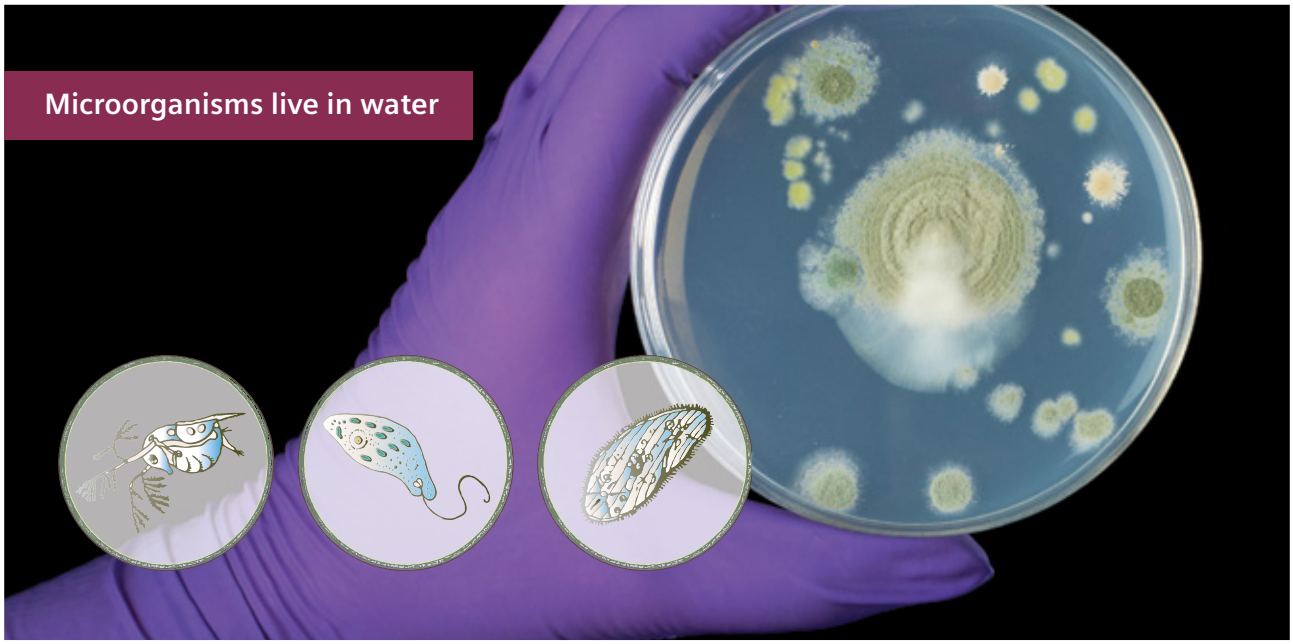
3A Finding and growing microbes



Microbes, often too small to be seen by the naked eye, are found everywhere. Millions can be found in just one litre of pond water!

Growing bacteria from pond water

Procedure:

1. Take one agar plate. Choose a suitable place to leave it open to the air.
- Label the base with your name, the date and the place.
- Take the lid off the dish and keep it open until the end of the lesson.
- Replace the lid at the end of the lesson.

2. Label another agar plate with your name, the date and 'pond water'.
- Shake your bottle of pond water to mix the contents.
- Remove the top, flame the neck in the Bunsen burner and draw up a small amount of water with a dropping pipette.
- Flame the neck again and replace the top.
- Lift the lid of the dish and dispense 2 or 3 drops on to the surface of the agar.
- Discard pipette and spreader into the beaker of disinfectant.

Adapted from "Microbes all around us" (Nuffield Foundation and Society of Biology) and 'Finding and growing microbes' (Society for General Microbiology) as published at **www.nuffieldfoundation.org/practical-biology/microbes-all-around-us**

3B Specification Sheet

SKYHYDRANT™ SPECIFICATION SHEET



Low Pressure High Volume Ultra-Filtration Unit

Water contaminated with pathogens and turbidity from both surface and ground sources is made safe to drink using the SkyHydrants. It is quick to set up; easy to operate, doesn't need replacement filters or spare parts and filtration process does not require power or chemicals. All operations are simple and manual. The gravity fed SkyHydrant can produce up to 1,000 litres per hour from a single lightweight compact portable unit weighing only 12 Kg (26 pounds) and standing 142 cm (4'6") tall x 15 cm (6") in diameter.

The SkyHydrant™ can be set up to operate as a single stand alone unit or as a multi-configured bank of units manifolded together for high volume water treatment plants. The sanitising and cleaning procedure to remove contaminates from the filter module is simple, easy to undertake and requires no tools, specialist skills or the need to access internal components of the filter.

As with all water processing equipment, operational limitations need to be considered. The SkyHydrant™ will significantly remove pathogens from water including bacteria, viruses, protozoa, cysts and parasites. Turbidity will also be removed however; high turbidity levels will necessitate the use of more regular cleaning cycles.

The SkyHydrant™ is not designed to remove salt or dissolved chemicals and minerals from water. If these contaminates are present at high or unsafe levels the water may not be suitable for filtering and drinking. Testing for unsuitable contaminates should be undertaken prior to the use of the SkyHydrant™.

