The City of Lake Oswego takes seriously its commitment to ensure a supply of water adequate to meet the needs of its citizens for consumption, recreation, public health purposes, sanitation and fire protection. This water curtailment plan reflects the City’s ongoing efforts to anticipate and proactively respond to a range of natural and human caused events that could result in water shortages of varying degrees of severity and duration. The primary objective of this water curtailment plan is to reduce demand due to prolonged drought, or system failure from unanticipated events including catastrophic events (flooding, landslides, earthquakes and contamination), mechanical or electrical equipment failure or events not under control of the City e.g., localized or area-wide power outages and intentional malevolent acts. Going forward, this plan must also acknowledge and be responsive to competing demands for the limited supply capacity of the Clackamas River due to the presence of several species of threatened and endangered fish stocks and the uncertainty of supply created by global climate change. These issues will demand increased vigilance and commitment with regard to how the City manages and uses its water.

Shortage Event Triggers

Analysis of consumptive demands on Lake Oswego’s supply, treatment and distribution system between the years 2001-2005 indicate that average day demands (ADD) range from 6.1 to 9.7 million gallons per day (mgd) and maximum day demands (MDD) have ranged from 12 - 16 mgd. Demand records also show that with increasing regularity, the average demand over a three-day period, in which the middle day is also the maximum day, approaches 90 percent of the MDD. In other words, there have been times when MDD demands equal our maximum supply capacity (16 mgd) and the 3-day MDD averages 14.4 mgd.

The City’s water system critical facilities and lifelines include its water supply intake on the Clackamas River (located approximately 0.8 mile upstream of the confluence with the Willamette River); its water treatment plant located in the neighboring community of West Linn, and its raw and finished water transmission mains. These systems form the backbone of the City’s water supply system and are now 40+ years old. During the peak season, these critical facilities operate 24/7 at maximum capacity. Analysis of these systems during an update of the City’s water master plan conducted in 2001 indicates that in order to meet MDD, all systems must operate at maximum installed capacity.
During non-peak demand periods, (November through May) climatic triggers are unlikely to be met, excepting the occurrence of a catastrophic natural disaster that could potentially impact multiple elements of the City’s source of supply simultaneously.

During the peak summer demand period when system capacity is operating at or near its maximum, interruption of or reductions to supply due to natural disaster, mechanical failure, terrorist act or low stream flows could present significant challenges to the City and it is for this period of time: generally June through October that this plan is most relevant and thus the shortage triggers and related curtailment actions are based on events occurring during this time period. Any stage of the plan that is triggered will remain in effect until conditions change to warrant increasing or decreasing the level of response.

**Curtailment Stages**

Depending upon the nature of the event giving rise to a water supply shortage and considering predecessor and successor conditions, this curtailment plan for City of Lake Oswego would be initiated and implemented in stages. Events causing this plan to be activated would include but not be limited to the following:

- Abnormal weather conditions preceding the peak summer supply season that present a high likelihood for below normal summer stream-flows in the Clackamas River.
- U.S. Drought Monitor level for region at D0 or higher.
- Declaration of a drought for Clackamas County by the Governor pursuant to ORS 536.720.
- Catastrophic natural disaster that damages individual critical facilities and/or lifelines or extensive portions of the City’s distribution system.
- Mechanical or electrical malfunction of critical pumping facilities at the City’s intake or water treatment plant or fire.
- Interruption of local utility electrical service.
- Terrorist act perpetrated on any of the City’s critical facilities, storage reservoirs or contamination of source water.
The City’s curtailment plan dealing with mechanical and infrastructure conditions has five distinct stages, each of which is triggered by one or more of the events listed below and grouped as follows:

<table>
<thead>
<tr>
<th>Curtailment Stages 1 through 5</th>
<th>Mechanical/Infrastructure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage Description</td>
<td>Initiating Conditions (Triggers)</td>
</tr>
<tr>
<td>Stage 1 - Water Shortage Alert</td>
<td>Mechanical or electrical malfunction causes the loss of any two pumps at intake facility, minor damage to its raw or treated water transmission mains e.g., leaking joint requiring repair.</td>
</tr>
<tr>
<td>Stage 2 - Serious Water Shortage</td>
<td>Mechanical or electrical malfunction causes the loss of the largest pump at intake; more extensive repairs needed on raw or treated water transmission mains.</td>
</tr>
<tr>
<td>Stage 3 - Severe Water Shortage</td>
<td>Loss of pump 1, 2, or 3 at WTP; loss of utility electrical service at intake; multiple failures in the joints of the raw or treated water transmission mains.</td>
</tr>
<tr>
<td>Stage 4 - Critical Water Shortage</td>
<td>Loss of utility electrical service at WTP or intake; major mechanical or electrical malfunctions causing loss of multiple pumps at intake or WTP; transmission main failures; fire at intake or WTP; terrorist threat against supply system; contamination of source of supply.</td>
</tr>
<tr>
<td>Stage 5 - Emergency Water Shortage</td>
<td>Extensive damage to transmission, pumping or treatment processes caused by natural disaster, intentional acts or fire, contamination of source or any other event resulting in an immediate, sustained deprivation of water supply.</td>
</tr>
</tbody>
</table>

In addition the City recognizes that weather cycles, droughts and other climatic events can have adverse effects on not only the quantity and quality of the water that is provided, but may also increase customer demand. In response, the City has also included in its curtailment plan specific environmental triggers to help us proactively anticipate and respond to conditions that would affect our source of supply or increase peak season usage. Activation is triggered by any two of the conditions or events occurring simultaneously within the constraints of a given stage. Monitoring of conditions is ongoing throughout the water year (October 1 - September 30) and data is analyzed for anomalies. Data for these triggers is gathered as follows:

**Clackamas River Basin Precipitation Levels:** Taken from two NOAA operated Precipitation Stations located at or near Three Lynx Creek (358466), and Estacada (352693). Monthly totals are averaged and compared against historical averages of normal monthly totals. This data reflects the relationship of historic precipitation accumulating between October and March, and downstream flows during the demand period of May through October.

**Intake Mean Stream flows:** This data is gathered at USGS gage 14211010 located just upriver from the City’s River Intake Pump Station, and compared with historic USGS gauged flows. ODFW has declared stream flow requirements for the Clackamas River that are necessary to the persistence of threatened and endangered fish species native to the Clackamas River. This data will be evaluated on a rolling seven-day average throughout the months of May through October.
**Drought Level:** Regional drought levels are published by the U.S. Drought Monitor, a national site used to forecast severity and predict probability of drought conditions nationally. Drought levels are reported in five levels of intensity: D0- abnormally dry; D1- Moderate Drought; D2- Severe Drought; D3- Extreme Drought and D4- Exceptional Drought. The drought monitor publishes and reports on state and regional conditions. This site will be monitored monthly throughout the year to anticipate the possibility and severity of drought during the upcoming peak demand season. Forecast drought levels will be used in combination with other climatic and stream flow information to proactively anticipate likely curtailment stages.

**Local Precipitation Levels:** Precipitation data will be collected from several local sites and evaluated as to percentages of normal as triggers. Local precipitation or lack thereof, is an indicator of anticipated peak season demands.

A summary of environmental triggers are as follows:

<table>
<thead>
<tr>
<th><strong>Curtailment Stages 1 through 5</strong></th>
<th><strong>Environmental (Any two triggers in effect simultaneously)</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Stage Description</strong></td>
<td><strong>Initiating Conditions (Triggers)</strong></td>
</tr>
<tr>
<td>Stage 1 - Water Shortage Alert</td>
<td>Average of monthly precipitation levels upstream of intake ≤ 90% of historic norms across a rolling 30-day period between November and April of any year; Monthly stream flows at USGS gage 14211010 ≤ 90% of historic norms across a rolling 30-day period; Regional drought level D0 or higher; Average local precipitation levels ≤ 90% of norms across a rolling 30-day period.</td>
</tr>
<tr>
<td>Stage 2- Serious Water Shortage</td>
<td>Average of monthly precipitation levels upstream of intake ≤ 85% of historic norms across a rolling 30-day period between November and April of any year; Monthly stream flows at USGS gage 14211010 ≤ 85% of historic norms across a rolling 30-day period; Regional drought level D1 or higher; Average local precipitation levels ≤ 80% of norms across a rolling 30-day period; stream flows at or below 1,200 cubic feet per second (cfs) on June 1.</td>
</tr>
<tr>
<td>Stage 3- Severe Water Shortage</td>
<td>Declaration of drought by Governor pursuant to ORS 536.720; Regional drought level D2 or higher; Average of monthly precipitation Levels upstream of intake ≤ 80% of historic norms across a rolling 30 day period between November and April of any year; Monthly stream flows at intake ≤ 80% of historic norms across a rolling 30 day period; Average local precipitation levels ≤ 75% of historic norms across a a rolling 30 day period; stream flows at or below 1,000 cfs on July 15.</td>
</tr>
<tr>
<td>Stage 4 - Critical Water Shortage</td>
<td>Declining river flows at or below 950 cfs on July 15. Regional drought level D3 or higher; Monthly precipitation levels upstream of intake ≤ 75% of historic norms across a rolling 30 day period. Average local precipitation levels ≤ 75% of historic norms across a rolling 30 day period;</td>
</tr>
</tbody>
</table>
Customer Categories:
Within each stage of the curtailment plan are specific actions to be taken by water users and the City in response to the aforementioned triggers for any particular event(s). The City’s customer base is comprised predominately of two customer types. They are categorized as follows:


Category B: Non-residential customers. Customers not included in Category A and customers with large turf areas i.e., greater than 1/2 acre, including schools, golf courses, office complexes, private or public parks and common use areas.

Stages and Actions:
Stage 1: Water Shortage Alert

City of Lake Oswego Actions: Water Shortage Alert status will activate a program to inform customers of the potential for drought and/or reasons other than drought where the need for temporary reductions in consumption are necessary due to the potential for the system supply capacity to fall below the 3-day MDD. The City Manager and /or City Engineer shall issue a general request for voluntary reductions in water use by all water users. The request will include a summary of the current water situation, the reasons for the requested reductions, and a warning that mandatory restrictions or prohibitions may be enacted if voluntary measures do not reduce system-wide water use by 2%.

Stage 1 public information program elements would include:

1. Issuing press releases to local media outlets informing residents and businesses about the potential for summer water shortages or temporary interruptions to normal service delivery;
2. Post pre-prepared public service announcement on City’s webpage and in the City’s Hello LO newsletter and LOdown Weekly News letter. Include prepared information regarding conservation tips;
3. Provide notice of potential shortages through utility bill inserts;
4. Activate water conservation hotline in the City’s Citizens Information Center. Include pre-recorded message providing conservation tips. Update recording weekly to maintain current status of event trigger;
5. If shortage is due to compromised infrastructure, initiate contact with senior operations staff at City of West Linn and Tigard regarding potential need to activate intersystem connections for temporary water supply to Lake Oswego;
6. Contact wholesale customers notifying them of the existence or potential for water shortages. In certain circumstances it may be necessary to “lock-out” interties with wholesale customers as a means of offloading demand on the City’s system.

Category A & B Users: Voluntary reductions in over all use by 2% (~20 gallons per household per day).
Stage 2: Serious Water Shortage

City of Lake Oswego Actions: If Serious Water Shortage status is reached, all of the actions for Stage 1 will remain in effect. Additional demand reduction goals will be achieved by limiting certain types of uses based upon customer category. Emphasis will be on reducing nonessential water use. Stage 2 will be initiated by the City Manager and/or the City Engineer. A demand reduction target of 4% will be communicated to the general public. Additional Stage 2 program elements would include:

1. Provide handouts/door hangers to field personnel with direction to remind customers of voluntary measures and shortage status.
2. Encourage, through public service announcements, voluntary restrictions on outdoor irrigation and limit outdoor irrigation times to between 8:00pm and 8:00 am.

