City of Windhoek

City of many faces

Drought Response Plan

DEPARTMENT OF INFRASTRUCTURE,

WATER AND

TECHNICAL SERVICES

Version 1/2015

INTRODUCTION

Namibia is a semi-arid country, with the lowest average rainfall in the Southern Africa region. Droughts are frequent occurrences, which require appropriate management to assist in the successful bridging thereof, while making every effort to sustain development, social and economic goals.

As a drought is a naturally occurring phenomenon each drought is different. It is therefore not considered practical to develop a set of hard-and-fast rules to apply to all droughts. Rather, these guidelines are intended to provide a framework for timely drought response while maintaining flexibility to respond to unique drought conditions. These guidelines are intended to assist the Windhoek City Council (the Council), through the Department of Infrastructure, Water and Technical Services, in making decisions throughout the course of a drought. The Council may adjust or refine the response based on actual drought conditions.

The Drought Response Plan outlines guidelines the City of Windhoek will use to manage water supply and water use during drought situations. The 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 individual customer needs as much as possible.

Windhoek as the capital city and seat of government encompasses the largest urban and industrial development in Namibia. The potable water supply scheme serving the city is owned, operated and maintained by NamWater as the national bulk supplier of water in the country. The so-called “three dam system” transferring water to the Von Bach Water Treatment Plant (VBWTP), located near the town of Okahandja, comprises the bulk of the NamWater supply scheme for the Central Areas of Namibia, including Windhoek.

Given the supply system to Windhoek, a drought is defined as a condition of insufficient water supplies in the aforementioned dams caused by a deficit in precipitation and subsequent runoff. Unfortunately, no one can predict how long drought conditions will continue once they begin which all the more raises the importance of early action in line with a defined strategy. This Drought Response Plan consists of the following components:

- **Drought Severity Indicators –** A variety of factors that should be considered in choosing an appropriate drought response.
- **Drought Response Actions –** Guidelines for augmenting water supplies and reducing water use during times of drought.
- **Drought Response Program Elements –** Guidelines for water uses during different levels of drought.

Contents

DROUGHT SEVERITY INDICATORS (DSI)

Given the reliance of the water supply to the Central Areas on the three dams, dam contents are considered an accurate indicator of a drought's impact on supplies. Dam levels are the bottom line result of the factors affecting supply, including weather, precipitation, runoff, evaporation, collection system limitations and water use.

Drought severity indicators can generally be based on a number of events, but for the purposes and intent of this document it will be based on the Central Areas Water Committee Analysis. The aforementioned provides an indication of the period for which water is available to sustain the present demand given available resources. The principle objective of the forecast modelling is to bridge two rainy seasons without any inflow into the main dams (i.e. dam water contents in relation to demand profile).

During a drought, the City of Windhoek (COW), Department of Infrastructure, Water and Technical Servicers will consider drought severity indicators in choosing the appropriate drought response program. The **Drought Response Program** section indicates how the drought severity indicators align with the suggested drought response framework. The combined water availability of the water supply dams/reservoirs providing water to the central water supply area will be the primary indicator for the Drought Severity Index (DSI).

NOTE: The Central Areas Water Committee Analysis is used to assess the water supply situation for the next two rainy seasons at the annual meeting in May each year.

