

## 2.11 Athletic Field Conservation

### A. *Applicability*

This BMP is intended for all Municipal Water User Groups (“utility”) which manage irrigated athletic field(s) and/or serve a customer with irrigated athletic field(s). Athletic fields often involve a visible use of water during the day, which comes under scrutiny by the public and water resource managers both because of large water demand to maintain an athletic field, and because of the perception that the water use may be excessive. The specific measures listed as part of this BMP can be implemented individually or as a group. Utilities may already be implementing one or more these elements and they may want to adopt additional elements outlined in this document.

Once a utility decides to adopt this BMP, the utility should follow the BMP closely in order to achieve the maximum water efficiency benefit from this BMP.

### B. *Description*

Athletic field conservation is an effective method of reducing system water demands. The athletic field manager implements a watering regimen that uses only the amount of water necessary to maintain the viability of the turf and maintain the turf adequately to maintain the health of users. Water is only applied to areas that are essential to the use of the field.

The utility provides the customer, by staff or a third party, a large landscape water-use survey and develops reference evapotranspiration (“ET<sub>o</sub>”)-based water-use budgets equal to no more than 100 percent ET<sub>o</sub> per square foot of landscape area. The survey includes the following elements: measurement of landscape area; measurement of total irrigable area; irrigation system checks and distribution uniformity analysis; and review or development of monthly irrigation schedules. If landscape use is determined to exceed 20 percent of total water use by the customer, the athletic facility should install a dedicated landscape meter. Alternatively the utility may allow customers to perform their own survey by properly trained staff and provide documentation of the survey to the utility. Proper athletic field management emphasizes precise nutrient management, soil preparation techniques, and regular watering as compared to simply using more water to ensure a dense turf.<sup>1,2,3</sup>

At a minimum, the athletic field BMP should require the replacement of all manual controlled or quick couple irrigation systems with automatic irrigation systems and controllers. The automatic controllers should be able to shut off flow when a sudden pressure loss occurs from a broken system. It is important that access to such controllers be limited to the authorized landscape manager or be designed to shut off flow automatically if the irrigation system is activated manually. The authorized landscape manager should be trained in good soil management and cultural practices such as proper aeration, nutrient management, mowing and soil testing as well as in irrigation management. The utility implementing this BMP should consider offering training for athletic field managers or co-sponsoring training with qualified agronomy program(s). Documentation of cultural practices and soil management measures should be

included in a successful program. Although expensive, replacement of natural turf grasses with artificial turf is becoming more popular in some areas of Texas.

When cost-effective, the athletic field user should be required to provide methods for achieving enhanced water conservation through computer controlled irrigation systems (“CCIS”) or similar technology. In order to achieve maximum efficiency a CCIS should include at least the following components: computer controller (“digital operating system”), software, interface modules, satellite field controller, soil moisture sensors, and weather station. A CCIS should be designed so as to prevent overwatering, flooding, pooling, evaporation, and run-off of water, and should prevent sprinkler heads from applying water at a rate exceeding the soil holding capacity. School districts or park systems with a number of remotely located athletic fields should consider a CCIS with satellite systems. Subsurface irrigation systems are also becoming more reliable and are an option. The utility may choose to offer incentives for athletic field management in direct relation to the size and sophistication of the system.

It is recommended and encouraged to use reclaimed, reused, and/or recycled water by athletic fields, however, such use must meet TCEQ water quality standards for treated effluent and human contact. When utilizing reclaimed water or water with high levels of total dissolved solids (“TDS”) or hardness, the water budget will need to be adjusted to permit leaching of salts below the root zone of the turfgrass. Consultation with local extension agents can assist athletic field managers in properly managing the use of lower quality water for irrigation.

Soil improvement is an effective method for reducing irrigation water usage while maintaining healthy soils. Soil improvement programs on high visibility areas such as athletic fields can demonstrate to the public the effectiveness of this method. For athletic fields, compost applications of 1/4 to 1/2 inch annually are recommended. Compost is most beneficial when applied in the fall.

### ***C. Implementation***

The utility should consider stakeholder information meetings. Working with stakeholder groups is important to achieving “buy in” from the athletic field managers. Also a number of voluntary environmental management programs exist in which athletic fields may already be participating. There are two approaches to be considered: an incentive or voluntary approach and an ordinance or other enforceable requirement approach.

- 1) Incentive or Voluntary Compliance Approach  
The utility may provide staff or contract with a third party to provide a water audit of the athletic field. The water-use surveys, at a minimum, include measurement of the irrigated turf areas; determination if hydrozones within the irrigation system are proper for the type of turf present; irrigation system checks and distribution uniformity analysis; review of irrigation schedules or development of schedules as appropriate; and provision of a customer survey report and information packet.

