



WATER SHORTAGE CONTINGENCY PLAN

REVISED MARCH, 2005

**SEATTLE PARKS AND RECREATION
WATER SHORTAGE CONTINGENCY PLAN
TABLE OF CONTENTS**

Section 1	1
Introduction	1
Objective of WSCP	1
Section 2 Overview of Drought Management Strategy	2
Recent drought experiences	2
Alternative water supplies	4
Section 3 Phased Curtailment Plan	5
Advisory Stage	6
Communications actions	7
Operating actions	7
Voluntary Stage	8
Communications actions	8
Operating actions	9
Supply and demand management actions	9
Mandatory Stage	12
Communications actions	12
Operating actions	13
Supply and demand management actions	13
Emergency Curtailment Stage	17
Communications actions	17
Operating actions	17
Supply and demand management actions	17
Section 4 Short-Term Emergency Curtailment Plan	20
Introduction	20
Supply and demand management during emergencies	20
Attachments	
A. Estimated savings from possible curtailment measures	
B. Contact List - Water Shortage Management Team	
C. Definitions and Lists	
D. New Landscape Irrigation Contingency Plan	

**SEATTLE PARKS AND RECREATION
WATER SHORTAGE CONTINGENCY PLAN**

SECTION I

Introduction

This plan provides guidelines for a systematic response, should the need arise, to reduce demand in the event of a water supply disruption or weather related water shortage. Disruptions require more immediate and dramatic demand management measures than progressive drought situations; therefore, two parts to the response plan have been developed. Long-term conservation will continue to be developed as part of an overall water management strategy by the Seattle Department's and Recreation and will be presented as part of the Department's Best Management Practices (BMPs).

This document updates the Department's 2002 Water Shortage Contingency Plan (WSCP), incorporating revisions made in 2002.

Objective of WSCP

The objective of the WSCP is to establish actions and procedures for managing water demands during water supply reductions or water shortages. The plan establishes a strategy in advance of actual conditions, so that the Department is prepared to maintain essential public health and safety and minimize adverse impacts on economic activity, park assets, environmental resources and the region's lifestyle. The Department will assist and support curtailment measures required by Seattle Public Utilities (SPU) to manage demand during an emergency or shortage. In order to be effective, a demand management strategy must be regionally consistent. This is based on several considerations:

- Public support and cooperation is likely to be higher if actions are equitable, i.e., all water users are experiencing the same service level and degree of hardship
- A unified message and approach is easier to understand and distribute through the media, which is key in communicating information to the public
- Consistency makes it easier for Seattle to forecast demand reductions, which is essential to effectively manage the system during a supply disruption

SECTION 2

OVERVIEW OF DROUGHT MANAGEMENT STRATEGY

While water supply disruptions can occur for a variety of reasons, a weather-related water shortage – generally referred to as a “drought” - is one category of particular importance. Droughts are naturally occurring but unpredictable weather events of varying frequency, duration and severity. In the region served by the Seattle water system, available data indicate a very low probability of a multi-year drought, but the region has experienced short- term droughts.

This region is generally faced with a relatively dry summer period. In Seattle, only about 5 of our 38 – 40 inches of annual precipitation fall during the summer months. The Seattle water system operates with an annual refill and drawdown cycle of its water supply storage reservoirs. Highly unusual weather events affect this cycle and can cause potential shortages. This can manifest in one or more of the following ways:

- Less than normal winter snowpack, which would limit the volume of instream flows available from snowmelt in the spring to fill Seattle's storage reservoirs for peak season demands and fish and wildlife habitat needs
- Unusually warm spring weather bringing with it early melting of the snowpack, resulting in early drawdown of the mountain reservoirs
- Unusually warm and dry summer weather which can significantly increase peak season demands, and create low flow conditions in streams tributary to the mainstem rivers
- A delayed return of the fall rains, or a dry winter, which can delay the fall reservoir refill cycle (which replenishes the storage reservoirs after the peak season), creating extended low flow conditions in the streams and rivers

The specific cause of any supply disruption will affect the department’s response, strategy and timing. Operational flexibility is key, with operating plans changing as conditions and forecasts change. A key assumption is that abundance, shortage and risk must be shared among all beneficiaries of the water resource. Coordination between SPU and other departments is necessary for decision-making related to real-time operations.

Recent Drought Experiences

In 1992, the system experienced a drought due to unusually warm weather at the same time that snow-pack and flows into the storage reservoirs were at record low levels. In late February, it was evident that there was insufficient snow-pack to fill the storage reservoirs and that the likelihood of recovery by June 1 due to rainfall was minimal. A

number of measures were taken to maximize available supply (e.g., reducing system flushing, adjusting stream flow levels, etc) and to reduce demand.

