

July 15, 2016

WATER USE SURVEY REPORT

Malibu High School
30215 Morning View Dr.
Malibu, CA 90265

Account: 29156489, 29156684

Meters: 15519729, 7165751B





WaterWise
Consulting, Inc.

"Conserving our natural resources for future generations"

july 15, 2016

Malibu High School
Attn: Virginia Hyatt
1651 16th Street
Santa Monica, CA 90404

Re: Water Use Survey Report

Dear Ms. Hyatt

Los Angeles County Water District provides this Indoor/Outdoor Water Use Survey Report of your facility as part of the city's on-going efforts to assist local water consumers with water use efficiency programs.

The onsite survey was conducted on June 24, 2016 by 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
- Evaluation of Landscape Water Use
- Survey Findings and Recommendations
- Summary of Recommendations

Implementation of the measures recommended in this report will reduce this facility's overall annual water use by approximately 4,338 CCF* (2,650,912 gallons). The corresponding water savings realized would be approximately \$21,426 per year at 2015 rates. Our goal is to provide the most accurate data possible. This is only a survey-level analysis and your actual savings may differ.

Please contact Angel Juarez with WaterWise Consulting at (888) 987-9473 or via e-mail at ajuarez@waterwise-consulting.com if you have questions regarding this survey or if you need additional information. Rebates may or may not be available to your specific property. Thank you for participating in this water use survey.

Respectfully,

Angel Juarez
Programs Director
WaterWise Consulting, Inc.

**CCF is the general unit of measurement for water consumption.
One CCF is equivalent to 748 gallons.*

Malibu High School

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I. Executive Summary

WaterWise conducted a water use survey of the premise on June 24, 2016. Our team inspected indoor water-using fixtures and irrigation system. The section below summarizes our findings and recommendations.

- WaterWise reviewed water consumption history for this facility (July 2013 through June 2014).
- Annual total water usage is approximately 20,398 CCF (15,257,704 gallons).
- The facility experienced high water use spikes during the months of May, June, July and August. This coincides with normal plant water needs for that time of year.
- Allocation of water use is as follows: 89% is for landscape/irrigation, 7% is for sanitary water use, 1% is for pool water use, and 1% for janitorial water use.
- For indoor water use, we identified a total potential water savings of 449 CCF (335,852 gallons). The primary recommendations include:

Replace forty-five lavatory faucet aerators flowing at 2.2 gallons per minute (gpm) with 0.5 gpm models.

Replace seventy-seven flush valve toilets flowing at 1.6 gallons per flush (gpf) or more with single flush toilets flushing at 1.28 gallons per flush (gpf) or less.

Replace twenty utility sink faucet aerators flowing at 2.5 gpm with 1.5 gpm models.

- For outdoor water use, we identified a total potential water savings of 3,889 CCF (2,898,514 gallons). The primary recommendations for this facility include:

Fix irrigation system problems.

Replace 373 spray nozzles with rotating nozzles.

Replace irrigation controllers with weather based irrigation controllers (Smart Controllers).

Upgrade irrigation controllers with rain sensors.

The implementation cost is \$36,146. The estimated annual savings is \$21,426 The simple payback is 1.4 years.

II. Facility Description



Aerial photograph of Malibu High School.

Source: Google Earth.

This site is located at 30215 Morning View Dr. in Malibu, California. The property size is approximately 1,118,900 square feet (25.7 acres).

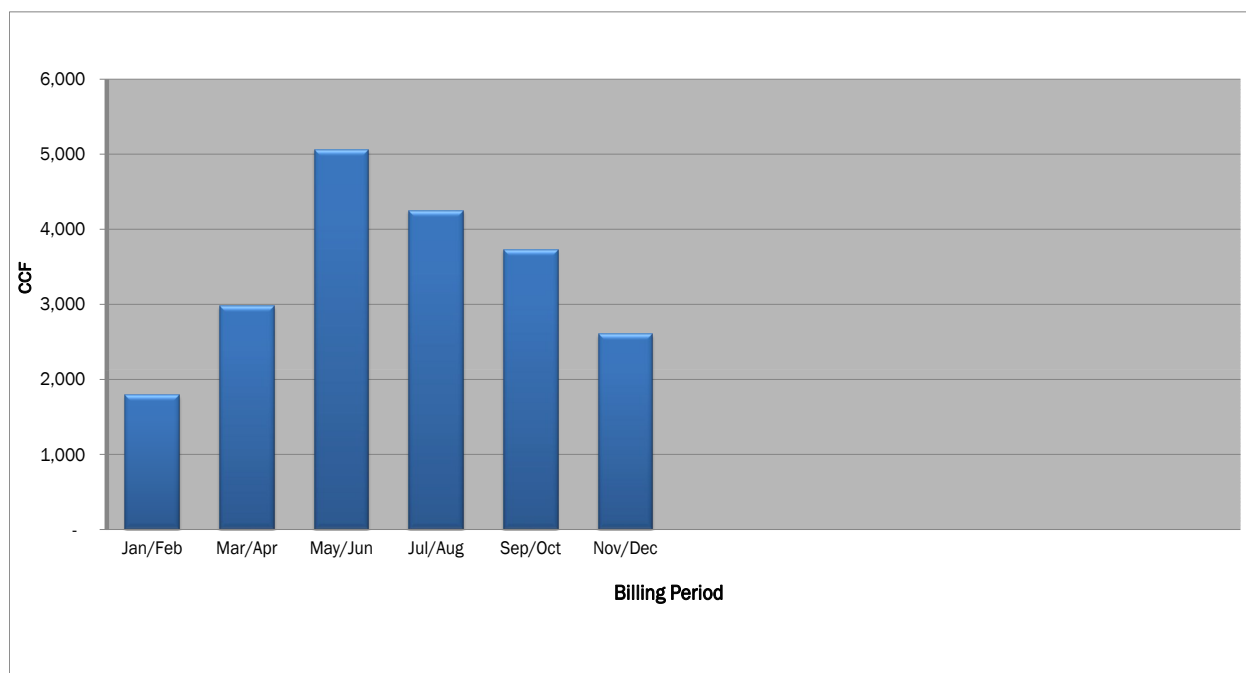
During the evaluation the surveyor found a total of 9 broken sprinklers and a broken line at the site. The surveyor also noticed that the irrigation controller was set to overwater.

