Anglian Water's AMP5 Catchment Management Programme

Wensum DTC Conference – 15th July 2010

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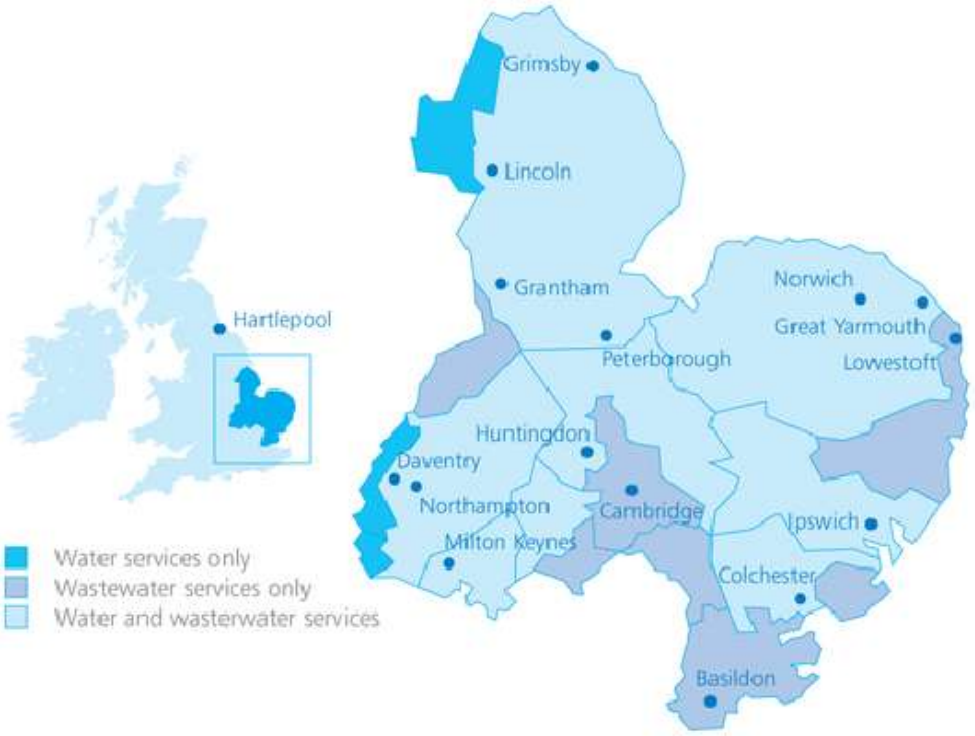
Contents of presentation

- Overview Anglian Water resources
- Abstraction in the Wensum
- Water Quality
- Water Treatment
- Catchment Management

Anglian Water

- Geographically the largest water company in England and Wales.
- 4.2 million water customers and 5.6 million wastewater customers.
- Abstraction of c.1200 Ml/d



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Catchments

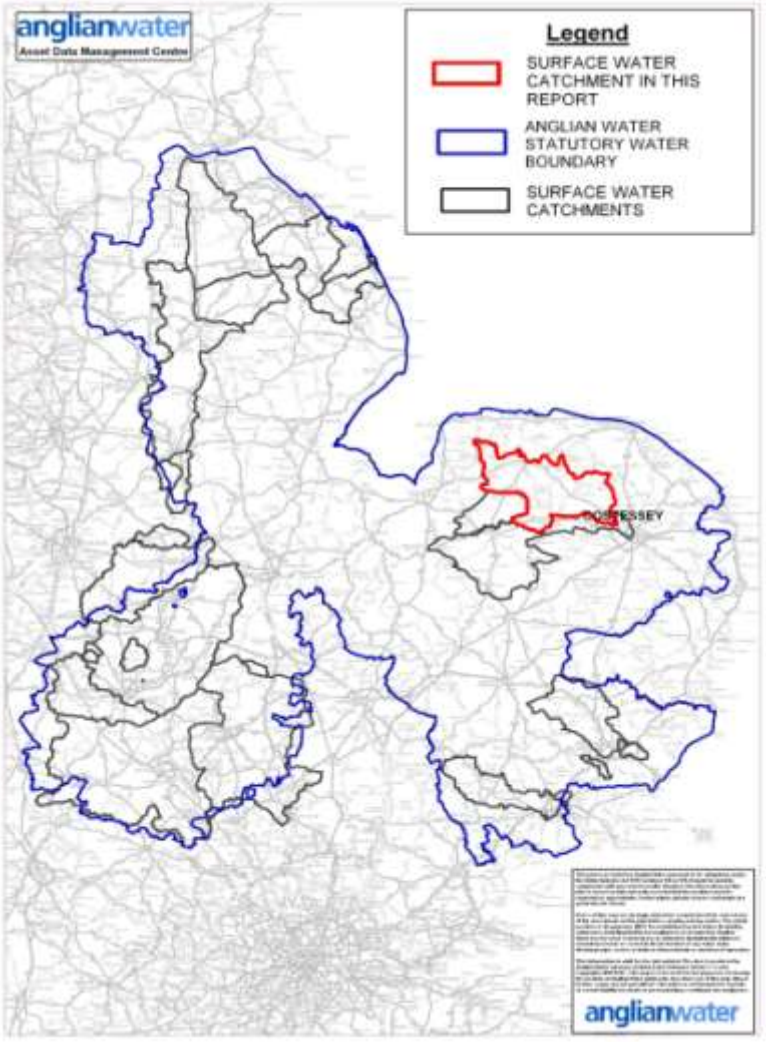
50% of our raw water comes from groundwater and 50% is from surface water.

