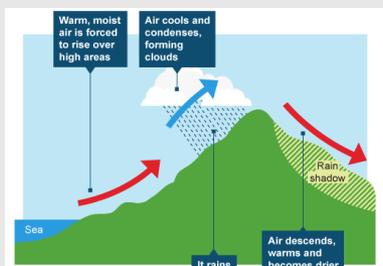


2018 Entry Pre-Release Issue Evaluation

UK Water Supply

Annual rainfall generally increases as you head north and west. The south east is the driest part of the UK. If you look at a relief map of the UK, you will see that the higher areas of the UK are also in the north and west, while the lower areas are in the south east. **Relief has an influence on rainfall patterns in the UK.**

UK Annual Rainfall
Map from Figure 1
Page 2



The 'rain shadow' is a dry area on the leeward side of a mountainous area (away from the wind). The mountains block the passage of rain-producing weather systems and cast a "shadow" of dryness behind them. Wind and moist air is drawn by the prevailing winds towards the top of the mountains, where it condenses and precipitates before it crosses the top. The air, without much moisture left, advances across the mountains creating a drier side called the "rain shadow". This makes the north and west of the UK wetter, while the south & east on the leeward side is drier.

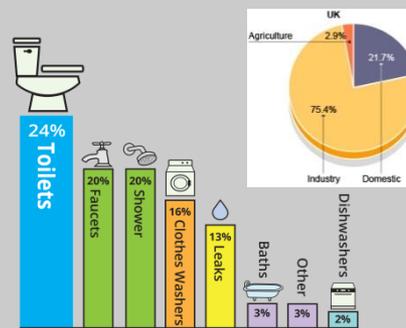
Pre-Release Booklet Glossary

Abstract- To be removed.	Cope- To deal with something successfully.	Drought- A long period of time where no rain falls.	Intensive- The maximum use of something.	Potential- If something has the potential, it means it can happen.	Reservoir- A Lake that is used for storing water before it is supplied to people.
Agriculture- Farming.	Demand- A need for something.	Efficient- Working or producing effectively & with the least waste.	Intrusive- Disturbs your life in a way that you do not like.	Proposed- Suggested.	Sacrifice- To give something up.
Alleviate- To make it less of a problem.	Desalination- The process of removing salt from sea water.	Embankment- A thick wall of earth that is built to prevent water from flooding the area.	Investment- To fund/pay for something.	Recreational- The activities that someone does in their spare time.	Shortfall- When there is less of something than you need.
Commuter- A person travelling to and from work.	Designated- Set aside for, that area will be used for that purpose.	Encourage- Try to persuade someone to do something.	Landscaped- Made to look nice with plants and trees.	Region- A particular area of the country.	Significant- Large enough to cause a problem.
Components- Parts of something.	Displaced- If someone is displaced, they have to look for somewhere new to live.	Ensure- To make sure that something happens.	Maintain- Something that you continue to have.	Regulations- Rules.	Substantially- A lot.
Consumer consumption Customers using something they pay for	Divert- To make something follow a new path.	Exceed- When the number/amount of something is bigger than something else	New era- A new time.	Remainder- What is left over.	Thrive- To be healthy and strong.
Contribute- Count towards.	Domestic- Within the home.	Guarantee- Something that will make sure something else happens.	Opposition- A strong disagreement.	Requirements- Something that is needed to pass certain rules.	Transfer- To move something from one place to another.

Water Stress in England

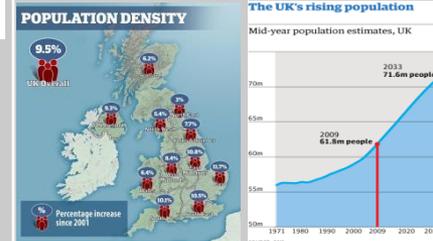
Water Stress Map from Figure 1 Page 2

Areas in the UK with high average rainfall have a good supply of water, while areas in the UK with high population densities have a high demand. **Water stress occurs when the demand for water exceeds the available amount** during a certain period or when poor quality restricts its use.



