

TREATMENT

With such a range of sources, there is also a wide variety of forms of treatment. The type of treatment works we build is first determined by the quality of raw (untreated) water we start with. To guide us, raw water is split into three categories: **DW1, DW2, DW3**. These categories determine the minimum treatment needed for the water, although other treatment processes can be added if required.

DW1 Very good quality underground sources (typically wells, boreholes & springs) requiring very little treatment, often only the addition of chlorine.

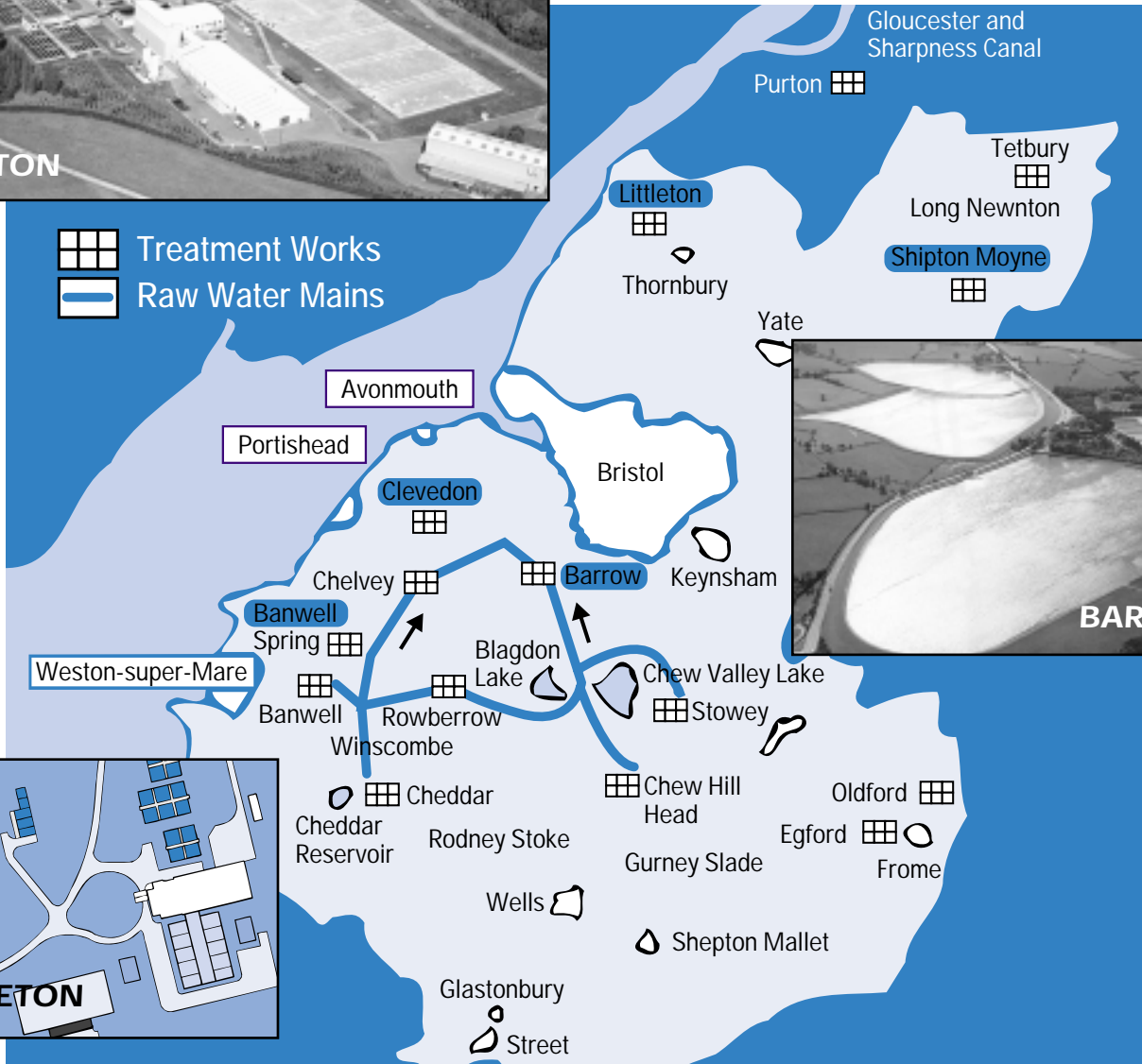
DW2 Good quality surface sources (typically catchment reservoirs) requiring 'normal' physical treatment like sand filtration to remove solids (dirt), algae, and colour.

DW3 Poorer quality surface sources (typically rivers, canals). This water might contain pesticides, nitrates as well as taste and odour and requires a more complex treatment process that is designed to deal with the specific problems.

