

Excerpt from *Site Water Management Planning, A Handbook for Landscape, Water Conservation, Golf and Irrigation Professionals*. This sample was created using the skills taught in the above listed book and the charts were developed using the software that comes with the same book.

Sample Water Management Plan

6/10/2004

Ms. Patricia Jones
Acme Property Management
1234 Corporate Park Blvd.
Anytown, MD 12345

Dear Ms. Jones,

As per your request, our firm has developed a water management plan for Bunker Hill Corporate Office Park, located in Trenton, New Jersey.

We are pleased to assist you in your efforts to conserve water and lower your water bills. The enclosed plan will accomplish both. We have analyzed your existing landscape and your irrigation system hardware. In addition, we have reviewed your site landscape management practices as well as the irrigation system operation and maintenance. During this process we have interviewed your on site staff as well as your landscape maintenance contractor. We are happy to report that you have competent employees and a professional contracting firm.

Even though your staff and contractor have demonstrated professional skills in your behalf in their work, there is room for improvement. The bulk of this improvement is due to advances in technology and research that are new and have not quite trickled down to the staff/contractor level. This is the reason that many of the proposed improvements have not been implemented to-date.

Besides the advancements in technology and research, another reason that your existing staff has not reduced your water use to date is that it is not part of your existing contracts that the staff and site maintenance contractors reduce water. It is, however, clearly stated in your contract that the site must be kept lush and green at all times. Most employees and contractors that work under such contracts tend to err on the side of caution and over water.

After having interviewed the site staff and contracting firm we find they are quite eager and willing to implement methods that are more efficient if that becomes part of the mandate from management.

We have done a limited Return On Investment analysis on the measures that are available for this site. We have eliminated those that were not financially viable and included those that show a respectable payback. In the report you will see the selected measures and we can discuss your wishes in regard to which measures you would like to implement at this time. If the listed measures are implemented then your water use will drop below the water budget for the site. In addition, it should reduce the water bills by about \$10,441.00 per year. Your initial capital investment should be about \$16,000 with a payback of 1.6 years. Some of the recommendations can be implemented over a 1-5 year period, if desired, as budget constraints allow.

Please review the enclosed report. We will make a presentation on the report on Tuesday at your offices at 9:00 a.m. Should you have any questions in the meantime please do not hesitate to call.

Sincerely,

Reginald Davies
Water Management Consultant

Report Contents

This report contains the following documents, in order:

1. Report on site current conditions
2. Site inventory
3. Water budget calculations table
4. Historical use table
5. Historical use vs. water budget and potential reductions
6. Return on investment estimates table
7. Monthly water use comparisons chart
8. Yearly cost comparisons chart
9. Yearly use comparisons chart
10. Schedule for implementation
11. Recommendations for long term site improvement

Report on current site conditions at Bunker Hill Corporate Park

The irrigation and landscape were installed in 1992. There has been little change to the site since the installation. At the time of installation, the system was considered “state of the art”. However, since that time there has been significant advancement in technology and research in regard to efficient landscape watering.

The planting beds were not designed by hydrozones, so there are low water use plants in the same bed with high water use plants. In addition, much of the site is in bluegrass which can be a high water user if not monitored closely. There appears to be poor soil conditions at the site. Compaction especially seems to be a problem.

The irrigation system was designed to get everything green, but it was not designed to do that efficiently. To compound the problem there are numerous low heads and clogged nozzles. Almost none of the nozzles are set up for matched precipitation rate. The controller is old with few or no water conservation features. Attached is a site inventory sheet which documents additional information.

The site is maintained by a contracting firm and their contract does not call for close attention to reducing water consumption. The site is kept looking green and well manicured, but with a high consumption of water.

The on-site staff is hard working and sincere, but lacks training in today’s high tech procedures for the maintenance and scheduling of irrigation systems.