Category A: Communicate goals to reduce daily residential water use by 4% (~40 gallons per household per day). No irrigation between 8:00am and 8:00 pm. Encourage customers to refrain from washing cars except at commercial establishments that recycle or reuse water in their cleaning process. Offer free single-wash coupons to encourage compliance. No filling of swimming pools. No pressure washing roofs, decks, or home siding unless such uses are necessary for painting, repair, remodeling or construction. No hosing and/or washing off of sidewalks, driveways or patios. No using water for dust control unless there is a demonstrable need to do so in order to meet public health or safety requirements including but not limited to abatement of fire or sanitation hazards or to meet air quality standards as mandated by the Oregon Department of Environmental Quality.

Category B: Communicate goals to reduce daily water use by 4%. No irrigation between 8:00am and 8:00 pm. No pressure washing roofs, decks, or building siding unless such uses are necessary for painting, repair, remodeling or construction. No using water for dust control unless there is a demonstrable need to do so in order to meet public health or safety requirements including but not limited to abatement of fire or sanitation hazards or to meet air quality standards as mandated by the Oregon Department of Environmental Quality.

Stage 3: Severe Water Shortage

Water Utility Actions: Stage 3 curtailment actions will be initiated by the City Manager as authorized by the City Council. In addition to the actions included in Stage 1 and 2, Stage 3 will expand mandatory prohibitions on non-essential water use with the goal of reducing system-wide demand by 8%. Under Stage 3, the City would take the following actions:

1. Implement additional water use restrictions as more thoroughly described below.
2. Contact wholesale customers notifying them of water shortages and that it may be necessary to “lock-out” interties with wholesale customers as a means of offloading demand on the City’s system.
3. Enact a schedule of penalties for violating such water use restrictions as may be imposed by Council action.

4. Request activation of intersystem connections with Tigard or West Linn. This measure would only be undertaken in a case where the severe water shortage was due to an event not related to a shortage in the source of supply, in which case both alternate systems could be used, or in the case where the Clackamas River system is constrained, the Tigard connection could be utilized to provide temporary supply from Portland’s Bull Run or JWC’s Trask River source.

**Category A:** Communicate goals to reduce daily water use by 8%. Restrict outdoor irrigation on residential properties to Sundays, Wednesdays and Fridays per every 7-day period and only between the hours of 8:00 pm and 8:00 am. Irrigation water shall not be allowed to overflow off any property onto adjacent property, public right-of-way or otherwise running into, pooling or flowing across streets, driveways, parking lots, pathways or sidewalks. Irrigating during any periods of rainfall is prohibited. No filling of pools, ponds or water features. No operation of fountains or waterfalls other than those that recycle water. No washing of vehicles other than in establishments that recycle water.

**Category B:** Communicate goals to reduce daily water use by 8%. Restrict outdoor irrigation on non-residential properties to Saturdays, Mondays and Tuesdays per every 7-day period and only between the hours of 8:00 pm and 8:00 am. Irrigation water shall not be allowed to overflow off any property onto adjacent property, public right-of-way or otherwise running into, pooling or flowing across streets, driveways, parking lots, pathways or sidewalks. Irrigating during any period of rainfall is prohibited. Operation of pools, ponds or fountains other than those that recycle water is prohibited. No washing of vehicles other than in establishments that recycle water.

**Stage 4: Critical Water Shortage**

**Water Utility Actions:** Conditions causing Stage 4 curtailment measures are severe enough in terms of extent and duration that significant reductions in water use must be achieved as quickly as possible. Initiation of Stage 4 curtailment measures would be made by the City Council and would include the measures enacted through all previous stages. In a Stage 4 shortage, the Lake Oswego City Council would restrict all outside and non-essential water use. Stage 4 measures would attempt to achieve reductions in residential and commercial demands of up to 20% of PDD. In the case of temporary water loss due to major damage to critical supply system facilities or major damage to local electrical utility systems, it may be necessary to bypass Stage 4 and move directly into Stage 5.
Additional actions in stage 4 include:

1. Increased enforcement actions.
2. Citations for violations.
3. Water main flushing allowed only for water quality concerns or for emergency purposes.
4. Prohibit washing of vehicles, unless the City Council finds that the public health, safety, and welfare is contingent upon frequent vehicle cleaning such as cleaning of solid waste transfer vehicles, vehicles that transfer food and other perishables, or as otherwise required by law.
5. If such a critical water shortage takes place in the Clackamas Basin, (that is, plant power failures, transmission line breaks), the City Council may pass additional restrictions and exemptions as necessary.
6. Offload demands from existing wholesale customers by closing intersystem connections to Lake Grove Water District, Skylands Water Company, Glenmorrie Water Cooperative and City of Portland.

