



City Improvement District
Blackheath





CITY OF CAPE TOWN
ISIXEKO SASEKAPA
STAD KAAPSTAD

SUMMARY OF GUIDELINES FOR INSTALLATION OF ALTERNATIVE WATER SYSTEMS IN CAPE TOWN

NOVEMBER 2017

Water and Sanitation Department

See City of Cape Town website for the full version and for the final publication in early 2018, and future updates.

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EXECUTIVE SUMMARY

The City of Cape Town is promoting the responsible use of alternative water sources, which can help minimize the quantity of water drawn from our dams in this worst drought in recorded history. Alternative water is also part of the City's water resilience drive, as the City recognizes that going forward water scarcity

is the 'new normal'.

The installation of alternative water systems needs to be well managed and regulated, as there are potentially serious associated health and environmental risks, including contamination of the drinking water supply.

The guidelines have been developed to promote the safe and legal installation of alternative water systems, including: greywater; rainwater; groundwater (from boreholes, wellpoints or springs); surface water (from streams/ rivers) and treated effluent/wastewater.

They are intended for homes and businesses which are investing in such systems, but do not address more complex systems for the largest users like industry. The same principles apply for large users, but further specialist expertise should be sought.

The key principles are:

- Prevent potentially dangerous alternative water from contaminating the drinking water system on the premises, and the surrounding area/s. Installing Reduced Pressure Zone (RPZ) back-flow preventers is mandatory, as shown in the illustrations, and as per the City's Water By-law. Non-return valves and standard stopcock valves are not sufficient. The City has to inspect and approve this level of backflow prevention.

- Water quality is key to where/how alternative water can be used. The quality of the alternative water source, and how it is stored and managed, determines where and how it can be used. There are national water quality guidelines and other regulations which are intended to protect people from potential serious health risks, and to protect our environment.

The appropriate uses for each alternative water source are outlined, and this is to be read in conjunction with the Risk and Water Quality Matrix below. Alternative water sources should be tested at a SANAS-accredited laboratory first, and the results compared with the summary table of national water quality guidelines (attached) to check compliance with the quality indicated for each use. Treatment may be needed for particular uses.

- Discharge/ overflow must go to the correct place. Harmful chemicals or substances should not enter the stormwater system, but should rather be directed into the sewer system so that they can be dealt with at the City's wastewater treatment works.

See the illustrations for guidance.

The guidelines are consistent with the requirements of current legislation, including the National Water Act, national standards, national water quality guidelines and the City's 2010 Water By-law which is set to be updated soon.

The guidelines will be updated later in 2017 once the updated Water By-law is approved by Council. See the City's website for all future updates. Under current legislation, all alternative water systems are subject to approval from the City, and the use of groundwater, surface water and treatment of own wastewater is also subject to authorisation and licencing from the national Department of Water and Sanitation (DWS).

In terms of the City's Water By-law, no alternative water is to be used for drinking, cooking and body washing (ablution). This is due to the City's statutory responsibility for the water quality of these uses which involve human close contact and ingestion, and the associated potential health risks.

Exceptions are made for large residential developments and businesses which contract with the City as a Water Service Intermediary to provide drinking quality water to those living, working or visiting that property, under strict conditions for treatment and monitoring.

The City's position on some aspects of alternative water use is being reviewed, in light of the current serious water shortage.

The City may make some temporary concessions if water supply reaches extremely low levels.

For example alternative water such as rainwater for body washing may be considered, with sufficient treatment and the mandatory back-flow prevention. These will be announced and see the City's website for updates.

The use alternative water is entirely at the risk of the consumer, and the City cannot be held liable for any consequential damage or loss arising directly or indirectly therefrom (as per the City's Water By-law).

MATRIX OF RISK AND WATER QUALITY

Most water uses in South Africa have water quality requirements specified by the national Water and Sanitation Department's Water Quality Guidelines and related legislation. However the water quality from different sources of water varies greatly, depending on a range of factors including how it is used.

