Utility Regulatory Authority
Male',
Republic of Maldives

ޔުޓިލިޓީ ރެގިއުލޭޓަރީ އޮތޯރިޓީ
މާލެ،
ދިވެހިރާއްޖެ

General Guideline:
Domestic Wastewater Disposal

URA 2002:2021

CONTENTS

1 MANDATE

The Utility Regulatory Authority (URA) are mandated to:

- Issue licensing for water and wastewater service providers and ensure compliance by them,
- Develop standards and guidelines for water and wastewater and ensure that they are being followed by water and wastewater service providers

2 PURPOSE

It is acknowledged that human development impacts upon the environment. The purpose of this guideline is to improve public health through improved sanitation and cleaner and safer environment by regulating the disposal of domestic wastewater.

3 GENERAL PROVISIONS

URA is the government Authority responsible for developing and enforcing regulations, guidelines and standards for public sewerage systems and on-site sanitation systems, so that these activities do not cause an adverse impact on human health and to the environment.

This guideline addresses the safe disposal of domestic wastewater in the Maldives and has been developed in consultation with other authorities.

Any person, company or organization that undertakes the construction or the provision of sewerage services shall comply with this guideline and standards set by the Authority. An application for a permit and subsequent approval from the Authority is required before the installation of the system.

This Guideline applies to all the islands in the Maldives. Special permission shall be obtained from the Authority for wastewater disposal from industrial areas/activities or industrial islands.

Where a public sewerage system exists, it shall be mandatory for all domestic properties to connect to the public sewerage system. Where there is no public sewerage system, or if specific problems arise, then arrangements should be made through the local authority.

This guideline does not exempt any applicant from adhering to, or complying with the laws and regulations enforced by other authorities

In time, there will be changes in societal values and additional experience will be gained in waste water treatment and disposal. Therefore, it is expected that this guideline and standards will need to be updated regularly.

4 DEFINITIONS

Aquifer is a permeable subsurface zone capable of yielding quantities of groundwater to wells.

Disposal system or facility means the system for disposing of treated wastewater generated by the treatment works of a sewerage system, facility or onsite wastewater treatment facility, by subsurface or surface methods.
Wastewater means the water discharged after any use

Grey water (otherwise known as gray water) means all wastewater from showers and washing and it does not include toilet and kitchen waste

Pollution means the adverse alteration of the chemical, physical biological integrity of water.

Potable means suitable for drinking.

Septic tank is a wastewater treatment system in which the sewage sludge is retained for sufficient time and under appropriate conditions to undergo decomposition (anaerobic decomposition) and from which an effluent discharge takes place.

Sewerage collection system means system of pipelines, conduits, manholes, pumping stations, force mains, and all other structures, devices and appurtenances that collect, contain and conduct sewage from its sources to a sewage treatment or a disposal facility.

Wastewater treatment system means all systems which treat wastewater.

Water table means the upper portion of the part of the ground that is completely saturated with water.

Sustainable groundwater yield means the amount of groundwater which can be extracted without reducing the volume of the freshwater lens

Public sewerage system means sewerage system which is under the control of or maintained by an organization

Receiving water means that body of water into which the treated effluent is discharged**.**

On-site treatment means treatment that takes place within the boundary of the property generating the wastewater**.**

On-site disposal means disposal to a water body within the boundary of the property generating the wastewater**.**

Local Authority means an authority such as atoll council or island council.

5 GENERAL REQUIREMENTS

5.1 All wastewater management systems shall meet the prescribed criteria for the use of groundwater *[Annex B: Criteria for the Use of Groundwater]*

5.2 All facilities such as manholes, collection chambers, lift stations and sump wells shall be durable, leak proof and prevent any surface run-off / solids from entering the system and facilities.

5.3 Easy access should be provided for: (i) cleaning of septic tanks and rodding points: (ii) inspection of manholes, and (iii) for the inspection and servicing of any other facility.

5.4 A copy of as-built drawings of the system and a copy of the operation and maintenance manual shall be submitted to the Authority upon completion of thesystem.

5.5 All public sewerage systems must be monitored and must comply with the standards and other requirements that the Authority may specify. [*Annex A: Analysis Schedule for Groundwater Sampling]* and *[Annex B: Criteria for the Use of Groundwater]*

5.6 Facilities for sampling the final effluent need to be installed and the Authority must be given reasonable access to the sampling points. The sampling points must be indicated on all the drawings submitted to the Authority.

6 CONSENT REQUIREMENTS

6.1 All public sewerage systems shall meet the discharge criteria set by the Authority based on the receiving water quality objectives. *[Annex C: Procedure for Determining Receiving Water Quality Objectives – Groundwater]*

6.2 All sewerage projects have to undertake the Environmental Impact Assessment (EIA) as required by Ministry of Environment, Energy and Water and then submit the EIA Decision Note to the Authority. The EIA must in particular assess the impact of the proposed project upon the island's water resources and receiving waters, including an assessment of the groundwater sustainable yield, quality and anticipated impacts/changes resulting from the project.

The EIA shall describe:

- **a.** Other options considered for wastewater collection, treatment and disposal systems and discharge control measures.
- **b.** The technical and economic advantages and disadvantages of the options considered.
- **c.** An evaluation of each option relative to the pollution load, discharge

reduction, site specific hydrologic and geological characteristics and other environmental impacts including water conservation or possible augmentation measures.

d. An assessment of the sustainability of the operation and maintenance of the proposed system

e. Performance specification of the treatment system under design conditions

6.3 When the applicant fulfills the provisions of this guideline, the Authority will issue a *commencement of works permit*

6.4 Within 30 days of submitting the permit application, the Authority shall inform the applicant, in writing, of the decision. If the Authority denies the application, it shall provide reasons in writing for the decision.

