposed to hold training sessions, but there has been little interest in expanding this program. This was jointly funded by Central/West Basin, MWD and SCWC.
8.1.2 Metering with Commodity Rates (BMP 4)

Evaluation Grade
Implementing on Schedule

BMP Requirements
Metering all new connections, and billing using rates that include a volume charge; retrofitting all unmetered existing connections and billing using rates that include a volume charge.

Evaluation Notes
BMP Schedule: The districts are implementing this BMP in accordance with the MOU schedule.

Program Description: The districts meter all water deliveries and apply volumetric rates to all water deliveries, as do all of their member agencies. Central and West Basin pass on MWD's commodity charge with an increase to cover their own costs. All Districts' sales are metered, and all subagency sales are metered.

8.1.3 Public Information (BMP 7)

Evaluation Grade
Implementing on Schedule

BMP Requirements
Implement public information programs to educate customers about water use and to promote water conservation. Program could include providing speakers to community groups and media; advertising; using bill inserts; providing water use information on customer bills comparing current and previous year use; working cooperatively with other groups promoting water conservation. No coverage requirement specified by Exhibit 1.

Evaluation Notes
The Districts have operated a public information program continuously since prior to 1991. It provides publications to public groups and its member agencies. It currently has underway a Drought-Proof 2000 campaign, that, in conjunction with the cities, is highlighting the need for conservation, recycling and education. Support for this function appears to be fluctuating.

BMP Schedule: The districts are implementing this BMP in accordance with the MOU schedule. The districts' public information programs pre-dates the signing of the MOU.

Program Description: In conjunction with member cities, the districts operate 15 low-water use demonstration gardens, have published a landscape water conservation handbook that is provided to the member cities for distribution to their consumers. The General Managers and Assistant General Managers meet with local press to publicize water issues. The districts have worked with local communities to set up a "Drought Proof 2000" program that highlights conservation, recycling and education. They have also published a handbook: Best Management Practices: Design Guidelines for Water and Resource Conserving Landscapes. The Districts also have an irregularly prepared bulletin that reports on water issues, and is mailed to anyone who has given their name and address to the districts for any reason -- if they have had a retrofit toilet, or if they have spoken at a public meeting, for example. The current mailing list includes 25,000 people. They distribute conservation brochures (including homeowners brochure) participate in community events, and operate a speakers bureau. Expenditures by the districts on public information for 1992 through 1995 totaled $425,000.
8.1.4 School Education (BMP 8)

Evaluation Grade

Partially Implementing

BMP Requirements

Implement school education programs within service area. Programs to include provision of educational materials and instruction assistance. No coverage requirement specified by Exhibit 1.

Evaluation Notes

The Districts have had an intermittent program, supported by MWD. However, this is limited in scope and has not been run continuously.

Program Description: The districts operated the Planet Protector program in 1993, but since then have concentrated on tours of the water treatment plant. Over the last two years they have had 1,400 children in the K-6 age group go through the plant. The districts plan to reimplement the Planet Protector program this year, and are planning several school events for Water Awareness Month. Overall, however, the district’s school education program is minimal.

8.1.5 Conservation Pricing (BMP 11)

Evaluation Grade

Implementing on Schedule

BMP Requirements

Requires eliminating non-conservation pricing and adopting conservation pricing. This is defined as no fixed rate or declining block pricing, and no high fixed costs coupled with low commodity charges. Where the agency also provides sewer services, these rate structures should also apply. No coverage requirement is specified for this BMP by Exhibit 1.

Evaluation Notes

BMP Schedule: The districts are implementing this BMP in accordance with the MOU schedule. The districts have metered and billed by volume of use deliveries to its retail agency customers since prior to 1991.

Program Description: The districts meters and bills by volume of use all water deliveries to their retail agency customers. The districts do not employ decreasing-block rates, and does not collect a disproportionate share of revenue through fixed charges. In addition, the districts sponsored a workshop with MWD to provide training in conservation-related water rates.

8.1.6 Water Conservation Coordinator (BMP 14)

Evaluation Grade

Implementing on Schedule

BMP Requirements

Designation of a water conservation coordinator responsible for preparing agency conservation plan, managing its implementation, and evaluating program results. No coverage requirement is specified for this BMP by Exhibit 1.

Evaluation Notes
BMP Schedule: The districts are implementing this BMP in accordance with the MOU schedule. The districts established and staffed the position of Water Conservation Coordinator in 1991. It has been staffed continuously since its inception.

Program Description: Conservation Coordinator is a full-time position. Coordinator dedicates 100% of their time to the agency’s conservation program.

8.1.7 Financial Incentives (BMP 15)

Evaluation Grade

Implementing on Schedule

BMP Requirements:

Financial incentives are to be offered to retail agencies to support conservation programs. No coverage requirement is specified for this BMP by Exhibit 1.

Evaluation Notes

BMP Schedule: The districts are implementing this BMP in accordance with MOU schedule. The districts have offered a variety of financial incentives and cost-sharing programs to their retail agencies since prior to 1992.

Program Description: Initially, the district’s "Johnny Rebate" program offered $75 per ULFT retrofit ($100 where retail agency also contributed). A total of 19,650 toilets were retrofitted through the end of 1993-94 FY. At this time, the district’s expenses for this program were $1 million. The districts have also provided assistance to Southern California Water Company’s two-year program to detect leaks on its system, and paid for a paper audit of several agencies’ distribution systems. In 1994/1995 they provided incentives for retrofit of existing irrigation systems for public facilities. The agencies also provide free toilets for distribution by service groups.

8.2 Evaluation of BMPs Not Applying Directly to Wholesalers

As discussed in section 2.5, signatory wholesale water suppliers are not obligated under the MOU to implement BMPs 1, 2, 5, 6, 9, 10, 12, 13, and 16. Most signatory wholesale water suppliers, however, provide some level of implementation support to their retail agency customers for these BMPs. This section presents the evaluation results for Central & West Basin Water Districts for these BMPs.

Table 8-2 summarizes the level of support provided to its retail agencies by Central & West Basin Water Districts for BMPs 1, 2, 5, 6, 9, 10, 12, 13, and 16. The subsections that follow provide the summary descriptions of district activities supporting this classification.

Table 8-3 summarizes implementation of the BMPs Central & West Basin Water Districts are implementing on a regional basis on behalf of its retail agencies. These BMPs were evaluated as though the district is directly responsible for their implementation because the district is operating the programs regionally, and the district’s retail agencies are not operating independent programs. It is important to emphasize, however, that under the MOU, the district is not actually responsible for the implementation of these BMPs, and that it is incumbent upon the districts’ signatory retail agencies to determine if the districts’ regional programs are satisfying their individual obligations under the MOU.
Table 8-2. Central & West Basin Water Districts Summary of Support Levels for BMPs Not Applying Directly to Signatory Wholesale Water Suppliers

<table>
<thead>
<tr>
<th>BMP No.</th>
<th>BMP Name</th>
<th>Extensive Support</th>
<th>Standard Support</th>
<th>Moderate Support</th>
<th>Negligible Support</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Res. Audits</td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Plumbing Retro.</td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Landscape Audits</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Landscape Req.</td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>CI Conservation</td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>10</td>
<td>CI Use Review</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Landscape SF Res.</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Water Waste Prof.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>ULFT Replacement</td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

Table 8-3. Summary of BMP Evaluation Results for BMPs Being Implemented Regionally by Central & West Basin Water Districts

<table>
<thead>
<tr>
<th>BMP No.</th>
<th>BMP Name</th>
<th>Implementing on Schedule</th>
<th>Implementing Not on Schedule</th>
<th>Partially Implementing</th>
<th>Not Implementing</th>
<th>Exempted</th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
<td>ULFT Replacement</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

8.2.1 Residential Water Audits (BMP 1)

Support Level

Standard Support

BMP Requirements

Identification of top 20 percent of water users; directly contact and offer audits to target customers; offer audits on a repeating cycle; provide customer incentives to implement measures. Programs to be underway by August 31, 1994. Coverage requirement: 70% of target customers to receive an audit by end of initial MOU term.

Evaluation Notes

The Districts are providing materials and planning assistance to their member agencies implementing residential audit programs. The districts co-funded a low-income water audit program that is reported in the CUWCC 1993-94 report as reaching 1,100 households. Costs were shared with MWD and California Water Service. The audit included leak detection and simple leak repair, and outdoor irrigation was tested. This was targeted at low-income housing, because it was felt that higher income households were able to invest in this technology to avoid penalty rates during the drought. This was undertaken in conjunction with the ULFT program.

8.2.2 Plumbing, New and Retrofit (BMP 2)

Evaluation Grade

Moderate Support

BMP Requirements
Identification of pre-1980 single- and multi-family homes; deliver retrofit kits, including low-flow showerheads, and toilet displacement devices to unretrofitted homes; offer to install the devices; follow up with customers at least three times. Program underway by August 31, 1993. Coverage requirement: 75% of pre-1980 single-family accounts and 80% of pre-1980 multi-family accounts to be retrofitted with low-flow devices (other than ULFTs) by end of initial term.

**Evaluation Notes**

The districts have provided intermittent support for this BMP to member agencies. The agencies held several seminars with building inspectors to address legislation for plumbing standards. The districts also report contacting legislators to support this statewide plumbing standards. In 1993/94, the districts co-funded the "Planet Protector" school education program that provided educational material, showerhead flow-rate bags and leak detection dye tablets. Where parents requested them, the program also supplied a maximum of two low-flow showerheads per family. Over 7,500 children participated, and 2,267 low-flow showerheads were distributed. This program was operated for one year then discontinued. The districts are planning to reimplement the program and have recently purchased an additional 7,500 low-flow showerheads. Overall, however, the level of support provided to member agencies has been modest.

8.2.3 Large Landscape Audits (BMP 5)

**Support Level**

Standard Support

**BMP Requirements**

Agencies are required to identify customers with at least 3 acres of landscaping, contacting them by mail; offering audits; offering incentives to effect customer implementation; providing follow-up audits at least once every five years; providing multilingual training and information. Coverage requirement: audits performed for 100% of landscape sites 3 acres or more by end of initial MOU term.

**Evaluation Notes**

The districts provide their retail agency customers with guidelines for contracting landscape management services. In addition, the districts employ a contractor to audit municipal landscapes within their service area. These audits identify potential water saving measures as well as potential opportunities for conversion to reclaimed water use. Through 1996, 156 audits had been completed by the district contractor. In addition, the districts' Circuit Rider program provides assistance to member agencies implementing landscape ordinances. Overall, the districts are providing a basic level of support to their retail agencies for BMP 5.

8.2.4 Landscape Water Conservation Requirement (BMP 6)

**Evaluation Grade**

Extensive Support

**BMP Requirements**

Enacting and implementing landscape water conservation ordinances, or cooperating with government/industry to develop and implement ordinances. Ordinances must be at least as effective as the Model Ordinance. Coverage requirement: 100% of new landscapes subject to ordinances by end of initial MOU term.

**Evaluation Notes**

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Much of the districts' service territory has water conservation ordinances that pre-date AB325. The districts provided substantial amounts of technical support to assist its member agencies in adopting such ordinances. The districts developed a model ordinance and guidelines for implementation to assist member agencies with compliance. They also developed a landscape water conservation handbook to provide information to cities to assist in administration of AB325. Most cities adopted model ordinance or modified it slightly. The adopted ordinances generally have a water budget approach. Central and West Basin have assisted in administering AB325-based local ordinances. The Districts set up a program to train planning department personnel to administer their local ordinances and the requirements of AB325. This program was jointly funded with MWD.

8.2.5 CII Water Conservation (BMP 9)

Evaluation Grade
Moderate Support

BMP Requirements

Identification of top 10% of commercial customers, top 10% of industrial customers, and top 20% of institutional customers. Directly contacting target customers and offering water audit. Providing incentives to encourage customer implementation of recommended measures. Offering follow-up audits at least once every five years if necessary. No coverage requirement specified by Exhibit 1 for commercial and industrial customers; coverage requirement for institutional accounts: 70% of top 20% of pre-1980 institutional accounts.

Evaluation Notes

The districts have funded 51 CII audits since 1993/94. The program has tailed-off substantially since 1994, however. Aside from these audits, the districts have not provided technical or funding assistance for CII programs to their member agencies. Planning for new CII conservation support programs is currently underway.

8.2.6 New Commercial/Industrial Water Use Review (BMP 10)

Evaluation Grade
Negligible Support

BMP Requirements

A program to assure the review of proposed water uses for new commercial and industrial water service and making recommendations for improved water use efficiency before completion of the building permit process. No coverage requirement is specified for this BMP by Exhibit 1.

Evaluation Notes

The districts do not currently have a plan for supporting this BMP.

8.2.7 Residential Landscape Conservation (BMP 12)

Support Level
Extensive Support

BMP Requirements
Requires provision of guidelines, information and incentives for more efficient landscape at new or existing single family homes; and enacting and implementing landscape water conservation ordinances. No coverage requirement is specified for this BMP by Exhibit 1.

**Evaluation Notes**

The Districts have provided materials and information to the public and to member agencies for their distribution. The districts established a program to train planning department personnel to administer their local ordinances and the requirements of AB325 (Circuit rider program). This program remains in effect. In addition, the districts distribute brochures and a landscape water conservation handbook, support a nursery plant tagging program, operate 15 demonstration gardens, and provide landscape management contracting guidelines to member agencies. Overall, they provide extensive support for BMP 12.

### 8.2.8 Water Waste Prohibition (BMP 13)

**Support Level**

Moderate Support

**BMP Requirements**

Enacting and enforcing measures to prohibit gutter flooding, single pass cooling systems in new connections, nonrecirculating systems in all new conveyor car wash and commercial laundry systems, and nonrecirculating decorative water fountains. Including water softener checks in home water audits and providing customers with information about DWR and exchange-type water softeners in their educational efforts.

**Evaluation Notes**

The Districts restrict during water shortages water uses for non-recirculating fountains, prohibit runoff to gutters, midday irrigation, hosing of hard surfaces, and water service in restaurants. Member agency water waste ordinances must include at least these prohibitions to comply with district policy. District prohibitions, however, do not address single-pass cooling systems, and nonrecirculating systems for new conveyor car wash and commercial laundry operations. Overall the support provided to member agencies to enact and enforce water waste ordinances is modest.

### 8.2.9 Ultra Low Flush Toilet Replacement (BMP 16)

**Evaluation Grade**

As Supporting Agency: Extensive Support

As Implementing Agency: Partially Implementing

**BMP Requirements**

Implementing programs to replace existing high-water-using toilets with ultra-low-flush toilets. Programs to be as effective as offering $100 rebates for toilets, or requiring replacement at time of resale, or replacement at time of change of service. Identifying all non-residential customers and ranking them by water use by December 31, 1995, and retrofitting toilets for at least 1% of their non-residential customers by June 30, 1998. Coverage requirement: per Exhibit 6 of the MOU, agency program must result in water savings equivalent to a retrofit on resale requirement for the service area.

**Evaluation Notes**

The districts operate a regional ULFT program for their member agencies. While under the terms of the MOU, the districts are not directly responsible for implementing a ULFT program,
they have assumed responsibility for a regional program on behalf of their retail agencies. If the program is viewed as supplemental to retail agency ULFT programs, the support level is quite extensive. However, retailers in the area are not operating ULFT programs independently of the agency’s program, and it therefore the district was also evaluated as though it were directly responsible for implementation. Viewed this way, estimated program savings through FY 1996 are 63% of the benchmark retrofit-on-resale savings target over the period of analysis using Exhibit 6 savings assumptions. Thus, when viewed as the primary agency responsible for implementation, the districts are found to be partially implementing BMP 16.

**BMP Schedule:** The districts initiated their replacement program in accordance with the MOU schedule, but are not on track to satisfy the coverage requirements for this BMP by the end of the initial MOU term. Estimated program savings through FY 1996 are 63% of the necessary target water savings through FY 1996 (see below).20

**Program Description:** Since 1992, rebates of up to $75 have been offered to residents within the districts’ service areas purchasing ULFTs. This program is cofunded through MWD.

**Program Results:** Program results are shown in the table below. As of FY 1996, a total of 65,046 single-family and 36,252 multi-family toilet replacements have been attributed to the program.

Program water savings depend on annual water savings per toilet, which, in turn, depend on household density, number of toilets per household, whether the retrofit was partial or complete, and the mix of pre- and post-1980 housing units receiving retrofits. Exhibit 6 provides water savings lookup tables (derived from empirical program evaluations) that take these factors into account, and, for purposes of the MOU, are to be used for calculating water savings attributable to ULFT programs. Based on these tables, the cumulative annual water savings (AF/yr) attributed to the agency’s program as of June 30, 1996, is 4,033 AF/yr.

To assess implementation effectiveness, annual program savings were compared to savings that could be attributed to a retrofit-on-resale requirement for the service area. We base this analysis on the methodology presented in Exhibit 6 of the MOU.21 It is important to emphasize that savings targets using this methodology are net of any savings that would occur naturally due to expected toilet depreciation and replacement. In other words, the method fully accounts for natural replacement. It is equally important to note that on the agency side, any toilet replacements directly attributable to the agency’s program are counted, including replacements by program participants that would have replaced their toilet regardless of the program (e.g., program free-riders). In this regard, the evaluation favors agencies, since it nets out natural replacement from the targets, but not from meeting the targets.

The results of this evaluation are shown in the proceeding table. A copy of the spreadsheet model and data used to generate this table are included with this report.

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20 This is calculated as the sum of annual cumulative program savings from each year of program operation divided by the sum of annual cumulative water savings targets starting from August 31, 1993. This is the total volume of water saved by the program divided by the total volume of water targeted to be saved.

21 The spreadsheet model used to calculate program savings and targets is included with this report. Prior to finalizing this evaluation, the model was submitted to A & N Technical Services, who authored Exhibit 6, for review and validation. The model was deemed by A & N Technical Services to be consistent with Exhibit 6 requirements.
## BMP 16. ULFT Retrofits
### Program Results through FY 1996
Using Exhibit 6-based Water Savings Estimates

<table>
<thead>
<tr>
<th>Fiscal Year</th>
<th>ULFT Program Toilet Replacements</th>
<th>Cumulative ULFT Program Savings</th>
<th>Exhibit 6-Based Cumulative Target &amp; Target Savings</th>
<th>Difference Between Program &amp; Target Savings</th>
<th>Cumulative Balance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Single-Family (no. of toilets)</td>
<td>Multi-Family (no. of toilets)</td>
<td>(AF/Yr)</td>
<td>(AF/Yr)</td>
<td>(AF)</td>
</tr>
<tr>
<td>1991/92</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1992/93</td>
<td>4,750</td>
<td>12,717</td>
<td>897</td>
<td>540</td>
<td>357</td>
</tr>
<tr>
<td>1993/94</td>
<td>25,201</td>
<td>0</td>
<td>1,619</td>
<td>2,616</td>
<td>(997)</td>
</tr>
<tr>
<td>1994/95</td>
<td>6,422</td>
<td>0</td>
<td>1,803</td>
<td>4,363</td>
<td>(2,560)</td>
</tr>
<tr>
<td>1995/96</td>
<td>28,673</td>
<td>23,535</td>
<td>4,033</td>
<td>5,827</td>
<td>(1,794)</td>
</tr>
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<td>1996/97</td>
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<td>1999/00</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>2000/01</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Graph

#### Notes:
1/ Total number of single- and multi-family toilet replacements credited to the agency’s ULFT program.
2/ The estimated cumulative annual water savings (AF/yr) associated with the credited toilet replacements. All savings are credited, including savings that would have occurred due to natural replacement (i.e. program free-ridership). Savings estimates derived from Exhibit 6.
3/ The agency’s cumulative annual savings targets (AF/yr) equivalent to a retrofit-on-resale requirement. Target calculated using Exhibit 6 methodology and data on housing resale rates for agency’s county. Targets are net of natural replacement; they only include savings directly attributable to a hypothetical retrofit-on-resale requirement.
4/ A running total of the difference between credited program savings and target savings. Negative quantities indicate the agency has not, on balance, met the targets at that point in time. Positive quantities indicate the agency has, on balance, exceeded the targets at that point in time.

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9. Evaluation of East Bay Municipal Utility District

East Bay Municipal Utility District was found to be implementing on schedule the majority of BMPs, but to be only partially implementing several key BMPs, including BMPs 1, 2, and 16. Partial implementation generally resulted from not being on track to meet the BMP coverage requirements by the end of the initial MOU term. This is particularly the case for BMP 16. However, we note that the district questions the cost-effectiveness of BMP 16 for its service area, though it has not formally exempted itself from implementing the BMP.

A summary of the evaluation results for East Bay Municipal Utility District as a signatory retail water supplier is presented in Table 9-1. Evaluation summaries and notes for each BMP are presented in the subsections that follow.

Table 9-1. Summary of BMP Evaluation Results for East Bay Municipal Utility District

<table>
<thead>
<tr>
<th>BMP No.</th>
<th>BMP Name</th>
<th>Implementing on Schedule</th>
<th>Implementing Not on Schedule</th>
<th>Partially Implementing</th>
<th>Not Implementing</th>
<th>Exempted</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Res. Audits</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Plumbing Retro.</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Dist. System</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Metering</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Large Landscape</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>New Landscape</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>7</td>
<td>Public Info.</td>
<td>X</td>
<td>X</td>
<td></td>
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</tr>
<tr>
<td>8</td>
<td>School Education</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>CII Conservation</td>
<td>X</td>
<td>X</td>
<td></td>
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<tr>
<td>10</td>
<td>CI Use Review</td>
<td>X</td>
<td>X</td>
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<td></td>
</tr>
<tr>
<td>11</td>
<td>Pricing</td>
<td>X</td>
<td>X</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>12</td>
<td>Res. Landscape</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Water Waste</td>
<td>X</td>
<td>X</td>
<td></td>
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<td></td>
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<tr>
<td>14</td>
<td>Coordinator</td>
<td>X</td>
<td>X</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Financial Incentives</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>ULEF Replacement</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

9.1 Residential Water Audits (BMP 1)

Evaluation Grade

Partially Implementing

BMP Requirements

Identification of top 20 percent of water users; directly contact and offer audits to target customers; offer audits on a repeating cycle; provide customer incentives to implement measures. Programs to be underway by August 31, 1994. Coverage requirement: 70% of target customers to receive an audit by end of initial MOU term.

Evaluation Notes

BMP Schedule: East Bay Municipal Utility District initiated implementation of this BMP in accordance with the MOU schedule, but is not on track to meet the BMP coverage requirements by the end of the initial MOU term. Based on data provided in its 1995/96 annual report to the
CUWCC, the district would need to complete audits for an additional 39,784 (299,000 accounts x 0.20 x 0.70 - 2076 audits completed through 6/30/95) single-family accounts and 3,747 multi-family accounts (28,000 accounts x 0.20 x 0.70 - 173 audits completed through 6/30/95) between 1996/97 and the end of the initial MOU term to meet the coverage requirement. The district’s Water Conservation Master Plan establishes annual audit targets of 3,700 for single-family accounts and 112 for multi-family accounts. If the district were to meet its goals for the next five years, it would fall short of the coverage requirement for single-family accounts by 21,284 audits, and for multi-family accounts by 3,187 audits. If the district were to double its audit rate, it would come within 93% of the coverage requirement for single-family accounts, but would still realize only 33% of the coverage requirement for multi-family accounts. Since the district has not indicated any plans to accelerate the rate of auditing even to this degree, we conclude that it will not meet the coverage requirement by the end of the initial MOU term.

Customer Targeting: The district offers residential audits to single- and multi-family accounts. The district has identified the top 20% of residential accounts and directly contacts them through mailings to offer audits. Through its Water Conservation Master Plan, the district established annual targets for residential water use surveys. The district has taken several actions in recent years to increase program participation rates. For example, to increase the participation rate of multi-family accounts in the program, in 1995 the agency started requiring multi-family accounts have a residential water use survey to be eligible for ULFT rebates.

Program Description: The district offers residential water use surveys to all single-family and multi-family customers. The survey for single-family customers takes from 30 minutes to one hour, during which indoor and outdoor water using devices and practices are reviewed and recommendations are made to improve water use efficiency. Water saving showerheads, dye tablets, toilet tank bags, and educational material are distributed, as appropriate. The customer is left with a list of water saving recommendations upon completion of the survey. The survey for multi-family customers is similar to that for single-family but takes somewhat longer. In situations where the landscape area exceeds one acre, the customer is also offered a Large Landscape Audit.

The district compiles data from residential water use surveys into a database for subsequent monitoring and evaluation.

Customer Incentives: The district provides customers with free water conservation devices, as appropriate. The agency offers large landscape audits to accounts with one acre or more of landscaping. Both single-family and multi-family customers are eligible for ULFT rebates. In addition, the district’s irrigation upgrade rebate program has been opened to residential accounts.

Program Results: According to agency’s 95/96 annual report to the CUWCC, 3,305 single-family connections (1.1% of single-family connections; 5.5% of the target number of connections) and 357 multi-family connections (1.3% of multi-family connections; 6.4% of the target number of connections) have been audited through June of 1996. The program has since been accelerated. For all of FY 96, the agency completed 3,029 audits, and to date has completed 2,501 audits in FY 97. In its Water Conservation Program Annual Report for 1995 the agency reported household water savings based on engineering estimates of approximately 7%; while average program savings based on a comparison of means test were approximately 2%.

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22 These are goals established for fiscal year 1996. District staff indicated that these goals remain stable over the term of the Water Conservation Master Plan. Telcom Dick Bennett, May 19, 1997.

23 To date the district has found it difficult to realize its own audit goals, and has refocused its efforts on marketing the program.

9.2 Plumbing, New and Retrofit (BMP 2)

Evaluation Grade
Partially Implementing

BMP Requirements
Identification of pre-1980 single- and multi-family homes; deliver retrofit kits, including low-flow showerheads, and toilet displacement devices to unretrofitted homes; offer to install the devices; follow-up with customers at least three times. Program underway by August 31, 1993. Coverage requirement: 75% of pre-1980 single-family accounts and 80% of pre-1980 multi-family accounts to be retrofitted with low-flow devices (other than ULFTs) by end of initial term.

Evaluation Notes
BMP Schedule: The district initiated implementation of this BMP in accordance with the MOU schedule, but is not on track to meet the coverage requirement for this BMP. At its current distribution rate, and assuming 100% of distributed devices get installed, the district would not meet the coverage requirement for single-family accounts. However, field evaluations of device distribution programs suggests the 100% installation rate assumption is not warranted. If instead we adopt the more plausible assumption that 70% of distributed devices are installed in unretrofitted homes within the service area, then the district would not be on track to meet either coverage requirement. This is shown in the table below.

<table>
<thead>
<tr>
<th>Year</th>
<th>Households Retrofitted**</th>
<th>Cumulative Retrofits</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Single-Family</td>
<td>Multi-Family</td>
</tr>
<tr>
<td>Prior to 92/93</td>
<td>85,855</td>
<td>54,565</td>
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<tr>
<td>1994</td>
<td>2,100</td>
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<tr>
<td>1997</td>
<td>91,455</td>
<td>57,785</td>
</tr>
<tr>
<td>1998</td>
<td>93,205</td>
<td>59,185</td>
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<tr>
<td>1999</td>
<td>94,255</td>
<td>59,885</td>
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<tr>
<td>2000</td>
<td>95,130</td>
<td>60,585</td>
</tr>
<tr>
<td>2001</td>
<td>96,530</td>
<td>61,635</td>
</tr>
</tbody>
</table>

Coverage Requirement: 167,250 81,000

** Assumes a 70% installation rate of delivered devices. Actual number of pre-1980 households retrofitted is unknown by the district.

Customer Targeting: East Bay Municipal Utility District has identified the number of pre-1980 single-family and multi-family homes within its service area, but does not target these homes for a

Note: It is beyond the scope of this study to evaluate the accuracy of study results cited herein. The citation is made to note that the agency has made a good faith effort to evaluate the effectiveness of its BMP implementation program.

Field studies suggest a 70% installation rate is still on the high side. Studies of Irvine Ranch Water District and Westchester in the LA Basin indicate an installation rate of 50% - 60%.

25
retrofit. We do not find the district’s method of distribution to be as effective as directly delivering devices with an offer to install to residential units constructed prior to 1980. The district’s distribution method (see Program Description below) will retrofit pre-1980 homes only by chance, cannot verify installation, and may result in delivery of devices to households with no need for them or residing outside the agencies service area.