The site has two mixed use meters servicing both the indoor and outdoor/landscape irrigation of the entire campus.

Water service is provided by the Los Angeles County Water District a rate of \$4.95 per CCF. The sewer rate charges will not be incorporated into the cost analysis. These are the rates used in the cost analysis figures found later in this report.

III. Water Use Patterns

This facility's water is serviced by two mixed use water meters. Water use data was analyzed for the following accounts: 29156489, 29156684. These meters are read on a monthly basis. In order to accurately assess the water use and potential savings at this facility, WaterWise reviewed historical water use data in order to set a base water consumption. For this survey, WaterWise reviewed monthly water consumption records between July 2013 to June 2014.



The twelve-month water use at this facility is 20,398 CCF (15,257,704 gallons). Monthly average water use is approximately 1,700 CCF (1,271,600 gallons).

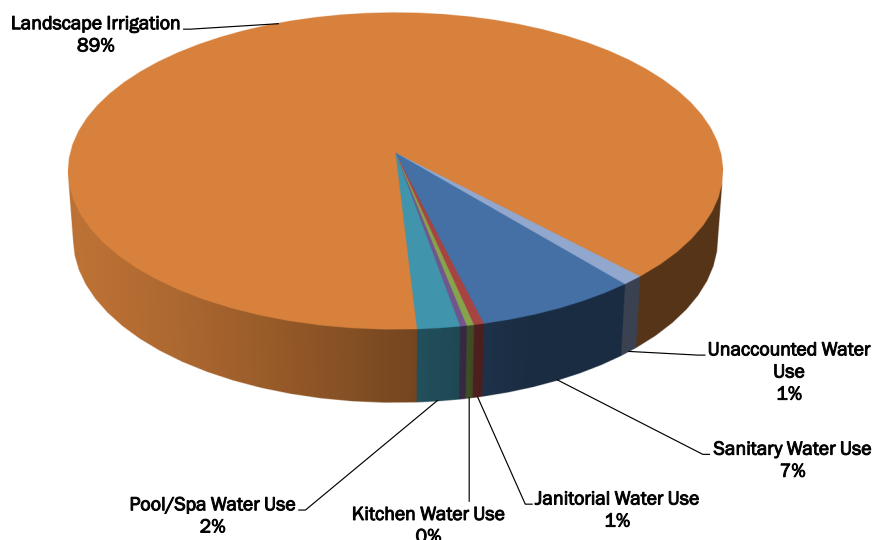
The months with the highest water use were in May and June with 5,058 CCF (3,783,384 gallons). The surveyor did not visually observe any leaks at the meter while conducting the on-site evaluation.

The months with the lowest water use were in January and February during which the facility used 1,788 CCF (1,337,424 gallons).

This is the base year water consumption established by reviewing water use history.

Water Use Allocation - Indoor and Outdoor Consumption

WaterWise was able to create an estimated water use allocation for this facility based on the site inspection and water use analysis. An allocation provides a glimpse of the water using categories for a facility. During the survey the team collected an inventory of the water using fixtures at the entire site. The pie chart below illustrates all of the main water use categories for this facility.



The estimated allocation of water use chart above shows water use at this site. The total water use is 20,398 CCF (15,257,704 gallons). The breakdown of water use per category is listed below. This allocation of water use may be helpful when deciding which recommendations should be implemented.

Landscape irrigation makes up 89%, sanitary use makes up 7% and pool use makes up 2%. Janitorial, kitchen and classroom and unaccounted use each make up 1 % or lower.

Water Use Allocation - Water Use Categories			
Category	% of Total	Annual Use (gal)	Annual Use (CCF)
Sanitary Water Use	7%	1,104,796	1,477
Janitorial Water Use	0%	66,572	89
Kitchen Water Use	0%	49,368	66
Classroom Water Use	0%	44,880	60
Pool/Spa Water Use	2%	287,980	385
Landscape Irrigation	89%	13,553,760	18,120
Unaccounted Water Use	1%	150,348	201
Total Water Use	100%	15,257,704	20,398

Landscape Water Budget

Water budgeting is a valuable tool to further water conservation efforts. The Landscape Water Budget is an allocation of how much water a site should use for irrigation. The budget is calculated by evaluating the irrigated landscape area, the types of plant material, the weather and the irrigation efficiency. The landscape water budget provided below is based on data collected during the field survey and the factors listed below.

Plant materials have different water needs according to their drought tolerance. A plant's drought tolerance will determine Plant Factor. The higher the plant factor, the higher the water requirement. The plant factor scale ranges from 0.1 to 0.9 for most landscape plants. The plant factor is also affected for the density among landscape planting and the microclimate. The size of landscape and the types of plant materials directly affect the water budget for a site.

