



# Wet News

Water Special Interest Group Newsletter

Issue 81, May 2020

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## EDITORIAL

I turn on my computer and try to remember what day it is, as one day seems to merge into another – always the same home environment but with different calls on Skype, Teams or conference calls. Sometimes I get a moment from the incessant meetings to catch up on emails or important tasks such as editing this newsletter!

The world is in turmoil and the challenges of COVID-19 affect how we, at the @one Alliance (Anglian Water's Capital Delivery Team) engage with site teams, operations teams and managing a design team working from home, whilst managing home schooling and all the usual demands of life! Little different, I am sure, from most of our readers.....the Summer weather is enticing and looking out the window I see signs of things returning to some sort of normality.

## BACKWASHINGS

Richard Hill\*

Rather frighteningly it's four months since the last issue of WETNews, and how the world has changed in that short time. Backwashings this issue comes in the middle of the COVID-19 lockdown and, whether from concern about infection or simply boredom, the fake news teams are out in force. Water, of course, is very often at the front line in fake news reports, and two stories have come to my attention. The first is that a "Japanese doctor" recommends drinking water every 15 minutes to flush out any virus that might have entered your mouth. Prof Trudie Lang of the University of Oxford says there is "no biological mechanism" that would support the idea that you can just wash a respiratory virus down into your stomach and kill it. Whilst staying hydrated is generally good advice, even constantly drinking water isn't going to prevent you from catching the virus.

The second bit of fake news is that the virus can be transmitted in water and that you can become infected by drinking it. Well, ingesting the virus will not cause infection – you have to inhale the virus in an aerosol – and in any case, normal treatment disinfection processes, including chlorination, destroy the virus. That is assuming that water companies are able to obtain supplies of sodium hypochlorite – demand is likely to increase from those who are going to follow President Trump's advice and drink bleach to cure the disease. Now that would certainly work: drinking bleach has been shown to cure all known ailments in the same way as hemlock – a cock to Asclepius!

With a bit of luck, HMG's instructions about frequent handwashing will lead to an increased demand for our product. Or we could wash our hands in milk. With coffee shops and restaurants closed, the UK's dairy farmers are pouring over a million litres a day of milk down the drain. Then there's reported to be about 50 million pints of beer sitting in pub cellars, much of which will also end up going down the drain. Does anyone know what the impact of the additional COD will be on wastewater treatment plants? Maybe all of this will result in an increased investment in the industry, keeping us all employed for a while longer! Assuming, of course, that we eventually get back to some kind of normality.

But what is normal, and is it going to change? It's interesting to see how rapidly people have settled in to remote working. Skype, Teams, WhatsApp, Zoom and all the other communications media have never been busier, and many of us are having to learn how to use them for the first time. With university students working at home, in many cases overseas, lectures are being recorded and made available as podcasts with Q&A sessions via video links. Aside from the usual meetings, in the last few weeks I have "visited" three students on industrial placements and, on behalf of IChemE, carried out a virtual accreditation "visit" to a company graduate training scheme. I blush to admit that I am due to attend a virtual speed awareness course by DriveTech (strapline *Education, not punishment*) later this week. Are we destined to spend our lives permanently wired to laptops and mobile phones, never seeing anybody in the "real world"? This all sounds like the first steps towards *The Matrix*! O brave new world ...

For those of you of a classical disposition, Gaius Antonius Coronavirus (52-115CE) was a Roman poet, artist and craftsman who designed the triumphal column that commemorates the emperor Trajan's victory in the Dacian Wars. He also crafted the imperial crown (the *corona radiata*) worn by the Trajan on ceremonial occasions. Trajan was so pleased with the result that he rewarded Gaius Antonius with the cognomen Coronavirus or "crown man". Of course, that could all be fake news.

Stay safe, gentle Reader, and wash your hands.

Those of you who know me will be aware that I'm no wastewater expert. Other than a dangerous flirtation with landfill leachate in my youth, my experience has generally been restricted to managing masters of the dark arts, and translating their sage council for easy digestion by lawyers & leaders. But, as with most people during the COVID-19 pandemic, I have been thrown out of my comfort zone.

