

Drinking water filtration

We filter the water, so you don't have to



At Sydney Water, we supply almost 5 million people daily with clean, safe drinking water. We filter 1,400 million litres of water a day using dual media filters. This allows us to achieve the high standards set by the *Australian Drinking Water Guidelines*.

Dual media filters

What is a dual media filter?

A dual media filter consists of two types of tightly packed filtering materials: a layer of anthracite coal, and layers of fine sand and gravel.

Anthracite coal

Anthracite coal is a sedimentary rock naturally found in mountain regions. It is made almost entirely out of carbon (91-95% pure carbon).

The granules of anthracite have an irregular shape, so they don't pack as tightly as sand. This enables sediment to penetrate deeper into the bed and makes it the perfect medium for filtering large amounts of water. The floc that is formed during chemical mixing as well as free hydroxide ions (OH⁻) adsorb (stick to) the positive charge of the anthracite.



This shows the composition of the dual media filter media used at Orchard Hills Water Filtration. The filter is 2 m deep with a 1.2 m layer of anthracite and 25 cm layer of filter sand grains and a base of larger sand and gravel.

Fine sand

The second media we use is a variety of different sized sand grains. The fine, tightly packed grains ensure that smaller particles are captured in the filter bed. The larger sand and gravel particles at the bottom stop the filter sand from being washed away.

How do dual media filters work?

Filters use gravity. Water to be filtered enters the top of the filter, and flows down through to the bottom. This downward flow allows us to capture different sized particles in the different filter media.

The two-metre deep dual media filters provide all the advantages of single-media filtration, but require less backwash water than sand or anthracite alone. The larger pieces of gravel at the bottom of the filter stop the sand from being washed away during filtration.



Water is naturally filtered through a sandstone landscape. Using natural products, such as anthracite and sand, we replicate this natural process.

How do we clean our filters?

We clean our filters several times a week by backwashing. We drain the filter bed and pump air up from beneath the filter to break up the media and dislodge trapped particles. Finally, we pump water up through the filter bed to flush out the trapped particles. This backwash water is then pumped into backwash lagoons for further treatment.

What does a drinking water treatment plant look like?

Sydney Water has nine drinking water filtration plants.



Orchard Hills Water Filtration plant

What quality is the filtered water?

Our drinking water is filtered to the *Australian Drinking Water Guidelines*. These strict guidelines outline the acceptable limits for drinking water quality. To ensure we meet these guidelines we monitor the quality of the filtered water 24-hours.

Want to know more?

Build your knowledge of filtration by booking a free tour of the Orchard Hills Water Filtration Plant.

All our programs are free of charge to schools and tertiary institutes within the greater Sydney, Illawarra and Blue Mountains.

Students will see real life applications of content learnt in the classroom and our HSC programs complement the NSW syllabus.