DROUGHT SEVERITY INDEX

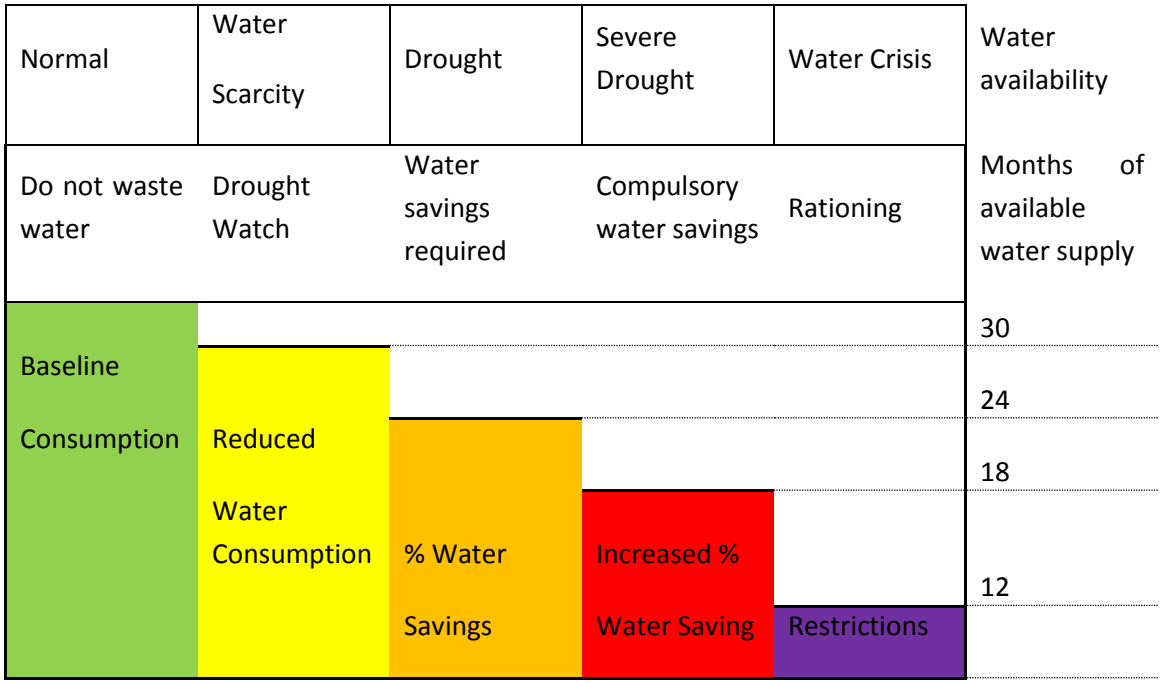


Figure 1: General guide for drought response in relation to dam contents and remaining period of supply.

DROUGHT IMPACT FACTORS

1. Political, Social and Economic Indicators

Consumer response to calls for saving water may be influenced by public perceptions about the drought, the drought response activities of other water providers in the Central Area, as well as news media and political responses. Although political, social and economic indicators may not always be quantitative; they can be monitored to some extent and described for consideration in the Council's decisions about drought response.

2. Central Areas Water Committee

Stakeholders of the Central Areas Water Supply Committee meet annually during May, after the rainy season. They weigh (analysis and forecast using computer model) the available water resources in relation to the water demand of the Central Area to determine the availability of water for the coming 24 months (two rainy seasons). Based on the outcome of such analysis a prediction including utilisation framework is agreed upon.

3. Media Response

Much of the information customers receive about drought comes from traditional and social media outlets. Members of the news media can be very helpful in conveying factual information to customers, and they also play a key role in shaping public perception of drought.

4. Political Response

Political response to the drought can take many forms and can depend on the constituents affected. For example, the Ministry of Agriculture, Water and Forestry, Board of NamWater, the Central Areas Water Supply Committee or the Windhoek City Council could guide the political decision making process and drought support programs.

5. Economic Impacts

One of the key principles guiding the City of Windhoek's drought response is to maintain economic vitality of the community to the best extent possible. Water restrictions imposed in response to drought can affect businesses in different ways. As part of its public outreach efforts, the City of Windhoek will continue to carefully coordinate restriction programs with water-based industries so that customer needs are accommodated as far as reasonable possible. The primary program is to apply consumption control by introducing appropriate tariff programs. Water restrictions are considered as last resource, since restrictions will impact on the integrity of infrastructure and have a negative impact on essential services.

6. Environmental Effects

Reduced stream flows and more particular lower dam levels caused by drought can affect the environment, recreation and the natural ground water recharge. The City of Windhoek monitor dam levels, wastewater quality and ground water levels so that environmental effects are taken into account in drought-response decisions.

7. Uncertainty Associated with Forecasts

The City of Windhoek's Drought Response relies on the national weather forecasts where scientists are limited in terms of their source and the availability of information. Weather forecast therefore has its limitations and is a science of probabilities. Forecasting a drought and knowing with

certainty if one exists can be difficult. When a dry year occurs, for example, it is unknown whether it is the first year of a three-, five- or 10-year 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, the City of Windhoek will continue to advise customers of the latest water supply information so they can consider it in their own planning.

DROUGHT RESPONSE ACTIONS

The City of Windhoek Drought Response Plan consists of two components; the *indicators* that help the Council decide on an appropriate drought classification and response, and the corresponding *actions* recommended for that response. This plan delineates four stages of drought severity. Each stage is based on water supply indicators, as discussed earlier.