At three o'clock on a sunny Friday afternoon my family was walking through the woods - getting our daily permitted exercise. Laura, my wife, mentioned a dull ache in her chest and had to sit down. By nine o'clock that night, it had developed into a sharp pain. I'm no medical expert either, and started to worry that it might be a heart attack. We were also concerned that we didn't want to waste NHS time if it wasn't serious, so I called 111. We got through after 15 minutes and, within an hour, a doctor called us back and put Laura into COVID-19 isolation.

I quickly moved my stuff out of our room, set up camp in my office & made up a bottle of 70% isopropanol spray before leaving a flask of tea outside Laura's door.

The WHO and UK government guidance is that people with COVID-19 symptoms should "...use a separate bathroom from the rest of the household". If you can't do that then they recommend that you "clean a shared bathroom each time you use it".

For environmental reasons, we had been considering installing a composting toilet for some time. I was also concerned that the spray disinfectant Laura had to use each time she went to the bathroom wasn't helping her lungs.

By the time you read this I'll have posted details at [aqueum.com/composting-toilet](http://aqueum.com/composting-toilet) on how we chose the unit that we chose, but the main point is that Dr Titia De Mes of Stantec, who was in my Atkins team in Dubai often spoke at conferences on the benefits of segregating urine... That was good news as separating toilets are generally half the price of internally composting toilets and I'm a stereotypically tight-fisted Scot. From there, we decided that we would prefer to collect the liquids in a tank in the garden rather than having to walk through to empty a tank every couple of days. That left us with a choice of one unit that we could find which was available for next day delivery.

My dad has a tool hire account, so he rented a diamond core cutting drill, and I proceeded to make my first mistake. We had our house roughcast a couple of years ago and I was overly concerned that we might knock off a sheet of render. So, I donned my PPE and drilled a couple of pilot holes out through our attic space at the correct location, so that my dad could core drill from the outside-in. The excuse I'm sticking to is that I couldn't drill outside, as Laura couldn't leave the house, so I had nobody to hold the bottom of the ladder. My dad drilled back more horizontally than I had... I'll post a video of the whole affair at [aqueum.com/composting-toilet](http://aqueum.com/composting-toilet) but the key learning point is to core drill out rather than in, in order to ensure the exit holes are exactly where you need them.

As I said, I'm no wastewater or medical expert, but reading the WHO interim guidance, I got the impression that the main risk of COVID-19 contagion through wastewater is due to aerosols when infected individuals flush the toilet. It is therefore recommended that, as well as washing our hands, we all close the lid when we flush. One advantage of composting-toilets in these times is that you don't need to flush.

My experience so far is that:

- They can be installed in a day and some don't require any plumbing - so can make excellent emergency toilets for those who need to isolate.
- They don't smell - in fact ours smells much less than a regular flush toilet as the constant fan immediately extracts any gaseous emissions.
- They use tonnes less water than even the most efficient low-flush toilet.
- While they do extract air from your house, I believe they remove less heat, since the specific heat of water is >4x that of air.
- The extractor fan has quite a cooling effect on one's undercarriage - an experience that requires some getting used to.

- Ours lets us apply our liquid nutrients direct to the garden - at least in theory: we still need to check with the local council, but the liquid collection tank has an educator that mixes irrigation water 8:1 with yellow water.
- No matter how hard I try, the model we chose won't work standing up - I consider this to be a design-flaw to be remedied, as I often find myself in the hall wondering whether I should waste water using our regular toilet or waste time with the composting one. Perhaps I should just install a waterless urinal...
- You never forget to flush - or have to flush a stubborn floater multiple times. The model we chose opens a hatch and rotates the drum automatically when you sit on the seat. When you have finished there's nothing more to do - you don't even need to flush.

That takes us neatly to the part we haven't yet experienced, the one more thing left for us to do. And a request for advice...

I am told by their salespeople that "internal composting" toilets (which mix solid and liquids) actually do the composting in the unit, and produce useable compost. I don't know whether I believe that, but we may replace our main toilet with an "internal composting" unit for a long-term trial. Any expertise here would be most welcome.

