

India-UK Water Security Capability Exchange Initiative

# History of the Thames Clean Up

Dr Martin Griffiths

UK Expert

15 February 2016

[martin.griffiths@pillon.co.uk](mailto:martin.griffiths@pillon.co.uk)



FOUNDATION *for*  
WATER RESEARCH

# Growth of the City of London



Inner London population in 1840 of about 3 million

- In 2010 population of about 8 million
- By 2030 population expected to be 8.8 million

# Public Health and Disease



Cholera epidemics, the 'Great Stink' and miasmas combined to create a death rate in Britain's cities higher than at any time since the Black Death. The Government was forced to face up to the need for an urban planning policy.

# Understanding of Science



A DROP OF LONDON WATER  
Punch, Jan.-Jun. 1850



# Public Health Disasters



- **DIPHTHERIA    SCROFULA    CHOLERA**
- FATHER THAMES INTRODUCING HIS OFFSPRING TO THE FAIR CITY OF LONDON
- (*A Design for a Fresco in the New Houses of Parliament*)
- Punch July 1858

# Awareness of Science and Leadership

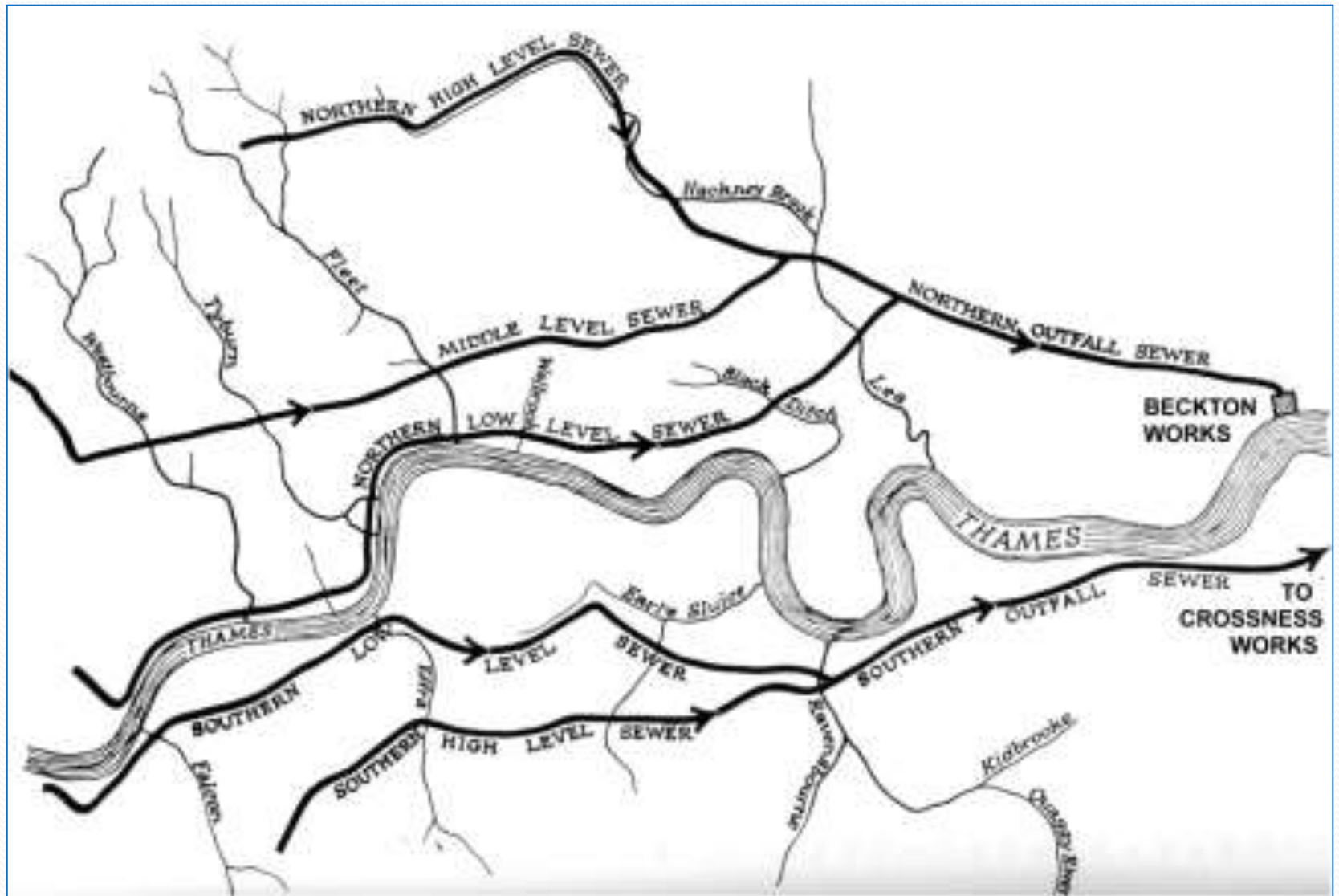


# Engineering Solutions



As a result, Parliament passed an enabling act to raise £3million to build a network of giant intercepting sewers, pumping stations and treatment works, designed by the engineer **Sir Joseph Bazalgette**. This network has been much improved and extended over the years, but still forms the backbone of London's sewerage system today.