For each stage, progressively more stringent responses are recommended. Some drought response measures, particularly those designated for mild episodes of drought, require minimal customer / consumer effort. However, measures can become mandatory, more costly and sometimes intrusive as a drought intensifies.

In short, the basic recommended responses are as follows:

- A Water Scarcity Classification requires increased communication on dry conditions;
- A Drought Classification implements mandatory watering restrictions;
- A Severe Drought Classification prohibits lawn watering, and
- A Water Crisis Classification rations water supplies for essential uses.

To activate a particular drought stage, City of Windhoek declares a drought stage and adopts an effective date for imposing applicable restrictions. Because the severity of a droughts (related to above description) involve mandatory restrictions, they are incorporated into the COW tariff and operating rules and become enforceable pursuant to the relevant COW Municipal Regulations and provisions in the COW water service agreements and water leases.

At the onset of drought, a “Drought Response Committee” will be formed. This committee will monitor drought conditions and evaluate the effectiveness of the drought response. Recommendations for adjusting the response will be communicated. Because every drought is different, the Committee will refine drought response actions based on actual conditions.

1. Increasing Water Supply

In addition to managing water use during a drought, City of Windhoek will increase its supplies by increasing the production from the aquifer and by optimising the Goreangab Reclamation water supply. In addition NamWater will engage the pumping of ground water sources, considered as Drought Response Sources. Each augmentation option presents unique challenges in relation to the current conditions.

2. Reducing Water Demand

The City of Windhoek's primary response to drought is to reduce water uses so that supplies will be available for the most essential uses for the duration of the drought through Water Demand Management. 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 education and enforcement, monitoring and evaluation, water scarcity tariffs, restrictions.*

Generally speaking, restricting the number of days and times allowed for watering landscapes can be an effective method for reducing water use. Other methods, such as drought water tariffs and public information efforts, complement those watering restrictions. Other restrictions may not substantially reduce water use but may eliminate indiscretionary uses of water or heighten public awareness of drought severity.

3. Water Scarcity Tariffs

This is the City of Windhoek's primary response to encourage water savings. Standard step tariff are adjusted and pricing increased. Water scarcity tariffs are designed to increase awareness of the drought's severity with the intent of defining a targeted contribution to save water through pricing incentives.

Water scarcity tariffs are different from the regular tariff structures for water services in that it is temporary in nature. The drought declaration will define the criteria for implementing and removing water scarcity tariffs once the status of the situation has changed.

City of Windhoek will consider several guiding principles in developing water scarcity tariffs:

- There is a relationship between price and demand. However the cost of water for the standard water demand should remain reasonable.
- Water scarcity tariffs should not be used alone, but should be incorporated into an overall program to increase customer awareness of the drought's severity and importance of saving water.
- Public communication is the most important element of drought awareness and water saving efforts.

- Water scarcity tariffs generally applies to domestic consumers. However during a severe drought or a water crisis all other consumers have to be controlled as well.
- Water scarcity tariffs should match the severity of the drought and drought response philosophies.
- Water scarcity tariffs must be reasonable, so that consumers who save water are not affected.
- Water scarcity tariffs should motivate investment in water saving technology.
- Public information is important in helping customers understand water scarcity tariffs.

4. Water Use Education and Enforcement

City of Windhoek has a water use education and enforcement program to educate customers about efficient water use, to enforce water waste rules and water restrictions, and to save water. During a drought, inspectors and law enforcement officers will patrol the Windhoek service area looking for customers who are not complying with drought response calls. The goal of the program is to educate and inform customers, not to merely penalize violators.

The Ministry of Education, Arts and Culture, in particular schools, are considered an imported public communication channel for awareness rising and to implement a sustainable drought awareness and water saving program. Their active support and participation is crucial in the quest for public cooperation.

During drought conditions, a community awareness program is engaged to address the community at various platforms including communal gathering places such as shopping centres and markets. Information regarding water saving methods and the severity of the drought is shared.

Drought monitors will distribute educational materials, help customers reduce their water use and answer questions about the drought. Customers are also able to report water waste through a City of Windhoek hotline, web page and social media outlets connected to the organisation. Violators are to receive written warnings and may be fined for repeat transgressions. Flow restrictors may be installed at properties with repeat violations or supply temporary suspended pending corrective action by the consumer. The resident (owner or occupant of the property) is responsible for complying with drought restrictions and emergency terms.

