

**INLAND BATHING WATERS AND
FUTURE RIVER QUALITY
MANAGEMENT – LESSONS TO BE
LEARNED FROM TWENTY YEARS OF
COASTAL BATHING WATERS AND WFD
MODELLING**

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COVERAGE

- History and lessons
- How we go forward
- Apologies – the slides are very boring, but I have had COVID and haven't had much time!!
- And I will probably cough



BATHING WATERS – BRIEF HISTORY

- 1976 – Bathing Waters Directive
- 1990-1995 – Early assessments, AMP2 Guidelines ('3-spills')
- 1995-2000 – development of approaches using coastal modelling and compliance assessment tools. Focus on continuous discharges
- 2000 - 2005 - application of compliance assessment approach. Focus switches to intermittents
- 2006 – revised Bathing Waters Directive. Simplification of standards and relates to actual risk of harm
- 2006 – 2015 – significant investment in investigations, solutions, identification of importance of diffuse sources
- 2015 – 2019 – continued investigations
- 2019/2020 – interest develops in inland bathing waters and bacterial quality of rivers

WHAT HAVE BEEN THE KEY ISSUES AND CONSIDERATIONS OVER THE YEARS



- Coastal bathing waters quality has been continuously improved since 1990
- In the 1990s:
 - Primary treatment (or, 'preliminary'!) treatment was not uncommon for coastal discharges
 - High background levels were common, and performance was poor
 - First issue was treatment. Secondary at least, tertiary (almost always UV) in many cases
 - Then the impact of episodic bacterial inputs (wet weather and diffuse) could be properly understood
- Hideous bacterial quality and bathing waters performance improved significantly over 2/3 AMP periods
 - (if you grew up in the 70s or 80s, and went to the beach, well done for surviving)
- Understanding of the key components, how they interact, and how to assess them
 - We went there via some routes that could have been better. The AMP2 guidelines possibly being a good example.

AMP2 GUIDELINES AND THE 3-SPILLS 'STANDARD'



- The AMP2 Guidelines were an important point in developing approaches to bathing waters improvements.
- In the absence of better science – and the 1976 Directive wasn't based on much either – they provided conservative assumptions which would help to deliver wholesale improvements from a bad starting position.
- Basically, restricting storm overflows to a maximum of 3 spills (based around assumptions of 24 hour blocks of impact), would deliver the Mandatory standard of the '76 Directive
- Assuming that treated discharges and diffuse sources didn't totally obscure this approach.
- This led to an approach that delivered large (very large) storm tanks, which theoretically delivered compliance.
 - If they ever emptied
 - If such large tanks could be managed and maintained effectively
 - If the assumptions for a given local area were correct

IMPLEMENTING DETAILED MODELLING STUDIES (AND SUPPORTING DATA COLLECTION)



- I'm bound to talk about modelling – it's what we do –models and compliance assessment provide:
 - An understanding of key sources
 - An understanding of the pattern of impact at each bathing water
 - Ability to move from gross assumptions to a detailed understanding of bathing water performance (at a local scale)
- A demonstration of whether a 3-spills type approach was sensible, cost effective and sustainable as a solution, or if there was a better way.
 - 4 spills. Or 5. Or 20. Or 50 (but fix the diffuse source and put UV on some river discharges)
- In using these approaches, we have learned:
 - What is important
 - When it is important
 - How we can fix it

2006 DIRECTIVE (2015 IMPLEMENTATION IN THE UK)



- The 'new' Directive put science behind new standards. They were a measured means of establishing standards that related to a risk of illness
- They were based on a percentile standard from a constructed distribution
- As such, assumptions based on time of impact, regardless of magnitude – looking at you, 3-spills – cannot be relevant, or accurate.
 - They may coincide at certain points or localities
- But we stayed with 3-spills. And actually reinforced it, refusing to accept the findings of detailed studies with £Ms of survey data behind them. In England, at any rate
- This may have led to excessive capital schemes (too much concrete), erroneous capital schemes (we didn't need any concrete) and ignoring diffuse sources (we needed a fence, not concrete)
- And of course some of those schemes, even though based on an outdated 3-spills approach, will have been correct and improved bathing water quality at reasonable cost and sustainability.

