

THE WHIRLIGIG OF HYDROGEOLOGICAL TIME

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WHAT AM I TALKING ABOUT?

William Shakespeare "Twelfth Night": Act 5, Scene 1



- q A metaphor for time
- q A spinning top or roundabout
- q A contemporary machine for punishing thieves - An elaborate contraption resembling a large hamster's treadmill, with a hatch in the cage which could be opened to drop the victim into water
- q Hydrogeological ideas have a habit coming around ... and around

WATER RESOURCES

- q UK groundwater resources science developing through 60s & 70s
- q The “Great Drought” - 1976
- q Aquifer storage
- q Transient responses
- q Conjunctive use
- q That was the 1970’s
- q September 2014
- ü Aquifer storage
- ü Transient responses
- ü Conjunctive use



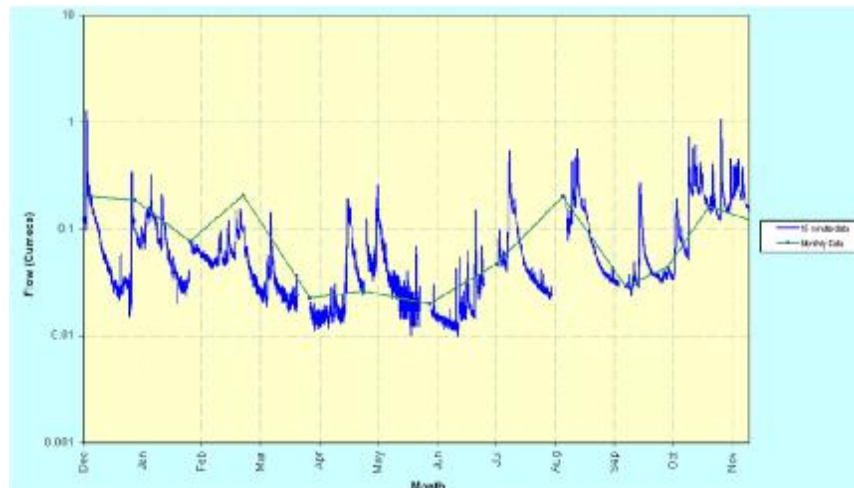
GROUNDWATER PROTECTION

- q 1980's a growing issue
- q Pollution being identified
- q Clean up being done in the US transposing to the UK
- q Issues with landfills identified
- q Dumps
- q Dilute & Disperse
- q Capped (gas)
- q Sealed
- q Natural attenuation



DATA COLLECTION

- q A little bit different
- q More of a continuum
- q My first paper was in 1988 on data collection during drilling
- q Most recent last July
 - ü Why
 - ü What
 - ü When
 - ü How



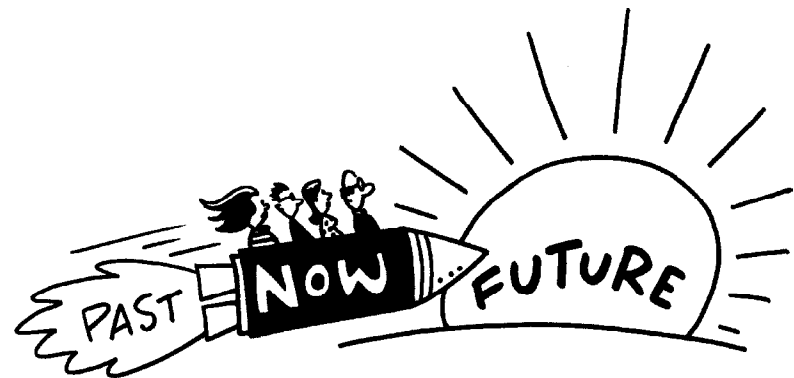
REGULATION

- q Pragmatic vs Pedantic
- q “Yes if” vs “No but”
- q Sensitivity
- q Evidence base
- q Industry knowledge & expertise
- q Regulator knowledge & expertise
- q Political pressure



THE FUTURE

- q Water Resources
 - Ø Storage, licence reform, fundamentals of WR hydrogeology
- q Groundwater Protection
 - Ø Diffuse pollution, catchment approach, cost recovery?
- q Data Collection
 - Ø Greater “digital” advances, power supply, cost
- q Regulation
 - Ø Better evidence base, trend toward pedantic,
 - Ø Need for flexibility



LESSONS

- ü Better science, understanding & prediction
 - ü Don't forget the past
 - ü Don't reinvent the wheel
 - ü Don't be afraid to revisit the past
 - ü Just because it was done 20 years ago doesn't mean it was done right!
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- ü **Build on it & improve it**

