

## 5.4 Outdoor Watering Schedule

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### *Applicability*

This best management practice (BMP) is intended for all utilities and is considered an essential component of a comprehensive outdoor water conservation program. Utilities across Texas are already familiar with the concept of water restrictions. However, utilities typically only impose water restrictions as a drought management strategy and maintain these limitations on outdoor water use for a temporary period. To promote continued water savings year-round regardless of drought conditions, this BMP provides a guiding framework for the adoption of mandatory, permanent outdoor watering schedules. Although all utilities can benefit from the implementation of outdoor watering schedules, utilities with high seasonal usage will see the greatest impact on outdoor water demands.

Utilities should consider combining the planning for and adoption of maximum outdoor watering schedules with other outdoor landscape education and incentive programs. Some of the programs that pair well with permanent outdoor watering schedules include robust education on regionally appropriate landscape practices, irrigation efficiency, and budgeting landscape water seasonally. These additional efforts are essential to achieving the maximum water savings from this BMP.

### *Description*

In periods of drought and/or emergency, utilities often employ watering restrictions as an immediate response for reducing non-essential water uses such as irrigation for landscaped areas. Once certain conditions are triggered, utilities enforce these restrictions on a mandatory basis, as set forth in their drought or water emergency contingency plans. Utilities typically rescind these temporary restrictions when water supply levels return to normal. This can cause a rebound in water usage and send a message that high water use landscape practices should return.

Permanent, year-round watering restrictions deliver several benefits to the utility and broader community. Given that all regions in Texas are prone to drought, keeping water restrictions in place on a full-time basis is a proactive strategy for helping utilities meet their current and future municipal water needs. Having permanent, agreed upon landscape watering regulations also provides stability for the landscape and irrigation industries by incentivizing customers to select plants and technologies for long-term efficiency. A permanent outdoor watering schedule also avoids the challenge of negative perceptions that some community leaders associate with “drought restriction” landscape measures. A long-term efficiency regulation need not be seen as a deprivation message, but instead reflects the value a community places on water efficiency. If

permanent restrictions are effective, then drought-emergency restrictions might rarely be required.

A mandatory outdoor watering schedule generally limits the number of days per week and the hours during which customers can use water for irrigation purposes as well as the specific water delivering technologies that are being limited. Utilities can enforce mandatory outdoor watering schedules by adopting these provisions as part of an ordinance or rule.

This BMP is designed to help utilities develop deeper outdoor water savings and promote proper outdoor watering practices year-round. Utilities experiencing high seasonal water usage can benefit the most from implementation of this BMP; however, all utilities can use outdoor watering schedules to promote more efficient landscaping and irrigation practices as well as consistent customer messaging.

Each utility must consider what outdoor watering schedule will result in long-term savings and provide reasonable support for regionally appropriate landscapes. Because restrictions of no more than twice per week watering have been effectively implemented across much of Texas, this schedule is a recommended starting point. If a community has managed well with no more than once per week irrigation during long drought periods, then a no more than once per week rule should be considered. Rules that allow more than two days per week for irrigation do not fit with this voluntary BMP, which is intended to promote resilient, regionally appropriate landscapes that thrive with modest supplemental water applications.

Without adequate structure, compliance with the watering schedule can be difficult to track, so this BMP recommends that utilities identify specific days and times when each customer class is allowed to water outdoors. For instance, the utility may structure the watering schedule by customer class and identify specific watering days within each class according to odd- and even-numbered addresses, garbage pick-up day, or different municipality areas (i.e., zip codes). This BMP also recommends that utilities identify an ideal watering window (i.e., from 10:00pm to 5:00am) for customers to water their lawns and landscaping to avoid the natural indoor water peak. Another consideration utilities may choose to address is the distinction between the watering methods that are allowed (i.e., watering by hand, by hose-sprinkler, by automatic irrigation system, etc.). When determining these criteria, the utility should consider system capacity and restraints, customer water use patterns, and stakeholder feedback to ensure the most appropriate schedule for its customers and system operations.