# Bazalgette London Sewer map - 1880

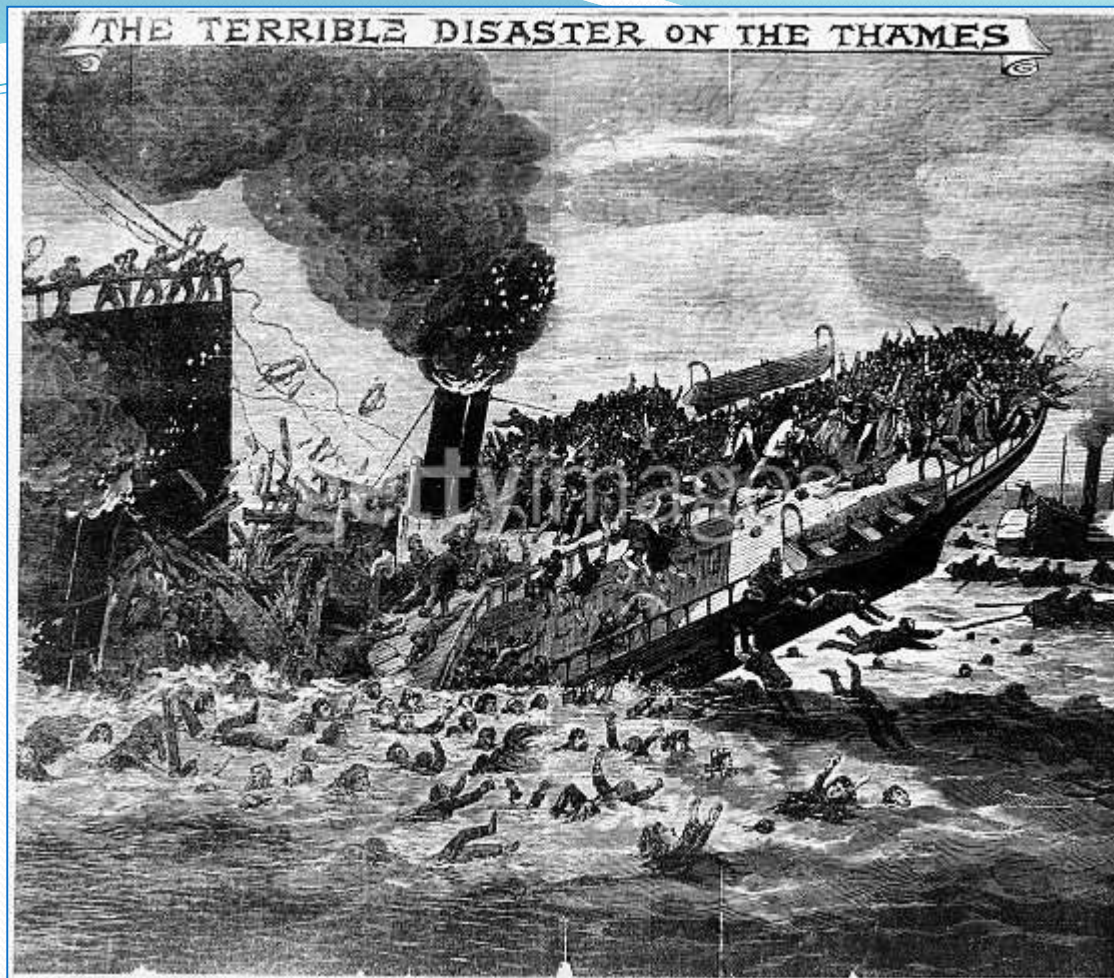




# Thames Sewer – River Fleet







## DISASTER prompts further action

In 1878 the Thames pleasure Steamer '*Princess Alice*', with about 800 people on board, sank, with the loss of 600 lives, in the vicinity of the Beckton outfall after colliding with another vessel the '*Bywell Castle*'. An Inquiry into the accident found that the deaths had been accelerated by the putrid state of the water.

# Crossness and Beckton Sewage Works Built



**A Royal Commission** was appointed in 1882 to look into the state of the River around the Outfalls and this resulted in new treatment methods being introduced at both Beckton and Crossness



