

**Water Reduction 101:  
An Audit Competition**

**Innovations in Irrigation  
Technical Session  
San Antonio, Texas**

**Author**

Mike Carr, Portland Parks & Recreation, Portland, OR

**Author**

James White, Ewing Irrigation, Portland, OR

**Author**

Gordon Kunkle, Hunter Industries, Portland, OR

**Abstract**

Portland Parks & Recreation Irrigation Services along with our four Service Zones found a way to further reduce water consumption in our park system. Based on past PP&R research, the best water efficiency and related cost savings can be gained by conducting irrigation audits, followed by performing a system tune-up. We have been following the recommendations of the Irrigation Association and the (EPA) Water Sense Program. This involves a combination of training and irrigation system tune-ups.

Each Service Zone group selected a team leader to attend the Irrigation Association Auditor's Course. Following this course, a half day training session was provided by Parks Irrigation Services and local irrigation distributors. It was attended by 30 Park Technicians who learned how to do irrigation system tune-ups. Each of the four Zone teams selected a sports field to analyze. An audit was performed to determine existing system efficiencies. The teams reviewed the data and decided on an improvement strategy. Once the improvements were accomplished, a post-audit was performed to determine the efficiency gains. The winning team went from a 26% DUlq to 63.6%DUlq.

Sponsored by the Portland Water Bureau, each member of the winning team received a Carhartt vest with both Parks & Water Bureau logos. All the teams won in the end by gaining the knowledge and experience to increase the efficiency of the irrigation systems they are responsible for.

## **Scope of the Portland Parks & Recreation System**

There are 247 parks and recreation sites within our system, with over 12,000 acres of land managed by PP&R.

345 full-time employees

1,300 part-time employees

491,757 volunteer hours

1452 acres of turf, maintained on a weekly schedule

A total of 750 irrigated acres

Irrigated park sites are categorized by the type of irrigation systems installed.

1) Automatic Irrigation System. 150 automatic irrigation systems

2) Centrally Controlled. 80 sites on central control

3) Irrigated Park Enterprise Property Golf

4) Well Sites

One of our largest used parks is Waterfront Park located in downtown Portland, hosting a variety of large events throughout the summer. Other facilities include:

102 play structures in parks

115 outdoor tennis courts

7 indoor tennis courts

223 sport fields

## **Overall Park Management Strategy**

*Portland Parks and Recreation has developed an action plan that ensures that its staff has the knowledge to use water efficiently, without jeopardizing the integrity of its facilities and programs.*

### ***General trends in water management that conserve water:***

*Innovations and time-tested practices continuously evolve to reduce the PP&R water use while keeping turf and plantings healthy and minimizing impact on the public's safety, use and enjoyment of parks. Some of the water conservation practices PP&R currently employs include:*

#### ***Irrigation system improvements***

*Weather data to manage centrally controlled irrigation systems utilizing evapo-transpiration rates*

*Replacement of inefficient irrigation systems*

*Refining existing irrigation systems for maximum efficiency*

*Using well water when available at park sites and golf courses.*

*Staying current on irrigation technology*

Irrigation operational improvements

*Performing on-going audits and maintenance for water efficiency on established systems*

*Education of PP&R staff on good irrigation practices*

*Utilizing water budget feature of controllers*

*Adjusting all nozzles to get even precipitation rates*

*Sharing weekly evapo-transpiration information with PP&R staff*

Plant cultural practices leading to water conservation

*Mulching plants to reduce water loss*

*Proper fertilization practices that result in healthy, drought tolerant plants and lawns*

*Use of more drought tolerant plants*

*Watering grass deeply to encourage deeper root systems, leading to need for less water*

Design and construction standards leading to reduced water use

*Shrubs are irrigated separately from lawns*

*Plants are placed in groupings according to their water requirements*

*Irrigation zoned for water requirements of plants*

*Program irrigation controllers to run at optimum times*

The Irrigation Section of PP&R has many responsibilities, one of which is being responsible for establishing and actively managing a 'Water Auditing Program' to review and optimize water usage for all irrigated parks. The Irrigation Section is also responsible for the coordination and water management of all Centralized Control Systems as they are implemented.

The Irrigation Section is made up of a Turf & Irrigation Supervisor, five Irrigation specialists and one Horticulturist (Water Manager).

All personnel assigned to IS are trained in water auditing principles, current irrigation theories and technologies, and industry standard construction techniques.

Our PP&R system is divided into 4 Service Zones of Park Technicians, with the Irrigation Section (IS) providing support to all 4 zones. The typical duties of the Park Techs include a full range of grounds maintenance to ensure safety, cleanliness, and the operability of park grounds and facilities. One of their duties is to perform minor repairs and adjustments of irrigation systems as necessary. Our goal is to improve their skills in maintaining their irrigation systems.

## **A Staffing Imbalance**

The one major / significant hurdle is the number of qualified irrigation staff members and the number of irrigated acres.

Irrigation Techs = 5

Park Techs = 30

Number of Parks = 247

Mowed acres = 1450

Irrigated Acres = 750!

### **The Question:**

**How to utilize all the resources available to create the most efficient irrigation systems?**

### **A Solution:**

**Basic Irrigation Training and an Audit Competition**

### **In Summary:**

Portland Parks organized an audit competition among the Park Techs, both to train the techs in basic irrigations skills, and to create an awareness of watering efficiency.

The park system is split into 4 work zones. Each team/zone is comprised of 6 members. Each Service Zone group elected a team leader to attend the Irrigation Association Auditor's Course. Following this course, all members from the 4 teams attended basic irrigation troubleshooting and repair classes provided by Irrigation Services staff & local irrigation distributors. All total, 30 Park Technicians attended, learning proper irrigation system tune up procedures. Following the training, each Zone team selected a sports field in their zone to do a pre-audit. A reasonable target goal of a 20% improvement over the current field's distribution uniformity was established. The audits and tune-ups were conducted in the winter months when the staff had the most available time.

Early fall is devoted to shutdowns and leaf removal. Spring is especially busy preparing for summer use. After improvements were made during the tune-up phase, the post-audit was done to determine the winning team. Each team member knew their improvements could get them an embroidered Carhartt vest sponsored by the Portland Water Bureau as a reward for their extra effort!!

## Results

Duniway Park	26.7% to 63.6%	+138.2%
Columbia Parks	31.8% to 56.8%	+78.6%
Flavel Park	30.8% to 56.3%	+82.8%
Bloomington Park	39.5% to 49.9%	+24.1%

The park techs were motivated to find ways to increase the irrigation efficiency. As a result, they became familiar with basic irrigation maintenance and tune-ups. They also discovered that efficient watering created healthy turf areas and an overall better appearance of their parks.

Mike Carr C.I.D, C.L.I.A  
Portland Parks & Recreation  
Turf & Irrigation Supervisor