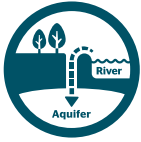


**We're planning
for the future**

Your water supplies
- underground storage

 Southern
Water



Southern Water is investigating the possibility of storing water in natural underground rock reservoirs as part of its long-term plans to secure water supplies for customers in the future.

We are looking into the potential of an aquifer storage and recovery (ASR) scheme in Worthing, Sussex and are planning a pilot. If this is successful, we would look to develop a permanent scheme. This is part of our approach for planning for the future. We need to plan to secure more water resources for the future to cater for the growing population, housing growth and the effects of climate change.

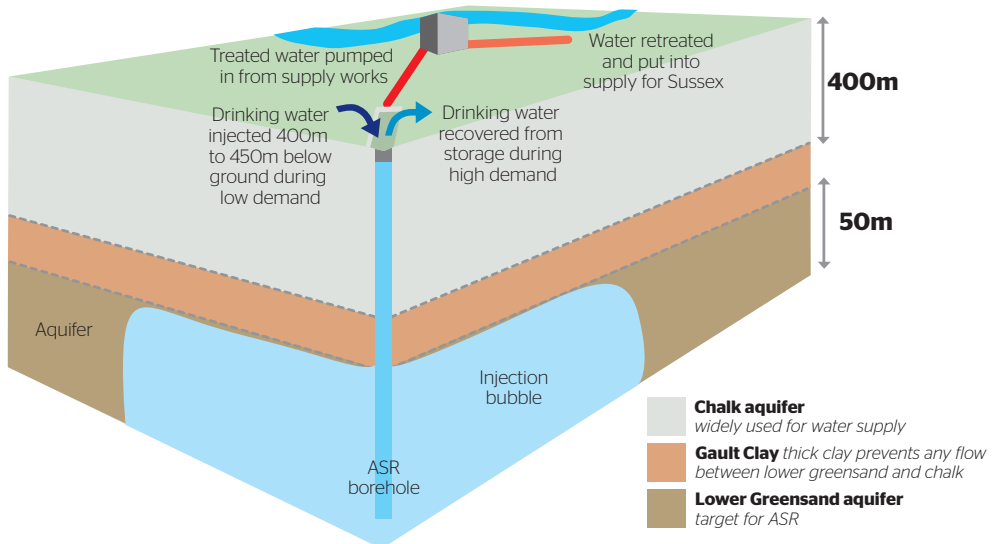
ASR is one of a number of long-term options we are exploring as part of our 25-year Water Resources Management Plan. Results from research with 1,000 customers showed ASR to be the most popular option for providing water, ahead of leakage reduction, surface reservoirs and desalination.

What is ASR?

ASR involves injecting drinking water underground where it can be stored in a natural rock reservoir - an aquifer - until it is needed. It can then be pumped back to the surface, retreated and put into supply. The scheme would involve storing treated water taken from the River Rother and groundwater from wells in the chalk during wet, winter months to help support supplies during dry, hot periods in the summer.

First, the water would be treated to drinking water quality at our water supply works near Pulborough, then transferred to the ASR site by existing pipeline, and diverted to a new ASR borehole via a short length of new pipeline.

The water would be stored about 450 metres below ground in the pore spaces within the Lower Greensand aquifer, beneath Worthing. This would create a drinking water bubble, which can be recovered and pumped to the surface where it would be retreated and put into supply to customers. As part of our future planning, the pilot scheme would establish how much water can be stored below ground, but it is expected that for one ASR borehole this would be between 250,000 and 450,000 cubic metres of water - enough, on its own, to supply the entire population of Worthing for about 20 days.



The benefits of ASR

ASR is widely used in the USA and other countries and there have been a number of UK trials in recent years. It can offer significant advantages over storing water in surface reservoirs - the environmental impact of ASR is very small as the aquifer is generally unused and at great depth.

The scheme is an important part of our plans to reduce the likelihood of restrictions on water use in droughts, such as hosepipe bans, to one in 10 years on average.

Where the site would be

Following detailed studies across the South East, we believe the Lower Greensand aquifer beneath Worthing is the most suitable location for ASR. We are planning the pilot ASR scheme on land to the north of Lyons Farm retail park, in the former Charmandean Quarry.