7 WASTEWATER TREATMENT AND DISPOSAL

7.1 Grey water or any other untreated *wastewater* shall not be discharged on land or reused before it has been treated to an acceptable standard *[Annex C: Procedure for Determining Receiving Water Quality Objectives – Groundwater]*, together with other conditions as specified by the Authority

7.2 Where a sea out-fall is used it should be placed away from areas such as commercial harbors or areas designated for recreational purposes. The sea out-fall must be placed in such a way that the effluent will be flushed out into the deep sea, where it can be diluted and dispersed so that the impact on the marine environment is reduced. Untreated wastewater shall not be disposed into the near shore lagoon.

7.3 Where an on-site septic tank and disposal system is used, it shall conform to the guidelines set by the Authority. *[Annex D: Guidelines for Septic Tank and Soakaway Construction, Operation and Maintenance]*

It is proposed, after consultation, to add the following clauses

Safe disposal certificates must be issued by licensed sludge removal contractors accepting sludge from septic tanks or the contents of grease traps. In turn, the sludge removal contractor must receive asafe disposal certificate for the discharge of their sludge from a licensed wastewater operator.

Septic tanks must be inspected every 2 years by a licensed inspector.

ANNEX - A

Analysis Schedule for groundwater sampling

Mandate: The URA is mandated to develop standards and guidelines for water and wastewater and ensure that they are being followed by water and wastewater service providers.

Purpose: this schedule is for monitoring and surveillance of groundwater so as to ensure public health and environmental protection.

Table -1 Monthly Tests

The following parameters must be tested monthly	on-site	Laboratory
Physical Appearance (colour, odour, taste)		√
Temperature		
Electrical Conductivity/ Total Dissolved Solids		√
pH		√
Turbidity		√
Ammonia		√
Nitrate/ Nitrite		√
Phosphate		√
Total Coliforms		√
Faecal Coliforms		√

Table -2 Annual Tests

The following parameters must be tested annually	Laboratory
Cadmium	√
Chromium	√
Copper	√
Iron	√
Manganese	√
Mercury	√
Sodium	√
Potassium	√
Calcium hardness	√
Total hardness	√
Arsenic	√
Bromide	√
Boron	√
Chloride	√
Cyanide	√
Fluoride	√
Sulphide	√
Sulphate	√
Phenolic compounds	√
Total petroleum hydrocarbon	√
Anionic detergents	√
COD	√
NOTE: The list is by no means comprehensive and site-specific conditions may necessitate a more comprehensive list of substances to be analyzed.	

ANNEX B

Criteria for the Use of Groundwater

Mandate
The URA is mandated to develop standards and guidelines for the use of water in the Maldives.

Purpose
These criteria have been drawn up to assist users of groundwater to assess the fitness of use for different domestic purposes – drinking (health and aesthetic), food preparation, bathing and laundry.

The suitability of water for gardening depends on a number of factors, such as climate and soil quality. This makes the classification of water for gardening difficult, and it is not included in this guide. However, as a general rule, if water is fit for drinking, it can also be used for gardening.

The health effects of water quality can be divided into two types:

(i) **Acute effects:** effects that can be seen after a very short time
(ii) **Chronic effects:** effects that show only after the water has been used for a long period of time.

The guideline will also assist the designers of water and wastewater treatment equipment. When used in conjunction with *Annex C: Procedure for Determining Receiving Water Quality Objectives*, target performance criteria for wastewater treatment equipment can be calculated.

Table 1: The effects of the different classes of water on the various domestic uses of water

Class	Description	Effects
Class A	*Ideal water quality*	**Drinking Health:** No effects, suitable for many generations **Drinking Aesthetic:** Water is pleasing **Food Preparation:** No effects **Bathing:** No effects **Laundry:** No effects
Class B	*Good water quality*	**Drinking Health:** Suitable for lifetime use. Rare instances of sub-clinical effects. **Drinking Aesthetic:** Some aesthetic effects may be apparent. **Food Preparation:** Suitable for lifetime use. **Bathing:** Minor effects on bathing and bath fittings. **Laundry:** Minor effects on laundry or on fixtures.
Class C	*Marginal water quality*	**Drinking Health:** May be used without health effects by the majority of individuals of all ages, but may cause effects insome individuals in sensitive groups. Some effects possible after lifetime use. **Drinking Aesthetic:** Poor taste and appearance are noticeable. **Food Preparation:** May be used without health or aesthetic effects by the majority of individuals. **Bathing:** Slight effects on bathing and bath fittings. **Laundry:** Slight effects on laundry or on fixtures.
Class D	*Poor water quality*	**Drinking Health:** Poses a risk of chronic health effects, especially in babies, children and the elderly. **Drinking Aesthetic:** Bad taste and appearance may lead to rejection of the water. **Food Preparation:** Poses a risk of chronic health effects, especially in children and the elderly. **Bathing:** Significant effects on bathing or on bath fixtures. **Laundry:** Significant effects on laundry or on fixtures.
Class E	*Unacceptable water quality*	**Drinking Health:** Severe acute health effects, even with short-term use. **Drinking Aesthetic:** Taste and appearance will lead to rejection of the water. **Food Preparation:** Severe acute health effects, even with short-term use. **Bathing:** Serious effects on bathing and on bath fixtures. **Laundry:** Serious effects on laundry and on fixtures.