Program Description: The district distributes plumbing fixture retrofit kits at public events within its service area, through depot pickup, and during residential audits. The district does not offer to install the devices, per the BMP, and does not track distribution other than through changes in inventory.

Program Results: Agency estimates that 127,650 of the 223,000 pre-1980 single-family accounts (57%) have been retrofitted with water-saving plumbing devices through June 30, 1996; and that 79,950 of the 101,250 pre-1980 single-family accounts (79%) have been retrofitted with water-saving plumbing devices through June 30, 1996. In making these estimates, the district assumes a 100% installation rate for all devices distributed. Even with this assumption, given current rates of distribution the district will not meet the coverage requirement for single-family accounts by the end of the initial MOU term.

9.3 Distribution System Water Audits (BMP 3)

Evaluation Grade
Implementing on Schedule

BMP Requirements
Distribution system to be inspected at least once every three years, using a methodology similar to that described in an AWWA manual; advising customers where leaks appear to exist on their side of the meter and making cost-effective repairs.

Evaluation Notes

BMP Schedule: East Bay Municipal Utility District is implementing this BMP in accordance with the MOU schedule. The district has operated a formal leak detection and distribution system audit program since prior to becoming a signatory to the MOU in 1994. The district audits its system and surveys approximately 20% of its distribution mains annually.

Program Description: The district has had a program to electronically detect and repair distribution system leaks since the 1960s. The district reports that it repairs 700-800 leaks annually and estimates that this program saves approximately 1,000 acre-feet per year.

Program Results: Total water losses equal approximately 8% of agency water supply, which is within industry standards for a well-operated system.

9.4 Metering with Commodity Rates (BMP 4)

Evaluation Grade
Implementing on Schedule

BMP Requirements
Metering all new connections, and billing using rates that include a volume charge; retrofitting all unmetered existing connections and billing using rates that include a volume charge.

Evaluation Notes
BMP Schedule: East Bay Municipal Utility District is implementing this BMP in accordance with the MOU schedule. The district has been metering all retail M&I potable water supply connections since prior to 1993. The district has been billing all retail M&I connections by volume of use since prior to 1993.

Program Description: The district meters and bills by volume of use all retail M&I potable water supply connections.

9.5 Large Landscape Audits (BMP 5)

Evaluation Grade

Implementing on Schedule

BMP Requirements

Agencies are required to identify customers with at least 3 acres of landscaping, contacting them by mail; offering audits; offering incentives to effect customer implementation; providing follow-up audits at least once every five years; providing multilingual training and information. Coverage requirement: audits offered to 100% of landscape sites 3 acres or more by end of initial MOU term.

Evaluation Notes

BMP Schedule: East Bay Municipal Utility District initiated implementation of this BMP in accordance with the MOU schedule, and is not on track to meet the coverage requirement by the end of the initial MOU term.

Customer Targeting: The district offers large landscape audits to all non-single-family customers with one acre of landscape or more. The district directly contacts target customers through mail, and publicizes its program with brochures and other media.

Program Description: The agency’s on-site large landscape audit includes the following elements: evaluation of current and past water use; site inspection and evaluation of existing irrigation systems, irrigation system uniformity tests; assistance with developing ET-based irrigation schedules; water-savings recommendations; and evaluation of eligibility for the district’s Irrigation Upgrade Program. A written report is provided to the customer summarizing audit results and upgrade program eligibility.

The district has conducted a variety of workshops focusing on irrigation management. Workshop topics include: ET, CIMIS, strategies to achieve uniform coverage, soil types and analysis, plant water use rates, sprinkler maintenance and scheduling, and water budgeting. The district staff responsible for these workshops is fluent in English and Spanish.

Customer Incentives: Customers that participate in the large landscape audit program may qualify for rebates of 50 to 100 percent of the materials cost of installing water-efficient irrigation equipment. Agency will pay up to 50% of cost for irrigation controllers and matched precipitation rate sprinkler heads; up to 75% of cost for drip irrigation systems and pressure regulation devices; and up to 100% of the cost for moisture sensors, rain shut-off devices, check valves, and nozzles. The agency estimates that it covers between 1/8 to 1/4 of the total upgrade cost for customers participating in the program. Since 1990, the agency has paid out an average of $20,000 annually for the upgrade program, and has been steadily increasing the funding for this program, as follows: FY95 - $80,000; FY96 - 130,000; FY97 - 180,000. These amounts include both rebate and staff salary costs.

Program Results: Through June 30, 1996, the agency has reported completing 611 large landscape audits for landscapes of one acre or more at a direct cost of approximately $152,750.
For planning purposes, the agency assumes that irrigation water audits will reduce site water use by 10% on average. Using a simple comparison of means test, the agency did not find an appreciable reduction in water use by accounts receiving an audit compared to accounts not receiving an audit over the period 1993 to 1995. In fact, over this period, water use fell by a substantially smaller percentage amount for accounts receiving an audit than for accounts not receiving the audit. This is likely less a reflection of program effectiveness, and more a reflection of the general inadequacy of simple comparison of means tests for evaluation of programs of this sort.26

<table>
<thead>
<tr>
<th>Report Year</th>
<th>Surveys Offered</th>
<th>Surveys Completed*</th>
<th>Cumulative Surveys Completed**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prior to 93</td>
<td>No Record</td>
<td>250</td>
<td>250</td>
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<tr>
<td>1994</td>
<td>800</td>
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<td>1995</td>
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<td>173</td>
<td>497</td>
</tr>
<tr>
<td>1996</td>
<td>320</td>
<td>114</td>
<td>611</td>
</tr>
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<td>1997</td>
<td></td>
<td>764</td>
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</tr>
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<td>1051</td>
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</tr>
<tr>
<td>1999</td>
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<td>1338</td>
<td></td>
</tr>
</tbody>
</table>

* Includes all surveys, including follow-up surveys and surveys for sights of less than 3 acres.

**Italic values represent extrapolation.

9.6 Landscape Water Conservation Requirement (BMP 6)

Evaluation Grade
Implementing on Schedule

BMP Requirements
Enacting and implementing landscape water conservation ordinances, or cooperating with government/industry to develop and implement ordinances. Ordinances must be at least as effective as the Model Ordinance. Coverage requirement: 100% of new landscapes subject to ordinances by end of initial MOU term.

Evaluation Notes

BMP Schedule: East Bay Municipal Utility District is implementing this BMP in accordance with its schedule. As a special district, the district does not have the authority to adopt landscape ordinances within its service area. The Counties and Cities within the agency’s service area have all adopted landscape ordinances pursuant to AB 325.

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26 Comparison of means tests have very low statistical power unless the control and subject groups are very carefully selected. Unless control and subject groups are very carefully matched, it is generally inappropriate and misleading to infer any discernible mean savings to a specific conservation program based on a simple comparison of means.
Program Description: Contra Costa County adopted a prescriptive-based ordinance in 1985. Alameda County adopted a prescriptive-based ordinance in 1988. Seventeen of the 20 cities within the agency’s service area adopted prescriptive-based ordinances between 1988 and 1990. Three of the 20 cities within the agency’s service area adopted budget-based ordinances between 1991 and 1993. In its implementation reports for its Water Conservation Master Plan, the agency expresses concern that ordinances are not being enforced by some cities. The district worked with all cities within its service area to develop and implement these ordinances.

The district also developed and adopted landscape standards in 1987 for new developments in the Creeks Canyon Corridor as part of an “annexation agreement” condition for water service. However, the agency reports uneven compliance with these standards, and notes that it does not have any enforcement policy in place to address noncompliance. In its 1995 Water Conservation Master Plan Report, the district indicated that it would discontinue monitoring compliance with the landscape standards in this portion of its service area, but would continue to review landscape plans upon request. None the less, all areas within the district’s service area come under a landscape ordinance consistent with AB 325.

9.7 Public Information (BMP 7)

Evaluation Grade
Implementing on Schedule

BMP Requirements

Implement public information programs to educate customers about water use and to promote water conservation. Program could include providing speakers to community groups and media; advertising; using bill inserts; providing water use information on customer bills comparing current and previous year use; working cooperatively with other groups promoting water conservation. No coverage requirement specified by Exhibit 1.

Evaluation Notes

BMP Schedule: The district is implementing this BMP in accordance with the MOU schedule. The district has maintained an active public information program promoting water conservation since prior to 1991.

Program Description: The district maintains an extensive, multi-faceted public information/education program which includes the following. Agency conservation staff provide verbal and slide presentations on conservation to community groups, other agencies, professional organizations, homeowner associations, and business groups. Staff presentations average 2-4 per month. The district staffs a portable exhibit promoting water conservation at a variety of community events throughout its service area. The district participates in an average of 10 events per year.

The district has established 35 conservation displays and information stands throughout its service area, including a drought-tolerant landscape display, and a ULFT display. The district operates the EBMUD Water Education Center in San Leandro, and provides group tours. The district distributes a variety of publications and materials promoting water conservation and efficient irrigation and landscaping. The district sells an average of 250 copies of Water Conserving Plants and Landscapes for the Bay Area each month, and approximately 800 individuals receive The district’s Landscape Advisory Newsletter every quarter. In addition, the district has developed a variety of customer brochures promoting its various conservation programs and explaining how customers can participate in them. The district has also developed a new home owners information packet which includes water conservation tips and information
about the district’s conservation programs. The district also includes a conservation message and information on available conservation programs in its bi-monthly bill inserts.

The district advertises its conservation programs in local papers and on local radio stations. In addition, the district maintains several billboards promoting conservation.

The district maintains an ET hotline enabling customers to call in for up-to-date ET information for irrigation scheduling. The district has assisted with the funding and development of 13 demonstration gardens throughout its service area. The district is currently examining ways to improve maintenance at some sites, and to better use the sites to evaluate water savings associated with drought-tolerant landscapes.

The district implemented an awards program in 1995 to recognize non-residential customers implementing effective water conservation measures.

9.8 School Education (BMP 8)

Evaluation Grade

Implementing on Schedule

BMP Requirements

Implement school education programs within service area. Programs to include provision of educational materials and instruction assistance. No coverage requirement specified by Exhibit 1.

Evaluation Notes

BMP Schedule: Agency is implementing this BMP in accordance with its schedule. Agency has maintained an active school education program promoting water conservation since 1974.

Program Description: The district’s school education program has been privately contracted since the mid 1980s. The district’s consultant coordinates program activities, interacts with school representatives, and arranges the development of program content. A detailed report on school program activities and accomplishments is prepared for the district’s board of directors each year.

The district’s school education program includes participating in school assemblies promoting water conservation; distribution of educational materials, including books, maps, posters, and videos; science fairs, professional plays, tours, and water awareness month activities; career programs, and teacher training.

The district’s school program was commended for excellence by the Senate Rules Committee of the California Legislature in 1995 to mark the program’s 20th anniversary, and is generally viewed as a model education program.

9.9 CII Water Conservation (BMP 9)

Evaluation Grade

Implementing on Schedule

BMP Requirements

Identification of top 10% of commercial customers, top 10% of industrial customers, and top 20% of institutional customers. Directly contacting target customers and offering water audit. Providing incentives to encourage customer implementation of recommended measures. Offering follow-up audits at least once every five years if necessary. No coverage requirement specified by
Exhibit 1 for commercial and industrial customers; coverage requirement for institutional accounts: 70% of top 20% of pre-1980 institutional accounts.

Evaluation Notes

**BMP Schedule:** East Bay Municipal Utility District initiated implementation of this BMP in accordance with the MOU schedule, and appears to be on track to meet the BMP coverage requirement. The coverage requirement requires 70% of the top 20% of pre-1980 institutional accounts receive audits by 2001. The exact proportion of pre- and post-1980 institutional accounts is not listed in district reports. Assuming the same proportion as for single- and multi-family accounts (75%) then the district would need to complete 305 audits by 2001. Current and projected audit rates for the institutional sector are sufficient to reach this target.

**Customer Targeting:** The district’s program initially targeted customers according to use, but has since modified its approach to target CII groupings according to two principle criteria: (1) perception of conservation potential; and (2) complexity of water use. The district focuses its audit effort on CII groups with fairly simple process water uses, so that it can maximize program coverage. We consider this approach to be at least as effective as targeting the top 20% of customers, regardless of their water saving potential. Targeted customers are contacted through mailings. The program is well advertised and available to all ICI accounts.

**Program Description:** The agency’s CII audits include an interview with the site manager, a review of the sites water using processes, and water-saving recommendations. Site efficiency is assessed through site inspection, questionnaires, and agency records. Customers receive written reports containing water balances, discussion of audit results and findings, recommendations and projected water savings, and estimated customer costs and payback periods of recommended measures.

**Customer Incentives:** In August 1995 the agency implemented a pilot incentive program for CII customers that provided cash rebates for water-efficiency improvements. The rebate is based on estimated water savings of the measure and cannot exceed half the installed cost of the measure. Customers receive rebates following agency verification that the measures have been implemented. In FY96, the rebate program was budgeted at $75,000 and actual expenditures totaled $91,000. In FY 97, program funding was increased to $200,000. The mean rebate amount is $2,000-$3,000, but there is no ceiling on rebate amounts other than program budget. The maximum rebate awarded was for $101,000 to replace a single-pass cooling system.

**Program Results:** The number of audits completed by the district as of June 30, 1996 are shown in the table below. Assuming the district maintains its program staffing capability of complete 30 to 40 institutional audits per year, it will stay on track to meet the coverage requirement for institutional audits. No coverage requirements pertain to commercial and industrial audits. We believe, however, that the district’s rebate program, by tying rebate amounts to the water savings potential of the proposed retrofit, will prove at least as effective, and probably more effective, than a program focused more narrowly on audits and on-site inspections.
Evaluation of BMP Implementation for East Bay Municipal Utility District

<table>
<thead>
<tr>
<th>Report Year</th>
<th>Commercial</th>
<th>Industrial</th>
<th>Institutional</th>
<th>Surveys Completed</th>
</tr>
</thead>
<tbody>
<tr>
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<td>No Record</td>
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</tr>
<tr>
<td>95/96</td>
<td>450</td>
<td>50</td>
<td>200</td>
<td>135 33 71</td>
</tr>
</tbody>
</table>

Number of Accounts in Service Area: 20,000+ 2000+ 2,900

Source: CUWCC Retail Annual Reports

9.10 New Commercial/Industrial Water Use Review (BMP 10)

Evaluation Grade

Partially Implementing

BMP Requirements

A program to assure the review of proposed water uses for new commercial and industrial water service and making recommendations for improved water use efficiency before completion of the building permit process. No coverage requirement is specified for this BMP by Exhibit 1.

Evaluation Notes

BMP Schedule: East Bay Municipal Utility District is not implementing this BMP in accordance with the MOU schedule. Review programs were to be underway by August 31, 1994. The district's program was initiated July 1995.

Program Description: The district initiated a non-residential plan review program in July 1995. The program requires a plan review for all new commercial and industrial facilities applying for new water meters three inches or larger. According to agency documents, as designed, the program applies to only about 1.5% of new meter applications -- about 10-15 plan reviews annually. Since the BMP calls for a program to assure the review of proposed water uses for all new commercial and industrial water service, this program constitutes partial, rather than full implementation. None the less by creating a formal review program for at least a portion of new CI uses, the district's efforts extend beyond those of most other signatory water suppliers with respect to this BMP.

9.11 Conservation Pricing (BMP 11)

Evaluation Grade

Implementing on Schedule

BMP Requirements

Requires eliminating non-conservation pricing and adopting conservation pricing. This is defined as no fixed rate or declining block pricing, and no high fixed costs coupled with low commodity charges. Where the agency also provides sewer services, these rate structures should also apply. No coverage requirement is specified for this BMP by Exhibit 1.

Evaluation Notes
BMP Schedule: The district is implementing this BMP in accordance with its schedule. The district has billed water consumption using a combination of service charges and volumetric charges based on metered use since prior to August 31, 1993. The district also has billed wastewater services using a combination of service charges and volumetric charges based on metered use since prior to August 31, 1993.

Program Description: The district uses uniform volume rates with charges based on metered usage for non-single-family accounts; and an increasing-block rate design for single-family accounts. Rates are designed to recover the agency’s cost of service. The consumption charge for typical residential and commercial customers exceeds 50% of the monthly or bimonthly bill, indicating that the agency does not employ high fixed charges coupled with low commodity charges.

9.12 Residential Landscape Conservation (BMP 12)

Evaluation Grade
Implementing on Schedule

BMP Requirements:

BMP Schedule: The district is implementing this BMP in accordance with the MOU schedule.

Program Description: The district provides guidelines and information, including brochures, new home information packet, and watering guidelines. The district provides an ET-hotline allowing customers to call in for ET data. The district assisted with the development of 13 demonstration gardens throughout its service area and operates a Water Education Center. The district offers free home water audits, which include a landscape irrigation element. Cities within the district’s service area have adopted landscape water conservation ordinances based on a model ordinance developed by the district.

The district also developed and adopted landscape standards in 1987 for new developments in the Crow Canyon Corridor as part of an “annexation agreement” condition for water service. However, the district reports uneven compliance with these standards, and notes that it does not have any enforcement policy in place to address noncompliance. In its 1995 Water Conservation Master Plan Report, the district indicated that it would discontinue monitoring compliance with the landscape standards in this portion of its service area, but would continue to review landscape plans upon request.

Customer Incentives: The district’s irrigation system rebate program was opened to multi-family customers in 1995. Landscape audits through the residential audit program are free to all customers.

9.13 Water Waste Prohibition (BMP 13)

Evaluation Grade
Partially Implementing

BMP Requirements

Enacting and enforcing measures to prohibit gutter flooding, single pass cooling systems in new connections, nonrecirculating systems in all new conveyor car wash and commercial laundry systems, and nonrecirculating decorative water fountains. Including water softener checks in home water audits and providing customers with information about DIR and exchange-type water softeners in their educational efforts.
Evaluation Notes

BMP Schedule: The district is implementing this BMP in accordance with the MOU schedule. The district adopted section 29 of Regulations Governing Water Service to Customers of the East Bay Municipal Utility District in 1989.

Program Description: The district ordinance prohibits the following during water shortages: gutter flooding, washing of hard surfaces in a manner that results in excessive runoff or waste, lawn and garden watering which results in excessive runoff or waste, vehicle and machinery washing which results in excessive runoff or waste, flushing sewers, hydrants, or washing streets, except when required for public health and safety. The agency ordinance encourages the use of recycling water systems where feasible, but does not prohibit nonrecirculating systems in new car washes, laundries, fountains, and cooling systems, as required by the BMP. Therefore, it is found that the agency is partially implementing BMP 13.

The agency’s ordinance includes specific enforcement provisions which include a written warning, followed by a special meter reading to ascertain wasteful use; followed by installation of a flow-restricting device; followed by termination of service. The customer is liable for all costs associated with enforcement.

9.14 Water Conservation Coordinator (BMP 14)

Evaluation Grade
Implementing on Schedule

BMP Requirements

Designation of a water conservation coordinator responsible for preparing agency conservation plan, managing its implementation, and evaluating program results. No coverage requirement is specified for this BMP by Exhibit 1.

Evaluation Notes

BMP Schedule: Agency is implementing this BMP in accordance with the MOU schedule.

Program Description: The district staffs a full-time conservation coordinator position, which oversees the district’s conservation programs, and manages support staff.

9.15 Financial Incentives (BMP 15)

Evaluation Grade
Implementing on Schedule

BMP Requirements:

Financial incentives are to be offered to retail customers. No coverage requirement is specified for this BMP by Exhibit 1.

Evaluation Notes

BMP Schedule: The district is implementing this BMP in accordance with the MOU schedule.

Program Description: The district offers or has offered the following financial incentives to facilitate implementation of conservation programs:

ULFT Rebates: the district implemented a ULFT rebate program in 1994, offering 5,000 $50 rebates to multifamily customers and 600 $150 rebates to single-family low income accounts. In
1995, the district provided 5,612 $50 rebates to single- and multi-family customers, and 607 $250 rebates to low income accounts.

Irrigation Upgrade Rebates: the district offers irrigation system upgrade rebates to its 3,000+ irrigation-only accounts.

CII Rebates: the agency initiated a pilot incentive program for its CII customers in August 1995. Rebates totaling $91,000 were distributed in FY96. The program budget for FY97 is $200,000.

Meter/Connection Fee Discounts: the district implemented a meter/connection fee discount policy in 1988 to encourage the installation of water efficient landscaping by public agencies. To be eligible, landscapes must not require supplemental water from the agency after three years. The agency describes this as an ineffective program, noting that few sites can meet this requirement, and that only one or two discounts have been provided since the program’s inception.

High Efficiency Washer Rebate Program: The district is participating with PG&E in a rebate program for high efficiency washing machines. To date, the district has provided 25 $75 rebates.

9.16 Ultra Low Flush Toilet Replacement (BMP 16)

Evaluation Grade
Partially Implementing

BMP Requirements

Implementing programs to replace existing high-water-using toilets with ultra-low-flush toilets. Programs to be as effective as offering $100 rebates for toilets, or requiring replacement at time of resale, or replacement at time of change of service. Identifying all non-residential customers and ranking them by water use by December 31, 1995, and retrofitting toilets for at least 1% of their non-residential customers by June 30, 1998. Coverage requirement: per Exhibit 6 of the MOU, agency program must result in water savings equivalent to a retrofit on resale requirement for the service area.

Evaluation Notes

BMP Schedule: The district is not implementing this BMP in accordance with the MOU schedule. BMP 16 is a second year BMP and the agency initiated its ULFT replacement program in the third year of the initial term of the MOU. In addition, the agency is not on track to satisfy the coverage requirements for this BMP by the end of the initial MOU term. Estimated program savings through FY 1996 are 17% of the Exhibit 6-based target water savings through FY 1996 (see below).27

Program Description: The agency’s ULFT replacement program consists of a rebate program initiated in 1994/95. Currently, rebates are set to $50 per toilet for single-family and multi-family residences. Qualifying low income customers may receive rebates of up to $250. Customers are required to recycle their old toilets to receive a rebate. The program is extensively advertised by the agency, and is currently open to all single- and multi-family agency customers.

Program Results: Program results are shown in the table below. As of FY 1996, a total of 3,800 single-family and 9,000 multi-family toilet replacements have been attributed to the program.

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27 This is calculated as the sum of annual cumulative program savings from each year of program operation divided by the sum of annual cumulative water savings targets starting from August 31, 1993. This is the total volume of water saved by the program divided by the total volume of water targeted to be saved.
Program water savings depend on annual water savings per toilet, which, in turn, depend on household density, number of toilets per household, whether the retrofit was partial or complete, and the mix of pre- and post-1980 housing units receiving retrofits. Exhibit 6 provides water savings lookup tables (derived from empirical program evaluations) that take these factors into account, and, for purposes of the MOU, are to be used for calculating water savings attributable to ULFT programs. Based on these tables, the cumulative annual water savings (AF/yr) attributed to the agency’s program as of June 30, 1996, is 516 AF/yr.

To assess implementation effectiveness, annual program savings were compared to savings that could be attributed to a retrofit-on-resale requirement for the service area. We base this analysis on the methodology presented in Exhibit 6 of the MOU. It is important to emphasize that savings targets using this methodology are net of any savings that would occur naturally due to expected toilet failure and replacement. In other words, the method fully accounts for natural replacement. It is equally important to note that on the agency side, any toilet replacements directly attributable to the agency’s program are counted, including replacements by program participants that would have replaced their toilet regardless of the program (e.g., program free-riders). In this regard, the evaluation favors agencies, since it nets out natural replacement from the targets, but not from meeting the targets.

The results of this evaluation are shown in the proceeding table. A copy of the spreadsheet model and data used to generate this table are included with this report.

It is noted that the district does not believe that ULFT replacement program of a scale necessary to reach Exhibit-6-based targets is cost-effective for its service area. Recently, the district has begun to re-examine the cost-effectiveness of ULFT rebate programs in its service area. The district’s preliminary analyses indicate that a wide-spread ULFT program would still not be cost-effective for its service area. This analysis appears to follow CUWCC cost-effectiveness guidelines, and may in the future serve as a basis for an exemption from BMP 16. However, to date the district has not submitted any cost-effectiveness analyses to the CUWCC to support an exemption and therefore is not considered to have made a valid claim of exemption for this BMP.

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28 The spreadsheet model used to calculate program savings and targets is included with this report. Prior to finalizing this evaluation, the model was submitted to A & N Technical Services, who authored Exhibit 6, for review and validation. The model was deemed by A & N Technical Services to be consistent with Exhibit 6 requirements.

29 A primary concern of the district is that its supply requirements do not warrant accelerating toilet replacement for most households, and that it would only be cost-effective to replace toilets that are not likely to be replaced naturally within 20 years. It has thus scaled its program to replace the number of toilets it estimates would still require retrofitting in 20 years. While there may be merit in this argument, the district has only applied the underlying logic to program funding, but not to program design. If the district truly believes it is only cost-effective to replace toilets for the customers it estimates will not have replaced their toilets in 20 years, then it should identify and direct rebates only to those customers. The district has not done this, but rather has opened the program to all residential customers, thus ignoring its own concerns regarding the cost-effectiveness of replacing residential toilets on an open basis.
### Evaluation of BMP Implementation for East Bay Municipal Utility District

#### BMP 16. ULFT Retrofits
EBMUD Program Results through FY 1996
Using Exhibit 6-based Water Savings Estimates

<table>
<thead>
<tr>
<th>Fiscal Year</th>
<th>ULFT Program Toilet Replacements 1/</th>
<th>Cumulative ULFT Program Savings 2/ (AF/Yr)</th>
<th>Exhibit 6-Based Cumulative Target 3/ (AF/Yr)</th>
<th>Difference Between Program &amp; Target Savings (AF/Yr)</th>
<th>Cumulative Balance 4/ (AF)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1991/92</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1992/93</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>178 (AF/Yr)</td>
<td>(178)</td>
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<tr>
<td>1993/94</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>868 (AF/Yr)</td>
<td>(868)</td>
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<tr>
<td>1994/95</td>
<td>600</td>
<td>5,000</td>
<td>241</td>
<td>1,474 (AF/Yr)</td>
<td>(1,233)</td>
</tr>
<tr>
<td>1995/96</td>
<td>3,200</td>
<td>4,000</td>
<td>516</td>
<td>2,005 (AF/Yr)</td>
<td>(1,489)</td>
</tr>
<tr>
<td>1996/97</td>
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<td></td>
<td></td>
<td>2,467</td>
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<td>1997/98</td>
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<td>2,868</td>
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<tr>
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<tr>
<td>2000/01</td>
<td></td>
<td></td>
<td></td>
<td>3,759</td>
<td>(3,759)</td>
</tr>
</tbody>
</table>

**Notes:**

1/ Total number of single- and multi-family toilet replacements credited to the agency's ULFT program.

2/ The estimated cumulative annual water savings (AF/yr) associated with the credited toilet replacements. All savings are credited, including savings that would have occurred due to natural replacement (i.e., program free-ridership). Savings estimates derived from Exhibit 6.

3/ The agency's cumulative annual savings targets (AF/yr) equivalent to a retrofit-on-resale requirement. Target calculated using Exhibit 6 methodology and data on housing resale rates for agency's county. Targets are net of natural replacement; they only include savings directly attributable to a hypothetical retrofit-on-resale requirement.

4/ A running total of the difference between credited program savings and target savings. Negative quantities indicate the agency has not, on balance, met the targets at that point in time. Positive quantities indicate the agency has, on balance, exceeded the targets at that point in time.
10. Evaluation of Los Angeles Department of Water & Power

In general, we found Los Angeles Department of Water & Power to be in nearly full compliance with the MOU requirements as they relate to signatory retail water suppliers. The department was found to be implementing all 16 BMPs on schedule, with the exception of BMP 10 -- CII new use review -- and BMP 13 -- water waste prohibition. The department is considerably ahead of schedule for ULFT replacements, having already more than met the BMP coverage requirement. A summary of the evaluation results are presented in Table 10-1. Evaluation summaries and notes for each BMP are presented in the subsections that follow.