Groundwater:
•226 sources, >500 boreholes

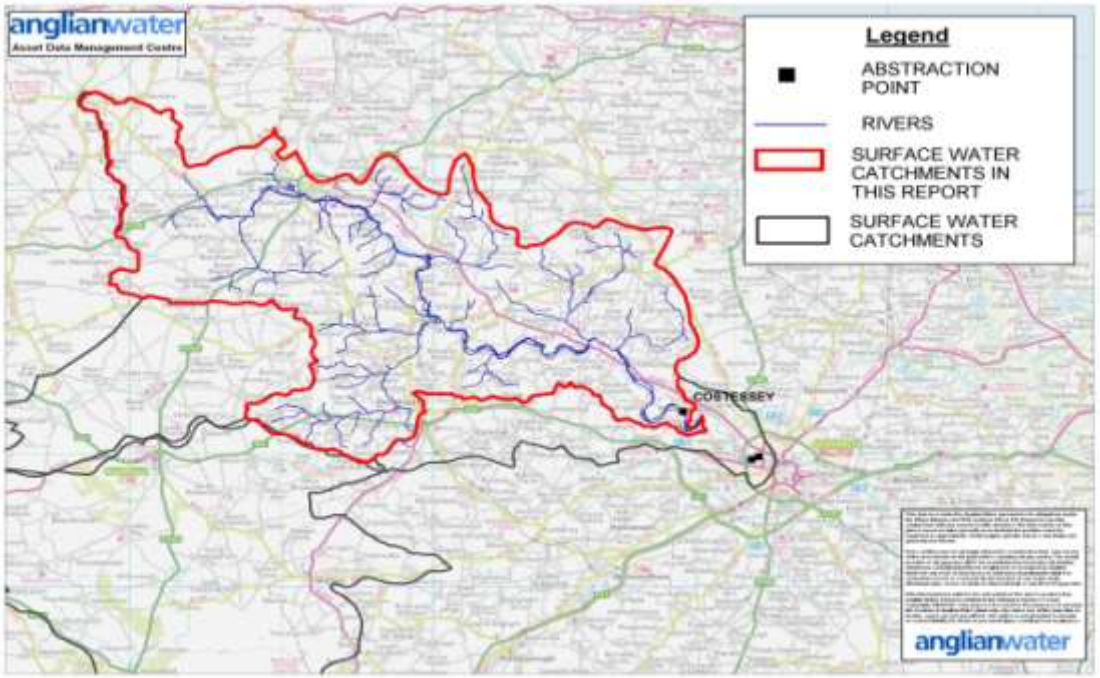
Surface water:

•9 reservoirs and 8 direct intakes

•Direct river abstraction into the treatment works
•Pumping of water from a river into an impounding reservoir
•Natural flow from streams and storage in reservoirs