Based on the data supplied by the water utility, your average current site water use is 19,434 hcf per year which is equal to 106” of water annually. This translates into a yearly cost of \$38,868. Based on our estimates the site should be using 14,225 hcf or 78” per year, with a cost of \$28,451.

There appears to be room for improvement without a major overhaul of the irrigation system. There are changes that should be made to the landscape, but again these are moderate.

Site Inventory

System info		Details	
Irrigated acres	Acres	Square feet	
Turf variety 1	4.0 Bluegrass		
Turf variety 2	0.50 Fescue		
Turf variety 3			
Shrub type 1	0.50 Misc.		
Shrub type 2			
Shrub type 3			
Total acreage	5		
Months of irrigation	12		
Seasonal ETo	54.77"		
Water supply info	Site use %	Notes	
Surface water			
Well			
Potable water	100%		
Reclaimed water			
Other			
Water meter	Irrigation	Dedicated	
Water rates	\$2.00/hcf		
Pump system	N/A		
Electrical rates	N/A		
System inventory			Notes
Year installed	1992		
Type of rotors	Gear Drive		
Type of sprays	3" pop-up		
Type of drip	N/A		
Other			
Other			
Central control	No		
Weather station	No		
ET controller	No		
Controller features	2 prog.		
2 Wire	No		
Pump station info	N/A		
Rain switch	No		
Piping material	PVC		
Soil moisture sensors	No		
Shrub separate from turf	Not everywhere		
Hydrozones	No		
Low water use plantings	No		
Estimated IE	60%		
Future site modifications	N/A		

Water Budget-Allotment						H2O Stewardship Solutions	
C _{wb}	1.00	Area (acres)	5.00	Cost is:	2.00		
Month	January	February	March	April	May	June	
ET _o	1.79	2.50	6.07	7.67	9.83	11.13	
HCF	324.68	454.55	1103.90	1394.81	1787.01	2023.38	
Cost/Mo	\$649.35	\$909.09	\$2,207.79	\$2,789.61	\$3,574.03	\$4,046.75	
Month	July	August	September	October	November	December	Yearly
ET _o	11.84	8.90	7.61	5.19	3.57	2.14	78.24
HCF	2153.25	1618.18	1384.42	942.86	649.35	389.61	14225.97
Cost/Mo	\$4,306.49	\$3,236.36	\$2,768.83	\$1,885.71	\$1,298.70	\$779.22	\$28,451.95

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Cost is:	Account #:	Historical Use					Meter #:
2.00	Site Name:	Property Address:					
Meter Address:		Property Address:					
Month	Year	Year	Year	Year	Year	Monthly Averages Water Use (PTG)	Deducted Monthly Water Use Averages (PTG)
	HCF	HCF	HCF	HCF	HCF		
January	667.00	786.00	811.00	799.00		765.75	765.75
February	767.00	867.00	954.00	925.00		878.25	878.25
March	890.00	1,089.00	967.00	1,002.00		987.00	987.00
April	1,298.00	1,508.00	1,632.00	1,598.00		1,509.00	1,509.00
May	1,798.00	1,854.00	1,647.00	1,705.00		1,751.00	1,751.00
June	2,203.00	2,289.00	2,307.00	2,200.00		2,249.75	2,249.75
July	2,805.00	2,875.00	3,009.00	3,125.00		2,953.50	2,953.50
August	2,400.00	2,765.00	2,445.00	2,346.00		2,489.00	2,489.00
September	1,800.00	2,600.00	2,276.00	2,459.00		2,283.75	2,283.75
October	1,700.00	1,976.00	1,889.00	1,789.00		1,838.50	1,838.50
November	1,134.00	1,265.00	990.00	1,104.00		1,123.25	1,123.25
December	660.00	487.00	587.00	687.00		605.25	605.25
Yearly Totals	18,122.00	20,361.00	19,514.00	19,739.00	0.00	H2O Stewardship So	
Yearly Averages	1,510.17	1,696.75	1,626.17	1,644.92	0.00		
Water Use Deduction	0.00						
						Total Yearly Averages	Total Yearly Cost Averages
						19,434.00	19,434.00