This matrix seeks to bring together the risk levels and water quality requirements for a range of different water sources and water uses.

Aggregate risk levels are indicated by colours, and the water quality required for each kind of use is indicated by a number which corresponds to the national water quality guidelines or other relevant legislation.

See the key/ explanations below, and note that no alternative water is allowed for drinking, cooking and body washing.

SOURCES OF WATER:	RAINWATER	GROUND WATER Boreholes, wellpoint	SURFACE WATER Springs and rivers	GREYWATER	TREATED EFFLUENT FROM THE CITY
	TEST FIRST, AND TREAT ACCORDING TO USE				
USES OF WATER:					
Plant bed irrigation (subsurface)	4	4	4	4	4
Fire fighting	3 (Categories 3 & 4)	3 (Categories 3 & 4)	3 (Categories 3 & 4)	3 (Categories 3 & 4)	3 (Categories 3 & 4)
Vehicle cleaning	3	3	3	3	3
Food garden (subsurface) & lawn irrigation	4	4	4	4	4
Outdoor hard surface cleaning	3 (Category 4)	3 (Category 4)	3 (Category 4)	3 (Category 4)	3 (Category 4)
Swimming pools*	SANS 241*	SANS 241*	SANS 241*	SANS 241*	SANS 241*
HVAC	3 (All 4 categories)	3	3	3	3
Toilet flushing**	**	**	**	**	**
Fish ponds	1	1	1	1	1
Indoor surface and kitchen cleaning	1	1	1	1	1
Laundry washing	1	1	1	1	1
Cooking & food preparation	1	1	1	1	1
Body washing (ablution)	1	1	1	1	1
Drinking	SANS 241	SANS 241	SANS 241	SANS 241	SANS 241
Water features (no contact)	1	1	1	1	1
Water features (e.g. splash parks)**	SANS 241	SANS 214	SANS 214	SANS 241	SANS 241

KEY/ EXPLANATION

COLOUR CODE	RISK OF USE	WATER QUALITY REQUIRED FOR INTENDED USE	TESTING AND TREATMENT REQUIRED, FOR INTENDED PURPOSES
USE WITH DISCRETION	Low, negligible risk No direct human contact with water	Low	<ul style="list-style-type: none"> No testing or treatment required. Use with discretion.
TEST QUALITY AND TREAT FOR USE/S	Moderate risk Some human contact with water	Moderate	<ul style="list-style-type: none"> Test water quality Check results against national guidelines for intended use. Treat if required. For this low risk category, treatment may be unlikely.
TEST QUALITY AND TREAT FOR USE/S	Medium risk Greater human contact	Medium	<ul style="list-style-type: none"> Test water quality Check results against national guidelines for intended use. Treat as required. For this risk category, treatment is likely.
TEST QUALITY AND TREAT FOR USE/S	Very high risk High levels of contact and human ingestion	High	<ul style="list-style-type: none"> Test water quality Check results against national guidelines for intended use. Treat as required. For this high risk category, high level of treatment is essential. Regular quality testing necessary to determine ongoing water quality and suitability for use. Filtering and or treatment will be necessary.
	No alternative water sources permitted for these uses – as per City's Water By-law. Unless by contract as a Water Service Intermediary	N/A	N/A

NOTES

- Swimming pool water quality has to comply with drinking quality standards as per SANS 241. Legislated requirements for

other
aspects
of
swimming
pool
management,
including
water
quality
maintenance,
is
determined
in
the
National
Environmental
Health
Norms
and
Standards
for
Premises
and
Acceptable
Monitoring
Standards
for
Environmental
Health
Practitioners,
under
the
National
Health
Act,
2003
(Act
No.
61
of
2003).

No water quality guideline available.