In May, a number of *mandatory* curtailment actions were implemented in the Seattle service area, including a ban on turf watering. This resulted in an average consumption reduction of 25 to 30 percent below normal throughout the summer. For Parks, this resulted in the loss of some turf assets, most noticeable on our golf courses and athletic fields. This loss of assets impacted revenues and scheduling far beyond the duration of the drought event. When raised as a concern, but after the damage was done, it was clear that this level of asset loss was not required for Parks to be in compliance with the drought related water cutbacks. The mandatory restrictions were eventually rescinded in September as supply levels returned to normal with the onset of fall rains. This drought event reminded us that we need to have a clear understanding among all city departments regarding which operations will be curtailed and when in order to conserve water resources. To that end, this WSCP, requested by SPU, will be reviewed Citywide for consistency.

Since 1995 SPU has incorporated numerous changes in their WSCP including updating the required responses for each of the Phased Curtailment Stages. The Department's 2002 WSCP incorporates those changes and incorporates further conservation measures that have been implemented as a result of the 1992 drought experience. Thus, both departments' Water Shortage Contingency Plans articulate the following principles:

- Given clear, timely and specific information on supply conditions and the necessary actions to forestall worsening conditions, customers prefer the opportunity to meet targeted demand reduction levels through **voluntary** compliance measures. The decision to move to mandatory restrictions is more acceptable if the voluntary approach has been tried first but has not resulted in enough demand reduction to ensure public health, safety and adequate streamflows through the projected duration of the shortage;
- Each drought or other shortage situation has enough unique characteristics that a plan cannot specifically define all the scenarios and specific supply and demand management actions. The usefulness of a Water Shortage Contingency Plan lies in planning the range of supply and demand management actions in advance of the situation, and in defining the communication mechanisms by which decisions will be made during the event;
- Given the effective long-term conservation programs operated by Department, it is important to distinguish between the short term **curtailment** measures necessitated by a water supply disruption, and the **conservation** measures Department promotes within its BMPs. Conservation focuses on efficiencies which do not affect the quality of life, whereas curtailment measures can involve short term actions which could impact it; and

- It is essential to closely monitor water quality during a supply disruption and particularly during a warm weather drought (an SPU responsibility). Water quality issues must be considered when supply management decisions are made.

Alternative Water Supplies

Depending on the nature and timing of a potential water shortage, alternative water supplies may be useful to supplement existing supplies.

Jackson Park Golf – Jackson Park Golf has historic water rights for the use of Thornton Creek for irrigation purposes. A current collaborative project with SPU will continue this practice into the future.

Reclaimed water - Using highly treated effluent instead of potable water for irrigation, street washing, construction purposes, etc. can reduce demand for potable water and lessen the impact of the shortage on the community. While high quality reclaimed water can be produced by King County at one or more of its wastewater treatment plants, issues include obtaining permits to use this water, and obtaining and distributing adequate amounts to decrease potable water demands. These issues – availability, permitting and distribution – are likely to change in future years, and should be revisited in the event of any future water shortage.

The potential exists for Department's to reuse wading pool water and swimming pool water in addition to the other sources of reclaimed water listed above. The method and scheduling of loading, transfer and application of this water is no small logistical undertaking. Nevertheless, the Department's Water Shortage Management Team will want to determine the feasibility of this idea with the potential of pilot projects. If determined feasible, the use of reclaimed water should be considered part of the Department's water shortage strategy at any curtailment stage.

SECTION 3

PHASED CURTAILMENT PLAN

This plan provides four stages of response based upon increasing severity, as progressively more serious conditions warrant. This type of response would be appropriate to a summer drought or other long-range disruption. The four stages include a variety of communications, internal operations, and demand management strategies as appropriate, and are characterized as follows:

- **Advisory Stage** -Customers are informed as early as meaningful data are available that a possible shortage may occur.
- **Voluntary Stage** - If supply conditions worsen, the plan moves to the "Voluntary" stage which relies on voluntary cooperation and support of customers to meet target consumption goals. During this stage, specific voluntary actions are suggested for both residential and commercial customers.
- **Mandatory Stage** – If the Voluntary Stage does not result in the reduction needed, the Mandatory Stage prohibits or limits certain actions. This stage would be accompanied by an enforcement plan, which could include fines for repeated violation.
- **Emergency Curtailment** – This addresses the most severe need for demand reduction and could include a combination of mandatory measures and rate surcharges. This could be used as the last stage of a progressive situation, such as a drought of increasing severity, or to address an immediate crisis, such as a facility failure.

A Water Shortage Management Team may be assigned at the direction of the Superintendent to review the Department's Water Shortage Contingency Plan, advice on current conditions and customer response.

ADVISORY STAGE

Objectives

- To prepare the Department, City, relevant agencies and water users for potential water shortage thereby allowing all parties adequate planning and coordination time
- To undertake supply management actions that forestall or minimize the need later for more stringent demand or supply management actions

Triggers

As presented earlier, there are a variety of weather and other conditions that may cause concern about water availability and a potential water shortage. Two of the primary conditions that would trigger an "Advisory" are as follows:

1. Total reservoir storage is not projected to be at standard operating capacity as of June 1, due to exceptionally low snow pack, precipitation and/or lack of carryover storage from previous year;
2. Total reservoir storage and predicted inflows are significantly below historical "normals" for the current time of year, and supply modeling indicates that expected demands may not be met if this trend continues or worsens.

