AQA

GCSE
GEOGRAPHY

Resources for Paper 3 Geographical applications

Pre-release resources booklet

To be issued to students on Monday 19 March 2018.

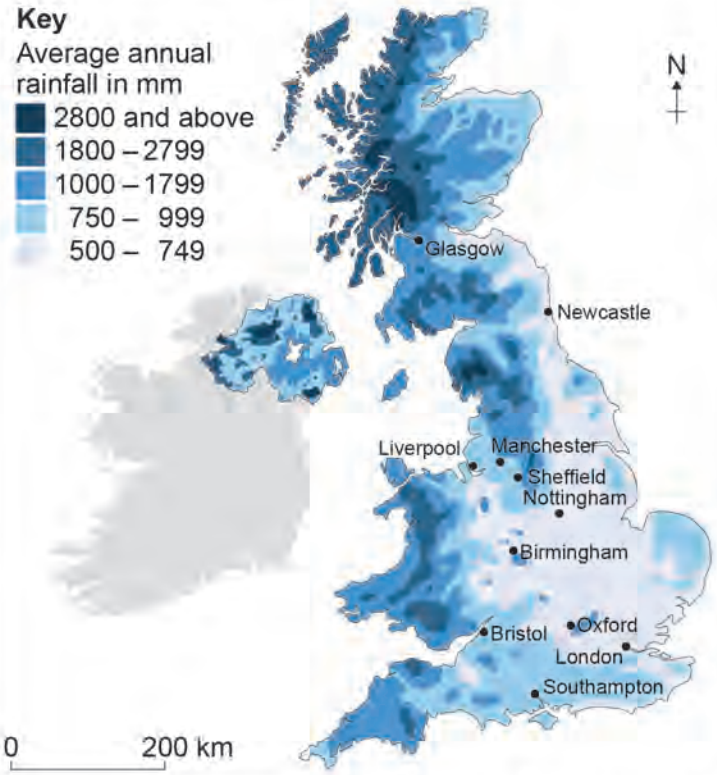
This booklet contains three resources as follows:

- Figure 1 – Water in the United Kingdom: pages 2–3
- Figure 2 – Managing water demand in Oxfordshire: pages 4–5
- Figure 3 – A new reservoir for Oxfordshire?: pages 6–7

Figure 1

Water in the United Kingdom

Annual rainfall in the UK



Water – the facts

Did you know that the UK has less rainfall per person than our northern European neighbours, and that London is drier than Istanbul?

In the UK every person uses approximately 150 litres of water a day, a figure that has been growing by 1% every year since 1930. If you take into account the water that is needed to produce the food and products you consume in your day-to-day life you actually consume 3400 litres per day.

This is quite alarming if you consider that the UK has less available water than most other European countries. If you live in the south east of England it is even more so, as this part of the country is the most water stressed.

By making small changes and choosing more water efficient products you can save water without sacrificing too much money, comfort, or level of service.

(Waterwise Factsheet)

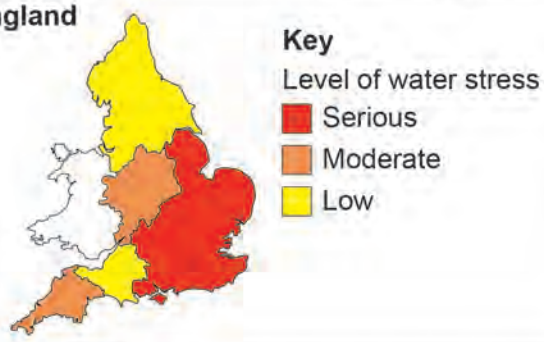
Water stress in England

What is water stress?

Water stress is when the demand for water exceeds the available amount during a particular time period.

What problems are caused by water stress?

Water stress can cause too much water to be removed from underground sources of water and rivers, damaging the environment.



Future demand for water in south-east England

All water companies have 25-year water resource plans. These show how companies plan to meet demand in the future. Water companies plan their water supply using methods agreed by the Environment Agency. Plans are designed to maintain water supply through the worst drought in the last hundred years, with at least a month's water supply left at the end of any potential period of drought.

It is expected that total water demand in south-east England will rise from about 4900 million litres/day in 2005 to 5600 million litres/day in 2030.