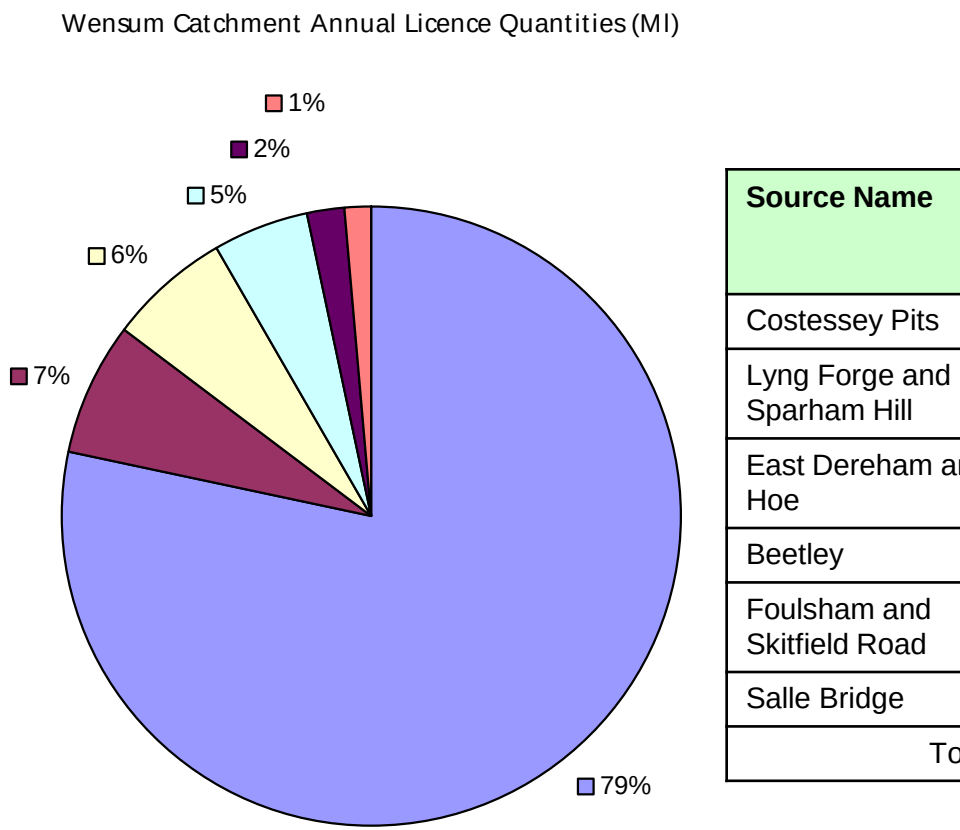
Wensum catchment



Catchment area: 556 km2

Catchment geology: Predominantly Chalk catchment with 95% superficial deposits, mainly Boulder Clay but with sands and gravels in valley bottoms.

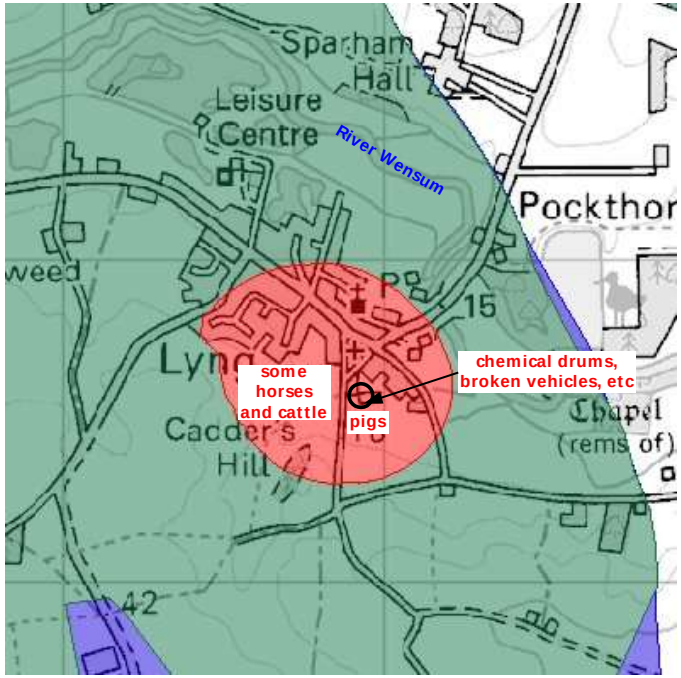
Wensum Abstractions (Ml/a)



Source Name	Source	Ann. Licence (Ml)	Daily Licence (Ml)
Costessey Pits	R.Wensum	17000	140
Lyng Forge and Sparham Hill	Chalk	1495	6
East Dereham and Hoe	Chalk	1364	4.1
Beetley	Chalk	1100	4
Foulsham and Skitfield Road	Chalk	400	1.5
Salle Bridge	Chalk	310	1.25
Total		21669	156.85

Lyng Forge Chalk groundwater source

Lyng Forge Source Protection Zones



Key

- Lyng Forge source
- SPZ1 (50 day travel time)
- SPZ2 (400 day travel time)
- SPZ3 (total catchment)