The Advisory is withdrawn when projected reservoir storage trends follow the normal water supply conditions.

Public Message

"Potential exists for lower than normal supply; conditions **may** return to normal or, later on, we may need to reduce consumption. We'll keep you informed."

Advisory Stage Actions

Communication Actions

Consult with SPU, participating in a committee if needed, to assist the SPU shortage advisory group to define message and provide feedback on utility actions

Superintendent appoints a Water Shortage Management Team (WSMT) to review the WSCP, evaluate conditions, determine action and establish communications network for department staff.

- WSMT initiates informational status report for staff
- Prepare and distribute public information materials via the Department's WebPages and other communication media explaining the WSCP stages and range of actions; link Department's WebPages to SPU's WebPages on water supply conditions and water conservation
- Standardize informational signage for public information
- Evaluate ability, resources, plans to move into Voluntary stage; as appropriate, begin preparatory measures

Parks' Internal Operating Actions

Initiate planning and preparation for Voluntary Stage actions, including an assessment of potential staffing impacts, training needs, and communications strategies including use of web-based information and informational signage

Focus attention on Best Management Practices for water conservation, including irrigation system periodic maintenance and repairs, mulching landscaped areas, turf aerification and adjustment of turf mowing heights

Review proposed landscape additions and projects; consider postponement and define specific criteria for postponement

Review aquatics programs and schedules for water conservation; limit hours for non-recirculating water fountains and water play features

Research technologies with the potential of providing water savings such as faucet aerators and automatic irrigation rain shut-off devices – implement new technologies as resources allow

Prioritize facility plumbing system repairs and periodic maintenance

VOLUNTARY STAGE

Objectives

To maintain or reduce demand to meet target consumption levels by voluntary actions

To forestall or minimize need later for more stringent demand or supply management actions

To minimize disruption to Parks' projects and programs while meeting target consumption goals

To minimize impact on revenue producing programs

To continue use and maintain valuable assets

Triggers

The "Voluntary Stage" is implemented when one or both of the following factors apply:

- Supply conditions identified in the Advisory Stage have not improved
- Demand levels indicate the need for a more systematic response to manage the situation

Public Message

"We are relying on support and cooperation of all water users to stretch the available water supply. Demand needs to be reduced by ____%. Customers are responsible for determining how they will meet that goal. Water waste is not allowed. If everyone cooperates, we may avoid imposing more stringent restrictions. In addition to meeting essential water needs of customers, meeting the needs of fish habitat and other environmental concerns is a priority."

Voluntary Stage Actions

Communication Actions

The WSMT will meet frequently to re-evaluate the situation based on information provided by SPU and determine the appropriate actions and strategies.

The WSMT will continue systematic communications with the Superintendent, staff and customer groups throughout the shortage, to help develop information messages and materials and to obtain feedback on actions.

The team will identify and review potential next steps necessary to reduce demand, including which restrictions will be imposed.

As needed, the WSMT will meet with other City/industry representatives to discuss compliance strategies.

Forward list of commercial car wash facilities from SPU that recycle water to staff

Initiate remaining planning and preparation for Mandatory Stage.

Parks' Internal Operating Actions

Continue actions listed in the Advisory Stage

Establish agreed upon methodologies for measuring water savings (to ensure compliance with % reduction required)

Eliminate all water uses determined to be non-essential to maintain water quality, continue Department projects and/or programs, maintain the health of valuable assets and ensure public safety and zoo animal health

Propose and/or implement staffing reassignments and schedules as needed, and plan staffing changes that may be needed for the Mandatory Stage

Evaluate ability to accelerate or enhance or expand long term conservation programs; implement as appropriate

Supply and Demand Management Actions

- Alternative water sources activated for use, if available

Facilities, Vehicles, Equipment, Picnic Areas, Boat Docks and Playgrounds

FACILITIES

1. Use pressure washers when feasible to accomplish necessary cleaning

COMFORT STATIONS

2. Clean as needed for public health and safety

VEHICLES

3. Wash all city vehicles only as needed
4. If possible, wash vehicles at a car wash that recycles water

HARD SURFACE MAINTENANCE

5. Limit washing hard surfaces such as sidewalks, driveways, parking lots, etc. where required for public health and safety

FOUNTAINS

6. Turn off all fountains and water features, except for those necessary to maintain water quality or animal health and containment

PLUMBING

7. Focus attention on leaks and repairs
8. Continue installation of faucet aerators

Continuing programs:

- Operate only high priority recirculating water features
- Water construction sites for dust control
- Continue normal water use for comfort station cleaning
- Do limited hard surface cleaning

Park Landscapes

IRRIGATION

1. Reduce water use by 10% overall
2. Automatic irrigation systems controlled by ET stations reduced by 10%
3. All irrigation on established plantings will be done between 7pm and 10am, except for hand watering of planted containers, tree wells , etc.
4. Reduce watering of general irrigated park turf
5. Reduce irrigation to general park landscape beds and mature trees

