Water Efficiency Audits

A Tool for Managing Water Use

Presented
by

WaterWise
Consulting, Inc.

Introduction

WaterWise Consulting, Inc.

- Founded in 2001
- Started with landscape & irrigation training
- Hundreds of CII audits conducted

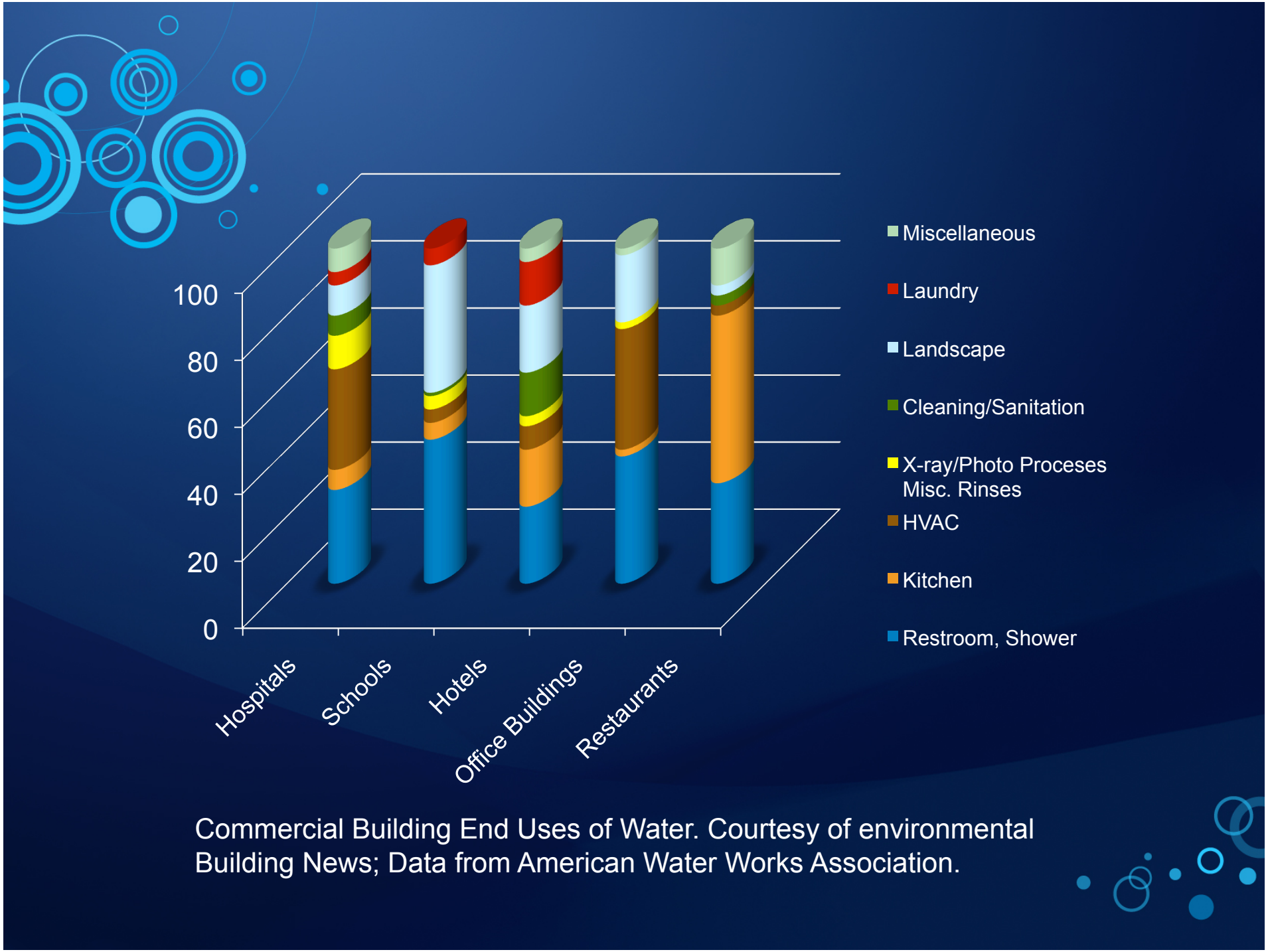
Past & Current CII Clients:

- Los Angeles County Waterworks Districts
- Metropolitan Water District of Southern California
- Santa Clara Valley Water District
- San Diego County Water Authority
- Metropolitan Water District of Orange County
- California American Water Service Company
- California Water Service Company

WATER USE
IN THE CII SECTOR

The CII Sector

- ***Commercial:*** Provide or distribute a product or a service.
- ***Industrial:*** Manufacturers or processors of materials
- ***Institutional:*** Dedicated to public service.