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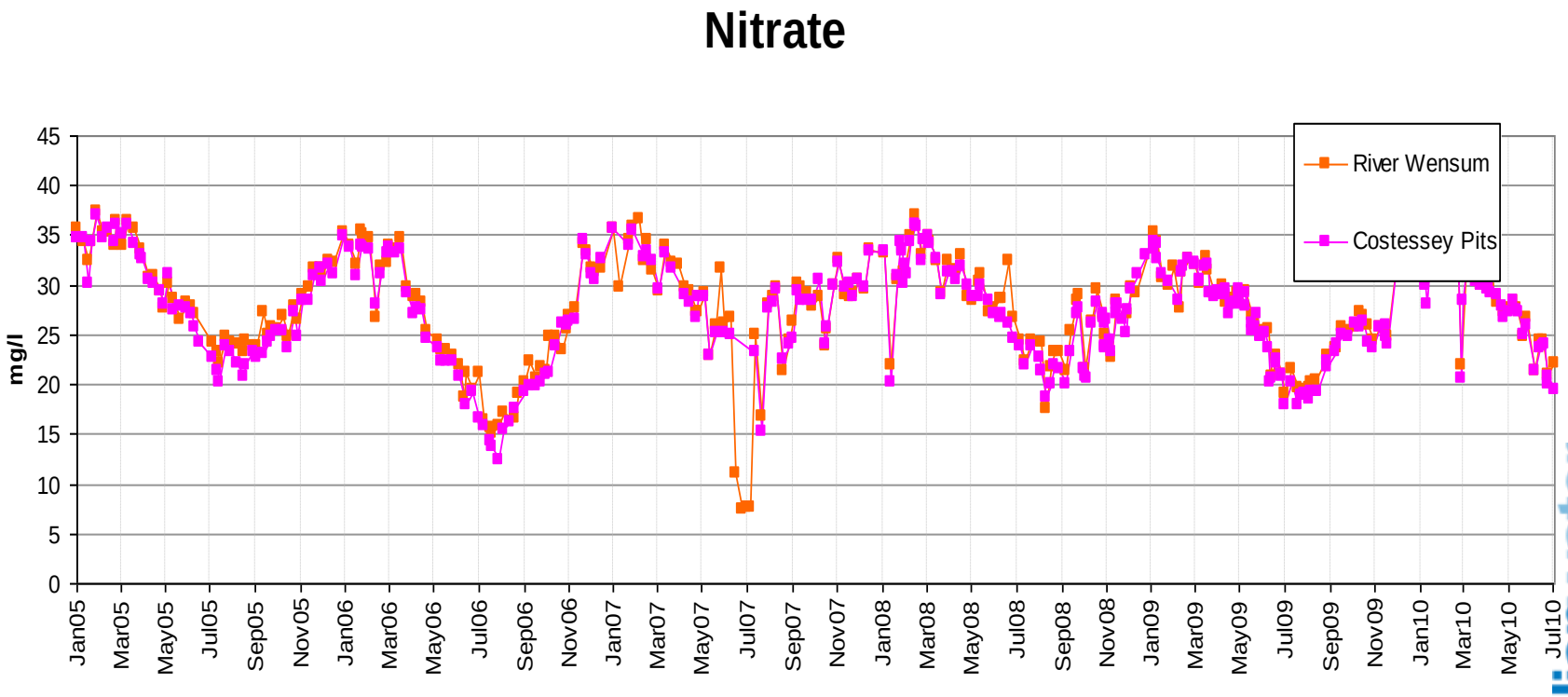
Costessey Pits Intake

Key raw water issues

- Wensum catchment a significant arable area
- Issues with diffuse pollution common in our raw water sources, in particular nitrate and pesticides
- Key drinking water standards:
  - Nitrate - 50 mg/l as NO3
  - Individual pesticide – 0.1 ug/l
  - Total pesticide 0.5 ug/l