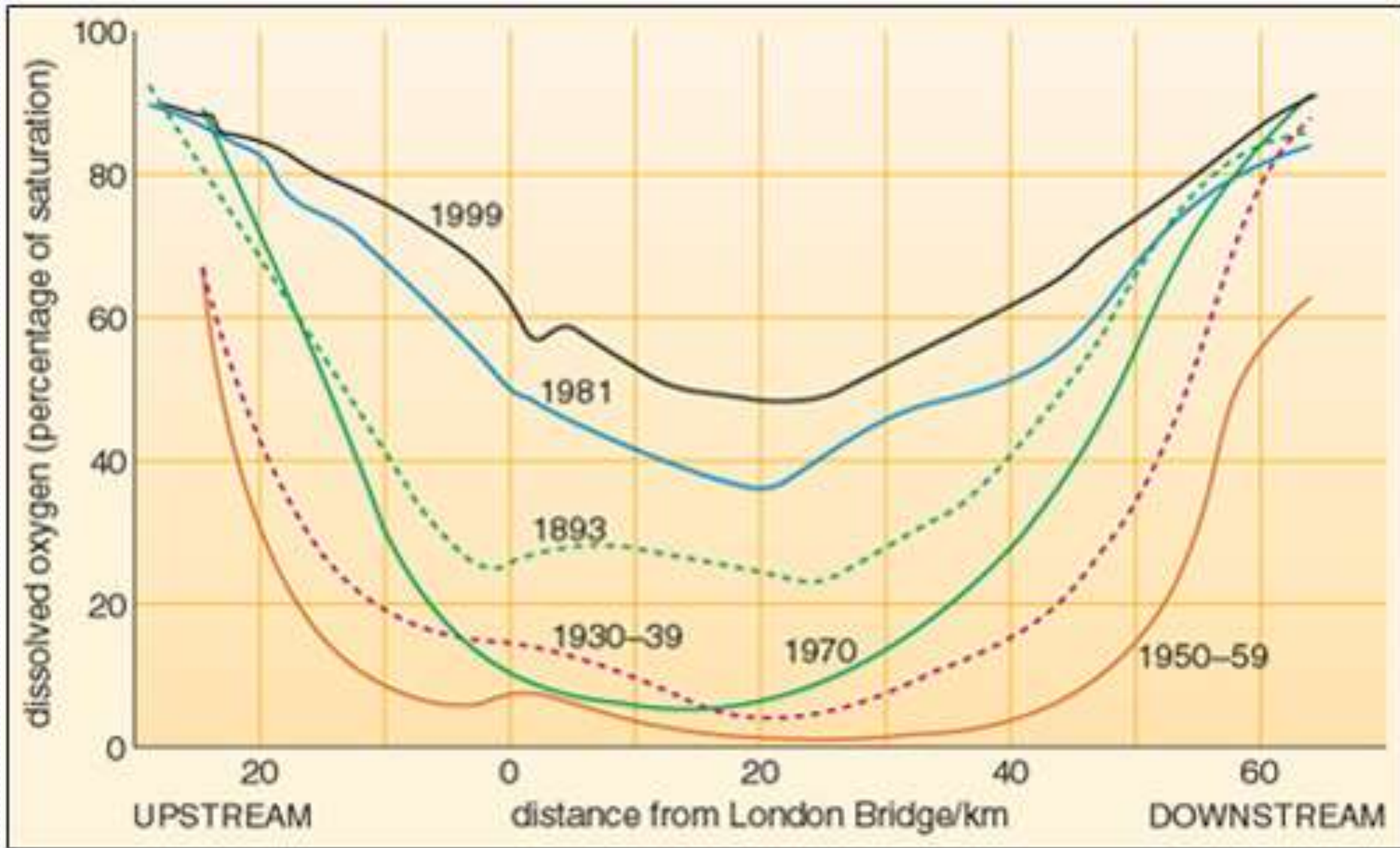
# Thames salmon recovery - 1970s



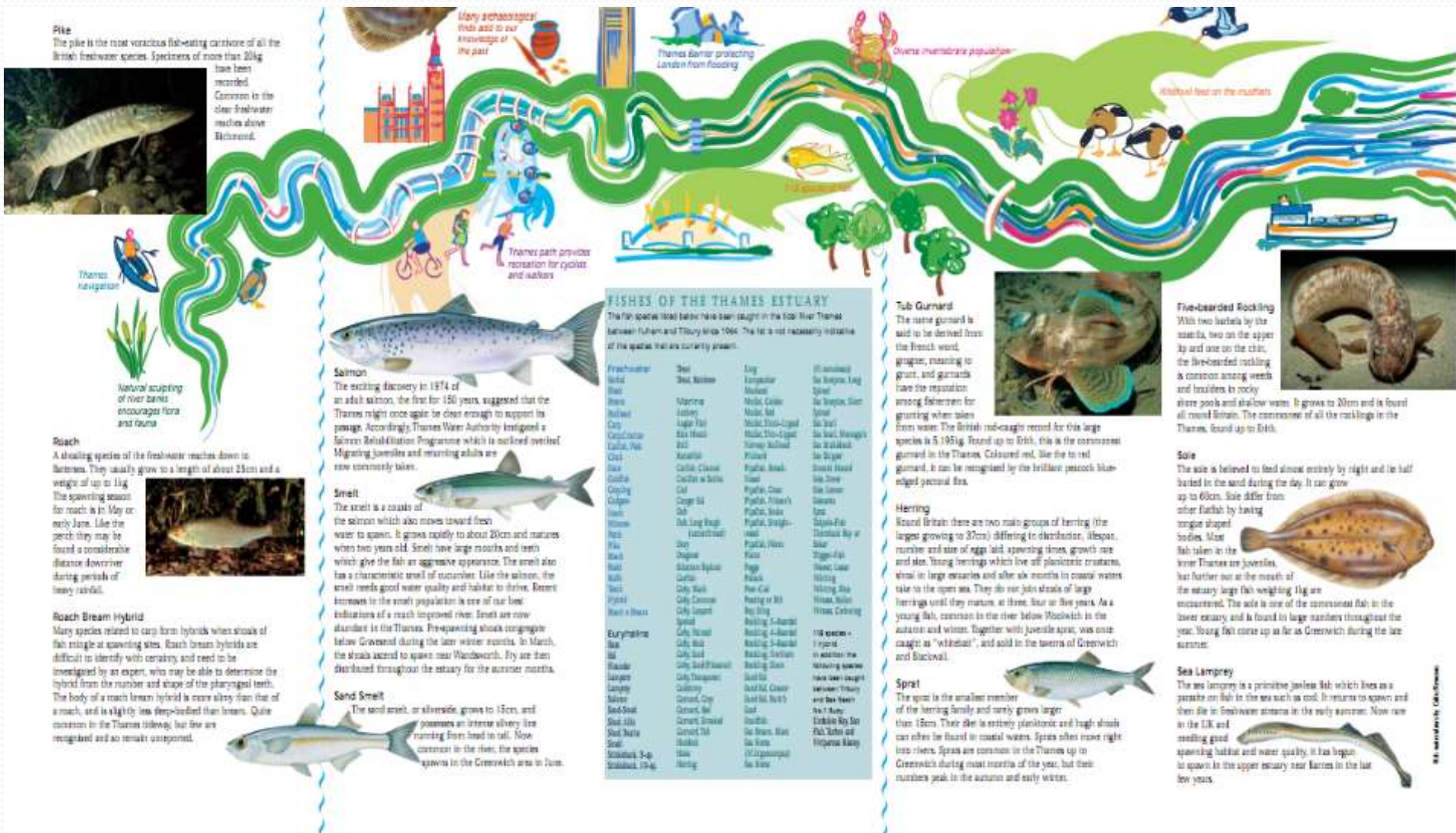
Prompted significant further clean up and allowed fish to live in the Tidal Thames