Commercial Building End Uses of Water. Courtesy of environmental Building News; Data from American Water Works Association.

Water Use in the U.S.

The U.S. uses approximately 400 billion gallons of water per day (gpd), as Follows:

- 48% thermoelectric power generation
- 34% agricultural irrigation
- 12% is water used in and around buildings, from both public water supplies and wells (about 47 billion gallons per day)
- 5% is used for industrial applications
- The remaining 1% is used for livestock, aquaculture, and mining

Water Use in the California

- Urban Water Use
- Agricultural Water Use

THE VALUE OF AUDITS

WHAT IS A WATER AUDIT?

- The general definition of an **audit** is an evaluation of a person, organization, system, process, enterprise, project or product.

Why Consider Water Audits?

- Legislation
- CUWCC BMPs & DWR DMMs
- Bottom line savings
- Green/Sustainable Standards (i.e.-LEED, Build-it Green, CALGreen)
- Prepare for future shortages

Table 1. Driving Forces for Water Efficiency

Driving Force	**Importance**
1. Water shortages/droughts in many states	Very important for short-run conservation
2. Incentive programs for efficient fixtures	Important in cities that offer such programs
3. Green certification programs such as LEED	Important for those project pursuing LEED certification, especially LEED-EBOM
4. Rising cost of water supplies and sewage treatment	Economic gain is still the most effective motivator; higher water costs lead to fixture retrofits
5. Stakeholder concern over water issues; political and regulatory changes	A weak motivator in most situations, except where regulations require new technology

11 McGraw-Hill Construction, 2009, Water Use in Buildings: Achieving Business Performance Benefits through Efficiency, http://construction.ecnext.com/coms2/summary_0249-307522_ITM_analytics, accessed August 18, 2009.

THE AUDIT PROCESS – 9 STEPS

General steps:

1. Program marketing
2. Customer qualification and application
3. Collect water-use records
4. Schedule site inspection
5. Conduct site inspection
6. Analyze data collected
7. Create report
8. Review & approval of report
9. Submit report to customer

Onsite Survey: Indoor

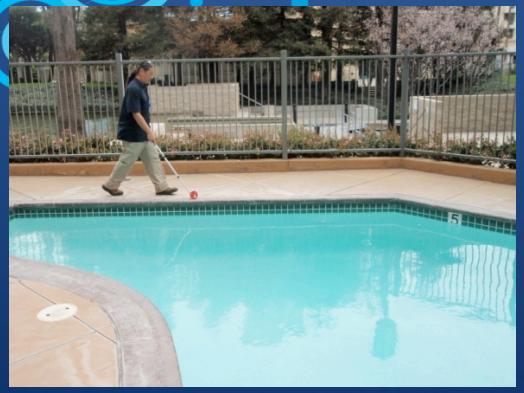


Checking devices in kitchen, public restrooms, laundry room



Checking fixture flows in guest rooms (12% sampling of total rooms)

Onsite Survey: Outdoor

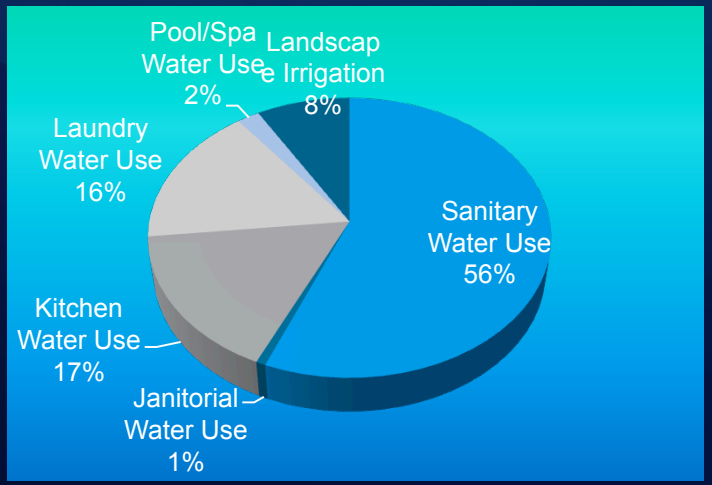


Measuring pools, locating meters, checking cooling towers


Checking irrigation efficiency, controller scheduling, types of soils

Calculations Spreadsheet

- Data entry
- Conversion
- Charts/graphs



Survey Data Entry Sheet

Survey ID Number:

Field Auditor Name:		Prepared By:	
Audit Date:	July 16, 2009	Report Date:	Monday, August 03, 2009

General Site Information

Facility Name:	Holiday Inn - Costa Mesa		
Street Address:	3131 Bristol Street		
City, State, Zip Code:	Costa Mesa	California	92626
Telephone Number:	(714) 557-3000		
Site Contact Name:	Ernesto Montalbo	Title:	General Manager
Site Contact Phone:	(714) 557-3000	Cell Phone:	
Mail Report To:	Ernesto Montalbo	Title:	
Addressee Phone:			
Mailing Address:	*Enter below if different than site address*		
Street Address:			
City, State, Zip Code			

Utility Information

Water Purveyor:	Mesa Water District	Water Rate:	$ 3.11
Sewer Service:	Mesa Water District	Sewer Rate:	$ 5.17
Water Bill Unit:	HCF	Other Cost	
Number of Meters:		Total Cost:	$ 8.280

Energy Rates for Water Heating

Gas Utility Company:	Southern California Edison	Cost per Therm:	$ 0.87	Date:
Electric Utility Company:	The Gas Company	Cost per Kwh:		Date:
Reclaimed Water Co:		Cost per Unit:		Date:

Account Numbers or Meter Numbers		Size of Meter:		Type:
		Size of Meter:		Type:
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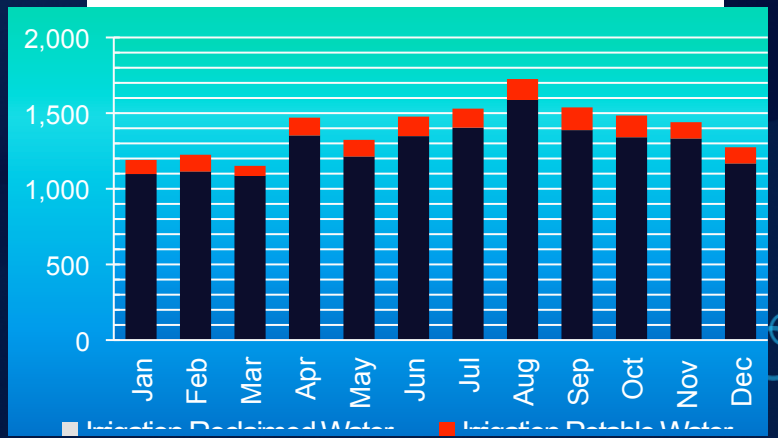
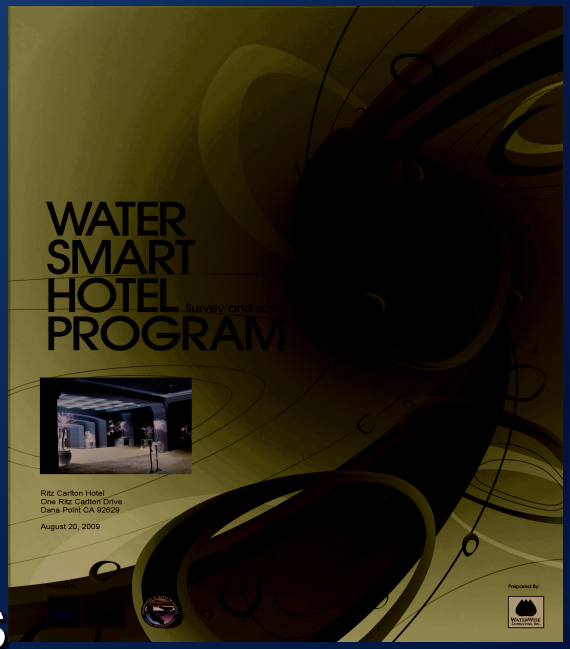


Final Report



- Facility description & photos
- Recommendations preview & tech sheets
- Implementation charts
- Rebate and contact information

CIEUWS Efficiency Benchmarks

- Data from audits of 433 establishments in five categories were used to establish statistical models.
- Three data sources compared (audit data, field study data, & modeled audit data). Rates of water use and values of efficient use were derived.
- The "efficiency benchmark" was selected as the 25th percentile value for each efficiency measure.