IRRIGATION SYSTEMS

6. Focus attention and resources on irrigation system monitoring, leaks and repairs
7. Monitor for obvious water waste such as hoses without shutoff nozzles or irrigation leaks; fix problems immediately
8. Accelerate installation of water conservation devices for manual and automated systems

EQUIPMENT

9. Wash equipment only as needed

PROJECTS

1. Review project schedules; postpone landscape projects if appropriate (See Attachment D: “Water Shortage Contingency Plans for Newly Established and Planned Landscapes”)

Continuing programs:

- Maintain normal irrigation programs at special gardens, high visibility public facility landscapes, prominent turf areas, zoo exhibits, lawn bowling greens, greenhouses and nursery
- Maintain normal irrigation programs on athletic field turf; water all-weather fields and infields for dust control
- Maintain normal irrigation programs in new turf, landscapes and tree plantings
- Irrigate construction sites for dust control

Golf

IRRIGATION

1. Automatic irrigation systems controlled by ET stations will be reduced by 10%
2. All irrigation on established plantings will be done between 7pm and 10am, except for handwatering on tree wells, container plantings, etc.

3. Reduce irrigation to “out-of-play” areas
4. Reduce irrigation to general park turf
5. Reduce irrigation to established shrub beds and mature trees

IRRIGATION REPAIR

6. Prioritize irrigation periodic maintenance and repair

EQUIPMENT/CARTS

7. Eliminate all washing of hard surfaces such as sidewalks, parking lots and cart paths, except as needed for public health and safety
8. Wash all equipment on an as needed basis in the field to utilize water efficiently
9. Wash carts as needed

Continuing programs:

- Maintain normal irrigation programs on tees, greens, lawn bowling greens and fairways
- Maintain normal irrigation programs on new turf, landscapes and tree plantings
- Water construction sites for dust control

Aquatics

WADING POOLS AND WATER PLAY FEATURES

1. Limit programs to sunny days of 70 degrees Fahrenheit(by 9:00am); update Hotline, as needed as needed
2. Fill pools to pre-determined lower level
3. Reduce hours of operation at non-recirculating water play features
4. Utilize informational signage to inform customers

SWIMMING POOLS AND BEACHES

5. Reduce shower temperatures to 100 degrees Fahrenheit to shorten use
6. Reduce spa temperatures by 2 degrees Fahrenheit
7. Reduce sauna hours of operation
8. Utilize informational signage to inform customers
9. Wash only full loads of clothes

Continuing programs:

- Operate normal programs for all pools and re-circulating water play features

MANDATORY STAGE

Objectives

To achieve targeted consumption reduction goals by restricting defined water uses

To protect public health and safety and ensure survival of valuable assets

To minimize disruption to Parks' projects and programs while meeting target consumption goals

To minimize impact on revenue producing programs

Triggers

The SPU Director would approve progression to this stage, as recommended by the SPU shortage advisory group, if goals established in the "Voluntary Stage" have not been met and additional action is needed. The specific restrictions imposed during the mandatory stage would be determined based on the season of the year, targeted demand levels, and other considerations previously mentioned. Variations of the specific restrictions may be applied based on water supply conditions. For example, turf watering restrictions may simply consist of time of day restrictions; or, if conditions warrant, turf watering could be restricted to certain times of day and allowed only once a week.

Public Message

"It is necessary to impose mandatory restrictions to reduce demand because the voluntary approach has not resulted in the necessary savings. We are continuing to rely on the support and cooperation of the public to comply with these restrictions but need the certainty and predictability of restricting certain water uses in order to ensure that throughout the duration of this shortage an adequate supply of water is maintained for public health and safety."

Mandatory Stage Actions

Communication Actions

The WSMT continues to meet frequently to re-evaluate the situation based on information provided by SPU and feedback from Voluntary Stage actions to determine appropriate actions and strategies. The group will determine target consumption goals to be achieved on a mandatory basis that may be revised as necessary.

Any exemptions from restrictions will be clearly identified

In communicating mandatory restrictions to the public, **a clear distinction will be made between turf watering and watering gardens and ornamental plantings.** Also, the **unique watering needs of the golf courses** will also be clearly identified. The type and amount of watering allowed will be clearly defined

Communication actions from the Advisory and Voluntary stages will be continued and enhanced

Plans will be made to move into the fourth stage - Emergency Curtailment - and to begin preparatory measures as appropriate

Department's Internal Operating Actions

Continue appropriate actions from previous stages

Finalize and implement procedures for exemptions from restrictions

Evaluate ability, resources and plans to move into Emergency Curtailment Stage; begin preparatory actions as appropriate

Supply and Demand Management Actions

- Continue all previous actions outlined in Advisory and Voluntary actions.