* Domestic uses as defined by the 1996 South African Water Quality Guidelines, and the City's 2010 Water By-law. SANS 241 is the South African national standard for water quality required for drinking water, and also for a range of other uses where there is high contact and possibly ingestion. See www.sabs.co.za

The numbers in the matrix above correspond to the numbered volumes of the South African national Water Quality Guidelines, as summarised in the table provided. Note that sub-categories are indicated in brackets.

1. Water
Quality
Guidelines
Volume
1
-
Domestic
Use.
2. Water
Quality
Guidelines
Volume
2
-
Recreational
Use
(2nd
edition,
1996)
Category
2
-
Full
contact
e.g.
swimming
in
uncontrolled
water
(sea,
river,
vlei)
Category
2
-
Intermediate
contact
3. Water
Quality
Guidelines
Volume

3

-

Industrial
Use.

There
are

4

(sub)categories.

4.

Water
Quality
Guidelines
Volume

4

—

Agricultural
Use
(Irrigation)

4. Water

Quality
Guidelines
Volume

5

—

Agricultural
Use
(Livestock
Watering)

5. Water

Quality
Guidelines
Volume

5

—

Agricultural
Use
(Aquaculture)

6. Water

Quality
Guidelines
Volume

5

—

Agricultural
Use
(Aquatic
eco-
systems)
Summary
table
of

these
provided
in
full
version
of
the
guidelines
on
the
City's
website.

WATER TESTING

- Step 1: Identify the intended use of the water. This will inform which tests will be necessary.
- Step 2: Select a testing laboratory accredited by the South African National Accreditation System (SANAS). See <http://www.sanas.co.za/>
- Step 3: Some laboratories may collect samples on your behalf, some may not. Consult laboratories on their options and sampling procedures.
- Step 4: Request a) results; b) recommendations for use/s of sample water; c) possible treatment options to improve quality if required.
- Step 5: Compare results to the summary table of the national Water Quality Guidelines to see if the quality of the source water meets the quality required for the intended use. i.e. do the numbers in the test report fall within the allowed ranges for the particular use you're considering.
- Step 6: If it falls below the water quality standard and you still want to use it for that purpose, then further treatment will be required. Consult a specialist to investigate treatment options, including consulting engineers, or suppliers of water treatment systems.

APPLICATION, REGISTRATION AND/OR LICENCING

Water is a highly regulated resource in South Africa, for many reasons including equitable use and the prevention of health risks and environmental damage.

Some alternative water uses have to be approved and/or licensed by the national Department of Water and Sanitation.

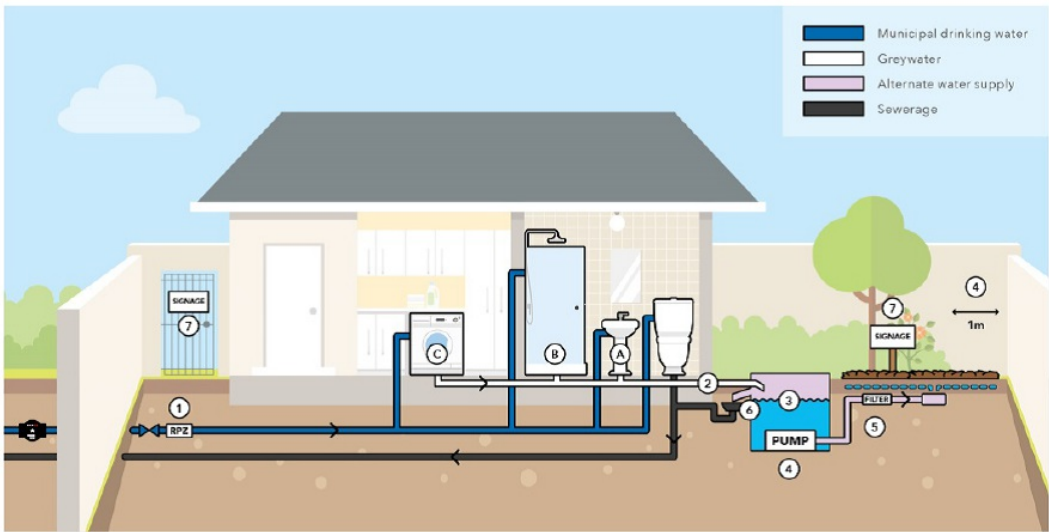
Approvals are also required from the City of Cape Town for drilling a borehole

and for all plumbing installations for alternative water systems.