# Recovery of Dissolved Oxygen in Tideway

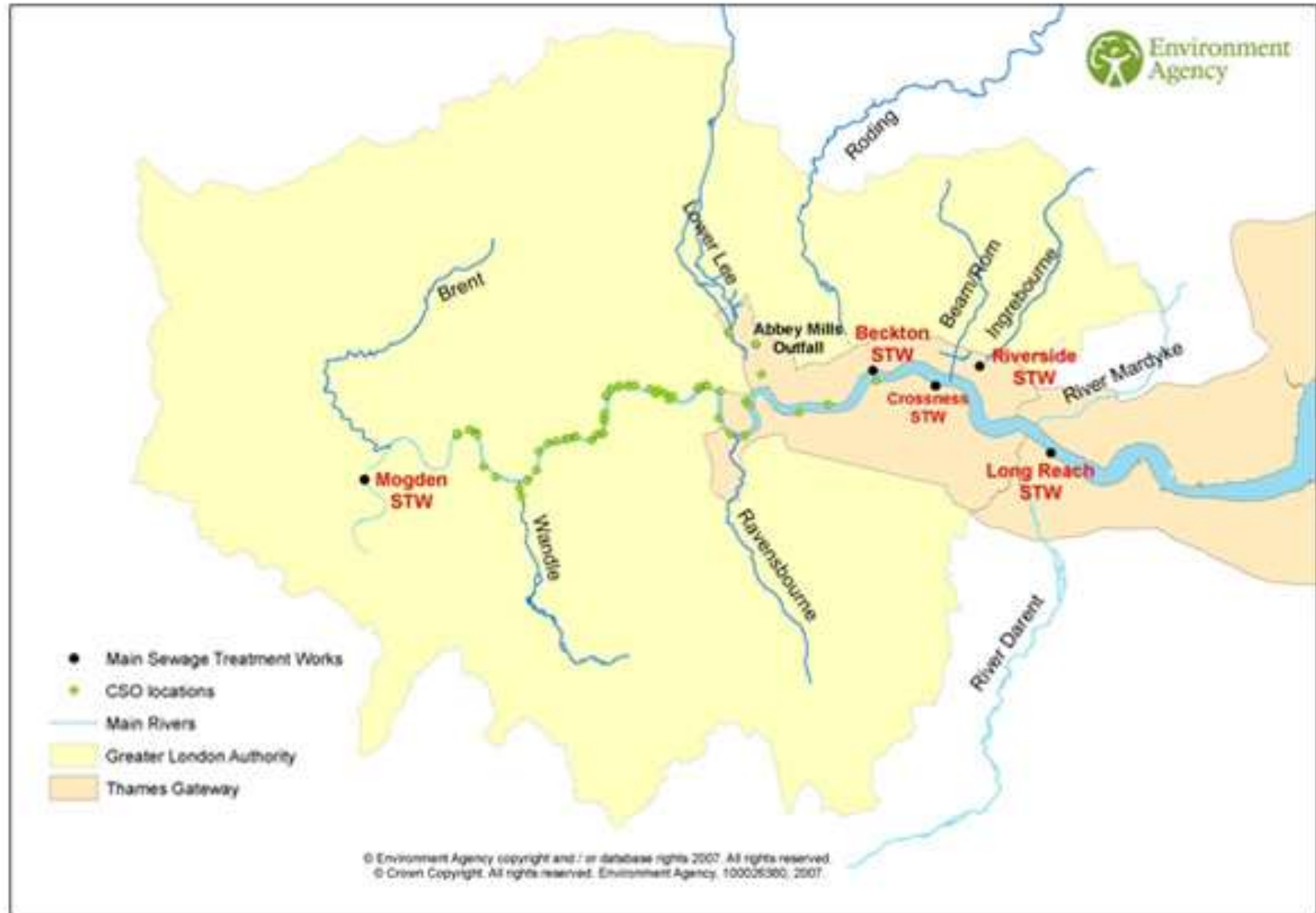


# Recovery of fish populations well documented





# Remaining Issues – Combined Sewer Overflows



# Remaining Issues – Combined Sewer Overflows



Combined sewer overflow point in Vauxhall on the River Thames (photograph: Environment Agency)



# Remaining Issues – Combined Sewer Overflows



Combined sewer overflow point in Putney on the River Thames (photograph: Environment Agency)

# Remaining Issues – Combined Sewer Overflows



The largest combined sewer overflow (CSO) discharges into the River Lee from Abbey Mills Pumping Station. The Lee Tunnel will help prevent more than 16 million tonnes of sewage mixed with rainwater overflowing from this CSO each year.