If indicated by survey results and if cost-effective, the utility may offer incentives to the athletic field user for upgrading of irrigation systems, installing or upgrading controllers, changing hydrozones to eliminate irrigation of areas that do not receive high foot traffic, or reducing the amounts of potable water used on the athletic fields. For athletic field managers that agree to manage water efficiently, variance procedures may assist them with watering schedules on large systems with many hydrozones. Utilities may consider assisting athletic field managers in developing an individualized conservation plan, which accounts for turf type, soils, and irrigation system constraints.

When cost-effective, the utility should offer workshops by trained professionals on pesticide and soil and nutrient management for optimal water use efficiency. To ensure that water savings goals are met, the utility should be explicit about the efficiency expectations of voluntary programs.

2) Ordinance or Enforceable Requirements Approach

- a. For utilities with ordinance-making powers, in the first twelve (12) months plan develop, and pass an ordinance, including stakeholder meetings as needed. Develop a plan for educating customers, especially those directly affected by the requirements of the ordinance. Plan customer follow-up compliance and education after ordinance passage. Implement ordinance and tracking plan for violations, compliance notifications, and enforcement.

After ordinance passage (in the 2nd year and on), continue implementation and outreach program for customers. Continue compliance education and initiate enforcement programs. Enforcement can include citations with fines for repeat offenders. Or,

- b. For utilities that lack ordinance-making powers, in the first twelve (12) months plan a program including stakeholder meetings as needed. Develop a plan for educating customers, especially those directly affected, about the requirements of an athletic field conservation program. Plan follow-up compliance and education program. Implement water conservation program and tracking plan for violations and compliance notifications. Consider passing excess-use rates as a disincentive to athletic fields that do not stay within a budgeted amount of water (*See Conservation Pricing BMP*).

**D. Schedule**

- 1) The utility should adopt an incentive program, an ordinance or rules within twelve (12) months of commencing this BMP.
- 2) The utility should implement the incentive plan or commence enforcement upon adoption of the ordinance or rule.

### ***E. Scope***

To accomplish this BMP, the utility should adopt athletic field conservation policies, programs or ordinances consistent with the provisions for this BMP specified in Section C.

### ***F. Documentation***

To track the progress of this BMP, the utility should gather and have available the following documentation:

- 1) Copy of incentive plan or athletic field conservation ordinances or rules enacted in the service area;
- 2) Copy of compliance or enforcement procedures implemented by utility, if applicable;
- 3) Records of enforcement actions including public complaints of violations, and utility responses, if applicable;
- 4) Number of customers completing the incentive plan;
- 5) Tracking mechanism developed to determine customer water use before and after implementation of BMP;
- 6) Water savings attributable to changes implemented; and
- 7) Costs of incentive plan(s) or ordinance if applicable.

### ***G. Determination of Water Savings***

Estimating total water savings for this BMP may be difficult, however, water savings can be estimated from each water-wasting measure eliminated through the actions taken under this BMP. For the replacement of inefficient equipment, the water savings are the difference in use between the new or upgraded equipment and inefficient equipment. For landscape water waste, the savings can be calculated based on estimated savings from each water waste incident. For an irrigation survey, water savings can be expected in the range of 15 percent to 25 percent for athletic fields that do not have a CCIS and where the efficiency measures recommended by the results of the survey are implemented. Switching to artificial turf, reuse or other nonpotable alternatives can save up to 100 percent of the potable water supply used in irrigation. These savings should be determined by measuring water use before and after the conversion to the new water supply.

### ***H. Cost-Effectiveness Considerations***

The labor costs for irrigation survey of an athletic field range from \$250 to more than \$1000 for an irrigation survey depending on the efficiency in scheduling the surveys, the size of the facility, and the scope of the survey. Surveys can be performed by utility staff or by contractors.

Marketing and outreach costs range from \$5 to \$15 per survey. Administrative and overhead costs are in the range of 10 to 20 percent of labor costs. Costs for upgrades to irrigation systems and controllers can be much more extensive depending upon the scale of changes needed. Costs for incentive programs for system upgrades will need to be evaluated on a case-by-case basis.

**I.     *References for Additional Information***

- 1)     *Athletic Fields and Water Conservation*, Texas Agricultural Extension Service.  
<http://soilcrop.tamu.edu/publications/pubs/b6088.pdf>
- 2)     *Maintaining Athletic Fields*, J. A. Murphy.  
<http://www.rce.rutgers.edu/pubs/pdfs/fs105.pdf>
- 3)     *Managing Healthy Sports Fields: A Guide to Using Organic Materials for Low-Maintenance and Chemical-Free Playing Fields*, by Paul D. Sachs, John Wiley & Sons, January 2004.
- 4)     *Managing Bermudagrass Turf: Selection, Construction, Cultural Practices, and Pest Management Strategies*, L. B. McCarty, Grady Miller, John Wiley & Sons, July 2002.
- 5)     *Irrigation System Design and Management Courses*, Irrigation Technology Center, Texas A&M. <http://irrigation.tamu.edu/courses.php>
- 6)     *Water Management Stretches Irrigation Water*, E. K. Chandler.  
<http://www.txplant-soillab.com/page32.htm>