<table>
<thead>
<tr>
<th>BMP No.</th>
<th>BMP Name</th>
<th>Implementing on Schedule</th>
<th>Implementing Not on Schedule</th>
<th>Partially Implementing</th>
<th>Not Implementing</th>
<th>Exempted</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Res. Audits</td>
<td>X</td>
<td></td>
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<tr>
<td>2</td>
<td>Plumbing Retro.</td>
<td>X</td>
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<tr>
<td>3</td>
<td>Dist. System</td>
<td>X</td>
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<td></td>
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<tr>
<td>4</td>
<td>Metering</td>
<td>X</td>
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<tr>
<td>5</td>
<td>Large Landscape</td>
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<td>6</td>
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<td>7</td>
<td>Public Info.</td>
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<tr>
<td>8</td>
<td>School Education</td>
<td>X</td>
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<tr>
<td>9</td>
<td>CII Conservation</td>
<td>X</td>
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<td>CII Use Review</td>
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<tr>
<td>11</td>
<td>Pricing</td>
<td>X</td>
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<tr>
<td>12</td>
<td>Res. Landscape</td>
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<td>Water Waste</td>
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<td>Coordinator</td>
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<td></td>
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<tr>
<td>15</td>
<td>Financial Incentives</td>
<td>X</td>
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</tr>
<tr>
<td>16</td>
<td>ULFT Replacement</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

10.1 Residential Water Audits (BMP 1)

Evaluation Grade
Implementing on Schedule

BMP Requirements

Identification of top 20 percent of water users; directly contact and offer audits to target customers; offer audits on a repeating cycle; provide customer incentives to implement measures. Programs to be underway by August 31, 1994. Coverage requirement: 70% of target customers to receive an audit by end of initial MOU term.

Evaluation Notes

BMP Schedule: LADWP is implementing this BMP in accordance with the MOU schedule. The department began its residential survey program in 1990 and has already satisfied the coverage requirement for this BMP.

Customer Targeting: LADWP’s audit program targets the top 20% of single-family and multifamily accounts. These accounts had been contacted directly at least three times by 1994. In 1991
this program was also promoted on TV. The program was temporarily suspended at the end of 1991 due to budget constraints, and restarted in 1993 with another targeted mailing. Customers are no longer contacted directly, but audits are still available upon request. By the end of 1991, this program was suspended because of budget restrictions due to drought. At that time 14,300 audits had been completed.

Program Description: Audits review indoor and outdoor water uses, check for leaks, and install low-flow devices as needed. Households are also offered the lawn watering guide and a customized irrigation schedule developed. The department's audit program has taken several forms over the years. With the electric department, the department ran the "Better Idea" program. This concentrated on installing fluorescent lights and vacuuming refrigerator coils. The water department provided showerheads and toilet displacement bags while the electric auditors were in the house. The auditors also identified any leaks. This program resulted in contacts with 161,424 households. However, these were not full water audits. In 1994/1995 the department began offering audits through Community Based Organizations. Households in the San Fernando Valley were contacted by letter, and 375 surveys were completed. This was expanded to the Harbor area in 1994/1995, when 957 homes were surveyed. Another audit program was the "In Concert" program cosponsored by MWD. Students were asked to survey water uses in their own homes. Data was entered into a database providing a breakdown of end-uses and bill comparisons. Low-flow showerheads and other incentives were distributed upon completion of the student survey. In the pilot year for this program 350 students participated. In 1994/1995 5,267 participated.

Customer Incentives: LADWP offers toilet rebates to customers with toilet leaks or other toilet performance problems. The department provides free low-flow devices to customers receiving audits.

Program Results: Through 1995, the department has completed more than 180,000 residential audits, and is on track to satisfy the BMP coverage requirements.

The department had the effectiveness of its audit program evaluated in 1995. The evaluation study used statistical models of household water use that incorporated weather data and individual household characteristics that could influence water demand. The study identified both "gross conservation", defined as the total amount of water conserved by the retrofitted households, and "net conservation", or that conservation over and above what would have occurred without the retrofit program. The study reports daily water savings associated with the installation of each device. These ranged from 1.5 gpd for faucet aerators to 13.7 gpd for turf audits with timers.

10.2 Plumbing, New and Retrofit (BMP 2)

Evaluation Grade

Implementing on Schedule

BMP Requirements

Identification of pre-1980 single- and multi-family homes; deliver retrofit kits, including low-flow showerheads, and toilet displacement devices to unretrofitted homes; offer to install the devices; follow-up with customers at least three times. Program underway by August 31, 1993.


Note: It is beyond the scope of this study to evaluate the accuracy of study results cited herein. The citation is made to note that the agency has made a good faith effort to evaluate the effectiveness of its BMP implementation program.
Coverage requirement: 75% of pre-1980 single-family accounts and 80% of pre-1980 multi-family accounts to be retrofitted with low-flow devices (other than ULFTs) by end of initial term.

**Evaluation Notes**

**Grade Summary:** This program was commenced before the signing of the MOU. The certification program indicates a high level of compliance.

**BMP Schedule:** LADWP is implementing this BMP in accordance with the MOU schedule. The department initiated its retrofit programs prior to the signing of the MOU and is on track to meet the coverage requirements for the BMP.

**Customer Targeting:** The department targeted all residential customers within its service area for retrofit. A city ordinance passed in 1988 required all residential accounts to certify the installation of low-flow plumbing devices. Single-family and small multi-family accounts were allowed to self-certify compliance. Large multi-family accounts were inspected to confirm compliance. In addition, recertification is required each time a residential property goes through escrow. 60,000 low-income households were mailed retrofit kits with offers for installation.

**Program Description:** Residences were required by ordinance to replace plumbing devices (except toilets) with low-flow fixtures. To date, the department has distributed 1.5 million conservation kits. Everyone in the city was required to certify that they had retrofitted.

**Program Results:** Department records indicate that 90% of its multi-family connections and 99% of single-family connections have filed affidavits.

### 10.3 Distribution System Water Audits (BMP 3)

**Evaluation Grade**

**Implementing on Schedule**

**BMP Requirements**

Distribution system to be inspected at least once every three years, using a methodology similar to that described in an AWWA manual; advising customers where leaks appear to exist on their side of the meter and making cost-effective repairs.

**Evaluation Notes**

**BMP Schedule:** LADWP is implementing this BMP in accordance with the MOU schedule. It has maintained an active leak detection program since prior to becoming a signatory. Annual water losses are within AWWA standards for a well-maintained system.

**Program Description:** The department conducts a water system audit annually to determine unaccounted for water. Unaccounted for losses average 8%, which is within AWWA standards for well-maintained systems.

The department keeps a leak record book, so when a street is torn up for other purposes it can determine whether there are existing leaks that need repairing, or whether the main in the street has experienced above average leaks that signal priority for mains replacement. High leak incidences trigger leak repairs without waiting for street works. The department maintains several leak repair crews to respond to leaks as they are reported or scheduled for repair.

LADWP has an ongoing multi-million dollar cement mortar lining program to rehabilitate old unlined cast-iron mains. This will be continued for ten years, after which it is expected to be completed.
Customer billing identifies any higher than expected water consumption, which are flagged for a recheck by the meter reader. If the meter read is confirmed, and meter is working appropriately, the customer is notified of the probability of a leak on the customer side of the meter.

10.4 Metering with Commodity Rates (BMP 4)

Evaluation Grade
Implementing on Schedule

BMP Requirements
Metering all new connections, and billing using rates that include a volume charge; retrofitting all unmetered existing connections and billing using rates that include a volume charge.

Evaluation Notes:
BMP Schedule: LADWP is implementing this BMP in accordance with the MOU schedule. The department has been metering and billing by volume of use all retail M&I potable water supply connections since prior to becoming a signatory to the MOU.

10.5 Large Landscape Audits (BMP 5)

Evaluation Grade
Implementing on Schedule

BMP Requirements
Agencies are required to identify customers with at least 3 acres of landscaping, contacting them by mail; offering audits; offering incentives to effect customer implementation; providing follow-up audits at least once every five years; providing multilingual training and information. Coverage requirement: audits offered to 100% of landscape sites 3 acres or more by end of initial MOU term.

Evaluation Notes
Grade Summary: The program began in 1988, and requires reduced water use. Incentives also allow reductions in water bills for those who are audited and implement a set of changes. Audits may be self audits, but personnel undertaking the audit must have completed an auditor training course. Multilingual information is provided.

Evaluation Notes:
BMP Schedule: LADWP is implementing this BMP in accordance with the MOU schedule and is on track to meet the BMP’s coverage requirement.

Customer Targeting: The department identified landscape sites of 3+ acres in 1988. However, the audit program is targeted at landscape sites with dedicated meters. This was achieved through identifying landscapes metered separately. This is effective, because landscape meters do not get charged a sewer fee, which is based on winter usage.

Program Description: Customers with dedicated landscape meters are required to reduce annual consumption by 10%, using 1986 as the baseline. These customers are required to reduced their water use by 10% from 1986 usage. To assist customers in achieving this reduction, LADWP provides multilingual master auditor classes in conjunction with Cal Poly and DWR. These are offered free to large landscape customers. Over 200 people have attended these classes. LADWP
also developed a handbook with Cal Poly on improving irrigation efficiency, with a follow up workshop.

Customer Incentives: Landscape sites with dedicated meters that exceed 90% of 1986 baseline usage pay a volume surcharge equal to 100% of the volumetric charge. In February 1993 LADWP introduced two-tier rates, and offered reduced summer water rates to large landscape customers implementing recommended water saving measures. These include use of weather controlled irrigation (e.g. CIMIS), and an audit with irrigation uniformity of 65 percent or better. To qualify the audit must be conducted by an individual who has passed the Cal Poly Auditors program. Under the department’s rate ordinance complying with these requirements allows water users to get 95 percent of their summer water use at the lower tier rate. This was particularly attractive to golf courses; the bill savings have spurred additional investments in water conservation.

10.6 Landscape Water Conservation Requirement (BMP 6)

Evaluation Grade
Implementing on Schedule

BMP Requirements

Enacting and implementing landscape water conservation ordinances, or cooperating with government/industry to develop and implement ordinances. Ordinances must be at least as effective as the Model Ordinance. Coverage requirement: 100% of new landscapes subject to ordinances by end of initial MOU term.

Evaluation Notes

BMP Schedule: LADWP is implementing this BMP in accordance with the MOU schedule. The City of Los Angeles adopted prescriptive landscape ordinance in 1988. It is administered by the Building and Safety Department. Ordinance requirements are incorporated into the city permitting process.

10.7 Public Information (BMP 7)

Evaluation Grade
Implementing on Schedule

BMP Requirements

Implement public information programs to educate customers about water use and to promote water conservation. Program could include providing speakers to community groups and media; advertising; using bill inserts; providing water use information on customer bills comparing current and previous year use; working cooperatively with other groups promoting water conservation. No coverage requirement specified by Exhibit 1.

Evaluation Notes

BMP Schedule: LADWP is implementing this BMP in accordance with its schedule. The department has maintained an active public information program promoting water conservation since the mid-1980s.

Program Description: LADWP uses all forms of public information, including advertising, bill inserts or messages, previous month's use shown on bill, brochures, lawn watering guides demonstration gardens, special events, speakers' bureau, exhibits and displays, and water awareness month. They also have Sunset publications and videos that are distributed on request,
and taken by speakers to any events. The department spends about $100,000 per year to promote conservation and advertise its conservation programs.

10.8 School Education (BMP 8)

Evaluation Grade
Implementing on Schedule

BMP Requirements
Implement school education programs within service area. Programs to include provision of educational materials and instruction assistance. No coverage requirement specified by Exhibit 1.

Evaluation Notes
BMP Schedule: LADWP is implementing this BMP in accordance with the MOU schedule. LADWP has maintained an active school education program on behalf of the City since prior to 1991.

Program Description: The department's school education program includes participating in school assemblies promoting water conservation; orchestrating contests promoting water conservation; distribution of educational materials, including books, maps, videos, and posters; tours, and water awareness month activities; teacher training and grants. The program targets grades K-12. The "In Concert" student audit program (see BMP 1) was also targeted at grades 9-10, but was not paid for from the school program budget. The department uses its own materials and materials provided by MWD. The program is a fixture on Department budget, and gets approximately the same level of spending every year.

10.9 CII Water Conservation (BMP 9)

Evaluation Grade
Implementing on Schedule

BMP Requirements
Identification of top 10% of commercial customers, top 10% of industrial customers, and top 20% of institutional customers. Directly contacting target customers and offering water audit. Providing incentives to encourage customer implementation of recommended measures. Offering follow-up audits at least once every five years if necessary. No coverage requirement specified by Exhibit 1 for commercial and industrial customers; coverage requirement for institutional accounts: 70% of top 20% of pre-1980 institutional accounts.

Evaluation Notes
BMP Schedule: LADWP is implementing this BMP in accordance with the MOU schedule. The department has operated a CII conservation program continuously since prior to 1991. Department records cannot verify if it is on track to meet the coverage requirement for institutional accounts. However, these accounts are subject to the city ordinances requiring retrofit of basic plumbing fixtures, which must be verified by an inspector.

Customer Targeting: Since 1988, all non-residential accounts have been required to certify installation of low-flow showerheads and toilet tank displacement devices or ULFTs. Accounts that have not filed certification are charged a 100% bill surcharge until certification is filed.

In addition, the department has identified the top 10% of commercial accounts and top 10% of industrial accounts, but does not directly offer audits to all these accounts. The department directly
offered audits to its 300 largest CI customers, and completed 40 audits. They now directly
distribute workbooks identifying probable saving opportunities by CII subcategory.

Municipal accounts were offered audits by the department in reference to the city retrofit
ordinances. The department monitors municipal usage and flags high usage. These accounts are
then alerted to potential leaks.

Program Description: LADWP has produced workbooks describing typical savings obtainable
by industry type -- e.g. restaurants, hospitals, hotels, grocery stores. These were distributed to
industry organizations and upon request. The department mailed notices to the top 75% of its CII
customers to advertise the availability of these workbooks, and has distributed more than 22,000 to
its customers. A specific guidebook for cooling towers was also developed and distributed, and
cooling tower workshops have been offered.

Customer Incentives: CII customers were offered incentives to implement programs under the
department’s technical assistance program. This is a rebate program available to non-residential
customers. The rebate requires examination of technologies before retrofit, and then a rebate
amount is offered equal to $1.25 per thousand gallons saved over a two year period. The
maximum rebate is set to the lower of $50,000 per site or retrofit cost. As of 1995, 16 projects
had received rebates totaling $352,847. In 1996 an additional 10 were authorized for a total of
$147,034.

In addition all CI accounts are subject to bill surcharges for not retrofitting basic plumbing
fixtures, as described previously.

10.10 New Commercial/Industrial Water Use Review (BMP 10)

Evaluation Grade
Not Implementing

BMP Requirements
A program to assure the review of proposed water uses for new commercial and industrial
water service and making recommendations for improved water use efficiency before completion
of the building permit process. No coverage requirement is specified for this BMP by Exhibit 1.

Evaluation Notes
BMP Schedule: The department does not have a CI new use review program in place, nor has
it file an exemption with the CUWCC, and is therefore not implementing this BMP in accordance
with the MOU schedule.

Program Description: The department does not have a new use review program in place. It has
developed A Guide to Water Conservation for Designers and Builders, which it distributes through
the building permitting process.

10.11 Conservation Pricing (BMP 11)

Evaluation Grade
Implementing on Schedule

BMP Requirements
Requires eliminating non-conservation pricing and adopting conservation pricing. This is
defined as no fixed rate or declining block pricing, and no high fixed costs coupled with low
commodity charges. Where the agency also provides sewer services, these rate structures should also apply. No coverage requirement is specified for this BMP by Exhibit 1.

**Evaluation Notes**

**BMP Schedule:** LADWP is implementing this BMP in accordance with the MOU schedule. The department has billed water consumption using a combination of service charges and volumetric charges based on metered use since becoming a signatory to the MOU. Its current rate structure does not employ a service charge.

**Program Description:** The Department has instituted a range of rates designed to encourage conservation. These include increasing block rates with high rate levels on the final block, bill surcharges for non-compliance with retrofit ordinances, and bill discounts for compliance with large landscape requirements. Therefore, the rate structure is deemed to be in conformance with the BMP's definition of a conservation rate structure.

### 10.12 Residential Landscape Conservation (BMP 12)

**Evaluation Grade**

Implementing on Schedule

**BMP Requirements:**

Requires provision of guidelines, information and incentives for more efficient landscape at new or existing single family homes; and enacting and implementing landscape water conservation ordinances. No coverage requirement is specified for this BMP by Exhibit 1.

**Evaluation Notes**

**BMP Schedule:** LADWP has initiated this BMP in accordance with the MOU schedule.

**Program Description:** The department uses developed a variety of information packages and incentives for residential landscape water conservation. These include brochures, demonstration gardens, awards, garden or home shows, and irrigation guidelines. The lawn watering guide was mailed to all single family residential customers in 1985 and again in 1990. This provides guidance for developing a customized irrigation schedule. This guide is available on request. The department has conducted several garden and landscape expos, featuring hands-on demonstrations of drip irrigation installation, lectures and booths. The 1992 expo attracted over 5000 people. Single family and multi-family customers can get a low-interest loan for installing more efficient irrigation systems. The amount of the loan is based on the projected savings. The minimum amount is $300, and the maximum is $7,500 for Single Family, and $5,500 for multifamily. This program, however, has not been extensively advertised.

### 10.13 Water Waste Prohibition (BMP 13)

**Evaluation Grade**

Partially Implementing

**BMP Requirements**

Enacting and enforcing measures to prohibit gutter flooding, single pass cooling systems in new connections, nonrecirculating systems in all new conveyor car wash and commercial laundry systems, and nonrecirculating decorative water fountains. Including water softener checks in home water audits and providing customers with information about DIR and exchange-type water softeners in their educational efforts.
Evaluation Notes

BMP Schedule: LADWP has implemented this BMP in accordance with the MOU schedule.

Program Description: The departments ordinance, adopted in 1988, addresses gutter flooding, non-recirculating fountains, customer plumbing leaks, midday irrigation, hosing of hard surfaces, and water served in restaurants. These apply at all times, not just during shortages. The ordinance does not prohibit nonrecirculating systems in all new conveyor car wash and commercial laundry systems, and therefore is not considered to be as effective as the BMP restrictions. We note, however, the LADWP believes that high sewer rates have probably resulted in the majority of laundry and car wash accounts converting to recirculating systems.

10.14 Water Conservation Coordinator (BMP 14)

Evaluation Grade
Implementing on Schedule

BMP Requirements

Designation of a water conservation coordinator responsible for preparing agency conservation plan, managing its implementation, and evaluating program results. No coverage requirement is specified for this BMP by Exhibit 1.

Evaluation Notes

BMP Schedule: LADWP's implementing this BMP in accordance with its schedule. The department established and staffed the position of Water Conservation Coordinator in 1986.

Program Description: The department's conservation section now includes 3.5 full-time-equivalent positions.

10.15 Financial Incentives (BMP 15)

Evaluation Grade
Implementing on Schedule

BMP Requirements:

Financial incentives are to be offered to retail customers. No coverage requirement is specified for this BMP by Exhibit 1.

Evaluation Notes

BMP Schedule: LADWP is implementing this BMP in accordance with its schedule.

Program Description: LADWP offers a broad range of financial incentives. Some of these are positive (such as rebates) and others are negative (including surcharges for failure to comply). These programs are summarized below.

CII customers were offered incentives to implement programs under the technical assistance programs. This is a rebate program available to all except single-family residential. The rebate requires examination of appliances before retrofit, and then a rebate is paid equal to $1.25 per thousand gallons saved over a two year period. The limit is the lower of $50,000 per site or retrofit cost.
In 1988 the City Council required all customers except single family to install low-flow showerheads and toilet dams. The penalty for non-compliance is 100 percent surcharge on the water bill for every month until the customer complies.

Large landscape customers were required to reduced their water use by 10% from 1986 usage, with a penalty for non-compliance of 100% surcharge on bills for every month out of compliance.

Single family and multi-family customers can get a low-interest loan for installing more efficient irrigation systems. The amount of the loan is based on the projected savings. The minimum amount is $300, and the maximum is $7,500 for Single Family, and $50,000 for multifamily. This has not been extensively advertised.

In February 1993 LADWP introduced two-tier rates, and offered reduced summer water rates to large landscape customers that had instituted recommended activities. Complying with these requirements allows water users to get 95 percent of water at the lower tier rate. This program is also available to smaller landscapes that use more than 200 percent of winter use levels during summer.

The Department offers rebates of $75 (multifamily and CII) and $100 (for single-family) for toilet replacements.

10.16 Ultra Low Flush Toilet Replacement (BMP 16)

Evaluation Grade
Implementing on Schedule

BMP Requirements

Implementing programs to replace existing high-water-using toilets with ultra-low-flush toilets. Programs to be as effective as offering $100 rebates for toilets, or requiring replacement at time of resale, or replacement at time of change of service. Identifying all non-residential customers and ranking them by water use by December 31, 1995, and retrofitting toilets for at least 1% of their non-residential customers by June 30, 1998. Coverage requirement: per Exhibit 6 of the MOU, agency program must result in water savings equivalent to a retrofit on resale requirement for the service area.

Evaluation Notes

BMP Schedule: LADWP is implementing this BMP in accordance to the MOU schedule and is on track to exceed the coverage requirements.

Program Description: The Department offers rebates of $75 (multifamily and CII) and $100 (for single-family). As of January 1992, 658,000 toilet replacements have been credited to the program. All new construction was required to have ULF toilets as of July 1990. To date, the department has invested $30 million into its ULFT retrofit program.

The City also has a "retrofit at time of resale" ordinance, that also requires retrofit at the time of building permit for alterations. A "Certificate of Compliance" must be filed with the Department of Building and Safety. For CII and large multifamily buildings, the certificate must be issued by a licensed contractor.

Program Results: Program results are shown in the table below. As of FY 1996, a total of 285,000 single-family and 373,000 multi-family toilet replacements have been attributed to the program.

Program water savings depend on annual water savings per toilet, which, in turn, depend on household density, number of toilets per household, whether the retrofit was partial or complete,
and the mix of pre- and post-1980 housing units receiving retrofits. Exhibit 6 provides water savings lookup tables (derived from empirical program evaluations) that take these factors into account, and, for purposes of the MOU, are to be used for calculating water savings attributable to ULFT programs. Based on these tables, the cumulative annual water savings (AF/yr) attributed to the agency’s program as of June 1996, is 29,038 AF/yr.

To assess implementation effectiveness, annual program savings were compared to savings that could be attributed to a retrofit-on-resale requirement for the service area. We base this analysis on the methodology presented in Exhibit 6 of the MOU. 31 It is important to emphasize that savings targets using this methodology are net of any savings that would occur naturally due to expected toilet failure and replacement. In other words, the method fully accounts for natural replacement. It is equally important to note that on the agency side, any toilet replacements directly attributable to the agency’s program are counted, including replacements by program participants that would have replaced their toilet regardless of the program (e.g. program free-riders). In this regard, the evaluation favors agencies, since it nets out natural replacement from the targets, but not from meeting the targets.

The results of this evaluation are shown in the proceeding table. We calculate that through 1996, LADWP is 388% of target water savings. A copy of the spreadsheet model and data used to generate this table are included with this report.

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31 The spreadsheet model used to calculate program savings and targets is included with this report. Prior to finalizing this evaluation, the model was submitted to A & N Technical Services, who authored Exhibit 6, for review and validation. The model was deemed by A & N Technical Services to be consistent with Exhibit 6 requirements.
## BMP 16. ULFT Retrofits
Program Results through FY 1996
Using Exhibit 6-based Water Savings Estimates

<table>
<thead>
<tr>
<th>Fiscal Year</th>
<th>ULFT Program Toilet Replacements 1/</th>
<th>Cumulative ULFT Program Savings 2/ (AF/Yr)</th>
<th>Exhibit 6-Based Cumulative Target 3/ (AF/Yr)</th>
<th>Difference Between Program &amp; Target Savings (AF/Yr)</th>
<th>Cumulative Balance 4/ (AF)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1991/92</td>
<td>52,294</td>
<td>11,383</td>
<td>0</td>
<td>11,383</td>
<td>11,383</td>
</tr>
<tr>
<td>1992/93</td>
<td>32,141</td>
<td>14,218</td>
<td>1,021</td>
<td>13,197</td>
<td>24,580</td>
</tr>
<tr>
<td>1993/94</td>
<td>82,193</td>
<td>19,209</td>
<td>4,936</td>
<td>14,273</td>
<td>38,854</td>
</tr>
<tr>
<td>1994/95</td>
<td>65,854</td>
<td>23,472</td>
<td>8,203</td>
<td>15,270</td>
<td>54,123</td>
</tr>
<tr>
<td>1995/96</td>
<td>52,261</td>
<td>29,038</td>
<td>10,911</td>
<td>18,127</td>
<td>72,250</td>
</tr>
<tr>
<td>1996/97</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1997/98</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td>1998/99</td>
<td></td>
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<td>1999/00</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>2000/01</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Notes:
1/ Total number of single- and multi-family toilet replacements credited to the agency's ULFT program.
2/ The estimated cumulative annual water savings (AF/yr) associated with the credited toilet replacements. All savings are credited, including savings that would have occurred due to natural replacement (i.e., program free-ridership). Savings estimates derived from Exhibit 6.
3/ The agency's cumulative annual savings targets (AF/yr) equivalent to a retrofit-on-resale requirement. Target calculated using Exhibit 6 methodology and data on housing resale rates for agency's county. Targets are net of natural replacement; they only include savings directly attributable to a hypothetical retrofit-on-resale requirement.
4/ A running total of the difference between credited program savings and target savings. Negative quantities indicate the agency has not, on balance, met the targets at that point in time. Positive quantities indicate the agency has, on balance, exceeded the targets at that point in time.
11. Evaluation of MWD of Orange County

11.1 Evaluation of BMPs Applying to Wholesalers

A summary of the evaluation results are presented in Table 11-1. Evaluation summaries and notes for each BMP are presented in the subsections that follow. In general, we found Municipal Water District of Orange County to be in full compliance with the MOU requirements as they relate to signatory wholesale water suppliers. MWDOC works closely with its member agencies, providing extensive financial, technical, and programmatic support for BMP implementation.

Table 11-1. Summary of BMP Evaluation Results for Municipal Water District of Orange County

<table>
<thead>
<tr>
<th>BMP No.</th>
<th>BMP Name</th>
<th>Implementing on Schedule</th>
<th>Implementing Not on Schedule</th>
<th>Partially Implementing</th>
<th>Not Implementing</th>
<th>Exempted</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Dist. System</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Metering</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Public Info.</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>School Education</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Pricing</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Coordinator</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Financial Incentives</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

11.1.1 Distribution System Water Audits (BMP 3)

Evaluation Grade

Implementing on Schedule

BMP Requirements

Distribution system to be inspected at least once every three years, using a methodology similar to that described in an AWWA manual; advising customers where leaks appear to exist on their side of the meter and making cost-effective repairs.

Evaluation Notes

BMP Schedule: MWDOC is implementing this BMP in accordance with the MOU schedule. The district has operated a distribution system survey and leak detection program since prior to 1991.

Program Description: MWD meters water going to Orange County, and MWDOC meters water going to its member agencies. Comparisons are made monthly using these meter reads to check for leaks. The Agency maintains a crew of 4 dedicated to operating this pipeline, including leak detection. They survey all system mains for leaks annually. They have also cosponsored water audit and leak repair seminars for member agencies (1993, and 1996).

MWDOC requires its member agencies to report estimated losses on an annual basis. These data are of uncertain validity: Irvine Ranch has 3 dedicated leak crews and seems to know their system's performance well. Other agencies may be less reliable. Most of the reported losses are within AWWA guidelines; one small agency appears to have losses exceeding industry standards. MWDOC provides each agency with an annual analysis of what their losses have cost them. Agency-wide, this is estimated to be $5 million. The district uses this information to encourage additional leak detection efforts by agencies. Three agencies have expressed an interest in having a full AWWA audit as a result. MWDOC will provide staff to complete these audits.
11.1.2 Metering with Commodity Rates (BMP 4)

Evaluation Grade
Implementing on Schedule

BMP Requirements
Metering all new connections, and billing using rates that include a volume charge; retrofitting all unmetered existing connections and billing using rates that include a volume charge.