I do certainly believe that our "composting toilet" does absolutely no composting. We have yet to empty the solids bin, which I guess will be the least attractive element of owner experience. Here's where we urgently need advice... Is it safe for us to add this material directly into our vegetable-waste garden composter, or does it require disinfection first? And, if disinfection is required, what means would you recommend? Once fully composted, we do use our garden compost to grow various vegetables that we eat.

I'd really value any advice from our wastewater treatment experts - please email me at [martin@aqueum.com](mailto:martin@aqueum.com)

But enough of my recklessly inexperienced venture to the dark side. I also promised to discuss **EVERYTHING the Water Industry is doing on COVID-19:**

Piers Clark (chairman of Isle Group) launched a WhatsApp group on COVID-19 for Water Utilities. Within three weeks they had over 300 utilities involved. Isle now have three subgroups that they would welcome you to join:

- Technology solutions
- SARS-CoV-2 in wastewater
- WASH Service Affordability

Other than my foray into composting toilets, I've been mainly working on economic mitigations that are broader than the water industry, so I've been feeling a little out of touch. I joined Piers' weekly webinar on Thursday morning at 06:30 GMT (he also does one at 15:30 GMT) and found it to be a breath of fresh air. Piers summarised the main points of the week from each of their subgroups. This basically means that it's a condense of everything that's going on globally in the Water Industry pertaining to COVID-19.

I had a quick flip through the past PowerPoints this morning and here are some of the points that I find most interesting for Process Engineers (I'd encourage you to follow up the references in Isle's PDFs):

#### **27 March:**

- Risk from faecal contact was considered low from the start, as only 2-10% experience diarrhoea
- Conventional water treatment (filtration & disinfection) deactivates the virus
- 99.9% reduction in wastewater in 2-3 days
- "Timing is paramount" - check warehouse stocks
- Work from home where possible (but with virtual coffee meetings, etc.) and keep crews separate

#### **2 April:**

- Ciclo Idrico have given instructions to reuse masks for 2-3 days after disinfection with 70% alcohol solutions or hypochlorite solution at 0.1 ppm
- Irish Water were advised that the wearing of PPE by operatives working in close proximity has no proven benefit

- US Occupational Safety & Health Administration stated: "There is no evidence to suggest that additional, COVID-19-specific protections are needed for employees involved in wastewater management operations, including those at wastewater treatment facilities."
- Sewage surveillance of SARS-CoV-2 RNA can be used to monitor community COVID-19

#### 9 April:

- Potable water sampling at customer premises has been suspended in many countries.
- "Everything is changing by the day, but [a study showing RNA but no virus in stools and no virus or RNA in urine] seems to indicate that there is no risks associated with wastewater or drinking water."
- "current disinfection conditions in wastewater treatment facilities is expected to be sufficient. This includes conditions for practices such as oxidation with hypochlorite (i.e., chlorine bleach) and peracetic acid, as well as inactivation using ultraviolet irradiation."
- Digital and remote monitoring and control are becoming increasingly important.
- Due to customers payment difficulties "Utilities are likely to go into the red soon."
- Demand patterns have changed: most days can be considered as per the weekends, demand reduction is also seen when nations collectively applaud their healthcare & critical workers.
- Legionella warnings as buildings are left with standing water.
- Various testing, removal/deactivation, remote monitoring/control, resilience & contingency technologies were listed.

#### 16 April:

- As per WHO, "For effective centralized disinfection, there should be a residual concentration of free chlorine of  $\geq 0.5\text{mg/l}$  after at least 30 minutes of contact time at  $\text{pH} < 8.0$ . A chlorine residual should be maintained throughout the distribution network."
- Isle "will provide a verified reference database which utilities can use with confidence to select solutions that address the four highlighted categories": Detection & Tests; Removal or Deactivation; Remote Monitoring / Control / Resilience; Contingency options.
- Rapid low-cost sanitation solutions are required.