Diffuse pollution – river nitrate trends



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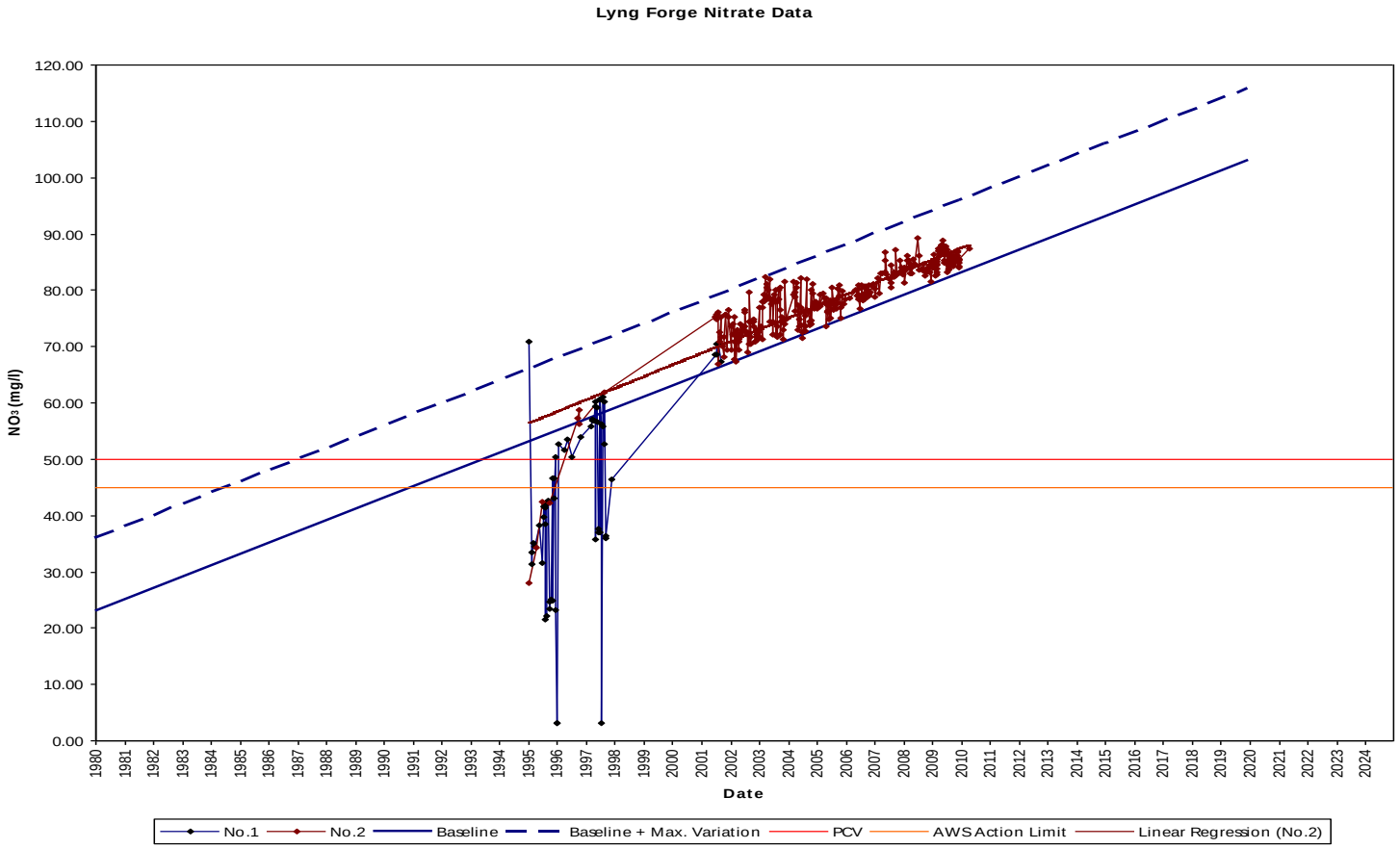
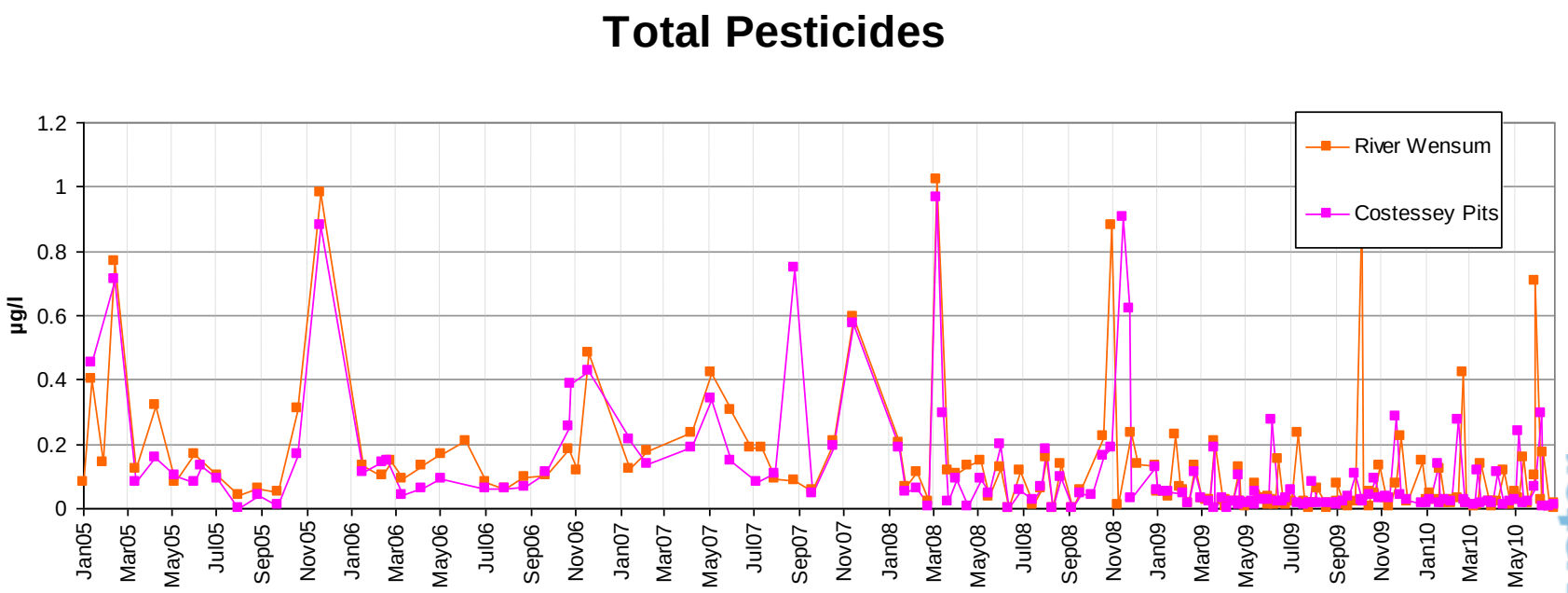
Diffuse pollution – groundwater nitrate trends