Evaluation Notes

BMP Schedule: MWDOC is implementing this BMP in accordance with the MOU schedule. The district has been metering deliveries to all retail agency connections since prior to 1991. The district has billed retail agency deliveries since prior to 1991.

Program Description: All delivery points are metered and have commodity rates. MWDOC also conducts a semi-annual water rate survey, that shows that its member agencies have commodity rates.

11.1.3 Public Information (BMP 7)

Evaluation Grade
Implementing on Schedule

BMP Requirements
Implement public information programs to educate customers about water use and to promote water conservation. Program could include providing speakers to community groups and media; advertising; using bill inserts; providing water use information on customer bills comparing current and previous year use; working cooperatively with other groups promoting water conservation. No coverage requirement specified by Exhibit 1.

Evaluation Notes

BMP Schedule: MWDOC is implementing this BMP in accordance with the MOU schedule. The district has maintained an active public information program promoting water conservation since prior to 1991.

Program Description: The agency has a full program of public information, including public service advertising; bill inserts provided to member agencies; previous use shown on bill; brochures; lawn watering guides; demonstration gardens; special events; speakers bureau; and community events.

MWDOC prints brochures, bill inserts, and other material that member agencies distribute. It co-funds or provides materials for much of the member agencies' public information programs. Since 1992, MWDOC has invested more than $790,000 into its public information programs.

11.1.4 School Education (BMP 8)

Evaluation Grade
Implementing on Schedule

BMP Requirements
Implement school education programs within service area. Programs to include provision of educational materials and instruction assistance. No coverage requirement specified by Exhibit 1.
Evaluation Notes

BMP Schedule: MWDOC is implementing this BMP in accordance with its schedule. The district has maintained an active school education program promoting water conservation since prior to 1991.

Program Description: The district has operated a school education program since 1974. The District uses MWD-supplied materials, provides supplemental materials, a resource library, and conducts an annual poster and slogan contest. The district targets its program at K-12. In 1994/1995, the district also reached over 25 percent of K-12 students, and in 1995/1996 reached just less than 25 percent of students.

11.1.5 Conservation Pricing (BMP 11)

Evaluation Grade

Implementing on Schedule

BMP Requirements

Requires eliminating non-conservation pricing and adopting conservation pricing. This is defined as no fixed rate or declining block pricing, and no high fixed costs coupled with low commodity charges. Where the agency also provides sewer services, these rate structures should also apply. No coverage requirement is specified for this BMP by Exhibit 1.

Evaluation Notes

BMP Schedule: MWDOC is implementing this BMP in accordance with the MOU schedule. The district has metered and billed by volume of use deliveries to its retail agency customers since prior to 1991.

Program Description: All delivery points are metered and have commodity rates. MWDOC also conducts a semi-annual water rate survey, that shows that its member agencies have commodity rates. It has also held a conservation rate workshop for its member agencies that looked at case studies, stressing how and how not to introduce conservation rates.

11.1.6 Water Conservation Coordinator (BMP 14)

Evaluation Grade

Implementing on Schedule

BMP Requirements

Designation of a water conservation coordinator responsible for preparing agency conservation plan, managing its implementation, and evaluating program results. No coverage requirement is specified for this BMP by Exhibit 1.

Evaluation Notes

BMP Schedule: MWD is implementing this BMP in accordance with the MOU schedule. The district established and staffed the position of Water Conservation Coordinator in 1988. It has been staffed continuously since its inception.

11.1.7 Financial Incentives (BMP 15)

Evaluation Grade

Implementing on Schedule
BMP Requirements:

Financial incentives are to be offered to retail agencies to support conservation programs. No coverage requirement is specified for this BMP by Exhibit 1.

Evaluation Notes

BMP Schedule: MWDOC is implementing this BMP in accordance with MOU schedule. The district has offered a variety of financial incentives and cost-sharing programs to its retail agencies since prior to 1992.

Program Description: The District has several toilet rebate/replacement programs, that in 1993 led to replacement of 4,300 Single Family toilets, 30,500 Multi-family toilets and 350 Public Authority toilets. Programs had rebates ranging from $75-$100 per toilet. The District later offered free toilets through a CTSI-run program. If householders don't want the standard white toilet offered through this program, they are offered a $50 rebate instead. The District is passing on MWD's incentive, and has none of its own.

The District is also developing an incentive program for CII implementation. This will be based on the 225 completed audits.

The District has a large landscape incentive program, through which they offer to pay half the cost of upgrading irrigation systems. This incentive requires performance guarantee - if water savings are not obtained over the next five years, landscape owner must repay incentive. This is underway with four landscape owners, and four more proposals are being negotiated.

Most financial incentive programs use MWDSC money for incentives, and administration, in-kind assistance are provided by MWDSC to member agencies.

11.2 Evaluation of BMPs Not Applying Directly to Wholesalers

As discussed in section 2.5, signatory wholesale water suppliers are not obligated under the MOU to implement BMPs 1, 2, 5, 6, 9, 10, 12, 13, and 16. Most signatory wholesale water suppliers, however, provide some level of implementation support to their retail agency customers for these BMPs. This section presents the evaluation results for Municipal Water District of Orange County for these BMPs.

Table 11-2 summarizes the level of support provided to its retail agencies by MWDOC for BMPs 1, 2, 5, 6, 9, 10, 12, 13, and 16. The subsections that follow provide the summary descriptions of district activities supporting this classification.

Table 11-3 summarizes implementation of BMPs MWDOC is implementing on a regional basis on behalf of its retail agencies. These BMPs were evaluated as though the district is directly responsible for their implementation because the district is operating the programs regionally, and the district's retail agencies are not operating independent programs. It is important to emphasize, however, that under the MOU, the district is not actually responsible for the implementation of these BMPs, and that it is incumbent upon the district's signatory retail agencies to determine if the district's regional programs are satisfying their individual obligations under the MOU.
Table 11-2. Municipal Water District of Orange County Summary of Support Levels for BMPs Not Applying Directly to Signatory Wholesale Water Suppliers

<table>
<thead>
<tr>
<th>BMP No.</th>
<th>BMP Name</th>
<th>Extensive Support</th>
<th>Standard Support</th>
<th>Moderate Support</th>
<th>Negligible Support</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Res. Audits</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Plumbing Retro.</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Landscape Audits</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Landscape Req.</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>CII Conservation</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>CI Use Review</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>12</td>
<td>Landscape SF Res.</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Water Waste Proh.</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>ULFT Replacement</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 11-3. Summary of BMP Evaluation Results for BMPs Being Implemented Regionally by Municipal Water District of Orange County

<table>
<thead>
<tr>
<th>BMP No.</th>
<th>BMP Name</th>
<th>Implementing on Schedule</th>
<th>Implementing Not on Schedule</th>
<th>Partially Implementing</th>
<th>Not Implementing</th>
<th>Exempted</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>CII Conservation</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>ULFT Replacement</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

11.2.1 Residential Water Audits (BMP 1)

Support Level

Standard Support

BMP Requirements

Identification of top 20 percent of water users; directly contact and offer audits to target customers; offer audits on a repeating cycle; provide customer incentives to implement measures. Programs to be underway by August 31, 1994. Coverage requirement: 70% of target customers to receive an audit by end of initial MOU term.

Evaluation Notes

With MWD assistance, MWDOC developed a guide book to assist member agencies in implementing this program. In 1993/1994 the District provided programs and materials to assist member agencies. It has a training program for member agency staff. This consists of eight one-day classes, that are held on the first Monday of every month.

The district completed 450 audits in 1995/1996 and reports approximately 12,000 audits by member agencies. During water audits, agency staff hand out information on water-efficient gardening, teach meter reading skills to check for leaks, and how to test toilets for leaks. The auditors set up indoor/outdoor water budgets. This is being recorded in a database, with the idea of using this to develop budget-based rates.

11.2.2 Plumbing, New and Retrofit (BMP 2)

Evaluation Grade
Evaluation of BMP Implementation for MWD of Orange County

Extensive Support

BMP Requirements

Identification of pre-1980 single- and multi-family homes; deliver retrofit kits, including low-flow showerheads, and toilet displacement devices to unretrofitted homes; offer to install the devices; follow-up with customers at least three times. Program underway by August 31, 1993. Coverage requirement: 75% of pre-1980 single-family accounts and 80% of pre-1980 multi-family accounts to be retrofitted with low-flow devices (other than ULFTs) by end of initial term.

Evaluation Notes

MWDOC member agencies have identified pre-1980 residential accounts, and are delivering retrofit kits. MWDOC assists member agencies to get program funding and equipment. In 1993/1994 completed 9,128 retrofits. In 1994/1995 completed 10,309. The district estimates that through February 1997, it has distributed 200,385 showerheads within the area, and another 52,762 outside of their service area.

11.2.3 Large Landscape Audits (BMP 5)

Evaluation Grade

Extensive Support

BMP Requirements

Agencies are required to identify customers with at least 3 acres of landscaping, contacting them by mail; offering audits; offering incentives to effect customer implementation; providing follow-up audits at least once every five years; providing multilingual training and information. Coverage requirement: audits offered to 100% of landscape sites 3 acres or more by end of initial MOU term.

Evaluation Notes

In partnership with MWDSC, offers free irrigation management training (Protector del Agua). Training is offered to the public and to professionals in Spanish and English. This is focused on professional landscape personnel, and is offered 6-8 times per year.

MWDOC is working towards setting up water budgets for its 12,000 dedicated landscape meters. However, they have not found an effective way to identify target customers. MWDOC are planning to test three methods for identifying target areas: use of aerial photographs; use of plot plans; and mail-out surveys. These three programs will be tested for accuracy and cost-effectiveness.

MWDOC has promoted water efficient landscape maintenance specifications contracts for Homeowners Associations (HOAs). They are conducting a pilot program with two computer controlled irrigation systems with HOAs. They also have developed a model landscape maintenance contract for use by HOAs. For these associations' budgets, water may be the largest line item.

MWDOC is participating with IRWD in a landscape study to determine appropriate levels of landscape maintenance. They have discovered that an early spring application with an iron-based fertilizer, followed by heavy irrigation promotes root growth, and improves summer irrigation efficiency.

They are working with maintenance operators at a small number of large landscapes, encouraging them to go from manual to automated systems where this is cost-effective. MWDOC uses MWD-supplied funding to pay for half of installation costs. The incentive requires water
savings. If sufficient water is not saved over five years, then landscape owner must repay incentive.

11.2.4 Landscape Water Conservation Requirement (BMP 6)

Evaluation Grade

Standard Support

BMP Requirements

Enacting and implementing landscape water conservation ordinances, or cooperating with government/industry to develop and implement ordinances. Ordinances must be at least as effective as the Model Ordinance. Coverage requirement: 100% of new landscapes subject to ordinances by end of initial MOU term.

Evaluation Notes

The District has designed water efficient landscape ordinances, and has worked with member cities to monitor their adoption, including holding a workshop to assist city staff in drafting ordinances. Most cities have adopted ordinances. A few cities adopted ordinances very close to the Model Ordinance. Most were prescriptive, and did not require reviews of landscape plans.

MWDOC has provided summaries of individual ordinances to landscape professionals to assist them in complying, and is monitoring cities' efforts. Has annual water efficient landscape contest for residential and commercial customers.

11.2.5 CII Water Conservation (BMP 9)

Evaluation Grade

As Supporting Agency: Extensive Support

As Implementing Agency: Implementing on Schedule

BMP Requirements

Identification of top 10% of commercial customers, top 10% of industrial customers, and top 20% of institutional customers. Directly contacting target customers and offering water audit. Providing incentives to encourage customer implementation of recommended measures. Offering follow-up audits at least once every five years if necessary. No coverage requirement specified by Exhibit 1 for commercial and industrial customers; coverage requirement for institutional accounts: 70% of top 20% of pre-1980 institutional accounts.

Evaluation Notes

If we evaluate the district’s program as supplemental to retail agency landscape audit programs, the support level is extensive. However, MWDOC is operating its regional CII audit program on behalf of its retail water agencies. While under the terms of the MOU, the district is not directly responsible for implementing a CII audit program, the district has taken it upon itself consolidate agency programs into a single regional effort. According to district staff, retailers in the area are not operating CII audit programs independently of the district’s program. We therefore have also evaluated the program as if the district were the responsible implementing agency. When evaluated as the responsible implementing agency, the district is found to be implementing on schedule BMP 9.

BMP Schedule: When viewed as the implementing agency, the district is implementing this BMP in accordance with the MOU schedule. The district initiated its CII audit program in 1994, and appears to be on track to meet the coverage requirements for institutional accounts.
Evaluation of BMP Implementation for MWD of Orange County

Customer Targeting: The district worked with member agencies to identify the top 20% of commercial and industrial accounts in their service areas. Contact persons were then identified and sent letters offering audits. These letters were followed up with phone calls. The program has a 95% acceptance rate.

Program Description:

The district provides three levels of audit depending on facility water use: (1) a simple walkthrough audit that focuses on change-out of basic plumbing fixtures ($450/audit); an intermediate level audit providing a more detailed walkthrough which examine some process water uses ($1000/audit); and (3) industrial water management studies ($9,000 - $12,000) which develop comprehensive water management programs based on facility water uses. Each audit results in a written report identifying water savings potential and including cost-benefit and payback analyses. Program budget for 1995/96 was $175,000. The district has completed 183 audits to date.

The district also has sponsored cooling tower workshops, and has developed several information sheets on CII water use.

11.2.6 New Commercial/Industrial Water Use Review (BMP 10)

Evaluation Grade

Negligible Support

BMP Requirements

A program to assure the review of proposed water uses for new commercial and industrial water service and making recommendations for improved water use efficiency before completion of the building permit process. No coverage requirement is specified for this BMP by Exhibit 1.

Evaluation Notes

The District provides information that is available from other sources. It does not have any other method of assisting members to comply.

11.2.7 Residential Landscape Conservation (BMP 12)

Support Level

Extensive Support

BMP Requirements

Requires provision of guidelines, information and incentives for more efficient landscape at new or existing single family homes; and enacting and implementing landscape water conservation ordinances. No coverage requirement is specified for this BMP by Exhibit 1.

Evaluation Notes

The district provides brochures, mandatory requirements, incentives, nursery plant tagging, new home information, demonstration garden, awards, garden or home shows, contests and guidelines. The district has an annual water efficient landscape contest for residential and commercial customers. MWDOC is working on expanding its irrigation training program to householders. It also cofunds upgrading of irrigation systems for homeowners' associations.

11.2.8 Water Waste Prohibition (BMP 13)

Support Level
Standard Support

**BMP Requirements**

Requires provision of guidelines, information and incentives for more efficient landscape at new or existing single family homes; and enacting and implementing landscape water conservation ordinances. No coverage requirement is specified for this BMP by Exhibit 1.

**Evaluation Notes**

The Board adopted a resolution on April 3, 1991 that instructed member agencies to adopt and enforce regulations prohibiting waste of water. The regulations included prompt repair of leaks, restrictions of washing of paved areas, use of hose shutoff valves, non-recirculating fountains, midday irrigation, water served in restaurants, gutter flooding. The District also monitored compliance with this resolution. However, the program was a drought response measure only, and has no long-term restrictions.

**11.2.9 Ultra Low Flush Toilet Replacement (BMP 16)**

**Evaluation Grade**

As Supporting Agency: Extensive Support

As Implementing Agency: Partially Implementing

**BMP Requirements**

Implementing programs to replace existing high-water-using toilets with ultra-low-flush toilets. Programs to be as effective as offering $100 rebates for toilets, or requiring replacement at time of resale, or replacement at time of change of service. Identifying all non-residential customers and ranking them by water use by December 31, 1995, and retrofitting toilets for at least 1% of their non-residential customers by June 30, 1998. Coverage requirement: per Exhibit 6 of the MOU, agency program must result in water savings equivalent to a retrofit on resale requirement for the service area.

**Evaluation Notes**

MWDOS operates a regional ULFT program for its member agencies. While under the terms of the MOU, the agency is not directly responsible for implementing a ULFT program, the agency has taken it upon itself to operate a regional program on behalf of its retail agencies. If the program is viewed as supplemental to retail agency ULFT programs, the support level is quite extensive. However, retailers in the area are not operating ULFT programs independently of the MWDOS's program, and therefore the district was also evaluated as though it were directly responsible for implementation. Viewed this way, estimated program savings through FY 1996 are 38% of the benchmark retrofit-on-resale savings target over the period of analysis using Exhibit 6 savings assumptions. Thus, when viewed as the primary agency responsible for implementation, MWDOS is found to be partially implementing BMP 16.

**BMP Schedule**: The agency initiated its replacement program in accordance with the MOU schedule, but is not on track to satisfy the coverage requirements for this BMP by the end of the initial MOU term. Estimated program savings through FY 1996 are 38% of the necessary target water savings through FY 1996 (see below). 33

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33 This is calculated as the sum of annual cumulative program savings from each year of program operation divided by the sum of annual cumulative water savings targets starting from August 31, 1993. This is the total volume of water saved by the program divided by the total volume of water targeted to be saved.
Evaluation of BMP Implementation for MWD of Orange County

Program Description: The program is funded by MWD, with some District money spent for marketing and staff time. However, some of this is subtracted from the MWD incentive. The district tracks how agencies are matching MWD targets. These targets are still evolving, and so the district is not yet alerting member agencies as to their performance relative to these goals. The agency does not track its performance relative to the MOU goals. The program has distributed approximately 43,703 toilets through FY 1996.

Program Results: Program results are shown in the table below. As of FY 1996, a total of 33,122 single-family and 10,583 multi-family toilet replacements have been attributed to the program.

Program water savings depend on annual water savings per toilet, which, in turn, depend on household density, number of toilets per household, whether the retrofit was partial or complete, and the mix of pre- and post-1980 housing units receiving retrofits. Exhibit 6 provides water savings lookup tables (derived from empirical program evaluations) that take these factors into account, and, for purposes of the MOU, are to be used for calculating water savings attributable to ULFT programs. Based on these tables, the cumulative annual water savings (AF/yr) attributed to the agency’s program as of June 30, 1996, is 1,387 AF/yr.

To assess implementation effectiveness, annual program savings were compared to savings that could be attributed to a retrofit-on-resale requirement for the service area. We base this analysis on the methodology presented in Exhibit 6 of the MOU. It is important to emphasize that savings targets using this methodology are net of any savings that would occur naturally due to expected toilet depreciation and replacement. In other words, the method fully accounts for natural replacement. It is equally important to note that on the agency side, any toilet replacements directly attributable to the agency’s program are counted, including replacements by program participants that would have replaced their toilet regardless of the program (e.g. program free-riders). In this regard, the evaluation favors agencies, since it nets out natural replacement from the targets, but not from meeting the targets.

The results of this evaluation are shown in the proceeding table. A copy of the spreadsheet model and data used to generate this table are included with this report.

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33 The spreadsheet model used to calculate program savings and targets is included with this report. Prior to finalizing this evaluation, the model was submitted to A & N Technical Services, who authored Exhibit 6, for review and validation. The model was deemed by A & N Technical Services to be consistent with Exhibit 6 requirements.
## Evaluation of BMP Implementation for MWD of Orange County

### BMP 16, ULFT Retrofits

**Program Results through FY 1996**

**Using Exhibit 6-based Water Savings Estimates**

<table>
<thead>
<tr>
<th>Fiscal Year</th>
<th>ULFT Program Toilet Replacements 1/</th>
<th>Cumulative ULFT Program Savings 2/ (AFYr)</th>
<th>Exhibit 6-Based Cumulative Target 3/ (AFYr)</th>
<th>Difference Between Program &amp; Target Savings (AFYr)</th>
<th>Cumulative Balance 4/ (AF)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1991/92</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1992/93</td>
<td>1,938</td>
<td>0</td>
<td>52</td>
<td>267</td>
<td>(215)</td>
</tr>
<tr>
<td>1993/94</td>
<td>7,632</td>
<td>1,700</td>
<td>338</td>
<td>1,307</td>
<td>(969)</td>
</tr>
<tr>
<td>1994/95</td>
<td>12,053</td>
<td>3,938</td>
<td>847</td>
<td>2,226</td>
<td>(1,380)</td>
</tr>
<tr>
<td>1995/96</td>
<td>11,499</td>
<td>4,945</td>
<td>1,387</td>
<td>3,037</td>
<td>(1,650)</td>
</tr>
<tr>
<td>1996/97</td>
<td></td>
<td></td>
<td>3,749</td>
<td>4,371</td>
<td>(4,911)</td>
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<tr>
<td>1997/98</td>
<td></td>
<td></td>
<td>4,371</td>
<td>4,371</td>
<td></td>
</tr>
<tr>
<td>1998/99</td>
<td></td>
<td></td>
<td>4,911</td>
<td>4,911</td>
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<tr>
<td>1999/00</td>
<td></td>
<td></td>
<td>5,377</td>
<td>5,377</td>
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<tr>
<td>2000/01</td>
<td></td>
<td></td>
<td>5,775</td>
<td>5,775</td>
<td></td>
</tr>
</tbody>
</table>

### Graph

![Graph showing cumulative savings](chart.png)

**Notes:**

1/ Total number of single- and multi-family toilet replacements credited to the agency's ULFT program.
2/ The estimated cumulative annual water savings (AFYr) associated with the credited toilet replacements. All savings are credited, including savings that would have occurred due to natural replacement (i.e. program free-ridership). Savings estimates derived from Exhibit 6.
3/ The agency's cumulative annual savings targets (AFYr) equivalent to a retrofit-on-resale requirement. Target calculated using Exhibit 6 methodology and data on housing resale rates for agency's county. Targets are net of natural replacement: they only include savings directly attributable to a hypothetical retrofit-on-resale requirement.
4/ A running total of the difference between credited program savings and target savings. Negative quantities indicate the agency has not, on balance, met the targets at that point in time. Positive quantities indicate the agency has, on balance, exceeded the targets at that point in time.
12. Evaluation of MWD of Southern California

12.1 Evaluation of BMPs Applying to Wholesalers

A summary of the evaluation results are presented in Table 12-1. Evaluation summaries and notes for each BMP are presented in the subsections that follow. In general, we found Metropolitan to be in full compliance with the MOU requirements as they relate to signatory wholesale water suppliers. Metropolitan works closely with its member agencies, providing extensive financial, technical, and programmatic support for BMP implementation.

Table 12-1. Summary of BMP Evaluation Results for Metropolitan Water District of Southern California

<table>
<thead>
<tr>
<th>BMP No.</th>
<th>BMP Name</th>
<th>Implementing on Schedule</th>
<th>Implementing Not on Schedule</th>
<th>Partially Implementing</th>
<th>Not Implementing</th>
<th>Exempted</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Dist. System</td>
<td>X</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>4</td>
<td>Metering</td>
<td>X</td>
<td></td>
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<tr>
<td>7</td>
<td>Public Info.</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>8</td>
<td>School Education</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Pricing</td>
<td>X</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>14</td>
<td>Coordinator</td>
<td>X</td>
<td></td>
<td></td>
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<tr>
<td>15</td>
<td>Financial Incentives</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

12.1.1 Distribution System Water Audits (BMP 3)

**Evaluation Grade**

Implementing on Schedule

Standard support to member agencies

**BMP Requirements**

Distribution system to be inspected at least once every three years, using a methodology similar to that described in an AWWA manual; advising customers where leaks appear to exist on their side of the meter and making cost-effective repairs.

**Evaluation Notes**

*BMP Schedule:* Metropolitan is implementing this BMP in accordance with the MOU schedule, operating a program since prior to the signing the MOU.

*Program Description:* Operations conduct a weekly system check. The Colorado River Aqueduct is patrolled daily by plane, and monitored by ground crews. The California Aqueduct has a similar maintenance schedule. All underground pipes are checked every six months. All leaks are repaired immediately.

Metropolitan co-sponsored three water audit and/or leak detection programs with its member agencies. These programs assisted member agencies and their retail suppliers to identify unaccounted water losses and locate leaks. The pilot programs received mixed reviews by the participating agencies.
12.1.2 Metering with Commodity Rates (BMP 4)

Evaluation Grade
Implementing on Schedule
Standard Support to Member Agencies

BMP Requirements
Metering all new connections, and billing using rates that include a volume charge; retrofitting all unmetered existing connections and billing using rates that include a volume charge.

Evaluation Notes

BMP Schedule: The District has met these requirements since before the signing of the MOU.

Program Description: Metropolitan meters all water deliveries and applies volumetric rates to all water deliveries, as do all of its member agencies.

12.1.3 Public Information (BMP 7)

Evaluation Grade
Implementing on Schedule
Standard Support to member agencies

BMP Requirements
Implement public information programs to educate customers about water use and to promote water conservation. Program could include providing speakers to community groups and media; advertising; using bill inserts; providing water use information on customer bills comparing current and previous year use; working cooperatively with other groups promoting water conservation. No coverage requirement specified by Exhibit 1.

Evaluation Notes

BMP Schedule: Metropolitan's public information program was in place prior to the signing of the MOU.

Program Description: Metropolitan has an extensive program, including the following:

Speakers' bureau, which is estimated to reach 15,000 to 20,000 people annually.

Media relations, including editorial briefings, media field trips and information packets.

Brochures, that are distributed by speakers, at special and community events and by member agencies.

Special/Community events, such as regional fairs, expositions, city festivals, Earth Day, and on college campuses. Metropolitan has information booths sponsoring conservation at all of these events.

Staff also conduct field trips for elected officials and community leaders, and lobby elected officials and government agencies on behalf of conservation-related legislation. Public information spending has dropped dramatically because of the end of the drought.

Over the first five years of the MOU, Metropolitan invested approximately 9 million dollars into its public information program for conservation. During the early 1990s, Metropolitan substantially increased spending on public information programs intended to educate Southern
California residents about the increasingly serious nature of the ongoing drought and about the acute need to modify water use practices and behaviors. Once the drought receded, spending on drought-focused public information campaigns was curtailed. Metropolitan maintains an active public information program promoting long-term conservation programs and investments.

12.1.4 School Education (BMP 8)

Evaluation Grade
Implementing on Schedule

BMP Requirements
Implement school education programs within service area. Programs to include provision of educational materials and instruction assistance. No coverage requirement specified by Exhibit 1.

Evaluation Notes

BMP Schedule: Metropolitan is implementing this BMP in accordance with the MOU schedule. The District’s program began in 1983.

Program Description: Metropolitan’s activities include the development and distribution of curriculum materials focusing on water conservation, classroom presentations and teacher training. These resources are available on a region-wide basis to teachers and students in grades K-12. Metropolitan also gives awards for water-related projects at the Los Angeles County Science Fair and provides mini-grants to teachers with innovative classroom programs.

Between FYs 1992/93 and 1995/96, Metropolitan has invested approximately $3.3 million in school education programs. These programs are estimated to have reached over 22,500 teachers and 925,000 students.

12.1.5 Conservation Pricing (BMP 11)

Evaluation Grade
Implementing on Schedule

BMP Requirements
Requires eliminating non-conservation pricing and adopting conservation pricing. This is defined as no fixed rate or declining block pricing, and no high fixed costs coupled with low commodity charges. Where the agency also provides sewer services, these rate structures should also apply. No coverage requirement is specified for this BMP by Exhibit 1.

Evaluation Notes

BMP Schedule: Metropolitan is implementing this BMP in accordance with the MOU schedule. Metropolitan has employed volumetric, non-declining-block rates that do not include a high fixed-cost component, since prior to signing the MOU in 1991.

Program Description: Metropolitan uses commodity-based rates, and averages approximately 75 percent of revenues through commodity charges. It also has a demand charge, which is a surcharge on abnormally high demand growth. The demand charge, however, is currently suspended, because post-drought water use has been low. Metropolitan plans to reinstate the surcharge if system demand exceeds 2.2 MAF.
12.1.6 Water Conservation Coordinator (BMP 14)

Evaluation Grade
Implementing on Schedule

BMP Requirements

Designation of a water conservation coordinator responsible for preparing agency conservation plan, managing its implementation, and evaluating program results. No coverage requirement is specified for this BMP by Exhibit 1.

Evaluation Notes

BMP Schedule: Metropolitan is implementing this BMP in accordance with the MOU schedule. Metropolitan established its Water Conservation Branch in 1990.