Here is a summary table, which is followed by the details for each alternative water source. ALTERNATIVE WATER TYPE FROM NATIONAL DWS FROM CITY OF CAPE TOWN

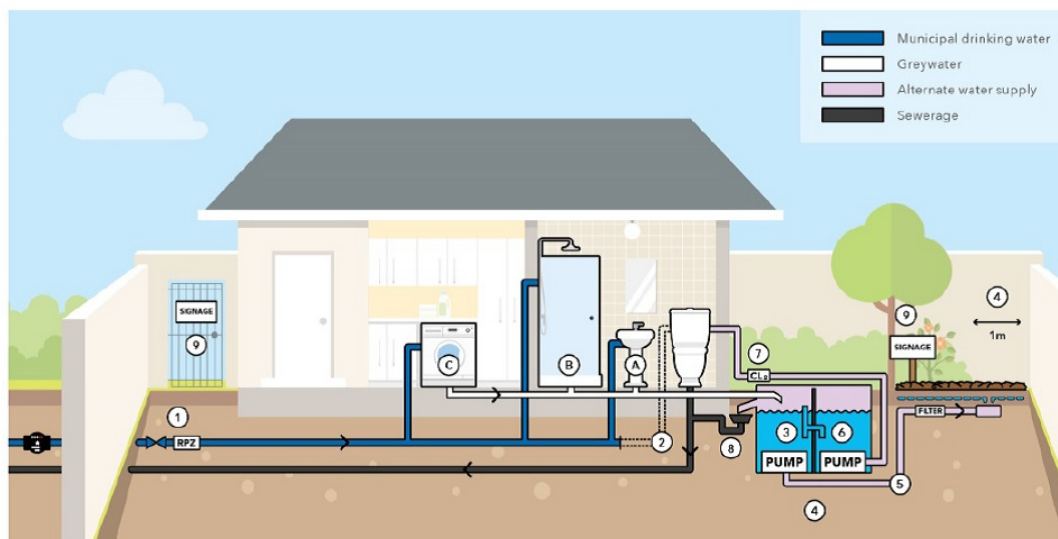
ALTERNATIVE WATER TYPE	FROM NATIONAL DWS	FROM CITY OF CAPE TOWN
Rainwater	Permissible use under Schedule 1. No licence required.	Approval for installation
Groundwater	Licencing – General Authorisation or Water Use Licence	Approval for installation
Surface water	Licencing – General Authorisation or Water Use Licence	Approval for installation
Greywater	No licence required.	Approval for installation
Treated effluent – own treatment	Licencing required.	Approval for installation
Treated effluent – from City	N/A for consumers buying from City	Approval for installation