Image 5 of 11



# Remaining Issues – Oxygen Injection Thames



# Remaining Issues

- Need to continue improvement of treatment



Mogden Sewage Treatment Works, West London

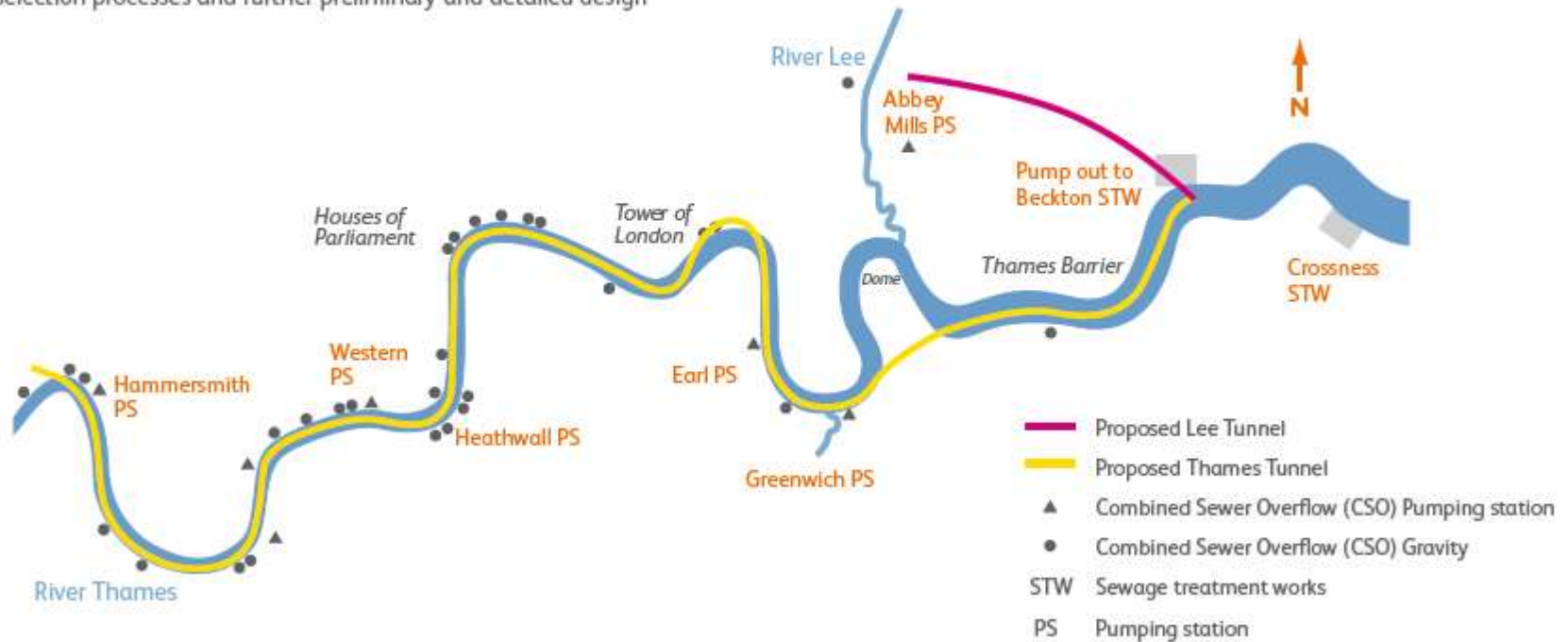


# London Environmental Issues – Water Quality

Long Term Solution – The Thames Tunnel – cost £3 billion approx

## Lee Tunnel and Thames Tunnel routes

The Thames Tunnel route is indicative only and subject to site selection processes and further preliminary and detailed design



# Thames Water - Tideway Tunnel

# Why does London **need** the Thames Tunnel?

The River Thames is as clean as  
think. Sewage  
overstretches  
network is polluting  
the capital's



## Thames Tunnel

Creating a cleaner, healthier River Thames

# Ten reasons why London **needs** the Thames Tunnel

- 1 The River Thames has become an environmental and public health hazard. Sewage regularly overflows into the river from London's Victorian sewerage system.
- 2 The current network of major sewers, founded 150 years ago, was designed for a city of four million people and is no longer big enough to meet the needs of modern day London. The city's population is now approaching eight million.
- 3 In a typical year, the city's sewers discharge 39 million cubic metres\* of untreated sewage into the River Thames – enough to fill the Royal Albert Hall 450 times.
- 4 The discharges are the last significant source of pollution in the tidal River Thames. Mixed with rainwater, the sewage content of the discharges ranges from 10 to 90 percent, depending on conditions.
- 5 This pollution kills fish, damages wildlife and carries pathogens such as hepatitis A and faecal streptococci, which threaten human health. It's a serious problem – and getting worse.