The site is at the back of the former quarry, behind agricultural buildings. Access would be via the farm track from Lyons Way, not via Charmandean Lane. A new connection would be made to the existing water main that runs down Charmandean Lane - a section of the lane may need to be closed for a couple of days while this connection is made. A temporary sewer would also be laid to connect to the existing sewer in Lyons Way. The quarry site is not within the South Downs National Park, however, the access track and the temporary sewer are. The quarry is a Regionally Important Geological Site, however, no works are proposed to the face of the quarry and the geological interest would not be disturbed by the work.

The pilot

The pilot scheme would require a temporary working site of about 20m x 30m. During construction this is likely to contain:



Photo courtesy: G Slow Plc

- A drilling rig of about 20m in height
- Approximately four enclosed tanks (each the size of a large skip) to contain drilling fluid
- Approximately two settlement tanks (each the size of a large skip) to settle out drill cuttings
- Temporary site cabins, accommodation and toilets
- Low level lighting
- Silenced generator
- Water supply tank
- Temporary pipe connections to existing water mains and sewers
- Temporary access for vehicles along the existing farm track from Lyons Way.

The pilot borehole is likely to take about four months to construct, depending upon the agreed drilling programme. Once the drilling equipment is in place, there would be occasional deliveries and collections by lorries and/or crane. There would be a low level of noise from the drilling activity, general vehicle movement and a silenced generator which would be controlled and monitored.

Once the borehole has been built, most of the construction equipment would be removed and there would be an initial phase of test pumping lasting up to four weeks. The results of this testing would be analysed before a decision is made on whether further testing is appropriate. Any further testing would last up to six months. During the test pumping, a silenced generator would power the pump and site lighting and occasional vehicles would come to and from the site. The water from the pilot scheme would not go into supply but be recycled into a drain.

A permanent ASR scheme

If the pilot proves successful, we would wish to develop a permanent ASR scheme to secure water supplies for our customers.

The water would predominantly be supplied to the Brighton and Worthing areas but could also be pumped into north Sussex if required.

The pump would be located deep beneath the ground and the only visible structure at ground level would be that typically used for a standard water supply borehole – a small hut.



Huts are the only visible structure at permanent ASR sites

Environmental care

Southern Water will work to ensure any ASR scheme does not adversely affect the environment or other water users. We have carried out initial surveys at the area and are liaising with Worthing Borough Council, the South Downs National Park Authority and the Environment Agency, among others.

What next?

Before we carry out a pilot scheme, we are talking to our customers and interested parties to share information about our plans and hear their feedback. In some instances, we are able to undertake surveys and investigations without needing planning permission. We are discussing the need for planning or other permissions with Worthing Borough Council, the South Downs National Park Authority and the Environment Agency. We will secure any necessary consents before we start construction work. If the outcome of this is positive, we aim to start work on the pilot borehole this winter (2014/15) at the earliest. Testing of the pilot borehole would then start during 2015.

If this is successful, we would look to develop a permanent scheme, applying for the appropriate planning permission and licences. We anticipate a permanent ASR scheme would then become fully operational between 2020 and 2025.

ASR is one of a number of options Southern Water is exploring as part of its long-term plans to secure water supplies for the next 25 years. Other schemes being developed in Sussex include water efficiency projects for homes, schools and businesses, reducing leakage, enhancing our network to move water round the county more easily and a water re-use scheme.

Find out more about our plans to secure water resources for the future at southernwater.co.uk/wrmp.

Timeline

2015	Initial testing of pilot borehole
2015/16	Further testing of pilot borehole, if appropriate
2017/18	Detailed analysis and modelling of results
2018/19	If pilot borehole is successful, begin permanent design and consultation

Fact file

- In a survey, our customers ranked ASR as their number one option to secure drinking water supplies for the future
- ASR is used in the USA, Canada, Australia and South Africa. There are a number of other ASR trials in the UK that have been completed or are underway
- One ASR borehole could store between 250,000 and 450,000 cubic metres of water - enough to supply the entire population of Worthing for an average of 20 days

If you would like to know more

More information about the ASR scheme and pilot and regular updates on its progress can be found at southernwater.co.uk/ASR or by calling **0845 278 0845**

If you would like this leaflet in another format, please call us on **0845 278 0845**

A constant supply of high-quality drinking water



No restrictions on your water use, such as hosepipe bans, unless there has been exceptional weather - at least two dry winters in a row.

This is one of the promises made in our 2015-20 Business Plan.
Find out more at southernwater.co.uk