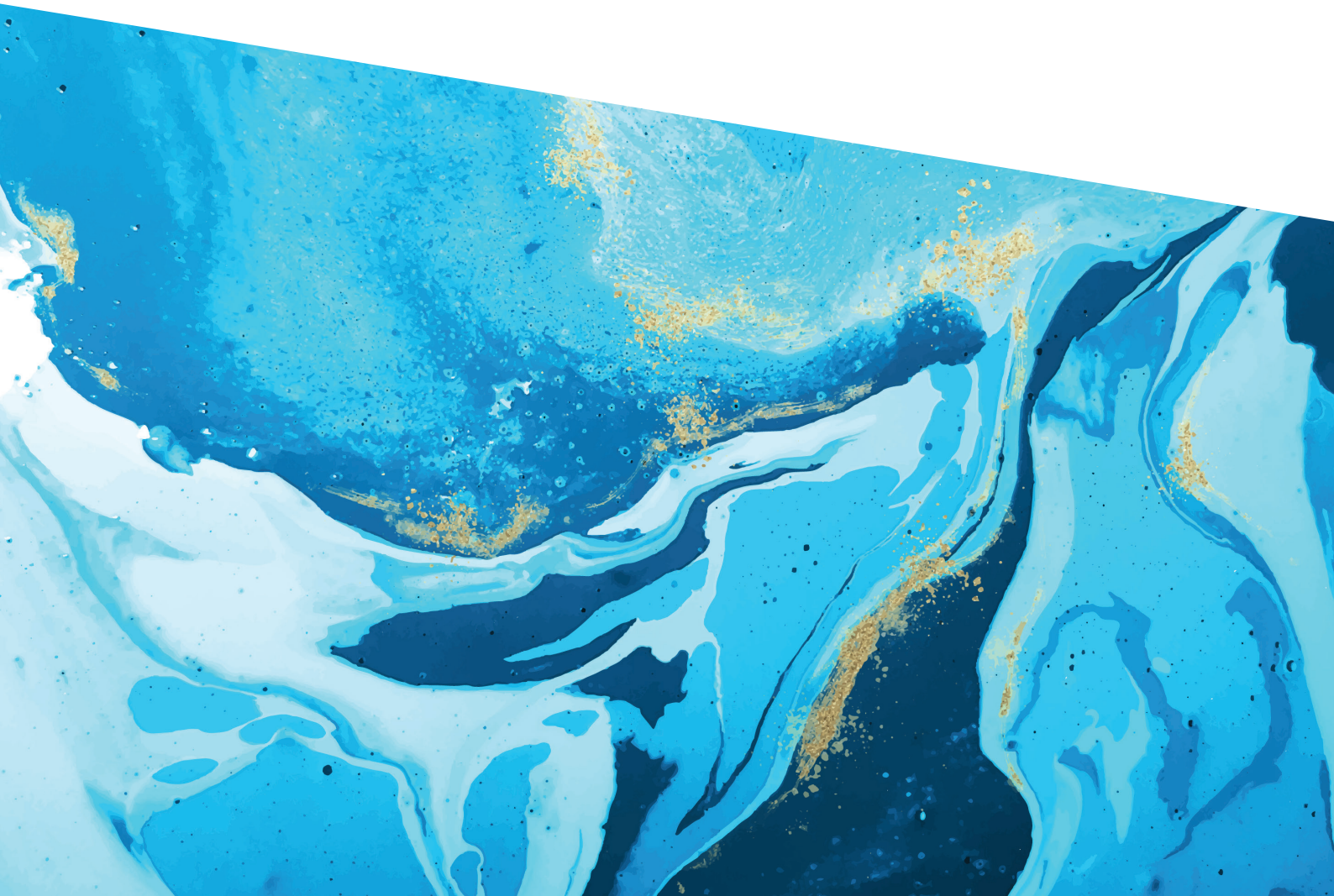


# gilghi

Remote Area Water



# Off-grid containerised water filtering unit

*The Gilghi remote water unit uses advance filtering technology and is a breakthrough water solution.*

With a range of configurations and a plug and play commissioning process, the Gilghi is a simple solution to a variety of applications.