Family Restaurant Efficiency Benchmarks

End Use/Benchmark Measure	N	Efficiency Benchmark Range*
TOTAL WATER USE		
Gal./sf/year	90	130 - 331
Gal./meal served	90	6 - 9
Gal./seat/day	90	20 - 31
Gal./employee/day	90	86 - 122

*Developed from combined methods (field studies, audit data, and modeling results)

Hotel & Motel Efficiency Benchmarks

End Use/Benchmark Measure	N	Efficiency Benchmark Range*
INDOOR USE		
Gal./day/occupied room	98	60 - 115
COOLING USE**		
Gal./year/occupied room	97	7,400 – 41,600
IRRIGATION USE**		
Inches per year	97	16 – 50
TOTAL WATER USE**		
Gal./year/occupied room	98	39,000 – 54,000

* Developed from combined methods (field studies, audit data, and modeling results)
** Appropriate benchmarks will depend upon local climate.

Office Building Efficiency Benchmarks

End Use/Benchmark Measure	N	Efficiency Benchmark Range*
INDOOR USE		
Gal./sf/year	62	9 - 15
Gal./employee/day	72	9 - 16
COOLING USE**		
Gal./sf/year	49	8.5 - 22
IRRIGATION USE**		
Inches per year	47	26 - 50
TOTAL WATER USE**		
Gal./sf/year	62	26 - 35

* Developed from combined methods (field studies, audit data, and modeling results)
** Appropriate benchmarks will depend upon local climate.

Supermarket Efficiency Benchmarks

End Use/Benchmark Measure	N	Efficiency Benchmark Range*
INDOOR USE (WITH COOLING)**		
Gal./sf/year	38	52 - 64
Gal./sf/daily transaction	38	9 - 16
IRRIGATION USE**		
Inches per year	5	30 - 50
TOTAL WATER USE**		
Gal./sf/year	38	57 - 80
Gal./transaction	38	3

* Developed from combined methods (field studies, audit data, and modeling results)
** Appropriate benchmarks will depend upon local climate.

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Water Use Survey Report

Evaluation of Water-Using Practices at Raley Field

Survey Provided By:

Regional Water Authority
5620 Birdcage Street, Suite 180
Citrus Heights, CA 95610
(916) 967-7625
www.rwah2o.org

March 20, 2009

Raley Field
400 Ballpark Drive
West Sacramento, CA 95691

Evaluation Conducted By:

WaterWise Consulting, Inc.
1147 S. Grand Ave.
Glendora, CA 91740
626-335-7888
www.waterwise-consulting.com

March 30, 2009

Shaun Meyer
Chief Engineer
400 Ballpark Drive
West Sacramento, CA 95691

Re: Evaluation of Water Using Practices at Raley Field

Dear Mr. Meyer:

The Regional Water Authority (RWA) hereby provides this Water Use Survey Report of your facility as part of RWA's on-going water efficiency program designed to assist local water purveyors throughout the region.

The onsite survey was conducted on February 19, 2009 by an independent consulting firm, WaterWise Consulting, Inc. (WaterWise). This report is based on the observations and data collected during the onsite inspection and subsequent interviews with site staff. The attached Water Use Survey Report includes the following items:

- Facility Description—a profile of the site and description of the operation
- Water Use Patterns—a detailed description of past water use
- Evaluation of Indoor Water Use
- Evaluation of Landscape Water Use
- Summary of Recommendations—potential water and money savings

Implementation of the measures recommended in this report will reduce this facility's annual water use by approximately 9,536 CCF* (7,132,928 gallons), or 30%. The corresponding water, and energy cost savings realized would be approximately $28,313 per year at 2008 rates. Our goal is to provide as accurate data as possible. This is only a survey-level analysis and your actual savings may differ. **CCF = standard billing unit of one hundred cubic feet*

Please contact Linda Higgins of the Regional Water Authority at (916) 967-7625 or via e-mail at lhiggins@rwah2o.org if you have questions regarding this survey or if you need additional information. Thank you for participating in this water use survey.

Respectfully,

David Isaacson
Programs Director
WaterWise Consulting, Inc.

How Much Can You Save?

- Combined water savings for indoor and outdoor water uses = 9,536 CCF units (7,132,928 gallons). This represents a 30% reduction in overall water demand.
- Total annual cost savings = $28,313 (including sewer and energy savings where applicable).
- Initial cost to implement all recommendations = $105,356 .
- Overall simple payback is equal to 3.7 years.