Project Description: The Conservation Branch currently includes 15 full-time employees and 4 consultants. The Branch consists of five "teams": Residential Indoor/Outdoor Surveys; Large Landscape and Education; ULFT Retrofits; CII Surveys; and Program Measurement and Evaluation. Each of these teams acts as technical advisors and quality control agents for member agency programs. They also co-fund many of the member agencies' conservation programs. Staff are active in the CUWCC at all levels.

12.1.7 Financial Incentives (BMP 15)

Evaluation Grade
Implementing on Schedule

BMP Requirements:

Financial incentives are to be offered to retail agencies to support conservation programs. No coverage requirement is specified for this BMP by Exhibit 1.

Evaluation Notes

BMP Schedule: Metropolitan is implementing this BMP in accordance with the MOU schedule. The district has offered a variety of financial incentives and cost-sharing programs to its retail members since 1988.

Program Description: Metropolitan provides cofunding for member agency programs. It developed the water conservation credits program (CCP) in 1988 to provide financial incentives to member agencies for water conservation programs. Through September 1993, it had signed contracts committing Metropolitan and member agencies to spend $64 million (of which Metropolitan pays half) on water conservation. Metropolitan funds any approved program up to the lesser of 50 percent of the cost of the program or $154 per AF saved.

Metropolitan has recently developed two "menu" funding mechanisms: a co-pay matrix for residential retrofits; and a co-pay menu for CII retrofits. Co-payments are tied to the devices being installed and their expected water savings. The co-pay matrix for single family audits authorizes payments ranging from $1 per installed aerator to $60 per installed ULFT. It has developed a similar menu approach to CII, where ULFTs earn $60, and cooling tower modifications earn $500. Payment is contingent upon installation of the approved devices.

Metropolitan holds annual workshops to discuss types of conservation programs eligible for funding, and how the agencies can qualify for the incentives. From 1992/1993 through 1995/1996 Metropolitan has spent a total of $72 million on conservation programs. The largest part of this ($54 million) has been spent on ULFT rebates, and $9 million on Public Information (BMP 7).
12.2 Evaluation of BMPs Not Applying Directly to Wholesalers

As discussed in section 2.5, signatory wholesale water suppliers are not obligated under the MOU to implement BMPs 1, 2, 5, 6, 9, 10, 12, 13, and 16. Most signatory wholesale water suppliers, however, provide some level of implementation support to their retail agency customers for these BMPs. This section presents the evaluation results for Metropolitan Water District of Southern California for these BMPs.

Table 12-2 summarizes the level of support provided to its retail agencies by Metropolitan for BMPs 1, 2, 5, 6, 9, 10, 12, 13, and 16. The subsections that follow provide the summary descriptions of district activities supporting this classification.

<table>
<thead>
<tr>
<th>BMP No.</th>
<th>BMP Name</th>
<th>Extensive Support</th>
<th>Standard Support</th>
<th>Moderate Support</th>
<th>Negligible Support</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Res. Audits</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Plumbing Retro.</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Landscape Audits</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Landscape Req.</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>CIH Conservation</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>CI Use Review</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Landscape SF Res.</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Water Waste Proh.</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>16</td>
<td>ULF1 Replacement</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

12.2.1 Residential Water Audits (BMP 1)

Support Level

Extensive Support

BMP Requirements

Identification of top 20 percent of water users; directly contact and offer audits to target customers; offer audits on a repeating cycle; provide customer incentives to implement measures. Programs to be underway by August 31, 1994. Coverage requirement: 70% of target customers to receive an audit by end of initial MOU term.

Evaluation Notes

Beginning in FY 1993/94 Metropolitan participated in a pilot project with the City of San Diego to assess the cost-effectiveness of single family residential surveys (i.e., audits). This pilot program served as the basis for developing a comprehensive single family residential survey program. As of the end of FY 1995/96, Metropolitan had co-funded approximately 20,000 residential surveys involving 7 member agencies and 22 subagencies.

Despite these financial incentives, the program was not widely accepted within Metropolitan's service territory. To encourage broader participation Metropolitan, in collaboration with its member agencies, has developed a series of planning, training and implementation resources, including a start-up kit for potential program managers, and training for the auditors. Metropolitan has also provided a minimum standard for what the audits should include in order to maximize the benefit of the audits.
Metropolitan has developed a "co-pay matrix" scheme intended to provide incentives for prescribed, verified audit activities. Under this scheme, for example, Metropolitan will pay $5 per installed showerhead, $18 for developing a schedule for an automated irrigation system, and $12.50 for databasing the results of each completed residential survey (i.e., audit).

12.2.2 Plumbing, New and Retrofit (BMP 2)

Support Level

Extensive Support

BMP Requirements

Identification of pre-1980 single- and multi-family homes; deliver retrofit kits, including low-flow showerheads, and toilet displacement devices to unretrofitted homes; offer to install the devices; follow-up with customers at least three times. Program underway by August 31, 1993. Coverage requirement: 75% of pre-1980 single-family accounts and 80% of pre-1980 multi-family accounts to be retrofitted with low-flow devices (other than ULFTs) by end of initial term.

Evaluation Notes

Metropolitan initiated retrofit program assistance in FY 1990/91. This assistance has gone through a variety of phases.

- Beginning in 1991, Metropolitan sponsored the Water Wise program. Between FY 1990/91 and 1991/92 Metropolitan paid a contractor approximately $7 million to assemble and distribute conservation "kits" comprising approximately 1.6 million showerheads and 850,000 toilet displacement bags and leak detection dye tablets. These kits were publicly distributed through "partner" outlets like McDonald's, Broadway department stores, Mattell, the California Angels, Thomas Bros. Map company, Goodwill Industries, Coca-Cola, local Lion's clubs and other organizations. As the drought waned, so did the partners' involvement. Approximately 336,000 undistributed "kits" were returned to Metropolitan during FY 1994/95. These were subsequently distributed by Metropolitan as part of ULF toilet retrofit programs, during Water Awareness Month and related public events, and made available to member agencies.

- Between FYs 1992/93 and 1993/94, Metropolitan contributed an additional $2.2 million towards showerhead kit distribution programs which were administered by member agencies.

- The Water Hunt education pilot program included the distribution of approximately 19,500 conservation "kits"—and over 25,000 showerheads—at 281 schools.

- Metropolitan gave approximately 22,000 showerheads to the Southern California Gas Company in FY 1995/96 to be distributed in conjunction with their own residential audit program.

While Metropolitan's Public Affairs Division continues to distribute showerheads at selected public events, the Conservation Branch has, since 1996, placed greater emphasis on verified installations. It currently pays $5 per installed showerhead, for example, as part of its "Residential Survey (Audits) Co-Funding Matrix" scheme developed in support of BMP 1. Information from surveys conducted by Metropolitan and by its member agencies suggests low flow showerhead saturation rates of 60% and higher.

12.2.3 Large Landscape Audits (BMP 5)

Support Level
Evaluation of BMP Implementation for MWD of Southern California

Extensive Support

BMP Requirements

Agencies are required to identify customers with at least 3 acres of landscaping, contacting them by mail; offering audits; offering incentives to effect customer implementation; providing follow-up audits at least once every five years; providing multilingual training and information. Coverage requirement: audits performed for 100% of landscape sites 3 acres or more by end of initial MOU term.

Evaluation Notes

The District cofunds landscape programs meeting district-established standards, usually paying 50 percent of the costs. It also has extensive training and information programs in place. The district’s landscape team develops information and guidelines for large landscape water audits, administers co-funding, assists with development and coordination of training programs for landscape professionals. Metropolitan also co-funded San Diego’s Large Turf Audit Program, that contacted consumers with 2 acres or larger of turf. To date, Metropolitan has funded or co-funded over 800 landscape water audits covering more than 11,000 acres of landscaped area. Metropolitan has also co-funded moisture sensor and central irrigation computer controlled system installations and/or retrofits in conjunction with landscape water audits. Since 1992, nine member agencies have participated in this program component involving over 1,370 acres of landscaped area.

In addition, Metropolitan offered a CIMIS Auditor Training Program in conjunction with the University of California at Riverside. In 1992-1993 230 professionals were trained through this program. Metropolitan also sponsors a workshop to assist member agencies in maintaining a database of landscape professionals. This is used to inform professionals of training/education opportunities available. In conjunction with Cal Poly, Metropolitan has developed a special landscape management program in English and Spanish. A sequel program is also being offered.

Metropolitan has funded the development of an advanced landscape software program (Water Resources Manager) that assists landscape architects to meet AB325 standards in new landscapes, and to assess the effect of proposed changes in existing landscapes.

The Public Facilities Assistance Program provides funding to upgrade equipment in public agencies, such as schools or parks. The funding is on a 50/30/20 percent basis, with Metropolitan providing the 50.

This program has a strong education/training component, including the Protector del Agua program, a bilingual program offered to landscape gardeners, foremen and irrigation supervisors. This is a fast-growing program, and more recently have targeted such as school districts, departments of parks and recreation, military bases and large corporations. During FY 1995/96, Metropolitan conducted 20 courses involving 11 member agencies. Approximately 600 people received training during this year, bringing the total number of program graduates to approximately 1500.

12.2.4 Landscape Water Conservation Requirement (BMP 6)

Support Level

Extensive Support

BMP Requirements

Enacting and implementing landscape water conservation ordinances, or cooperating with government/industry to develop and implement ordinances. Ordinances must be at least as effective as the Model Ordinance. Coverage requirement: 100% of new landscapes subject to ordinances by end of initial MOU term.
Evaluation Notes

Metropolitan staff participated in the drafting of AB325 and has co-funded 5 agencies' participation in the Circuit Rider program providing technical assistance for municipalities checking landscape plans. Since its inception, 63 cities have participated in this program. Metropolitan also developed a software program (Water Resource Manager) that allows a landscape professional to check the water needs of a proposed landscape design against AB325 standards. The software also enables professionals to perform cost/benefit analyses of changes to existing landscapes.

12.2.5 CII Water Conservation (BMP 9)

Support Level

Extensive Support

BMP Requirements

Identification of top 10% of commercial customers, top 10% of industrial customers, and top 20% of institutional customers. Directly contacting target customers and offering water audit. Providing incentives to encourage customer implementation of recommended measures. Offering follow-up audits at least once every five years if necessary. No coverage requirement specified by Exhibit I for commercial and industrial customers; coverage requirement for institutional accounts: 70% of top 20% of pre-1980 institutional accounts.

Evaluation Notes

Metropolitan has developed and conducted various training courses and workshops for member agency staff. Topics have included developing effective strategies for marketing conservation programs to the CII sector and procedures for conducting CII water use surveys and formulating water efficiency recommendations. It has also conducted end-user workshops for facility engineers on efficient cooling tower operation and water use efficiency conferences for specific CII customer segments including hospitals and hotels/motels.

Metropolitan assists its member agencies and their retail water distributors in identifying their CII market segments and by determining the types of conservation programs and services which best fit the needs of different customer groups. The process involves taking a retail agency's CII billing data and, by combining multiple accounts and identifying customer types, ranking customers by total water use. This comprehensive profile serves as the basis for deciding how to tailor program efforts for different customer segments. Approximately 50 distinct customer profiles—termed "Program Layouts"—have been developed for Metropolitan's retail member agencies as part of this program.

Metropolitan has also financed or co-funded over 900 site-specific water use surveys within its service territory. The information compiled by these surveys has been databased and is believed to represent the largest single source of information available about CII water end-uses.

12.2.6 New Commercial/Industrial Water Use Review (BMP 10)

Support Level

Moderate Support

BMP Requirements

A program to assure the review of proposed water uses for new commercial and industrial water service and making recommendations for improved water use efficiency before completion of the building permit process. No coverage requirement is specified for this BMP by Exhibit 1.

Evaluation Notes
Metropolitan has investigated ways of assisting member agencies with this BMP, but as yet has not identified a satisfactory approach. Metropolitan believes that building code changes are necessary, but has not determined how to codify the necessary requirements.

12.2.7 Residential Landscape Conservation (BMP 12)

Support Level

Extensive Support

BMP Requirements

Requires provision of guidelines, information and incentives for more efficient landscape at new or existing single family homes; and enacting and implementing landscape water conservation ordinances. No coverage requirement is specified for this BMP by Exhibit 1.

Evaluation Notes

Metropolitan is working with 3 or 4 homeowners’ associations to revamp irrigation systems. In addition, it provides brochures and information related to waterwise gardening. Up to 1993, Metropolitan offered a CIMIS Auditor training course in conjunction with U.C. Riverside to all of its members and subagencies. Over 1400 individuals have participated in the program. Metropolitan has also assisted its member agencies in developing databases of irrigation professionals to identify the target population for workshops, training and incentives.

In 1994, Metropolitan's training program changed to Protector del Agua, developed in cooperation with the Irrigation Training and Research Center of California Polytechnic State University at San Luis Obispo. This began as a single three-hour multilingual course in basic concepts of irrigation efficiency, and was offered to landscape gardeners, foremen and irrigation supervisors. Thirty one workshops were held in 1994. As a result of feedback from participants in these courses, the program was expanded to consist of six classes offered over six consecutive weeks. During FY 1995-1996, Metropolitan conducted 20 courses involving 11 member agencies. Approximately 600 participants attended during that year. This program is increasing, with more member agencies becoming involved and more instructors hired.

The 20,000 residential audits discussed in the “Evaluation Notes” for Section 5.1 (“Residential Water Audits”) all included an outdoor landscape water efficiency component. Assessments were made of the irrigation requirements and current watering practices at each residence and recommendations were made, when warranted, about more efficient irrigation schedules and other water-efficient landscape practices.

12.2.8 Water Waste Prohibition (BMP 13)

Support Level

Moderate Support

BMP Requirements

Enacting and enforcing measures to prohibit gutter flooding, single pass cooling systems in new connections, nonrecirculating systems in all new conveyor car wash and commercial laundry systems, and nonrecirculating decorative water fountains. Including water softener checks in home water audits and providing customers with information about DIR and exchange-type water softeners in their educational efforts.

Evaluation Notes

Metropolitan has acted as a clearing house to provide examples of prohibition and control ordinances.
12.2.9 Ultra Low Flush Toilet Replacement (BMP 16)

Support Level
Extensive Support

BMP Requirements

Implementing programs to replace existing high-water-using toilets with ultra-low-flush toilets. Programs to be as effective as offering $100 rebates for toilets, or requiring replacement at time of resale, or replacement at time of change of service. Identifying all non-residential customers and ranking them by water use by December 31, 1995, and retrofiting toilets for at least 1% of their non-residential customers by June 30, 1998. Coverage requirement: per Exhibit 6 of the MOU, agency program must result in water savings equivalent to a retrofit on resale requirement for the service area.

Evaluation Notes

Metropolitan began co-funding member agency retrofits of ULF toilets in September of 1988 under its Conservation Credits Program. Metropolitan’s initial contribution was $75 per acre foot (AF) of water saved or half of the cost of the program, whichever was less. The size of this contribution was increased to $154 per AF in 1990 based on revised estimates of Metropolitan’s avoided costs of energy.

ULF toilet (ULFT) retrofit programs co-funded by Metropolitan have taken two basic forms -- cash rebates and direct distributions. Under the rebate scheme, customers purchase an ULFT from a retail outlet, submit proof of purchase to their retail water agency and receive a rebate check by return mail. By March of 1992, twelve ULFT rebate programs representing over 201,000 retrofits and a financial contribution of over $11 million had been co-funded by Metropolitan.

In an attempt to better serve lower income communities, Metropolitan developed two types of direct distribution programs, both of which provided ULFTs free-of-charge to the customer. These programs had the additional benefit of progressively lowering manufacturers’ ULF toilet prices due to the large volume of purchases involved.

One version of the direct distribution program involved partnering with community based organizations (CBOs). The CBOs recruited participants and coordinated installations in exchange for a fixed fee per ULFT. The second type of direct distribution involved single-day programs conducted by high schools, seniors groups and other local non-profit groups. By July of 1996, these direct distribution programs had increased the total number of ULFTs distributed within Metropolitan’s service territory to approximately 400,000 and involved a Metropolitan contribution of roughly $45 million.

To simplify program administration, Metropolitan implemented its current “flat rate” co-funding arrangement of $60 per installed ULFT in 1993 for all ULFT retrofit programs. By 1996, most member agency programs had developed beyond Metropolitan’s single vendor “turn key” direct distribution programs to best meet the distinct needs of their own service territories. Metropolitan continues to provide co-funding and also assists the agencies in selecting contractors, writing contracts, assessing ULFT performance and in other areas of program management.

As of 1996, Metropolitan had co-funded the replacement of about one million ULFTs at a cost of approximately $60 million.

Recently, the pace of Metropolitan co-funded retrofit programs has slowed somewhat. This can be attributed to several major factors:

- The large volume of ULFTs distributed to date through existing programs suggests that customers most likely to respond to these programs may have already been reached. Different
mechanisms may be needed to achieve greater penetration in some member agencies’ service territories.

- The transition from use of Metropolitan’s turn-key programs to the development and administration of their own service area specific programs has involved some start-up time.
- USBR contributions during 1993/94 and 1994/95 allowed member agencies to participate in ULFT retrofit programs with only a 10 percent contribution, making it financially feasible for many more agencies to participate in these programs. This funding is no longer in place.
13. Evaluation of Santa Clara Valley Water District

13.1 Evaluation of BMPs Applying to Wholesalers

A summary of the evaluation results are presented in Table 13-1. Evaluation summaries and notes for each BMP are presented in the subsections that follow. In general, we found Santa Clara Valley Water District to be in full compliance with the MOU requirements as they relate to signatory wholesale water suppliers. Santa Clara works closely with its member agencies, providing extensive financial, technical, and programmatic support for BMP implementation.

Table 13-1. Summary of BMP Evaluation Results for Santa Clara Valley Water District

<table>
<thead>
<tr>
<th>BMP No.</th>
<th>BMP Name</th>
<th>Implementing on Schedule</th>
<th>Implementing Not on Schedule</th>
<th>Partially Implementing</th>
<th>Not Implementing</th>
<th>Exempted</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Dist. System</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Metering</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Public Info.</td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>8</td>
<td>School Education</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>11</td>
<td>Pricing</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Coordinator</td>
<td>X</td>
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<td></td>
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</tr>
<tr>
<td>15</td>
<td>Financial Incentives</td>
<td>X</td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

13.1.1 Distribution System Water Audits (BMP 3)

Evaluation Grade

Implementing on Schedule

BMP Requirements

Distribution system to be inspected at least once every three years, using a methodology similar to that described in an AWWA manual; advising customers where leaks appear to exist on their side of the meter and making cost-effective repairs.

Evaluation Notes

BMP Schedule: Santa Clara Valley Water District is implementing this BMP in accordance with the MOU schedule. The district has operated a distribution system survey and leak detection program since prior to 1991.

Program Description: Monthly distribution system checks are performed on all district-owned distribution systems. Retail suppliers within the district’s service area independently audit their distribution systems. The district reported system-wide losses for annual report years 92/93, 93/94, and 95/96 averaged less than 1%. The district reported county-wide unaccounted water losses of less than 6% of total use.

13.1.2 Metering with Commodity Rates (BMP 4)

Evaluation Grade

Implementing on Schedule

BMP Requirements

Metering all new connections, and billing using rates that include a volume charge; retrofitting all unmetered existing connections and billing using rates that include a volume charge.
Evaluation Notes

**BMP Schedule:** Santa Clara Valley Water District is implementing this BMP in accordance with the MOU schedule. The district has been metering deliveries to all retail agency connections since prior to 1991. The district has billed retail agency deliveries since prior to 1991.

**Program Description:** The district meters and bills by volume of use all retail agency potable water supply deliveries.

13.1.3 Public Information (BMP 7)

**Evaluation Grade**

Implementing on Schedule

**BMP Requirements**

Implement public information programs to educate customers about water use and to promote water conservation. Program could include providing speakers to community groups and media; advertising; using bill inserts; providing water use information on customer bills comparing current and previous year use; working cooperatively with other groups promoting water conservation. No coverage requirement specified by Exhibit 1.

Evaluation Notes

**BMP Schedule:** Santa Clara Valley Water District is implementing this BMP in accordance with the MOU schedule. The district has maintained an active public information program promoting water conservation since prior to 1991.

**Program Description:** Since 1991, Santa Clara Valley Water District has operated a variety of public information programs and campaigns to promote efficient water uses and water conservation. These include the following:

**ULFT Program** -- Currently, the agency is pursuing a three week ULFT radio ad campaign with East Bay Municipal Utility District and Marin Municipal Water District promoting their ULFT rebate programs. In addition, the agency will place ads in local newspapers informing the public about the toilet rebate program.

**Nursery Program** -- In 1995, the agency developed its Nursery program, which consists of a series of educational materials and store displays that have been distributed and maintained in 32 nurseries throughout its service area.

**Water Efficient Landscape Workshop Series** -- Each spring, the agency hosts a Water-Efficient Landscape Workshop series for residents within its service area. The series consists of three sessions addressing garden design, plant selection, and irrigation design, installation, and maintenance.

**Spanish-Language Irrigation Workshop Series** -- The agency conducts workshops on landscape irrigation system operation, scheduling, and maintenance to Spanish-speaking landscape professionals.

**CII Workshops** -- In May and June 1995, the agency hosted with the City of San Jose three Cooling Tower Workshops developed by Black & Veatch. The workshops focused on cooling tower operation and water conservation opportunities.

**Leak Detection Workshop** -- In June 1996, the agency hosted a Water Audit and Leak Detection Seminar developed by DWR. The 2-day seminar discussed distribution system water audit and leak detection techniques for retail water supply systems.
Evaluation of BMP Implementation for Santa Clara Valley Water District

Public Events -- The agency staffs booths at expositions, garden shows, and other public events throughout its service area.

Bill Stuffers -- The agency encourages its retail water agencies to include Water Conservation Program information with their water bills.

13.1.4 School Education (BMP 8)

Evaluation Grade

Implementing on Schedule

BMP Requirements

Implement school education programs within service area. Programs to include provision of educational materials and instruction assistance. No coverage requirement specified by Exhibit 1.

Evaluation Notes

BMP Schedule: Santa Clara Valley Water District is implementing this BMP in accordance with its schedule. The district has maintained an active school education program promoting water conservation since prior to 1991.

Program Description: Santa Clara Valley Water District's school education program provides free classroom presentations, puppet plays, and tours of agency facilities to schools within Santa Clara County. The district also provides school curriculum including any required workbooks, videos, and presentations. These programs are designed to teach children in grades K-12 about water conservation, water supply, and flood protection issues. The goal of the program is to reach 5,000 students each year. The district's Public Information Office hired a full-time teacher to develop school education programs in 1994.

13.1.5 Conservation Pricing (BMP 11)

Evaluation Grade

Implementing on Schedule

BMP Requirements

Requires eliminating non-conservation pricing and adopting conservation pricing. This is defined as no fixed rate or declining block pricing, and no high fixed costs coupled with low commodity charges. Where the agency also provides sewer services, these rate structures should also apply. No coverage requirement is specified for this BMP by Exhibit 1.

Evaluation Notes

BMP Schedule: Santa Clara Valley Water District is implementing this BMP in accordance with the MOU schedule. The district has metered and billed by volume of use deliveries to its retail agency customers since prior to 1991.

Program Description: Santa Clara Valley Water District meters and bills by volume of use all water deliveries to its retail agency customers. The district does not employ decreasing-block rates, and does not collect a disproportionate share of revenue through fixed charges. In addition, all 13 of the district's retail water supplier customers employ rate structures consistent with BMP 11.

13.1.6 Water Conservation Coordinator (BMP 14)

Evaluation Grade

118
Implementing on Schedule

**BMP Requirements**

Designation of a water conservation coordinator responsible for preparing agency conservation plan, managing its implementation, and evaluating program results. No coverage requirement is specified for this BMP by Exhibit 1.

**Evaluation Notes**

**BMP Schedule:** Santa Clara Valley Water District is implementing this BMP in accordance with the MOU schedule. The district established and staffed the position of Water Conservation Coordinator in 1990. It has been staffed continuously since its inception.

**Program Description:** Conservation Coordinator is a full-time position. Coordinator dedicates 100% of their time to the agency’s conservation program. Coordinator manages a conservation program staff. Current staffing level is two but has ranged between two to six.

**13.1.7 Financial Incentives (BMP 15)**

**Evaluation Grade**

Implementing on Schedule

**BMP Requirements:**

Financial incentives are to be offered to retail agencies to support conservation programs. No coverage requirement is specified for this BMP by Exhibit 1.

**Evaluation Notes**

**BMP Schedule:** Santa Clara Valley Water District is implementing this BMP in accordance with MOU schedule. The district has offered a variety of financial incentives and cost-sharing programs to its retail agencies since prior to 1992.

**Program Description:** The district has provided the following financial incentives and cost-sharing arrangements to its retail agencies:

**ULFT Program** -- Since 1992, the district has worked with eleven of its retail water agencies to offer rebates of up to $75 to residents within Santa Clara County purchasing ULFTs. To date, the agency has expended, excluding administrative overhead costs, approximately $4.5 million on the program. The district has entered into a cost-sharing agreement with the City of San Jose to install 41,250 ULFTs. The district is expecting to spend $3.2 million on this program over the next year. The agency provide marketing collateral to its retail agencies for program promotion, and maintains displays in over 80 plumbing outlet, hardware, and home improvement stores in the county.³⁴

**CII Financial Incentives Program** -- The agency has entered into a cost-sharing agreement with the City of San Jose to provide financial incentives to commercial and industrial customers implementing water conservation measures that result in permanent reductions in demand. Financial incentives range between $400 to $20,000 per site. The district has allocated $75,000 to this program.

**Horizontal-Axis Washing Machine Rebate Program** -- the agency has entered into partnership with PG&E, East Bay MUD, and the City of Davis to offer rebates of up to $300 for to residents within their service areas who install approved horizontal-axis clothes washers. To date the agency

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³⁴ We note that the district may want to consider the potential for increasing program free-ridership by advertising rebates in plumbing and hardware outlets.
has issued 220 rebates totaling $16,500, excluding administrative costs. The district has budgeted $15,000 for this program in FY 96-97 and $35,000 for FY 97-98.

13.2 Evaluation of BMPs Not Applying Directly to Wholesalers

As discussed in section 2.5, signatory wholesale water suppliers are not obligated under the MOU to implement BMPs 1, 2, 5, 6, 9, 10, 12, 13, and 16. Most signatory wholesale water suppliers, however, provide some level of implementation support to their retail agency customers for these BMPs. This section presents the evaluation results for Santa Clara Valley Water District for these BMPs.

Table 13-2 summarizes the level of support provided to its retail agencies by Santa Clara Valley Water District for BMPs 1, 2, 5, 6, 9, 10, 12, 13, and 16. The subsections that follow provide the summary descriptions of district activities supporting this classification.

Table 13-3 summarizes implementation of the three BMPs Santa Clara Valley Water District is implementing on a regional basis on behalf of its retail agencies. These BMPs -- 5, 9, and 16 -- were evaluated as though the district is directly responsible for their implementation because the district is operating the programs regionally, and the district’s retail agencies are not operating independent programs. It is important to emphasize, however, that under the MOU, the district is not actually responsible for the implementation of these BMPs, and that it is incumbent upon the district’s signatory retail agencies to determine if the district’s regional programs are satisfying their individual obligations under the MOU.

<table>
<thead>
<tr>
<th>BMP No.</th>
<th>BMP Name</th>
<th>Extensive Support</th>
<th>Standard Support</th>
<th>Moderate Support</th>
<th>Negligible Support</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Res. Audits</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Plumbing Retro.</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Landscape Audits</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Landscape Req.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>CII Conservation</td>
<td>X</td>
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<td></td>
</tr>
<tr>
<td>10</td>
<td>CI Use Review</td>
<td></td>
<td></td>
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<td>X</td>
</tr>
<tr>
<td>12</td>
<td>Landscape SF Res.</td>
<td>X</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Water Waste Proh.</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>ULFT Replacement</td>
<td>X</td>
<td></td>
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</tr>
</tbody>
</table>

Table 13-3. Summary of BMP Evaluation Results for BMPs Being Implemented Regionally by Santa Clara Valley Water District

<table>
<thead>
<tr>
<th>BMP No.</th>
<th>BMP Name</th>
<th>Implementing on Schedule</th>
<th>Implementing Not on Schedule</th>
<th>Partially Implementing</th>
<th>Not Implementing</th>
<th>Exempted</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>Landscape Audits</td>
<td>X</td>
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<td></td>
<td></td>
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<tr>
<td>9</td>
<td>CII Conservation</td>
<td>X</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>ULFT Replacement</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
13.2.1 Residential Water Audits (BMP 1)

Support Level
Standard Support

BMP Requirements
Identification of top 20 percent of water users; directly contact and offer audits to target customers; offer audits on a repeating cycle; provide customer incentives to implement measures. Programs to be underway by August 31, 1994. Coverage requirement: 70% of target customers to receive an audit by end of initial MOU term.

