



# Drought Response Plan

2023



**Mission:** To provide safe, sustainable and reliable water and wastewater utility services to our customers with superior quality and value.

**Vision:** To set the standard of excellence for community-based water and wastewater utility services through innovative practices in finance, operations and resource management.

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## Introduction

The goal of a coordinated Drought Response Plan is to maintain the health, safety and economic vitality of the community to the extent possible. This Drought Response Plan (Plan) is designed to maximize available water supplies and reduce water use during times of water shortage caused by drought.

Providing a reliable supply of water, which is the central mission of Highlands Ranch Water, requires being prepared for droughts of varying degrees and duration. Proper planning before a water shortage occurs from drought allows for the selection of appropriate drought responses consistent with the varying severity of droughts.

This Plan outlines guidelines Highlands Ranch Water will use to manage water supply and water use during a period of drought. These guidelines are designed to maintain the health, safety and economic vitality of the community; to avoid adverse impacts to public activity and quality of life for the community; and to consider the needs of differing customer categories as much as possible. The Plan also outlines communication strategies Highlands Ranch Water may implement during a period of drought.

Because each water shortage event from drought is different, developing a set of hard-and-fast rules to apply to all drought situations is not practical. Rather, these guidelines are intended to provide a framework for timely drought response while maintaining flexibility to respond to unique water-shortage conditions. The guidelines define objectives and tactics for drought responses Highlands Ranch Water staff may recommend to the Highlands Ranch Water Board of Directors (the Board) for implementation. The Board may adjust or refine its response as it deems appropriate.

This Plan is a product of lessons learned from past drought conditions in Highlands Ranch Water's service area and the Denver metropolitan area and will be updated as needed. The Plan is in accordance with Highlands Ranch Water's Rules and Regulations (Article V, Water Conservation; Article VII, Violations, Penalties, and Complaints; and Article VIII, Fees and Charges) and the Highlands Ranch Metro District Rules and Regulations (Article VI, Water Conservation; Article VIII, Violations Penalties and Complaints; and, Article IX, Fees and Charges).

Highlands Ranch Water recognizes the need to develop a drought response plan that provides a menu of options that can be implemented to ensure Highlands Ranch Water can provide sufficient water for essential purposes in its service area. This Plan is also intended to be a guide for the Board to facilitate decision-making.

Drought response plan implementation is a dynamic process that evolves as conditions change and new information becomes available. This Plan includes specific mandatory measures and communication strategies that may need to be implemented when certain water-shortage conditions occur due to drought. All drought response actions taken by Highlands Ranch Water are subject to approval by the Board.

## **Drought Response Plan Components**

The Plan consists of:

- Drought Severity Indicators – A variety of factors that should be considered in choosing an appropriate water-shortage response.
- Drought Response Tools – A description of the most common tools Highlands Ranch Water may use during a water shortage.
- Drought Response Actions – Guidelines for augmenting water supplies and reducing water use during times of drought conditions.

### **Defining Drought**

A drought, in the most general sense, is a deficiency of precipitation over an extended period, resulting in a water shortage for some beneficial activity or environmental purpose. A water shortage from drought occurs when available water supply from anticipated runoff and storage is reduced to a level that supporting customer demands is at risk. Not knowing exactly when a drought begins, when it will end, and its severity makes uncertainty one of the defining characteristics of drought.

Drought is a normal, recurring feature of the climate in most parts of the world. Water shortages from drought can occur quickly and require immediate response or may occur gradually, with multiple months or years passing before any response is required. A variety of factors are at play in determining how long a drought response will be required.

### **Supply**

Colorado's climate is generally characterized as semi-arid and, in the South Platte River basin, much of the water supply in the non-mountainous areas is dependent on the seasonal snowpack accumulation in the mountains that is then delivered to the various tributaries, diversion ditches, and storage reservoirs. Nontributary groundwater stored in the Denver Basin aquifers beneath Highlands Ranch Water's service area is also a source of supply, but this water is nonrenewable.

Highlands Ranch Water's water supply includes both surface water and nontributary groundwater, which in most years is more than sufficient to meet the annual demands of Highlands Ranch Water's customers. The surface water supply is comprised of a combination of junior and senior water rights on the South Platte River, surface water leases, and storage rights. Highlands Ranch Water's surface water is stored in four reservoirs with a combined storage volume of more than 17,412 AF. However, in a dry year the estimated yield of surface water is only about 9,200 AF.

The nontributary groundwater supply is stored in three Denver Basin bedrock aquifers beneath Highlands Ranch with an annual appropriation of about 18,000 AF. However, well pumping capacity limits the potential annual groundwater yield to approximately 8,000 AF to 9,000 AF, or from about 7.25 MGD to 8.0 MGD flow rate.

Shifts in weather patterns can be substantial from year-to-year and decade-to-decade, affecting both water supply and water use. Highlands Ranch Water constantly monitors

reservoir levels and ensures they are managed effectively and efficiently.

### **Long-term Customer Water Efficiency Efforts**

Highlands Ranch Water has always been committed to water efficiency and customer outreach. The water-use restrictions described in this Plan should not be confused with ongoing water efficiency efforts, described in Highlands Ranch Water's Water Efficiency Plan that can be viewed on Highlands Ranch Water's website. The Water Efficiency Plan is reviewed annually and updated at least every seven years. These efforts for all customers include the use of low water-use fixtures, creation of individual water budgets since 2003, an escalating rate structure and the following permanent lawn watering rules, which are summarized below (Highlands Ranch Metro District Rules and Regulations, Exhibit A-2, Water Conservation Measures):

#### Water Use

Wasteful use of water is prohibited at all times. Examples include:

- Excess water flowing in street gutters from irrigation or other outdoor uses.
- Unrepaired leaks or fixture malfunctions that lead to excess water use.

#### Mandatory Outdoor Water Restrictions

The following restrictions apply at all times:

- Outdoor irrigation is prohibited between the hours of 10 a.m. and 6 p.m. from May 1 to September 30, with the exception of prior approved daytime watering permit.
- Operation of an irrigation system for maintenance is allowed at any time. Maintenance is defined as actively observing an irrigation zone while it is operating to ensure it is functioning properly. A person must be visible at the location of the zone while it is running. Each zone must be turned off prior to leaving the location and not left running until the completion of a cycle.
- Hand watering of landscape materials is allowed at any time. Hand watering is defined as the application of irrigation from a hose held in the hand with a shut-off valve; or a water-conserving method such as a drip, trickle, deep root water device or watering can are used.
- Car washing is allowed at any time. However, if water for car washing is coming from a hose rather than a bucket, a hose end shut off device must be in use to prevent uninterrupted water flow.

#### Landscape Permit Outdoor Usage Adjustment

An additional allotment of irrigation for outdoor usage pursuant to the provisions of the Landscape Water Adjustment Request Form.

In addition to the above water conservation measures, Highlands Ranch Water highly recommends customers limit lawn watering with sprinklers to no more than two days per week.

There will be times when drought response actions are needed in addition to standard water efficiency efforts. Water-use restrictions are one example of a response action that is reserved for water shortage events caused by drought; but such restrictions are not intended for long-term application. Restrictions are used to minimize the impacts to community safety and quality of life and to assist in the return of normal water-supply and storage levels.

Water use restrictions will be lifted if the water supply and storage levels return to normal or, in the case of a new normal for water availability, these restrictions, in part or whole, may become permanent as the Highlands Ranch Water service area adapts to new conditions.

## **Drought Severity Indicators**

Drought severity indicators can generally be divided into two categories: (1) water supply and (2) environmental, social and economic.

Drought severity indicators are used to inform and help guide Highlands Ranch Water's staff in its recommendations to the Board. During a period of drought, the Board will carefully consider each of the drought indicators in choosing the appropriate drought response actions. When considering these actions, the Board will consider the severity and immediacy of the situation.

### **Water Supply Indicators**

Water supply indicators include snowpack, precipitation, average daily temperature, predicted reservoir storage, forecasted water use, evaporation, streamflow, soil moisture and weather forecasts. Highlands Ranch Water considers numerous drought indices such as, but not limited to, the U.S. Drought Monitor as published NDMC in conjunction with NOAA and USDA; the Surface Water Supply Index of the Natural Resources Conservation Service (SNOTEL); the Standardized Precipitation Index (SPI) as prepared by the National Center for Atmospheric Research and the University Corporation for Atmospheric Research; and, the Palmer Drought Severity Index, as published by the National Oceanic and Atmospheric Administration. Each tool integrates multiple measurements and is referenced as appropriate for a particular drought situation as water shortage indicators. The U.S. Drought Monitor provides a visual drought index and is often referenced in combination with other indices to determine a water shortage condition due to drought.