Effective implementation of a watering schedule regulation requires careful planning, stakeholder input, education, and tracking to ensure compliance. While these steps are rigorous,

there are few other efforts that will yield as much peak water savings. When carefully planned and executed, utilities can also leverage outdoor watering schedules as a demand management strategy. Savings from outdoor watering schedules can lead to daily peak demand reductions, which have the potential to relieve system capacity constraints and delay the need for future system expansions. Utilities should consider the full benefits of outdoor watering restrictions when pursuing this BMP.

### *Implementation*

#### 1. Community input

The first step is to build consensus among stakeholder groups that an outdoor watering schedule is a reasonable, permanent water efficiency measure for the community. While it is unreasonable to expect agreement from all citizens, it is important to have a large base of supportive stakeholders. Working through rule details and implementation strategy with representatives of these stakeholder groups can help ensure a smoother rule or ordinance adoption process.

Some of the key stakeholders include:

- Neighborhood associations
- Property management companies
- Local irrigation association
- Local Texas Nursery Landscape Association chapter
- County extension services (Texas Master Gardener and Master Naturalist chapters)
- Local real estate council
- Gardening groups
- Athletic field managers
- Large campus sites

Utilities should invite representatives from these stakeholder groups to participate in an advisory committee overseeing the development of the outdoor watering schedule. Their input is critical to adopting an effective watering schedule that adequately meets local needs. During the early phases of implementing this BMP, it is also advantageous for the conservation coordinator to reach out to other utilities who have implemented outdoor watering schedules and obtain feedback from them, as well.

#### 2. Assess existing water patterns

After conducting preliminary stakeholder review, the utility — led by its Conservation Coordinator — should evaluate outdoor water usage patterns in each of its municipal water use categories. Having a sound understanding of seasonal use patterns is necessary for determining the likely conservation benefit associated with this BMP. Utilities with higher seasonal use, for instance, can expect a greater savings potential from this BMP. Seasonal use customer profiles are also helpful for determining the scope of the outdoor watering schedule. If a utility observes higher seasonal use in one customer class, the utility may choose to implement a more stringent watering schedule for that user category.

Data on savings from past drought restrictions is also important to analyze. Seasonal use patterns during periods of drought compared to hot, dry periods when drought restrictions were not in place may help illustrate potential savings.

### 3. Consideration of potential watering schedules

When assigning the days of the week that different customer classes are allowed to water, utilities should pay careful attention to how the proposed watering schedule could impact daily peak demand. To avoid possible disruptions to the distribution system caused by increased peak demand — such as low pressure and depletion of storage — utilities should evaluate system capacity and compare system thresholds to projected future demands with the proposed watering schedule in place.

An example is that automatic spray irrigation concurrent with indoor morning peak water use times may be problematic. To avoid peak hourly demand issues, the conservation coordinator should work with the operations department to determine what the system's natural peak demands are using available Supervisory Control and Data Acquisition (SCADA) data. Utilities can use this insight to inform the specific days and watering window that customers are allowed to irrigate. In order to shift away from the natural peak hourly demand, utilities can designate a shorter watering window, such as between the hours of 10:00pm and 5:00am. If a utility decides to implement a broader watering window, the utility should use education and outreach to encourage residents to water during non-peak hours. This is especially critical if the utility observes a high penetration of automatic irrigation systems in its service area, which use a higher rate of water compared to hose sprinklers.

After addressing these concerns, utilities should work with the advisory committee of local stakeholders to finalize the proposed outdoor watering schedule and solicit additional feedback. The conservation coordinator can use this opportunity to discuss the potential

need for variances. Some of the variances to standard rules that may need to be considered include:

- Athletic field schedule
- New construction installation of landscapes
- Remodeled landscapes at homes and businesses
- Large properties
- Low application rate methods: drip irrigation
- City parks

Variances to normal rules must be defined carefully as to who qualifies for them, how long the variance will last, how to apply, and the consequence of violating the variance agreement granted. Variance approval can also be tied to efficiency measures such as improved irrigation design.