## KEY FEATURES

- Able to produce potable water to Australian Drinking Water Guidelines (ADWG)
- Capable of operating completely off grid or with a grid connection
- Scalable and modular in design, standard unit produces up to 28kL/day
- Low maintenance and all consumables are easily replaced in the field
- Factory tested prior to delivery

## POWER OPTIONS

The unit uses a stand-alone hybrid power supply utilising:

- photovoltaic solar power generation
- battery storage
- diesel back-up generator
- 240V mains power adapter
- power quality and voltage optimisation inbuilt

## REMOTE MONITORING

The system can offer either a 3G/4G or iridium satellite link for remote monitoring and alarming of the power system and water treatment plant diagnostics. Additional ability to log on-ground pre-starts/maintenance to the cloud.

## HYDROLOGY DESIGN

Recognised leaders in the water sector, Aurecon custom design the treatment system required for each application. Depending on feedwater quality, this may range from basic filtration and sterilisation through to complete reverse osmosis systems.



28kL per day



Multiple power options



Delivered complete to site



Remote monitoring



Filtering and sterilisation



Reverse osmosis



Australia wide



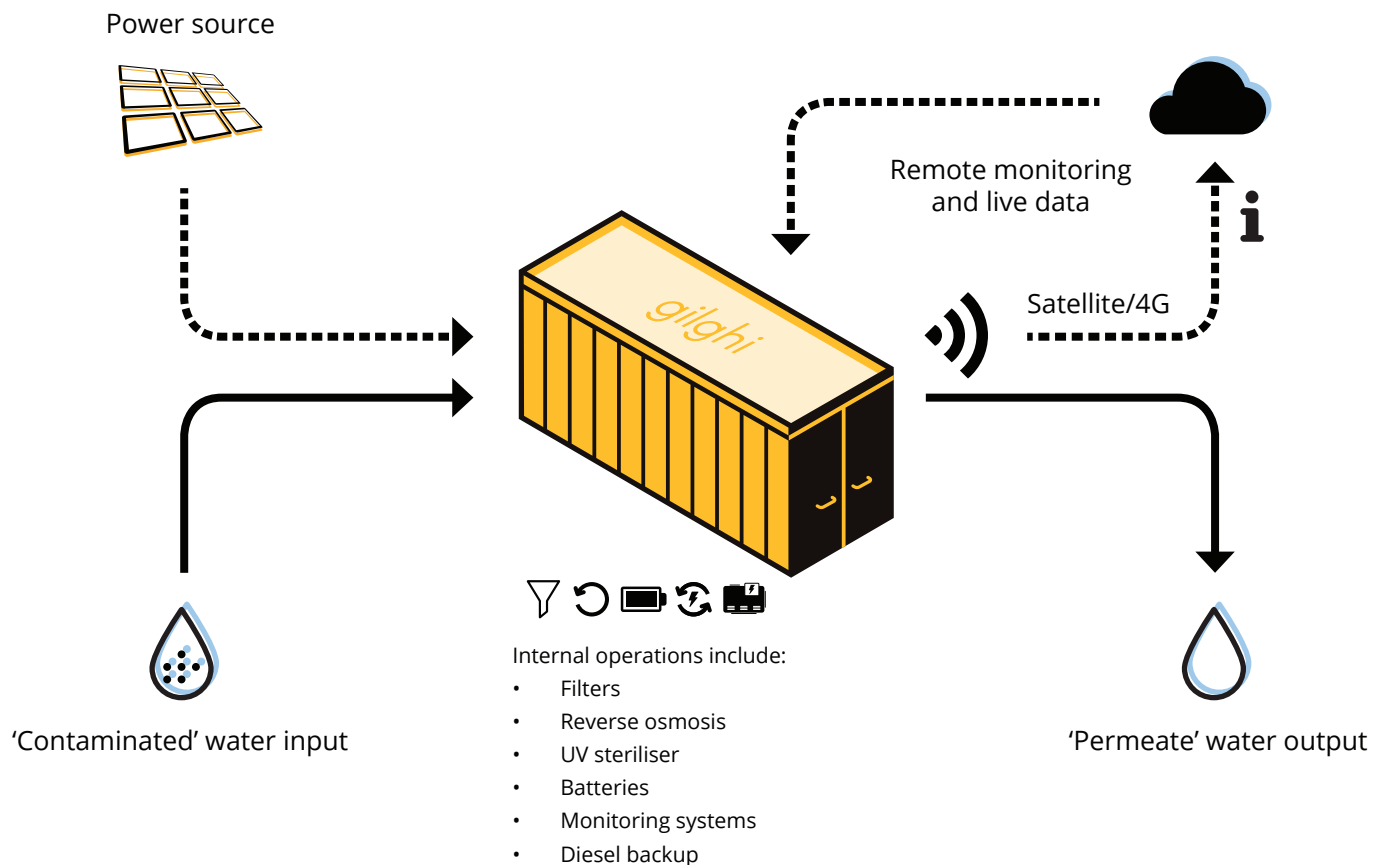
## Configuration

**The Gilghi unit is engineered as a standard or typical unit that allows for reconfiguration and scalability.**

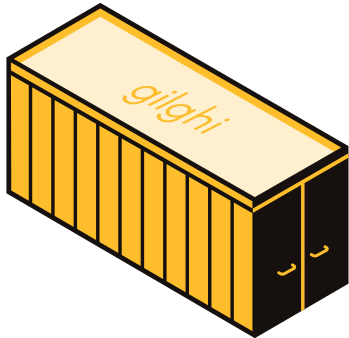
The container size, solar array, batteries and power systems generate the required power to output 28,000L per day, including the filtering, sterilisation and reverse osmosis in the standard unit.

Configurations and scalability however allow for increased energy output, filtration variables and higher permeate water output - up to 250kL per day.

An outline of the typical variations are illustrated below:



## Configuration



### Source water



High salinity bore water  
 High total dissolved solids (TDS) river water  