When is water safe to use?

According to the classification system

- Water in the Blue class (Class A) and the green class (Class B)
- Water in the Yellow class (Class C) may be safe for use but should be used under certain conditions, but should be used with caution:
    - It is most important to sample and assess the quality of water in the yellow class (Class C) regularly.
    - Expert advice should be called upon to determine the real threat to sensitive users.
    - Sensitive groups should also be informed when water falls into the yellow class (Class C)
- Water falling into the Red class (Class D) should be considered unsafe for use and should be treated. Waterin the Red class (Class D) may be used for short-term emergency supply, but only where no alternative supplies are available.
- Water falling into the purple class (Class E) should be considered as unsafe for use and should be treated.
- Water in the Purple class (Class E) is unsafe even for short-term emergency use.

Table 2: Groundwater Faecal coliforms criteria

FAECAL COLIFORMS RANGE (Count/100 ml)	DRINKING (Health)	DRINKING (Aesthetic)	FOOD PREPARATION	BATHING	LAUNDRY
0	A No detectable chance of infection	A No effect	A No effect	A No effect	A No effect
0 – 1	B Insignificant chance of infection	A No effect	B Insignificant chance of infection	B Insignificant effects	B Insignificant effects
1 – 10	C Clinical infections unlikely in healthy adults, but may occur in some sensitive groups	A No effect	Clinical infections unlikely in healthy adults, but may occur in some sensitive groups	B Insignificant effects	B Insignificant effects
10 – 100	D Clinical infections common, even with once-off consumption	A No effect	D Clinical infections common, even with once-off consumption	C Slight risk	C Slight risk
> 100	E Serious health effects common in all users	A No effect	E Serious health effects common in all users	D Possibility of infection	D Possibility of infection

Class A Ideal	Class B Good	Class C Marginal	*Class D *Poor	*Class E *Completely unacceptable

Note: * Not to be used without treatment

Table 3: Groundwater electrical conductivity (EC) and total dissolved solids (TDS) criteria

ELECTRICAL CONDUCTIVITY RANGE (EC: µS/cm)	DRINKING (Health)	DRINKING (Aesthetics)	Food Preparation	Bathing	Laundry
EC: < 700 µS/cm	A No effects	A Water tastes	A No effects	A No effects	A No effects
EC: 700 – 1 500	B Insignificant effects on sensitive groups	B Water tastes	B Insignificant effects on sensitive groups	B No effects	A No effects
EC: 1 500 – 3 700	C Slight possibility of salt overload in sensitive	C Water has a distinctly salty taste	C Slight possibility of salt overload insensitive	A No effects	A Insignificant corrosion
EC: 3 700 – 5 200	D Possible health risk to all individuals	D Water tastes extremely	D Possible healthrisk to all individuals	B Impaired soap latherin	C Slightly corrosive
EC: < 5 200	E Increasing risk of dehydratio	E Tastes extremel ysalty and	E Increasing risk of	B Impaired soap latherin	D Corrosive

Class A	Class B	Class C	Class D	Class E
Ideal	Good	Marginal	Poor	Completely unacceptable

Table 4: Groundwater pH criteria

pH range	DRINKING (Health)	DRINKING (Aesthetics)	FOOD PREPARATION	BATHING	LAUNDRY
< 3	E Acid burns	E Extremely sour taste	E Acid burns	E Burns skin and eyes	E Extremely corrosive
3 – 3.5	D Severe irritation of mucous membranes	E Extremely sour taste	E Severe irritation of mucous membranes	E Burns skin and eyes	D Very corrosive
3.5 – 4	D Severe irritation of mucous membranes	D Very sour taste	D Severe irritation of mucous membranes	D Burns skin and eyes	D Very corrosive
4 – 4.5	C Irritation of mucous membranes	C Sour taste	C Irritation of mucous membranes	C Slight skin / eye sensitivity	D Very corrosive
4.5 – 5	B Mild irritation of mucous membranes	C Sour taste	B Mild irritation of mucous membranes	B Mild skin / eye sensitivity	C Corrosive in some instances
5 – 6	A No health effects	B Slightly sour taste	A No effect	B Insignificant effect	B Possible corrosion
6 – 9	A No health effects	A No aesthetic effects	A No effects	A No effect	A No effects
9 – 9.5	A No health effects	B Slightly soapy	A No effects	B Insignificant effect	A No effect
9.5 - 10	B Mild irritation of mucous membranes	C Soapy taste	B Mild irritation of mucous membranes	C Mild skin / eye sensitivity	B Mild rinsing problems
10 – 10.5	C Irritation of mucous membranes	D Very soapy taste	C Irritation of mucous membranes	D Marked skin / eye sensitivity	C Rinsing problems
10.5 - 11	D Severe irritation of mucous membranes	E Extremely soapy taste	D Severe irritation of mucous membranes	E Burns skin / eyes	D Increasing rinsing problems
>11	E Alkali burns	E Extremely soapy taste	E Alkali burns	E Burns skin / eyes	E Severe rinsing problems

Class A Ideal	Class B Good	Class C Marginal	*Class D *Poor	*Class E *Completely unacceptable