GREYWATER SYSTEM FOR IRRIGATION



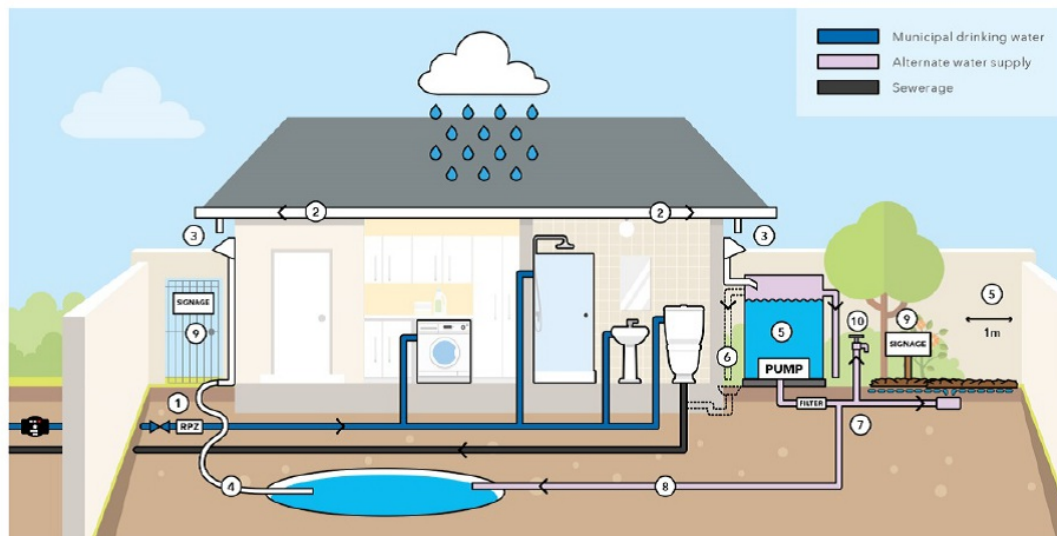
- ① Municipal drinking water supply into property fitted with a Reduced Pressure Zone (RPZ) valve back-flow preventer. Currently not mandatory for systems where there is no connection between the alternative water and municipal drinking water supply. But strongly recommended best practice, as many want to plumb it into the building for indoor use in future and possible contamination to be avoided.
- ② Greywater sources connected to storage tank. The inclusion of greywater sources A, B and/or C depends on irrigation needs.
- ③ Collection and treatment of greywater in storage tank. Tank installation must comply with national building regulations, SANS 2001-CC2 and manufacturer's specifications. Greywater water must be used within 24 hours. Ensure empty storage tank when going away for longer than 24 hours.
- ④ Any underground tank installation must be at least 1m away from the boundary wall and comply with national building regulations.
- ⑤ Filtered greywater for drip/subsurface irrigation, under a thick layer of mulch. Not sprayed for health reasons and to reduce evaporation.
- ⑥ Storage tank overflow to sewer.
- ⑦ Official signage weather proofed, to be placed in main thoroughfare e.g. at entrance and at points of use to warn people not to drink this water.

GREYwater SYSTEM FOR IRRIGATION AND TOILET FLUSHING



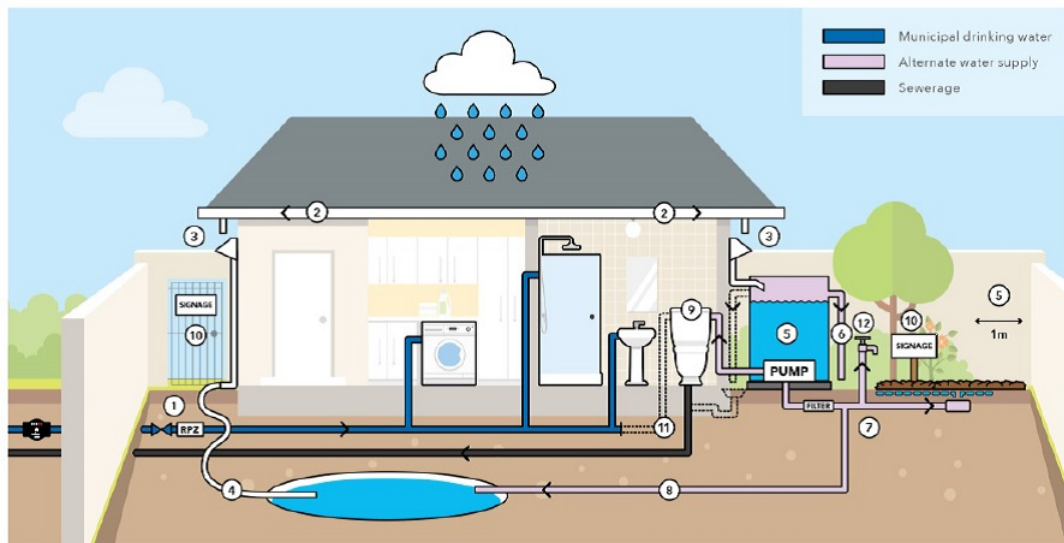
- ① Municipal drinking water supply into property fitted with a Reduced Pressure Zone (RPZ) valve back-flow preventer. (Mandatory).
- ② Municipal water supply to cistern must be disconnected.
- ③ Collection, settlement and filtration of greywater in storage tank/s. All tank installations must comply with national building regulations, SANS 2001-CC2 and manufacturer's specifications. Greywater water must be used within 24 hours. Ensure empty storage tank when going away for longer than 24 hours.
- ④ Any underground tank installation must be at least 1m away from the boundary wall and comply with national building regulations.
- ⑤ Screen-filtered greywater for drip/subsurface irrigation, under a thick layer of mulch. Not sprayed for health reasons and to reduce evaporation.
- ⑥ Collection, disinfection and distribution of greywater in second part of the storage tank.
- ⑦ Filtered and disinfected greywater for toilet flushing, using an in-line chlorinator (or other equivalent).
- ⑧ Storage tank overflow to sewer.
- ⑨ Official signage weather proofed, to be placed in main thoroughfare e.g. at entrance and at points of use to warn people not to drink this water.