 Sea water/coastal bores  
*Optional:*  
 Solar feed-water pump

### Power source



Solar 5kW (scalable)  
*Optional:*  
 Mains power  
 Diesel generation  
 Wind

### Internal power system



Enerverter (integrated power and control system)  
 Lithium Ion batteries  
 Diesel back-up

### Treatment modules



Media filter  
 Carbon filter  
 Softener/dosing  
 Reverse Osmosis plant  
 UV steriliser  
*Optional:*  
 Pre-treatment screening  
 Nano filtration  
 Coagulation and flocculation  
 Chlorination  
 Fluoridation  
 Clarifiers/settling basins  
 Ion exchangers

### Remote monitoring



Remote monitoring ready  
 Customised Human Machine Interface (HMI) for process status and alarms  
*Optional:*  
 4G or iridium satellite connection and alarming  
 Cloud based user-interface and maintenance auditing  
 Remote emergency shut-off

### Why containerisation?

Containerised plants have many advantages over built-in plant room installations:

- Plug and play unit
- Express manufacturing
- Quick installation
- Limited civil work (only container foundation)
- Small foot print
- Easy transportation
- Relocatable
- Scalable from standard unit



## Standard Specifications

DIMENSIONS	
<b>Container</b>	
Length:	6,100mm
Width:	2,438mm
Height:	2,590mm
<b>Dimensions with Solar Array</b>	
Length:	6,100mm
Width:	2,738mm
Height:	2,790mm

WEIGHT	
Shipping weight:	4,350kg

HYDROLOGY	
Permeate %:	50
Permeate output:	28,000L per day
Feedwater:	56,000L per day

TREATMENT MODULES	
Filter types:	Media, Carbon, Dosing, Reverse Osmosis
Sterilisation:	UV

MECHANICAL	
Pumps:	Intake, RO, permeate
Diesel generator:	7kVA

SOLAR PV PLANT	
Energy output:	~5kWp
Panel output:	400W
Panel number:	12

BATTERIES	
Type:	Lithium Ion
DC voltage (nominal):	51.2
Amp hours:	134
Operating efficiency:	98%
DC voltage range:	40-58
Operating temp:	-20 to 60 deg C
Energy output:	6.88kW hours
Warranty:	10 years

### Maintenance Requirements

Parts of the plant require regular servicing and maintenance.