Facilities, Vehicles, Equipment, Picnic Areas, Boat Docks and Playgrounds

FACILITIES

1. Limit pressure washing of facilities to planned project work or operations that protect public health and safety on a case by case basis

COMFORT STATIONS

2. Limit pressure washing of comfort stations to operations that protect public health and safety on a case by case basis

VEHICLES

3. Continue washing only when needed, if possible, at car washes that recycle water

EQUIPMENT

4. Stop all equipment washing, except for cutting units, power tools or similar equipment

HARD SURFACE MAINTENANCE

5. Stop washing hard surfaces, except at those places necessary to maintain water quality, public safety or zoo animal health

FOUNTAINS

6. Turn off all fountains

PLUMBING

7. Continue to focus attention on plumbing leaks and repairs
8. Continue installation of faucet aerators

Continuing programs:

- Water construction sites for dust control
- Comfort station washing is done on a case by case basis
- Reduced hard surface cleaning

Park Landscapes

IRRIGATION

1. Reduce water use by ___% overall
2. Automatic irrigation systems controlled by ET stations reduced by _____%
3. All irrigation on established plantings will be done between 7pm and 10am, except for hand-watered tree wells, container plantings, etc.
4. Further reduce or stop irrigating general park turf
5. Further reduce irrigation to established park landscape beds and mature trees for survivability

IRRIGATION SYSTEMS

6. Continue to focus attention on irrigation system leaks and repairs
7. Accelerate installation of water conservation devices for manual and automated systems

EQUIPMENT

8. Stop all equipment washing, except for cutting units and similar equipment

PROJECTS

9. Postpone landscape projects, if appropriate

Continuing programs:

- Maintain normal irrigation programs at special gardens, high visibility public facility landscapes, prominent turf areas, zoo exhibits, lawn bowling greens, greenhouses and nursery
- Maintain normal irrigation programs on athletic field turf; water all-weather fields and infields for dust control
- Maintain normal irrigation programs in new turf, landscapes and tree plantings
- Water construction sites for dust control

Golf

IRRIGATION

1. Stop irrigating out-of-play areas
2. Stop irrigating roughs
3. Stop irrigating fairways on par 3 courses except Interbay
4. Stop all equipment washing, except for cutting units and similar equipment
5. Reduce irrigation to general established landscape beds and mature trees
6. Reduce irrigation of selected fairways

IRRIGATION REPAIR

7. Repair all leaks within 24 hours

EQUIPMENT/CARTS

8. Eliminate all washing of hard surfaces, such as sidewalks, parking lots and cart paths
9. Stop all equipment washing, except for cutting units, power equipment and similar equipment
10. Reduce cart washing frequency as necessary for public health and safety

Continuing programs:

- Maintain normal irrigation programs on tees, greens, lawn bowling greens and most fairways
- Maintain normal irrigation programs on new turf, landscapes and tree plantings
- Water construction sites for dust control

POSSIBLE ADDITIONAL IRRIGATION RESTRICTIONS FOR LANDSCAPES AND GOLF

Overall, the SPU shortage advisory group, in evaluating which restrictions to impose, will consider supply conditions. If supply conditions continue to deteriorate, before moving to the Emergency Curtailment Stage, and if irrigation is still occurring, turf watering will be banned (**except for golf greens and tees and athletic fields**). Newly installed turfs may be exempted from this ban if the procedures listed below are followed.

Watering Restrictions

The following are several possible approaches to watering restrictions. The nature of the restrictions used will depend on the situation, and may change as severity of the situation changes.

- Prohibit all watering during the warmest hours of the day, for example between 10:00 a.m. and 7:00 p.m.
- Limit all watering to a specific number of days per week or per month. This choice will depend on target consumption goals, the time of year and the extent to which watering is occurring, and how much demands have already decreased. For example, if demand has already been reduced by 15% through other measures, during July and August limiting turf watering to **two** days a week on a region-wide basis would further reduce average daily demand by approximately 15 million gallons. Limiting turf or turf watering to **one** day a week will yield an additional average daily reduction of 15 to 20 million gallons. (These figures are based on experience during 1992.)
- Ban turf watering (see exemptions below), with other watering prohibited during the warmest hours of the day, for example, between 10:00 am and 7:00 p.m.

Exemptions from Water Use Restrictions

Turf watering ban exemption- Newly installed turfs may be exempted from a ban if the procedures listed below are followed. The procedures relating to the exemption and the requirements of the exemption would be clearly outlined at the time of the ban. For purposes of this exemption, “new turf” refers to a turf newly installed during the current year only. Overseeding or other turf programs would not be exempt

In the event that the shortage continues to worsen and the Emergency Curtailment Stage is invoked, these special turf exemptions could be revoked. It could also be revoked on a case by case basis if the rules stated above are not followed, or in the case of a water system emergency.

Automatic Irrigation System Exemption - Users of automatic irrigation systems may be exempt from certain mandatory watering restrictions if proper procedures are followed— **but not from a total watering ban**. This approach allows an alternate path to achieving savings due to the precision with which such systems can be operated, but is not intended to be a loophole to avoid the need to curtail use. For example, if only 30 minutes of turf watering is allowed per week, automatic irrigation systems which meet the criteria would be allowed to water based on a certain percentage of evapotranspiration (ET), such as 50%, instead of the time-limit based restriction. [Note: ET is a factor calculated according to climatic data, which is commonly used for turf watering in commercial applications; ET data would be made available on the SPU web page and in alternate formats.] **In the event of a total watering ban, these users would also be prohibited from watering** (unless other safety-based criteria are met, as stipulated in the WSCP).