Since 1975, the amount of water used by households in the UK has gone up by about 70%. This is partly because people have **more appliances** that use lots of water, e.g. dishwashers & washing machines.

The UK's population is also predicted to increase by 10 million more people by 2040. Population densities are also changing; **lots of new homes are planned to be built in the south east where there is already a water deficit.**



2. Water Management Schemes in the UK

Reduce Demand

- ✓ Low cost solution
- ✓ Technology such as low-flush toilets & meters can help
- ✗ Relies on individual water users
- ✗ Difficult if population increases

Repair Leaking Pipes

- ✓ Effective
- ✗ Expensive & time-consuming
- ✗ Many pipes installed in Victorian times now need replacing- big task! 3b litres lost every day!!

Recycle Sewage Water

- ✓ Preserves environment
- ✓ Bio-fuel as by-product
- ✗ Expensive to set-up & operate
- ✗ Not a popular idea with the public!

Build New Reservoirs

- ✓ Effective
- ✓ Energy & recreation uses also
- ✗ Expensive to set-up
- ✗ Controversial issue for area affected by flooding reservoir

3. Abingdon Reservoir Location Factors

Thames Water first proposed plans for a reservoir at Abingdon in 1976. The issue has been controversial ever since with much debate of the pros and cons.

1. Reservoir
2. Possible construction area
3. Existing East Hanney to Steventon road



There are several options for volume with the largest being 150 million cubic metres of water - making it the UK's second largest reservoir in terms of volume, behind Kielder Reservoir in Northumberland. The proposal is for a walled reservoir which would be up to 25 metres high in places, taller than County Hall in Oxford which stands at 23 metres tall, and span four square miles, almost as big as Heathrow airport at 4.7 square miles. If no action is taken & the reservoir is not built Oxford will be left with a shortfall of 1 million litres of water per day by 2020.

Why Abingdon is a good place for the reservoir

- ✓ Near to London – water will be piped to customers here
- ✓ Good access by road for construction vehicles
- ✓ Large open space – big enough to store 150 billion litres of water
- ✓ Will not flood any major settlements
- ✓ Low lying clay vale – water will not soak through

Why Abingdon is a not a good place for the reservoir

- ✗ Site is on flat land – an embankment will need to be built to contain the water

4. Abingdon Reservoir Impacts

Positive Impacts ☺

- ✓ About 90% of the Abingdon Reservoir water would benefit London, with the remainder shared between Swindon and Oxfordshire.
- ✓ Will prevent Oxford from having the predicted shortfall of 1 million litres of water per day by 2020.
- ✓ Potential nature reserve – especially birds
- ✓ Potential recreational opportunities – fishing, water sports, walking/cycling trails & associated employment to support these. Similar to Farmoor ↓
- ✓ Potential employment opportunities during the construction phase and after completion at the new treatment works at Drayton.

Negative Impacts ☹

- ✗ Destruction of natural habitats; voles, bats, hedgehogs and many bird species
- ✗ Visually intrusive (an eyesore), especially where embankments are 20m+ high
- ✗ Disruption to Steventon during building phase as rock & other building materials are brought into the area by rail and Marcham as pipeline works and HGV traffic access the construction site.
- ✗ Increased risk of flooding in Abingdon & East Hanney – areas already prone to flooding. This is because the reservoir will saturate the surrounding water table meaning the ground in the local area cannot absorb as much water after rainfall
- ✗ Local towns and villages will be impacted, but 90% of the water from the reservoir will be sent to London.
- ✗ Drayton will become the site of a large continuous treatment works; fog and insect risks have been identified.
- ✗ Valuable, productive farmland lost.



5. Should the Abingdon Reservoir be built?

The Stakeholders: How will they be affected & is it worth it?