Evaluation Notes
Agency provides materials and training supporting its retail agencies' residential water audit programs. For example, the agency purchases and provides its retail agencies with water conservation kits to be distributed during home water use surveys. Kits include a low-flow showerhead, aerators, and information about water conservation programs. In 1990 the agency co-funded a Residential Water Audit pilot program with the City of San Jose, which was completed by Black & Veatch in February 1992. This program served as a model for agency programs within the district's service area.

13.2.2 Plumbing, New and Retrofit (BMP 2)

Evaluation Grade
Extensive Support

BMP Requirements
Identification of pre-1980 single- and multi-family homes; deliver retrofit kits, including low-flow showerheads, and toilet displacement devices to unretrofitted homes; offer to install the devices; follow-up with customers at least three times. Program underway by August 31, 1993. Coverage requirement: 75% of pre-1980 single-family accounts and 80% of pre-1980 multi-family accounts to be retrofitted with low-flow devices (other than ULFTs) by end of initial term.

Evaluation Notes
Santa Clara Valley Water District provides its retail agencies with low-flow showerheads for distribution to their retail customers. The agency also distributes these devices at public events and upon request. Since 1992, the agency has distributed more than 60,000 low-flow showerheads.

The agency has carried out several targeted mailings to neighborhood associations, hotels, motels, and apartment complexes. In addition, the agency tracks monthly the number of conservation devices distributed by each of its retailers.

13.2.3 Large Landscape Audits (BMP 5)

Evaluation Grade
As Supporting Agency: Extensive Support
As Implementing Agency: Partially Implementing

BMP Requirements
Agencies are required to identify customers with at least 3 acres of landscaping, contacting them by mail; offering audits; offering incentives to effect customer implementation; providing follow-up audits at least once every five years; providing multilingual training and information.
Coverage requirement: audits offered to 100% of landscape sites 3 acres or more by end of initial MOU term.

Evaluation Notes

Santa Clara Valley Water District operates a regional large landscape audit program on behalf of its retail water agencies. While under the terms of the MOU, the district is not directly responsible for implementing a large landscape audit program, the district has taken it upon itself to consolidate agency programs into a single regional effort. If we evaluate the district’s program as supplemental to retail agency landscape audit programs, the support level is extensive. However, according to district staff, retailers in the area are not operating landscape programs independently of the district’s program. We therefore have also evaluated the program as if the district were the responsible implementing agency. When evaluated as the responsible implementing agency, the district is found to be partially implementing BMP 5.

BMP Schedule: The district is not meeting the MOU schedule for this BMP. The district initiated its Irrigation Technical Assistance Program in 1995. The MOU schedule calls for large landscape programs to be underway by August 31, 1994. District staffing and budgeting for this program allow it to complete about 75 audits per year. It is not possible to determine if this audit rate is sufficient to meet the coverage requirement for this BMP because the district has not identified the number of landscapes of 3+ acres in its service area. However, the district estimates there are between 7,238 to 20,000 sites in its service area with dedicated irrigation accounts. Given the size of the district’s service area, it seems unlikely that the district’s current audit rate will be sufficient to meet the BMP coverage requirement. In addition, we note that the program is scheduled to run through 1998 with the current contractor, in which case the district will complete at most 300 audits unless it renews the program. Because the level of investment in this program is unlikely to be equivalent to the level of effort required to meet the coverage requirement, the district’s program is considered partial implementation of BMP 5.

Customer Targeting: The district’s program is open to all landscape sites of one acre or more. The district has tried several different targeting strategies. In 1995, the district relied on its retail agencies to identify candidate sites. Program results indicated that additional screening was required. In 1996, sites were screened based on an assessment of water savings potential. This has been further modified to focus initial audits on a portion of a site’s landscape, and to only follow-up with a full audit if the site follows through with initial recommendations.

It is difficult to know if this approach is at least as effective as targeting landscapes of 3 or more acres. However, we note that many water agencies have reported higher potential water savings in medium sized landscape sites relative to large sized landscape sites, and opening landscape audit programs to sites of less than 3 acres has become standard practice. We also believe making full audits conditional on implementation of initial recommendations may prove effective. We therefore consider the district’s current approach to targeting to be at least as effective as targeting sites of 3 plus acres.

Program Description: Audits include a water-use analysis, in-depth irrigation system evaluations, scheduling information, and recommendations for irrigation system improvements. To date, 150 sites throughout the county have participated in the program. The district has set a goal of completing 75 audits per year through 1998. The district also provides free multi-lingual irrigation training workshops (see BMP 7 above), as well as landscape water management training seminars for landscape professionals operating in the county.

13.2.4 Landscape Water Conservation Requirement (BMP 6)

Evaluation Grade

Standard Support
BMP Requirements

Enacting and implementing landscape water conservation ordinances, or cooperating with government/industry to develop and implement ordinances. Ordinances must be at least as effective as the Model Ordinance. Coverage requirement: 100% of new landscapes subject to ordinances by end of initial MOU term.

Evaluation Notes

BMP Schedule: The district is implementing this BMP in accordance with the MOU schedule. The district developed a model water-efficient landscape ordinance pursuant to AB 325 in 1992, and assisted its 13 retail agencies in developing and adopting water-efficient ordinances based on this model.

Program Description: The district’s model ordinance is based on the prescriptive approach described by the state’s model landscape ordinance. District staff worked with the district’s 13 retail agencies to develop and adopt ordinances based on this model. The district has also employed Agtech Associates to assist planning departments of cities within its service area in reviewing landscape designs for new developments for efficiency.

13.2.5 CII Water Conservation (BMP 9)

Evaluation Grade

As Supporting Agency: Extensive Support
As Implementing Agency: Partially Implementing

BMP Requirements

Identification of top 10% of commercial customers, top 10% of industrial customers, and top 20% of institutional customers. Directly contacting target customers and offering water audit. Providing incentives to encourage customer implementation of recommended measures. Offering follow-up audits at least once every five years if necessary. No coverage requirement specified by Exhibit 1 for commercial and industrial customers; coverage requirement for institutional accounts: 70% of top 20% of pre-1980 institutional accounts.

Evaluation Notes

If we evaluate the district’s program as supplemental to retail agency landscape audit programs, the support level is extensive. The district has funded a regional pilot program, entered a cost-sharing agreement with the City of San Jose to supplement the city’s commercial incentives program, and sponsored several CII conservation workshops. However, Santa Clara Valley Water District is operating its regional CII audit program on behalf of its retail water agencies. While under the terms of the MOU, the district is not directly responsible for implementing a CII audit program, the district has taken it upon itself consolidate agency programs into a single regional effort. According to district staff, retailers in the area are not operating CII audit programs independently of the district’s program. We therefore have also evaluated the program as if the district were the responsible implementing agency. When evaluated as the responsible implementing agency, the district is found to be partially implementing BMP 9.

BMP Schedule: When viewed as the responsible implementing agency, the district is not meeting the MOU schedule for this BMP. BMP 9 is a third year BMP to be implemented by August 31, 1994. The district initiated a pilot CII audit program in 1996. In addition, the districts CII audit program is not on track to satisfy the coverage requirement for institutional audits. Based on an incomplete survey of its member agencies, the district has identified 500 institutional sites in
its service area. To date, the district’s program has offered audits to 5 institutional accounts and completed 2. Accepting the district’s count of institutional accounts as the universe of institutional accounts within its service area, its current rate of audit would still fall well short of the coverage requirement. Given the small number of institutional accounts identified, it conceivably could accelerate audits of institutional accounts to meet the coverage requirements by 2001. However, if the actual number of institutional accounts in the district’s service area greatly exceeds their current estimate, as we suspect, then it becomes much less certain that their current program could be geared to meet the coverage requirement.

Customer Targeting: The district’s CII program is not scaled to directly contact and offer audits to the top 10% of CI accounts. For the pilot program, the district identified the top 10% of commercial and industrial sites within its service area (approx. 400 sites), and then identified those sites using more than 1,300 ccf per month (approx. 89). Of these 89 sites, 38 were targeted for audits. The district is currently reviewing ways to extend the program to include the top 10% of commercial and industrial customers in the region.

Program Description: In addition to the pilot audit program, the district has hosted three Cooling Tower Workshops developed by Black and Veatch. The district co-sponsors the annual Peninsula Conservation Center’s Business Environmental Awards Program. The district has also recently entered into a cost-sharing agreement with the City of San Jose to expand a financial incentives program designed for commercial and industrial water users implementing conservation measures resulting in permanent demand reductions. The district will add $75,000 to the program, increasing the program budget from $200,000 to $275,000.

13.2.6 New Commercial/Industrial Water Use Review (BMP 10)

Evaluation Grade

Negligible Support

BMP Requirements

A program to assure the review of proposed water uses for new commercial and industrial water service and making recommendations for improved water use efficiency before completion of the building permit process. No coverage requirement is specified for this BMP by Exhibit 1.

Evaluation Notes

The district does not currently have a plan for supporting this BMP. The district did make efforts to provide support and assistance to retailers and planning departments in the early 1990s, but encountered limited agency acceptance. As a result, the district has focused its efforts on other BMPs.

13.2.7 Residential Landscape Conservation (BMP 12)

Support Level

Extensive Support

BMP Requirements

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35 We note that this is likely a substantial understatement of institutional accounts within Santa Clara County. According to district staff, the tabulation is based on responses from 6 of 13 agencies and not all of those agencies reported the number of institutional accounts in their service areas.
Requires provision of guidelines, information and incentives for more efficient landscape at new or existing single family homes; and enacting and implementing landscape water conservation ordinances. No coverage requirement is specified for this BMP by Exhibit 1.

**Evaluation Notes**

**BMP Schedule:** The district is implementing this BMP in accordance with the MOU schedule.

**Program Description:** The district provides guidelines and information, including landscape brochures and watering guidelines. The district installs and maintains demonstration gardens at the Santa Clara County Fair and at the South Bay Home & Garden Show. The district has also provided financial and technical support for several demonstration gardens located throughout its service area. The district also operates a nursery plant tag program (see BMP 7). The district developed a model landscape ordinance pursuant to AB 325 and assisted its 13 retail agencies in developing and adopting ordinances based on this model (see BMP 10).

### 13.2.8 Water Waste Prohibition (BMP 13)

**Support Level**

Negligible Support

**BMP Requirements**

Enacting and enforcing measures to prohibit gutter flooding, single pass cooling systems in new connections, nonrecirculating systems in all new conveyor car wash and commercial laundry systems, and nonrecirculating decorative water fountains. Including water softener checks in home water audits and providing customers with information about DIR and exchange-type water softeners in their educational efforts.

**Evaluation Notes**

The district does not currently have a plan for supporting this BMP.

### 13.2.9 Ultra Low Flush Toilet Replacement (BMP 16)

**Evaluation Grade**

As Supporting Agency: Extensive Support

As Implementing Agency: Partially Implementing

**BMP Requirements**

Implementing programs to replace existing high-water-using toilets with ultra-low-flush toilets. Programs to be as effective as offering $100 rebates for toilets, or requiring replacement at time of resale, or replacement at time of change of service. Identifying all non-residential customers and ranking them by water use by December 31, 1995, and retrofitting toilets for at least 1% of their non-residential customers by June 30, 1998. Coverage requirement: per Exhibit 6 of the MOU, agency program must result in water savings equivalent to a retrofit on resale requirement for the service area.

**Evaluation Notes**

SCVWD operates a regional ULFT program for the entire Santa Clara County. While under the terms of the MOU, the agency is not directly responsible for implementing a ULFT program, the agency has taken it upon itself to operate a regional program on behalf of its retail agencies. If the program is viewed as supplemental to retail agency ULFT programs, the support level is quite extensive. However, retailers in the area are not operating ULFT programs independently of the
agency's program, and therefore the district was also evaluated as though it were directly responsible for implementation. Viewed this way, estimated program savings through FY 1996 are 51% of the benchmark retrofit-on-resale savings target over the period of analysis using Exhibit 6 savings assumptions. Thus, when viewed as the primary agency responsible for implementation, the agency is found to be partially implementing BMP 16.

**BMP Schedule:** The agency initiated its replacement program in accordance with the MOU schedule, but is not on track to satisfy the coverage requirements for this BMP by the end of the initial MOU term. Estimated program savings through FY 1996 are 51% of the necessary target water savings through FY 1996 (see below).\(^{36}\)

**Program Description:** Since 1992, the agency has worked with eleven of its retail water agencies to offer rebates of up to $75 to residents within Santa Clara County purchasing ULFTs. To date, the agency has expended, excluding administrative overhead costs, approximately $4.5 million on the program, and has distributed approximately 50,000 toilets through FY 1996.

Recently, the agency has entered into a cost-sharing agreement with the City of San Jose to install 41,250 ULFTs. The agency is expecting to spend $3.2 million on this program over the next year.

The agency provides marketing collateral to its retail agencies for program promotion, and maintains displays in over 80 plumbing outlet, hardware, and home improvement stores in the county. The agency has established a goal of 230,000 ULFT rebates by 2002, which is expected to result in annual water savings of 9,000 acre-feet per year, which, if realized, would exceed the cumulative annual target calculated for this analysis by approximately 2,500 acre-feet.

**Program Results:** Program results are shown in the table below. As of FY 1996, a total of 37,572 single-family and 11,273 multi-family toilet replacements have been attributed to the program.

Program water savings depend on annual water savings per toilet, which, in turn, depend on household density, number of toilets per household, whether the retrofit was partial or complete, and the mix of pre- and post-1980 housing units receiving retrofits. Exhibit 6 provides water savings lookup tables (derived from empirical program evaluations) that take these factors into account, and, for purposes of the MOU, are to be used for calculating water savings attributable to ULFT programs. Based on these tables, the cumulative annual water savings (AF/yr) attributed to the agency's program as of June 30, 1996, is 1,680 AF/yr.

To assess implementation effectiveness, annual program savings were compared to savings that could be attributed to a retrofit-on-resale requirement for the service area. We base this analysis on the methodology presented in Exhibit 6 of the MOU.\(^{37}\) It is important to emphasize that savings targets using this methodology are net of any savings that would occur naturally due to expected toiled depreciation and replacement. In other words, the method fully accounts for natural replacement. It is equally important to note that on the agency side, any toilet replacements directly attributable to the agency's program are counted, including replacements by program participants that would have replaced their toilet regardless of the program (e.g. program free-

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\(^{36}\) This is calculated as the sum of annual cumulative program savings from each year of program operation divided by the sum of annual cumulative water savings targets starting from August 31, 1993. This is the total volume of water saved by the program divided by the total volume of water targeted to be saved.

\(^{37}\) The spreadsheet model used to calculate program savings and targets is included with this report. Prior to finalizing this evaluation, the model was submitted to A & N Technical Services, who authored Exhibit 6, for review and validation. The model was deemed by A & N Technical Services to be consistent with Exhibit 6 requirements.
Evaluation of BMP Implementation for Santa Clara Valley Water District

riders). In this regard, the evaluation favors agencies, since it nets out natural replacement from the targets, but not from meeting the targets.

The results of this evaluation are shown in the proceeding table. A copy of the spreadsheet model and data used to generate this table are included with this report.
### BMP 16. ULFT Retrofits
#### SCVWD Program Results through FY 1996
#### Using Exhibit 6-based Water Savings Estimates

<table>
<thead>
<tr>
<th>Fiscal Year</th>
<th>ULFT Program Toilet Replacements 1/</th>
<th>Cumulative ULFT Program Savings 2/ (AF/Yr)</th>
<th>Exhibit 6-Based Cumulative Target 3/ (AF/Yr)</th>
<th>Difference Between Program &amp; Target Savings (AF/Yr)</th>
<th>Cumulative Balance 4/ (AF)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1991/92</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1992/93</td>
<td>4,089</td>
<td>207</td>
<td>273</td>
<td>(66)</td>
<td>(66)</td>
</tr>
<tr>
<td>1993/94</td>
<td>6,449</td>
<td>334</td>
<td>1,330</td>
<td>(796)</td>
<td>(862)</td>
</tr>
<tr>
<td>1994/95</td>
<td>12,279</td>
<td>1,094</td>
<td>2,252</td>
<td>(1,158)</td>
<td>(2,019)</td>
</tr>
<tr>
<td>1995/96</td>
<td>14,755</td>
<td>1,680</td>
<td>3,052</td>
<td>(1,372)</td>
<td>(3,391)</td>
</tr>
<tr>
<td>1996/97</td>
<td></td>
<td></td>
<td>3,744</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1997/98</td>
<td></td>
<td></td>
<td>4,338</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1998/99</td>
<td></td>
<td></td>
<td>4,844</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1999/00</td>
<td></td>
<td></td>
<td>5,272</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2000/01</td>
<td></td>
<td></td>
<td>5,629</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Chart

- □ Agency Cumulative Annual Savings
- □ Cumulative Annual Targets

**Notes:**
1/ Total number of single- and multi-family toilet replacements credited to the agency's ULFT program.
2/ The estimated cumulative annual water savings (AF/yr) associated with the credited toilet replacements. All savings are credited, including savings that would have occurred do to natural replacement (i.e. program free-ridership). Savings estimates derived from Exhibit 6.
3/ The agency's cumulative annual savings targets (AF/yr) equivalent to a retrofit-on-resale requirement. Target calculated using Exhibit 6 methodology and data on housing resale rates for agency's county. Targets are net of natural replacement; they only include savings directly attributable to a hypothetical retrofit-on-resale requirement.
4/ A running total of the difference between credited program savings and target savings. Negative quantities indicate the agency has not, on balance, met the targets at that point in time. Positive quantities indicate the agency has, on balance, exceeded the targets at that point in time.
14. Evaluation for San Diego County Water Authority

14.1 Evaluation of BMPS Applying to Wholesalers

In general, we found San Diego County Water Authority to be in full compliance with the MOU requirements as they relate to signatory wholesale water suppliers. A summary of the evaluation results are presented in Table 14-1. In addition, SDCWA works closely with its member agencies, providing extensive financial, technical, and programmatic support for BMP implementation.

Table 14-1. Summary of BMP Evaluation Results for San Diego County Water Authority

<table>
<thead>
<tr>
<th>BMP No.</th>
<th>BMP Name</th>
<th>Implementing on Schedule</th>
<th>Implementing Not on Schedule</th>
<th>Partially Implementing</th>
<th>Not Implementing</th>
<th>Exempted</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Dist. System</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Metering</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Public Info.</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>School Education</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Pricing</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Coordinator</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Financial Incentives</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

14.1.1 Distribution System Water Audits (BMP 3)

Evaluation Grade
Implementing on Schedule

BMP Requirements
Distribution system to be inspected at least once every three years, using a methodology similar to that described in an AWWA manual; advising customers where leaks appear to exist on their side of the meter and making cost-effective repairs.

Evaluation Notes
BMP Schedule: SDCWA is implementing this BMP in accordance with the MOU schedule. SDCWA has intensively monitored its system since prior to 1991.

Program Description: The Agency conducts twenty-four hour computer monitoring of all pipe systems, weekly physical inspections, and monthly paper audits. SDCWA was also working with local agencies on this issue, but due to issues of local control, this effort has been suspended.

14.1.2 Metering with Commodity Rates (BMP 4)

Evaluation Grade
Implementing on Schedule

BMP Requirements
Metering all new connections, and billing using rates that include a volume charge; retrofitting all unmetered existing connections and billing using rates that include a volume charge.

Evaluation Notes
BMP Schedule: SDCWA is implementing this BMP in accordance with the MOU schedule. SDCWA has met requirements for this BMP since before the signing of the MOU.

Program Description: SDCWA meters all water deliveries and applies volumetric rates to all water deliveries, as do all of its member agencies. SDCWA has also held workshops for member agencies on conservation rate designs. This was heavily attended by member agency staff. SDCWA also conducts an annual survey of member agency rate structures.

14.1.3 Public Information (BMP 7)

Evaluation Grade
Implementing on Schedule

BMP Requirements

Implement public information programs to educate customers about water use and to promote water conservation. Program could include providing speakers to community groups and media; advertising; using bill inserts; providing water use information on customer bills comparing current and previous year use; working cooperatively with other groups promoting water conservation. No coverage requirement specified by Exhibit 1.

Evaluation Notes

BMP Schedule: SDCWA is implementing this BMP in accordance with the MOU schedule. SDCWA's public information program pre-dates the signing of the MOU.

Program Description: SDCWA uses brochures, bill inserts, table tents, hotel room cards, multilingual advertising, lawn watering guides, demonstration gardens, special events, speakers' bureau, and fair displays. Key programs include: booths at the Del Mar Fair; articles in San Diego Home and Garden Magazine; working with the Xeriscape Council to have booths at home shows in the area; co-sponsoring a demonstration garden and xeriscape training at the San Diego Wild Animal Park. From 1993 through 1996, SDCWA has invested more than $3 million into public information programs for conservation.

14.1.4 School Education (BMP 8)

Evaluation Grade
Implementing on Schedule

BMP Requirements

Implement school education programs within service area. Programs to include provision of educational materials and instruction assistance. No coverage requirement specified by Exhibit 1.

Evaluation Notes

BMP Schedule: SDCWA is implementing this BMP in accordance with the MOU schedule. SDCWA's program pre-dates the signing of the MOU.

Program Description: SDCWA provides classroom presentations for grades 1 through 12. They also sponsor development of educational materials, and provide theater presentations for classes K through 9. Since 1992, SDCWA has invested more than $1 million into its school programs. Funding for this program has increased steadily since 1992.

14.1.5 Conservation Pricing (BMP 11)

Evaluation Grade
Implementing on Schedule

BMP Requirements

Requires eliminating non-conservation pricing and adopting conservation pricing. This is defined as no fixed rate or declining block pricing, and no high fixed costs coupled with low commodity charges. Where the agency also provides sewer services, these rate structures should also apply. No coverage requirement is specified for this BMP by Exhibit 1.

Evaluation Notes

BMP Schedule: Since prior to 1991, SDCWA has had volumetric single-block rates that do not include a high fixed-cost component. SDCWA provided a water rate workshop for member agencies that was heavily attended. SDCWA member agencies also bill under conservation rates.

14.1.6 Water Conservation Coordinator (BMP 14)

Evaluation Grade
Implementing on Schedule

BMP Requirements

Designation of a water conservation coordinator responsible for preparing agency conservation plan, managing its implementation, and evaluating program results. No coverage requirement is specified for this BMP by Exhibit 1.

Evaluation Notes

BMP Schedule: SDCWA is implementing this BMP in accordance with the MOU schedule. SDCWA established the position of conservation coordinator in 1988. The program is staffed with four full-time positions.

Project Description: Conservation Coordinator staff provides technical/programmatic/monetary support to member agencies, and administer some programs county-wide.

14.1.7 Financial Incentives (BMP 15)

Evaluation Grade
Implementing on Schedule

BMP Requirements:

Financial incentives are to be offered to retail agencies to support conservation programs. No coverage requirement is specified for this BMP by Exhibit 1.

Evaluation Notes

BMP Schedule: SDCWA is implementing this BMP in accordance with the MOU schedule.

Program Description: SDCWA has two current financial incentive programs:


2. ULFT program: SDCWA distributes 5,000 to 10,000 toilets per year through a Community-Based Organizations Program.
In addition to these financial incentive programs, SDCWA provides other incentives to its member agencies. These include provision of plumbing retrofit kits and the administration of some programs. SDCWA is currently working on CII program to include financial incentives that will be inaugurated next year.

14.2 Evaluation of BMPs Not Applying Directly to Wholesalers

As discussed in section 2.5, signatory wholesale water suppliers are not obligated under the MOU to implement BMPs 1, 2, 5, 6, 9, 10, 12, 13, and 16. Most signatory wholesale water suppliers, however, provide some level of implementation support to their retail agency customers for these BMPs. This section presents the evaluation results for San Diego County Water Authority for these BMPs.

Table 14-2 summarizes the level of support provided to its retail agencies by SDCWA for BMPs 1, 2, 5, 6, 9, 10, 12, 13, and 16. The subsections that follow provide the summary descriptions of district activities supporting this classification.

Table 14-3 summarizes implementation of the three BMPs SDCWA is implementing on a regional basis on behalf of its retail agencies. These BMPs -- 5, 9, and 16 -- were evaluated as though the district is directly responsible for their implementation because the district is operating the programs regionally, and the district's retail agencies are not operating independent programs. It is important to emphasize, however, that under the MOU, the district is not actually responsible for the implementation of these BMPs, and that it is incumbent upon the district's signatory retail agencies to determine if the district's regional programs are satisfying their individual obligations under the MOU.

### Table 14-2. San Diego County Water Authority Summary of Support Levels for BMPs Not Applying Directly to Signatory Wholesale Water Suppliers

<table>
<thead>
<tr>
<th>BMP No.</th>
<th>BMP Name</th>
<th>Extensive Support</th>
<th>Standard Support</th>
<th>Moderate Support</th>
<th>Negligible Support</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Res. Audits</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Plumbing Retro.</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Landscape Audits</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Landscape Req.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>CII Conservation</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>CI Use Review</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Landscape SP Res.</td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>13</td>
<td>Water Waste Prob.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>ULFT Replacement</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Table 14-3. Summary of BMP Evaluation Results for BMPs Being Implemented Regionally by San Diego County Water Authority

<table>
<thead>
<tr>
<th>BMP No.</th>
<th>BMP Name</th>
<th>Implementing on Schedule</th>
<th>Implementing Not on Schedule</th>
<th>Partially Implementing</th>
<th>Not Implementing</th>
<th>Exempted</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>Landscape Audits</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>CII Conservation</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>ULFT Replacement</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
14.2.1 Residential Water Audits (BMP 1)

Support Level

Extensive Support

BMP Requirements

Identification of top 20 percent of water users; directly contact and offer audits to target customers; offer audits on a repeating cycle; provide customer incentives to implement measures. Programs to be underway by August 31, 1994. Coverage requirement: 70% of target customers to receive an audit by end of initial MOU term.

Evaluation Notes

SDCWA assists member agencies with residential audit programs, and operates the programs for its smallest agencies. Member agencies have provided SDCWA with lists of consumers ranked by use. SDCWA determined cutoff point at 30 percent, and then identified the lowest monthly use included for any one agency. Then all consumers using water at levels above this amount were offered audits. This was felt necessary because selecting top 30 percent of county consumers would leave some agencies with no program. SDCWA provides a number of incentives including hose-end timers, buckets, coupons and catch cans. County is undertaking multifamily program for small agencies. Carlsbad, Santa Fe, Escondido are doing their own single family programs. The City of San Diego is administering its own program.

The audit includes an irrigation review, leak identification, faucet aerators, low flow showerheads, information and news about other conservation programs. Member agency compliance is variable. In some cases member agencies do not have sufficient staff or budget. Over time, the database of identified customers becomes outdated and less useful. This program is very popular with member agencies as a reactive program (i.e., responding to high bill complaints, etc), but is not really successfully implemented in a proactive way.

14.2.2 Plumbing, New and Retrofit (BMP 2)

Evaluation Grade

Extensive Support

BMP Requirements

Identification of pre-1980 single- and multi-family homes; deliver retrofit kits, including low-flow showerheads, and toilet displacement devices to unretrofitted homes; offer to install the devices; follow-up with customers at least three times. Program underway by August 31, 1993. Coverage requirement: 75% of pre-1980 single-family accounts and 80% of pre-1980 multi-family accounts to be retrofitted with low-flow devices (other than ULFTs) by end of initial term.

Evaluation Notes

SDCWA sponsored a waterwise plumbing seminar for local plumbers, and made presentations informing professionals of new legislative requirements. SDCWA estimates that 600,000 water conservation kits with low-flow fixtures have been distributed in its service territory.

Audit records indicate a coverage of 60-80 percent has been achieved to date for the county, indicating the region is on track to meet the coverage requirement of this BMP.