Note: * Not to be used without treatment

Table 5: Groundwater Nitrate + Nitrite (as N) criteria

NITRATE + NITRITE RANGE mg/L as N (mg/L as NO_3)	DRINKING (health)	DRINKING (Aesthetic)	FOOD PREPRATION	BATHING	LAUNDRY
< 6 mg/L as N (< 26 mg/L as NO_3)	A Negligible heath effects	A No aesthetic effects	A Negligible heath effects	A No effects	A No effects
6 – 10 mg/L as N 26 – 44 mg/L as NO_3)	B Insignificant risk	A No aesthetic effects	B Insignificant risk	A No effects	A No effects
10 – 20 mg/L as N 44 – 89 mg/L as NO_3)	C Slight chronic risk to some babies	A No aesthetic effects	C Slight chronic risk to some babies	B Insignificant risk	A No effects
20 – 40 mg/L as N 89 – 177 mg/L as NO_3)	D Possible chronic risk to some babies	A No aesthetic effects	D Possible chronic risk to some babies	C Slight risk to babies only	A No effects
> 40 mg/L as N (> 177 mg/L as NO_3)	E Increasing acute health risk to babies	A No aesthetic effects	E Increasing acute health risk to babies	D Possible chronic risk to babies	A No effects
Note: Nitrate is not normally present in drinking water					

Class A Ideal	Class B Good	Class C Marginal	Class D Poor	Class E Completely unacceptable

Table 6: Groundwater Turbidity criteria

TURBIDITY RANGE (NTU)	DRINKING (Health)	DRINKING (Aesthetic)	FOOD PREPARATION	BATHING	LAUNDRY
< 0.1	A No effect	A No effect	A No effect	A No effect	A No aesthetic effect
0.1 – 1	B Slight risk of potential health	B Water has good transparency	B Slight risk of indirect health effects	B Insignificant effects	A No aesthetic effect
1 – 20	C Possibility of secondary health	C Water slightly cloudy	C Slight risk with	C Slight risk of infection if ingested	B Insignificant aesthetic effects
20 – 50	D Secondary health effects	D Water has a muddy appearance	D Secondary health effects	D Risk of infection if ingested	C Possibility of staining of white goods
> 50	E Serious health effects common in	E Water has an increasingly muddy	E Secondary health effects	D Risk of infection if ingested	D Staining of clothes

Note: Turbidity can have indirect health effects in association with microbial contamination

Class A	Class B	Class C	Class D	Class E
Ideal	Good	Marginal	Poor	Completely unacceptable

Reference:

Quality of Domestic Water Supplies, (1998) Vol 1 Assessment Guide, TT 101/98, Second Edition, ISBN No.: 1 86845 416 9, South African Department of Water Affairs and Forestry, South African Department of Health, Water Research Commission, Pretoria

South African Water Quality Guidelines, (1996) Department of Water Affairs and Forestry, Pretoria, South Africa.

Health Guidelines: Drinking Water Quality, (1995) Department of Health, Pretoria, South Africa.

ANNEX C

Procedure For Determining Receiving Water Quality Objectives - Groundwater

MANDATE:

The Utility Regulatory Authority (URA) is mandated to develop standards andguidelines for water and wastewater and ensure that they are being followed by water and wastewater service providers

PURPOSE

This procedure describes the scientific principles for calculating the total effluent load to an aquifer while satisfying set environmental objectives.

GENERAL PROVISIONS:

URA is the government Authority responsible for developing and enforcing regulations, guidelines and standards for public sewerage systems and on-site sanitation systems, so that these activities do not cause an adverse impact on human health and to the environment.

The Ministry of Environment, Energy and Water require an Environmental Impact Assessment (EIA) to be undertaken for sewerage systems.

The information in an EIA can be used to calculate the total effluent load to an aquifer.

In the case where no data or where unknown conditions prevail, the *Precautionary Principle*

shall be applied.

OUTLINE PROCEDURE

The impact of the wastewater treatment strategy needs to be determined at the scale of both the entire island and between discharges and wells

The following steps need to be undertaken in order to determine the receiving water quality objectives for the entire island:

1. define planning horizon
2. define target ground water quality (e.g. equal to or better than the present water quality class-*Annex-B : Criteria for the use of groundwater*)
3. assess the current status of the aquifer (extent and quality)
4. estimate the current and projected rates (volumes and pollutant loads) of abstraction and infiltration from all sources (rain, evaporation, abstraction from wells, infiltration from septic tanks and grey water etc.) taking into account any proposed new development plans
5. estimate the steady-state ground water status (sustainable yield and quality)
6. compare the estimated quality (step 5) with the target quality (step 2)
7. reassess the targets

8. set volume and pollutant load standards for the planning time interval

The following steps need to be taken to assess the impact of wastewater discharge on neighboring wells

1. identify potential points of cross contamination between discharges and wells.
2. calculate the impact
3. assess the receiving water quality
4. compare the estimated quality with the target quality
5. re-evaluate the design

DEFINITIONS

a) Precautionary Principle

Where there are threats of serious or irreversible damage to the environment, lack of full scientific certainty should not be used as a reason for postponing cost-effective measures to prevent environmental degradation.