Water demand management is broken down into three components:

- **leakage** is expected to fall by 25% by 2030
- **non-household demand** is expected to increase by 200 million litres/day between 2005 and 2030
- **household demand** is expected to increase from 164 litres per person/day to 180 litres per person/day between 2005 and 2030.

Figure 1 continued

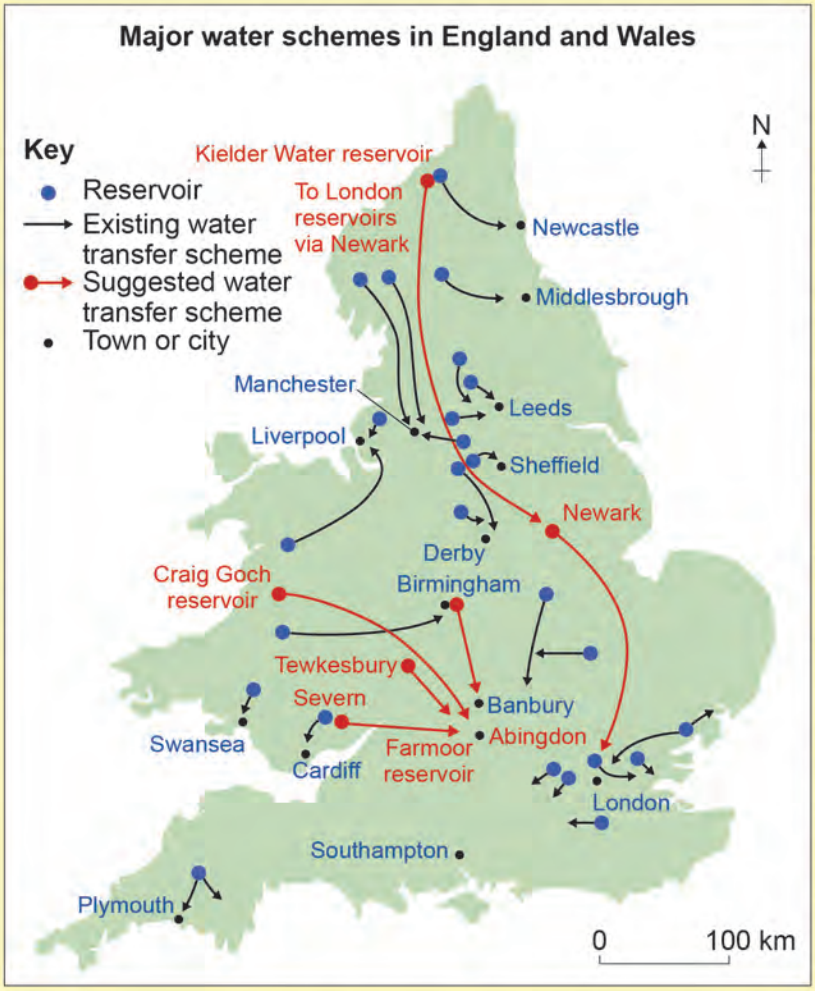
Water in the United Kingdom

Water suppliers are being encouraged to consider engineering projects as they prepare to cope with growing demand.

A new era of building pipes and canals to divert water from rivers and underground sources across Britain is being proposed as concern grows about how to keep the taps flowing in drought-prone regions of the country.

After the driest spring for a century left crops dying in parts of England, and the threat of bans on hose pipes and car washes becomes an annual summer event, experts say around four major transfer projects could be approved in the coming years as water companies struggle with growing demand and falling supplies.

The government is expected to allow companies in water-rich areas to make money from selling it to drier regions. However, the plans are likely to meet opposition from those worried about the impact on the landscape and wildlife, and the cost of pumping water over vast distances.



One of the most controversial proposals is a huge project to move water from the River Severn. It would be transported more than 160 kilometres from mid-Wales or the west of England into the River Thames, in order to supply London and south-east England.

Other large schemes could include bringing supplies from south Wales, Birmingham via the Oxford canal, and from the Kielder reservoir in Northumberland in the north-east of England – down to the east and south-east of England, where the need is greatest.

The most likely schemes will involve transfers between neighbouring regions. These schemes will be considered alongside measures to reduce demand and repair leaking pipes, and other investments such as building new reservoirs or 'recycling' sewage water.