For practical reasons, drought awareness is seen as a public responsibility and public programs are strongly motivated. Pursuant to this all private and public cooperation programs are fully supported and is considered essential for public cooperation.

5. Restrictions

Once Council has declared a drought severity, the City of Windhoek will activate the corresponding set of recommended responses. The City of Windhoek'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. The City of Windhoek follows the basic principles indicated below in so far as is possible when restricting water use during a drought:

"Clear communication is essential. Communicate the drought severity and only the relevant restriction program."

Avoid irretrievable loss of natural resources.

- Allow for watering of trees if possible.
- Avoid damaging perennial landscaping if possible.
- Motivate the introduction of hardy and indigenous plants to reduce water demand for gardens and parks.
- Restrict the time of watering, to minimise evaporation losses.

Restrict less essential uses before essential uses.

- Curtail outdoor water use (except for trees and shrubs) before restricting domestic indoor use.
- Eliminate water waste.
- Restrict car wash operations, to allow only such operations that comply with the environmental, sewer and water saving regulations.
- Stop the watering of public lawns with clean water.

Affect individuals or small groups before affecting large groups or the public as a whole, allowing as much public activity as possible to be unaffected.

- Have a water quota program for public spaces watered by semi-purified water to allow those customers to prioritize water use for heavily-used landscapes.
- All private pools shall be closed with a pool cover, if not in use.
- Preserve public pools before residential private pools. To shorten the open period of the pool, to raise public awareness and save water.

Minimize adverse financial effects

- Be respectful of water-based businesses that will be financially affected by restrictions.
- Engage in ongoing dialogue with the landscaping industry to obtain input and to allow these businesses to plan for future dry months.
- Consider long term planning to implement and manage suitable landscapes and gardens which address low water demand.

Implement extensive public information and media relations programs.

- Inform customers about conditions and actions they can take to reduce water use.
- Have open, clear and consistent messaging and communication.
- Maintain the trust of customers and stakeholders.
- Communicate the drought severity index applicable and define the relevant requirements.

Integrated development planning

- Inform building industry customers about drought conditions and actions to reduce water use.
- Reschedule water intensive building programs until after the drought period
- Plan drought efficient developments by integrating water efficient technology and related programs.
- Consider decentralisation for economic benefits and stability.

6. Monitoring and Evaluation

When drought conditions emerge, staff will intensify its monitoring and evaluation activities. The monitoring and evaluation program will track information such as precipitation, 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-reduction goals are not being met, the Committee may increase public outreach and/or the level of drought response.

7. Recycled Water

The City of Windhoek has fully adopted the principle of total re-use of water which has been implemented to a large extent.

Currently three reclamation plants are being operated by the City of Windhoek for the purpose of providing:

i. Treated water for irrigation and non-potable use;
ii. Treated water for potable use;
iii. Treated water for commercial irrigation projects

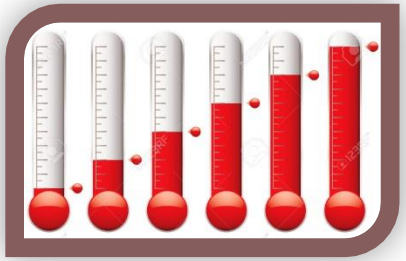
Semi-purified water has different characteristics than potable water. In periods of drought, re-usable water may be more or less abundant than other water supplies. In recognition of these potential differing circumstances, the Committee may adopt specific drought restrictions for semi-purified water customers depending on conditions.

The recycling of water for industrial purposes is supported by the City of Windhoek. In some consumer applications, the recycling of water is acceptable and my reduce water consumption.

8. Use of Water Not Provided by the City of Windhoek

Some customers in the City of Windhoek service area have access to water sources that are not owned, controlled, or provided by City of Windhoek. Though the use of such water is not under the direct control of the City of Windhoek, those customers will be subject to restrictions in the operating rules related to avoidance of contamination of the potable water system and prevention of water waste. In addition, the City of Windhoek reserves the right to restrict the use of such water sources, if such sources are over consumed to the negative effect of fellow users.