In addition to variances, utility staff and stakeholders can address strategies for transitioning to the new watering schedule. For instance, the utility can allow a temporary transition period before the watering schedule is enforced so that customers can acclimate their irrigation practices to the new schedule. The conservation coordinator should also take this time to gather input on recommended education and enforcement strategies.

After finalizing the proposed watering schedule and related provisions, the conservation coordinator should conduct a public review period to introduce the proposed outdoor watering schedule. Utilities may utilize these public engagement opportunities to convey the importance of the proposed watering schedule in achieving city-wide conservation objectives and long-term cost savings. Listening carefully to concerns and addressing them with adjustments to schedules, variance options, and education programs will build support for the rule or ordinance.

Other special considerations will vary with community characteristics. If there is a wide disparity in homes that have automatic irrigation systems and the homes without, it may be possible to devise distinct rules for both. Mandatory watering schedules are more of a burden for people exclusively using more manual watering application methods from hoses. Hose-end methods also generally result in lower water consumption. Exempting hand-held watering is another option to consider as it provides an outlet for people concerned about what to do if they miss their assigned day or have a malfunction with their irrigation schedule.

#### 4. Ordinance/rule drafting and enforcement plan

After determining an appropriate outdoor watering schedule, utilities can move forward with drafting the rule or ordinance. This draft should be shared with all stakeholder groups for vetting and clarification well before adoption.

The enforcement plan is critically important to success. If the rules are part of city ordinance, they may be a criminal violation enforced by local peace officers and administered by the local municipal courts. The rules might also result in fees on the water bill which should have a cost basis for how the amount is set. The fee can reflect the costs of education and enforcement. The fee amount can also reflect the estimated volume of water wasted from non-compliance and apply long-term costs of new water supplies to generate a fee. If fees are collected, utilities should identify how funds will be used. Applying funds to other conservation or environmental needs in the community smooths over concerns that the rules exist for revenue needs of the utility.

There will be many decisions to discuss and logistics to plan. Consider carefully what steps are practical at all stages. For example, will it be practical to require a photo of the violation before a fine or citation can be issued? Under what circumstances will a violation have a penalty? Is it practical to require a warning first before each one? Utilities should think through answers to these common questions and consider talking with other utilities experienced with long-term enforcement processes. Utilities must also keep in mind who will maintain records of complaints and what the process will be for disputing a violation that is imposed.

#### 5. Starting regulation

##### Education and outreach

- a. Develop a public education and outreach campaign that delivers ongoing messaging to customers about the outdoor watering schedule and offers educational resources on landscape watering needs and efficient irrigation practices.
- b. Promote educational opportunities both internally, as well as externally through the local landscaping community (e.g., at local nurseries, garden centers).
- c. Team up with educational institutions and local organizations representing irrigators and landscapers to offer information-based tools and materials to water customers (e.g., Texas A&M Agrilife Extension's *Water My Yard* Program).
- d. Engage with local media to broaden the reach of the messaging and awareness of the watering schedule.

### Enforcement

- a. Provide water customers with an easily accessible method for reporting watering violations, including an online form, hotline, web app, etc.
- b. Dedicate at least some staff resources or contract with peace officers to patrol for watering violations.
- c. Utilize violations as opportunities to amplify education and outreach efforts by making water customers more aware of watering schedules and effective irrigation practices.

Robust educational and enforcement efforts are essential for ensuring the greatest water savings possible. Utilities can enhance the implementation of outdoor watering schedules with time of day restrictions, which aim to prevent watering during the hottest and windiest part of the day, and water waste prohibitions, which aim to reduce water lost to wasteful activities.

