



# Meeting minutes and actions

## Beachbuoy Working Group

Wednesday 31st January 2024 15:00 – 16.30	Teams Meeting
Nick Mills	Southern Water
Luke Hyttner	Southern Water
Nicole McNab	Southern Water
Robert Kevin Holmes	Independent Expert
Roger Falconer	Independent Expert
David Kay	Independent Expert
Chloe Flood	Surfers Against Sewage
Simon Radford	Chichester Harbor Federation
Emily O'Brien	Green Party Councillor, Ouse Valley & Ringmer
Luke Glover	Thanet District Council
Rose Bircham	SOS Whitstable
Andrew Coleman	Surfers Against Sewage (Brighton Rep)
Victoria Thornton-Field	Swim the Wight
Mike Owens	Hayling Sewage Watch
Jonathan Driver	Havant Borough Council

No	Minute	Action Owner
1	Introduction <ul style="list-style-type: none"><li>Nick Mills NM (Chair) Welcome everyone in attendance.</li></ul>	
2	NM Outlined agenda for the call: <ul style="list-style-type: none"><li>Overview of findings from the independent expert review, with experts summarizing</li><li>Plan to implement the recommendations.</li><li>A Q&amp;A for the experts</li><li>Updates on development of next version of Beachbuoy product</li></ul>	

	<ul style="list-style-type: none"> <li>- Updates on the Clean Rivers and Seas Task Force</li> <li>- AOB</li> </ul>	
3	<p>NM Introduced the background of the independent review, and the experts involved in its creation and the coordination role of Atkins Realis.</p> <ul style="list-style-type: none"> <li>- Prof David Kay (Water Quality)</li> <li>- Prof Roger Falconer (Oceanographic Modelling)</li> <li>- Dr Robert Kevin Holmes (Software and Systems)</li> <li>- Dr Artemis Skarlatidou (User Engagement)</li> </ul> <p>NM informed that the scope of the work was co-create with participants from an external Working Group, some of whom are in the call today, to cover the following areas:</p> <ul style="list-style-type: none"> <li>- Human health implications</li> <li>- Process and Systems</li> <li>- The automatic review processes.</li> <li>- Coastal Modelling</li> <li>- User Engagement</li> <li>- Software aspects</li> </ul>	
4	<p>NM Presented slide 5, which outlined the key summaries of findings from the Independent Review Experts across the four specialist areas.</p> <p>NM Introduced David Kay (DK) to discuss his findings:</p> <p>DK outlined how his work has found that the best predictor for illness after water use is IE (intestinal enterococci) over E. coli.</p> <p>DK outlined how the main driver for the modelling is the Event Duration Monitors. It was outlined that EDM's do not measure the coliforms in the water. And therefore, sampling should be done to validate the modelling. NM confirmed that IE will be used within the tidal modelling, and this will be live from next week.</p> <p>NM outlined that Southern Water will be developing methods to validate model predictions with sampling programmes in the future.</p>	
5	<p>Roger Falconer (RF) was introduced by NM, who outlined his academic and commercial background in the field of tidal modelling.</p> <p>RF outlined his main finding is that the modelling that Beachbuoy (BB) uses is dated and simple compared with more modern versions.</p>	

	<p>RF outlined his key recommendation that the current model should be replaced with a more modern version of the modelling software.</p> <p>RF stated that SW have already begun work to replace this model.</p> <p>RF stated that he had questions around the open boundary used in the existing model, as the Earth's rotation is an important factor in modelling. RF confirmed that this will be included in the new modelling software upgrade (MIKE) that is in progress by SW.</p> <p>RF stated that the next finding was that the model had been calibrated and verified against admiralty chart data from 1995 onwards. RF Outlined that Acoustic Doppler Current Profiles (ADCP's) provide better accuracy and reliability for water levels and velocity.</p> <p>RF outlined that SW are planning to use ADCP's for the next phase of the work on Beachbuoy.</p> <p>RF outlined his next recommendation refers to the grid size used in the model being too coarse and that this will be refined in SW's new unstructured grid model.</p> <p>RF informed that he also recommended if using the existing model, that SW need to change the nesting from the coarse grid down to fine grid model.</p> <p>RF informed that the seabed roughness is an important parameter in these models and further work can be carried out to justify the changes to this.</p> <p>RF informed a concern of his was the use of wind stress (variable) in the models and was unsure whether wind stresses had been considered enough.</p> <p>RF confirmed that it is his understanding that SW will incorporate wind stress variable in the new MIKE model that will be implemented.</p> <p>RF informed that he found some processes in existing model quite simple, for example wind turbulence and dispersion and diffusion are important variable in FOIs in the water column and that a simple constant value had been used, and therefore needs to be improved.</p> <p>RF concluded his overview of his recommendations and findings</p>	
6	<p>Attention shifted to Kevin Robert Holmes, (KRH) to overview his recommendations and findings.</p> <p>KRH outlined his academic and commercial background in the field of system engineering and software and infrastructure management in regulated organisations.</p>	