Drought severity indicators may include, but are not necessarily limited to, the following:

1. Current and projected reservoir storage levels (as a percentage of total volume) reservoir content historic trends and forecasts for:
  - a. Water supply reservoirs used by Highlands Ranch Water showing historic median, minimum, maximum and current year projected values.
  - b. During applicable seasons, large downstream agricultural and municipal reservoirs as reported monthly for the Lower South Platte River Basin by the the Colorado Division of Water Resources.
  - c. Upstream municipal reservoirs.
2. Watershed characteristics in the South Platte River basin, such as precipitation, snowpack, streamflow, and soil moisture, with comparisons to varying timeframes:
  - a. Snowpack measurements in March, April, May and June
  - b. Average daily temperatures compared to long-term (30 yr.) average
  - c. Precipitation received compared to long-term (30 yr.) average
  - d. Local soil moisture deficit conditions (as a percentage saturation of normal) from federal, state and local sources.
  - e. Flows at the South Platte at South Platte gage compared to average flows and forecasts for the summer months.
3. Water rights call history versus long term averages, shown graphically.

4. Water use, including projected water use, graphically show daily system use compared with forecasted billable demand.
5. Most recent U.S. Drought Monitor map for Colorado and most recent U.S. Seasonal Drought Outlook map for the United States.
6. Weather projections for temperature and precipitation (produced by NOAA or others):
  - a. 8 to 14 day
  - b. Monthly outlook
  - c. Three-month outlook
  - d. Six-month outlook
7. Actions taken by local, regional and/or state governments or other water suppliers regarding water use
8. Drought response actions taken by state water officials.
9. Water availability conditions and/or drought conditions in the South Platte River basin including cumulative precipitation compared with the 30-year average in the South Platte River watershed.
10. Ambient water treatment capacity:
  - a. Algae conditions in each of the reservoirs used by Highlands Ranch Water
  - b. Filter run times at the Joseph B. Blake Water Treatment Plant
  - c. Other pertinent water quality or operational limitations
11. System demand factors:
  - a. Measured and anticipated landscape irrigation demands as compared to the computed five-year average.
  - b. Measured and anticipated evaporation losses as compared to long-term averages.

The significance of indicators is dependent on the season. For example, from January through May, snowpack and early spring runoff are important indicators; from April through June, streamflow is an important indicator of likely senior calls on the South Platte River; and from June through December, reservoir storage, water use and precipitation in the South Platte basin are important indicators. Each drought event is unique, and the impact of each drought indicator can vary greatly based on the time of year.

Reservoir storage is the result of multiple factors affecting supply, including weather, snowpack, soil moisture, runoff, water rights, bypass requirements, collection system limitations and water use.

Aggregate reservoir storage in Highlands Ranch Water's surface-water system usually peaks in May or June during the early spring snowmelt. For this reason, forecasted system-wide June 1 reservoir storage is an important indicator for drought response during the runoff season.

System wide reservoir storage is forecasted and closely monitored throughout each year. Forecasts of reservoir storage are updated monthly. Predictions are based on measurements of snowpack, stream flows, bypass requirements, soil moisture, water usage, precipitation and the previous year's reservoir carryover storage.

Regardless of the water supply situation, Highlands Ranch Water staff routinely monitor hydrologic conditions, and this monitoring intensifies during dry periods. If conditions change after a water shortage and response have been declared, the declaration can be lifted, or the level of drought response can be adjusted.

### Response Guidelines

There are no hard-and-fast relationships between reservoir storage and appropriate drought response. The Board will evaluate many factors in addition to reservoir storage when making its drought response decisions. A list of drought indicators the Board will consider can be found at the beginning of this section. The Board is not limited to just these indicators and may also use other tools, information and/or resources.

### Environmental, Social and Economic Indicators

In addition to hydrologic data and reservoir storage information, Highlands Ranch Water's water-shortage response due to drought will take into account public perceptions about the water shortage, the drought response activities of other local, regional and/or state governments or water providers, media coverage and economic considerations. Although environmental, social, and economic indicators may not always be quantitative, they can be monitored and described for consideration in the Board's decisions about the appropriate drought response.

### Response of Other Water Suppliers

Water shortages due to drought effect the water supplies of the Denver metropolitan area water providers in different ways. For example, systems, like Highlands Ranch Water, that rely principally on a single watershed (in Highlands Ranch Water's case, the South Platte basin) may be better or worse off during a drought, depending on localized water supply conditions. Additionally, metro-area systems, like Highlands Ranch Water, that partially rely on junior water rights could be impacted earlier or more severely than Denver Water's system.

The Board will weigh the effects of implementing restrictions on Highlands Ranch Water customers' water use if those restrictions differ from other utilities, either in timing or level of restrictions. Alternately, the Board may consider participating in a unified metropolitan area response with restrictions consistent with those of other utilities. Because of Denver Water's service area size, and corresponding local media influence, Denver Water's response decisions can influence the drought response decisions of other local water utilities, including Highlands Ranch Water.

Highlands Ranch Water is also mindful of water shortage conditions across Colorado, especially in the South Platte River basin.

### Media Response

Much of the information customers receive about drought comes from traditional and social media outlets. Members of the news media can be helpful in conveying factual information to customers, and they also play a key role in shaping public perception of water shortage. Highlands Ranch Water staff will work closely with the news media and share information via social media and Highlands Ranch Water's website to keep customers as informed as possible.

## Economic Impacts

One of the principles guiding Highlands Ranch Water's drought response is to maintain the economic vitality of the Highlands Ranch community to the greatest extent possible. Water restrictions imposed in response to water shortage due to drought can impact businesses in different ways. Highlands Ranch Water recognizes our customers' benefit from maintaining greenbelts and sports fields for recreational activities. As part of its public outreach efforts, Highlands Ranch Water will continue to carefully coordinate restriction programs with water-reliant governmental and commercial customers so that the economic activity of the community, recreation activities and other individual customer needs are considered as much as possible.

## Environmental Effects

A water-shortage event due to drought that reduces streamflow within the South Platte River system will reduce inflows to Highlands Ranch Water's reservoirs. Water use restrictions, and subsequent reductions in customer water demand, support the conservation of water stored in Highlands Ranch Water's reservoirs. However, water-use restrictions and subsequent reductions in customer usage in Highlands Ranch Water's service area will not directly result in increased water in the South Platte River. There are several factors that effect diversion rates from streams in the South Platte River basin, such as water right priority, reservoir storage levels, treatment plant operations, various operations and maintenance needs, and resiliency of water supply sources among other factors besides customer demand rates.

## Uncertainty Associated with Forecasts

Although Highlands Ranch Water's water resources staff are continually monitoring weather reports and water shortage indicators throughout the year, future weather, precipitation and temperature cannot be predicted with absolute certainty. Forecasting a future drought and resulting water shortage or knowing with certainty if one currently exists can be difficult. When a dry year occurs, for example, it is unknown whether it is the first year of a three-, five-, 10-year or longer drought, or if it is merely a dry year somewhere in a series of average-to-wet years. Even though droughts cannot always be predicted, Highlands Ranch Water will continue to prepare for drought contingencies and continue to advise customers about water use efficiency, conservation and leak detection.

## Goals and Assumptions

The Plan must be flexible to address both short-duration droughts lasting several consecutive months, or long-duration droughts lasting multiple consecutive years. Water supply assumptions may remain largely static, with the exception of groundwater production, which may gradually decline over time as pumping levels in each well drops. Additionally, from time-to-time, some wells will be off-line for maintenance and equipment replacement.

Also, each of Highlands Ranch Water's surface water leases include provisions allowing for some reduction in water delivery quantities, at the discretion of the lessor during drought conditions. Water deliveries from the WISE project can also be reduced, or suspended all-together, during a severe drought.

### Drought Response Plan Goals

In order of priority, the Plan goals to be achieved through improved water-use efficiency and conservation measures are as follows:

1. Provide sufficient water supply to maintain the health, safety and economic vitality of the community; and meet the indoor water requirements for all customers, but with a priority for hospitals, health clinics, residences, schools, government offices and businesses.
2. Provide sufficient water supplies for the maintenance of heavily used irrigated landscapes and facilities such as, but not limited to, school play areas, irrigated sports fields, golf courses, irrigated outdoor wedding venues, indoor recreation and athletic facilities, historic sites, botanic gardens and amphitheaters to the extent achievable depending upon the drought severity.
3. Provide sufficient water supplies for the maintenance of irrigated residential property and parks to the extent achievable depending upon the drought severity.
4. Provide sufficient water supplies for the maintenance of irrigated common areas such as government property within the community to the extent achievable depending upon the drought severity.
5. Provide sufficient water supplies for the maintenance of irrigated commercial property to the extent achievable depending upon the drought severity.

### Water Supply Assumptions

1. Estimated build-out water demand: 20,000 acre-feet/year.
  - a. Includes estimated demand: 18,500 AF/YR (which includes 1,200 AF/yr (7%) of potable water system loss from leaks, meter under-registration, hydrant flushing and non-billed water usage).
  - b. Includes reservoir storage evaporation (including Chatfield Reservoir): 1,500 AF/YR
2. Reservoir storage capacity (including Chatfield Reservoir): 17,412 AF.