## 6. Tracking progress

It is important to evaluate the success of the watering schedule, variance procedures, and enforcement mechanisms regularly. It is expected that adjustments will be needed periodically. Scheduling a six-month or one-year check-in with stakeholders is recommended so that they know their concerns will be considered.

Utilities can maximize the effectiveness of outdoor watering schedules by introducing measures to complement this BMP. These complementary BMPs include:

- Athletic Field Conservation
- Golf Course Conservation
- Landscape Irrigation Conservation & Incentives
- Park Conservation
- Residential Landscape Irrigation Evaluation

### *Scope & Schedule*

The full scope and schedule depends on the utility's unique context. What follows is a recommended scope and schedule for utilities with or without ordinance making powers. These efforts should be tailored based upon what water customers are willing to accept and participate in, as well as resources available to the utility.

1) For utilities with regulatory authority:

a. First 12 months

- i. Organize and conduct stakeholder process to gather community input and identify key stakeholders.
- ii. Plan, design, and propose outdoor watering schedule in coordination with an advisory committee of key stakeholders. Special items to consider include:
  1. Appropriate variance program for new landscapes, new construction, trees, athletic fields, etc.;
  2. Transitional period before watering schedule is enforced; and
  3. Potential strategies for education and enforcement.
- iii. Propose the inclusion of other outdoor watering provisions, such as time-of-day restrictions and water waste prohibition, if not already in place.
- iv. Identify enforcement mechanisms, including citations with fines and service interruption for repeat offenders.
- v. Conduct public review period to obtain additional feedback on the proposed ordinance, related provisions, and enforcement strategies.
- vi. Develop an education and outreach campaign for informing residents of the watering schedule and of the long-term cost-savings for delayed or avoided infrastructure and work with local landscape and irrigation professionals to promote proper landscaping and irrigation practices.
- vii. Develop an enforcement plan for ensuring compliance with the ordinance, including a mechanism for reporting violations or the enlistment of code enforcement officers.
- viii. Obtain final approval of ordinance.

b. Following ordinance adoption

- i. Continue implementation and outreach efforts.
- ii. Initiate enforcement program.
- iii. Review effectiveness of education and enforcement strategies and refine as needed.
- iv. Review effectiveness of the watering schedule in reducing outdoor water use and adapt as appropriate to maximize savings. Consider whether a once per week watering schedule would be feasible.

2) For utilities without regulatory authority:



- a. First 12 months
  - i. Organize and conduct stakeholder process to gather general public input as well as input from the landscape and irrigation community.
  - ii. Design and implement a voluntary, no more than twice per week watering schedule.
  - iii. Assess potential to adjust fee structure to incentivize compliance with the watering schedule.
  - iv. Develop an educational campaign for informing water customers of the voluntary program and work with local landscape and irrigation professionals to promote proper landscaping and irrigation practices.
- b. Following program adoption
  - i. Continue implementation and outreach efforts.
  - ii. Review effectiveness of the education campaign and voluntary program and refine as needed.

### *Measuring Implementation & Determining Water Savings*

The evaluation of BMP implementation should focus on education, customer engagement, and overall compliance. Utilities should conduct an internal review of their educational outreach and enforcement plans to assess the success of their implementation efforts. Utilities may address the following metrics:

- 1) Frequency of public messaging campaigns, including number of residents reached via social media or number of people signing up for newsletters;
- 2) Number of external educational opportunities pursued by the utility (i.e., teaming with garden centers or institutions to produce educational materials or tools);
- 3) Records of enforcement mechanisms, including number of violations reported online or via hotline and number of residents using the mobile app;
- 4) Records of enforcement actions, including number of reported violations, location of violations, time of violations, and amount of revenue generated by fines; and
- 5) Customer water use records prior to and after the ordinance was adopted in the context of seasonal, temperature, and precipitation changes.