Kielder Water reservoir

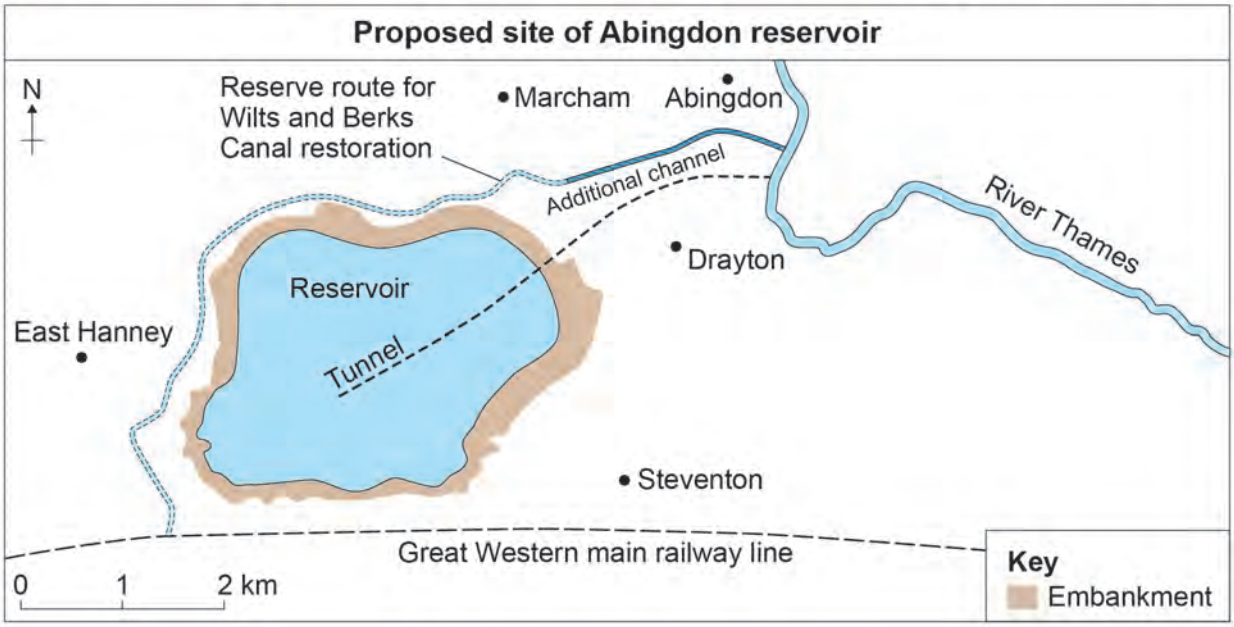
Figure 2

Managing water demand in Oxfordshire

New reservoir for Oxfordshire

Lower rainfall, increased consumer consumption, housing and industrial growth, and leakage are all contributing to a growing problem of water stress and shortage in the Thames Water region.

To alleviate the shortage Thames Water want to build a large reservoir near Abingdon, in Oxfordshire. When completed, the reservoir will store approximately 150 billion litres of water which would be transferred from other parts of the UK. The site is largely agricultural and is a low-lying clay vale, so there will be a need to build an embankment around the reservoir in order to contain the water. The height of the embankment will vary, but estimates suggest that it will be approximately 20 metres at its highest, near the village of Marcham.