	<p>KRH outlined his approach of Initially looking at Beachbuoy product and the data supply chain from EDM monitors through to the public facing data.</p> <p>KRH commented how the PI system used is good in that it takes a risk reduction approach for false negatives, and therefore the need for manual reviews 'downstream'. KRH stated that this complies with industry best practice.</p> <p>KRH acknowledges that there are some latency issues in the system but that these are not significant.</p> <p>KRH stated that the spill event data from the system is used for two purposes:</p> <ol style="list-style-type: none"> <li>1) to send to regulators.</li> <li>2) to send to Beachbuoy for the public to view</li> </ol> <p>KRH then outlined the development process approach taken for Beachbuoy being 'Agile' (Rapid App Development) and that this was implemented in a way of industry best practice.</p> <p>KRH outlined his main issue with the approach was that it does not have an overarching design and documentation that enabled a high-level view of the system.</p> <p>KRH stated that testing improvements have been made.</p> <p>KRH highlighted a historic problem with Beachbuoy development was that it did not involve the user community of the product enough. As a consequence, the perspective has been focused on a narrow persona, rather than a broad application view.</p> <p>KRH stated that the technologies used for Mapping and information transfer were not industry best practice, but acknowledges that these are being addressed in the new version of the product.</p> <p>KRH stated that the latency issue in the system is the most difficult issue to resolve.</p> <p>KRH informed that no data is lost in the system and that it is all auditable, but that improvement can be made to transparency of data to the public. KPH used the example of how spills from remote outfalls are not shown on the map as they are not relevant to bathing water impacts.</p> <p>KRH concluded that his main recommendations are to improve transparency, governance, and documentation.</p>	
7	<p>Luke Hyttner (LH) provided an overview of the User Engagement Expert Recommendations and approach in her absence.</p>	

	<p>LH Outlined that Artemis Skarlatidou approached her assessment by conducting a series of interviews with Beachbuoy users and stakeholders and followed a heuristic evaluation to look at the interface design.</p> <p>LH outlined that the recommendation fall into 3 high-level categories:</p> <ol style="list-style-type: none"> <li>1) Better provision of information content e.g. how tidal modelling works and determining spatial accuracy.</li> <li>2) User Interface Design</li> <li>3) Ways of working – improvement with community engagement and user research.</li> </ol>	
8	<p>NM Presented slide 6 from the presentation pack, which summarises the key improvement recommendations.</p> <p>NM highlighted that there are ~100 recommendations in the report and that SW are committing to acting on all of them, which are outlined in the report response by SW with timeframes added.</p> <p>NM outlined the high-level plans for BB moving forward, that relate directly to the recommendations.</p>	
9	<p>NM welcomed questions from participants relating to the independent review recommendations and findings:</p> <p>VTF asked “<i>doesn’t earth rotation depend on basin size?</i>” to RF</p> <p>RF answered this is a relatively minor point relating to Coriolis slope/effect that should be factored into the new modelling</p> <p>NM confirmed that it will be enacted with the new modelling</p> <p>NM took question from AC</p> <p><i>Will the revised modelling (if all expert recommendations are implemented) have the capacity to predict water quality at non-designated bathing sites, including estuarine and inland?</i></p> <p>NM answered: It will have the capacity to predict water quality and non-designated bathing sites on the coast. In-land, no – needs another equation. NM noted this is problematic for in-land locations, due to landowners not wanting to include these sites due to trespassing concerns. Non-designated coastal bathing sites can and SW want to add these over time</p> <p>NM took question from Andrew from Surfers Against Sewage:</p>	