#### 23 April:

- TU Delft have produced a brilliant poster on 12 Facts About COVID-19 Virus in Water.
- Sludge recycling to land is being stopped in many countries although research so far suggests that, while the virus is present in sludge, it is inert.
- "Viruses, being obligate intracellular organisms, can't sustain beyond a certain time in any body of water, unless they have found a host. The presence of viral RNA or proteins specific to nCoV2 does not mean the water is infectious." Ash Heada, Las Vegas Valley Water
- Chloramine should theoretically be as effective with SARS-CoV-2 as with other viruses, but confirmation is needed
- Process specific challenges include: difficulties in getting chemicals, reagents and other resources for operation, cancellation of infrastructure projects

#### 30 April:

- Persistence of Coronaviruses on Surfaces accounting to Medscape: plastic 5 days, paper 4-5 days, glass 4 days, wood 4 days, steel 48 hours, surgical gloves 48 hours, aluminium 2-8 hours
- COVID-19 is likely to be with us for 2-3 years until >3bn people vaccinated and we should expect resurgence in waves, with periods of lockdown as the new normal.
- Domestic demand is up 15-25%, non-domestic down 30-50%, revenue only increased where domestic meters had been installed
- Most utilities are trying to re-mobilise their capital programmes
- Wastewater RNA monitoring can lead to targeted lockdowns
- Many utilities are accelerating supply-chain payment

#### 7 May:

- Madrid domestic water consumption changes (sensors in ~300 homes): -16% washing machine -12% shower +14% tap +19% dishwasher +6% toilet, overall consumption +3.5% with peak between 11:00-15:00, 4 hours later than usual
- Faecal shedding is lower than with enteric pathogens like norovirus, so concentration in raw sewage should also be lower
- Dwr Cymru have seen virus in wastewater steadily decreasing over the last 4-5 weeks



- The three sub-groups mentioned above were launched, others proposed were: water affordability initiatives, water conservation and lobbying/comms

#### 14 May:

- Three COVID-19 wave scenarios proposed by University of Minnesota: Peaks and Valleys (regular repeat of what we have seen), Fall Peak (we haven't yet seen the worst) and Slow Burn (regular repeat but we're past the worse). None of these show COVID-19 going away in the next 2 years.
- Water Safety Planning is now a large focus of the WhatsApp group & many recommend the WHO Water Safety Plan Manual
- Xylem have published "Continuity Through the Coronavirus and Beyond. Managing water and wastewater utility risks during Covid-19."
- Isle are hosting a Digital Water Webinar on 21 May and an AI Water Group Webinar on 4 June
- World Bank have set up fast-track financing for Cov-19 response efforts
- The Federation of European Heating Ventilation and Air Conditioning Associations have produced a document on COVID-19 in air conditioning systems
- Comms needs to be considered: "EXAMPLE: UK, 12th May, Prime Minister Johnson mistakenly referred to 'Covid19 in water supply'. Correction issued but to late?...."
- "Detecting the virus's RNA in a water sample simply tells you that the virus has been there, the same as detecting a person's DNA at a crime scene tells you that the person has been there - it doesn't tell you that they are still there now OR whether they were guilty!"
- An [aguasresiduales.info](https://www.aguasresiduales.info) webinar pointed out that traces of SARS-CoV-2 RNA have been found in WWTPs prior to treatment, but the virus was already inactivated. No traces have been found after secondary or tertiary treatment or in raw sludge,
- "No special or additional PPEs are required to operate the WWTPs other than those that prevent the transmission among humans."
- "No additional treatment or disinfection is required to remove the virus from the wastewater."
- [Nature](#) article mentions that SARS-CoV-2 can appear in faeces within 3 days of infection, much sooner than symptoms requiring hospital care.
- KWR have been doing detailed sewage surveillance across the Netherlands and will be interviewed in the 21 May webinar.

Those are just my poorly referenced highlights that I imagine may be of interest to water process engineers. I'd strongly recommend contacting [charlotte.dewitte@isleutilities.com](mailto:charlotte.dewitte@isleutilities.com) if you'd like to join the next webinar, get your hands on the PowerPoints that I gleaned these nuggets from, or join one of the subgroups. And thanks again to Piers & Isle for collating all this information and letting me pull out my favourites for the WaterSIG.