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Historical Use Totals			Current ET _o Use	Water Budget		Water Budget in inches of ET _o	Total Reductions		Water Use Reduction in ET _o
Month	HCF	Cost/Mo. Total		HCF	Cost/Mo. Total		HCF Reduction	Total Cost Reduction	
Jan.	765.75	\$1,531.50	4.21	324.68	\$649.35	1.79	441.07	\$882.15	2.43
Feb.	878.25	\$1,756.50	4.83	454.55	\$909.09	2.50	423.70	\$847.41	2.33
Mar.	987.00	\$1,974.00	5.43	1,103.90	\$2,207.79	6.07	-116.90	-\$233.79	-0.64
Apr.	1,509.00	\$3,018.00	8.30	1,394.81	\$2,789.61	7.67	114.19	\$228.39	0.63
May	1,751.00	\$3,502.00	9.63	1,787.01	\$3,574.03	9.83	-36.01	-\$72.03	-0.20
Jun.	2,249.75	\$4,499.50	12.37	2,023.38	\$4,046.75	11.13	226.37	\$452.75	1.25
Jul.	2,953.50	\$5,907.00	16.24	2,153.25	\$4,306.49	11.84	800.25	\$1,600.51	4.40
Aug.	2,489.00	\$4,978.00	13.69	1,618.18	\$3,236.36	8.90	870.82	\$1,741.64	4.79
Sep.	2,283.75	\$4,567.50	12.56	1,384.42	\$2,768.83	7.61	899.33	\$1,798.67	4.95
Oct.	1,838.50	\$3,677.00	10.11	942.86	\$1,885.71	5.19	895.64	\$1,791.29	4.93
Nov.	1,123.25	\$2,246.50	6.18	649.35	\$1,298.70	3.57	473.90	\$947.80	2.61
Dec.	605.25	\$1,210.50	3.33	389.61	\$779.22	2.14	215.64	\$431.28	1.19
Yearly	19,434.00	\$38,868.00	106.89	14,225.97	\$28,451.95	78.24	5,208.03	\$10,416.05	28.64