3. Groundwater production into the water distribution system (after treatment and disinfection) as limited by existing well pumping capacity: 7.25 to 8 MGD; approximately 8,000 AF/YR to 9,000 AF/YR, depending upon which wells are operating.
4. Dry-year surface water yield: 9,200 AF (from average of 2002, 2003 and 2004).
5. WISE deliveries: 0 to 1,000 AF/YR.
6. Desired minimum surface water storage prior to the start of irrigation season: 6,000 AF.
7. Water production from wastewater treatment plant reuse system: 400 AF/YR current capacity.

## Drought Response Tools

As water shortage indicators emerge due to drought, efforts to add water supplies and reduce water use increase.

This Plan consists of two components: the **indicators** that inform and help guide Highlands Ranch Water staff recommendations to the Board regarding an appropriate drought response, and the corresponding **tools** and **actions** the Board may decide to use and take in response to drought.

### Drought Response Committee

Highlands Ranch Water has an ongoing inter-departmental Drought Response Committee formed to oversee the Highlands Ranch Water response to conditions of unusual dryness and droughts. The committee is chaired by Highlands Ranch Water's water rights administrator. The committee is comprised of the following individuals: general manager, director of finance, director of public works, director of operations, water resources manager, water rights administrator, water efficiency coordinator, communications manager, representatives of the Highlands Ranch Metro District and any other person recommended by the chairperson and agreed to by the members.

The members generally meet monthly during periods of drought but can meet at whatever frequency is jointly determined by the members. The committee monitors drought indicators and develops and recommends appropriate drought responses to the Highlands Ranch Water Board of Directors.

When there is an ongoing water shortage due to drought, this committee will evaluate the effectiveness of any current drought response and the need for additional responses. Recommendations for adjusting the response are submitted to the Board by the committee for final approval, disapproval or adjustment. Because every drought is different, the Board may refine drought response actions based on actual conditions, as determined by the Board.

The framework for the Board's drought response actions includes four stages of drought severity. Each stage is based on drought indicators, as well as various environmental, social and economic indicators discussed in the previous section.

### Four Stages of Drought

For each drought stage, progressively more stringent responses are recommended. Some drought response measures — particularly those designated for mild episodes of drought — require minimal modification of customer usage. However, measures can become mandatory, more costly and potentially intrusive as water shortage intensifies due to drought. The four stages of drought include:

1. Drought Watch – increased communication and education.
2. Stage 1 Drought – mandatory water use restrictions, including limited outdoor watering.
3. Stage 2 Drought – increased mandatory water use restrictions, including certain prohibitions on outdoor watering.

#### 4. Stage 3 Drought – prohibition of outdoor water use and potential water rationing.

To activate a particular drought stage, the Board, in a public Board meeting, declares a drought stage and adopts an effective date for imposing the applicable and appropriate restrictions.

Because many water shortages due to drought involve mandatory restrictions, they must be consistent with and become enforceable pursuant to Highlands Ranch Water's Rules and Regulations and provisions in Highlands Ranch Water's water service agreements. The decision of the Board will be communicated to Highlands Ranch Water customers and other stakeholders, as provided in Appendix B.

Fact sheets for each of the four drought stages can be found on page 18 of this Plan.

### **Toolbox of Drought Response**

Highlands Ranch Water's primary response to drought is to reduce water use so supplies will be available for the most essential uses throughout the drought. Where possible, Highlands Ranch Water will take steps to augment supply. A variety of actions, rather than one single approach, is generally more effective at creating an overall atmosphere that promotes water use reductions. The actions discussed in the sections that follow include water use messaging, education and enforcement and water use restrictions, drought pricing, and monitoring and evaluation.

Restricting the number of days and times allowed for watering landscapes can be an effective method for reducing water use. Other methods, such as public information efforts and drought pricing, complement those watering restrictions. Other actions may not substantially reduce water use but will heighten public awareness of drought severity and may eliminate discretionary uses of water.

#### **Water Use Messaging, Education and Enforcement**

During a water shortage due to drought, Highlands Ranch Water will continue to educate customers about efficient water use, conservation, leak detection, the enforcement of water waste rules and drought restrictions, and help customers to save water. Highlands Ranch Water will also monitor its service area to identify non-compliance with drought restrictions. The primary goal of the program is to educate and inform customers and, secondary, to enforce penalties against violators.

Highlands Ranch Water will distribute educational materials, help customers reduce their water use and answer questions about the water shortage caused by the drought. Customers can report water waste to Highlands Ranch Water's customer service department at 303-791-0430 or [contactus@hrwater.org](mailto:contactus@hrwater.org). Violators may receive written warnings and may be fined for violations. All customers (owner or occupant of a property) are responsible for complying with drought restrictions and exemption terms.

#### **Water Use Restrictions**

Once the Board has declared a drought stage, Highlands Ranch Water will activate the corresponding set of recommended responses. Highlands Ranch Water's goal for drought

response is to maintain the health, safety and economic vitality of the community to the extent possible in the face of water shortage caused by the drought.

The character of Highlands Ranch Water's service area and surrounding communities includes a verdant tree canopy, greenbelts, and important recreational amenities for the residents and visitors. Highlands Ranch Water will strive to avoid completely prohibiting outdoor water use to protect those resources during periods of water shortage due to drought. While Highlands Ranch Water staff and the Board recognize future uncertainties may limit the ability of Highlands Ranch Water to meet this goal, projects and programs will be put in place to reasonably maintain suburban landscapes, with a priority on public spaces that provide a community benefit.

Highlands Ranch Water, as directed by the Board, will strive to follow the principles below as much as practical when restricting outdoor water use during a water shortage caused by drought.

Avoid loss of urban landscapes.

- Allow for watering of trees and shrubs, if possible.
- Avoid damaging perennial landscaping, if possible.
- Tailor watering restrictions to know landscape needs as much as possible.

Restrict less-essential uses before essential uses.

- In Drought Stages 2 and 3, customers must follow Highlands Ranch Water's rules for outdoor water use throughout the year.
- Highlands Ranch Water will curtail less-essential water use before restricting essential outdoor use. For example, limiting or prohibiting irrigation of residential / commercial / government lawns first while allowing watering of trees and shrubs.

Prioritize the preservation of public and community spaces.

- Prioritize water use for heavily used irrigated landscapes (as defined on page 9).
- Preserve community pool use before residential pool use.

Minimize adverse financial effects to customers.

- Be respectful of water-based businesses that will be financially impacted by restrictions.

Implement extensive public information and media relations programs.

- Provide clear and accurate information to customers about conditions and actions they can take to reduce water use.
- Increase the frequency and modes of communication with customers and stakeholders.
- Maintain the trust of customers and other stakeholders.

- Ensure communications and education are appropriate and tailored to the needs of customers.

### Drought Pricing

Drought pricing may be implemented as part of a drought response or declaration by the Board. Drought pricing is designed to increase awareness of the drought's severity and provide motivation for customers to reduce water use, which will help meet water-use reduction targets through pricing signals. Drought pricing is different from the regular rate structures for water service in that it is temporary in nature. The drought declaration will define the criteria for implementing and removing drought pricing.

Highlands Ranch Water may consider several guiding principles in developing drought pricing, including, but not limited, to:

- The relationship between price, supply and demand reduction – that is how much of an increase is necessary to achieve a specific percent water demand reduction based on industry research or experience.
- Different rate structure adjustments for residential customers and irrigation only customers.
- Projected amount of time expected from the date of adopting drought pricing to a measurable reduction in water demand.
- The ability to incorporate drought pricing into an overall program to increase customer awareness of the drought's severity and importance of saving water.
- The applicability of drought pricing to current water demands or other demands on the water supply.
- The severity of the drought and response philosophies.
- The ability to integrate drought pricing into existing Highlands Ranch Water and master meter billing systems.
- Public information and education necessary to help customers understand drought pricing in a short timeframe.

Any new or changed drought pricing will be developed during Highlands Ranch Water's annual rate setting process in the latter months of the calendar year and be subject to the public hearing procedure that is part of the normal budget-setting process. The rates, including the drought rates, are adopted by the Highlands Ranch Water Board in December of each year and are displayed in Exhibit A, Rates, Charges and Restrictions of the Highlands Ranch Water's Rules and Regulations.

To impose or change drought rates, the Highlands Ranch Water Board shall comply with the 30-day notice provisions, as stated in CRS 32-1-1001(2), which states: "The governing body ... may increase rates ... only after consideration of the action at a public meeting held at least 30 days after providing notice that the action is being considered and stating the date, time and place of the meeting at which the action is to be considered."

For drought pricing to be as effective as possible, it is likely more effective to introduce new drought pricing as early in the irrigation season as practical because there is up to a two-month lag time before all customers will see the impact of the changed rates in their water bills. Therefore, if the decision to use or change drought pricing can be determined in May or June, this will give more time for the program to be effective in reducing more of the summer season's higher water use.

### Drought Response Within Master Meter Districts

Northern Douglas County Water and Sanitation District (NDCWSD), which receives water from Highlands Ranch Water through a master meter, is governed by its service agreement with Highlands Ranch Water and as such must fully abide by any drought restrictions imposed by the Board. NDCWSD retains the right to make and enforce its own rules, including more restrictive rules, as long as the rules are not inconsistent with Highlands Ranch Water's Rules and Regulations.