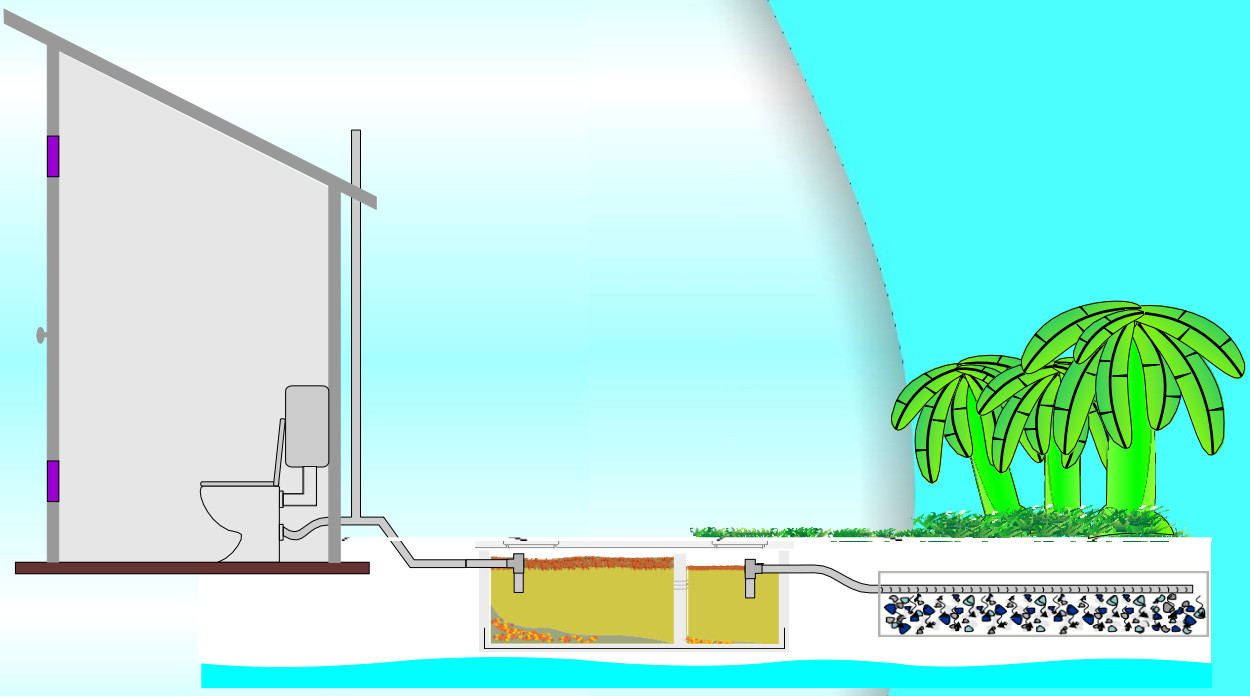
ANNEX-D

Guidelines for septic tank and Soak away Construction, Operations and Maintenance

SANITATION

Septic Tanks, the right way to Safe Sanitation

Guidelines for septic tank and Soak away Construction, Operations and Maintenance



SANITATION

Good Sanitation begins in the home

It is households and communities themselves who are responsible for their health, for a clean environmentand for improved sanitation. Sanitation means collecting and disposing waste including human excreta andhousehold wastewater, in a hygienic manner.

Why is sanitation important?

Sanitation is vital for good health. Health risks associated with poor sanitation include diarrhoea , typhoid ,cholera, malaria, eye infections, skin diseases and worm infestations. In the Maldives our shallow groundwater needs protection from poor sanitation such as leaking or poor built septic tanks and soakaways.

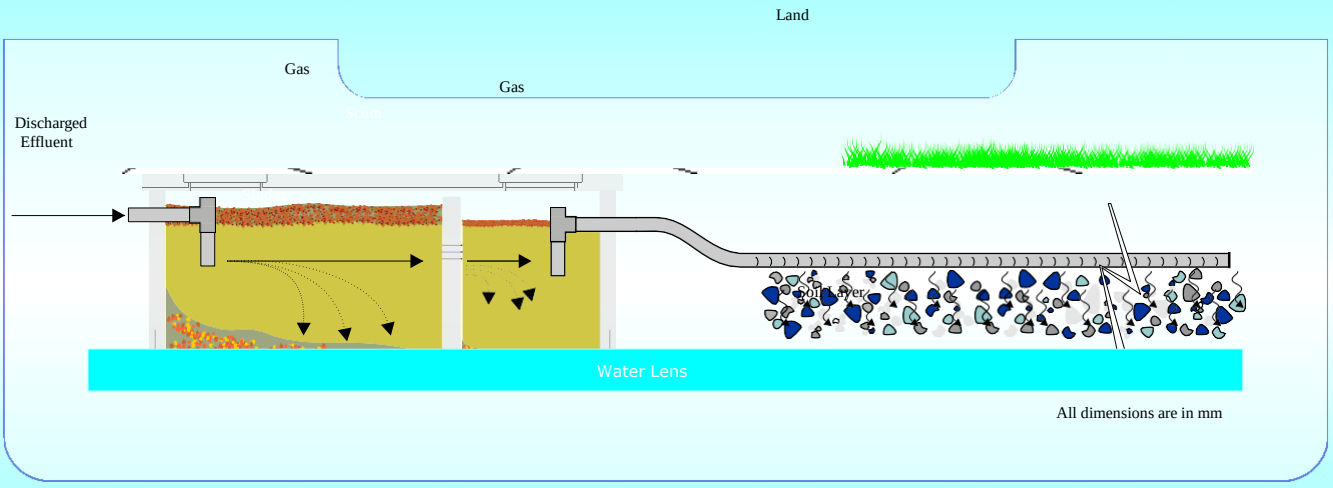
Why septic tanks?

Septic tanks are one of the safest and easiest ways for households to dispose of sewage whilst protectingtheir families' health and the groundwater. Its important that septic tanks are built correctly, using the right design and materials and that they are properly maintained.

Septic tanks and soakways, how do they work?

