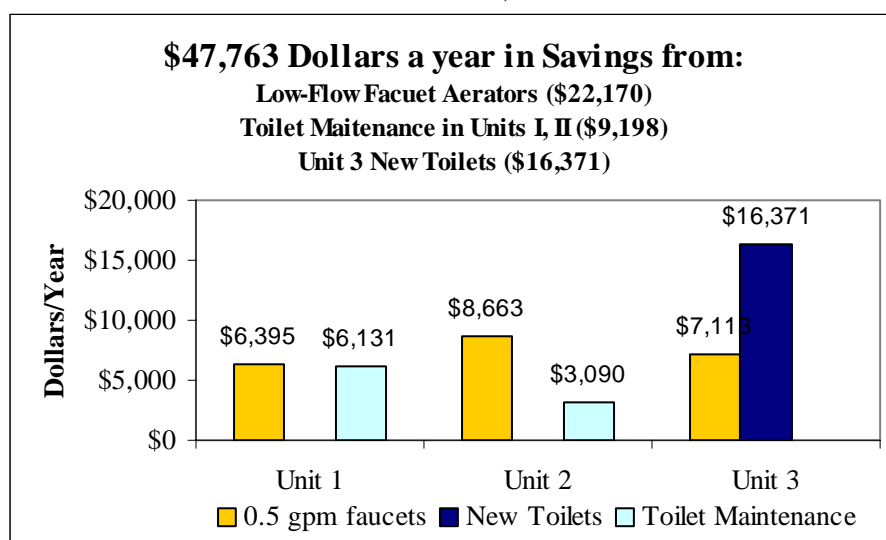


WATER AUDIT RESULTS SUMMARY

Residence Halls I, II and III



PROJECT SUMMARY

1. Faucets

- \$22,170 a year in predicated savings from installing low flow faucet aerators in Units I, II, III (See supporting tables for more information).
- EBMUD provided 400 free low-flow (0.5 gpm) faucet aerators, delivered to Lou Giddings.
- We signed a contract with EBMUD that we would either install the aerators or return them.
- Waiting for the water strainers in Unit 1, II, and III to be cleaned before installing the aerators.
- Evaluate performance and reduced utility bills from the low-flow aerators, Install in the other Residence Units if project is successful.

2. Toilet Maintenance

- A detailed restroom water audit of Units I and II identified all toilets that were leaking (see detailed bathroom map for which toilets need maintenance). All toilets are 1.6 gpf
- 49% of the toilets in Unit 1 and 24% of the toilets in Unit II were leaking
- Unit I was using a 3.5 gpf flush valve kit instead of a 1.6 gpf flush valve part
Should be using part# A41A 3301041 1.6gph (green relief valve), rather than Part # A38A 330108 3.5 gpf (white relief valve),
- (Part # A38A 330108 3.5 gpf (white relief valve), Should be using part# A41A 3301041 1.6gpf (green relief valve)
- Toilet maintenance would save Unit I \$6,125 dollars a year and Unit II \$3,073 dollars a year (See supporting tables for more information)

3. Replace Unit 3 Toilets (\$36,114 rebate from EBMUD)

- Unit 3 toilets are 4.5 gpf (and some are leaking and coming away from the walls)
- Replacing the toilets is expected to save \$16,324 dollars/ year
- EBMUD will provide a \$36,114 rebate for upgrading the 162 toilets in Unit 3 (see summary tables for additional information)
- Bob Jacobs begun the process by signing a contract with EBMUD.
- Still need to implement toilet replacement

Additional Information

Jubilee Daniels: Housing Service, Water Audit Coordinator
jubilee@berkeley.edu, 925-518-1128

**Residence Halls I, II and III: \$22,170 a year in savings
from low –flow (0.5 gpm) faucet aerators provided free from EBMUD**