Diffuse pollution – pesticide trends



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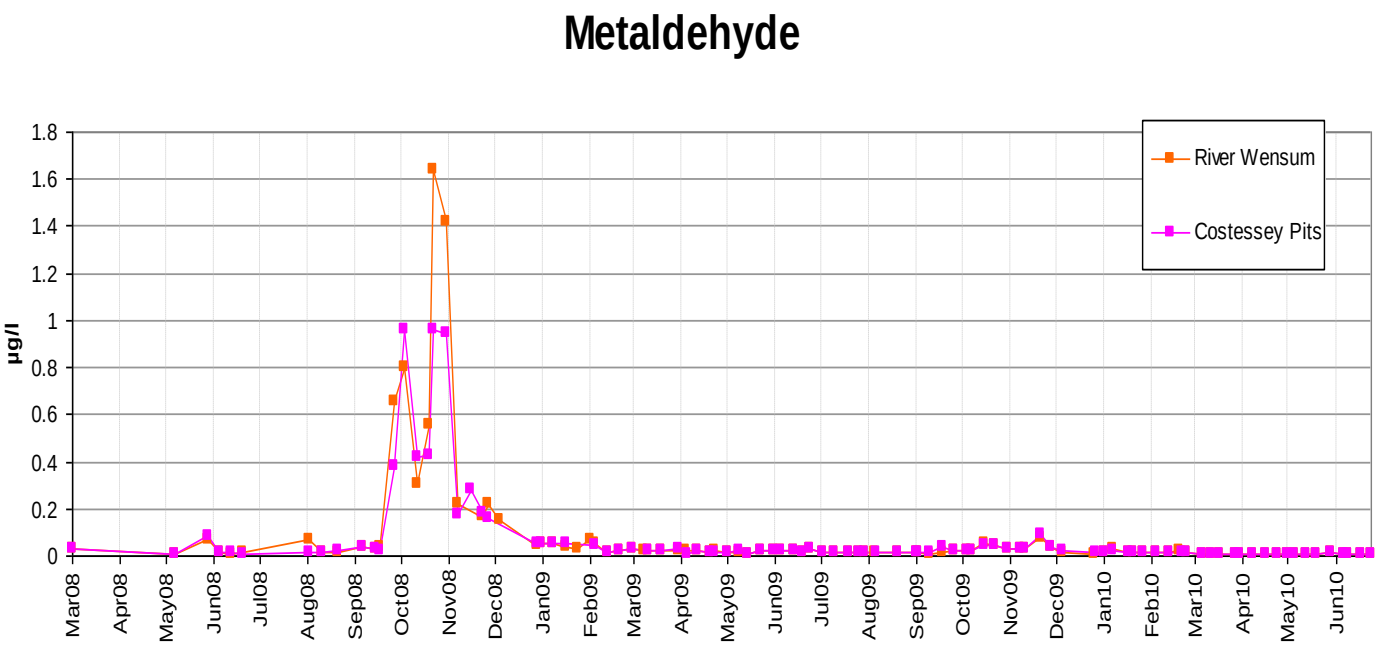
Diffuse pollution – pesticide trends



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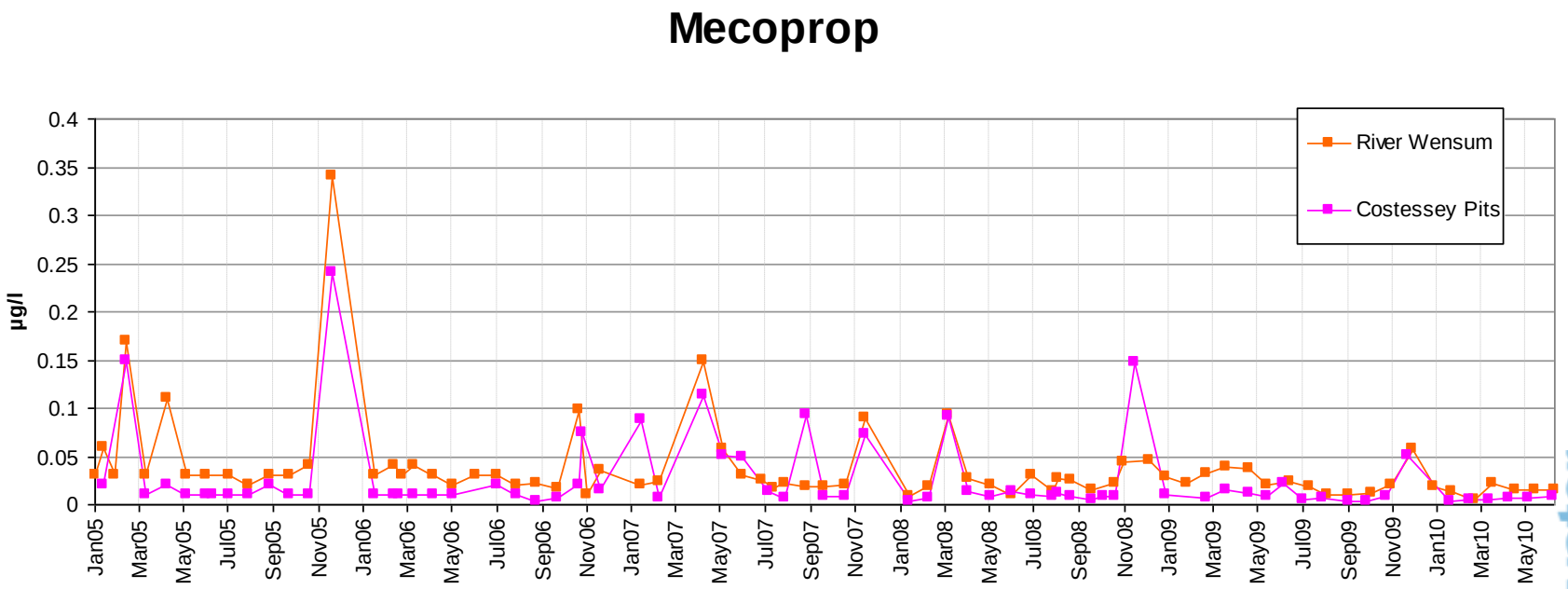
Diffuse pollution – pesticide trends