Waste from the toilet and domestic wastewater is flushed into the settling chamber of the septic tankswhere it is retained for at least 24 hours to allow settlement and biological digestion. A natural processtakes place inside where the sewage settles to the bottom and tiny living microorganisms feed on the sewage and break it down so that only a small amount remains

Partially treated liquids then pass out of the tank and into the soakaway system. Digested sludge gradually builds up in the tank and eventually requires removal by de-sludging the tank. Its important thatthe liquid from the septic tank is cleaned further using a properly built soakaway. This should be designed so that the liquid flows through some dry soil before reaching the groundwater below. More pollutants are removed by the soil because it acts as a filter as the liquid passes through it..



5 Important Points to Remember - Designing and building your septic Tank Soakaway.

1. Build them in the right place..

The septic tank and soakaway should be as far as possible (and at least 15m) from nearest well. Thesoakaway should also be 10m from the nearest other soakaway.

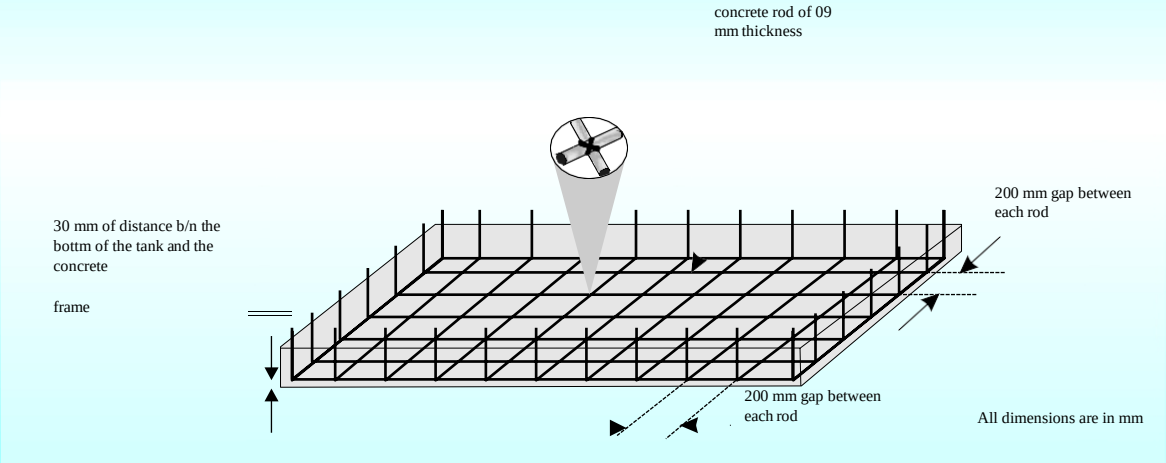
2. Keep the tank watertight

The most important quality of a septic tank is that it should be watertight. If the tank leaks then untreatedsewage can escape into the groundwater and cause pollution. For this reason, waterproofing compound should be added to all concrete mixes. The completed tank should be tested for leaks by filling it with water and allowing it to stand for several hours before it is ever used.

The tank should not only be watertight at the beginning of its life, but throughout its lifetime. The natural process that takes place inside a septic tank produces hydrogen sulphide gas and this can attack and crackconcrete surface, causing leakage. For this reason, all internal surface of the septic tank should be coated with a 20mm thick mortar made using sulphate resistant cement (1 part sulphate resistant cement :2 partssand).These surfaces can also be covered with a coat of bituminous paint.

3. Make the tank strong enough

The tank needs to be strong enough to support the weight of the sewage it contains (1 liter of water weighs 1 kg so a half full 2000-liter tank weighs a tonne!). The base of the tank should be made from reinforced concrete. The base slab should be cast above ground using wooden formwork and then loweredinto the excavation. The base of the excavation should already have been leveled.



4. Make the tank the right size, and use the right parts

The tank should be of the dimensions shown beside. This is large enough for households of 8 people (usinga pour flush toilets). It will need to be emptied every five years. If more people are using the tank or it is connected to a cistern flush toilet it will need to be emptied more frequently, perhaps every three years.
The tank should be rectangular with two chambers.

The diagram shows the right way to build a septic tank with all necessary components. They all playimportant roles in making sure it works properly so they all need to be included.

5. Build your soakaway in the right way

The liquid from the septic tank must go to a properly built soakaway if the groundwater below and thenearby wells are to be protected from pollution.
The liquid from the septic tank is filtered as it passes through the dry soil beneath the soakaway, so the bottom of the soakaway needs to be at least 0.5m above the groundwater below. It is better to build shallow trench soakaway rather than deep pits. The soakaway needs to be large enough for all the liquid entering it to have time to soakaway! For the average household a trench of 5m length with a depth of 0.5m and a width of 0.5m is sufficient. The diagram beside shows right way to build a soakaway with all the necessary components. They all play important roles in making sure it works properly so all need to beincluded.

It is a good idea to put plants such as chilies, bamboo or banana suckers along the sides of the trench.Their roots can remove some of the liquid from the ground.