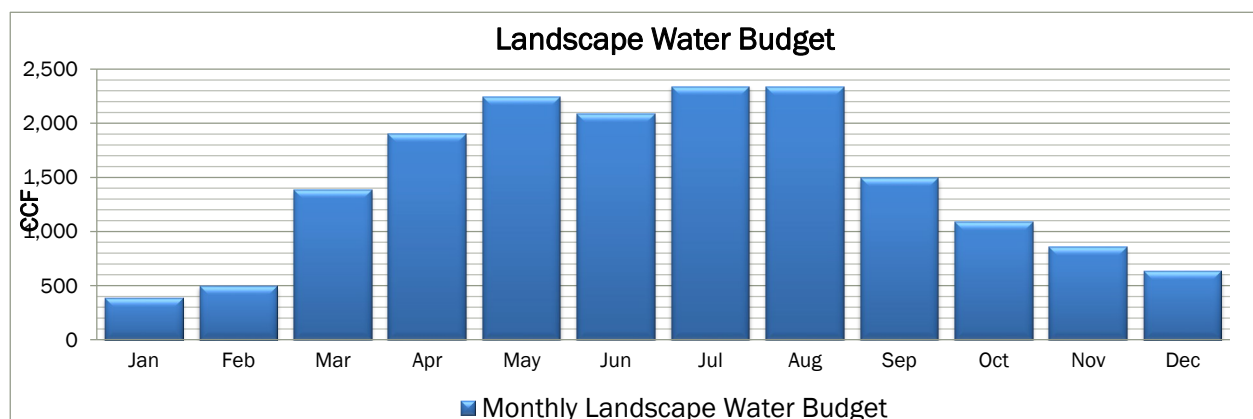
Weather is a factor that is evaluated as Evapotranspiration (ET). ET is a measurement of water loss from a reference plant material. The rate of water loss is affected by weather factors such as solar radiation, temperature, wind, and humidity. Reference ET is measured in inches of water loss. For this site, an annual ET of **49.6** inches was used.

Irrigation efficiency includes the efficiency of the irrigation system (Distribution Uniformity) and the efficiency of the people managing the system (Management Efficiency). Both efficiency factors are evaluated as percentages.

The plant factor used for the water budgets is 0.5 and the Irrigation Efficiency used is 0.85 (drip irrigation). ET is calculated monthly using 3 regional weather sensors (coast, foothills, inland).

The next section provides a site specific landscape water budget that incorporates all the factors listed

Landscape Water Budget											
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
384	495	1,385	1,901	2,241	2,088	2,340	2,331	1,492	1,087	858	632
Total Site Landscape Water Budget:					17,234	CCF	or	12,891,032	gallons		
*Minimun Distribution Uniformity (DU) Spray Systems, 65%, Rotor Systems, 80%, Micro Spray and Bubbler Systems, 80%, Drip Systems, 90%											
*Calculated Based on Local Weather, Landscape Area, Types of Plant Materials, and Irrigation System Variables (Type, Condition, Management).											

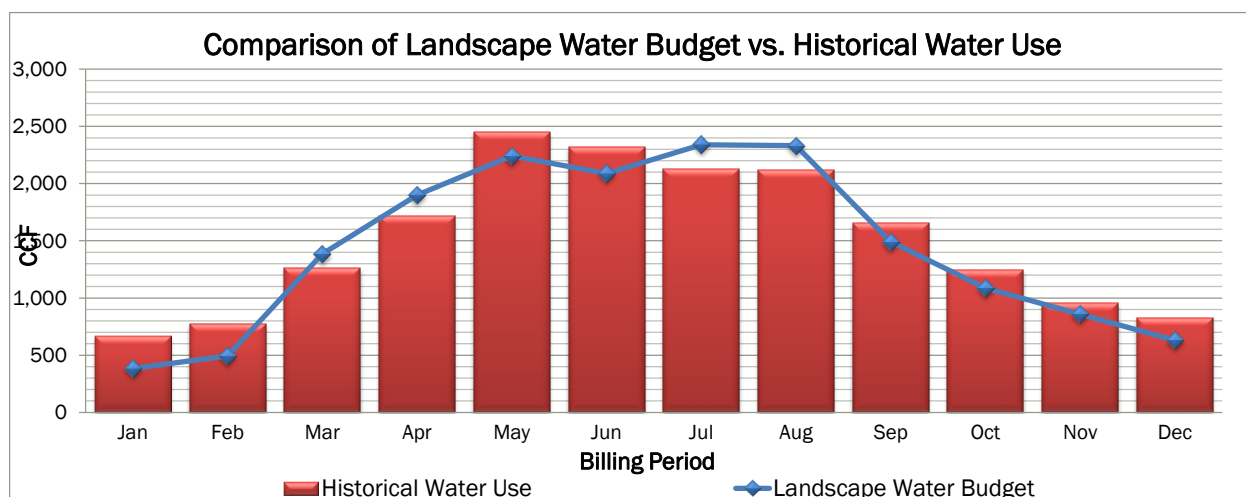


Historical Water Use vs. Landscape Water Budget

WaterWise reviewed water use records for this meter from July 2013 to June 2014 in order to establish a baseline for comparison purposes. The established baseline serves as the historical water use for this water use analysis. This facility has two mixed-use water meters for tracking indoor and outdoor water use.

The landscape water budget from the previous page is 17,234 CCF (12,891,032 gallons). WaterWise can estimate the potential water savings by comparing historical water use to the landscape water budget. According to our calculations this landscape is using approximately 1,623 CCF (1,214,004 gallons) over the budget. The table below provides a comparison of historical water use versus landscape water budget for each month of the year.

