Resource 11 – Water recycling

In this activity you will learn of different 'grades' of water, the purposes for which they are suited and importance of recycling and reclaiming water for the community.

To complete this activity, watch video 2, *Australia Advances: recycled water.* Themovie is the second movie located at the bottom right of the main screen of the Eastern Treatment Plant Explorer.

Background

In most modern cities, sewage from homes and industry flows into the sewerage system, is treated and is then discharged into the oceans. Yet this treated effluent could be reused to water parks, golf-courses, gardens or even to flush the toilet. It all depends to what level it is treated. (Did you know that in Singapore they treat sewage till it's as good or better than regular drinking water. They call it, "New Water").

Melbourne Water is taking a great interest in the different ways of recycling and reusing treated effluent to help conserve and maximise the use of the water resources.

One initiative was the trialling of a water recycling plant and irrigation system in the King's Domain Gardens in Melbourne during 2002. The aim was to demonstrate that water from sewers could be successfully recycled and used to irrigate parks and gardens.

The water recycling plant and irrigation system used in the King's Domain Gardens in Melbourne, 2002.

The recycling plant is housed in a portable shipping container and uses the latest membrane technology to deliver 30,000 litres of high quality, recycled water each day. The plant uses 1.4 W of energy for each litre of recycled water at a cost of 1.4 cents per litre.

How does it work?

Raw sewage is pumped from the sewer, screened and fine screened. Particulates larger than 3 mm are returned to the sewer. During the first stage of the process, the membrane bioreactor reduces organics and removes particles in the product water down to 0.04 micron using an aerobic biological treatment process coupled with an ultrafiltration separation membrane.

During the second stage, the product water is treated by reverse osmosis to reduce nutrients, pathogens and salts to acceptable levels. Before passing through the reverse osmosis unit, the product water is preconditioned through filtering, LIV disinfection and descaling to avoid fouling the reverse osmosis membranes.

A rigorous testing program will be carried out during the trial to ensure that recycled water meets the Environment Protection Authority (EPA) and the Department of Human Services health requirements. The purpose is to demonstrate the technology to the public and show that sewage can be used as a resource and is not a waste product.

What to do

After reading the background notes above and watching the video, answer the following questions.

1. Why bother to recycle water from sewage? After all, there is plenty of tap water. Do you agree or disagree?

2. How large is the discharge from Melbourne's sewage treatment plants?

3. Melbourne Water aims to recycle 20 per cent of the city's treated effluent by 2010. How could this be achieved?

4. If we recycle and reuse treated effluent, what other benefits are there besides saving our water resources?

5. Recycling is only one way of conserving Melbourne's water resources. Make a list of other ways that water can be conserved and saved.

6. Draw a flow chart that shows how sewage is converted into clean water.

7. Think of some creative ways that water could be recycled by completing the following sentence: 'We could recycle water by …'.