14.2.3 Large Landscape Audits (BMP 5)

Evaluation Grade

As Supporting Agency: Extensive Support
Evaluation of BMP Implementation for San Diego County Water Authority

As Implementing Agency: Implementing on Schedule

BMP Requirements

Agencies are required to identify customers with at least 3 acres of landscaping, contacting them by mail; offering audits; offering incentives to effect customer implementation; providing follow-up audits at least once every five years; providing multilingual training and information. Coverage requirement: audits offered to 100% of landscape sites 3 acres or more by end of initial MOU term.

Evaluation Notes

San Diego County Water Authority operates a regional large landscape audit program on behalf of its retail water agencies. While under the terms of the MOU, SDCWA is not directly responsible for implementing a large landscape audit program, the district has taken it upon itself to consolidate agency programs into a single regional effort. If we evaluate the district’s program as supplemental to retail agency landscape audit programs, the support level is extensive. However, most retailers in the area are not operating landscape programs independently of the district’s program. We therefore have also evaluated the program as if the district were the responsible implementing agency. When evaluated as the responsible implementing agency, the district is found to be partially implementing BMP 5.

BMP Schedule: SDCWA initiated this BMP in accordance with the MOU schedule, starting a large-landscape program prior to 1991. It is not possible, however, to determine if SDCWA is completing audits at a rate sufficient to meet the BMP’s coverage requirement because it has not been able to identify the number of landscape sites over three acres in the county. Through 1996, SDCWA has completed 925 audits of large landscapes, averaging about 160 audits per year.

<table>
<thead>
<tr>
<th>Report Year</th>
<th>Surveys Offered</th>
<th>Surveys Completed</th>
<th>Cumulative Surveys Completed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prior to 92</td>
<td>No Record</td>
<td>287</td>
<td>287</td>
</tr>
<tr>
<td>92/93</td>
<td>2+ acre sites</td>
<td>155</td>
<td>442</td>
</tr>
<tr>
<td>93/94</td>
<td>2+ acre sites</td>
<td>178</td>
<td>620</td>
</tr>
<tr>
<td>94/95</td>
<td>2+ acre sites</td>
<td>176</td>
<td>796</td>
</tr>
<tr>
<td>95/96</td>
<td>2+ acre sites</td>
<td>129</td>
<td>925</td>
</tr>
</tbody>
</table>

Estimated number of 3+ acre landscapes in service area: unknown
Source: CUWCC Retail Annual Reports

Customer Targeting: The landscape program targets landscape sites over 2 acres for audits. SDCWA has made several attempts to determine the universe of these sites without success. It has worked with county assessors’ files, but this has proved too expensive. It is also considering identifying large turf areas through aerial surveys. It currently relies on its member agencies to identify sites in their service areas with high potential savings.

Program Description: Audits include a water-use analysis, in-depth irrigation system evaluations, scheduling information, and recommendations for irrigation system improvements. SDCWA provides multilingual training and information through its Protector del Agua program.

Since 1994, spending on large landscape audits has been declining. This is partially due to changes in budget approval cycles.
14.2.4 Landscape Water Conservation Requirement (BMP 6)

Evaluation Grade

Standard Support

BMP Requirements

Enacting and implementing landscape water conservation ordinances, or cooperating with government/industry to develop and implement ordinances. Ordinances must be at least as effective as the Model Ordinance. Coverage requirement: 100% of new landscapes subject to ordinances by end of initial MOU term.

Evaluation Notes

Over half of the service territory is covered by the city or the county. Both have stringent ordinances that predate AB325 and are enforced. As of 1993, 12 of SDCWA's member agencies had adopted or were considering adopting ordinances. SDCWA sponsored a series of workshops for the county, cities, green industry and local water agencies, designed to facilitate the implementation of the Water Conservation Landscaping Act in SDCWA's service area. At that time, only two regulatory agencies did not have ordinances.

Additionally, Authority staff served on advisory committees to jurisdictions drafting landscape ordinances. Not all agencies have ordinances, but those that do not have different approaches with similar goals.

14.2.5 CII Water Conservation (BMP 9)

Evaluation Grade

As Supporting Agency: Extensive Support

As Implementing Agency: Implementing on Schedule

BMP Requirements

Identification of top 10% of commercial customers, top 10% of industrial customers, and top 20% of institutional customers. Directly contacting target customers and offering water audit. Providing incentives to encourage customer implementation of recommended measures. Offering follow-up audits at least once every five years if necessary. No coverage requirement specified by Exhibit 1 for commercial and industrial customers; coverage requirement for institutional accounts: 70% of top 20% of pre-1980 institutional accounts.

Evaluation Notes

BMP Schedule: SDCWA is implementing this BMP in accordance with the MOU schedule. The program was initiated in 1994 and is being implemented at a level consistent with the coverage requirement for this BMP.

Customer Targeting: SDCWA identified the top 10% of commercial and industrial accounts and offered audits. Only 12 audits were completed in the first year of the program. In 1995/96 the number of audits increased to 233. For institutional accounts, the program focuses on retrofitting plumbing fixtures, since this accounts for the majority of potential water savings for these accounts. In addition, institutional accounts within City of San Diego are being targeted by the city for irrigation system retrofits.

Program Description: In response to MWD funding specifications, the program is changing to put more emphasis on device retrofits. The audited customers are to have a "follow up" contact, to ascertain implementation and to offer incentives where this has not occurred. The incentives will
be based on a "menu" approach; customers will be offered a fixed amount for specific retrofits (e.g. ULFTs, urinals, cooling towers.) After this follow-up stage, SDCWA will probably branch out to others. They expect to present the program to professional groups such as Hotel Managers' Association, to gain maximum publicity for the program.

For public institutions, SDCWA's program has begun by targeting ULFTs. They have employed a full-time plumber that replaces toilets in governmental offices with ULFTs provided by MWD and SDCWA. This is being broadened to include schools. In 1992, 8,500 low-flow showerheads were provided to public agencies.

14.2.6 New Commercial/Industrial Water Use Review (BMP 10)

Evaluation Grade
Standard Support

BMP Requirements
A program to assure the review of proposed water uses for new commercial and industrial water service and making recommendations for improved water use efficiency before completion of the building permit process. No coverage requirement is specified for this BMP by Exhibit 1.

Evaluation Notes
In 1993/1994, SDCWA budgeted $10,000 to develop a new use review model program. They have also worked with regional energy utilities to develop a combined review program, but with the restructuring of electricity markets, energy utilities have lost interest. SDCWA has found implementation of this BMP to have a number of practical limitations. First, by the time the permit process is begun, the firms have plans drawn and are not prepared to revise. Second, very few projects can be identified before the permitting phase, as corporations keep their plans confidential. An alternative approach that SDCWA has considered is developing building codes that specify efficient water use before permits can be granted. However, the potential range of process water uses that would need to be specified likely make this approach impracticable.

14.2.7 Residential Landscape Conservation (BMP 12)

Support Level
Extensive Support

BMP Requirements
Requires provision of guidelines, information and incentives for more efficient landscape at new or existing single family homes; and enacting and implementing landscape water conservation ordinances. No coverage requirement is specified for this BMP by Exhibit 1.

Evaluation Notes
SDCWA has conducted a series of Xeriscape workshops, and developed brochures and demonstration gardens, awards, garden or home shows, and garden contests. It also sponsored residential xeriscape education classes at the San Diego Zoo and Animal Park. In 1993/1994, SDCWA spent $24,000 on residential landscape classes and xeriscape garden at the Animal Park. This included Spanish classes, but few signed up for these. It was noted that Spanish speakers attended the English classes, with family members translating. While this program was successful, it fell prey to budget constraints. Classes are best held over summer (July August September), and to achieve this, Zoo staff must work in April May & June to plan and publicize. However, the program must be approved by the County Board each July, so the Zoo was left with a great deal of uncertainty. This could not be overcome and the program was discontinued.
14.2.8 Water Waste Prohibition (BMP 13)

Support Level
Moderate Support

BMP Requirements

Enacting and enforcing measures to prohibit gutter flooding, single pass cooling systems in new connections, nonrecirculating systems in all new conveyor car wash and commercial laundry systems, and nonrecirculating decorative water fountains. Including water softener checks in home water audits and providing customers with information about DIR and exchange-type water softeners in their educational efforts.

Evaluation Notes

SDCWA assisted member agencies by developing a set of water guidelines to assist member agencies in the development of water waste ordinances. The guidelines suggest prohibiting the following uses: gutter flooding; automatic water softeners; nonrecirculating car washes; customer plumbing leaks; midday irrigation; hosing of hard surfaces; water served in restaurants; temporary ban on all outside irrigation; no refilling of pools, spas, fountains.

14.2.9 Ultra Low Flush Toilet Replacement (BMP 16)

Evaluation Grade
As Supporting Agency: Extensive Support
As Implementing Agency: Implementing on Schedule

BMP Requirements

Implementing programs to replace existing high-water-using toilets with ultra-low-flush toilets. Programs to be as effective as offering $100 rebates for toilets, or requiring replacement at time of resale, or replacement at time of change of service. Identifying all non-residential customers and ranking them by water use by December 31, 1995, and retrofitting toilets for at least 1% of their non-residential customers by June 30, 1998. Coverage requirement: per Exhibit 6 of the MOU, agency program must result in water savings equivalent to a retrofit on resale requirement for the service area.

Evaluation Notes

SDCWA operates a regional ULFT program for its small retail agencies (City of San Diego operates its own program). While under the terms of the MOU, the agency is not directly responsible for implementing a ULFT program, the agency has taken it upon itself to operate a regional program on behalf of its retail agencies. If the program is viewed as supplemental to retail agency ULFT programs, the support level is quite extensive. However, most retailers in the area are not operating ULFT programs independently of the agency’s program, and it therefore the district was also evaluated as though it were directly responsible for implementation. Viewed this way, estimated program savings through FY 1996 are 227% of the benchmark retrofit-on-resale savings target over the period of analysis using Exhibit 6 savings assumptions. Thus, when viewed as the primary agency responsible for implementation, the agency is found to be implementing on schedule BMP 16.

BMP Schedule: SDCWA initiated implementation of this BMP in accordance with the MOU schedule and is on track to satisfy the coverage requirements.
Program Description: In addition to MWD co-funding, SDCWA expends approximately $1 million annually on toilet replacements. Program funding will be reviewed in 2002, but until then is expected to remain stable. SDCWA provides a $75 per toilet rebate.

Program Results: Program results are shown in the table below. As of FY 1996, a total of 107,192 single-family and 105,804 multi-family toilet replacements have been attributed to regional programs.

Program water savings depend on annual water savings per toilet, which, in turn, depend on household density, number of toilets per household, whether the retrofit was partial or complete, and the mix of pre- and post-1980 housing units receiving retrofits. Exhibit 6 provides water savings lookup tables (derived from empirical program evaluations) that take these factors into account, and, for purposes of the MOU, are to be used for calculating water savings attributable to ULFT programs. Based on these tables, the cumulative annual water savings (AF/yr) attributed to the agency’s program as of June 30, 1996, is 8,602 AF/yr.

To assess implementation effectiveness, annual program savings were compared to savings that could be attributed to a retrofit-on-resale requirement for the service area. We base this analysis on the methodology presented in Exhibit 6 of the MOU.

The spreadsheet model used to calculate program savings and targets is included with this report. Prior to finalizing this evaluation, the model was submitted to A & N Technical Services, who authored Exhibit 6, for review and validation. The model was deemed by A & N Technical Services to be consistent with Exhibit 6 requirements.
### Evaluation of BMP Implementation for San Diego County Water Authority

**BMP 16: ULFT Retrofits**

Program Results through FY 1996

Using Exhibit 6-based Water Savings Estimates

<table>
<thead>
<tr>
<th>Fiscal Year</th>
<th>ULFT Program</th>
<th>Cumulative ULFT Program</th>
<th>Exhibit 6-Based Cumulative Target &amp; Target Savings</th>
<th>Cumulative Balance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Toilet Replacements</td>
<td></td>
<td>Between Program &amp; Target Savings (AF/Yr)</td>
<td>(AF)</td>
</tr>
<tr>
<td></td>
<td>Single-Family (no. of toilets)</td>
<td>Multi-Family (no. of toilets)</td>
<td>Savings 2/ (AF/Yr)</td>
<td>3/ (AF/Yr)</td>
</tr>
<tr>
<td>1991/92</td>
<td>25,789</td>
<td>17,309</td>
<td>1,676</td>
<td>0</td>
</tr>
<tr>
<td>1992/93</td>
<td>25,109</td>
<td>17,648</td>
<td>3,346</td>
<td>458</td>
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<tr>
<td>1993/94</td>
<td>32,182</td>
<td>23,549</td>
<td>5,531</td>
<td>2,226</td>
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<td>1994/95</td>
<td>16,922</td>
<td>18,347</td>
<td>6,969</td>
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<td>1995/96</td>
<td>7,190</td>
<td>28,951</td>
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<td>1999/00</td>
<td>8,587</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>2000/01</td>
<td>9,133</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Notes:

1/ Total number of single- and multi-family toilet replacements credited to the agency's ULFT program.
2/ The estimated cumulative annual water savings (AF/yr) associated with the credited toilet replacements. All savings are credited, including savings that would have occurred do to natural replacement (i.e. program free-ridership). Savings estimates derived from Exhibit 6.
3/ The agency’s cumulative annual savings targets (af/yr) equivalent to a retrofit-on-resale requirement. Target calculated using Exhibit 6 methodology and data on housing resale rates for agency’s county. **Targets are net of natural replacement;** they only include savings directly attributable to a hypothetical retrofit-on-resale requirement.
4/ A running total of the difference between credited program savings and target savings. Negative quantities indicate the agency has not, on balance, met the targets at that point in time. Positive quantities indicate the agency has, on balance, exceeded the targets at that point in time.
15. Evaluation of San Francisco Public Utilities Commission

Overall, SFPUC was found to be mostly in compliance with the MOU as a signatory retail water supplier, but only partially in compliance as a signatory wholesale water supplier. Partial compliance as a signatory wholesale water supplier is mostly attributable to a master water supply agreement that governs the relationship between SFPUC and its retail agencies. This relationship is in transition, however, and SFPUC will likely assume a more active role in regional conservation program assistance in coming years.

15.1 Evaluation of BMP Implementation within Retail Service Area

With the exceptions of BMPs 1, 10, and 16, SFPUC is in compliance with the MOU as it relates to signatory retail water suppliers. We note that SFPUC is currently exploring ways to increase residential audit rates to be in full compliance with BMP 1. It has also begun to accelerate its ULFT replacement program, and is exploring legislation requiring toilet replacement on resale for residential and commercial buildings.

A summary of the evaluation results for San Francisco Water Department as a signatory retail water supplier is presented in Table 15-1. Evaluation summaries and notes for each BMP are presented in the subsections that follow.

Table 15-1. Summary of BMP Evaluation Results for San Francisco Water Department

<table>
<thead>
<tr>
<th>BMP No.</th>
<th>BMP Name</th>
<th>Implementing on Schedule</th>
<th>Implementing Not on Schedule</th>
<th>Partially Implementing</th>
<th>Not Implementing</th>
<th>Exempted</th>
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</thead>
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<tr>
<td>1</td>
<td>Res. Audits</td>
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<td>X</td>
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<tr>
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<td>Plumbing Retro.</td>
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<td>3</td>
<td>Dist. System</td>
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<tr>
<td>4</td>
<td>Metering</td>
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<td></td>
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</tr>
<tr>
<td>5</td>
<td>Large Landscape</td>
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<td>7</td>
<td>Public Info.</td>
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<td>8</td>
<td>School Education</td>
<td>X</td>
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<td>9</td>
<td>CII Conservation</td>
<td>X</td>
<td></td>
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<tr>
<td>10</td>
<td>CII Use Review</td>
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<tr>
<td>11</td>
<td>Pricing</td>
<td>X</td>
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<tr>
<td>12</td>
<td>Res. Landscape</td>
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<td>13</td>
<td>Water Waste</td>
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<tr>
<td>15</td>
<td>Financial Incentives</td>
<td>X</td>
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<tr>
<td>16</td>
<td>ULFT Replacement</td>
<td></td>
<td>X</td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

15.1.1 Residential Water Audits (BMP 1)

Evaluation Grade

Partially Implementing

BMP Requirements
Identification of top 20 percent of water users; directly contact and offer audits to target customers; offer audits on a repeating cycle; provide customer incentives to implement measures. Programs to be underway by August 31, 1994. Coverage requirement: 70% of target customers to receive an audit by end of initial MOU term.

Evaluation Notes

BMP Schedule: San Francisco Water Department initiated implementation of this BMP in accordance with the MOU schedule. Agency identified and initiated contacting top 20% of residential accounts during 1994, per the MOU. However, the agency is not on track to meet the coverage requirement for this BMP by the end of the initial MOU term. To meet the coverage requirement, the agency would need to complete audits for 14,980 single-family residences and 31,856 multi-family units by August 31, 2001. As of June 30, 1996 the agency had audited 1,140 single-family residences and 12,523 multi-family residences. Agency annual reports show that the most audits completed in a single year was 518 for single-family residences and 4,735 for multi-family audits. Assuming this implementation rate could be sustained through 2001, the agency would audit an additional 2,590 single-family residences and 23,675 multi-family units. Under this assumption the agency would satisfy the coverage requirement for multi-family units, but would fall short of the coverage requirement for single-family residences by 11,250 audits. If the agency were to double the rate of auditing single-family residences from 500 to 1000, it would still fall short of the coverage requirement by almost 9,000 audits. To meet the coverage requirement, we calculate that the agency would have to increase its audit rate for single-family residences to roughly 2,800 per year.

Customer Targeting: San Francisco Water Department is targeting customers in accordance with the BMP. The department directly contacts top 20% of single-family and multi-family accounts by letter. The letter offers a free water audit, explains the audit process, explains the benefits of an audit, and provides information on how to schedule an audit. Customers are informed that they may request follow-up audits. The department has scheduled follow-up dates for recontacting target customers with letters offering free audits.

Program Description: The department’s audit process is in accordance with the BMP. A trained auditor spends approximately one hour at customer’s home. Auditor checks for leaks in toilets and faucets, measures shower flow and installs a low-flow showerhead if necessary, and provides faucet aerators if needed. Landscape water use is evaluated for customers with landscaping. Irrigation systems are analyzed for leaks and proper landscape watering is reviewed. Irrigation timer programming is reviewed. A copy of audit results are left with the customer and forwarded to Conservation office. The conservation office maintains records of audits completed and services performed.

Customer Incentives: Agency provides customer incentives in accordance with the BMP. Agency offers lower water rates to customers with affidavits that their homes have been retrofitted for conservation. Homes receiving audits that have all required retrofit items in place but have not filed an affidavit are given the lower rate following the inspection. Agency offers toilet rebates to customers with toilet leaks or other toilet performance problems. Agency offers to install devices upon customer request.

Program Results: The agency evaluated the effectiveness of its multi-family audit program in 1996.39 The evaluation found that water use for the first six months of 1996

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for multi-family accounts using 25 ccf or less receiving an audit fell by 6%-24% relative to their use over the same time period in 1994 and 1995. By comparison, for the total population of multi-family accounts using 25 ccf or less the evaluation found use fell by 3% in the first six months of 1996 as compared to the same time period in 1994 and 1995.

15.1.2 Plumbing, New and Retrofit (BMP 2)

Evaluation Grade
Implementing on Schedule

BMP Requirements

Identification of pre-1980 single- and multi-family homes; deliver retrofit kits, including low-flow showerheads, and toilet displacement devices to unretrofitted homes; offer to install the devices; follow-up with customers at least three times. Program underway by August 31, 1993. Coverage requirement: 75% of pre-1980 single-family accounts and 80% of pre-1980 multi-family accounts to be retrofitted with low-flow devices (other than ULFTs) by end of initial term.

Evaluation Notes

BMP Schedule: Agency is implementing this BMP in accordance with its schedule. The City and County of San Francisco passed ordinances 185-91, 346-91, and 359-91 in 1991 requiring retrofit on resale or within three years, whichever occurs first, of all single-family, multi-family, and commercial buildings within the City and County of San Francisco. The agency estimates based on home audits and returned conservation affidavits that 89% of its accounts have retrofitted their plumbing fixtures.

Customer Targeting: Agency customer targeting is in accordance with this BMP. All commercial and residential accounts are subject to the retrofit ordinances, which by definition includes all pre-1980 homes. The Conservation Section notified all accounts about the requirements in December 1991. Reminders were sent to multifamily buildings in February 1994, again in May 1994, and again in November 1994. Reminders were sent to single-family accounts in October 1993, and again in January 1994. Advertisements were placed in local and regional newspapers to inform customers of ordinance requirements. Unretrofitted customers receive a bill message showing the extra amount they are paying by not retrofitting their plumbing fixtures.

Program Description: Residential and commercial accounts required by law to retrofit plumbing fixtures. Buildings sold in San Francisco have to be inspected by an inspector registered with the Bureau of Building Inspection. Those who have not sold their property within three years of the ordinances’ passage are required to file conservation affidavits certifying that they have retrofitted plumbing fixtures. Customers with retrofitted plumbing fixtures receive a 33% discount on their water rate.

Program Results: Based on home audits and returned conservation affidavits, the agency estimates that 89% of its accounts have retrofitted their plumbing fixtures.

15.1.3 Distribution System Water Audits (BMP 3)

Evaluation Grade

Note: It is beyond the scope of this study to evaluate the accuracy of study results cited herein. The citation is made to note that the agency has made a good faith effort to evaluate the effectiveness of its BMP implementation program.
Implementing on Schedule

**BMP Requirements**

Distribution system to be inspected at least once every three years, using a methodology similar to that described in an AWWA manual; advising customers where leaks appear to exist on their side of the meter and making cost-effective repairs.

**Evaluation Notes**

**BMP Schedule:** San Francisco Water Department is implementing this BMP in accordance with the MOU schedule. The department implemented a formal leak detection program beginning in the mid-1980s. The agency surveys approximately 1/3 of its main and lateral lines each year.

**Program Description:** The department’s audit procedure follows the methodology presented in the American Water Works Association’s “Manual of Water Supply Practices, Water Audits and Leak Detection.” The department uses its meter reading system to identify and flag potential leaks on the customer’s side of the meter.

**Program Results:** Total water losses reported by agency range from 6% to 8% of agency water supply, which is within industry standards for a well-operated system.

15.1.4 Metering with Commodity Rates (BMP 4)

**Evaluation Grade**

Implementing on Schedule

**BMP Requirements**

Metering all new connections, and billing using rates that include a volume charge; retrofitting all unmetered existing connections and billing using rates that include a volume charge.

**Evaluation Notes:**

**BMP Schedule:** San Francisco Water Department is implementing this BMP in accordance with its schedule. The department has been metering all retail M&I potable water supply connections since 1916. Agency bills all retail M&I connections by volume of use since prior to 1993.

**Program Description:** Agency meters and bills by volume of use all retail M&I potable water supply connections.

15.1.5 Large Landscape Audits (BMP 5)

**Evaluation Grade**

Implementing on Schedule

**BMP Requirements**

Agencies are required to identify customers with at least 3 acres of landscaping, contacting them by mail; offering audits; offering incentives to effect customer implementation; providing follow-up audits at least once every five years; providing multilingual training and information. Coverage requirement: audits offered to 100% of landscape sites 3 acres or more by end of initial MOU term.

**Evaluation Notes**
Evaluation of BMP Implementation for San Francisco Public Utilities Commission

BMP Schedule: Agency initiated implementation of this BMP in accordance with the MOU schedule. Agency initiated a large landscape water audit program prior to August 31, 1994, and has operated it continuously since program inception. The agency estimates that it has audited all landscape customers with 3 acres or more at least once.

Customer Targeting: Agency has identified the number of large landscapes of 3+ acres in its service area, directly contacted them, and offered audits. Agency has followed-up with each large landscape customer at least once.

Program Description: Audits consist of a walk-through inspection of the site, irrigation system tests, and identification of water saving measures. Customers are provided with a report presenting findings following the audit.

The agency also has provided two English-only landscape irrigation workshops -- "Auditing Your Landscape" and "Irrigation System Trouble-Shooting" -- for caretakers of large landscapes within its service area. The agency determined there was no need for multilingual training based on the target audience. (It was able to do this because of the small number of large landscapes in the service area and knowledge of the groundskeeping staff that maintain them.) In addition, the agency has developed and distributed a variety of landscape conservation reading material.

Customer Incentives: The agency offered a cash grant of $40,000 to the San Francisco Parks and Recreation Department in FY 94-95 to upgrade its irrigation equipment. This was a one-time offer, and financial incentives have not been continued as part of the department's large landscape audit program.

Program Results: The table below summarizes the number of large landscape audits offered and completed by the agency through June 30, 1996.

<table>
<thead>
<tr>
<th>Report Year</th>
<th>Surveys Offered</th>
<th>Surveys Completed</th>
<th>Cumulative Surveys Completed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prior to 92</td>
<td>No Record</td>
<td>118</td>
<td>118</td>
</tr>
<tr>
<td>92/93</td>
<td>33</td>
<td>16</td>
<td>134</td>
</tr>
<tr>
<td>93/94</td>
<td>88</td>
<td>5</td>
<td>139</td>
</tr>
<tr>
<td>94/95</td>
<td>95</td>
<td>12</td>
<td>151</td>
</tr>
<tr>
<td>95/96</td>
<td>21</td>
<td>21</td>
<td>172</td>
</tr>
</tbody>
</table>

Number of 3+ acre landscapes in service area: 83
Source: CUWCC Retail Annual Reports

15.1.6 Landscape Water Conservation Requirement (BMP 6)

Evaluation Grade
Implementing on Schedule

BMP Requirements
Enacting and implementing landscape water conservation ordinances, or cooperating with government/industry to develop and implement ordinances. Ordinances must be at
least as effective as the Model Ordinance. Coverage requirement: 100% of new landscapes subject to ordinances by end of initial MOU term.

Evaluation Notes

BMP Schedule: San Francisco Water Department is implementing this BMP in accordance with the MOU schedule. The City and County of San Francisco passed Ordinance No. 92-91 -- Water Use for Landscaping in New Developments -- in 1992.

Program Description: The ordinance is based on the prescriptive approach described by the state’s model landscape ordinance, and applies to all retail customers requesting an irrigation meter, and all new commercial buildings being built within the City and County of San Francisco. The agency enforces the ordinance by denying irrigation meter installations unless ordinance requirements are satisfied.

15.1.7 Public Information (BMP 7)

Evaluation Grade
Implementing on Schedule

BMP Requirements
Implement public information programs to educate customers about water use and to promote water conservation. Program could include providing speakers to community groups and media; advertising; using bill inserts; providing water use information on customer bills comparing current and previous year use; working cooperatively with other groups promoting water conservation. No coverage requirement specified by Exhibit 1.

Evaluation Notes

BMP Schedule: San Francisco Water Department is implementing this BMP in accordance with its schedule. Agency has maintained an active public information program promoting water conservation since the mid-1980s.

Program Description: The department’s public information program includes paid advertising, public information announcements, direct mailings, bill inserts, water conservation brochures, irrigation guides, conservation workshops, speakers bureau, and booths at public events. The department actively promotes all of its water conservation programs.

15.1.8 School Education (BMP 8)

Evaluation Grade
Implementing on Schedule

BMP Requirements
Implement school education programs within service area. Programs to include provision of educational materials and instruction assistance. No coverage requirement specified by Exhibit 1.

Evaluation Notes

BMP Schedule: San Francisco Water Department is implementing this BMP in accordance with the MOU schedule. The department has maintained an active school education program promoting water conservation since 1992.
Program Description: The department’s school education program includes participating in school assemblies promoting water conservation; orchestrating contests promoting water conservation; distribution of educational materials, including books, maps, videos, and posters; tours, and water awareness month activities; teacher training and grants. The program targets grades K-8.

15.1.9 CII Water Conservation (BMP 9)

Evaluation Grade

Implementing on Schedule

BMP Requirements

Identification of top 10% of commercial customers, top 10% of industrial customers, and top 20% of institutional customers. Directly contacting target customers and offering water audit. Providing incentives to encourage customer implementation of recommended measures. Offering follow-up audits at least once every five years if necessary. No coverage requirement specified by Exhibit 1 for commercial and industrial customers; coverage requirement for institutional accounts: 70% of top 20% of pre-1980 institutional accounts.