Frequency	Operation
Weekly	Refill brine tank with 20kg bag of salt
Monthly	Clean UV quartz tube
6-Monthly	Replace coin cell batteries in filter control units
	Inspect container for water leaks / insect ingress
Annually	Replace UV lamp
	Inspect filter media for fouling
As required	Replace media if a number of backwash cycles does not reduce pressure load, or if significant biological fouling is identified
	Replace blue filter cartridges on RO system
	Clean RO membranes

### Failsafe's

The system is installed with a diesel backup generator.

The reverse osmosis system will cut out automatically should any one of a range of criteria be met, including:

1. Any pressure/flow trips occur
2. Filters require maintenance
3. The intake water tank level goes low
4. The internal permeate 'clean' water tank becomes full.



## Standard Specifications

### Unit

The unit is built in a customised shipping container with a bank of solar panels mounted on a frame on the roof which charge a set of Lithium Ion storage batteries. The plant also contains a diesel backup generator to ensure that the system always has power available to process water.

### Container

Length	6100mm
Width	2500mm
Height	2600mm
Mass	3500kg

### Transport Requirements

Truck transportation as per a normal shipping container. The unit can be lifted using a crane or suitably sized forklift from standard shipping container lifting points.

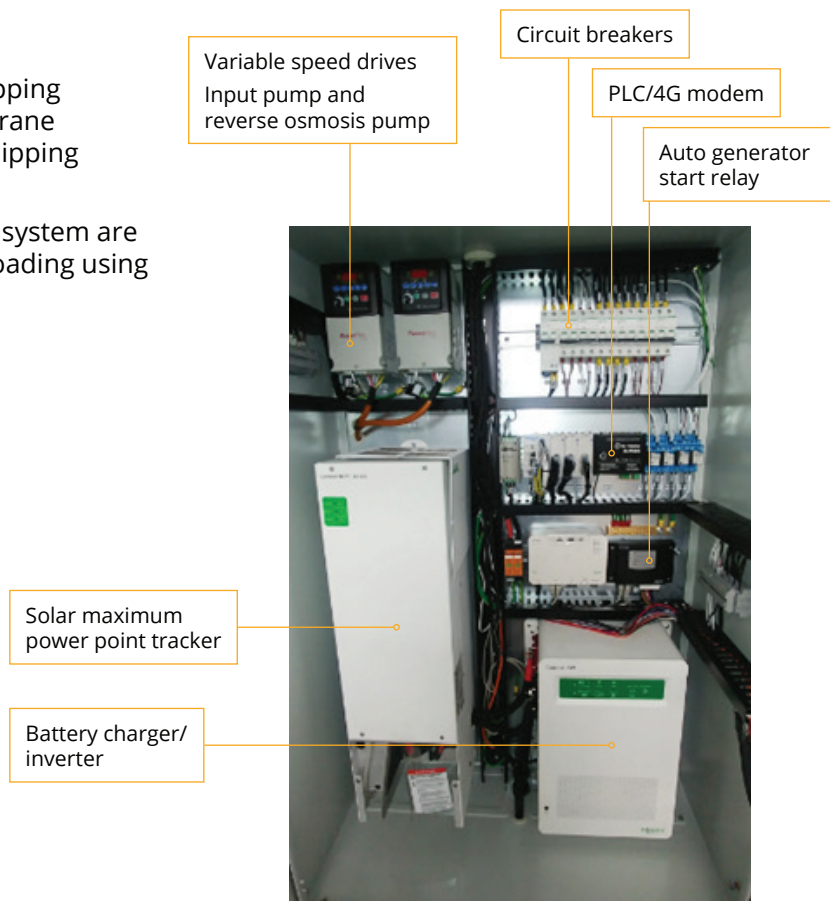
All ancillary parts for the assembly of the system are delivered on pallets to allow for easy unloading using a suitably rated forklift.