RAINWATER SYSTEM FOR OUTDOOR USE



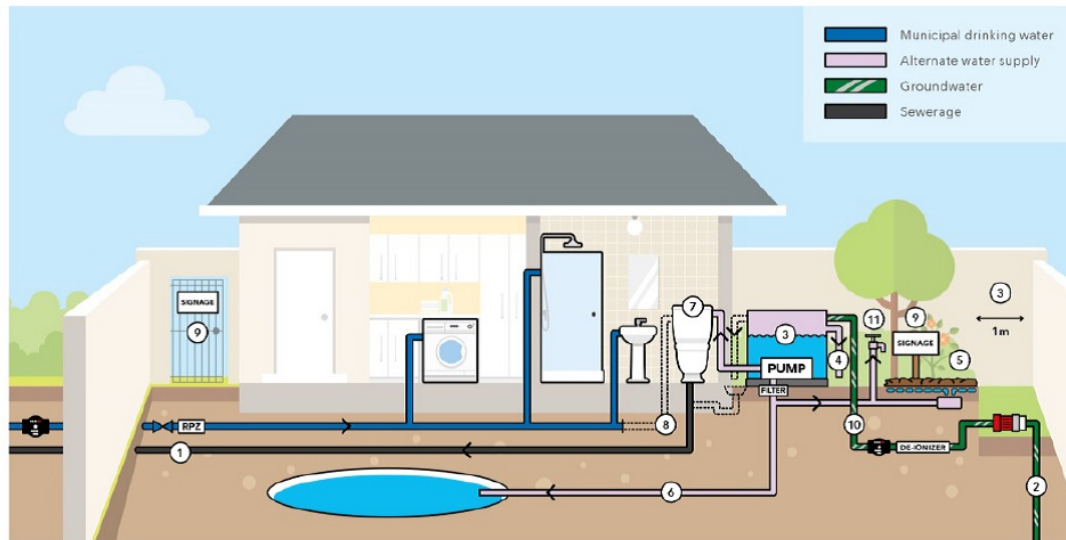
- ① Municipal drinking water supply into property fitted with a Reduced Pressure Zone (RPZ) valve back-flow preventer. Currently not mandatory for systems where there is no connection between the alternative water and municipal drinking water supply. But strongly recommended best practice, as many want to plumb it into the building for indoor use in future and possible contamination to be avoided.
- ② Rainwater channeled to storage tank via gutters.
- ③ Debris diverted by sloped screen.
- ④ Rainwater for topping up pool or other outdoor use, directly from gutters using gravity feed, via e.g. flexible plastic sleeve. (This is one option, and from a tank is another option).
- ⑤ Collection of rainwater in storage tank. Installation of tanks can be below or above ground, but must comply with national building regulations, SANS 2001-CC2 and manufacturer's specifications. Any underground tank installation must also be at least 1m away from the boundary wall.
- ⑥ Storage tank overflow to stormwater. If rainwater is treated with any chemicals then the overflow must be discharged to the sewer.
- ⑦ Rainwater for drip/subsurface irrigation, under a thick layer of mulch, vehicle washing and/or hard surface cleaning.
- ⑧ Rainwater for topping up pool. Pool cover as per requirements of water restrictions.
- ⑨ Official signage weather proofed, to be placed in main thoroughfare e.g. at entrance and at points of use to warn people not to drink this water.
- ⑩ This water is not for drinking, cooking or ablution. Preferably, make it a 'demand' tap so that nobody drinks from it or wastes water from it.