Local Residents

- 👂 Will receive a share of 10% of the water from the reservoir to supply their homes
- 👂 Opportunity to use reservoir for recreational activities; water sports, walking, cycling, bird watching
- 👂 Employment opportunities in recreational facilities at reservoir or water treatment works at Drayton
- 👂 20m+ high embankments spoil the scenery
- 👂 Increased traffic and noisy traffic on roads during construction phase at Steventon & Marcham
- 👂 Increased flood risk at Abingdon & East Hanney
- 👂 Most of the water is sent to London > no benefit to locals
- 👂 Fog and insect risks at water treatment works at Drayton



Possible impact on house prices losing value?

Thames Water & Water Customers

- 👂 90% water from reservoir transferred to homes in London via pipes.
- 👂 Prevent Oxford having shortfall of water in 2020
- 👂 Income generated from activities on reservoir; water sports, fishing & car park revenue
- 👂 Cost of investment to construct reservoir; Local Authority estimates approximately £1 billion
- 👂 Negative publicity of destroying habitat, farmland and small settlements



Thames Water have said that the local area will benefit from the reservoir, similar to Farmoor Reservoir, constructed in 1967.

What to see and do at Farmoor

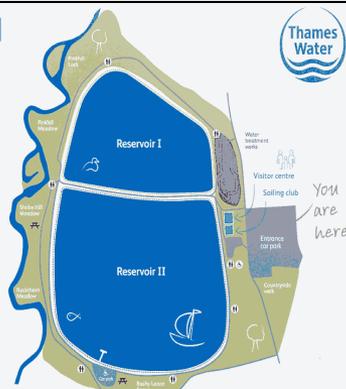
During your visit to Farmoor Reservoir you can enjoy a variety of activities.

There are three nature reserves – Pinkhill Meadow, Buckhorn Meadow and Slatie Meadows where you can enjoy birdwatching.

There is a large trout fishery at the reservoir – please go to the visitor centre, located next to the sailing club, to obtain your permit for fishing or for more information.

While you are here you can also enjoy sailing and windsurfing – lessons are available at the sailing club.

We hope you enjoy your visit and please remember to take care and observe any warning notices.



- Short walk (Reservoir 1) 1.7 miles
- Long walk (Reservoir 2) 2.4 miles

Alternatives to the reservoir?

- Manage existing water supplies more carefully by reducing leakage and encouraging people to reduce their water usage
- Build desalination plants (although this is expensive and also has its own environmental impacts)
- Building a number of smaller reservoirs, rather than the second largest reservoir in the UK
- Remove water further downstream in the lower course of the River Thames.



Local Landowners

- 👂 Will receive a share of 10% of the water from the reservoir to supply their homes/businesses
- 👂 Opportunity to generate extra income from visitors to the reservoir.
- 👂 Valuable, productive farmland lost.
- 👂 20m+ high embankments spoil the scenery
- 👂 Increased traffic and noisy traffic on roads during construction phase at Steventon & Marcham
- 👂 Increased flood risk
- 👂 Most of the water is sent to London > no benefit to locals
- 👂 Fog and insect risks at water treatment works at Drayton

Environmental Groups

- 👂 Potential nature reserve – especially birds
- 👂 Destruction of natural habitats; voles, bats, hedgehogs and many bird species
- 👂 20m+ high embankments spoil the scenery
- 👂 Increased traffic and noisy traffic on roads during construction phase at Steventon & Marcham
- 👂 Increased flood risk
- 👂 Insect risks at water treatment works at Drayton

Commuters

- 👂 Increased traffic on roads during construction phase



Making your mind up!

Its likely that the 9 mark question will be something along the lines of:

- Do you think that the proposed reservoir at Abingdon should go ahead?
 - Tick the box of your choice: Yes or No - you can explain in the answer if you are not 100% yes or no & this is probably good!
 - Use evidence from the resource booklet and your own knowledge to explain your decision. (9 marks + 3 SPAG)
- It would be an excellent idea to plan your answer for this question before you go into the exam.

Good luck ☺

However, Farmoor Reservoir near Oxford is 10 times smaller than the largest proposed Abingdon Reservoir.