### Monitoring and Evaluation

When drought conditions emerge, staff will intensify their monitoring and evaluation activities. The monitoring and evaluation program will track information, such as snowpack, soil moisture, streamflow, precipitation, water right priority, reservoir levels, and weather forecasts. In addition, water usage and its corresponding revenue will be compared to normal use and weather-adjusted expected use. If water-use reduction goals are not being met, the Board may increase public outreach and/or the level of drought response.

### Increasing Water Supply

In addition to reducing water use during a drought, Highlands Ranch Water will continue to evaluate the potential for increasing its supplies by gaining access to other water sources.

Each augmentation option presents unique intergovernmental, technical and financial issues, and each will depend on current conditions.

### Use of Recycled Water

Highlands Ranch Water has the right to make additional use of its reusable water, as allowed by its water right decrees. Highlands Ranch Water has a recycling facility located at the Marcy Gulch Wastewater Treatment Plant that takes previously treated wastewater, treats it to state standards for recycled water, and delivers it to certain customers which are located near the Joseph B. Blake Water Treatment Plant, for irrigation purposes. At the present time, these customers include Redstone Park (Highlands Ranch Metro District), Highlands Ranch Golf Course and Windcrest.

Recycled water has different supply characteristics than potable water. Customers who use recycled water are subject to regulations on usage that do not apply to customers of potable water. In recognition of these differing circumstances, Highlands Ranch Water reserves the right to adopt different water use restrictions for recycled water customers, or to refrain from imposing any water use restrictions on recycled water customers, depending on the availability of the recycled water source at the time of a declaration.

# Drought Response Actions

## Program Actions by Stage

The table of drought stages and potential responses in Appendix A is meant to be a guide to water uses under various levels of water-shortage restrictions because of drought. Highlands Ranch Water reserves the right to modify these program elements as needed to meet changing water-supply conditions.

## Drought Stage Severity Indicator Guidance Table

The recommendation by the Drought Response Committee to the Board is based on multiple sources of information including the drought severity indicators. The severity indicators are organized and summarized in the following Table 1, which is broken into the subcategories of quantitative indicators, qualitative indicators and additional information. The table is a guideline only of the possible indicators and considerations related to each stage of drought response and a tool for presenting the stage recommendation to the Board. There are no hard and fast rules on the selection of stages and all indicators should be considered together, subject to additional human reasoning.

Table 1: Drought Stage Severity Indicator Guidance

All to be considered together, subject to human reasoning and not absolute. Data reflects suggested targets per drought stage.

### Quantitative Indicators

Quantitative Indicators	Source of Information	No Stage: Normal	Drought Watch	Stage 1	Stage 2	Stage 3
HR Water storage reservoirs: percent full on April 30, May 31, June 30 and July 31	HR Water daily accounting	Above 45%	40-45%	30-40%	25-30%	Less than 25%
Downstream reservoirs tracked monthly by Division Engineer: percent full of total volume	Division Engineer monthly report	Above 50%	50-30%	30-20%	Less than 20%	Less than 20%
Snowpack in South Platte Watershed: percent of 30-year median	USDA SNOTEL	100%	90%	80%	70%	Less than 70%
Cumulative precipitation South Platte Watershed: percent of 30-year average	NWS/NRCS	100% or more	90%	80%	70%	Less than 70%
Accumulated precipitation in Denver area: percent of normal	National Weather Service	90%	80%	60%	Less than 60%	Less than 60%

<b>Quantitative Indicators</b>	<b>Source of Information</b>	<b>No Stage: Normal</b>	<b>Drought Watch</b>	<b>Stage 1</b>	<b>Stage 2</b>	<b>Stage 3</b>
HR Water water demand: percent above projection for last month	HR Water daily accounting	None	0-5	6-8	9-12	More than 12
South Platte River streamflow at Chatfield: percent of average	DNR/USGS	100%	90%	80%	70%	Less than 70%

### Qualitative Indicators

<b>Qualitative Indicators</b>	<b>Source of Information</b>	<b>No Stage: Normal</b>	<b>Drought Watch</b>	<b>Stage 1</b>	<b>Stage 2</b>	<b>Stage 3</b>
Call on day of committee meeting	HR Water daily accounting	1900-1948	1880-1900	1870-1880	Before 1870	Before 1870
US Drought Monitor: characterization of conditions	Drought monitor website	None	Moderate drought	Severe drought	Severe drought or worse	Extreme or exceptional drought
South Platte River at South Platte station streamflow forecast	USGS/NRCS	At or above average	Slightly below average	Below average	Considerably below average	Considerably below average
Weather forecasts: temperature and precipitation: varying timeframes	NWS/NOAA	Normal	Leaning dry and hotter	Dry and hot	Very dry and hot	Very dry and hot
Soil moisture descriptions	NRCS	Normal	Slightly dry	Dry	Very dry	Extremely dry

NWS: National Weather Service

USDA: U.S. Department of Agriculture

NRCS: Natural Resources Conservation Service

DNR: Colorado Department of Natural Resources

USGS: U.S. Geological Survey

NOAA: National Oceanic and Atmospheric Administration

### Drought Response Fact Sheets

Below are separate fact sheets for each of the four stages of drought responses that might be declared by the Board. The potential responses for each stage are described in both the fact sheet and in Appendix A.

## Drought Watch Drought Response: Increased Communication and Education and Mandatory Outdoor Water Use Restriction

### Description:

A Drought Watch will increase communication to customers to alert them that water supplies are below average, conditions are dry, and continued dry weather could lead to mandatory outdoor water use restrictions.

### General Indicators (applicable for each of the four drought stages):

During a water shortage due to drought, each of the drought indicators will be carefully considered in choosing the appropriate drought response actions as determined by the Board. When considering these actions, the Board will take into account the severity and immediacy of the situation as determined by the Board.

Drought indicators include, but are not necessarily limited to, the following: (See page 5 for a more detailed description of drought severity indicators that can be used for decision-making and the Drought Stage Severity Indicator Guidance Table on page 16 for additional guidance.)

1. Current and projected reservoir storage supply.
2. Watershed characteristics in the South Platte River basin, such as daily average temperature trends, precipitation, snowpack, streamflow, evaporation and soil moisture.
3. Water use, including projected water use.
4. Weather forecasts and regional weather patterns.
5. Actions taken by local, regional and/or state governments or water suppliers regarding water use.
6. Drought response actions taken by state water officials.
7. Water availability conditions and/or drought conditions in the South Platte River basin.

### Specific Drought Watch Indicators for the Drought Watch Stage:

1. Highlands Ranch Water's projected usable reservoir storage is between 40% and 45% full (6,900 AF to 7,700 AF) on either April 30, May 31, June 30 or July 31.
2. Watershed characteristics, such as precipitation, snowpack, streamflow, evaporation and soil moisture, indicate abnormal and prolonged dryness.
3. Service-area precipitation indicates abnormal and prolonged dryness.
4. Other local, regional and/or state governments or water suppliers are preparing to respond to the dryness.
5. News media are sending messages that imply drought may be pending.
6. Customer water use is significantly above recent average.
7. Denver Water and other water providers in the Denver metropolitan area adopt a Drought Watch or similar response.
8. There are water availability issues and/or drought conditions inside of the South Platte River basin.

Use Reduction Target: 5 – 10% of customer average use (currently (2021) 16,500 AF/YR), or

approximately 825 AF to 1,650 AF.

Potential Highlands Ranch Water Responses:

1. Increase communication and education to customers and stakeholders to explain that we are beginning to see indicators of drought (see communications plan in Appendix B).
2. Encourage customers to continue to use water efficiently and provide suggestions for voluntarily reducing water use to reduce the risk of progressing to mandatory restrictions.
3. Prepare external stakeholders and internal staff for the possibility of mandatory restrictions.
4. Enhance the water use education and enforcement program.
5. A table of drought stages and potential responses is presented in Appendix A. See Appendix C for potential response impacts to irrigated properties owned and managed by the Highlands Ranch Metro District.
6. Outdoor watering shall be limited to three days per week. Below is a sample of what a three-day per week watering schedule may look like:

Property	Watering Days
Single-family and small multi-family (less than seven units) residential properties with odd-numbered addresses	Sunday Tuesday Thursday
Single-family and multi-family (less than seven units) residential properties with even-numbered addresses	Saturday Monday Wednesday
Multi-family (seven or more units) and apartment properties	Sunday Tuesday
Office buildings	Saturday Monday Tuesday
Properties managed for the sole enjoyment and recreation of the public, including parks and schools	Any day(s) of the week, but entities must stay equal to or under their water budget
All others	Saturday Monday Wednesday

Stage Exit Criteria

The drought response committee will regularly monitor the Drought Severity Indicators to determine if multiple conditions have relieved the concerns that caused the drought stage to initially be recommended and adopted.

The committee will also consider if the lessening of the concerns due to changing conditions appear to be reasonably sustainable for the foreseeable future.