DROUGHT SEVERITY INDICATORS (DSI) AND DESCRIPTIONS



Water Scarcity:

Conditions requiring public awareness to avoid water wastage

Description:

A Water Scarcity 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 watering restrictions. A Water Scarcity will not require a formal declaration from the Technical Committee

Indicators:

- Projected usable surface water contents between 24 and 30 months without inflow into the dams on May 1 (see Figure 1).
- Watershed characteristics such as precipitation, wind and soil moisture indicate abnormal and prolonged dryness.
- Service-area precipitation indicates abnormal and prolonged dryness.
- Other water suppliers are preparing to respond to the dryness.
- News media are sending messages that imply drought may be pending.
- Customers believe a Water Scarcity and its corresponding actions are appropriate.
- Elected officials are suggesting the City of Windhoek adopt a Water Scarcity or similar response.

Responses:

- Increase communication and outreach to customers and stakeholders to explain we are beginning to see indicators of drought.
- Encourage customers to continue to use water efficiently and provide suggestions for reducing water use in order to reduce the risk of progression to mandatory restrictions.
- Warn of and prepare for the possibility of mandatory watering restrictions.
- Enhance the water use education and enforcement program.

Fixed Quota Water Contracts:

- Customers who receive potable water under a quota contracts will be encouraged to reduce usage

Drought:

Dry to Severely Dry

Description:

A Stage 1 drought imposes mandatory watering restrictions and requires effort on the part of customers. Stage 1 watering restrictions will appear in the City of Windhoek operating rules.

Indicators:

- Projected usable surface water contents available between 18 and 24 months on May 1 (see Figure 1).
- Watershed characteristics such as precipitation, wind and soil moisture indicate severe and prolonged dryness.
- Other water suppliers are engaging to enact mandatory watering restrictions.
- Customers believe that mandatory watering restrictions are appropriate, to save water.
- State water officials are engaged in drought response activities.
- Circumstances warrant possible adverse impacts on water-dependent businesses involved in outdoor water use.

Responses:

1. Use Reduction Target

A 10-25 percent reduction based on a predetermined quantity water saving. This target is generally suggested to be met with approximately a 10 percent decrease in indoor use and a 35 percent decrease in outdoor use.

2. Restrictions

Below is the required garden watering schedule for this drought response.

- Single-family residential properties with odd-numbered addresses: Saturday, Wednesday
- Single-family residential properties with even-numbered addresses: Sunday, Thursday
- All others (multi-family, High density, commercial, industrial, government): Tuesday, Friday

3. Drought Pricing

A drought pricing program may be used to increase awareness of the drought's severity, assist in meeting water-use reduction targets through pricing signals and/or maintain the financial health of the Council as service provider.

4. Strategic Water Reserve

The Technical Committee may make water from the aquifer water reserve available for use during a Stage 1 drought. Such action could reduce the severity of Stage 1 restrictions, to delay or eliminate a Stage 2 drought response.

5. Fixed-Amount Water Contracts:

Water deliveries to customers who receive semi-purified or potable water under fixed-amount contracts will be restricted as follows:

- For agreements with provisions allowing the City of Windhoek to reduce supply under drought conditions, supply will be reduced by proclaimed percent from normal use to save water.
- For agreements without these provisions, the Technical Board may adopt drought pricing or other methods to reduce water consumption outside Windhoek as necessary to provide an adequate water supply to the people of Windhoek.

Severe Drought:

Severely Dry

Description:

A Stage 2 drought imposes compulsory water savings on City of Windhoek's customers. Stage 2 drought restrictions are severe and will likely result in damage to or loss of landscapes.

Indicators:

- Projected useable surface water contents available 12 and 18 months on May 1 (see Figure 1).
- Watershed characteristics such as precipitation, wind and soil moisture indicate extreme dryness.
- The Central Area Water Supply Committee has enacted or are considering severe restrictions on outdoor water use.
- Customers believe that severe water-use restrictions are appropriate.
- State water officials have declared a drought emergency.
- Bans on most lawn watering justify prohibitions on some water-dependent businesses.
- No tolerance to leaks and open water features as well as extensive watering of lawns, common believes that no unnecessary consumption can be tolerated.

Responses:

1. Use Reduction Target

A 25-35 percent reduction based on a predetermined quantity water saving. This target is generally suggested to be met with approximately a 15 (proclaimed) percent decrease in indoor use and a 50 percent decrease in outdoor use.

2. Drought Pricing

A drought pricing program is likely to be used to increase awareness of the drought's severity, assist in meeting water-use reduction targets through pricing signals and/or maintain the financial health of the Council as service provider.