Step by Step

Building a Septic Tank and Soakaway

The Septic Tank

1. The septic tank should be sited as far as possible (and at least 15m) from the nearest well.
2. A hole big enough to house a septic tank of the dimensions shown should be dug and the base ofit leveled.
3. The concrete base slab should be cast at ground level using wooden formwork. Steel reinforcingbars laid at 200mm spacing in both directions should be included to give the slab enough strength.
4. The slab should be lowered into position and leveled. The walls of the tank can then be built upeither with unreinforced concrete (using formwork) or with blockwork. The inlet and outlet pipes shouldbe built into the walls at this stage. These pipes should be softened with jointing solvent and covered with fine sand to allow them to bond into the walls.
5. The wall between the first and second chambers of the tank can be built either from unreinforcedconcrete (using formwork) or from blockwork. Two holes of 100mm diameter should be built into this wall to allow the sewage to pass from the first to the second chamber.
6. T-shaped baffles of the dimensions shown on the previous diagram should be built from UPVC pipe and fixed into the tank. These pipes should be softened with jointing solvent and covered with finesand so that they can be bonded into the walls of the tank.
7. The internal surfaces of the tank should be covered with a 20mm thick mortar made using sulphate resistant cement. If available, a coat of bituminous paint can also be added to make sure thetank is watertight.
8. The cover of the tank should be cast at ground level using formwork. Two circular access holes of600mm diameter should be included at the points shown. Covers for these holes should be cast at the same time.
9. The underside of the cover slab should be given a layer of sulphate resistant mortar and a coat ofbituminous paint. Once the cover slab has been fixed into position the joints between the walls and the slab should be covered by mortar and bituminous paint to make a continuous seal.
10. A vent pipe should be placed on the pipeline from the toilet to the septic tank, as near to thetoilet as possible. This should be at least 4m high and secured against a wall.

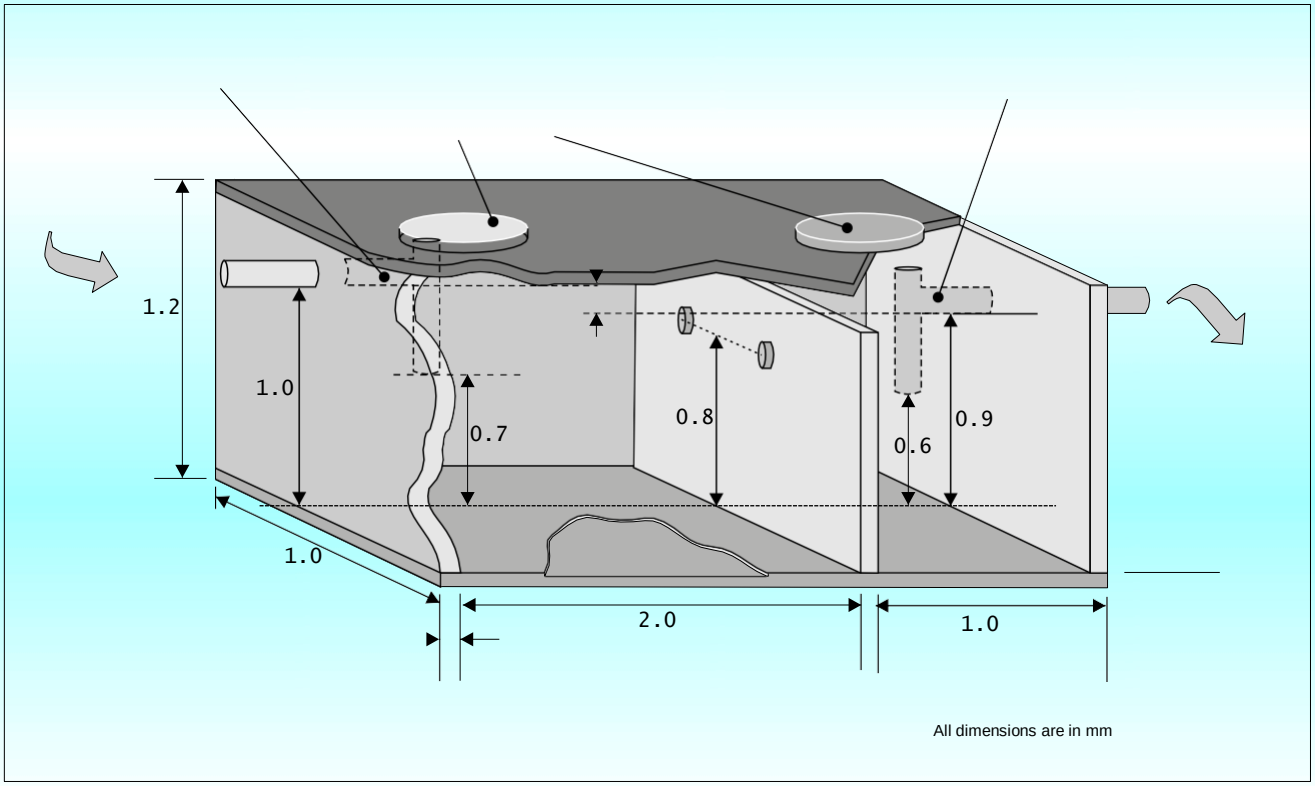
Testing your Tank

1. The tank should be tested to check that it is watertight by filling it with water and leaving it tostand for a few hours. If the water level goes down over time then there's a leak. This should be plugged with mortar and sealed with bituminous paint.
2. The venting of the tank should be tested by holding a burning piece of paper in the tank. Thesmoke should be drawn back through the inlet pipe and up through the vent pipe.
3. Once these tests have been carried out the tank is ready for use. However, without a properly builtsoakaway, even a properly built septic tank can still pollute the groundwater nearby.