Thanks also to everyone who participated in our COP26 consultation on IChemE and the climate crisis, we hope to publish a WaterSIG document on this shortly. I'd encourage us all to consider how we can build-back-better.

Keep safe

\*[martin@aqueum.com](mailto:martin@aqueum.com)

#### SECRETARY'S REPORT

Alice Elder\*

You will see elsewhere in this WET news my article on the AGM. It was (in my opinion) an inspiring event as it highlighted all the amazing work done by the SIG over the past year or so. We have enjoyed webinars on a wide range of topics, and encourage our members (as always) to put forward both ideas of topics you would like to learn more about and also topics you have expertise in that you could share with others. The commitment is really not onerous and our Webinars team, along with IChemE head office support, make the process as easy as possible. As we move into a new world of limited social contact, webinars really are a fantastic way to keep up with technical developments and best practice.

While we are putting on hold all physical meetings (true as of 17-Mar-2020 when this was written) we would still very much like to hear your suggestion so possible future physical events that we can begin the planning of to deliver in the future. We are also very open to the idea of "virtual" site tours and visits, whereby the

visit is recorded and then made available via the website – this is particularly appropriate for remote sites. If this option would be of interest to you, please get in touch.

## AGM

Alice Elder\*

The Water SIG AGM was held on 28 January 2020 with a turnout of 30 attendees, comprising both committee members (new, current and retiring) and SIG members. While we were sad to have some committee members step down, we recognised the contributions they have made to the SIG and the committee and hope to welcome them back in the future if they are able to. The departure of some committee members, as well as the creation of a significant number of new roles, enabled us to welcome many new people into a larger committee, which we hope will be better able to serve the needs of our SIG and share the responsibilities more widely across our membership. We also saw some people transfer into new roles, to broaden their own experience and benefit their professional development – there are so many reasons to join the committee!

The Chair's report, Activity report and Treasurer's report were all accepted, and all those standing for positions on the committee were elected. The AGM is still available as a recorded webinar, so please do watch if you would like to see all the detail. Otherwise the slides are available **VIA THIS LINK** for you to flick through.

\*Alice Elder (Affinity Water, UK)

## UNFLUSHABLES 2030? MAPPING CHANGE POINTS FOR INTERVENTION FOR SEWER BLOCKAGES': WORKSHOP PROCEEDINGS 27TH & 28TH JANUARY 2020

Amanda Lake\*



Unflushables 2030? was held earlier this year as part of a University of Manchester research project and the workshop was led by Clare Pillinger - Anglian Water, Rachel Dyson – Anglian Water and Business in the Community, Dr Vittoria Danino – Anglian Centre for Water Studies, Dr Alison Browne & Dr Claire Hoolohan – University of Manchester. The event was co-sponsored by United Utilities.

Sewer blockages causes the UK Water Industry some £88m per year to address– some half of these are attributed to unflushables, with wipes a key constituent of fatbergs (wet wipes made up more than 90% of the material causing sewer blockages [investigated by Water UK in 2017](#)). **Unflushables** are products often found causing problems in sewer systems having been disposed of via the toilet. The most problematic being wipes, sanitary products, incontinence pads, cotton buds, condoms, bandages, disposable nappies, syringes, razors, and dental floss. Some products are more flushable than others, but many of these products cause damage to wastewater treatment systems and contribute to blockages.

(Incidentally, we can deal with STEM and sorting out behaviours in the next generation with this [enlightening Go Jettors episode](#) set in a London sewer from which, over 11 minutes, my 5 year old learned what a fatberg was, not to flush wipes and that we can generate energy from waste fats, oils and grease from sewers ...some of the hydraulic lessons were a bit more dubious. If only it were that easy for rest of the population.)





(Source: [BBC iPlayer](#))

The workshop was great, particularly for its diversity - from academia, industry, water companies and the third sector. It sought to look beyond behavioural and at disrupting the current products and pathways for flushables and it's clear the diversity of thought is required.