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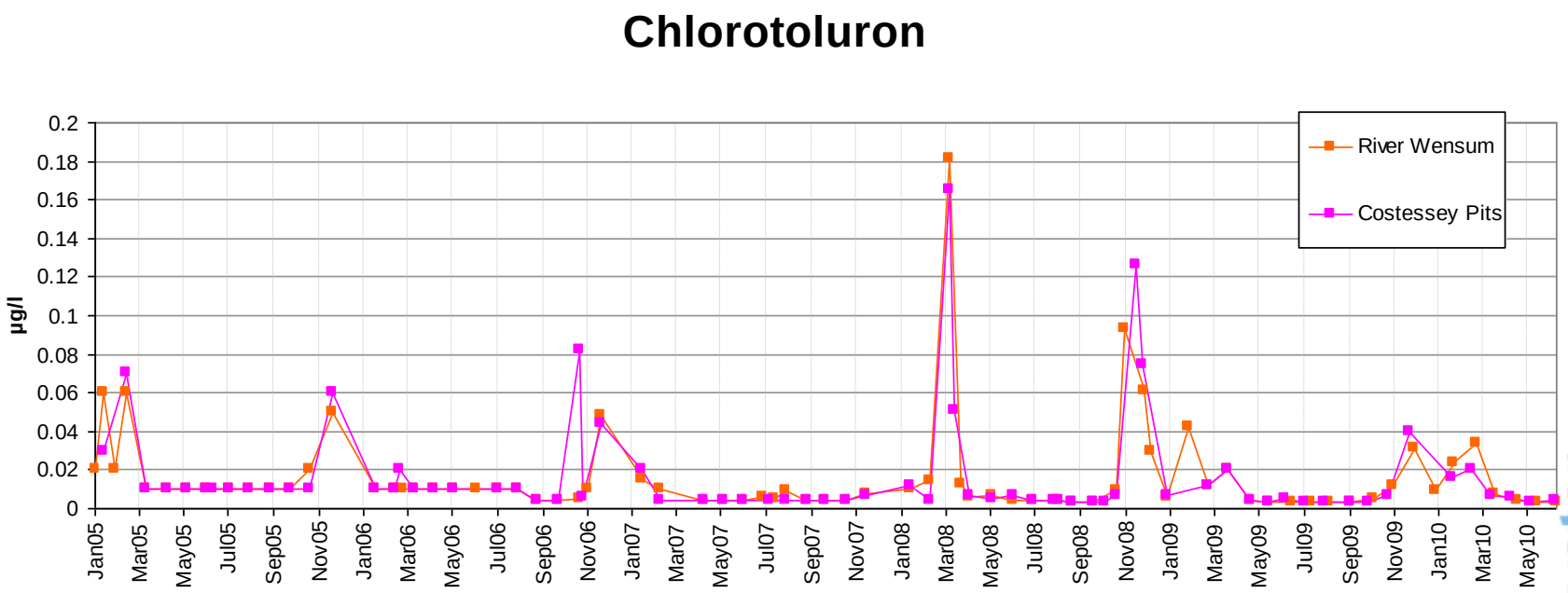
Diffuse pollution – pesticide trends



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Other pesticides

- In addition to metaldehyde, chlorotoluron and mecoprop:
  - Carbetamide
  - MCPA
  - Clormequat
  - Propyzamide
  - Bentazone
  - Metamitron
  - Glyphosate
  - Atrazine
  - Simazine

Drinking water treatment

- The processes used to treat the water before it is supplied to customers vary depending on the quality of the raw water.
- Surface water sources derived from rivers or reservoirs usually have variable water quality and pass through an extensive sequence of treatment processes.
- Ozone and granular activated carbon are used for pesticide reduction.

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Drinking water treatment

- Ion exchange technology is used for nitrate reduction at groundwater treatment works, with GAC or UV used for pesticide reduction.

- Across the region, over 20% of our supplies are treated to reduce nitrate, with 55% treated to remove pesticides.

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Priority issues - Metaldehyde

- Poor removal with current treatment processes
- Little reduction in reservoirs – long-term, low level exceedances.
- Short-term, higher exceedances observed at direct abstraction sites
- 2009 trends are different to 2008

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Priority issues - Nitrate

- Increasing trend
- Original blending solution now inadeqate
- Installation of ion-exchange plant in AMP4
- Finite capacity to nitrate removal
- Increased operating costs

Catchment Management

- AMP5 catchment management in Wensum catchment therefore targeted at:
  - Costessey Pits intake (Metaldehyde and Total Pesticides)
  - Lyng Forge (nitrates)

Catchment Management – why?