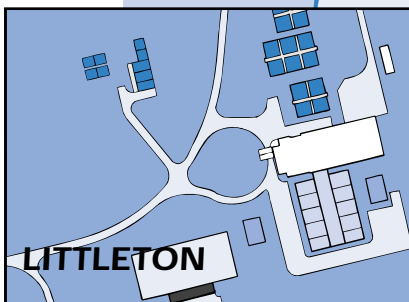


PURTON

 Treatment Works
 Raw Water Mains



BARROW



LITTLETON

In total Bristol Water has **24 treatment works** with output ranging from 0.5 million litres a day at Priddy to 165 million litres from Purton. We have listed a variety of different treatment works and their processes. You will find a detailed look at Purton (river DW3) and Cheddar (Mendip DW2) on pages 6 & 7, as well as a glossary of treatment terms on page 5.

Littleton - DW3 - commissioned 1964.

Source/raw quality: Gloucester & Sharpness canal, requiring extensive treatment to remove pesticides, algae, colour, ammonia, viruses and bacteria.

Process: Clarification - pre-ozone GAC filtration
 Ozone - phosphate dosing

Supply capacity: 60-65 million litres a day

Main supply area: Avonmouth, Bristol

Shipton Moyne Well - DW1 - commissioned 1930

Source/raw quality: Local wells requiring filtration to remove natural iron.

Process: Chlorine - filtered to remove iron - dechlorination, phosphate

Supply capacity: 18 million litres a day

Main supply area: Sherston, Luckington

Clevedon - DW1 -

Source/raw quality: Well, of excellent quality. Treatment used largely as a precaution.

Process: Simple chlorination.

Supply capacity: 4.5 million litres a day.

Main supply area: Clevedon.



OZONE ▼



GAC FILTRATION ▲

Banwell Spring - DW1 - commissioned 1923

Source/raw quality: Natural spring of very good quality, we only need to consider treatment for bacteria and viruses.

Process: Super and dechlorination - phosphate dosing.

Supply capacity: 16 million litres a day.

Main supply area: Weston-super-Mare.



SAND FILTER

Barrow - DW2 - commissioned 1887
(Bristol Water's first treatment works)

Source/raw quality: Chew Res., Cheddar Res., Line of Works, Blagdon Res. Requires physical treatment to remove particulate matter, algae, viruses and bacteria.

Process: Microstrainers - slow sand filter - super and dechlorination - phosphate dosing.

Supply capacity: 120 million litres a day.

Main supply area: Southern Bristol.



SUPER PULSATOR

Glossary of treatment terms

Microstrainers

Large rotating sieves which remove particles (mainly algae) from the water.

Slow sand filtration

A football pitch sized bed of sand about a metre deep. As the water trickles down through the sand both organic matter and harmful bacteria are removed from the water.

Schmutzdecke

A biologically active layer of plant life that occurs naturally and actually eats up bacteria.

Super & Dechlorination

Chlorine is added at around 2 parts per million to kill bacteria. The chlorine is then reduced typically to 0.5 parts per million to maintain excellent water quality throughout its journey through our distribution network to customers.

Rapid Gravity Filters

These typically contain about 1 metre of sand. As the water flows down through the sand any solids remaining in the water are removed.

Ozone

This is a form of oxygen added to the water to kill bacteria, destroy pesticides and break down organic compounds.

GAC filtration (Granular Activated Carbon) - see page 10

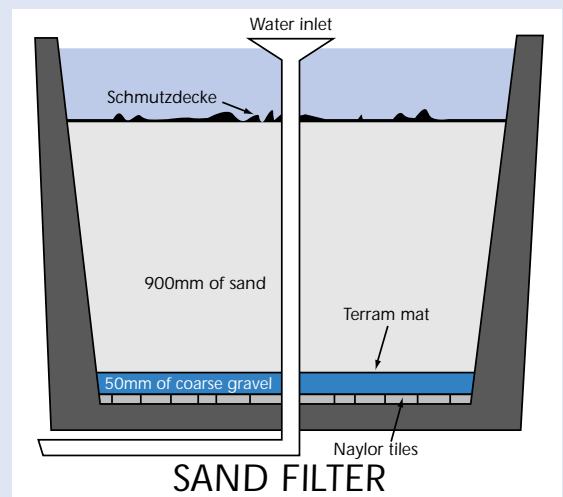
Used to remove taste, odour and pesticides from the water.

Clarification - see page 9

Water is dosed with ferric sulphate solution, which makes tiny particles in the water clump together to form a substance called floc. When the water passes into clarifiers, the floc becomes larger and settles out, taking most of the bacteria and colour with it

Phosphate dosing

A small amount of phosphate is added to the water to reduce the possibility of lead dissolving into the water from old lead pipes that connect water mains to houses. (Prior to the 1970s lead was often the material used. Nowadays plastic pipes are used).



SAND FILTER