Upon the consensus of the drought response committee members that conditions are significantly improving, and are likely to continue improving, the committee will make a

recommendation to the Highlands Ranch Water Board of Directors to exit a drought stage, as appropriate.

## Stage 1 Drought Response: Mandatory Outdoor Water use Restrictions, Including Limiting Outdoor Watering

### Description:

A Stage 1 Drought Response imposes mandatory outdoor water use restrictions and requires greater effort on the part of customers. The Board will adopt a plan to set specific customer watering days once they declare Stage 1 restrictions. Stage 1 allows two days per week watering.

### General Indicators:

During a water shortage due to drought, each of the drought indicators will be carefully considered in choosing the appropriate drought response actions as determined by the Board. When considering these actions, the Board will take into account the severity and immediacy of the situation as determined by the Board.

Drought indicators include, but are not necessarily limited to, the following: (see page 5 for a more detailed description of drought severity indicators that can be used for decision-making and the Drought Stage Severity Indicator Guidance Table on page 16 for additional guidance).

1. Current and projected reservoir storage supply.
2. Watershed characteristics in the South Platte River basin, such as daily average temperature trends, precipitation, snowpack, streamflow, evaporation and soil moisture.
3. Water use, including projected water use.
4. Weather forecasts and regional weather patterns.
5. Actions taken by local, regional and/or state governments or water suppliers regarding water use.
6. Drought response actions taken by state water officials.
7. Water availability conditions and/or drought conditions in the South Platte River basin.

### Specific Stage 1 Drought Indicators for the Drought Watch Stage:

See page 5 for a more detailed description of drought severity indicators that can be used for decision-making and the Drought Stage Severity Indicator Guidance Table on page 16 for additional guidance.

1. Highlands Ranch Water's projected usable reservoir storage is between 30% and 40% full (5,200 AF to 6,900 AF) on either April 30, May 31, June 30 or July 31.
2. Watershed characteristics, such as precipitation, snowpack, streamflow, evaporation and soil moisture, indicate severe and prolonged dryness.
3. Other local, regional and/or state governments or water suppliers are planning to enact mandatory restrictions.
4. Customers believe mandatory water use restrictions are appropriate.
5. State water officials are engaged in drought response activities.
6. Circumstances warrant possible adverse impacts on water-dependent businesses involved in outdoor water use.
7. Customer water use is significantly above recent average.

- There are water availability issues and/or drought conditions inside of the South Platte River basin.

Use Reduction Target: 15 – 20% of customer average use (currently (2021) 16,500 AF/YR), or approximately 2,500 AF to 3,300 AF.

Potential Highlands Ranch Water Responses:

- Increase communication and education to customers and stakeholders to explain Stage 1 Drought restrictions (see communications plan in Appendix B).
- Existing watering rules will still be in effect as specified in Highlands Ranch Water’s Water Efficiency Plan. Monitoring and enforcement will be increased.
- Trees, shrubs, and perennials may be watered by means of a hand-held hose equipped with a shut-off device or low-volume non-spray irrigation on any day.
- Annuals and vegetables may be watered any day by means of a hand-held hose equipped with a shut-off device or low-volume non-spray irrigation.
- An irrigation system may be operated outside the watering schedule for installation, repair or reasonable maintenance, so long as the system is attended throughout the period of operation and water waste does not occur.
- All irrigation control systems must be reprogrammed for operation in compliance with Stage 1 Drought watering schedule approved by the Board or must be operated manually.
- A table of drought stages and potential responses is presented in Appendix A. See Appendix C for potential response impacts to irrigated properties owned and managed by the Highlands Ranch Metro District.
- Outdoor watering will be limited to two days per week. Below is a sample of what a two-day per week watering schedule may look like:

Property	Watering Days
Single-family and small multi-family (less than seven units) residential properties with odd-numbered addresses	Sunday Wednesday
Single-family and multi-family (less than seven units) residential properties with even-numbered addresses	Saturday Tuesday
Multi-family (seven or more units) and apartment properties	Monday Thursday
Office buildings	Tuesday Friday
Properties managed for the sole enjoyment and recreation of the public, including parks and schools	Any day(s) of the week, but entities must reduce water consumption by 20% or more of their water budget
All others	Monday Friday

### Drought Pricing

A Stage 1 Drought pricing program may be used to increase awareness of the drought's severity and assist in meeting water-use reduction targets through pricing signals.

### Stage Exit Criteria:

The drought response committee will regularly monitor the Drought Severity Indicators to determine if multiple conditions have relieved the concerns that caused the drought stage to initially be recommended and adopted.

The committee will also consider if the lessening of the concerns due to changing conditions appear to be reasonably sustainable for the foreseeable future.

Upon the consensus of the drought response committee members that conditions are significantly improving, and are likely to continue improving, the committee will make a recommendation to the Highlands Ranch Water Board of Directors to exit a drought stage, as appropriate.

## Stage 2 Drought Response: Mandatory Outdoor Water use Restrictions, Including Certain Prohibitions on Outdoor Watering

### Description

A Stage 2 Drought Response imposes mandatory outdoor water use restrictions on Highlands Ranch Water's customers. The Board will adopt a plan to set specific customer watering days once they declare Stage 2 restrictions. Stage 2 allows at most one day per week watering. Stage 2 Drought restrictions are severe and may result in damage to or loss of landscapes.

### General Indicators

During a water shortage due to drought, each of the drought indicators will be carefully considered in choosing the appropriate drought response actions as determined by the Board. When considering these actions, the Board will take into account the severity and immediacy of the situation as determined by the Board.

Drought indicators include, but are not necessarily limited to, the following: (See page 5 for a more detailed description of drought severity indicators that can be used for decision-making and the Drought Stage Severity Indicator Guidance Table on page 16 for additional guidance.)

1. Current and projected reservoir storage supply.
2. Watershed characteristics in the South Platte River basin, such as daily average temperature trends, precipitation, snowpack, streamflow, evaporation and soil moisture.
3. Water use, including projected water use.
4. Weather forecasts and regional weather patterns.
5. Actions taken by local, regional and/or state governments or water suppliers regarding water use.
6. Drought response actions taken by state water officials.
7. Water availability conditions and/or drought conditions in the South Platte River basin.

### Specific Stage 2 Drought Indicators for the Drought Watch Stage:

See page 5 for a more detailed description of drought severity indicators that can be used for decision-making and the Drought Stage Severity Indicator Guidance Table on page 16 for additional guidance.

1. Highlands Ranch Water's projected useable reservoir storage is between 25% and 30% full (4,300 AF to 5,200 AF) on either April 30, May 31, June 30 or July 31.
2. Watershed characteristics, such as precipitation, snowpack, streamflow, wind and soil moisture, indicate extreme and prolonged dryness.
3. Other local, regional and/or state governments or water suppliers have enacted or are considering severe restrictions on outdoor water use.
4. Customers believe increased mandatory water use restrictions are appropriate.
5. State water officials have declared a drought emergency.
6. Lack of water begins restricting some water-dependent businesses.
7. Customer water use is significantly above recent average.
8. Drought conditions inside of the South Platte River basin.

Use Reduction Target: 25 – 35% of customer average use (currently (2021) 16,500 AF/YR), or approximately 4,100 AF to 5,800 AF.

Potential Highlands Ranch Water Responses

1. Increase communication and education to customers and stakeholders to explain Stage 2 water restrictions (see the communications plan in Appendix B).
2. Existing watering rules will still be in effect as specified in Highlands Ranch Water’s Water Efficiency Plan. Monitoring and enforcement will be increased.
3. Existing trees, shrubs and perennials may be watered by means of a hand-held hose equipped with a shut-off device or low-volume non-spray irrigation no more than once a week in accordance with the schedule set forth in the declaration. Such irrigation may not occur between the hours of 10 a.m. and 6 p.m. during all months of the year.
4. Existing annual and vegetable plantings in household and community gardens may be watered any day of the week by means of a hand-held hose equipped with a shut-off device or low-volume non-spray irrigation. Such irrigation may not occur between the hours of 10 a.m. and 6 p.m. during all months of the year.
5. An irrigation system may be operated for installation or repair, so long as the system is attended throughout the period of operation and water waste does not occur.
6. Promote voluntary drinking water upon request program for food service operations.
7. A table of drought stages and potential responses is presented in Appendix A. See Appendix C for potential response impacts to irrigated properties owned and managed by the Highlands Ranch Metro District.
8. Outdoor watering will be limited to one day per week. Below is a sample of what a watering schedule could look like for one day per week watering schedule:

<b>Property</b>	<b>Watering Days</b>
Single-family and small multi-family (less than seven units) residential properties with odd-numbered addresses	Sunday
Single-family and multi-family (less than seven units) residential properties with even-numbered addresses	Saturday
Multi-family (seven or more units) and apartment properties	Monday
Office buildings	Tuesday
Properties managed for the sole enjoyment and recreation of the public, including parks and schools	Any day(s) of the week, but entities must reduce water consumption by 20% or more of their water budget
All others	Friday

Drought Pricing

A Stage 2 Drought pricing program may be used to increase awareness of the drought’s severity and assist in meeting water-use reduction targets through pricing signals.