Comparison of Landscape Water Budget vs. Historical Water Use												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Landscape Water Budget	384	495	1,385	1,901	2,241	2,088	2,340	2,331	1,492	1,087	858	632
Historical Water Use	668	777	1,260	1,715	2,451	2,318	2,126	2,119	1,657	1,247	953	829
Usage Above Budget	284	282	-	-	210	230	-	-	165	160	95	197
Total Site Landscape Water Usage Above Budget: 1,623 CCF or 1,214,004 gallons												



The following pages will provide recommendations for improving the condition of the system and the water management at this site.

IV. Survey Findings & Recommendations

The table below summarizes our recommendations for improving water use efficiency at this facility. This analysis includes the costs associated with implementing each water efficiency measure, any available rebates or incentives, total annual water savings, and the estimated annual financial savings resulting from improved efficiency in water, sewer, and energy use. The “simple payback” is the number of years it will take for the cost savings to pay for the cost of implementing the measure. Payback calculations do not account for inflation, equipment life, or operation and maintenance costs.

Summary of Recommended Water Efficiency Measures

Water Efficiency Measures	Units	Initial Cost	Rebates & Incentives	Water Savings (Gal/Yr)	Water Savings (CCF/Yr)	Annual Savings ¹	Simple Payback ² (Years)
Sanitary Water Efficiency Recommendations							
Replace Flush Valve Toilets 1.6 gpf with Single Flush HET 1.28	77	\$ 30,800	\$ 3,080	166,804	223	\$ 1,104	25.1
Replace Lavatory Faucet Aerators with 0.5 gpm Models	45	\$ 225	\$ -	151,096	202	\$ 1,000	Less than One Year
Classroom Water Efficiency Recommendations							
Replace Utility Sink Faucet with 1.5 gpm Model	20	\$ 100	\$ -	17,952	24	\$ 119	Less than One Year
Pool & Spa Water Efficiency Recommendations							
Use a Cover for Pool and Spa	5000 sq ft		\$ -	-	-	\$ -	
Landscape Irrigation Recommendations							
Fix Irrigation Systems Problems	122	\$ 1,331	\$ -	2,181,168	2,916	\$ 14,434	Less than One Year
Replace Spray Nozzles with Rotating Nozzles	373	\$ 1,865	\$ 746	117,436	157	\$ 778	1.4
Replace Conventional Irrigation Controller with Weather Based Irrigation Controller	5	\$ 1,625	\$ 1,625	599,896	802	\$ 3,969	Immediate
Upgrade Irrigation Controller with Rain Sensor	5	\$ 200	\$ -	10,472	14	\$ 22	9.1
Totals:		\$ 36,146	\$ 5,451	3,244,824	4,338	\$ 21,426	1.4

- 1) The total simple payback period is based on the total implementation costs and the total savings amount (the bottom line), it is not an average of the payback periods of each recommended measure.

Water Efficiency Recommendation: Low Flow Lavatory Faucet Aerators

This site has 45 lavatory faucets in the public and staff restrooms that have flow rates of 2.2 gpm.

We recommend the replacement of these lavatory faucet aerators with new efficient models which have flow rates of 0.5 gpm.

The total potential water savings for replacing the faucet aerators is 202 CCF (151,096 gallons). The annual cost savings is estimated to be \$1,000.



Lavatory Faucet at
Malibu High School

Low flow faucet aerators can be purchased at most plumbing supply distributors.



Low Flow Faucet
Aerator (0.5 gpm)

Low Flow Faucet Aerators (0.5 gpm)	
Estimated Annual Water Savings	202 CCF (151,096 gallons)
Estimated Annual Cost Savings*	\$1,000
Simple Payback in Years	Less than One Year

*Low flow aerators have an average cost of \$5; Installation is not included.

Water Efficiency Recommendation: High Efficiency Toilets

The facility has 77 flush valve toilets located in the public and staff restrooms that flush at 1.6 gpf. These toilets should be replaced with High Efficiency Toilets (HETs) that have a flush rate of 1.28 or less gpf.

These 1.28 or less gpf toilets save water with every flush since there is only a single flush option. These models use about 20% less water than a standard 1.6 gpf toilet.

The estimated water savings from this replacement is equal to 223 CCF (166,804 gallons) per year, which will yield an estimated annual cost savings of approximately \$1,104.

HETs can be purchased at most plumbing supply distributors. Rebates of \$40 per HET are available from Metropolitan Water District's SoCalWaterSmart Rebate Program. For more information visit:

<http://socalwatersmart.com>



High Efficiency Toilet
(HET)

High Efficiency Toilets	
Estimated Annual Water Savings	223 CCF (166,804 gallons)
Estimated Annual Cost Savings	\$1,104
Estimated Cost of Fixtures	\$30,800
Simple Payback in Years	25.1

Water Efficiency Recommendation: Low Flow Utility Faucet Aerators

This site has 20 lavatory faucets in classrooms that have flow rates of 2.5 gpm.

We recommend the replacement of these utility faucet aerators with new efficient models which have flow rates of 1.5 gpm.

The total potential water savings for replacing the faucet aerators is 24 CCF (17,952 gallons). The annual cost savings is estimated to be \$119.



Utility Faucet

Low flow faucet aerators can be purchased at most plumbing supply distributors.



Utility Faucet Aerator

Low Flow Faucet Aerators (1.5 gpm)	
Estimated Annual Water Savings	202 CCF (151,096 gallons)
Estimated Annual Cost Savings*	\$1,000
Simple Payback in Years	Less than One Year

**Low flow aerators have an average cost of \$5; Installation is not included.*

Water Efficiency Recommendation: Irrigation System Improvements—Fix Irrigation System Problems Identified

During the inspection, WaterWise surveyors inspected five irrigation controllers and a total of 70 active irrigation stations. A total of 769 sprinkler heads were inspected. At least 122 sprinklers of the sprinkler heads have problems and need repairs. Water will be wasted with every irrigation cycle until the irrigation problems are repaired.