Following the first year of implementation, utilities may wish to conduct a general survey to assess the public's general level of awareness of the watering schedule, the effectiveness of enforcement mechanisms, and opportunities for improving educational and enforcement initiatives. Utilities may consider additional stakeholder outreach to guide BMP review, depending on the results of the survey. After gathering input from the survey and stakeholder meetings, utilities should refine their education and enforcement strategies as needed.

When it comes to estimating the total water savings that will be achieved from this BMP, it is important to assess the baseline water habits of the utility customers. For utilities where most homes have automatic irrigation systems, the savings will likely be greater. A survey of current irrigation frequency habits and methods will help to assess the potential. A typical home irrigation system uses 1,400 to 2,000 gallons of water each time it is operated. This number can be applied to an estimate of the number of irrigation cycles that will be eliminated per month for a savings estimate.

According to a study based on savings data from multiple cities in Texas and other states, utilities can expect 2 to 11 percent savings on total municipal water usage from the implementation of no more than twice per week outdoor watering schedules for all municipal water use categories ([Water Conservation by the Yard: A Statewide Analysis of Outdoor Water Savings Potential](#)). The amount of effort a utility dedicates to educating the public and enforcing the watering schedule has a significant impact on the overall savings associated with this BMP. Utilities can refer to this study for additional information on how these factors affect the range of potential savings.

When assessing actual water savings, utilities should incorporate weather and other variables impacting outdoor water use patterns. Analytical approaches to calculating these savings can include linear regression modeling. Utilities should enlist the help of appropriate staff members to conduct these analyses. For smaller utilities lacking significant staff support, calculating precise savings may not be possible. However, these utilities can estimate general savings results by evaluating before and after water usage. All utilities should keep in mind that if they are concurrently pursuing other new initiatives to lower outdoor water consumption, such as incentive programs or conservation pricing, it may be difficult to tease these factors out of the savings calculations. Utilities should be transparent with these data limitations when measuring and presenting the savings from no more than twice per week watering schedules.

### *Cost-effectiveness Considerations*

The primary costs associated with implementing this BMP will be ongoing administrative and staff costs. These costs will depend heavily on the extent to which the utility delivers education and outreach messaging, as well as enforces compliance with the watering schedule.

Considerations when determining the cost-effectiveness of this BMP include:

- 1) Comparing the cost of enforcement versus expected water savings and projected cost of avoided/delayed additional water supply projects;

- 2) Benchmarking implementation costs against the cost of water – higher costs of water (new water supplies) can justify more expenditures on oversight;
- 4) Utilities can expect greater water savings with more robust education and enforcement efforts;
- 5) If fines are implemented as part of the enforcement program, the revenues can be included in the cost-effectiveness analysis;
- 6) Cost categories may include marketing, advertising, hiring of additional staff, etc.

### *References for Additional Information*

#### Analyzing seasonal use & system peaks

Cabrera, R.I., K.L. Wagner, and B. Wherley. 2013. An Evaluation of Urban Landscape Water Use in Texas. *Texas Water Journal*, 4, 14-27.

<https://journals.tdl.org/twj/index.php/twj/article/view/6992>

Hermitte, S.M. and R.E. Mace. 2012. The Grass is Always Greener... Outdoor Residential Water Use in Texas. Texas Water Development Board.

[http://www.twdb.texas.gov/publications/reports/technical\\_notes/doc/SeasonalWaterUseReport-final.pdf](http://www.twdb.texas.gov/publications/reports/technical_notes/doc/SeasonalWaterUseReport-final.pdf)

McCormick, L. and J. Walker. 2010. Sprayed Away: Seven Ways to Reduce Texas' Outdoor Water Use. National Wildlife Federation, Lone Star Chapter of the Sierra Club. [http://texaslivingwaters.org/wp-content/uploads/2013/03/sprayed-away\\_report.pdf](http://texaslivingwaters.org/wp-content/uploads/2013/03/sprayed-away_report.pdf)

Texas Living Waters Project. 2015. Water Conservation by the Yard.