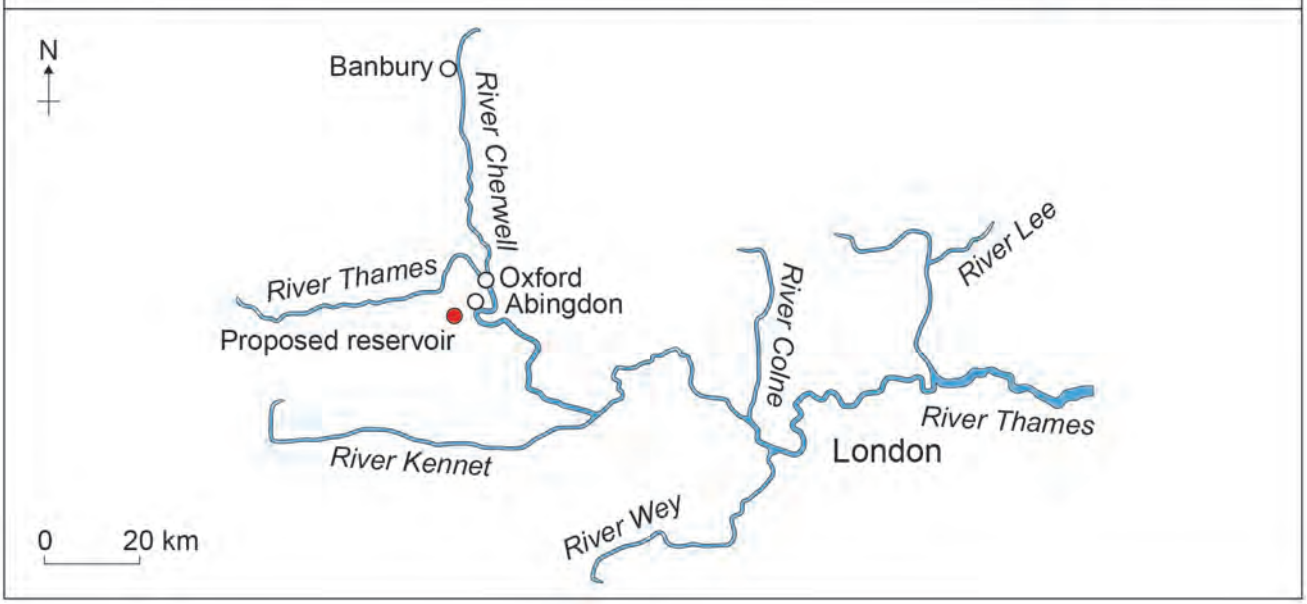


Figure 2 continued

Managing water demand in Oxfordshire

Thames Water management plan

The Thames Basin is the largest river basin in the south of England. The average rainfall for the area is 737 mm per year, substantially less than the national average. Of the rain that falls, two thirds is lost to evaporation and transpiration and 55% of the remainder is abstracted for use, making it one of the most intensively used river basins in the world. In total, we supply over 9 million customers in over 3.4 million properties. The population in the Thames Water area has been growing at approximately 100 000 per year.

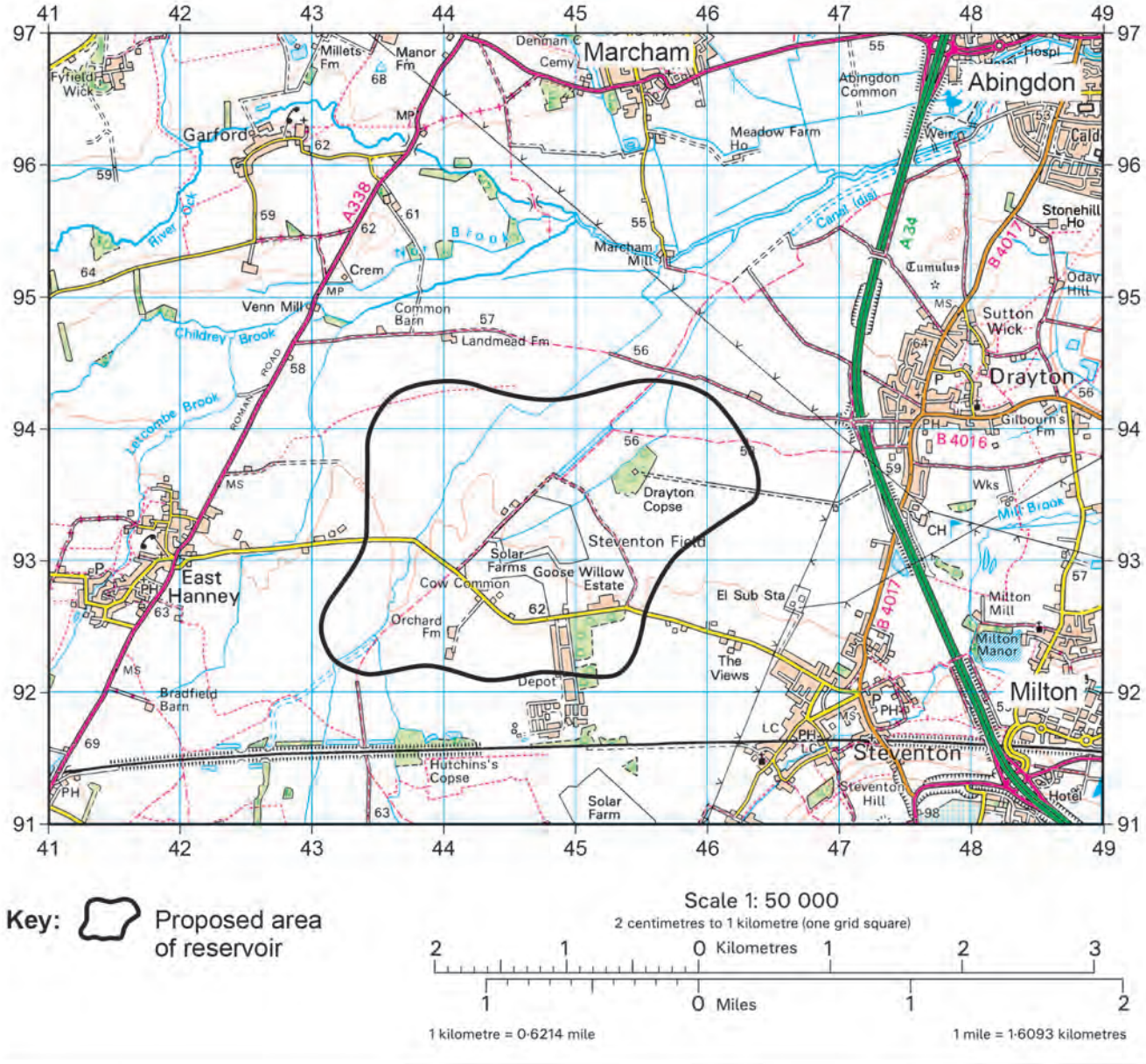
Over the planning period we face continued growth in demand from:

- population increase
- increasing number of households
- increasing domestic water use per person
- climate change.

These pressures are partially offset by:

- modern low-volume toilet cisterns
- modern, water-efficient dishwashers and washing machines
- water-efficient new housing resulting from design requirements of Building Regulations.

Source: Thames Water



Turn over ►

Figure 3

A new reservoir for Oxfordshire?

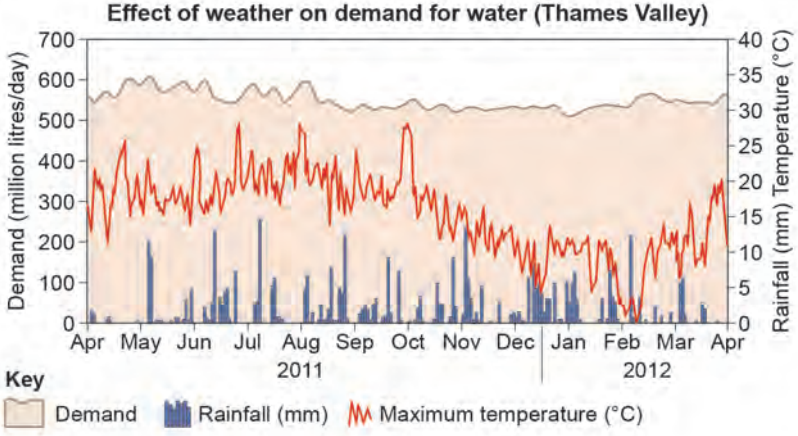
The proposed Abingdon reservoir

Thames Water states that:

- the building of the Abingdon reservoir is required in order to reduce the future risk from drought in the area and ensure that the future water supplies are sustainable. If no action is taken, Oxford will be left with a shortfall of 1 million litres of water a day by 2020.
- reducing water leakage and encouraging people to use less water is unlikely to solve the problem of the growing demand for water. The store of water in the reservoir would also help to manage the challenges resulting from seasonal precipitation and variations in demand.

Total household water use							
Year	2011–12	2014–15	2019–20	2024–25	2029–30	2034–35	2039–40
Million litres/day	1377	1390	1431	1476	1525	1577	1634

Effect of weather on demand for water (Thames Valley)



A Thames Water Resource Manager said, "We are determined that the potential shortfall in water supply will not become a reality", adding that "If we do build a reservoir, we will make sure that it has a limited impact on the surrounding area. Not only would it be a site for storing water, but also a place for nature to thrive and for people to use and enjoy, as they do at our Farmoor reservoir."