Unit 1: \$6,395 dollars a year savings form low-flow faucet aerators

Rated Flow Rate	Where We Are Now				Where We Could Be	
	2.2 gpm	2.0 gpm	1.5 gpm	total	1.5 gpm	0.5 gpm
Actual Flow rate*	1.4 gpm	1.2 gpm	1.0 gpm		1.0 gpm	0.5 gpm
# of faucets	24	23	79	120**		
% of student using each faucet type	19	18	63		100	100
total students using each faucet type	180	170	596	946	946	946
total gallon/day***	2,038	1,655	4,827	8,521	7663	3831.3
total CCF/year	817	664	1,936	3,417	3,073	1,537
\$ costs/year****	2,779	2,257	6,583	\$11,619	\$10,449	\$5,225
Unit 1 Potential savings/year*****					\$1,170	\$6,395

* Actual flow rate is lower than marked flow-rate
 ** total includes 17 unknown faucet flow rates
 *** user rates based on industry standard of 8.1 minutes/person/day
 ****Water and wastewater costs are \$2.37 and \$1.03 respectively
 ***** Does not include additional savings from reduced energy costs
 0.5 gpm aerators are free from EBMUD

Unit 2: \$8,663 dollars a year savings form low-flow faucet aerators

Rated Flow Rate	Where We are Now				Where We Could Be	
	2.5 gpm	2.0 gpm	1.5 gpm	total	1.5 gpm	0.5 gpm
Actual Flow rate*	1.7 gpm	1.2 gpm	1.0 gpm		1.0 gpm	0.5 gpm
# of faucets	56	2	70	136**		
% of students using each faucet type	43.8	1.6	54.7		100.00	100
total students using each faucet type	424	15	530		969	969
total gallon/day***	5,838	147	4,292		7848.9	3924.45
total CCF/year	2,341	59	1,722		3,148	1,574
\$ costs/year****	7,960	201	5,853		10,703	5,352
Unit 2 Potential savings/year*****					\$3,311	\$8,663

* Actual flow rate is lower than flow rate written on aerators
 ** total includes 8 unknown faucet flow rates

Unit 3: \$7,113 dollars a year savings form low-flow faucet aerators

Rated Flow Rate	Where We Are Now	Where We Could Be	
	2 gpm	1.5 gpm	0.5 gpm
Actual flow rate	1.2 gpm	1.0 gpm	
gallons/day	8,942	7,452	3,726
CCF/year	3,587	2,989	1,494
\$ cost/year	12,194	10,162	5,081
Unit 3 Potential Savings		\$2,032	\$7,113

\$25,569 dollars a year in savings from toilet maintenance and upgrading Unit 3 toilets

Annual Maintenance of the toilets in Units 1 and 2 will save over \$9,000 a year

	# of toilets/unit	% of toilets that used > 1.6 gpf	# of students that used toilets >1.6 gpf	excess water use per year* CCF	excess utility spending/year	Cost of 1st year maintenance **	savings 1st year	savings 2nd year	payback period years
Unit 1	120	49	464	1801	\$6,125	3445	\$2,680	\$6,125	0.56
Unit 2	120	24	233	904	\$3,073	1690	\$1,383	\$3,073	0.55

* water use is based on 5.1 uses/student/day (Vickers, 2002), Year = 300 days

** Maintenance cost is based on \$15/kit, labor=\$50/hour, time is 1 hour per kit

Unit 1: 946 students, Unit 2: 969 students

Upgrading Unit 3 toilets can save over \$16,000 a year

EBMUD will provide a \$36,114 dollar rebate

# of toilets	Labor Cost \$250/toilet	Hardware costs \$150/toilet	total costs	annual water savings CCF	\$ annual savings	payback period Years w/ EBMUD credit	payback period w/out EBMUD credit	avoided costs after ten years
162	40,500	24,300	64,800	4,815	\$16,371	1.75	3.96	\$163,710

Assumptions

Hardware and labor cost per fixture are \$250 + \$150 / Toilet

920 students

Water and Wastewater costs are \$2.37 and \$1.03 respectively