Other Exemptions -

For purposes of dust control, water may be applied to construction areas or other areas needing to comply with air quality requirements. **If reclaimed water is available, consider requiring or promoting that it be used for dust control, if feasible**

Aquatics

WADING POOLS AND WATER PLAY FEATURES

1. Limit programs to sunny days of 75 degrees Fahrenheit (by 9:00am); update Hotline, as needed
2. Implement schedule limitations to selected sites to maximize use
3. Update informational signage to inform customers

SWIMMING POOLS AND BEACHES

4. Postpone PM's and maintenance fills
5. Close spas and saunas
6. **Colman pool:** Implement saltwater backwash
7. Wash only full loads of clothes
8. Update informational signage to inform customers

Continuing programs:

- Maintain normal wading pool programs at the Big 3 (Green Lake, Lincoln Park and Volunteer Park) and selected others
- Operate normal public programs at all swimming pools

EMERGENCY CURTAILMENT STAGE

At this stage, SPU recognizes that a critical water situation exists. Without additional significant curtailment actions, a shortage of water for public health and safety will be imminent. No prior emergency in the Seattle water system's history fits this description.

This stage is characterized by two basic approaches. First, increasingly stringent water use restrictions are established and enforced. Secondly, significant rate surcharges are used to encourage customer compliance. While a rate surcharge may be implemented in either the Voluntary or Mandatory stages, a surcharge is a key component to the success of this stage and previous surcharge may be increased if appropriate.

Emergency Curtailment Stage Actions

Communication Actions

Continue all previous, applicable actions

The Water Shortage Management Team defines the problem to staff and the public as an emergency. Staff and customers are informed of possible pressure reductions and problems that this may entail.

Department's Internal Operating Actions

Continue actions listed in prior stages

Supply and Demand Management Actions

Continue actions listed in prior stages

Facilities, Vehicles, Equipment, Picnic Areas, Boat Docks and Playgrounds

FACILITIES

1. Limit pressure washing of facilities to planned project work or to protect public health and safety on a case by case basis

COMFORT STATIONS

2. Limit pressure washing of comfort stations except to protect public health and safety on a case by case basis

VEHICLES

3. Wash city vehicles only as needed, if possible, at a car wash that recycles water

EQUIPMENT

4. Stop all equipment washing except for cutting units, power equipment or similar equipment

HARD SURFACE MAINTENANCE

5. Limit washing hard surfaces except to maintain public health and safety

FOUNTAINS

6. Turn off all fountains

PLUMBING

7. Continue to focus attention on leaks and repairs
8. Continue installation of faucet aerators

Continuing programs:

- Water construction sites for dust control
- Continue normal water use for comfort station cleaning
- Reduced hard surface cleaning for public health and safety

Park Landscapes

IRRIGATION

1. Reduce water use by _____%
2. Automatic irrigation systems controlled by ET stations reduced by _____%
3. All irrigation on established plantings will be done between 7pm and 10am, except for hand-watered tree wells, container plantings, etc
4. Stop irrigating general park turf
5. Further reduce irrigation to general park landscaped areas/mature trees for survivability
6. Reduce turf irrigation in special gardens, high visibility public facilities, and prominent irrigated turf for survivability
7. Reduce irrigation on soil-based athletic field turf
8. Stop irrigating manually-irrigated annual plantings; remove plants if necessary

IRRIGATION SYSTEMS

9. Continue to focus attention on irrigation system leaks and repairs
10. Accelerate the installation of water conservation devices for automatic systems

EQUIPMENT

11. Stop all equipment washing, except for cutting units, power equipment or similar equipment

Continuing programs:

- Maintain normal irrigation programs at special gardens, high visibility public facility landscapes, zoo exhibits, lawn bowling greens, greenhouses and nursery
- Maintain normal irrigation programs on sand-based athletic field turf only; water all-weather fields and infields for dust control
- Maintain normal irrigation programs in new turf, landscapes and tree plantings, or as instructed for survivability
- Water construction sites for dust control

Golf

IRRIGATION

1. Stop irrigation to out-of-play areas
2. Stop irrigating roughs
3. Stop irrigating fairways on par 3 courses
4. Significantly reduce fairway irrigation for survivability
5. Further reduce irrigation to general landscape beds and mature trees for survivability

IRRIGATION REPAIR

6. Continue to repair all leaks within 24 hours

EQUIPMENT/CARTS

6. Eliminate all washing of hard surfaces except to protect public health and safety
7. Stop all equipment washing, except cutting units, power equipment and similar equipment

Continuing programs:

- Maintain normal irrigation programs on tees, greens and lawn bowling greens
- Maintain normal irrigation programs on new turf, landscapes and tree plantings, or as instructed for survivability
- Water construction sites for dust control