SkyHydrant™ - *Packaging Information*

Packaging (cardboard box)	Dimensions Volume Weight	145cm x 19cm x 27cm 0.07m3 16 kg (packaged including all kits & contents)
Contents Leg Brackets, Wall Brackets, Accessory kit, Hose Kit	SkyHydrant™ Instruction Guide	12 Kg (unit only) 1 off

SkyHydrant™ - *Product Specifications*

Minimum Recommended Differential Pressure (m)		0.5
Maximum Recommended Differential Pressure (m)		4.0
Nominal capacity (Lph)		400min - Max1,000
Cleaning chemical per CIP 10% Hypochlorite (mL) Citric Acid Powder (g)		40 300
Approx Weight (kg)	Dry Operating Packaged	12 27 16
Overall Dimensions (cm)	Height Width Length	143 18 25
Packaged Dimensions (cm)	Height Width Length	145 19 27
Recommended location		Undercover

Taken from Sky Juice Foundation Skyhydrant™ Specication Sheet
www.skyjuice.com.au

3C Fact Sheet

SKYHYDRANT™ FACT SHEET

Low Pressure Ultra-Filtration Filtration Unit

Low Pressure Ultra-Filtration technology meeting and exceeding World Health Organisation requirements for safe drinking water.

Low pressure ultra-filtration membrane technology is highly effective in removing all non dissolved species in feed waters. The filtration unit will meet and exceed requirements for key criteria to produce "safe" drinking water. In most cases it will exceed WHO standards, however it is important to test the water and validate the composition of the feed water. Please refer to the technical bulletins and Specifications to obtain specific information on performance.



Ultra -Filtration (to 0.1 um) <u>will remove</u> Pathogens (disease causing organisms) and Turbidity (dirt) from water:

- Pathogens removed (to log reduction value >4) by ultra-filtration include:
  - Bacteria
  - Protozoa
  - Cysts
  - Helminths
  - Total Coliform TC
  - Faecal Coliform FC
  - Ecoli
  - Virus (significantly reduces virus levels)
- Turbidity - NTU (Nephelometric Turbidity Units) is removed by ultra-filtration to <0.1 NTU.
  Turbid water contains suspended matter such as clay, silt, fine fragments of organic matter, and similar material.
- Total Suspended Solids (TSS) will be removed. TSS is similar to turbidity.
- Iron and Manganese if first oxidised or if colloidal can be removed by ultra-filtration.
- Arsenic Manganese if first oxidised can be removed by ultra-filtration.

Ultra -Filtration (to 0.1 um) <u>will not remove</u> Chemicals or Minerals or Salinity (salt) from water:

Note: mg/L (milligrams per litre) also equals ppm (parts per million).
WHO (World Health Organisation)

- Chemicals not removed by ultra-filtration include:
  - Arsenic (unless first oxidised) (WHO safe drinking standard- Max 0.01 mg/L)
  - Cadmium (WHO safe drinking standard- Max 0.003 mg/L)
  - Chromium (WHO safe drinking standard- Max 0.05 mg/L)
  - Copper (WHO safe drinking standard- Max 2.0 mg/L)
  - Cyanide (WHO safe drinking standard- Max 0.07 mg/L)

3C Fact Sheet

- Fluoride (WHO safe drinking standard- 1.5 mg/L)
- Lead (WHO safe drinking standard- Max 0.01 mg/L)
- Mercury (WHO safe drinking standard- Max 0.006 mg/L)
- Nickel (WHO safe drinking standard- Max 0.07 mg/L)
- Nitrate (WHO safe drinking standard- Max 50 ml/L as NO3)
- Nitrite (WHO safe drinking standard- 3 mg/L as NO2)
- Sulphate (safe drinking levels: 250 mg/L but up to 500 mg/L can be tolerated)

- Minerals (Hardness) is not removed by ultra-filtration, this includes:
  - Total Hardness, Hard water is mainly calcium and magnesium and is not considered a health risk but can be unpleasant to taste and cause a build up of scale in pipes. (WHO safe drinking standard- Max 500 mg/L).
  - Calcium, Carbonate (WHO safe drinking standard- Max 250 mg/L)
  - Iron and Manganese (unless first oxidised) (WHO safe drinking standard- 0.4 mg/L Note: exceeding this level is not unsafe but is unpleasant to taste - max 1.0 mg/L).
  - Magnesium (WHO safe drinking standard- Max 150 mg/L)

- Salinity and Salts are not removed by ultra-filtration include:
  - Salinity (WHO safe drinking standard- Max 250 mg/L)
  - Chloride and Sodium (WHO safe drinking standard- Max 600 mg/L)
  - Conductivity – (WHO safe drinking standard- Max 2000 uS/cm).

- Total Dissolved Solids (TDS) cannot be successfully removed by ultra-filtration:
  - TDS (WHO safe drinking standard- Max 1000 mg/L)
  - TDS contain a wide range of substances including organic and inorganic (chemicals).

- Unpleasant Tastes are not successfully removed in most cases using ultra-filtration

Ultra-Filtration will have no effect on PH levels:

- PH Scale (WHO safe drinking standard 6.5 – 9.0)
- Total Alkalinity (WHO safe drinking standard max 500)
- PH levels are not considered a health issue but may cause corrosion or encrustation of plumbing fittings and pipes.

SkyJuice
FOUNDATION
Pure Water for Every Child

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Taken from Sky Juice Foundation Skyhydrant™ Fact Sheet –
for further information visit **www.skyjuice.com.au**