The drought pricing is developed by the Highlands Ranch Water Board as part of their annual budget process and is detailed in their rules and regulations. Before the drought pricing can be implemented or changed, Highlands Ranch Water must give 30 days' notice to the public, in accordance with State Statutes.

#### Stage Exit Criteria

The drought response committee will regularly monitor the Drought Severity Indicators to determine if multiple conditions have relieved the concerns that caused the drought stage to initially be recommended and adopted.

The committee will also consider if the lessening of the concerns due to changing conditions appear to be reasonably sustainable for the foreseeable future.

Upon the consensus of the drought response committee members that conditions are significantly improving, and are likely to continue improving, the committee will make a recommendation to the Highlands Ranch Water Board of Directors to exit a drought stage, as appropriate.

## Stage 3 Drought Response: General Prohibition of Outdoor Water Use and Potential Water Rationing

### Description

A Stage 3 Drought Response activates a general prohibition of outdoor water use for Highlands Ranch Water's customers. Conditions that would lead to a Stage 3 Drought are highly unlikely. However, if conditions warrant, the Board may also implement a rationing program for an indefinite period of time to ensure, to the extent possible, that there is adequate water for essential uses (e.g., domestic indoor use). Stage 3 Drought restrictions may have an adverse effect on the quality of life in Highlands Ranch Water's service area, including the long-term loss of landscapes.

### General Indicators

During a water shortage due to drought, each of the drought indicators will be carefully considered in choosing the appropriate drought response actions as determined by the Board. When considering these actions, the Board will take into account the severity and immediacy of the situation as determined by the Board.

Drought indicators include, but are not necessarily limited to, the following: (See page 5 for a more detailed description of drought severity indicators that can be used for decision-making and the Drought Stage Severity Indicator Guidance Table on page 16 for additional guidance.)

1. Current and projected reservoir storage supply.
2. Watershed characteristics in the South Platte River basin, such as daily average temperature trends, precipitation, snowpack, streamflow, evaporation and soil moisture.
3. Water use, including projected water use.
4. Weather forecasts and regional weather patterns.
5. Actions taken by local, regional and/or state governments or water suppliers regarding water use.
6. Drought response actions taken by state water officials.
7. Water availability conditions and/or drought conditions in the South Platte River basin.

### Specific Stage 3 Drought Indicators

See page 5 for a more detailed description of drought severity indicators that can be used for decision-making and the Drought Stage Severity Indicator Guidance Table on page 16 for additional guidance.

1. Highlands Ranch Water's projected useable reservoir storage is less than 25% full (less than 4,300 AF) on either April 30, May 31, June 30 or July 31.
2. Watershed characteristics, such as precipitation, snowpack, streamflow, wind and soil moisture, indicate exceptional and prolonged dryness.
3. Other water suppliers are rationing water.
4. News media are sending messages that we are in a crisis situation.
5. Customers believe we are in a crisis situation.
6. Elected officials are saying water rationing is appropriate.

7. The situation suggests that severe impacts to water-dependent businesses are unavoidable.
8. There are drought conditions inside of the upper Colorado River or South Platte River basins.

Use Reduction Target: 35 – 50% of customer average use (currently 16,500 AF/YR), or approximately 5,800 AF to 8,200 AF.

### Potential Highlands Ranch Water Responses

1. Increase communication and education to customers and stakeholders to explain Stage 3 Drought restrictions (see the communications plan in Appendix B.)
2. A Stage 3 Drought activates a general prohibition of outdoor water use, including watering trees, shrubs, perennials and vegetables.
3. Stage 3 Drought activates a potential rationing program for Highlands Ranch Water's customers. The Board may implement a rationing program for an indefinite period of time to ensure, to the extent possible, there is adequate water for essential uses (e.g., domestic indoor use). Voluntary residential and commercial indoor water use reductions will be emphasized through extensive outreach efforts including contacts with customers who have a history of indoor use over 120% of historic averages.
4. Monitoring and enforcement will be rigorous.
5. A table of drought stages and potential responses is presented in Appendix A. See Appendix C for potential response impacts to irrigated properties owned and managed by the Highlands Ranch Metro District.

### Drought Pricing

A Stage 3 Drought pricing program shall be used to achieve water-use reduction targets through pricing strategies that will provide a clear incentive for customers to make lifestyle changes with irrigation practices and indoor use through economic impacts to their cost of water.

The drought pricing is developed by the Highlands Ranch Water Board as part of their annual budget process and is detailed in their rules and regulations. Before the drought pricing can be implemented or changed, Highlands Ranch Water must give 30 days' notice to the public, in accordance with State Statutes.

### Stage Exit Criteria

The drought response committee will regularly monitor the Drought Severity Indicators to determine if multiple conditions have relieved the concerns that caused the drought stage to initially be recommended and adopted.

The committee will also consider if the lessening of the concerns due to changing conditions appear to be reasonably sustainable for the foreseeable future.

Upon the consensus of the drought response committee members that conditions are

significantly improving, and are likely to continue improving, the committee will make a recommendation to the Highlands Ranch Water Board of Directors to exit a drought stage, as appropriate.

## Appendix A: Table of Drought Stages and Potential Responses

The table below is meant to be a guide to water uses under various levels of water shortage restrictions. Highlands Ranch Water reserves the right to modify these program elements as needed to meet changing water supply conditions.

### Existing Restrictions Applicable at All Times:

#### Water Use

Wasteful use of water is prohibited at all times. Examples of wasteful water use include:

- Excess water flowing in street gutters from irrigation or other outdoor uses.
- Unrepaired leaks or fixture malfunctions that lead to excess water use.

#### Mandatory Outdoor Water Restrictions

The following restrictions apply at all times:

- Outdoor irrigation is prohibited between the hours of 10 a.m. and 6 p.m. from May 1 to Sept. 30, except for a prior approved daytime watering permit.
- Operation of an irrigation system for maintenance is allowed at any time. Maintenance is defined as actively observing an irrigation zone while it is operating to ensure that it is functioning properly. A person must be visible at the location of the zone while it is running. Each zone must be turned off prior to leaving the location and not left running until the completion of a cycle.
- Hand watering of landscape materials is allowed at any time. Hand watering is defined as the application of irrigation from a hose held in the hand with a shut-off device, or a water-conserving method such as a drip, trickle, deep root water device or watering can are used.
- Car washing is allowed at any time. However, if water for car washing is coming from a hose rather than a bucket, a hose end shut-off device must be in use to prevent interrupted water flow.

#### Landscape Permit Outdoor Use Adjustment

An additional allotment of irrigation for outdoor usage pursuant to the provisions of the Landscape Water Adjustment Request Form.

#### Outdoor Watering and Irrigation

Element	Normal	Drought Watch	Stage 1	Stage 2	Stage 3
<b>Turf grass irrigation</b>	Existing restrictions	Existing restrictions plus outdoor watering restricted to 3 days per week	Existing Restrictions plus no sprinkler irrigation from Nov. 1 through Apr.	Existing Restrictions plus no sprinkler irrigation from Nov. 1 through Apr. 30;	Prohibition of outdoor water use

Element	Normal	Drought Watch	Stage 1	Stage 2	Stage 3
			30; any outdoor watering restricted to 2 days per week	any outdoor watering restricted to 1 day per week	
<b>Irrigation of new turf grass from seed or sod</b>	Existing restrictions including outdoor usage adjustment program	Existing restrictions including outdoor usage adjustment program	Existing Restrictions. No outdoor usage adjustment program available	Existing restrictions. No outdoor use adjustment program available. All drought rates apply.	Existing restrictions and prohibition of outdoor water use
<b>Turf replacement with low water plant materials</b>	Existing restrictions. Participants of turf replacement rebate program exempt from daytime watering restrictions.	Existing restrictions. Participants of turf replacement rebate program exempt from day and time watering restrictions.	Existing restrictions. Participants of turf replacement rebate program exempt from day and time watering restrictions.	Existing restrictions. Turf replacement rebate program not available.	Existing restrictions and prohibition of outdoor water use
<b>Irrigation of trees, shrubs, perennials, flowers and community vegetable gardens</b>	Existing restrictions	Existing restrictions plus outdoor watering restricted to three days per week	Existing restrictions plus no sprinkler irrigation Nov. 1 - April 30. Any outdoor watering restricted to two days per week	Existing restrictions plus no sprinkler irrigation Nov. 1 - April 30. Any outdoor watering restricted to one day per week	Prohibition of outdoor water use
<b>Irrigation of sports fields, wedding venues, historic sites, botanic gardens, amphitheaters, HOA common areas and golf courses</b>	Existing restrictions	Existing restrictions	Existing restrictions plus no sprinkler irrigation Nov. 1 - April 30. All are exempt from daily restrictions but subject to obligation of reducing overall water use from water budgets by 20%.	Existing restrictions plus no sprinkler irrigation Nov. 1 - April 30. All are exempt from daily restrictions but subject to obligation of reducing overall water use from water budgets by 35%.	Prohibition of outdoor water use
<b>Irrigation of common area landscapes, parks, greenbelts and school playgrounds</b>	Existing Restrictions	Existing Restrictions	Existing Restrictions plus no sprinkler irrigation Nov. 1 - April 30. All are exempt from daily restrictions but subject to obligation of reducing overall water use from water budgets by 20%.	Existing Restrictions plus no sprinkler irrigation Nov. 1 - April 30. All are exempt from daily restrictions but subject to obligation of reducing overall water use from water budgets by 35%.	Prohibition of outdoor water use
<b>Turf grass sprinkler irrigation using</b>	Existing Restrictions	Existing Restrictions	Existing Restrictions plus no sprinkler irrigation	Existing Restrictions plus no sprinkler irrigation	Prohibition of outdoor water use