### Solar Panels

The standard 5kW system consists of 12 x 400W PV panels mounted on the roof of the container. The output of these are used to run the process and/or charge the battery system.

### AC and DC Supply

The specialist inverter allows both AC>DC and DC>AC conversions. This allows multiple power sources to be connected with automatic switching of these sources.



# Standard Specifications

## Filter Types

The Gilghi system is designed to take feed water from a number of sources including bores, streams, brackish and salt water. Water is stored in an inlet tank, before it is passed through a number stages for treatment.

These stages include:

### 1. A series of media filters

- a. Sand Media
- b. Carbon
- c. Softener

### 2. A commercial reverse osmosis unit which is comprised of:

- a. A series of cartridge filters
- b. A pressure booster pump
- c. A series of reverse osmosis membranes

### 3. An outlet tank and UV steriliser

Once treated, the water is directed to a storage tank where it is made available for use by the customer.

Under normal operation, the standard Gilghi plant will produce clean water at ~38L/min. The inlet pump will operate at ~114m hydraulic head (1100 kPa).

Process	Flow Rate (L/min)
Media Filter	56
Carbon Filter	28
Softener	20

## Water Sampling and Treatment

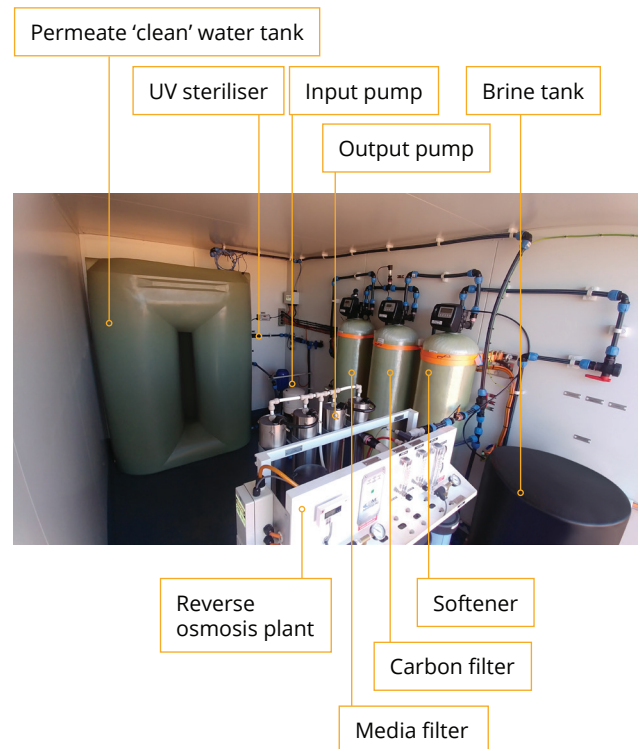
Monitoring and testing against the Australian Drinking Water Guidelines is required to ensure the output does not pose any significant risk to the health of the consumer. The system contains multiple H<sub>2</sub>O sample points.

This involves processes such as defining routine intervals and acceptable results for output water quality sampling.

### Additional treatments include:

- Ensuring adequate disinfection of the water (eg via chlorination)
- Ensuring fluoridation is implemented as requested or required by the state or territory legislation.

## Equipment identification



## Project Reference



### GILLEN BORE

Located 78km north of Alice Springs, the Gillen Bore services a remote community with fresh clean drinking water throughout the year.

Amcontrol successfully designed, built and commissioned the Gilghi remote area water treatment unit.

The unit contains a remote monitoring function that operates via satellite due to the location.

The Gillen Bore water treatment unit is sponsored by the Northern Territory Government through the Department of Local Government, Housing and Community Development.