System Improvements

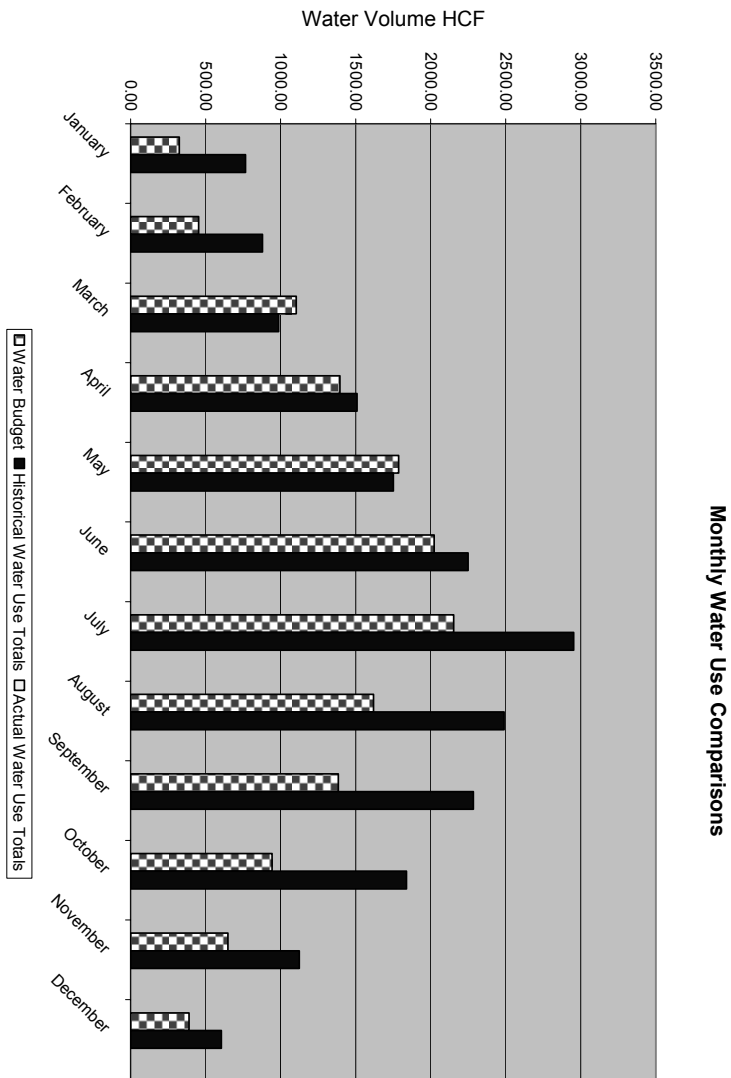
Measure	Estimated Water Savings Potential %	Potential Billing Unit Savings HCF	Initial Capital Cost	Rebate Funding	Potential Annual Dollar Savings	Payback in Years
Improve Head Spacing		0.00			\$0.00	0.0
Improved Zone Separation		0.00			\$0.00	0.0
Head Replacement		0.00			\$0.00	0.0
Low Angle Nozzles	3%	583.02	\$850.00		\$1,166.04	0.7
MPR Nozzles	3%	583.02	\$840.00		\$1,166.04	0.7
Pressure Regulation		0.00			\$0.00	0.0
Head Check Valves		0.00			\$0.00	0.0
Fix Misaligned Heads	1%	97.17	\$450.00		\$194.34	2.3
Flow Sensors		0.00			\$0.00	0.0
Raise Low Heads	2%	388.68	\$1,500.00		\$777.36	1.9
Unclog Nozzles	1%	194.34	\$350.00		\$388.68	0.9
Adjust Pressure		0.00			\$0.00	0.0
Irrigation Audits		0.00			\$0.00	0.0
Controllers w/ conservation features		0.00			\$0.00	0.0
Drip Irrigation		0.00			\$0.00	0.0
Training Classes	4%	777.36	\$1,200.00		\$1,554.72	0.8
Convert to Recycled Water		0.00			\$0.00	0.0