Aquatics

WADING POOLS AND WATER PLAY FEATURES

1. Close all wading pools and water features; update Hotline, as needed
2. Update informational signage to inform customers

SWIMMING POOLS AND BEACHES

3. Continue all reductions in Mandatory Stage

Continuing programs:

- Operate normal public programs at all swimming pools

SECTION 4

SHORT TERM EMERGENCY CURTAILMENT PLAN

Introduction

Although many of the demand reduction measures employed would be similar to those used during a progressive, weather-related shortage, **short term emergencies** are unique because of a lack of preparation time and the urgency of immediate, large-scale demand reductions. Each emergency scenario is different, but most of them require major curtailment actions by customers. Also, unlike drought, some emergencies would be localized, requiring demand reduction for only a limited geographic area.

Strategies for dealing with emergencies have been developed based on lessons learned from previous water utility events, other utility experiences, and a sorting of measures based on specific criteria. There are several criteria by which to decide which demand management measures are appropriate to initially reduce demand during an emergency:

- **Timing:** can the measure(s) or action(s) deliver the necessary savings in the necessary timeframe, i.e., are immediate savings needed or can the system support a gradual reduction in demand;
- **Magnitude of savings:** will the measure produce enough savings to make a meaningful difference i.e., reduce demand to the level the impaired water system can handle;
- **Season:** does the action make any impact at the time of year that the emergency occurs, i.e., banning turf watering will have little impact in November;
- **Costs:** How severe are the cost implications of the measure to the customer, including local business and industry.

Supply and Demand Management during Emergencies

No single strategy can be created which will meet the needs of the Department for all emergency scenarios. The criteria listed above create a framework for decision-making. Emergencies initially require quick and immediate response. Once an assessment is made as to how long it will take to restore the system, the immediate response strategy may change if it appears that the repair process will be lengthy.

The strategy for most emergencies can be narrowed to measures having the most immediate impact on water supply and consumption. All needed and available back up supplies would be activated during an emergency: interties, well-fields, off-loading wholesale customers who have other sources, etc.

The table in the attachments presents a range of potential demand management savings. The range depends on factors including the season, weather conditions, how effectively and urgently the message is communicated, whether or not an emergency surcharge is included, etc.

Attachment A
Estimated Savings from Possible Curtailment Measures

Major Uses	Total Use	Curtailment		Savings			
	MGD	MGD	MGD	% of Savings	%		
	May 15 - Sep 15	Low	High	Residential	Low	High	
Toilet	31	1.9	3.9	65%	6%	13%	"1 fewer flush" (25-50% compliance)
Irrigation	27	18.9	24.3	84%	70%	90%	"Irrigation ban" (75-95% compliance, new landscapes exempt)
Other Household Use	22	1.1	2.2	84%	5%	10%	"Use less, don't let it run" (25-50% compliance)
Shower	18	1.8	3.6	100%	10%	20%	"5 minutes max" (25-50% compliance)
Water System Use	18	1.8	3.6	0%	10%	20%	"Only crucial health and safety needs" (100% compliance)
Clotheswashing	16	0.8	1.6	100%	5%	10%	"Eliminate partial loads" (25-50% compliance)
Cooling	11	0.6	1.1	0%	5%	10%	"Raise the thermostat" (25-50% compliance)
Process	10	0.5	1.0	0%	5%	10%	"Cut non-essential use" (25-50% compliance)
Other	6	0.3	0.6	0%	5%	10%	"Cut non-essential use" (25-50% compliance)
Leaks	6	0.3	0.6	91%	5%	10%	"Fix the leaks" (5-10% compliance)
Dishwashing	5	0.3	0.5	100%	5%	10%	"Eliminate partial loads" (25-50% compliance)
Recreation	5	0.6	1.3	78%	13%	25%	"Don't let it run" (25-50% compliance)
Food Service	5	0.3	0.5	0%	5%	10%	"Cut non-essential use" (25-50% compliance)
Total	180	29.2	44.8	68%	16%	25%	
Outside Water Use (included in categories above)							
Home Car Washing	1	0.2	0.4	100%	20%	40%	"Go to Recycled Car Washes" (25-50% compliance)

Hydrant Permits	1	0.4	0.8	0%	38%	75%	"Only crucial health and safety needs"
Turf Watering	20	14.0	18.0	86%	70%	90%	"Turf watering ban"
All Watering	27	18.9	24.3	84%	70%	90%	"All watering ban"
All Outdoor Use	31	21.7	27.9	89%	70%	90%	"All outdoor use ban" (Health and safety exempt)
Nonresidential Irrigation	4	0.5	1.0	0%	13%	25%	"Water to 50% of ET" (25-50% compliance)

Attachment B

CONTACT LIST

Department's Water Shortage Management Team

Division Director(s)
Horticulture Manager
Operations Manager(s)
Maintenance Services Manager
Aquatics Manager
Environmental Stewardship Manager
Aquarium Manager
Zoo Operations Manager
Golf Manager
Public Information Officer
Resource Conservation Coordinator

A working list of contacts for easy reference in case of a drought or emergency should be developed and regularly updated in consultation with Department management.

