APPENDIX G: EXAMPLE REPORT

This example report is from a small BBQ restaurant with limited seating.

Addressee

Re: Restaurant Water Audit Summary

Dear :

The City of X would like to thank you for your participation in the Commercial Water Audit Project. The goal of this project was to reduce commercial water use; 10 City of X establishments participated in the project, and the City plans to continue conducting additional restaurant water audits in the future.

Three years of data were evaluated for your establishment prior to conducting the site visit. A figure showing billed water use for the *Establishment 1* location for 2006, 2007, and 2008 is enclosed. Average monthly water use by *Establishment 1*for these three years was 40,111 gallons (average daily water use was 1,337 gallons per day (gpd) during this period). This does not include October thru December 2007 when the establishment was closed for renovations and water use was less than 10,000 gallons per month.

In 2008, summer water use (the average of June, July, and August) was approximately 2.5 times the amount of water used that was used in December. The restaurant used 67,000 and 61,000 gallons during August and September respectively. These monthly totals are approximately double the average monthly water use during the other 7 months of operation in 2008.

The *Establishment 1* site visit was conducted on February 9, 2009. The existing pre-rinse spray nozzle was replaced, reducing the amount of water used by this fixture from 3.5 to 1.5 gallon per minute (gpm). Assuming that this fixture is used for a total of one hour per day, using the new fixture will conserve approximately 120 gallons of water per day or 3,600 gallons per month, resulting in a monthly water bill savings of approximately $11.70 (current City of X commercial water rates are $3.24 per 1,000 gallons). Other recommendations for how *Establishment 1* can conserve water follow.

City of X staff analyzed the hourly water use data for this location, and found a 25 gallon per hour base flow (water use never goes to zero). A 600 gallon per day (18,000 gallons per month) leak is expected, but was not found as a part of the audit. This leak is likely located underground, somewhere between the sidewalk and building, and we recommend that a plumber be called to look for it. A loss of 18,000 gallons per month accounts for approximately $60.00 per month on the water bill.

The ice machine at *Establishment 1* is a Hoshizaki Model KM-250BWE. This is a water cooled, cube style ice machine, which is the least energy- and water-efficient type of ice machine available. Cube ice machines use 30 or more gallons of water to make 100 pounds

of ice, while flake/nugget ice machines use 20 gallons of water per 100 pounds of ice (EBMUD, 2008). In addition to the amount of water used to make ice, water cooled ice machines also use between 72 and 240 gallons of water per 100 pounds of ice to cool the machine's compressor (EBMUD, 2008). Should this ice machine need to be replaced in the future, we recommend that an air-cooled, flake-ice machine be chosen instead.
An air-cooled ice machine reduces water use by between 72 and 240 gallons per 100 pounds of ice produced (EBMUD, 2008). A nugget/flake-ice machine reduces water use by about 15 gallons per 100 pounds of ice produced (EBMUD, 2008). The existing ice machine can make 250 pounds of ice per 24 hour period. Assuming that the machine is working at capacity (producing 250 pounds of ice per day), this machine is using between approximately 190 and 640 gallons more each day than an air-cooled, flake-ice machine would. This is equivalent to between 5,700 and 19,200 gallons of water more per month, and between $18 and $62 per month on the water bill.

An air-cooled ice machine costs about $1,000 more than a water-cooled ice machine, and a nugget/flake-ice machine costs between $500 and $1,200 more than a cube style ice machine. If *Establishment 1* were to replace the existing ice machine with an air-cooled, flake-ice machine costing between $1,500 and $2,200 more than the type of ice machine currently installed, the water bill savings alone would pay for the replacement ice machine within 3 to 7 years of its installation. Adding in energy savings would further decrease the pay back time.

The lavatory sink aerator in the men's restroom was replaced, reducing flow from 3 gpm to 1 gpm. Assuming that this faucet is used for 1 hour per day, this will lead to a savings of approximately 60 gallons of water per day and 1,800 gallons per month, leading to monthly water bill savings of approximately $6.00. The lavatory sink aerator in the women's restroom was also replaced, reducing flow from 3 gpm to 1 gpm. This will lead to an addition $6.00 per month savings. The valve under the sink in the men's restroom was leaking during the audit, and should be fixed as soon as possible. It was not possible to quantify this leak, but assuming that the leak amounts to 5 gallons per day, 150 gallons could be being wasted per month.

The men's and women's restrooms each have one toilet with a flush volume of 3.5 gallons per flush (gpf). These toilets should be replaced with low flow pressure assist toilets, reducing their flush volumes from 3.5 to 1.6 gpf. Assuming 20 flushes by each toilet each day, a total of 76 gallons per day or 2,280 gallons per month could be conserved due to the reduction in flush volume. This would lead to a monthly water bill savings of approximately $7.40. New pressure assist toilets can be purchased for between approximately $300.00 and $350.00. At this cost, the water bill savings would pay for both replacement toilets within 8 years of their installation.

Establishment 1 does not use any water for outdoor irrigation, so no savings can be achieved by changing the landscaping practices.

In summary, total savings could be between $1,300 and $1,850 per year if all recommended conservation strategies are incorporated (Table 1).