Evaluation Notes

BMP Schedule: San Francisco Water Department is implementing this BMP in accordance with its schedule. The department has operated a CII water audit program continuously since 1993. Department records indicate that it is on track to meet the coverage requirement for this BMP.

Customer Targeting: The department identified top 10% of commercial accounts and top 10% of industrial accounts in December 1993, and directly contacted them by letter from December 1993 through May 1994. Municipal accounts were offered audits in reference to the city retrofit ordinances. The department monitors municipal usage and flags high usage.

Program Description: Qualified department staff are sent to sites requesting audits. For each audit, the inspector is required to complete a work order and a conservation audit worksheet on the account. A report of the audit is sent to the customer, and filed with the Conservation Branch. Customers are offered follow-up audits. During these audits, the inspector checks which measures from the previous audit were implemented.

Customer Incentives: High sewer rates ($5.20 or more per ccf) are the primary customer incentive the agency relies on to reduce water waste. The agency also offers a lower water rate to customers that install plumbing retrofit devices required by Ordinance 359-91.

Program Results: The number of audits completed through June 30, 1996 are shown in the table below. Exhibit 1 does not provide coverage requirements for commercial and industrial accounts. The coverage requirement for institutional accounts is 70% of the top 20%. Department records indicate that it is on track to meet the coverage requirement for this BMP.

The department evaluated the effectiveness of its CII audit program in 1995.40 The department found that water use for the first six months of 1995 for commercial accounts

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receiving an audit fell on average by 10% for accounts that passed their audit and by 7% for accounts that failed their audit relative to their use over the same time period in 1994. By comparison, the department found that use by all commercial accounts increased by 1% in the first six months of 1995 as compared to the same time period in 1994.

<table>
<thead>
<tr>
<th>Report Year</th>
<th>Commercial</th>
<th>Industrial</th>
<th>Institutional</th>
<th>Surveys Completed</th>
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</tr>
<tr>
<td>95/96</td>
<td>0</td>
<td>0</td>
<td>60</td>
<td>101</td>
</tr>
</tbody>
</table>

Number of Accounts in Service Area: 20,000+ 138 959

Source: CUWCC Retail Annual Reports

15.1.10 New Commercial/Industrial Water Use Review (BMP 10)

Evaluation Grade

Partially Implementing

BMP Requirements

A program to assure the review of proposed water uses for new commercial and industrial water service and making recommendations for improved water use efficiency before completion of the building permit process. No coverage requirement is specified for this BMP by Exhibit 1.

Evaluation Notes

BMP Schedule: Agency is implementing this BMP in accordance with its schedule. Agency established a review program with the Department of Building Inspection in 1991.

Program Description: New and renovated commercial buildings are required to show that they have installed ULFTs, 2.5 gpm or less showerheads, and multi-pass cooling systems when they are inspected by the Department of Building Inspection for their certificate of occupancy. The same requirement apply to new and renovated industrial buildings. The program does not review commercial or industrial process water uses or configurations, other than the basic plumbing fixtures just discussed, and therefore is not considered to be at least as effective as a program designed to review all proposed water uses for new commercial and industrial water service. None the less, the department’s requirements go beyond those of most water agencies.

15.1.11 Conservation Pricing (BMP 11)

Evaluation Grade

Note: It is beyond the scope of this study to evaluate the accuracy of study results cited herein. The citation is made to note that the agency has made a good faith effort to evaluate the effectiveness of its BMP implementation program.
Implementing on Schedule

**BMP Requirements**

Requires eliminating non-conservation pricing and adopting conservation pricing. This is defined as no fixed rate or declining block pricing, and no high fixed costs coupled with low commodity charges. Where the agency also provides sewer services, these rate structures should also apply. No coverage requirement is specified for this BMP by Exhibit 1.

**Evaluation Notes**

**BMP Schedule:** San Francisco Water Department is implementing this BMP in accordance with the MOU schedule. The department has billed water consumption using a combination of service charges and volumetric charges based on metered use since 1916. Sewer service is also billed by volume of use.

**Program Description:** Agency uses a uniform volume-based rate. Customers with filed affidavits affirming that they have retrofitted plumbing fixtures in accordance with Ordinances 185-91, 346-91, and 359-91 pay a reduced rate. The rate structure does not result in a disproportionate share of the bill being collected through the service charge. Therefore, the rate structure is in conformance with the BMP's definition of a conservation rate structure.

**15.1.12 Residential Landscape Conservation (BMP 12)**

**Evaluation Grade**

Implementing on Schedule

**BMP Requirements:**

Requires provision of guidelines, information and incentives for more efficient landscape at new or existing single family homes; and enacting and implementing landscape water conservation ordinances. No coverage requirement is specified for this BMP by Exhibit 1.

**Evaluation Notes**

**BMP Schedule:** San Francisco Water Department has initiated this BMP in accordance with the MOU schedule.

**Program Description:** The department provides guidelines and information, including landscape brochures, and watering guidelines. The department offers free home water audits, which include a landscape irrigation element.

City and County of San Francisco has adopted a landscape water conservation ordinance based on the state's model ordinance. Building permits are denied to any commercial, governmental, or multi-family residential buildings on lots exceeding 3,500 sq. ft. found not to be in compliance with ordinance.

**Customer Incentives:** Within San Francisco, less than 10% of residential water use is for outdoor uses. Therefore, the agency does not offer customer incentives to reduce residential landscape water use.

**15.1.13 Water Waste Prohibition (BMP 13)**

**Evaluation Grade**

148
Implementing on Schedule

BMP Requirements

Enacting and enforcing measures to prohibit gutter flooding, single pass cooling systems in new connections, nonrecirculating systems in all new conveyor car wash and commercial laundry systems, and nonrecirculating decorative water fountains. Including water softener checks in home water audits and providing customers with information about DIR and exchange-type water softeners in their educational efforts.

Evaluation Notes

BMP Schedule: San Francisco Water Department has implemented this BMP in accordance with the MOU schedule.

Program Description: The department prohibits gutter flooding; single pass cooling systems; non-recirculating carwashes, and fountains; and hosing of hard surfaces. Prohibitions apply at all times during the year. The department has developed a "Waste of Water Notice" identifying customer violations with water waste prohibitions.

15.1.14 Water Conservation Coordinator (BMP 14)

Evaluation Grade

Implementing on Schedule

BMP Requirements

Designation of a water conservation coordinator responsible for preparing agency conservation plan, managing its implementation, and evaluating program results. No coverage requirement is specified for this BMP by Exhibit 1.

Evaluation Notes

BMP Schedule: San Francisco Water Department is implementing this BMP in accordance with its schedule. The department established and staffed the position of Water Conservation Coordinator in 1986.

Program Description: Conservation Coordinator is a full-time position. Coordinator dedicates 100% of their time to the agency’s conservation program. Coordinator manages a conservation program staff. Current staffing level is four full-time positions.

15.1.15 Financial Incentives (BMP 15)

Evaluation Grade

Implementing on Schedule

BMP Requirements:

Financial incentives are to be offered to retail customers. No coverage requirement is specified for this BMP by Exhibit 1.

Evaluation Notes

BMP Schedule: San Francisco Water Department is implementing this BMP in accordance with its schedule.

Program Description: The department provides $37.50 rebates towards purchase of ULFT; agency has offered grants for purchase of water saving irrigation equipment. The
department provides a water rate discount to customers with filed affidavits affirming that they have retrofitted plumbing fixtures in accordance with City and County requirements.

15.1.16 Ultra Low Flush Toilet Replacement (BMP 16)

Evaluation Grade

Partially Implementing

BMP Requirements

Implementing programs to replace existing high-water-using toilets with ultra-low-flush toilets. Programs to be as effective as offering $100 rebates for toilets, or requiring replacement at time of resale, or replacement at time of change of service. Identifying all non-residential customers and ranking them by water use by December 31, 1995, and retrofitting toilets for at least 1% of their non-residential customers by June 30, 1998. Coverage requirement: per Exhibit 6 of the MOU, agency program must result in water savings equivalent to a retrofit on resale requirement for the service area.

Evaluation Notes

BMP Schedule: San Francisco Water Department is not implementing this BMP in accordance with the MOU schedule. The department initiated its ULFT replacement program in accordance with the MOU schedule, but has subsequently fallen behind its Exhibit 6-based annual water savings targets (see below). An analysis of program results through June 30, 1996 show the program not to be as effective as a retrofit-on-resale requirement. Estimated program savings through FY 1996 are 20% of the benchmark retrofit-on-resale savings target over the period of analysis using Exhibit 6 savings assumptions, and 18% of the target savings using SFWD savings assumptions.41

Program Description: The agency’s ULFT replacement program consists of two elements. The first is a retrofit ordinance, requiring all renovated buildings to install ULFTs whenever a substantial modification to the building’s drainage system is being made. This ordinance was put into effect in January 1991. The second element is a rebate program initiated in January 1995. Rebates equal $37.50 per toilet if the old toilet is recycled, and $30.00 if the old toilet is not recycled. The program is extensively advertised by the agency, and is open to all single- and multi-family agency customers.

Program Results: Program results are shown in the table below. As of FY 1996, a total of 8,321 single-family and 6,178 multi-family toilet replacements have been attributed to the program.

Program water savings depend on annual water savings per toilet, which, in turn, depend on household density, number of toilets per household, whether the retrofit was partial or complete, and the mix of pre- and post-1980 housing units receiving retrofits. Exhibit 6 provides water savings lookup tables (derived from empirical program evaluations) that take these factors into account, and, for purposes of the MOU, are to be used for calculating water savings attributable to ULFT programs. Based on these tables, the cumulative annual water savings (AF/yr) attributed to the agency’s program as of June 30, 1996, is 483 AF/yr.

---

41 This is calculated as the sum of annual cumulative program savings from each year of program operation divided by the sum of annual cumulative water savings targets starting from August 31, 1993. This is the total volume of water saved by the program divided by the total volume of water targeted to be saved.
San Francisco Water Department, however, believes that Exhibit 6 water savings estimates overstate the actual savings attributable to toilet retrofits in their service area. Exhibit 6 indicates a 23.8 gpd per toilet savings for single-family retrofits and a 37.7 gpd per toilet savings for multi-family retrofits. San Francisco Water Department believes that 10 gpd per toilet for single-family retrofits and 15 gpd per toilet for multi-family retrofits are better estimates of actual savings.\textsuperscript{42} Using these estimates, the cumulative annual water savings (AF/yr) attributed to the agency’s program as of June 30, 1996 is 197 AF/yr.

To assess implementation effectiveness, annual program savings were compared to savings that could be attributed to a retrofit-on-resale requirement for the service area. We base this analysis on the methodology presented in Exhibit 6 of the MOU.\textsuperscript{43} It is important to emphasize that savings targets using this methodology are net of any savings that would occur naturally due to expected toileted depreciation and replacement. In other words, the method fully accounts for natural replacement. It is equally important to note that on the agency side, any toilet replacements directly attributable to the agency’s program are counted, including replacements by program participants that would have replaced their toilet regardless of the program (e.g. program free-riders). In this regard, the evaluation favors agencies, since it nets out natural replacement from the targets, but not from meeting the targets.

Because San Francisco Water Department does not believe that Exhibit 6-based water savings estimates are appropriate to its service area, we calculate program savings relative to savings targets using both the Exhibit 6-based water savings estimates and San Francisco Water Department’s alternative water savings estimates. The results of each evaluation are shown in the proceeding tables. A copy of the spreadsheet model and data used to generate these tables are included with this report.

\textsuperscript{42} It is important to note that SFWD has not conducted any substantive ULFT program evaluation, other than a rudimentary pre- and post-retrofit difference-in-means test, to validate this belief.

\textsuperscript{43} The spreadsheet model used to calculate program savings and targets is included with this report. Prior to finalizing this evaluation, the model was submitted to A & N Technical Services, who authored Exhibit 6, for review and validation. The model was deemed by A & N Technical Services to be consistent with Exhibit 6 requirements.
### BMP 16. ULFT Retrofits
Using Exhibit 6-based Water Savings Estimates

<table>
<thead>
<tr>
<th>Fiscal Year</th>
<th>ULFT Program Toilet Replacements 1/</th>
<th>Cumulative ULFT Program Savings 2/ (AF/Yr)</th>
<th>Exhibit 6-Based Cumulative Target 3/ (AF/Yr)</th>
<th>Difference Between Program &amp; Target Savings (AF/Yr)</th>
<th>Cumulative Balance 4/ (AF)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1991/92</td>
<td>360 Single-Family (no. of toilets)</td>
<td>609 Multi-Family (no. of toilets)</td>
<td>35</td>
<td>0</td>
<td>35</td>
</tr>
<tr>
<td>1992/93</td>
<td>260 Single-Family (no. of toilets)</td>
<td>340 Multi-Family (no. of toilets)</td>
<td>57</td>
<td>162</td>
<td>(105)</td>
</tr>
<tr>
<td>1993/94</td>
<td>446 Single-Family (no. of toilets)</td>
<td>345 Multi-Family (no. of toilets)</td>
<td>83</td>
<td>787</td>
<td>(704)</td>
</tr>
<tr>
<td>1994/95</td>
<td>1,834 Single-Family (no. of toilets)</td>
<td>735 Multi-Family (no. of toilets)</td>
<td>163</td>
<td>1,323</td>
<td>(1,160)</td>
</tr>
<tr>
<td>1995/96</td>
<td>5,421 Single-Family (no. of toilets)</td>
<td>4,149 Multi-Family (no. of toilets)</td>
<td>483</td>
<td>1,781</td>
<td>(1,298)</td>
</tr>
<tr>
<td>1996/97</td>
<td>2,169 Single-Family (no. of toilets)</td>
<td>2,496 Multi-Family (no. of toilets)</td>
<td>2,169</td>
<td>2,768</td>
<td>(1,934)</td>
</tr>
<tr>
<td>1997/98</td>
<td>2,993 Single-Family (no. of toilets)</td>
<td>2,768 Multi-Family (no. of toilets)</td>
<td>2,993</td>
<td>3,175</td>
<td>(3,232)</td>
</tr>
</tbody>
</table>

#### Notes:
1/ Total number of single- and multi-family toilet replacements credited to the agency's ULFT program.
2/ The estimated cumulative annual water savings (AF/Yr) associated with the credited toilet replacements. All savings are credited, including savings that would have occurred do to natural replacement (i.e. program free-ridership). Savings estimates derived from Exhibit 6.
3/ The agency's cumulative annual savings targets (afyrs) equivalent to a retrofit-on-resale requirement. Target calculated using Exhibit 6 methodology and data on housing resale rates for agency's county. Targets are net of natural replacement; they only include savings directly attributable to a hypothetical retrofit-on-resale requirement.
4/ A running total of the difference between credited program savings and target savings. Negative quantities indicate the agency has not, on balance, met the targets at that point in time. Positive quantities indicate the agency has, on balance, exceeded the targets at that point in time.
## Evaluation of BMP Implementation for San Francisco Public Utilities Commission

### BMP 16. ULFT Retrofits
Program Results through FY 1996
Using SFWD Water Savings Estimates

<table>
<thead>
<tr>
<th>Fiscal Year</th>
<th>ULFT Program Toilet Replacements 1/</th>
<th>Cumulative ULFT Program Savings 2/ (AF/Yr)</th>
<th>Exhibit 6-Based Cumulative Target 3/ (AF/Yr)</th>
<th>Difference Between Program &amp; Target Savings (AF/Yr)</th>
<th>Cumulative Balance 4/ (AF)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1991/92</td>
<td>360 Single-Family (no. of toilets)</td>
<td>14</td>
<td>0</td>
<td>14</td>
<td>14</td>
</tr>
<tr>
<td>1992/93</td>
<td>260 Multi-Family (no. of toilets)</td>
<td>23</td>
<td>76</td>
<td>(53)</td>
<td>(39)</td>
</tr>
<tr>
<td>1993/94</td>
<td>446</td>
<td>34</td>
<td>368</td>
<td>(334)</td>
<td>(373)</td>
</tr>
<tr>
<td>1994/95</td>
<td>1,834</td>
<td>67</td>
<td>618</td>
<td>(552)</td>
<td>(924)</td>
</tr>
<tr>
<td>1995/96</td>
<td>5,421</td>
<td>197</td>
<td>832</td>
<td>(635)</td>
<td>(1,559)</td>
</tr>
<tr>
<td>1996/97</td>
<td>6,013</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1997/98</td>
<td>1,165</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>1998/99</td>
<td>1,291</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>1999/00</td>
<td>1,396</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2000/01</td>
<td>1,480</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

![Cumulative Savings Chart](chart.png)

- **Agency Cumulative Annual Savings**
- **Cumulative Annual Targets**

### Notes:
1/ Total number of single- and multi-family toilet replacements credited to the agency's ULFT program.
2/ The estimated cumulative annual water savings (AF/yr) associated with the credited toilet replacements. All savings are credited, including savings that would have occurred do to natural replacement (i.e. program free-ridership). Savings estimates based on SFWD's per toilet savings estimates for single and multi-family residences.
3/ The agency's cumulative annual savings targets (AF/yr) equivalent to a retrofit-on-resale requirement. Target calculated using Exhibit 6 methodology, SFWD's toilet savings assumptions, and data on housing resale rates for agency's county. Targets are net of natural replacement; they only include savings directly attributable to a hypothetical retrofit-on-resale requirement.
4/ A running total of the difference between credited program savings and target savings. Negative quantities indicate the agency has not, on balance, met the targets at that point in time. Positive quantities indicate the agency has, on balance, exceeded the targets at that point in time.
15.2 Evaluation of BMPs Applying to Wholesale Suppliers

The relationship between the San Francisco Public Utilities Commission is governed by a 1984 Settlement Agreement and Master Water Sales Contract. This agreement significantly restricts SFPUC's ability to recover costs associated with supporting BMP implementation by its wholesale customers. As a result, SFPUC has generally not implemented BMPs or supported BMP implementation within its wholesale service areas.

SFPUC and its wholesale customers are currently developing a Water Supply Master Plan that will address options for regional conservation programs. The plan is currently in its scoping phase and is expected to be completed in two to three years.

A summary of the evaluation results of the wholesale operations of the San Francisco Public Utilities Commission are presented in Table 15-2. Evaluation summaries and notes for each BMP are presented in the subsections that follow. In general, we found SFPUC not to be full compliance with the MOU requirements as they relate to signatory wholesale water suppliers. Specifically, we found SFPUC not to be implementing BMPs 7, 8, 14, and 15.

Table 15-2. Summary of Wholesale BMP Evaluation for San Francisco Public Utilities Commission

<table>
<thead>
<tr>
<th>BMP No.</th>
<th>BMP Name</th>
<th>Implementing on Schedule</th>
<th>Implementing Not on Schedule</th>
<th>Partially Implementing</th>
<th>Not Implementing</th>
<th>Exempted</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Dist. System</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Metering</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Public Info.</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>School Education</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Pricing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Coordinator</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Financial Incentives</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

15.2.1 Distribution System Water Audits (BMP 3)

Evaluation Grade

Implementing on Schedule

BMP Requirements

Distribution system to be inspected at least once every three years, using a methodology similar to that described in an AWWA manual; advising customers where leaks appear to exist on their side of the meter and making cost-effective repairs.

Evaluation Notes

BMP Schedule: SFPUC has operated a transmission system inspection and leak repair program since the early 1990s.

Program Description: The program inspects transmission lines on a repeating basis; leaks are repaired when detected.
15.2.2 Metering with Commodity Rates (BMP 4)

Evaluation Grade
Implementing on Schedule

BMP Requirements
Metering all new connections, and billing using rates that include a volume charge; retrofitting all unmetered existing connections and billing using rates that include a volume charge.

Evaluation Notes
BMP Schedule: SFPUC is implementing this BMP in accordance with the MOU schedule.

Program Description: All wholesale deliveries are metered and billed according to volume of use. SFPUC is initiating a program to replace old meters with newer venturi meters that measure low and high flows more accurately.

15.2.3 Public Information (BMP 7)

Evaluation Grade
Not Implementing

BMP Requirements
Implement public information programs to educate customers about water use and to promote water conservation. Program could include providing speakers to community groups and media; advertising; using bill inserts; providing water use information on customer bills comparing current and previous year use; working cooperatively with other groups promoting water conservation. No coverage requirement specified by Exhibit 1.

Evaluation Notes
SFPUC has no formal program of support for its wholesaler customers at this time.

15.2.4 School Education (BMP 8)

Evaluation Grade
Not Implementing

BMP Requirements
Implement school education programs within service area. Programs to include provision of educational materials and instruction assistance. No coverage requirement specified by Exhibit 1.

Evaluation Notes
SFPUC has no formal program of support for its wholesale customers at this time.

15.2.5 Conservation Pricing (BMP 11)

Evaluation Grade
Implementing on Schedule

BMP Requirements
Requires eliminating non-conservation pricing and adopting conservation pricing. This is defined as no fixed rate or declining block pricing, and no high fixed costs coupled with low commodity charges. Where the agency also provides sewer services, these rate structures should also apply. No coverage requirement is specified for this BMP by Exhibit 1.

**Evaluation Notes**

All wholesale customers are billed by volume of use. Rates are derived from the 1984 Settlement Agreement and Master Water Sales Contract. Rates are based on cost of service.

**15.2.6 Water Conservation Coordinator (BMP 14)**

**Evaluation Grade**

Not Implementing

**BMP Requirements**

Designation of a water conservation coordinator responsible for preparing agency conservation plan, managing its implementation, and evaluating program results. No coverage requirement is specified for this BMP by Exhibit 1.

**Evaluation Notes**

SFPUC has not designated a conservation coordinator for its wholesale operations.

**15.2.7 Financial Incentives (BMP 15)**

**Evaluation Grade**

Not Implementing

**BMP Requirements:**

Financial incentives are to be offered to retail agencies to support conservation programs. No coverage requirement is specified for this BMP by Exhibit 1.

**Evaluation Notes**

SFPUC does not have a formal program to provide financial incentives to its wholesale customers at this time. We note that under the 1984 Settlement Agreement and Master Water Sales Contract, SFPUC is limited in the costs (including those for financial incentive programs) it can recover from wholesale customers through rates and charges.

**15.3 Evaluation of BMPs Not Applying Directly to Wholesalers**

As discussed in section 2.5, signatory wholesale water suppliers are not obligated under the MOU to implement BMPs 1, 2, 5, 6, 9, 10, 12, 13, and 16. Most signatory wholesale water suppliers, however, provide some level of implementation support to their retail agency customers for these BMPs. This section presents the evaluation results for the San Francisco Public Utilities Commission for these BMPs.

Table 15-3 summarizes the level of support provided to its wholesale customers by SFPUC for BMPs 1, 2, 5, 6, 9, 10, 12, 13, and 16. The subsections that follow provide the summary descriptions of district activities supporting this classification.
Evaluation of BMP Implementation for San Francisco Public Utilities Commission

We note that while SFPUC does not provide direct BMP support to its wholesale customers, the majority of those customers are implementing BMPs. We also note that the Bay Area Water Users Association has begun to track member agency BMP implementation efforts.

Table 15-3 SFPUC Summary of Support Levels for BMPs Not Applying Directly to Signatory Wholesale Water Suppliers

<table>
<thead>
<tr>
<th>BMP No.</th>
<th>BMP Name</th>
<th>Extensive Support</th>
<th>Standard Support</th>
<th>Moderate Support</th>
<th>Negligible Support</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Res. Audits</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>2</td>
<td>Plumbing Retro.</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>5</td>
<td>Landscape Audits</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>6</td>
<td>Landscape Req.</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>9</td>
<td>CII Conservation</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>10</td>
<td>CI Use Review</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>12</td>
<td>Landscape SF Res.</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>13</td>
<td>Water Waste Proh.</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>16</td>
<td>ULFT Replacement</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>

15.3.1 Residential Water Audits (BMP 1)

Support Level

Negligible Support

BMP Requirements

Identification of top 20 percent of water users; directly contact and offer audits to target customers; offer audits on a repeating cycle; provide customer incentives to implement measures. Programs to be underway by August 31, 1994. Coverage requirement: 70% of target customers to receive an audit by end of initial MOU term.

Evaluation Notes

SFPUC has no formal program to provide support to its wholesale customers for this BMP.

15.3.2 Plumbing, New and Retrofit (BMP 2)

Support Level

Negligible Support

BMP Requirements

Identification of pre-1980 single- and multi-family homes; deliver retrofit kits, including low-flow showerheads, and toilet displacement devices to unrefitted homes; offer to install the devices; follow-up with customers at least three times. Program underway by August 31, 1993. Coverage requirement: 75% of pre-1980 single-family accounts and 80% of pre-1980 multi-family accounts to be retrofitted with low-flow devices (other than ULFTs) by end of initial term.

Evaluation Notes
SFPUC has no formal program to provide support to its wholesale customers for this BMP.

15.3.3 Large Landscape Audits (BMP 5)

Support Level
Negligible Support

BMP Requirements

Agencies are required to identify customers with at least 3 acres of landscaping, contacting them by mail; offering audits; offering incentives to effect customer implementation; providing follow-up audits at least once every five years; providing multilingual training and information. Coverage requirement: audits performed for 100% of landscape sites 3 acres or more by end of initial MOU term.

Evaluation Notes

SFPUC has no formal program to provide support to its wholesale customers for this BMP.

15.3.4 Landscape Water Conservation Requirement (BMP 6)

Support Level
Negligible Support

BMP Requirements

Enacting and implementing landscape water conservation ordinances, or cooperating with government/industry to develop and implement ordinances. Ordinances must be at least as effective as the Model Ordinance. Coverage requirement: 100% of new landscapes subject to ordinances by end of initial MOU term.

Evaluation Notes

SFPUC has no formal program to provide support to its wholesale customers for this BMP.

15.3.5 CII Water Conservation (BMP 9)

Support Level
Negligible Support

BMP Requirements

Identification of top 10% of commercial customers, top 10% of industrial customers, and top 20% of institutional customers. Directly contacting target customers and offering water audit. Providing incentives to encourage customer implementation of recommended measures. Offering follow-up audits at least once every five years if necessary. No coverage requirement specified by Exhibit 1 for commercial and industrial customers; coverage requirement for institutional accounts: 70% of top 20% of pre-1980 institutional accounts.

Evaluation Notes

SFPUC has no formal program to provide support to its wholesale customers for this BMP.
15.3.6 New Commercial/Industrial Water Use Review (BMP 10)

Support Level
Negligible Support

BMP Requirements
A program to assure the review of proposed water uses for new commercial and industrial water service and making recommendations for improved water use efficiency before completion of the building permit process. No coverage requirement is specified for this BMP by Exhibit 1.

Evaluation Notes
SFPUC has no formal program to provide support to its wholesale customers for this BMP.

15.3.7 Residential Landscape Conservation (BMP 12)

Support Level
Negligible Support

BMP Requirements
Requires provision of guidelines, information and incentives for more efficient landscape at new or existing single family homes; and enacting and implementing landscape water conservation ordinances. No coverage requirement is specified for this BMP by Exhibit 1.

Evaluation Notes
SFPUC has no formal program to provide support to its wholesale customers for this BMP.

15.3.8 Water Waste Prohibition (BMP 13)

Support Level
Negligible Support

BMP Requirements
Enacting and enforcing measures to prohibit gutter flooding, single pass cooling systems in new connections, nonrecirculating systems in all new conveyer car wash and commercial laundry systems, and nonrecirculating decorative water fountains. Including water softener checks in home water audits and providing customers with information about DIR and exchange-type water softeners in their educational efforts.

Evaluation Notes
SFPUC has no formal program to provide support to its wholesale customers for this BMP.

15.3.9 Ultra Low Flush Toilet Replacement (BMP 16)

Support Level
Negligible Support
BMP Requirements

Implementing programs to replace existing high-water-using toilets with ultra-low-flush toilets. Programs to be as effective as offering $100 rebates for toilets, or requiring replacement at time of resale, or replacement at time of change of service. Identifying all non-residential customers and ranking them by water use by December 31, 1995, and retrofitting toilets for at least 1% of their non-residential customers by June 30, 1998. Coverage requirement: per Exhibit 6 of the MOU, agency program must result in water savings equivalent to a retrofit on resale requirement for the service area.

Evaluation Notes

SFPUC has no formal program to provide support to its wholesale customers for this BMP.