Reduce Site Net ET₀

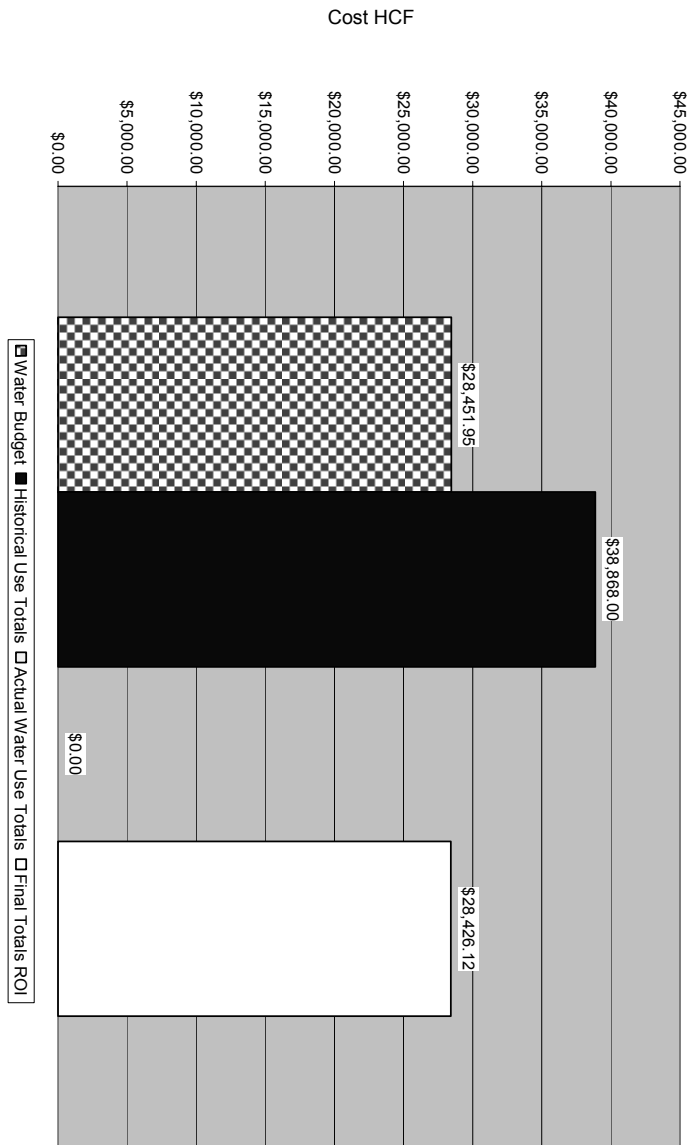
Measure	Estimated Water Savings Potential %	Potential Billing Unit Savings HCF	Initial Capital Cost	Rebate Funding	Potential Annual Dollar Savings	Payback in Years
Group Plantings by Watering Needs		0.00			\$0.00	0.0
Convert to Low Water Use Plantings		0.00			\$0.00	0.0
Convert to Low Water Use Varieties of Turf	5%	971.70	\$3,200.00		\$1,943.40	1.6
Reduce or Eliminate Unneeded Turf Areas		0.00			\$0.00	0.0
Improve Soil Conditions		0.00			\$0.00	0.0
Aeration	1%	194.34	\$600.00		\$388.68	1.5
Soil Amendments		0.00			\$0.00	0.0
Monitor Soil Moisture		0.00			\$0.00	0.0
Mulch Beds	2%	388.68	\$2,200.00		\$777.36	2.8
Grass-Cycling		0.00			\$0.00	0.0
Adjust Mowing Height		0.00			\$0.00	0.0
Increase Decorative Hardscapes		0.00			\$0.00	0.0
Minimize Fertilizer Use		0.00			\$0.00	0.0
Weed Control		0.00			\$0.00	0.0
Training Classes		0.00			\$0.00	0.0