Element	Normal	Drought Watch	Stage 1	Stage 2	Stage 3
<b>treated reuse water and raw water</b>			Nov.1 - Apr. 30. All are exempt from daily restrictions but subject to obligation of reducing overall water use from water budgets by 20%.	Nov.1 - Apr. 30. All are exempt from daily restrictions but subject to obligation of reducing overall water use from water budgets by 35%.	
<b>Water budgets</b>	Normal allocated budget	Normal allocated budget	Normal allocated budget	Normal allocated budget	Prohibition of outdoor water use

### Water Features

Element	Normal	Drought Watch	Stage 1	Stage 2	Stage 3
<b>Unlined ponds</b>	Filled using approved backflow	Filled using approved backflow	Limit filling to minimum required to maintain ecosystem.	Limit filling to minimum required to maintain ecosystem	Prohibition of outdoor water use
<b>Swimming pools/lined ponds</b>	N/A	N/A	N/A	N/A	Prohibition of outdoor water use
<b>Commercial and residential interactive water features: spray grounds/wading streams/water play features</b>	N/A	N/A	N/A	Prohibited	Prohibition of outdoor water use
<b>Commercial outdoor ornamental water features (fountains, waterfalls, etc.)</b>	N/A	N/A	Prohibited	Prohibited	Prohibition of outdoor water use
<b>Outdoor misting devices</b>	N/A	N/A	Prohibited	Prohibited	Prohibition of outdoor water use

### Washing/Events

Element	Normal	Drought Watch	Stage 1	Stage 2	Stage 3
<b>Cars – washing at home</b>	With bucket or hand-held hose with shut-off device	With bucket or hand-held hose with shut-off device	With bucket or hand-held hose with shut-off device	Prohibited	Prohibition of outdoor water use
<b>Cars – commercial car washes (drive-through and self-service)</b>	N/A	N/A	N/A	N/A	Prohibition of outdoor water use
<b>Charity event car washes</b>	With bucket or hand-held hose with shut-off device	With bucket or hand-held hose with shut-off device	With bucket or hand-held hose with shut-off device	Prohibited	Prohibition of outdoor water use

Element	Normal	Drought Watch	Stage 1	Stage 2	Stage 3
Street cleaning equipment	N/A	N/A	N/A	NA	Prohibition of outdoor water use
Washing/impermeable outdoor surfaces	NA	NA	NA	NA	Prohibition of outdoor water use; use dry clean-up methods only

### Commercial-Industrial Processes

Element	Normal	Drought Watch	Stage 1	Stage 2	Stage 3
Restaurants	N/A	N/A	Voluntary participation in the "water served only on request" program. Participants asked to comply with Highlands Ranch Water's signage standards.	Voluntary participation in the "water served only on request" program. Participants asked to comply with Highlands Ranch Water's signage standards.	Voluntary participation in the "water served only on request" program. Participants asked to comply with Centennial's signage standards.
Lodging	N/A	N/A	N/A	Innkeepers requested to limit laundry services	Innkeepers requested to limit laundry services
Construction water	N/A	N/A	Best management practices; no water waste; permit rescinded for violations.	Best management practices; no water waste; permit rescinded for violations.	Prohibition of outdoor water use
Hydrant special use permits	N/A	N/A	Limited uses only; permit rescinded for violations	Limited uses only; permit rescinded for violations	Prohibition of outdoor water use

## **Appendix B: Drought Communications and Education Plan**

This Plan focuses on communicating with our customers to provide information about drought response and water conservation measures. Communications staff will work with coworkers to determine the timely, evolving messaging, as appropriate for conditions.

The following are Highlands Ranch Water's existing communications tools and activities that may be used during drought conditions.

### **Communications Tools**

**Websites** –Highlands Ranch Water's website, and partner websites including Highlands Ranch Metro District, Highlands Ranch Community Association, and Mirabelle Metro District and Solstice websites.

**eNewsletters** – There are more than 10,000 contacts in our water conservation eNewsletter list. This is sent out monthly, approximately the first week of each month.

**Water Wise Guide** – Mailed to all customers in early April and an electronic version is posted to the website.

**Social Media** – Highlands Ranch Water has six social media accounts that include Facebook, X, LinkedIn, Instagram, YouTube and Nextdoor.

**Messenger magazine** – Highlands Ranch Water has a dedicated page in each issue of the Metro District's Messenger magazine. It is published four times annually - January, March, July and October.

**Direct mail postcards** – Postcards are a tool to provide targeted messaging with delivery to all homes in Highlands Ranch and Solstice.

**Flyers and posters** – Post at high profile locations including recreation centers, library, Chamber of Commerce, Solstice club house and local businesses.

**Media - newspaper articles, letters to the editor and editorials** – Pitch articles or submit letters to the editor on specific topics to local newspapers and media or ask newspaper editor to write an editorial on a specific topic.

**Events** – Highlands Ranch Water hosts a booth at a variety of community events throughout the year. This could include booths at KidFest, Ice Cream Social, Holiday Celebration, Beer Festival, and others. In addition, the district hosts four conservation-themed events throughout the year at a local brewery.

**Decals on fleet vehicles** – Decals with targeted messaging can be displayed on fleet vehicles traveling the community. Decals can also be shared with the Metro District and HRCA to display on their vehicles as well.

**Community message board signs** – Located along major streets throughout the community, we can target messages as needed, and as space is available on the signs. Community event signs are scheduled with the Metro District's reservations specialist.

**Targeted messaging to customers** – We can design specific communications and/or door hangers to target individual customers. An example of this are customers who have exceeded their water budgets. These items could be distributed via direct mail, email or a combination of both.

**Water bill inserts** – Flyers can be included in water bills mailed to customers.

**Back of water bills** – We have designated space on the back of paper water bills to communicate timely information.

**Water bill payment portal** – We can work with Invoice Cloud to have message placed on the log-in screen to our customer’s online payment portal.

**External eNewsletters** – Share messaging, infographics, etc. with other organizations for inclusion in their eNewsletters and email blasts: HRCA, Solstice and HOAs.

**Webinars** – Host free webinars with customers on a variety of topics that may include turf conversion, rebate and incentive programs, low water landscape options, irrigation tips, drought measures, etc.

**Online drought resource center** – A dedicated page that can be added to the website in times of drought. Provides timely information about the latest drought measures.

## **Communications Response During Specific Drought Stages**

### **Normal Conditions**

The Communications staff will provide information about drought conditions and strategies, water supply, conservation and usage as we have in the past under normal conditions. If conditions indicate drought restrictions might be in the future, increased education and messaging will take place.

### **Drought Watch Measures**

The following are examples of steps that may be taken during Drought Watch utilizing existing communications tools:

- News release announcing move to Drought Watch
- News story posted on Highlands Ranch Water website
- Announce Drought Watch in emergency banner on website
- Share news release/story with community partners –Metro District, HRCA, Solstice, Douglas County
- Announce Drought Watch via social media channels
- Add Drought Resource Center to website
- Update homepage spotlight
- Community event signs to announce Drought Watch
- Message on Invoice Cloud dashboard
- Add information to back of water bills

- eNewsletter article announcing Drought Watch
- Based on timing, either include Drought Watch messaging in Water Wise Guide, or consider a direct mail postcard
- Vehicle decals for fleet vehicles (HR Water, Metro District and HRCA)

In addition to utilizing existing communications channels and activities, the following actions are examples of additional measures that may be taken:

**FAQs** – Create FAQs about Drought Watch for staff who answer phones to have as a resource, and post on website – Drought Resource Center

**Meet with HRCA** – Meet with HRCA’s General Manager and Director of Marketing and Communications to update them on Drought Watch, answer their questions, provide them with a list of FAQs to share with their staff and discuss opportunities to partner on communications.

**Internal Communications** – Employees are our first customer, so it is important any change in drought conditions is communicated to staff first. This can be accomplished in a variety of ways including:

- **Pipeline eNewsletter** – send an email to all staff when a Drought Watch is issued. Provide an explanation of what it means and why the decision was made. Provide resources to seek out more information.
- **Pipeline website** – update home page of the Pipeline website with information and resources about the Drought Watch.
- **TVs** – share information on the TVs across the district with links or a QR code that drives employees to more information on the Pipeline website.
- **Team Huddle** – if timing aligns, General Manager and Water Resources Manager will update staff on the current drought conditions, drought measures, etc.