RAINWATER SYSTEM FOR OUTDOOR AND INDOOR USE



- ① Municipal drinking water supply into property fitted with a Reduced Pressure Zone (RPZ) valve back-flow preventer. (Mandatory).
- ② Rainwater channeled to storage tank via gutters.
- ③ Debris diverted by sloped screen.
- ④ Rainwater for topping up pool or other outdoor use, directly from gutters using gravity feed, via e.g. flexible plastic sleeve.
- ⑤ Collection of rainwater in storage tank. Installation of tanks can be below or above ground, but must comply with national building regulations, SANS 2001-CC2 and manufacturer's specifications. Any underground tank installation must also be at least 1m away from the boundary wall.
- ⑥ Storage tank overflow to stormwater. If rainwater is treated with any chemicals then the overflow must be discharged to the sewer.
- ⑦ Rainwater for drip/subsurface irrigation under a thick layer of mulch, vehicle washing and/or hard surface cleaning.
- ⑧ Rainwater for topping up pool. Pool cover as per requirements of water restrictions.
- ⑨ Rainwater for toilet flushing.
- ⑩ Official signage weather proofed, to be placed in main thoroughfare e.g. at entrance and at points of use to warn people not to drink this water.
- ⑪ Municipal water supply to cistern must be disconnected when rainwater is used. This may be seasonally disconnected over winter rainfall months, or permanently if there is sufficient storage.
- ⑫ This water is not for drinking, cooking or ablution. Preferably, make it a 'demand' tap so that nobody drinks from it or wastes water from it.

GROUNDWATER SYSTEM FOR OUTDOOR AND INDOOR USE



- ① Municipal drinking water supply into property fitted with a Reduced Pressure Zone (RPZ) valve back-flow preventer. (Mandatory).
- ② Groundwater sources (wellpoint, borehole or spring water) connected to storage tank.
Collection and treatment (if testing indicates it is required) of groundwater in storage tank. Installation of tanks can be below or above ground, but must comply with national building regulations, SANS 2001-CC2 and manufacturer's specifications. Any underground tank installation must also be at least 1m away from the boundary wall.
- ③ Storage tank overflow to stormwater or a garden for aquifer recharge if not treated. If treated with chemicals, the overflow must discharge to sewer.
- ④ Groundwater for drip/subsurface irrigation under a thick layer of mulch (not sprayed for health reasons and to reduce evaporation), vehicle washing and/or hard surface cleaning.
- ⑤ Groundwater for topping up pool. Pool cover as per requirements of water restrictions.
- ⑥ Groundwater for toilet flushing.
- ⑦ Municipal water supply to cistern must be disconnected.
- ⑧ Official signage weather proofed, to be placed in main thoroughfare e.g. at entrance and at points of use to warn people not to drink this water.
- ⑨ Borehole water meter to be installed by owner as per water by-law.
- ⑩ This water is not for drinking, cooking or ablution. Preferably, make it a 'demand' tap so that nobody drinks from it or wastes water from it.



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