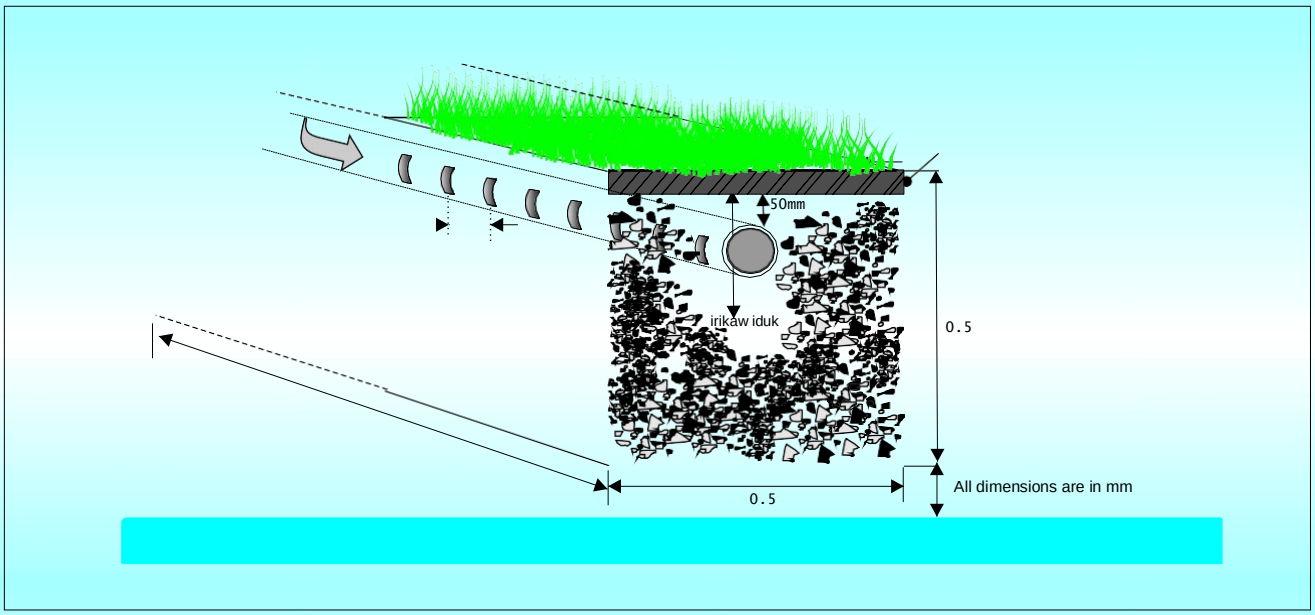
The Soakaway

1. The soakaway should be sited as far as possible (and at least 15m) from the nearest well. Itshould also be 10m from the nearest other soakaway.
2. A 100mm diameter UPVC pipe should be perforated with thin slots (thickness of two hacksawblades) at 100mm intervals along its length.
3. A trench should be dug to a depth of 0.5m below the septic tank outlet. The trench should be0.5m wide and 5m long.The trench should be filled with small gravel to the depth of the septic tank outlet.
4. The pipe should be laid horizontally from the septic tank outlet along the top of the gravel. Thepipe should then be covered with more gravel to a depth of 50mm above the top of the pipe.
5. On top of the gravel, for the length of the trench, should be laid gunny bags. These are to stop too much soil being washed into the trench. Over the top of the bags the rest of the trench can be filledup with the soil that was removed.

Septic Tank



Soakaway



Don't Forget to Maintain your Septic Tank

Once the septic tank and soakaway has been built properly the important thing to remember is that they do require maintenance to keep them working at their optimum.This means DESLUDGING your Septic Tank.

How often should I desludge the septic tank?

Your septic tank needs to be emptied every few years. The tank of the dimensions shown is big enough for a family of 8 people to use for 5 years before it needs to be emptied. That's provided they are using a pour flush toilet. If the family are using a cistern flush toilet (which uses much more water) then the sametank will need to be emptied every 3 years.

You should also check the depth of the sludge at regular intervals. This can be done by opening the accessmanhole and using a stick to feel for the top of the sludge. The septic tank is 'full' when the sludge in the first chamber reaches the bottom of the T-shaped baffle. If the sludge builds up more than this then the inlet pipe will become blocked and flooding will occur. When the tank is opened a crust may be found on the surface of the liquid. This is normal and helps the natural process to take place. The crust should not be broken up unless the tank is being emptied.

How do I dispose of the sludge safely?

Sludge from the septic tank should be treated as a potential health risk and always disposed of correctly. Care should be taken during transfer of the sludge from the septic tank to the disposal site. Sludge shouldbe transported in a sealed watertight container, such as an old oil drum.

The removed sludge should be dumped into the deep sea. The site selected should be of sufficient distance from the island to avoid sludge washing back to the shore. Ideally, the site should be outside thelagoon in relatively deep water with a strong offshore current that will help to disperse the sludge.

Step-by- Step Desludging your Septic Tank

1. Provide a suitable watertight container into which the sludge can be placed and easily carried away.
2. Remove both covers from the top of the tanks.
3. If there is liquid in the 1st chamber it must transferred to the 2nd chamber. Scoop the liquor with a suitable tool into the 2nd chamber. Once the 1st chamber is empty of liquid, replace the 2nd chambercover.
4. Scoop out the sludge from the 1st chamber and place it in the watertight container. Continue until MOST of the sludge has been removed from the tank.
5. It is important that all the sludge is NOT removed from the tank, leave a layer about 100mm deep.Removing all the sludge takes away the accumulation of bacteria that helps to digest new sewage entering the tank.
6. It is important that the tank is NOT cleaned with chlorine or other disinfectants, as this will also kill thebacteria that are required for future treatment.
7. While the tank is open, remove any fats or greases that have built up around the exit from the 2nd chamber and clean the inlet and outlet pipes by rodding them. If there is a layer of scum.
8. On completion, replace the 1st chamber cover and thoroughly clean any spillages from the surroundingarea and apply a weak solution of chlorine or other disinfectant.