### Stage 1, Stage 2 and Stage 3 Drought Measures

The following are examples of steps that may be taken during Stage 1, Stage 2 and Stage 3 drought conditions utilizing existing communications tools:

- News release announcing Stage 1 restrictions
- News story posted on Highlands Ranch Water website
- Share news release with community partners – Metro District, HRCA, Solstice, Douglas County
- Emergency notification posted on Highlands Ranch Water website
- Update homepage spotlight
- Update Drought Resource Center
- Partner with HRCA to push out messaging through their channels (website, print newsletter, eNewsletter, social media)

- Partner with Metro District to push out messaging through their channels (website, social media)
- Increase frequency of eNewsletter to every two weeks to provide drought updates and tips
- Create social media plan to provide weekly reminders, tips and information about drought measures and water conservation; boost social media posts as needed for greater reach
- Community event signs to announce drought measures
- Create posters for display at recreation centers, library, Solstice clubhouse and local businesses
- Include flyer in water bills about drought measures and/or update messaging on back of water bills
- Message on Invoice Cloud dashboard
- Direct mail postcard announcing drought measures
- Vehicle magnets for fleet vehicles (HR Water, Metro District, HRCA)

In addition to utilizing existing communications channels and activities, the following actions are examples of additional measures that may be taken:

**Internal Communications** – Employees are our first customer, so it is important any change in drought conditions is communicated to staff first. This can be accomplished in a variety of ways including:

- **Pipeline eNewsletter** – send an email to all staff when a Drought Watch is issued. Provide an explanation of what it means and why the decision was made. Provide resources to seek out more information.
- **Pipeline website** – update home page of the Pipeline website with information and resources about the Drought Watch.
- **TVs** – share information on the TVs across the district with links or a QR code that drives employees to more information on the Pipeline website.
- **Team Huddle** – if timing aligns, General Manager and Water Resources Manager will update staff on the current drought conditions, drought measures, etc.

**Partner with Water Efficiency Coordinator on the following:**

- Landscape maintenance tips and resources during drought conditions. Information can be updated on the website, shared via eNewsletter, social media, etc.
- Create videos to post on our YouTube channel and share via social media, eNewsletter, etc. that address topics that may include landscape maintenance tips, two-day watering schedule, cycle and soak instructional video, etc.
- Develop key messages for landscape companies

- Contact sub-HOAs, work with them to evaluate their irrigation practices and identify ways to meet the reduction goal

**Speaking opportunities** – Look for opportunities to speak to community groups including HRCA delegate meetings, Rotary Club, Metro District board meeting, Highlands Ranch Senior Center groups, sub-HOA meetings, Wind Crest, etc.

**Community open house** – Coordinate a community open house where we will share information about drought measures, drought information, why we are in a drought, tips homeowners can implement to conserve water at home, etc.

**Lunch & Learn** – Organize 30 minute to one-hour long educational lunch and learn sessions for both employees, and externally, for water customers. This is an opportunity to share information about the current drought, our water supply and tips homeowners can implement to conserve water at home.

**Coordinate regional messaging with local water providers** – Monitor and align our messaging with Douglas County and regional water providers.

**Advertising** – Pay for advertising in print publications like the *Highlands Ranch Herald*, digital advertising through AMC, and busses traveling Highlands Ranch routes, etc.

**Local Media** – Contact will be made, with a greater sense of urgency/importance, as needed, with the *Highlands Ranch Herald*, television and radio news stations and other local media.

**Fact Sheet** – create an internal fact sheet about drought restrictions for management and Board members. A fact sheet ensures consistent, accurate and timely information is in the hands of staff who may be answering questions from customers, community partners and the media.

## Appendix C: Highlands Ranch Metro District Responses and Challenges for Various Stages of Drought

The Highlands Ranch Metropolitan District (Metro District) is a major water user in the Highlands Ranch community and, since it is also a governmental entity and leader, its vigorous response to drought will be a key leadership role and visible leadership example for the community. Below is a detailed articulation, developed by the Parks, Recreation and Open Space Department, of the various responses and the associated challenges, for each drought response stage for the Metro District:

### Drought Watch

#### Response

1. Communication: In addition to HR Water's Drought Communication and Education Plan, send preemptive notification to community gardeners for possible future water restrictions.
2. Parks and Parkways: Reduce overall water consumption in parks and parkways by 5-10%.

#### Challenges

Increase in dry spots and dormant areas in grass.

- Possible decline in less hardy plants
- Possible increase of turf disease
- Possible increase in tree disease/pests
- Possible increase in weeds

### Stage 1

#### Response

1. Communication: In addition to HR Water's Drought Communication and Education Plan, utilize signage and messaging to directly notify community gardeners, dog park users, pond users and interactive fountain users of possible or known water restrictions.
2. Parks and Parkways:
  - a. Reduce overall water consumption in parks and parkways by 15-20%
  - b. Reduce watering of passive areas in parks while maintaining sports fields at safe levels
  - c. Raise mowing heights from three to four inches in parks (parkways is already four inches) Reduce mowing frequency when possible in parks and parkways
  - d. Eliminate fall lawn aeration in parks and parkways if conditions too dry
  - e. Reduce nitrogen fertilizer applications in parks
  - f. Where possible, utilize wetting agents in turf
  - g. Defer annual flower planting if timing of Stage 1 notification permits
  - h. Defer large landscape restoration projects
  - i. Turn off all decorative non-interactive water features/fountains

- j. Deter HOAs from planting annual flowers in beds watered by HRMD, if timing allows; cease watering these sites if necessary to achieve water use reduction goals
- 3. Forestry:
  - a. Supplement water to new trees (planted within last three years) with direct watering devices including watering bags
  - b. Maximize use of bubblers and quick couplers
  - c. Utilize wetting agents where possible
- 4. Open Space:
  - a. Decrease filling of Fly'n B and Johnny's Ponds with potable water
  - b. Provide sufficient water to maintain ecosystem
  - c. Manage vegetation while pond levels are low

### Challenges

- Increase in dry areas and dormant landscape; prolonged 15-20% water reduction will result in some loss of turf due to desiccation
- Increased weed control due to reduced cultural practices and reduced watering
- Increased scarring and disturbance to parkway landscape if unable to restore damage created by utility contractors
- Increase of turf disease
- Increase of tree disease/pests
- Noticeable decline to less hardy plants
- Increased pond vegetation management

### Stage 2

#### Response

1. Communication: In addition to HR Water's Drought Communication and Education Plan, utilize signage and messaging to directly notify gardeners, dog park users, pond users, interactive fountain users, Mansion clientele and sports programs of possible or known water restrictions.
2. Parks and Parkways:
  - a. Reduce overall water consumption in parks and parkways by 25-35%
  - b. Turn off all interactive water features
  - c. Reduce watering of passive areas in parks while maintaining sports fields at safe levels
  - d. Raise mowing heights from three to four inches in parks (parkways is already four inches)
  - e. Reduce mowing frequency when possible in parks and parkways
  - f. Eliminate fall lawn aeration in parks and parkways if conditions too dry
  - g. Reduce nitrogen fertilizer applications in parks
  - h. Utilize wetting agents where possible
  - i. Defer annual flower planting and/or cease irrigation of existing annual flowers
3. Forestry:

- a. Supplement water to new trees (planted within last three years) with direct watering devices including watering bags
- b. Maximize use of bubblers and quick couplers
- c. Utilize wetting agents where possible
4. Open Space: Turn off dog park water spigots
5. Other: Wash only vehicles and equipment necessary for routine hygiene and safe operation

### Challenges

- Increase in dry areas and dormant landscape; prolonged 35% water reduction will result in significant loss of turf due to desiccation and tree/shrub damage
- Increased weed control due to reduced cultural practices and reduced watering
- Increased scarring to parkway landscape if unable to restore damage created by utility contractors
- Increase of turf diseases
- Increase of tree diseases
- Pronounced decline in less hardy plant material
- Decline in large trees (Unable to water large trees with direct watering devices, above ground irrigation is the best means to water large trees due to expansive root systems and high volume of mature trees)

### Stage 3

#### Response

1. Communication: In addition to HR Water's Drought Communication and Education Plan, utilize signage and messaging to directly notify gardeners, dog park users, pond users, interactive fountain users, Mansion clientele and sports programs of water restrictions.
2. Parks Recreation and Open Space
  - a. Shut down all irrigation systems and drinking fountains
  - b. Defer all cultural practices activities
  - c. Defer all mowing operations
  - d. Defer all landscape projects
  - e. Restrict usage of parks/grass
  - f. Reassign staff and resources accordingly

### Challenges

- Imminent loss of and irreversible damage to most plant material
- Potential cancellation of sports programs
- Significantly impactful to Mansion rentals/programming
- Significantly impactful to shelter rentals
- Significant loss in revenue from cancellations
- Possible loss of seasonal jobs
- Plan for increased costs for multi-year rehabilitation of landscape