- The WaterWise inspection team was able to locate multiple irrigation problems at this site, such as low, tipped, misaligned, overspraying, clogged, broken and leaking sprinklers.

The total potential annual water savings for fixing the irrigation system problems is 2,916 CCF (2,181,168 gallons) or approximately \$14,434.



Overspraying Sprinklers



Example of Broken Sprinkler

Fix Irrigation System Problems	
Estimated Annual Water Savings	2,916 CCF (2,181,168 gallons)
Estimated Annual Cost Savings	\$14,434
Estimated Implementation Cost	\$1,331
Simple Payback in Years	Less than One Year

Water Efficiency Recommendation: Irrigation Management Efficiency—Smart Controllers

Weather Based Irrigation Controllers (Smart Controllers) work by using specific information about the site, including weather patterns, plant types, soil type, slope, and irrigation system application rate to automatically adjust irrigation schedules. Smart Controllers help to improve the management efficiency of the irrigation system.

The irrigation system at this site is operated by five conventional irrigation controllers. We recommend retrofitting the conventional controllers to Smart Controllers.



The total potential annual water savings for improving the management of the irrigation system with Smart Controllers is 802 CCF (599,896 gallons). This is equal to approximately a \$3,969 cost savings per year.

Smart Controllers can be purchased at most irrigation supply distributors.

Rebates of \$35 per station are available from Metropolitan Water District's SoCalWaterSmart Rebate Program. For more information visit:

<http://socalwatersmart.com>



*Weather Based Irrigation
Controller (Smart Controller)*

Smart Controllers	
Estimated Annual Water Savings	802 CCF (599,896 gallons)
Estimated Annual Cost Savings	\$3,969
Estimated Cost of Smart Controllers*	\$1,625
Estimated Rebate Amount	\$1,625
Simple Payback in Years	Immediate

*The controller cost does not include labor costs to install it. Some Smart Controllers charge a monthly or annual service fee for weather data download or communication. Smart Controllers with onsite weather monitors do not charge a service fee. The cost of retrofitting the manual control valves into automatic valves is included.

Water Efficiency Recommendation: Irrigation Management Efficiency—Rain Sensors

A rain sensor is a water conservation device that is set to automatically shut off the irrigation system when there is rainfall. A rain sensor will automatically interrupt the watering schedule of any irrigation controller. It can be manually adjusted to become activated at various rates of rainfall. Some rain sensors will shut off the irrigation after sensing one-eighth of an inch of rainfall or less. After rainfall, the rain sensor will automatically activate the irrigation controller to resume normal operation.

We recommend upgrading the existing irrigation controllers with rain sensors. The total potential annual water savings for improving the management of the irrigation system with rain sensors is 14 CCF (10,472 gallons). This is equal to a savings of approximately \$22 per year.

Rain Sensors can be purchased at most irrigation supply distributors.



Rain Sensor

Rain Sensors	
Estimated Annual Water Savings	14 CCF (10,472 gallons)
Estimated Annual Cost Savings	\$22
Estimated Cost of Rain Sensors *	\$200
Simple Payback in Years	9.1

*Rain sensor is estimated to cost approximately \$40 per unit.

Irrigation System Improvements—Retrofit Spray Nozzles with Rotary Spray Nozzles

During the inspection, WaterWise identified 373 spray-type sprinkler nozzles irrigating lawn and planter areas. The site management may consider replacing 373 existing spray nozzles on site with more efficient rotary spray nozzles.

Rotary nozzles deliver increased efficiency over standard spray head installations by lowering the standard precipitation rate to a half inch per hour, or less. These nozzles are designed to use less water and reduce run off. On slopes and clay-like soils, a lower application rate allows water to soak into the landscape instead of creating runoff and waste. In addition, the special design of these nozzles eliminates water loss from the misting which is common in spray nozzles.

The total potential annual water savings for retrofitting spray nozzles is 157 CCF (117,436 gallons). This is equal to approximately \$778 in cost savings per year.

This site may be eligible to participate in a rebate program offered by Metropolitan Water District's SoCal Water \$mart program. For more information on available rebates go to:
<http://socalwatersmart.com/>



*Rotary Nozzles for
Sprayhead Bodies*

Rotary Nozzles for Sprayhead Bodies	
Estimated Annual Water Savings	157 CCF (117,436 gallons)
Estimated Annual Cost Savings	\$778
Estimated Cost of Rotary Nozzles*	\$1,865
Estimated Rebate Amount Available	\$746
Simple Payback in Years	1.4

*Cost of fixtures is estimated at \$3 per rotary spray nozzle, this does not include any associated labor and installation costs.