Farmoor reservoir – Oxfordshire

Farmoor reservoir, built in 1967, lies in an old river channel 7 km west of Oxford. It is owned by Thames Water, who have a longstanding relationship with the Environment Agency and Pond Conservation, who have created wetland wildlife habitats which have been designated as nature reserves. The area is one of the most important birdwatching sites in Oxfordshire; the combination of open water, wetlands and meadows, attracting migrating and wintering birds. Thames Water have installed car parks and toilets as well as a bird-feeding station. In addition to birdwatching, the area provides a range of recreational opportunities, including:

- a 6 km walkway around the reservoir
- a wetland trail for nature lovers and photographers
- fishing, including a trout fishery
- sailing and windsurfing.

Figure 3 continued

A new reservoir for Oxfordshire?

Group Against Reservoir Development (GARD)

The proposed reservoir at Abingdon would:

- destroy natural habitats. It is estimated that a number of protected species would be displaced, including water voles, bats, hedgehogs, and many bird species
- be visually intrusive, especially where 20-metre embankments are constructed
- cause massive disruption during the building phase as millions of tonnes of rock and building materials are brought to the area
- increase the risk of flooding in an area which is already prone to flooding
- have a significant impact on local towns and villages, which is unacceptable to Oxfordshire communities when most of the water will be used to supply London.

Campaign to Protect Rural England

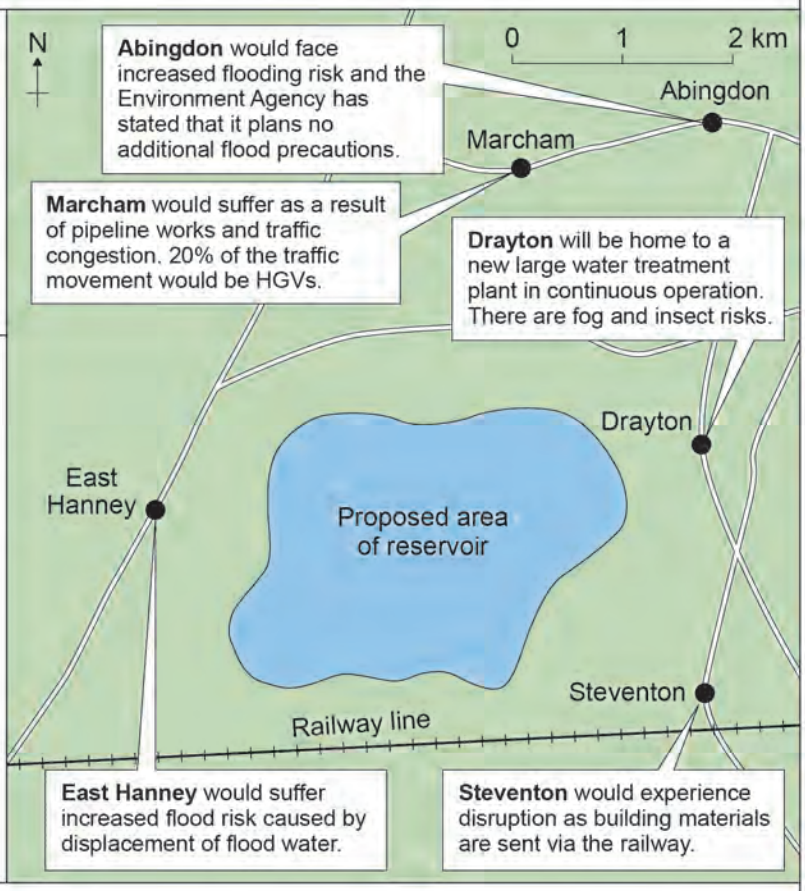
"The proposed reservoir would be huge and have a devastating impact on the environment and local communities as well as losing valuable farmland."

Water Conservation

There is no doubt that the south east faces a growing risk of water shortages, but much of this could be alleviated by managing existing water supplies more effectively or building a number of smaller reservoirs.

Some of the measures that could be taken include:

- reducing leakage
- encouraging lower water use
- building more desalination plants.



Local views

Many people would rather see a reservoir than have the countryside covered in new houses.

Rather than have one large reservoir, why not have a number of smaller water storage facilities, serving local communities?

This project may guarantee water security to the area, but during construction there would be a massive increase in traffic in an area that already suffers from congestion and commuter delays.

The reservoir will be landscaped with wooded hills and could be a fantastic environmental and recreational facility.

END OF SOURCES

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