DEFINITIONS AND LISTS

IRRIGATED PARK AREAS

Prominent turf: High visibility or high use turf areas. Examples: Community centers, popular picnic or sunbathing areas, zoo turfs or smaller neighborhood Department's where the turf is the major amenity

General park turf: Turf areas in Department's of various types where irrigation is available

Athletic field turf: Turf areas characterized by scheduled sports play

Soil-based athletic field: Athletic fields with substrates generally composed of native soil formed onsite with minimal amendment

Sand-based athletic field: Athletic fields with substrates composed entirely of imported sand

All-weather athletic field: Athletic fields with a well drained playing surface; often non-turf but can include turf-artificial composition surfacing

High visibility public facility landscapes: Landscaped areas in a high visibility or high use, prominent location. These landscapes include woody and /or herbaceous plant material, and occasionally turf areas. Examples: Community Centers or park entrances

General landscape bed areas: Non-turf planted areas that include woody plant material such as shrubs, trees and ground covers.

Floral beds: A landscaped bed for floral display, containing herbaceous plants such as perennials, annuals and bulbs

Special Garden: A high visibility, highly maintained landscape display area containing a collection of valuable, unique and rare plants

Greenhouse: A house of glass or polymer plastic construction that is used for the propagation, growing and care of plants

Nursery: A facility for the propagation and growing of plants for use on developed and undeveloped park property

New turf, landscape or trees: Landscapes, trees and turf plantings that were installed within the last 12 months

Zoo exhibit landscapes: Landscapes, trees and turf plantings in an exhibit habitat zone, planted in a naturalistic fashion to represent a bioclimatic region of the world

SPECIAL GARDENS

Japanese Garden

Kubota Garden

Parson's Garden

Washington Park Arboretum

Woodland Park Rose Garden

Woodland Park Zoological Gardens

GREENHOUSES

Jefferson Greenhouse

Volunteer Park Conservatory

Volunteer Park Greenhouse

Woodland Park Zoo Greenhouses

NURSERY

Atlantic Nursery

Attachment D

Water Shortage Contingency Plans for Newly Established or Planned Landscapes

New Landscape installations shall be defined as those tree, planting beds, including shrubs, perennials and ground covers, and turf plantings that are substantially complete and were installed within the last 12 months. These landscapes will be exempt from irrigation restrictions for during their establishment period as defined below. This ensures that the City's asset investment is properly managed and maintained for long-term health.

The Office of Sustainability and Environment publication: The Landscape Guidelines for City Departments provides a basis for organizing and analyzing new landscapes for irrigation management in a critical water shortage. The guidelines refer to two categories of project:

- ❑ Newly installed landscapes and;
- ❑ Proposed, funded landscape projects

Each of these requires assessment and analysis for proper water management. Proposed projects should also be analyzed to consider the impacts of schedule changes or postponement.

New Landscapes

Parks' Best Management Practices identify the critical need for regular irrigation of new landscapes, be they trees, shrubs, perennials or turf. The Landscape Guidelines support this position indicating that new landscapes need to be adequately irrigated to fully ensure asset survival and establishment. SPU's and Parks' Water Shortage Contingency Plans are also in agreement with this position. It is well documented that the future health of plants is directly tied to proper post-construction cultural care, including irrigation. Therefore:

- ❑ New landscapes are exempt from irrigation restrictions and shall be watered as needed for establishment
- ❑ The establishment period for new landscapes is generally considered to be at least two to three years
- ❑ New planting areas shall be mulched to retain moisture
- ❑ Weed control shall be consistently employed to maximize the use of available water by the desired landscape plants

Proposed Landscapes

Proposed landscapes shall be defined as those that are scheduled to be installed during the remainder of the current year. These projects include CIP, CRF, CDBG, NMF, in-house (M&O), volunteer and projects from other fund sources. In order to conserve water the Department shall determine whether these projects can/should be postponed. Criteria for postponement consideration shall include:

- ❑ Contractual concerns - will delaying the project result in problems with in-place contracts (such as the sequencing of work)?
- ❑ Budget concerns - will delaying the project increase costs to the project?
- ❑ Timing - have the plant materials already been purchased and are ready for installation? (If the answer is yes, it is recommended that these projects be installed as planned to avoid the possibility of undue plant stress which can lower the chances for healthy plant establishment.)
- ❑ Community/partnership commitments - does the project have multiple partners? Might postponement cause one or more partners to withdraw the partnership?

A "No" answer to any of these questions should result in serious consideration of project postponement. "Yes" answers are an indication that the project might need to proceed as planned. In addition, consideration should be given to partial project implementation, as follows:

- ❑ Can the new landscape site be prepared now with planting delayed until fall/winter?
- ❑ Can the major trees/shrubs be planted now (for hand watering) with ground covers and turf plantings delayed until fall/winter?

Landscape/project managers should assess all of the new and planned landscape installations to determine the irrigation management required for each, and plan according to the above guidelines.

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