3. Strategic Water Reserve

The Technical Committee may (high probability) make water from the aquifer water reserve available for use for use during a Stage 2 drought. Such action could reduce the severity of Stage 2 restrictions, or it could be used to delay or eliminate a water crisis response.

4. Fixed-Quota Water Contracts

Water deliveries to customers who receive semi-purified water or potable water under fixed-amount contracts will be restricted as follows:

- For non-domestic consumers with provisions allowing reduced supply under drought conditions, the amount supplied shall be reduced by the water saving percent from normal use.
- For domestic consumers the water tariff structure will be adjusted for a lower consumption quantity.
- For agreements without these provisions, the Technical Committee may adopt drought pricing or other methods to reduce water consumption outside Windhoek or the Windhoek water supply network, as necessary to provide an adequate supply of water of Windhoek.

Water Crisis:

Exceptionally Dry & Insufficient Water Supply

Description:

A Water Crisis activates a rationing program for the City of Windhoek's customers. *Conditions that would lead to a Water Crisis are highly unlikely, but possible.* However, if conditions warrant, the City of Windhoek may implement a rationing program for an indefinite period of time to ensure, to the extent possible, that there is adequate water for essential uses. No outdoor watering will be allowed and indoor water use will be restricted. Water Crisis restrictions will affect the quality of life in the City of Windhoek's service area, including the long-term damage or loss of landscapes.

Indicators:

- Projected usable surface water contents available for less than 12 months on May 1 (see Figure 1).
- Watershed characteristics such as precipitation, wind and soil moisture indicate exceptional and prolonged dryness.
- Other water suppliers are rationing water.
- News media are sending message that we are in a water crisis situation.

- Customers believe we are in a water crisis situation.
- Elected officials are saying that water rationing is appropriate.
- The situation suggests that severe impacts to water-dependent businesses are unavoidable.
- No tolerance to leaks and no filling of water features and pools as well as bi-weekly watering only, common believe that no unnecessary consumption can be tolerated.

Response:

1. Use Reduction Target

A 50 percent reduction based on a predetermined quantity water saving.

2. Drought Pricing

A drought pricing program is maintained and likely to be become more severe.

3. Strategic Water Reserve

Because of the severity of the situation, the Technical Committee will likely make any water remaining available for essential uses during a Water Crisis.

Challenges:

- To maintain an operational state of water availability, to guaranty a minimum water supply.
- To ensure a fair distribution of water to maintain sustainability and operations during water crisis conditions.
- To obtain public support and understanding at all levels for the implementation of this Drought Management Program.
- Not to run out of water. In such a case, water supply can no longer be maintained.
- To motivate decentralization to reduce water demand.
- Motivate a change in perspective, to consider alternative production, cleaning or operations which do not require water.

Decentralisation of operations:

- Government institutions could decentralize their operations by moving workers and offices out of the water crisis area.
- Businesses could divert operations and office out of the water crisis area.
- To close selected water intensive operations and businesses.
- To minimize and stop operation of water infrastructure where significant water losses occur.

Halting of non-essential construction:

- Government to consider delaying construction until water becomes available.
- A business to consider the delay of construction until water is available.
- Private developments and renovations to be put on hold, to save the water during the water crisis.
- Consider alternative construction methods which require much less water.

DROUGHT RESPONSE PROGRAM

The program table below is meant to be a guide to water users under various levels of drought restrictions related to the Water Severity Index (WCI).

This program refers to the available water supply in months (WS)