V. Appendices

Appendix A: Fixture Inventory & Water Use

Existing Equipment	Number of Units	Volume of Use Use Units		Annual Use (gal)	Annual Use (CCF)
Tank Toilet	1	1.6	gpf	748	1
Flush Valve Toilets	83	1.6	gpf	819,060	1,095
Waterless Urinal	15	0.0	gpf	-	-
Regular Showerheads	61	2.5	gpm	44,880	60
Lavatory Faucet Aerator	12	0.5	gpm	25,432	34
Lavatory Faucet Aerators	49	2.2	gpm	192,236	257
Drinking Fountains	28	0.5	gpm	22,440	30
Bathroom Cleaning Activities				21,692	29
Utility-Janitorial Faucet	10	2.5	gpm	44,880	60
Mixed Use Faucet	6	2.5	gpm	40,392	54
Breakroom Faucet	2	5.0	gpm	8,976	12
Classroom Utility Sink Faucet	20	2.5	gpm	44,880	60
Swimming Pool	1			287,980	385
Landscape Irrigation (Mixed Meter)				13,553,760	18,120
Unaccounted Water Use				150,348	201
Total Water Use:				15,257,704	20,398

Notes:

1. CCF is equivalent to 748 gallons, a standard billing unit for water
2. GAL: gallons
3. GPF: gallons per flush
4. GPM: gallons per minute
5. GPD: gallons per day

Appendix B: Location of Plumbing Fixtures

Toilet Location for Recommended Retrofits					
Restroom Description/Location	No. of Restrooms	Toilets per Restroom	Current Toilets		Recommendation
			Type	GPF	
Admin Men	1	1	Flush Valve Toilet	1.6	Replace with Flush Valve Toilet 1.28 gpf
Admin Women	1	3	Flush Valve Toilet	1.6	Replace with Flush Valve Toilet 1.28 gpf
Nurse's Office	1	1	Flush Valve Toilet	1.6	Replace with Flush Valve Toilet 1.28 gpf
Girl's	2	6	Flush Valve Toilet	1.6	Replace with Flush Valve Toilet 1.28 gpf
Boy's	2	3	Flush Valve Toilet	1.6	Replace with Flush Valve Toilet 1.28 gpf
Cafeteria Girl's	1	2	Flush Valve Toilet	1.6	Replace with Flush Valve Toilet 1.28 gpf
Cafeteria Boy's	1	1	Flush Valve Toilet	1.6	Replace with Flush Valve Toilet 1.28 gpf
Teacher's Lounge Women	1	1	Flush Valve Toilet	1.6	Replace with Flush Valve Toilet 1.28 gpf
Teacher's Lounge Men	1	1	Flush Valve Toilet	1.6	Replace with Flush Valve Toilet 1.28 gpf
Staff Near Portables	1	1	Flush Valve Toilet	1.6	Replace with Flush Valve Toilet 1.28 gpf
Old Gym Girl's	1	3	Flush Valve Toilet	1.6	Replace with Flush Valve Toilet 1.28 gpf
Old Gym Girl's Locker	1	7	Flush Valve Toilet	1.6	Replace with Flush Valve Toilet 1.28 gpf
Locker Room Girl's	1	3	Flush Valve Toilet	1.6	Replace with Flush Valve Toilet 1.28 gpf
Locker Room Boy's	1	3	Flush Valve Toilet	1.6	Replace with Flush Valve Toilet 1.28 gpf
Gym Girl's	1	13	Flush Valve Toilet	1.6	Replace with Flush Valve Toilet 1.28 gpf
Gym Boy's	1	3	Flush Valve Toilet	1.6	Replace with Flush Valve Toilet 1.28 gpf
P.E. Office Girl's	1	1	Flush Valve Toilet	1.6	Replace with Flush Valve Toilet 1.28 gpf
Kitchen Unisex	1	1	Flush Valve Toilet	1.6	Replace with Flush Valve Toilet 1.28 gpf
Theater Unisex	1	1	Flush Valve Toilet	1.6	Replace with Flush Valve Toilet 1.28 gpf
Library Unisex	1	1	Flush Valve Toilet	1.6	Replace with Flush Valve Toilet 1.28 gpf
Special Aid	1	1	Flush Valve Toilet	1.6	Replace with Flush Valve Toilet 1.28 gpf
Old Gym Boy's	1	3	Flush Valve Toilet	1.6	Replace with Flush Valve Toilet 1.28 gpf
P.E. Office Boy's	1	1	Flush Valve Toilet	1.6	Replace with Flush Valve Toilet 1.28 gpf
Football Field Girl's	1	4	Flush Valve Toilet	1.6	Replace with Flush Valve Toilet 1.28 gpf
Football Field Boy's	1	2	Flush Valve Toilet	1.6	Replace with Flush Valve Toilet 1.28 gpf
Old Gym Boy's	1	1	Flush Valve Toilet	1.6	Replace with Flush Valve Toilet 1.28 gpf

Notes:

1. CCF is Hundred Gallons, a standard billing unit for water, and is equivalent to 100 gallons.
2. GAL: gallons
3. GPF: gallons per flush
4. GPM: gallons per minute
5. GPD: gallons per day