	<p><i>That point about the transparency of data being filtered out is important - to increase confidence in BB. Which are these 'far out at sea' outfalls being filtered out?</i></p> <p>NM answered that long sea outfalls that do not impact bathing sites were historically filtered from the BB map. For example Easley Long Sea outfall is not currently on BB.</p> <p>All of these will be on the new version (BB2.0)</p>	
<p>10</p>	<p>NM welcomed questions from Participants (spoken)</p> <p>EOB asked:</p> <ol style="list-style-type: none"> <li>1) The report that's been circulated to meeting participants – can this be shared publicly?</li> </ol> <p>NM answered: SW plan to publish the report in the coming week. The purpose of the call today is to clarify anything that wasn't clear in the report before publishing</p> <ol style="list-style-type: none"> <li>2) Is there an existing water sampling program that the inclusion of IE will be included in, or is this a new program of water quality sampling? What does this mean in practice?</li> </ol> <p>NM answered: There are two parts:</p> <ol style="list-style-type: none"> <li>1) The new model allows SW to predict thresholds of IE and this is being done now</li> <li>2) Backing up the modelling with sampling studies: it will be a new program. SW are exploring a collaborative study with UK Water Industry Research (UKWIR), who will help fund this with other water companies involved.</li> </ol> <p>NM clarified that this will be initially targeting at specific sites</p> <p><b>ACTION:</b> NM to provide a list of proposed sites for the IE water Sampling to EO</p> <p>NM welcomed question from Rose Bircham</p> <p>“How does IE recommendation affect the testing that SOS Whitstable are doing currently? Is it better to be testing for IE or E.coli?</p> <p>NM: Answered by referring to DK recommendation that it should be IE, but highlight the challenge is that there is not suitable equipment to do this kind of testing quickly and requires lab samples</p> <p>DK added:</p> <p>It needs to be IE due to correlations with illness. The WHO standards and EU 2006 directive bathing water standard</p>	<p>NM</p>

<p>state that: What is the 95<sup>th</sup> percentile value which indicated a 10% chance of illness of Intestinal Gastritis – that's the pass/fail level.</p> <p>NMc added that in the Citizen Science work they are trialing additional/new devices testing for EndoToxins and that this is an evolving space using new technologies.</p> <p>NM welcomed question from Victoria Thornton:</p> <p>“Are we saying that Ecoli is not a proxy for IE? All the research she has read seem to say that if you have a certain level of Ecoli, you will likely have a certain level of IE.”</p> <p>NM Answered: If you have high levels of Ecoli you are highly likely to also have IE in the waters as well, but there are a lot of sources.</p> <p>DK stated that IE and EC die-off at different rates in the environment – but that his studies did not find a statistical relationship between EC and illness. But that EC is useful for a measure of compliance – whether the water would pass or fail the EU bathing water directive. DK fully supports SW stance to look at both IE and EC Indicators.</p> <p>NM Welcomed a question from Mike Owens (MO)</p> <p>MO comment on his impression on the high level of detail for the report and its informative nature</p> <p>Question: “The grid size needs to be finer – how will that affect the processing speed of the models and make BB slower?”</p> <p>RF answered: Speed of processing will increase significantly.</p> <p>NM Clarified: The models are being ran offline to inform look-up tables and logic that is hard-wired in – so will not impact performance of BB.</p> <p>Chloe Floor asked: Do models run in real-time?</p> <p>NM answered: In the future, SW want to build a ‘model of a model’ as per RF recommendations to be a real-time system for determining impact.</p> <p>RF expanded:</p> <p>His recommendation for the ‘model of the model idea is to:</p> <p>Run very coarse and complex model runs for each bathing site and a wide range of data parameters. This data is then stored and ran through Artificial Intelligence tools Once this is achieved, there is no need to run this models in real-time – you can pull the data from his models to provide very</p>	
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	<p>accurate information in BB, varying in real-time throughout the day – this is RF’s recommendation to SW.</p> <p>MO asked in chat:</p> <p>How would you distinguish between treated effluent and stormwater effluent OR if they happen to be both mixed?</p> <p>NM answered: They will be storm-water driven</p> <p>MO asked: Will David revisit review questions when IE is included please?</p> <p>NM answered: SW will commit to a review of the implementation of the recommendation in the Autumn</p> <p>AC commented:</p> <p>I was struck by the claim in the User and Engagement Review that users preferred BB to other sources of info (by implication SSRS), although I'd like to see if they actually asked that direct question. Everyone I speak to prefers SSRS!</p> <p>LH Replied: this was the view of the users interview by the user engagement specialist in her interviews with Beachbuoy users.</p> <p><b>Action:</b> SW to review this part of the report and if appropriate remove or add context</p> <p>MO Questioned:</p> <p>Can someone explain to me the research into changing the EDM sensors that is taking place?</p> <p><b>ACTION:</b> NM to provide the research on reliability of EDM’s to MO</p> <p>KRH answered:</p> <p>Sensors, like other engineering products, sourced from third parties. It is KRH understanding that reliability of failure statistic and malfunction with coming up with incorrect false positives. They detect level changes across weirs – if objects get in the way of a sensor, they will get a false positive. Failures are when they do not detect a spill happening.</p> <p>KRH explained his understanding is that the Control Centre as SW are informed of these, and will repair the sensors if found to be faulty.</p>	<p>LH</p> <p>NM</p>
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	<p><b>ACTION:</b> KRH to get reliability stats from SW on failure statistics and malfunctions, and how this influences procurement decisions</p> <p>KRH outlined that SW employ risk mitigation through using multiple EDM sensors at a location and that this is a good policy.</p> <p><b>ACTION:</b> NM to circulate research on EDM Data and common problems with reliability faced by the water industry.</p> <p><b>ACTION:</b> NH to follow-up offline a session to discuss the work being done to improve auto-verification and data quality to speed up review process</p> <p>MO asked: Will sampling be all year round or just bathing water season?</p> <p>NM: responded SW would like to do this all-year round</p> <p>DK: agreed that this would be a good approach.</p> <p>Andrew asked “Is IE and EC found in non-human animal feces?”</p> <p>DK answered: True [it is].</p>	<p>KRH</p> <p>NM</p> <p>NM</p>
11	<p>NM handed over to LH to present plans for BB 2.0</p> <p>LH presented slide on BB 2 product Development with the Beta Program</p> <p>LH linked the Beta Program being used with the way of working suggestions from Artemis</p> <p>LH outlined the user-centered approach and research tactics being employed through the beta program</p> <p>LH outlined the cross-section of users that are participating in the program and how they are contributing to the product success</p>	
12	<p>LH presented Slide 10 around the latest update for the BB 2.0 beta site and the key improvements being released</p>	
13	<p>LH Demoed the beta site with the new changes launched that day:</p> <p>Highlight that different regional views have been provided to get user feedback on preference (previously blue clusters only)</p>	