Aside from expense, blockages can flood wastewater systems, resulting in damage to properties and the environment. Often unflushables aren't effectively removed in wastewater and stormwater treatment/management infrastructure and this is the reason our children find more cotton bud sticks than

shells at some beaches. Further, the plastic content of unflushables contributes to plastic and microplastic pollution. Demand side water efficiency and climate emergency is reducing flows in our sewers; this further exacerbates the issue.

The workshop output, [available here](#) from the University of Manchester includes a shared vision for 2030 and 9 key ideas we developed in group work for addressing the Unflushables challenge which included engineering solutions, promoting reuse, lifting taboos and recycling ideas.

As Chemical Engineers, it's easy to consider the engineering aspects – blocked sewers and damaged environments; of course infrastructure is just one of the issues and many social, cultural and material issues which contribute to the Unflushables challenge.

One aspect that struck me and was a topic in a number of the group discussions I participated in was the gender dimension and the social taboo around talking about in particular menstruation - which can contribute to unnecessary flushing or not trying reusable products. This could be an issue in work/school settings where facilities don't exist to allow the safe, private use of reusable menstrual products- though also in homes and house-shares where separate sanitary bins are not provided in bathrooms (did you know that a significant majority of people's homes don't have a bathroom bin and that under current UK Workplace (Health, Safety & Welfare) Regulations, male only facilities don't legally require a bathroom bin, despite that incontinence affects [some 10%](#) of men over 65).



Globally, [debate continues](#) around 'flushability' claims; I was also surprised to learn that even some luxurious toilet papers do not break down sufficiently. Agreeing on what constitutes flushable in terms of materials specification and testing is key and Water UK introduced a 'Fine to Flush' [specification](#), pioneered by Anglian Water and the UK Water Industry in January 2019 and recently in February 2020, a large UK manufacturer, Andrex (also owned by Kimberly Clark) achieved a [product certification](#) to this standard.

With manufacturers now supporting this new certification (after significant challenges), the future looks a lot brighter for our sewers in this respect - though given the associated carbon impacts of single use products, flushable or not, significant challenges remain.

The engineering norm of waste disposal using (drinking) water is only likely to become more topical going forward. In particular what infrastructure and social provisions the [55%](#) of global population without access to a safe sanitary system would benefit best from given water scarcity, the climate crisis and the imperative for circular economy.

The workshop outputs are being shared with the Environment Agency (UK) to feed into the Government's current consultation on the next round of river basin management plans (RBMP) and it is also hopeful to note that one of the Environment Agency's key measures in the next RBMP is around collaboration on a joined up outreach programme to reward changing attitudes to water.



(Image credit: [AquaEnviro](#))

And Dewatering, 2020 and Beyond and Resource Recovery. For an excellent summary of the event, please refer to Chris Thornton's from the European Sustainable Phosphorus Platform [here](#), otherwise, please continue!

From my perspective as an attendee and as an industry consultant, key challenges and opportunities for the biosolids industry worldwide, covered in presentations included landbank availability (not moreso in the UK where most sewage residuals are treated and applied to land), some brief mentions of the increasingly understood impact of the 'forever chemicals' (anyone seen [Dark Waters?](#)), energy generation/usage (and associated 'green' incentives), resource recovery (biogas, heat, nutrients, char, syngas...) and, in the UK, the [new de-regulated](#) sludge trading market (opening imminently; the panel discussion on this at the event last year highlighted many issues and much understanding yet to be resolved).



Topics including emerging technologies – e.g. pyrolysis, circular economy and alternative process technologies were also covered though the Climate Emergency was not mentioned as much as I would have expected or liked given the potential impacts and opportunities associated with biosolids (nitrous oxide emissions, carbon and nutrient benefits, circular product carbon footprints... I could go on forever). However, AquaEnviro do have an exciting, now slightly deferred, [Net Zero event](#) on later this year.

