

Black Rock Water Reclamation Plant

How does sewage get to the Black Rock Water Reclamation Plant?

Sewage treatment and recycling

We all produce waste water, or sewage, every day. Each time we have a shower, flush the toilet or wash the dishes, sewage flows out of our houses and into the **sewerage network**. But where does the sewage go, and how is it converted to useful end-products?

Influent

Each day approximately **50 million litres** of sewage, from all over the Geelong region, is treated at the facility.

Waste water treatment

Residential waste water contains elements harmful to humans and the environment. **Pathogens** (bacteria and viruses), **organic particles** (faeces and vomit) and **gases**

(methane and hydrogen sulfide) need to be removed from the liquid before it can be discharged into the environment or recycled for other uses.

At the **Black Rock Water Reclamation Plant** we pass the waste water through a number of processes, changing it from a harmful waste material to beneficial **biosolids pellets** and **recycled water**.



What happens to sewage at the facility?

Screening out rubbish

Two screens, a coarse and fine screen, are used to remove plastics and other solid objects from the liquid. More than 1.5 tonnes of rubbish is removed from the incoming sewage each day.

Selector tanks

The screened sewage is mixed with material from the end of the process (return activated sludge), containing billions of beneficial micro-organisms.

Aeration tanks

In the aeration tanks, air is injected to aid in mixing and to provide much needed oxygen for the hardworking organisms to eat and digest the sewage. The by-products of this stage of the process are water, carbon dioxide and an ever increasing bio-mass sludge (concentration of dead and living organisms).