Improve Scheduling

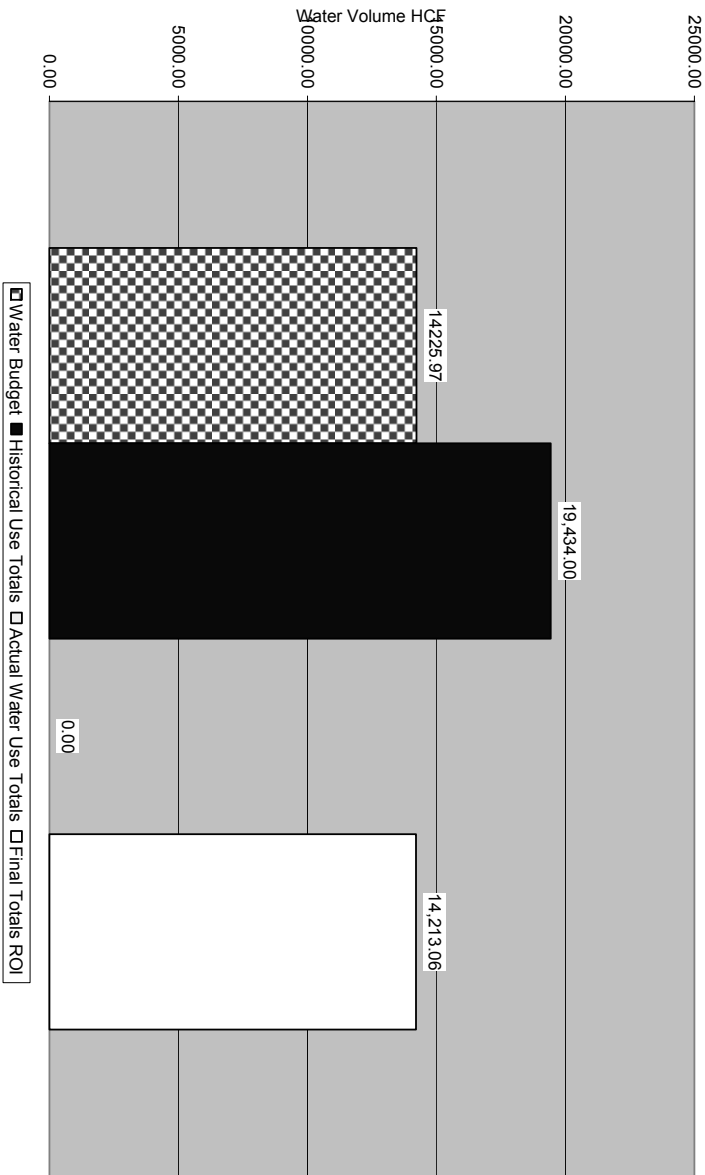
Measure	Estimated Water Savings Potential %	Potential Billing Unit Savings HCF	Initial Capital cost	Rebate Funding	Potential Annual Dollar Savings	Payback in Years
Develop Detailed Schedules		0.00			\$0.00	0.0
Monitor and Update Schedules		0.00			\$0.00	0.0
		0.00			\$0.00	0.0
Access Weather Stations		0.00			\$0.00	0.0
Upgrade Controller		0.00			\$0.00	0.0
Convert To Sensor Based Control	9%	1749.06	\$5,100.00		\$3,498.12	1.5
Install Central System		0.00			\$0.00	0.0
Train Staff		0.00			\$0.00	0.0
Monitor Soil Moisture		0.00			\$0.00	0.0



Yearly Cost Comparisons



Yearly Use Comparisons



Implementation Schedule

As can be seen from the ROI tables we are recommending the following improvements:

1. Install low angle nozzles to all of the turf heads
2. Install MPR Nozzles in all heads
3. Fix all misaligned heads
4. Raise all low heads
5. Unclog nozzles (or replace)
6. Basic irrigation maintenance and repair training for all on-site staff
7. Convert 2 of the 4 acres of turf to a low water use variety
8. Perform aeration on all turf areas
9. Mulch all beds
10. Convert to Sensor Based Control for the site to improve scheduling

The schedule for implementing these improvements is as follows:

Items 1-5 (system improvements) will be done over the next 3 weeks. The scheduled completion date is June 5.

Item 6 (training) will be scheduled for this fall during the last two weeks of November.

Item 7 (turf conversion) will be scheduled for early fall to be completed by mid October.

Item 9 (mulching) is scheduled for the week of June 15.

Item 10 is scheduled for late winter of next year. It should be operational by March 15.

After meeting with your property manager and site maintenance staff, this schedule was developed to match up with budget projections for expenditures. In addition, both your on-site staff and maintenance contractor had input so as to not conflict with their schedules and seasonal staffing, as well as current projects underway.

Recommendations for Long Term Site Changes and Improvements

As water costs continue to rise (and they will) other options can be considered to reduce your water use even more. The following items should be considered as possible projects over the next 6 years:

- Redesign of the head layout in the turf areas
- Convert all shrub areas to drip
- Increase shrub area by reducing turf areas
- Replace all electric zone valves with pressure regulating valves
- Rezoning shrub plantings by plant water requirements

According to our analysis, these items did not produce a viable payback at this time. When the price of water increases these will produce a respectable Return On Investment.

Thank you for the opportunity to work with you. We commend you for your efforts to reduce your water use and conserve a precious natural resource.

Your property manager expressed a desire to have our firm supervise the implementation of these measures. We would be happy to do so. If that is your wish, we will present you with a contract addendum to include those services and fees.

Please feel free to contact us should you have any questions or concerns.

Reginald Davies
Water Management Consultant