Water Supply Status (WSS)		Normal WSS>30Months	Water scarcity WSS<30 Months	Drought WSS<24 Months	Severe Drought WSS<18	Water crisis WSS<12 Months
1	**Outdoor Watering and Irrigation**					
a	Turf grass	Maximum of three days/week of customer's choice.	Maximum of three days/week of customer's choice.	Two days/week per mandatory schedule based on customer class and address.	No watering allowed. Only semi-purified Private: once weekly only	No watering allowed. Restricted semi-purified
b	New seed and sod (lawn establishment)	Allowed with exemption. Written approval for establishment.	Allowed with exemption. Written approval for establishment.	Allowed with exemption. Written approval for establishment. Not recommended.	Not allowed	Not allowed
c	Co Water program	Allowed	Allowed	Not allowed, Only semi-purified watering	Not allowed, Only semi-purified watering	Not allowed , restricted semi-purified watering
d	Trees, shrubs and perennials	May be watered by hand-held hose or low-volume non-spray on any day, not between 9 a.m. and 6 p.m. Summer, 9 a.m. and 4 p.m. Winter	May be watered by hand-held hose or low-volume non-spray on any day, not between 9 a.m. and 6 p.m. Summer, 9 a.m. and 4 p.m. Winter	May be watered by hand-held hose or low-volume non-spray on any day, not between 9 a.m. and 5 p.m. Summer, 10 a.m. and 4 p.m. Winter	Existing trees and shrubs may be watered by means of a hand-held hose or low-volume non-spray irrigation no more than once per week on scheduled day.	Use of hand-held hose or low-volume spray may be limited to no more than every second week
e	Flowers, vegetables, and community gardens	May be watered by automatic system on any day, not between 10 a.m. and 6 p.m., and by hand-held hose or low-volume spray at any time.	May be watered by automatic system on any day, not between 9 a.m. and 6 p.m., and by hand-held hose or low-volume spray at any time.	May be watered by means of a hand-held hose or low-volume non-spray irrigation on the assigned watering days, not between 9 a.m. and 6 p.m.	Existing plants may be watered only every third day by means of a hand-held hose or low-volume non-spray irrigation.	No watering allowed.
f	Athletic, sport and playing fields (incl golf courses)	No waste of water.	No waste of water.	Irrigation limited to every third day only	No watering with potable allowed. Only Semi-Purified water	No watering with potable allowed. Restricted Semi-Purified
g	Irrigation taps not covered by other rules	No waste of water.	No waste of water.	Same as Trees, shrubs and perennials.	Same as Trees, shrubs and perennials.	Same as Trees, shrubs and perennials

	Water Supply Status (WSS)	Normal WSS>30Months	Water scarcity WSS<30 Months	Drought WSS<24 Months	Severe Drought WSS<18	Water crisis WSS<12 Months
2	**Washing Events**					
a	Cars – washing at home	With bucket or hand-held hose with shut-off nozzle.	With bucket or hand-held hose with shut-off nozzle.	With bucket or pressure Jet. NO hand-held hoses.	Not allowed. Must use certified commercial car washes.	Not allowed.
b	Cars – commercial car washes	N/A	Only certified commercial car washes	Only certified commercial car washes	Only certified commercial car washes	Only certified commercial car washes
c	Fleet vehicle washing	Must use a car wash or washing certified equipment	Must use a car wash or washing certified equipment	Maximum once per week, certified car washes only.	Once per month only for health and safety at certified car washes only.	Not allowed.
d	Charity events (car wash)	On case-by-case basis.	On case-by-case basis.	Approval needed.	Not allowed.	Not allowed.
e	Street cleaning	N/A	N/A	N/A	Obtain water from semi-purified source only.	Extreme health and safety reasons only;
f	Washing impermeable surfaces	Use dry cleanup methods prior to washing. No waste of water.	Use dry cleanup methods prior to washing. No waste of water.	Use dry cleanup methods only.	Use dry cleanup methods prior to washing. Washing for health and safety issues only;	Use dry cleanup methods prior to washing. Washing for health and safety issues only;
3	**Water Features**					
a	Unlined ponds	Not allowed.	Not allowed.	Not allowed.	Not allowed.	Not allowed.
b	Swimming pools	Cover pool	Cover pool	Cover pool	Cover pool, Single-family residential pools shall not be filled or refilled. Operation of public pools will be permitted.	Cover pool, No filling of private pools. Closure or restriction at public pools.
c	Public pools	N/A	Water saving	Water saving	Reduced opening period	Reduced opening period/Closure of pools
d	Other water features (fountains, waterfalls etc.)	N/A	No construction of new water features not incorporating water savings measures	Customers are highly encouraged not to operate any existing outdoor fountain or waterfall that sprays water into the air.	Customers are prohibited from operating any existing outdoor fountain or waterfall that sprays water into the air. No new features allowed.	No filling or operation of water features. No new water features allowed.
e	Misting devices	N/A	N/A	Restricted to commercial application.	Not allowed.	Not allowed.