[http://texaslivingwaters.org/wp-content/uploads/2015/03/SC\\_WaterConservByYard\\_report\\_031115\\_R.pdf](http://texaslivingwaters.org/wp-content/uploads/2015/03/SC_WaterConservByYard_report_031115_R.pdf)

#### Designing a water schedule

Alliance for Water Efficiency. 2015. Explaining Outdoor Water Use Restrictions.

<https://www.youtube.com/watch?v=pLXSGRMXrk8&feature=youtu.be>

Texas Living Waters Project. 2018. Water Conservation by the Yard: A Statewide Analysis of Outdoor Water Savings Potential.

<http://texaslivingwaters.org/deeper-dive/wcbty-2018/>

#### Designing education & enforcement efforts

Quesnel, K., and N. Ajami. 2017. Changes in Water Consumption Linked to Heavy News Media Coverage of Extreme Climatic Events. *Science Advances*. Retrieved from:

<http://advances.sciencemag.org/content/3/10/e1700784.full>

San Antonio Water Systems. Garden Style San Antonio.

<http://www.gardenstylesanantonio.com/>

Texas Living Waters Project. 2018. Water Conservation by the Yard: A Statewide Analysis of Outdoor Water Savings Potential.

<http://texaslivingwaters.org/deeper-dive/wcbty-2018/>

Texas A&M Agrilife Extension. Water Resources for Homeowners. Sprinklers & Irrigation / Landscaping, Plants & Trees.

<https://water.tamu.edu/water-resources-homeowners/>

Texas A&M University. Earth-Kind Landscaping.

<http://ekps.tamu.edu/>

#### Evaluation of water savings & cost-effectiveness

Halich, G. and K. Stephenson. 2009. Effectiveness of Residential Water-Use Restrictions under Varying Levels of Municipal Effort. Land Economics, 85(4), 614-626.

<http://www.jstor.org/stable/27759705>

Texas Water Development Board. 2017. Statewide Water Conservation Quantification Project.

[https://www.twdb.texas.gov/publications/reports/contracted\\_reports/doc/160001\\_2030\\_Water%20Conservation.pdf](https://www.twdb.texas.gov/publications/reports/contracted_reports/doc/160001_2030_Water%20Conservation.pdf)

Texas Living Waters Project. 2018. Water Conservation by the Yard: A Statewide Analysis of Outdoor Water Savings Potential.

<http://texaslivingwaters.org/deeper-dive/wcbty-2018/>

Texas Living Waters Project. 2015. Water Conservation by the Yard.

[http://texaslivingwaters.org/wp-content/uploads/2015/03/SC\\_WaterConservByYard\\_report\\_031115\\_R.pdf](http://texaslivingwaters.org/wp-content/uploads/2015/03/SC_WaterConservByYard_report_031115_R.pdf)

Texas Water Development Board. Determining Cost Benefit and Demand Savings of Municipal Conservation Efforts.

[https://www.twdb.texas.gov/publications/reports/contracted\\_reports/doc/124832\\_1507\\_Watearth.pdf](https://www.twdb.texas.gov/publications/reports/contracted_reports/doc/124832_1507_Watearth.pdf)

#### Case studies

Once per week watering schedule:

City of Austin (applies to automatic irrigation systems, only)

- Informational website
- Water Conservation Code

Twice per week watering schedule:

City of Frisco

- Informational website
- Water Management Plan

City of Dallas

- Informational website
- Water Conservation Ordinance

City of Lubbock

- Informational website
- Water Conservation Ordinance

Sample variances

City of Austin

- Variance ordinance
- Types of variances:
  - i. New xeriscape landscape
  - ii. Large property
  - iii. Environmental
  - iv. Health / safety
  - v. Income
  - vi. Medical / disability
  - vii. Tree disease / pest control

City of Lubbock

- Variance ordinance
- New landscape variance