Appendix B: Location of Plumbing Fixtures

Lavatory Faucet Location for Recommended Retrofits					
Restroom Description/Location	No. of Restrooms	Lavatory Faucets per Restroom	Current Lavatory Faucets		Recommendation
			Type	GPM	
Principle's Office	1	1	Lavatory Faucet Aerator	2.2	Replace with 0.5 gpm
Admin Men	1	1	Lavatory Faucet Aerator	2.0+	Replace with 0.5 gpm
Admin Women	1	2	Lavatory Faucet Aerator	2.0+	Replace with 0.5 gpm
Nurse's Office	1	1	Lavatory Faucet Aerator	2.2	Replace with 0.5 gpm
Girl's	2	2	Lavatory Faucet Aerator	2.0+	Replace with 0.5 gpm
Boy's	2	1	Lavatory Faucet Aerator	2.0+	Replace with 0.5 gpm
Cafeteria Girl's	1	3	Lavatory Faucet Aerator	2.0+	Replace with 0.5 gpm
Cafeteria Boy's	1	1	Lavatory Faucet Aerator	2.0+	Replace with 0.5 gpm
Teacher's Lounge Women	1	1	Lavatory Faucet Aerator	2.0+	Replace with 0.5 gpm
Teacher's Lounge Men	1	1	Lavatory Faucet Aerator	2.0+	Replace with 0.5 gpm
Staff Near Portables	1	1	Lavatory Faucet Aerator	2.0+	Replace with 0.5 gpm
Old Gym Girl's	1	1	Lavatory Faucet Aerator	2.2	Replace with 0.5 gpm
Old Gym Girl's Locker	1	1	Lavatory Faucet Aerator	2.2	Replace with 0.5 gpm
		2	Lavatory Faucet Aerator	0.5	Replace with 0.5 gpm
Locker Room Girl's	1	2	Lavatory Faucet Aerator	2.2	Replace with 0.5 gpm
Locker Room Boy's	1	2	Lavatory Faucet Aerator	2.2	Replace with 0.5 gpm
Gym Girl's	1	3	Lavatory Faucet Aerator	2.2	Replace with 0.5 gpm
Gym Boy's	1	3	Lavatory Faucet Aerator	2.2	Replace with 0.5 gpm
P.E. Office Girl's	1	1	Lavatory Faucet Aerator	2.2	Replace with 0.5 gpm
Kitchen Unisex	1	1	Lavatory Faucet Aerator	2.2	Replace with 0.5 gpm
Theater Unisex	1	1	Lavatory Faucet Aerator	2.2	Replace with 0.5 gpm
Library Unisex	1	1	Lavatory Faucet Aerator	2.2	Replace with 0.5 gpm
Special Aid	1	1	Lavatory Faucet Aerator	2.2	Replace with 0.5 gpm
Old Gym Boy's	1	1	Lavatory Faucet Aerator	2.2	Replace with 0.5 gpm
P.E. Office Boy's	1	1	Lavatory Faucet Aerator	2.2	Replace with 0.5 gpm
Football Field Girl's	1	3	Lavatory Faucet Aerator	2.2	Replace with 0.5 gpm
Football Field Boy's	1	3	Lavatory Faucet Aerator	2.2	Replace with 0.5 gpm
Old Gym Boy's	1	2	Lavatory Faucet Aerator	2.2	Replace with 0.5 gpm

Notes:

1. CCF is Hundred Gallons, a standard billing unit for water, and is equivalent to 100 gallons.
2. GAL: gallons
3. GPF: gallons per flush
4. GPM: gallons per minute
5. GPD: gallons per day

Appendix C: Irrigation System Inspection Summary
Controller One

Meter Number:		Choose "Yes" for the Month that the Controller is Shut Off:										No	No	No	No	No	No	No	No	No	Date:		Water Management Proposed																									
Auditor Name:	Charlie	Area																			Baseball Fields				Stations Inspected: 23				Total Area: 280,002				Replace Irrigation Controller: upgrade smart controller (Weather Based) with a Rain Sensor				Smart Controller (Weather Based)											
Irrigation Controller Make & Model:	Hartline TC2400	Description: Controller Type: Programs:																			Conventional Controller				Existing Sensor: Start Times:				None				Total Stations: Booster Pump:				24 HP Electric Motor:				23				No			
Controller Location:	Baseball Field	Landscape Area																			Irrigation System Type				Controller Programs				Sprinkler Problems				System Condition				Landscape and System Upgrades Proposed											
Station Number	Area per Station (sq ft)	Plant Material	Microclimate	Plant Density	Stress Factor	Root Zone Depth (if it is known)	Soil Type	Slope Condition	Irrigation System Primary Type	Total # Sprinklers	Irrigation System Secondary Type	Total # Sprinklers	Precipitation Rate Over the Area (in/hr)	Sprinklers Factor for Rotors	% Wetted Soil (Drip or Bubbler)	Assign Program (Current System)	Assign Program (System Upgraded)	Low	Tipped	Arc Misaligned	Overspray	Clogged	Spray Blocked	Leaking	Broken	No-Rotation	Pressure Reading	Broken Irrigation Line	Valve Malfunction	System Condition or Distribution Uniformity	Picture #	Replace Unused Area of Lawn	System Upgrades Proposed															
1	12,174	Warm Season Turfgrass	A	A			CL	SL	R	10						A	A					1																										
2	12,174	Warm Season Turfgrass	A	A			CL	SL	R	6						A	A						1																									
3	12,174	Warm Season Turfgrass	A	A			CL	SL	R	6						A	A																															
4	12,174	Warm Season Turfgrass	A	A			CL	SL	R	7						A	A																															
5	12,174	Warm Season Turfgrass	A	A			CL	SL	R	7						A	A																															
6	12,174	Warm Season Turfgrass	A	A			CL	SL	R	7						A	A																															
7	12,174	Warm Season Turfgrass	A	A			CL	SL	R	7						A	A																															
8	12,174	Warm Season Turfgrass	A	A			CL	SL	R	14						A	A						1																									
9	12,174	Warm Season Turfgrass	A	A			CL	SL	R	4						A	A																															
10	12,174	Warm Season Turfgrass	A	A			CL	SL	R	15						A	A					2																										
11	12,174	Warm Season Turfgrass	A	A			CL	SL	R	5						A	A																															
12	12,174	Warm Season Turfgrass	A	A			CL	MD	R	6						A	A						1																									
13	12,174	Warm Season Turfgrass	A	A			CL	MD	R	7						A	A																															
14	12,174	Warm Season Turfgrass	A	A			CL	MD	R	7						A	A																															
15	12,174	Warm Season Turfgrass	A	A			CL	SL	R	8						A	A																															
16	12,174	Warm Season Turfgrass	A	A			CL	SL	R	7						A	A																															
17	12,174	Warm Season Turfgrass	A	A			CL	SL	R	8						A	A																															
18	12,174	Warm Season Turfgrass	A	A			CL	SL	R	8						A	A																															
19	12,174	Warm Season Turfgrass	A	A			CL	SL	R	14						A	A																															
20	12,174	Warm Season Turfgrass	A	A			CL	SL	R	9						A	A						1																									
22	12,174	Warm Season Turfgrass	A	A			CL	MD	R	7						A	A							1																								
23	12,174	Warm Season Turfgrass	A	A			CL	SL	R	7						A	A																															
24	12,174	Warm Season Turfgrass	A	A			CL	SL	R	7						A	A																															