Table 1. *Establishment 1* Estimated Conservation Savings

Conservation Measure	Estimated Savings (gallons per month)	Estimated Savings ($ per month)	Estimated Savings ($ per year)
Replacement of the pre-rinse spray nozzle (completed)	3,600	$11.70	$140.40
Finding and fixing underground leak	18,000	$60.00	$720.00
Replacement of ice machine	5,700-19,200	$18.00-$62.00	$216.00-$744.00
Replacement of two restroom aerators (completed)	3,600	$12.00	$144.00
Replacement of two toilets (men's and women's restrooms)	2,280	$7.40	$88.80
Changes in landscaping irrigation and/or plant types	0	$0	$0
Total	**33,180-46,680**	**$109.10-$153.10**	**$1,309.20-$1,837.20**

Again, we appreciate your involvement in this project. Please contact me at (505) ***-**** if you have any questions.

Sincerely,

Water Conservation Specialist
City of X

Enclosure: Completed Audit Questionnaire from Establishment 1

City of
Commercial Water Audit Questionnaire

Date of Audit 2/9/2009

1. General information

Business name _____ Phone (505) _____

Contact person name and title _____

Physical address _____

Mailing address (if different) _____

2. Background information

Restaurant meter account # 6556373

Is all of the water billed to this account used by this restaurant? Yes ☒ No ☐

Total water billed in 2008 (gallons)

Jan	2,000	Apr	21,000	Jul	45,000	Oct	49,000
Feb	3,000	May	27,000	Aug	67,000	Nov	22,000
Mar	10,000	Jun	48,000	Sep	61,000	Dec	21,000

Meter: Size 1-inch Type Badger AMR Installed February 1, 2007

Number of employees 5 Number of shifts per day 2

Number of meals served per day 50 on average

Days and hours of operation 6:30 a.m.-8 p.m. Monday-Friday, 6:30 a.m.-7 p.m. on Saturday, closed on Sunday

Date the facility was built 1983/1984 Size of the facility (square footage) ~1,500 ft²

Restaurant seating capacity 32

Date of last remodel None (they just opened on April 1, 2008)

Description of any existing water conservation measures They are very conscious of their water use. Dishes are washed by hand, using a gray tub (there aren't many dishes to be washed).

3. Kitchen water use

Dishwasher description and use (number of loads washed each day) None (dishes are washed by hand).

Is the dishwasher rinse water reused? Yes ☐ No ☒

Number of kitchen faucets 3

	Type:	Usage:	Aerator Yes/No	Flow rate (gpm)
1	Handwashing	Handwashing sink in the kitchen.	Yes	2.5
2	Pre-rinse spray nozzle	Used for dishwashing; nozzle was replaced with a low flow nozzle, reducing flow from 3.5 to 1 gallons per minute (gpm).	NA	3.5
3	Dishwashing	Dishwashing sink in the kitchen.	Yes	4

Pressure on main line coming into the restaurant 92 pounds per square inch (psi) (measured at the hose bib behind the restaurant).

Ice machine Brand Hoshizaki Model number KM-250BWE

Pound capacity 250 lbs./24 hours Cooling method (water or air?) Water

Is a garbage disposal used? Yes ☐ No ☒

Is there a water softener? Yes ☐ No ☒

Describe cleaning methods and equipment (for floors, etc.) The floors are cleaned using a mop and bucket daily.

Discuss any other kitchen water use None

4a. Men's Restroom water use

Toilets: *Gravity tank:* Number 1 Volumes 3.5 gpf

Flush valve: Number 0 Volumes

Urinals: Number 0 Volumes

Have any toilets or urinals been retrofitted with lower flow models? Yes ☐ No ☒

Lavatory sinks: Number 1 Estimated flow 3 gpm

How many faucets have aerators installed? None ☐ All ☒ Number _____

The aerator on this lavatory sink was changed as a part of the audit, reducing its flow to 1gpm.

The valve under this sink is leaking.

4b. Women's Restroom water use

Toilets: *Gravity tank:* Number 1 Volumes 3.5 gpf

Flush valve: Number 0 Volumes _____

Have any toilets been retrofitted with lower flow models? Yes ☐ No ☒

Lavatory sinks: Number 1 Estimated flow 3 gpm

How many faucets have aerators installed? None ☐ All ☒ Number _____

The aerator on this lavatory sink was changed as a part of the audit, reducing its flow to 1gpm.

5. Laundry water use

Are any clothes washing machines used on-site? Yes ☐ No ☒

6. Cooling water use

Cooling Units:	Number	Size
Evaporative cooler	2	55 cfm
Refrigerated air		
Other _____		

If evaporative cooling is used, do the cooling units recirculate water? Yes ☒ No ☐

How much of the year are the coolers used? June-September, on during the day and off at night

7. Outdoor water use

Area of irrigated landscape: None

The restaurant has one island containing juniper bushes, but it isn't watered.

8. Other uses, leaks, and lost water

Method of floor mat cleaning: The floor mats are taken to the car wash and power washed there.

Describe any wait station water use. None

Describe any janitor closet water use. None

List any quantifiable leaks and estimated rates and locations. City staff analyzed hourly data for this location, and found a 25 gallon per hour base flow (water use never goes to zero). A 600 gallon per day (18,000 gallons per month) leak is expected, but was not found as a part of the audit.

Are there any showers on-site? Yes ☐ No ☒

Describe any other water uses. None