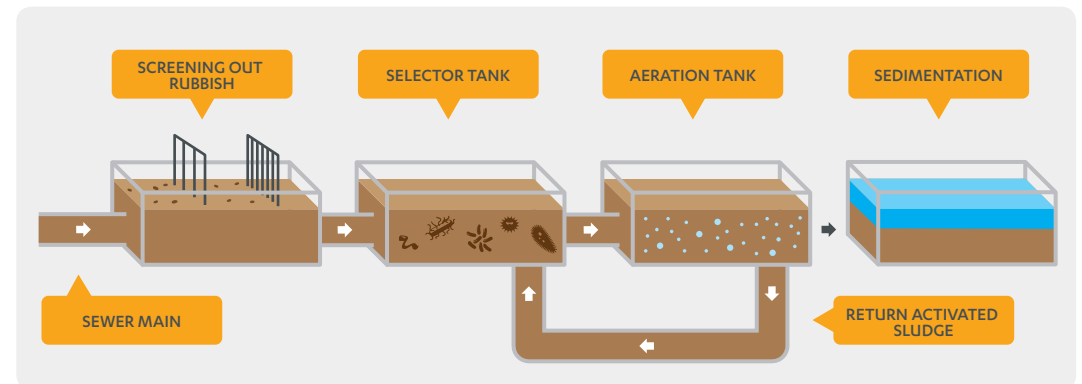
Sludge removal

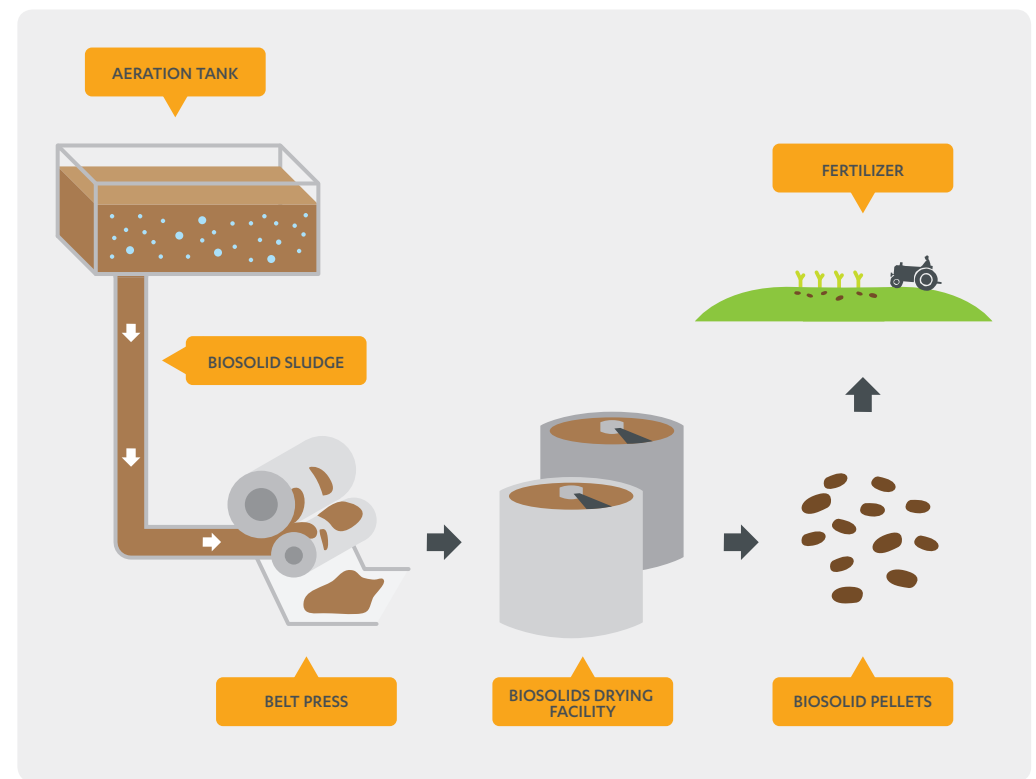
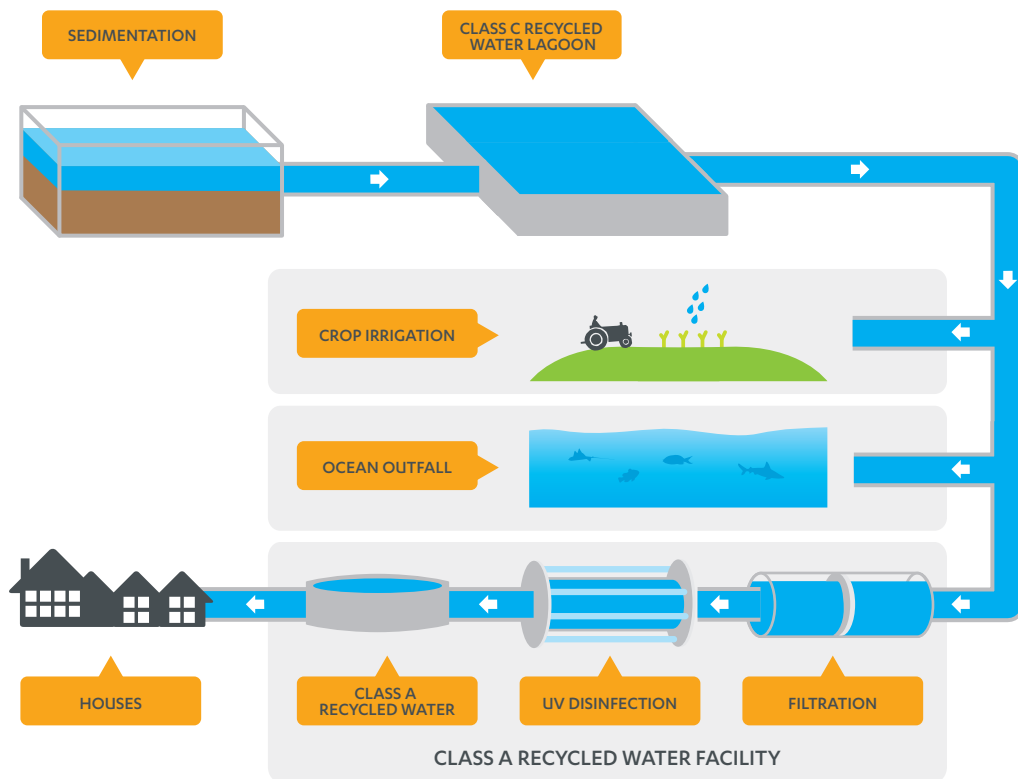
During the aeration stage, sludge is continually removed from the bottom of the tanks and directed either to the start of the process as return activated sludge, or to the belt press for further processing into biosolids.

Sedimentation

After two hours aeration, the air pumps are turned off and the tanks allowed to settle.

The heavier sludge sinks to the bottom of the tank, leaving the clear water on the surface.





What happens to the clear water and sludge?

Decanting

Large booms lower down from each end of the tanks to 'skim' the clear water off the surface. This water is equivalent to Class C recycled water.

Recycled water lagoon

The recycled water is sent to a holding lagoon before being used by local farmers or undergoing further treatment.

Class C recycled water

This sustainable resource, high in nutrients, is used by nearby farmers to irrigate their crops.

Ocean outfall

Class C recycled water not used for irrigation is discharged into the ocean via a 1.2 kilometre

ocean outfall pipe. Rather than a vast and bare sandy ocean floor, the area directly adjacent to the outfall pipe is a flourishing marine ecosystem. Seaweed and other marine life thrive on the nutrients in the liquid. The pipe itself and boulders used to keep it in place provide a habitat for marine animals.

Filtration – UF and RO

By further processing Class C recycled water we can produce a very high quality product - Class A recycled water. Specialised filtration processes, known as ultra-filtration (UF) and reverse osmosis (RO), remove harmful organisms, salt and chemicals from the water.

UV disinfection

As a final step, the filtered water is then passed through a UV disinfection chamber, inactivating any organisms that may still be present. The resulting product is crystal

clear water with no smell, colour or flavour – essentially pure water.

Class A recycled water

In some countries, water equivalent to Class A recycled water is used to supplement the drinking water supplies. Here in Geelong, this high quality water is used to flush toilets, water gardens and wash cars in new housing estates. The use of this sustainable product reduces the demand on the drinking water supply.

Belt press

At the belt press, water is squeezed out of the sludge resulting in a thickened mud that is sent across to the nearby drying facility.

Biosolids drying facility

Here the de-watered sludge is brushed back-and-forth on a series of heated revolving turntables. The heat treatment kills

off all micro-organisms, resulting in a small pelletised product that is safe to handle.

Biosolids pellets

The nutrient-rich pellets produced by the drying facility are used exclusively as a broad acreage fertiliser. Future uses could include the production of compressed briquettes for burning in wood heaters.



For further information

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