- 6 More frequent and especially in summer, problem, as is the fact that only 1% of the river's surfaces are able to soak up 2mm of rainfall before sewage is discharged.
- 7 Years of independent research have concluded that the only timely and cost-effective solution. Alternatively, to be more direct, not achieve the environmental standards required.
- 8 British taxpayers will have to fund half the cost of the UK's confirmed Urban Waste Water Treatment Directive.
- 9 Other world-leading cities, Stockholm, Helsinki, and Washington DC, have similar schemes.
- 10 A clean, healthy River Thames is essential for the protection of the reputation of Britain. Future generations will forgive us for failing to prevent unacceptable pollution.

\*one cubic metre of sewage equals 1,000 litres and weighs around one tonne

# Doing nothing is **not an option**

The current sewerage system is full to capacity with simply nowhere for excess flows to go apart from into the River Thames. As the population increases and further permeable surfaces are lost, CSO discharges will continue to rise. It is no exaggeration to say that, in the future, we are likely to see CSO discharges during dry weather and not just after rainfall.

Doing nothing will simply result in:

- more frequent overflows
- more frequent environmental damage
- continued increased health risks to recreational users
- worse litter blight
- an adverse impact on the attractiveness of the water frontage
- the risk of heavy fines being imposed on the UK

The Thames Tunnel will provide greater robustness and flexibility for the future impacts of population growth and changes in the pattern of rainfall.