IN SUMMARY



- Many studies, a lot of modelling and data collection, and implementation over a long period with lessons learned and methods improved have provided us with a good understanding of many bathing waters
- We understand that compliance factors can be complex, and that we get better results if we consider them all
- We need to get continuous sources fixed first - these drive the baseline and are critical to overall performance
- With these fixed, we have an operating environment where intermittent, episodic sources can be managed
- Other sources – diffuse (generally livestock, but birds can be a factor), can often be critical, and can be the driving factor in compliance.



RIVERS AND INLAND BATHING WATERS PRACTICAL CONSIDERATIONS AFTER THE DRAMA

- None of us want bacteria in excess in our rivers
- None of us want stormwater in our rivers at all – but we at least understand the constraints of the current system and the implications of no overflows (how much sh*t are you prepared to store in your garden or cellar to stop it being discharged into rivers?)
- How do we provide an orderly approach to managing the cessation of overflows and the management of bathing waters (or swimming areas) in our rivers
 - (I am deliberately ignoring all the other determinands, but the same considerations apply. Bacteria is a direct health risk, not a consideration of environmental performance, however)
- It is vitally important that science and critical thinking drive this process, and not populist politics, or political pressure, or single-issue type protesting
- We need to dial in the reality of cost and programme time -£600Bn and £1000 on bills doesn't seem that sensible



RIVERS – INITIAL CONSIDERATIONS

- Where are your bacterial loads coming from?
- What proportion is coming from those sources?
- How do they interact?
- What are the implications for bathing/swimming (how do we place a health risk on a given operational condition)?
- Knowing these things, we need to prioritise an improvement plan
 - Easy wins
 - High value/high amenity areas
 - Probably a combination of both

RIVERS – HOW ARE WE INTENDING TO MANAGE SWIMMING?



- Are we designating new, formal bathing areas?
 - If we do, and can't control key bacterial sources, bathing prohibited after 5 years at the moment. Is this better?
- Are we setting swimming areas? New designations under Environment Bill? New formal or informal areas?
 - If informal, who manages? Who monitors? What are your criteria? How do we define success?
- We need to understand sources, interaction of sources, and overall risk
 - Using 'standards' from 1992 is not going to deliver this – and arguably not a standard but an assumption anyway
- Is part of the plan management and information provision (warnings against swimming, for instance, similar to short term water quality notices for coastal bathing waters)

RIVERS – HOW DO WE USE THE INFORMATION WE HAVE TO DELIVER AN ORGANISED PLAN?



- We know the treatment level we have on WwTWs
- We know where CSOs/stormtanks are – and in many cases SOAF and similar are providing us with info regarding spills and volumes (volumes are key because that governs the bacteria going into the river)
- We know any industrial sources through trade consent details
- We can obtain livestock information and apply it to catchments (we probably don't have the ideal amount of detail at the moment)
- We have a wealth of data and information – the work of Prof. David Kay on bacterial sources and fates, for instances, AND dare I say our modelling work since 1996

RIVERS – TOOLS AND APPROACHES



- Once we know how we are designating, how we are setting criteria, and how we are measuring performance:
 - How many watercourses/stretchers are under consideration
 - How many sources
 - Prioritise
 - Manage or plan investment – probably both
- Needs a sensible conversation about cost and implementation. If there are 13000 overflows to rivers (and many more cows), what timeframes do we need to solve the problem?
 - Lets make sure we understand the problem first – no point in a 50 000 cubic metre tank if 2km of fence does a better job?
- What can we do with data? Do we need models? What sort of models?

RIVERS – FINAL THOUGHTS



- Spills – if we are talking 40 spill solutions costing £Bs to deliver current political requirements, how does that square with 3-spills
 - It's probably unachievable?
- Need to understand the improvements that SOAF/WFD schemes might bring
- Need to integrate catchment solutions/SMNR/'natural' solutions. For both diffuse and stormwater sources.
- Sensible timeframes
- Engagement with stakeholders and transparent communication – the public need to understand the timescales and challenges involved – and how they can help – don't flush wet wipes, there will be fewer stormwater overflows
- There is a wealth of experience, understanding and data from coastal schemes and assessments
- We understand we can't rush into an overly conservative approach which will not solve the problems

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