**Category A:** Turf irrigation prohibited. Trees and shrubs may be watered by hand and only between the hours of 8:00pm and 8:00am. No use of outdoor water features. Water running off properties onto adjacent property, sidewalks, streets, etc. will be considered waste and subject to civil citation.

**Category B:** Trees and shrubs may be watered but only of sufficient amount to maintain health. No use of outdoor water features. Turf irrigation prohibited, except as follows and only between the hours of 8:00pm and 8:00am. No use of outdoor water features. Water running off properties onto adjacent property, sidewalks, streets, etc. will be considered waste and subject to civil citation.

   1. Turf areas of golf tee boxes and greens. No watering of fairways, roughs, driving ranges or common areas is allowed.
   2. High use athletic fields used for organized sports play. Only the field itself may be watered. Public viewing areas, common areas or border areas may not be watered.
   3. Designated Parks and/or park facilities deemed by the City Council to be of particular significance or value to the community may be watered no more than twice weekly between the hours of 8:00pm and 8:00am.

**Stage 5: Emergency Water Shortage**

**Water Utility Actions:** Stage 5 responds to events causing an immediate and sustained loss of the source of supply or major damage to critical treatment, transmission and pumping systems. Examples include failure of a main transmission line, failure of the intake or water treatment plant, a chemical spill into the Clackamas River upstream of the intake, or a malevolent attack on the system that introduces a contaminant at some
point in the system. Under Stage 5, all restrictions implemented under Stage 4 will remain in effect for all categories of users.

Under the Emergency Water Shortage status, as necessary, the City Council may prohibit all water use except that necessary for human consumption and sanitation needs. If the emergency causes or is expected to cause a shortage of water for a period of time, the City Council shall consider implementing the curtailment measures of Stage 3 or Stage 4, as appropriate. The City Council or City Manager may also activate the City’s Emergency Operations Center (EOC) in order to mobilize sufficient resources to respond to the event(s) causing the need for a Stage 5 action.

If the event renders water in the system unsafe to drink e.g., chemical spill or intentional act against the system, the EOC will be activated and the Incident Commander will assume command and control of the City’s response to the event. As the cause and severity of the event dictates, the Incident Commander will:

1. Implement the appropriate response protocols of the City’s Emergency Response Plan for the Lake Oswego Water System.
2. Activate the Code Red communications system.
3. Contact the Oregon Drinking Water Program, Department of Human Services, and request their assistance in response actions.
4. Notify the local news media, to solicit their assistance in notifying customers.
5. Contact County, State and Federal law enforcement officials as appropriate to the severity and nature of the event.
6. Contact the County Public Health Officer and local hospitals as appropriate to the type of event.
7. Contact the Regional Water Providers Consortium staff and seek use of portable water distribution systems as available.

The city will continue to investigate and develop specific back-up plans for a Stage 5 emergency. These plans may include purchasing water from the City of Portland via the City of Tigard, purchasing water from the South Fork Water Board (assuming this source is available), directing residents to a pre-designated water distribution location, and/or supplying bottled water.

**Violations of Mandatory Curtailment Measures**

As any curtailment stage listed in the shortage plan is activated by action of the City Manager, City Engineer or City Council, the City will issue a notice to all water customers informing them that a certain stage is in effect. Included in this notice will be a listing of mandatory and/or voluntary water use reduction levels that will be in effect as well as specific activities that will be prohibited. Violations of mandatory curtailment action measures would be considered a violation of Lake Oswego Code (LOC) Chapter 38.26.935.

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1 Demand reduction targets will be measured against the average of the previous 7-days of plant production.