	<p>Demoed the new filtering tools for ongoing and ended releases</p> <p>Impacted and non-impacted filters were demoed.</p> <p>Informational page prototype was demoed and explained was a response to user feedback on the initial design of the beta site</p> <p>LH confirmed that informational page will contain and host all of the information content recommendations made from the independent review</p> <p>LH Demoed how the interactive content recommendation have already begun with the introduction of step-guys and a commissioned video</p>	
14	<p>LH welcomed questions following the demo</p> <p>VT asked: <i>“is there a way of only showing my area of interest?”</i></p> <p>LH answered: The idea of bookmarks are being explored so that users can save their area and quickly return to that view</p> <p>MO asked: “Are SW speaking and coordinating efforts with other water companies?”</p> <p>NM answered: “SW are talking [with other water companies] and NM has proposed a project to standardize an approach for all water companies”.</p> <p>EOB asked:</p> <p>Is it okay to share this information with other?</p> <p>NM confirmed is it fine to be shared with others and that we will publish the report and minutes from this meeting.</p>	
15	<p>The group discussed the need and idea of a unified approach to how storm overflows are shown publicly at the station level, with NM outlining the work being done with Surfers Against Sewage and other water companies to drive for standardization.</p> <p>EOB asked:</p> <p>Are SW connected with public health on the issue of storm overflows? Would public health data be usable?</p> <p>DK replied:</p>	

	<p>Epidemiology communities will gather data on who they are exposing the risk to, such as swimming in the sea. This data is important, as sampling could not confirm whether people contracted Noro virus with sampling but combining with public health data and period of incubation data and symptom, people this could be possible to work out. However, with 'less serious illnesses like people report at beaches, this data doesn't exist.</p> <p>RB Asked:</p> <p>"Are SW confident that the Mike software upgrade will answer the questions that were raised, and how often does this software need upgrading and will SW do these upgrades?</p> <p>NM answered: Upgrading the MIKE software is one step, but doing to modelling on the software is the second step. SW have commissions specialists to do this work.</p> <p>RF added: MIKE Upgraded is a lot more sophisticated and should provide a much better accuracy – especially the recommendation of the 'model of a model'</p> <p>MO asked: is the investment making a difference? Is the impact modelling too complicated and valuable?</p> <p>RF: Thinks that this work is important to demonstrate that water quality is not just determined by Storm Overflows e.g. given of cattle in streams.</p> <p>MO asked: How can we quantify the difference?</p> <p>RF: thinks this is a valuable exercise for SW and their customers</p> <p>MO agreed the independent review has been valuable.</p>	
16	<p>NMc outlined the importance of data quality.</p> <p><i>Is it worth investing in more accurate data?</i></p> <p>NMc stated: it depends on end-goal and that investing on accuracy helps understand when water companies are having an impact on water quality and then put further investment into mitigating the impact and reduce impact.</p> <p>It was added that SW work in partnership with other parties to leave the environment in a better state,</p>	

	and that investment in this work can open doors to better partnerships to achieve environmental goals.	
17	NM closed the meeting and thanked participants.  NM outlined plans to publish the report in the coming weeks.  NM outlined plans to follow-up with another independent review on how SW are actioning the recommendations	

Meeting finished.