Some highlights from the sessions I was able to attend included an excellent presentation from David Tompkins (AquaEnviro) regarding the UK Biosolids Assurance Scheme ([BAS](#)) which highlighted very relevant issues around HACCP application within the scheme and its certification. It appears the Environment Agency are considering some of these issues with their [March 2020 published](#) review of the current sludge to land framework. The issue has also received media attention elsewhere recently with [this BBC broadcast](#). Some interesting work from Cranfield University on a Phosphate Acceptance Map also discussed in [this](#) paper and a very interesting perspective, in published Nature [paper here](#), from Celine Baneckhaute from Universite Laval, Canada, As Chemical Engineering Head of Department, Celine and her team are researching the application of a Quality by Design modelling approach from the Pharmaceutical Industry to circular products from wastewater residuals – for example fertilisers– in response to a no organics to landfill directive by 2022 in Quebec and new pan-Canadian 0.1mg/l TP in effluent from wastewater treatment.

In the thickening and dewatering session, some interesting thoughts on the challenges of vivianite with increasing chemical phosphorus sludges from Matthew Smyth (AquaEnviro), and a great overview of post THP-AD dewatering options from my colleague Ester Rus Perez (Jacobs). In Ammonia Management, Joe Merry from MWH gave a really interesting lessons learned in commissioning Basingstoke THP.

In the Resource Recovery session, in which I had the pleasure of presenting around the Climate Emergency and Wastewater with my colleague Sam Hughes, there were some interesting processes. In particular

around sustainable fertiliser products and carbon capture – with this process from **CCm technology** which uses captured carbon dioxide to stabilise nutrients and organic chemicals in waste streams [recently awarded](#) a £1m BEIS funding grant in February this year with Severn Trent Water, UK.

The event was divided into 3 rooms which ran concurrently with brief networking in breaks and over hand held lunches in the convention hall; it was run very well by Frances and the team from Aqua Enviro and such a pleasure to attend. In the face of Covid-19 I do think there is an opportunity (plus some carbon benefits) to try such an event virtually. Using video conferencing software and some effective moderators, you can easily bring people to and from parallel streams and open the floor to spoken or written questions... Yes you miss the networking but conference networking doesn't always suit all and I do wonder whether there are diversity and inclusion benefits in different approaches. Perhaps some value in thinking further about this... and, of course, plenty of value yet for us to realise in bioresources!

## WATER & SUSTAINABILITY

**Tawana Muchatuta\***



On the 8th of March 2020 the IChemE student chapter for the University of Malaya and Nottingham University hosted a “*Think Sustainable*” day for chemical engineering students from five universities across the country. Tawana Muchatuta, our newly appointment Events Co-Ordinator for Malaysia, was invited to present on the topic of sustainability with a focus on Water.

The timing could not have been more apt with the topical nature of sustainability globally. Typically, often dwarfed by the energy subject areas, water is often an afterthought when it comes to sustainability

and this was a great opportunity to share, to what was an enthusiastic group of our future chemical engineers, how water plays a part.

Key highlights included an emphasis on the framework of sustainability through the UN's 17 goals and showcasing the alignment in our very own IChemE 2024 Vision. Tawana explored the concept of the triple bottom line and anchored the talk with the poignant description of sustainability in the 1987 Brundtland Report: “Sustainability is meeting the needs of today without compromising the ability of future generations to meet their needs”



Through a case study of bottling plant operations, the audience was shown how simply applying the 3R's (Reduce, Reuse and Recycle) can almost fully describe and guide a Water Use Ratio (WUR) reduction program at multiple sites and visualising how the solutions can translate and subsequently make an impact in our daily lives.

Water is a resource we most certainly cannot live without and although the world is mostly full of it (~70%), a **tiny** proportion of it is potable (2.5% of which 2/3 is ice). We all need to do what we can and it starts with knowing how much we waste. <https://www.linkedin.com/company/icheme-um-sc/>

## WANTED: BOOK REVIEWERS

In previous years book reviews have typically been carried out by committee members, however we would like to open this up to the wider Water SIG in 2020. This is a great opportunity to promote yourself as well as your company, and you get a free copy of an exciting new industry text!

For more information, and to register your interest in reviewing any titles, please look on the Water SIG web page:

<https://www.icheme.org/membership/communities/special-interest-groups/water/news/icheme-water-sig-book-reviews/>

For any questions on book reviewing, please contact Kirsty McCall (Water SIG Book Reviews Coordinator) at [kmccall@esd.scot](mailto:kmccall@esd.scot).