Other solutions are costly.

- Options:
  - close source and replace
  - blend with better quality water (if available)
  - Treat to remove/reduce pollutant
- 25 nitrate schemes in AMP4; >£80M CAPEX and significant increase in OPEX
- Typical Ion exchange plant (5.6 Ml/d); CAPEX £3.7m, OPEX £55k per annum
- Treatment increases carbon footprint

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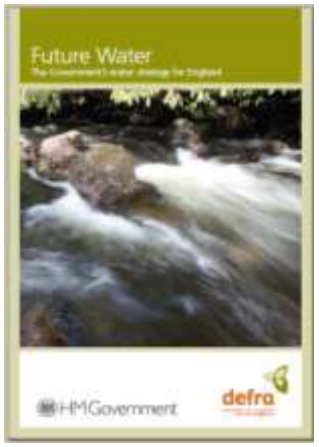
Catchment Management – why now?

- Promoted by the WHO in 2001 and subsequently the Drinking Water Inspectorate as part of Drinking Water Safety Planning (DWSP)
- Defra Water Strategy (February 2008): ‘We will encourage water companies to work with farmers to tackle pollution at source’
- Commitment in the AW Strategic Direction Statement (2007); sustainable approach to management of drinking water quality



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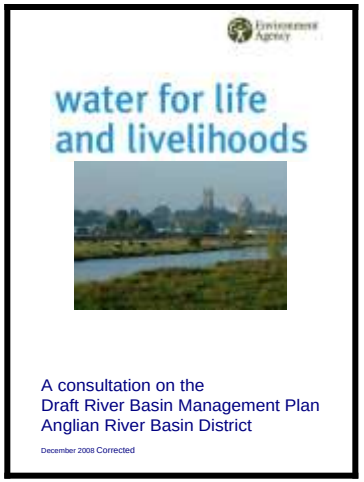
Catchment Management – why now?

- Opportunities given by DWI and Ofwat (our economic regulator) to invest in catchment management work as an important component of our forward investment plans for 2010 to 2015 (AMP5)
- Water Framework Directive Article 7: DrWPAs require catchment protection measures to avoid the deterioration of raw water quality and the installation of additional treatment

Therefore, a regulatory shift of expectation from ‘traditional’ end-of-pipe solution to catchment management



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Catchment Management – Strategy

Key aspect of catchment management is to answer questions such as:

- What has caused the pollution problem?
- What land use management practices to promote and where?
- What impacts on raw water quality would different practices have?
- How soon would the impacts be seen?

And the strategic ones:

- Would we ever be able to do away with end-of-pipe solutions?
- If yes, would catchment management be cost-effective?
- And what are the risks?

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Catchment Management –Strategy

- Investigations in specific catchments
- Acquisition of land use and pesticide and fertiliser application data
- Development of catchment specific nitrate and pesticide models and hazard maps
- Continued monitoring of raw water to calibrate models and inform our source risk assessments

Catchment Management –Strategy

- Liaise with stakeholders, particularly Catchment Sensitive Farming Officers, the Voluntary Initiative and the Metaldehyde Stewardship Group
- Work with the Environment Agency to exchange data and information
- Provide information and education to land-users and their advisors – working with the National Farmers Union and agronomists
- Actively look for links with other drivers, eg biodiversity in conjunction with Natural England
- Support and contribute to catchment initiatives eg Wensum DTC project

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Catchment Management – Stakeholder Liaison

- Gain understanding of stakeholders' roles, working relationships, influences and interests
- Raise awareness of pollution-induced drinking water quality compliance issues
- Build up knowledge of catchments feeding our sources, including;
  - Land use history and practices
  - Fertiliser and pesticide storage, application and disposal
- Review the effectiveness of voluntary measures and stewardship incentives
- Help to identify priorities and influence third party work

Catchment Management – Main Issues

- Planning, focussing and targeting measures
- Developing means of assessing the success of catchment work
- Engaging with the right stakeholders and maintaining communication
- Implementing catchment measures without powers of entry or enforcement
- Aligning with other catchment management initiatives
- Managing expectation of when and in what circumstances catchment management will work

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To summarise …..

- Catchment management is supported by regulators and others as an alternative to continued investment in water treatment
- Our role is to undertake hazard and pathway identification, and assess risk through stakeholder liaison, data acquisition, monitoring and scenario modelling
- Our data and information will be shared, and will be used to help influence others' activities to the highest risk catchments.
- We fully support the current range of voluntary initiatives, and will continue to look for opportunities for wider involvement
- This work gives us a real opportunity to enhance our working relationship with agricultural and other stakeholders, to raise awareness among landowners of their potential impact on raw water quality, and hopefully reduce the risk to our water supplies.

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