	Water Supply Status (WSS)	Normal WSS>30Months	Water scarcity WSS<30 Months	Drought WSS<24 Months	Severe Drought WSS<18	Water crisis WSS<12 Months
4	**Commercial/Industrial Processes**					
a	Lodging	N/A	N/A	Laundry restrictions. Advertise and encourage water savings programmes	Laundry restrictions. Enforce water savings programmes	Laundry restrictions. Enforce water savings programmes
b	Barber and hairdresser	N/A	N/A	Water saving	Water saving	Water restrictions
c	Construction water	Best management practices; no water waste	Best management practices; no water waste	Best management practices; no water waste; Utilise semi-purified water for earth works, building/construction permit rescinded for violations.	Best management practices; no water waste; Utilise semi-purified water for earth works, building/construction permit rescinded for violations.	On case by case basis; best management practices, no water waste; Only semi-purified water for earth work, permit rescinded for violations. Construction projects postponed/halted.
d	Commercial water reuse	N/A	Recommended water re-use where possible	Recommended water re-use where possible	Re-use of water	Re-use of water/Restrictions or reduced production
e	Hydrant permits	For fire emergency only	For fire emergency only	For fire emergency only	For fire emergency only	For fire emergency only
5	**Tariff Program**					
a	Residential block tariff	Three level block tariff, level 3 at >45 kl / month	Three level block tariff, level 3 at >36 kl/month	Three level block tariff, level 3 at >36 kl/month	Four level block tariff, level 3 at >36 kl/month Level 4 at >50 kl/month	Four level block tariff, level 3 at >30 kl/month Level 4 at >40 kl/month
b	Water Leak Rebate	Two month leak rebate	Monthly meter logging required Two months leak rebate	Monthly meter logging required Two month leak rebate	Weekly meter logging required One month leak rebate	Daily meter logging required No leak rebate
c	No tolerance for water leaks	Monthly water leak management	Monthly water leak management	Weekly leak management Isolate for all leaks	Weekly leak management Isolate for all leaks	Daily leak management Isolate for all leaks
d	Commercial block tariff	N/A	N/A	N/A	Two level block tariff * Latest normal average annual consumption - % saving required. Apply third level residential tariff for exceeding limit	Two level block tariff * Latest normal average annual consumption - % saving required. Apply fourth level residential tariff for exceeding supply limit.
e	Close main supply during times of no use	N/A	N/A	Apply	Apply and reduce flow during operations	Apply and reduce flow during operations
f	Tariff code WA26 (Sport field)	N/A	N/A	Standard consumption tariff	Standard consumption tariff, restricted	Water isolated. No watering

	Water Supply Status (WSS)	Normal WSS>30 Months	Water scarcity WSS<30 Months	Drought WSS<24 Months	Severe Drought WSS<18	Water crisis WSS<12 Months
6	**Community Awareness Program**					
a	Publications and pamphlets	Basic awareness campaign	Basic awareness campaign	Defined awareness campaign related to % water savings	Intensive Awareness campaign, % water savings and consumption barometer	Intensive Awareness campaign, % water savings and consumption barometer
b	Water saving law enforcement.	Warnings	Warnings & Fines	Warnings & Fines	Fines	Fines & disconnection
c	Education program	Ministry of Education, Arts & Culture	Ministry of Education, Arts & Culture	Schools and public campaign	Schools, ministries and public campaign	Schools, ministries and public campaign
d	Public Sector water awareness program and communication	Basic Awareness	Implement awareness	Full drought awareness program, % water savings	Intensive Awareness campaign, % water savings and consumption barometer. Top 100 consumers identified and consulted on a monthly basis	Intensive Awareness campaign, % water savings and consumption barometer Top 250 consumers identified and consulted on a monthly basis
e	Water Meter management	Recommended	Weekly reading recommended	Weekly reading required	Weekly reading required, recommend daily reading	Weekly reading required, recommend daily reading
f	Leak management	required	required	No leaks tolerated	Isolate water leak, no leaks tolerated	Isolate water leak, no leaks tolerated
g	New water installations	N/A	N/A	N/A	N/A	May not be provided
h	Water for water intensive construction work	N/A	N/A	N/A	Cannot be provided with water, unless semi-purified water is available	Cannot be provided with water, unless semi-purified water is available
i	No sewer water contamination	No contamination allowed	No contamination allowed	No contamination allowed	No contamination allowed	Critical to ensure reclaimed water

Notes:

- Water connections for new installations larger than 20mm, should reflect a manageable installation plan that supports easy control to isolate water leaks
- All such installations have to comply with water saving infrastructure and equipment in line with the Water Supply Regulations.
- For water supply applications, where water recycling is possible, such options may be required. An appropriate agreement may apply.