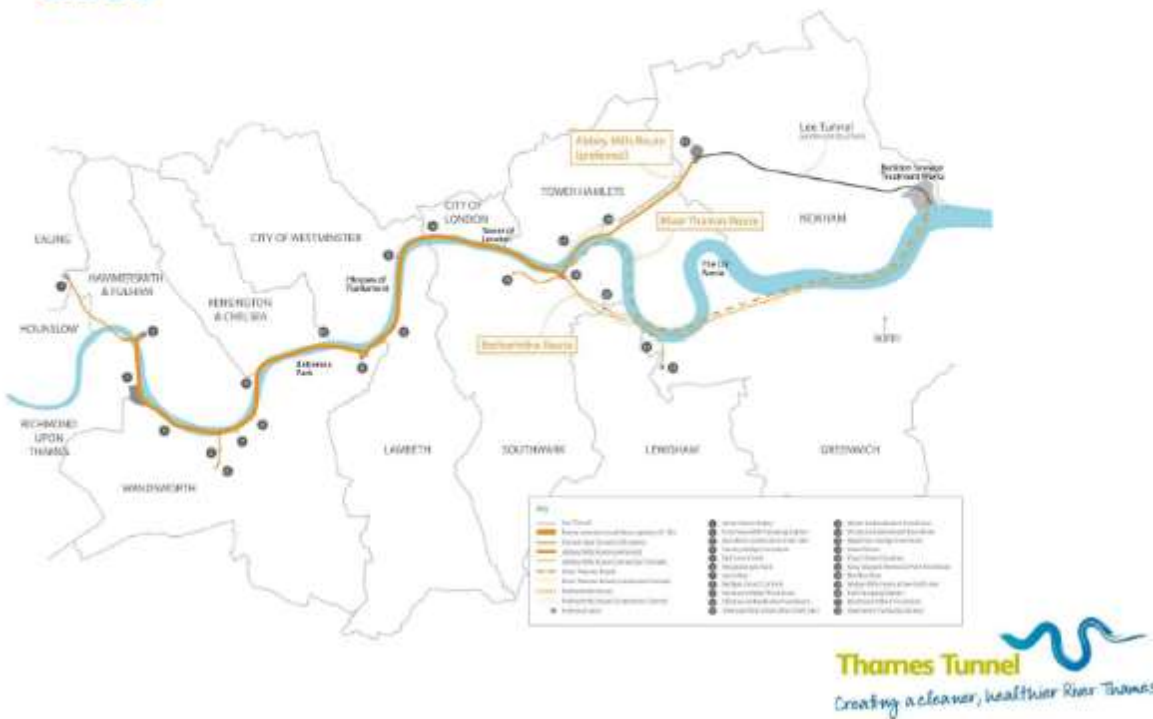
The recommended full-length storage tunnel (Abbey Mills route) achieves compliance with the UWWTD and environmental objectives. It is the most cost-effective scheme, involving the least disruption to residents, businesses and transportation when compared to alternatives. It also has the shortest implementation time, which will facilitate Defra's target date for completion.

At the same time the Thames Tunnel, which will last for at least 100 years, will ensure our sewerage system is modernised and ready to meet the needs of a growing population and the demands of future generations.

Our generation has reaped the benefits of visionary 19th century planning and construction by Sir Joseph Bazalgette and his contemporaries. The needs and expectations of future generations of Londoners will surely be no less than our own. With the Thames Tunnel, we can create our own legacy for them, which will still be functioning in the 22nd century.

# Thames Water - Tideway Tunnel

## Thames Tunnel routes and preferred sites



**Summer 2010**

First round of public consultation

**Early 2011**

Analysis of responses and tunnel design amendments

**Autumn 2011**

Second round of public consultation

**Mid-2012**

Planning Submission

**2013**

Start of construction

**2020\***

Completion of the Thames Tunnel

Estimated cost – about  
£3 billion

\*Subject to review

For further information see our website:  
[www.thamestunnelconsultation.co.uk](http://www.thamestunnelconsultation.co.uk)  
or call us on 0845 366 2950



# Benefits to London of good river environment

£xx billion ++