Appendix C: Irrigation System Inspection Summary
Controller Two

Meter Number:		Choose "Yes" for the Month that the Controller is Shut Off:										Water Management Proposed																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
Auditor Name:	Charlie	Area Description: Football Field										Replace Irrigation Controller: Smart Controller (Weather Based)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
Irrigation Controller Make & Model:	RainBird ESP-24MC	Conventional Controller Type: Programs:										Upgrade Smart Controller (Weather Based) with a Rain Sensor																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
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Appendix C: Irrigation System Inspection Summary

Controller Four

Meter Number:		Choose "Yes" for the Month that the Controller is Shut Off:						No	No	No	No	No	No	No								
Auditor Name:	Charlie	Area Description:																				
Irrigation Controller Make & Model:	Irritrol RD600							Controller Type:		Conventional Controller		Existing Sensor:	None									
Controller Location:								Programs:	1		Start Times:	1										
Station Number	3																					
Area per Station (sq ft)	1,500	Landscape Area						Irrigation System Type						Controller Programs								
		Plant Material	Warm Season Turfgrass	A	A	Microclimate	Plant Density	Stress Factor	Root Zone Depth (if it is known)	Soil Type	Slope Condition	Irrigation System Primary Type	15	Total # Sprinklers	Irrigation System Secondary Type	Total # Sprinklers	Precipitation Rate Over the Area (in/hr)	Sprinklers Factor for Rotors	% Wetted Soil (Drip or Bubbler)	Assign Program (Current System)	Assign Program (System Upgraded)	Low

WaterWise Consulting, Inc.

Appendix D: Inventory of Irrigation Equipment

Inventory of Controllers									
Controller Index	Controller Brand & Model	Area (sq ft)	Total Stations	Active Stations	Stations Inspected	Irrigation Controller Type	Existing Sensor	Booster Pump	Electric Motor (HP)
1	Hardie TC2400	280,002	24	23	23	Conventional Controller	None	No	0
2	RainBird ESP-24MC	100,980	24	22	22	Conventional Controller	None	No	n
3	Rainbird ESP-24MC	10,776	6	6	6	Conventional Controller	None	No	0
4	Irritrol RD600	1,500	3	1	1	Conventional Controller	None	No	n
5	Irritrol MC 24	32,004	20	18	18	Conventional Controller	None	No	n

Inventory of Sprinklers												
Controller Index	Controller Brand & Model	Total Sprinklers	Rotors	Impact Rotors	Stream Rotors	Rotary Nozzles	Precision Nozzles	Sprays	Stream Sprays	Bubblers	Micro Sprays	Drip Stations
1	Hardie TC2400	183	183	0	0	0	0	0	0	0	0	0
2	RainBird ESP-24MC	217	152	0	0	0	0	65	0	0	0	0
3	Rainbird ESP-24MC	84	2	0	0	0	0	82	0	0	0	0
4	Irritrol RD600	15	15	0	0	0	0	0	0	0	0	0
5	Irritrol MC 24	270	44	0	0	0	0	226	0	0	0	1

Inventory of Irrigation Problems												
Controller Index	Controller Brand & Model	Total Problems	Low	Tipped	Arc Misaligned	Over-Spray	Clogged	Spray Blocked	Leaking Sprinklers	Broken Sprinklers	Broken Lines	Non-Operating Valve
1	Hardie TC2400	13	4	0	0	1	4	4	0	0	0	0
2	RainBird ESP-24MC	33	5	2	16	5	0	4	0	1	0	0
3	Rainbird ESP-24MC	20	0	1	0	6	8	0	0	5	0	0
4	Irritrol RD600	2	0	0	0	2	0	0	0	0	0	0
5	Irritrol MC 24	54	4	4	4	5	33	0	0	3	1	0

Appendix E: Certified Landscape Irrigation Auditor



Disclaimer

The intent of this report is to estimate water savings associated with recommended upgrades to water-using fixtures at the surveyed site. Appropriate details are included in this report to make decisions about implementing water-use efficiency measures at the facility. However, this report is not intended to serve as a detailed engineering design document, for the description of the improvements are diagrammatic in nature only. The report documents the basis of cost estimates and savings and demonstrates the feasibility of implementing the improvements.

It should be noted that detailed design efforts may be required in order to implement several of the improvements evaluated as part of this water-use analysis. While the recommendations in this report have been reviewed for technical accuracy and are believed to be reasonable and accurate, the findings are estimates and actual results may vary. As a result, WaterWise is not liable if projected estimated savings or economics are not actually achieved.

All savings and cost estimates in the report are for informational purposes, and are not to be construed as a design document. The report and its recommendations do not constitute any warranties, expressed or implied. In no event will WaterWise be liable for the failure of the customer to achieve a specified amount of water savings, the operation of customer's facilities, or any incidental or consequential damages of any kind in connection with this report or the installation of recommended measures.