The Journal of the Water Management Society

THE WATER MANAGEMENT SOCIETY

visit: www.waterline.digital

waterline

www.wmsoc.org.uk ISSN 0954 7711 • Autumn 2020

What can we learn from COVID-19?

Improving Standards for Risk Assessments of Pseudomonas aeruginosa within the Healthcare and Leisure Industries

Managing water safely during COVID-19 outbreak

PLUS

- Preventing Legionella contamination and Legionnaires' disease outbreaks in the UK
- Toolbox Talks - Pseudomonas
- Addressing Antibiotic Resistance

Aqua *free*

KILLS WITHIN 4 HRS.
MetalSkin Medical® Coating
99.5% OF SARS-CoV2

3

Baclyser®

Now with up to three months operating time

Highly effective medical water filters with MetalSkin® Medical Coating against waterborne bacteria.

Receive a free test set *

Aqua *free* Solutions Ltd.
info@aqua-free.co.uk
+44 (0)1484 483045
www.aqua-free.com/gb

* The test set consists a Baclyser® TL (3M) tap filter and Baclyser® S (3M) shower filter. The offer can only be redeemed once. Limited to one per person whilst stocks last. Valid until 31/12/2020.

For registration visit aqua-free.com/testset or scan the QR-Code

waterline

The Journal of the Water Management Society

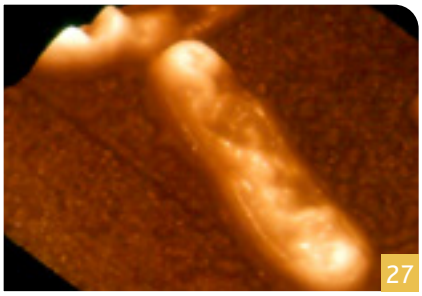
waterline Editor:
Geoff Walker

Guest Editor:
Sophia Kloda

12

21

24



27

42

IN THIS ISSUE

THE WATER MANAGEMENT SOCIETY

Water Management Society
6, Sir Robert Peel Mill, Hoye Walk, Fazeley,
Tamworth, Staffordshire. B78 3QD

Telephone: 01827 289 558 | Fax: 01827 250 408

Email: admin@wmsoc.org.uk

www.wmsoc.org.uk | www.waterline.digital

@WMSoc1 | @WMSoc_Waterline

What can we learn from COVID-19?

Jimmy Walker

Summary

So, like many organisations there was WMSoc organising their 2020 conferences and before we knew it the world was in lockdown and all events were rescheduled for 2021. Many freedoms were taken away, most people isolated at home and were practicing social distancing during the biggest pandemic in our lifetime. The emergence of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2; previously named 2019 novel coronavirus or 2019-nCoV) disease (COVID-19) in China at the end of 2019 has become the largest public health disaster in our lifetime[1]. And then, the public were asked to consider wearing face coverings in certain situations and then before we knew it wearing a facemask was compulsory to protect those around us.

So what is Covid-19?

Coronaviruses are enveloped viruses with a single-stranded RNA genome that were first recognised in the 1960s[2,3], are roughly spherical, moderately pleomorphic (can change their form) and have the largest genomes among all RNA viruses. The name "coronavirus" was derived from Latin corona, meaning "crown" or "wreath", and refers to the characteristic appearance of virions (the infective form of the virus), which are large bulbous surface projections that create an image reminiscent of a crown or of a solar corona[4].

Infection / transmission route

Whilst the initial transmission was considered to be human exposure in a large seafood and live animal market in Wuhan city, it is clear that the main human to human routes are respiratory droplets produced during coughing, sneezing, talking, singing and of contact with contaminated surfaces[5,6]. The virus has been identified in respiratory tract specimens 1–2 days before the onset of symptoms and peaks at around the time of symptom onset[7]. Hence, those droplets that we are expelling have received much attention. Van Doremalen *et al.*, (2020) were able to demonstrate that SARS-CoV-2 was more stable on plastic and stainless steel than on copper and cardboard, and the viable virus was detected up to 72 hours after application to those surfaces[8]. Meanwhile SARS-CoV-2 RNA was identified on a variety of surfaces in cabins of both symptomatic and asymptomatic infected passengers up to 17 days after cabins were vacated[9]. Such evidence has led to recommendations to wash hands after touching surfaces and there are those that wash their groceries after getting them home.

Interestingly whilst there was much conjecture in on-line forums that aerosols may play a role in dispersal and transmission, an analysis of 75,465 COVID-19 cases in China, did not identify airborne transmission as a route of transmission[6,10,11]. Chia *et al.*, were only able to recover the virus from aerosols in rooms of two of 30 patients in a hospital[8,12]. This does not mean the aerosol routes should be completely discounted as Van Doremalen et al., (2020) were also able to demonstrate that SARS-CoV-2 remained viable in aerosols for 3 hours[8].

So whilst we know that we expel droplets that contain viable viruses up to 2 metres and that these droplets land on surfaces, then you can understand the public health guidance for social distancing (2m apart), respiratory etiquette (for example, by coughing into a flexed elbow), rigorous hand washing (with soap and water or using an alcohol-based hand rub) after touching anything and not to touch your face[8].

Having published a manuscript in 2013 entitled "Testing the efficacy of homemade masks: would they protect in an influenza pandemic?" we started receiving communications and queries about our methods and results. This work was carried out by Anna Davis and led by Allan Bennett[13]. The conclusions of the study were "Improvised homemade face masks may be used to help protect those who could potentially, for example, be at occupational risk from close or frequent contact with symptomatic patients. However, these masks would provide the wearers little protection from microorganisms from other persons who are infected with respiratory diseases".

There is no doubt that the wearing of home-made face coverings by the public has caught the imagination of the press and many scientists as a way to combat the spread of the virus.

We know that healthcare professionals are trained in standard and isolation precautions, which will include wearing respiratory protective equipment (RPE) and a mask that will control the transmission of the virus (FFP3 respiratory mask) and that each mask needs to be fit tested to each individual.

The HSE have a practical guide to RPE at work (*https://www.hse.gov.uk/pubns/priced/hsg53.pdf*) which is relevant to a variety of organsations and service providers, including WMSoc members.

So would encouraging the public to wear face masks make a difference? Greenhalgh *et al.*, have recently published a review on whether wearing facemasks by the public would make a difference and were not able to find any conclusive publications that supported wearing of the masks by the public[14]. However, despite these conclusions they felt that now was not the time to wait for randomised controlled trials and advocated the precautionary principle that the public should wear facemasks in certain enclosed situations such as public transport.

Bearing in mind that the rates for asymptomatic carriers vary e.g. on board the Diamond Princess cruises ship, the proportion of asymptomatic individuals among those who tested positive for SARS-CoV-2 on board the ship was 17.9%[15]. Of the Japanese citizens who were evacuated from Wuhan to Japan, 33.3% were considered to be asymptomatic[16]. However, alarmingly the BMJ reported that up to 78% of new coronavirus cases could be asymptomatic.

If you do not have any symptoms but are shedding the virus then clearly a face covering would significantly reduce dispersal of contaminated respiratory droplets[17]. My own precautionary principle will stand, thus far on the scientific evidence which will include social distancing, regular and rigorous hand washing, respiratory etiquette (for example, by coughing into a flexed elbow), as well as not touching my face. I initially questioned the efficacy of wearing a face covering as I was not convinced that enough people would wear them to actually make a difference, but the tide of public opinion changed when face coverings became mandatory in shops and on public transport. It will take time to gather evidence on the efficacy of wearing face coverings by the general public to what impact this has made on the pandemic.

Whilst we are now all encouraged to wear a face covering and some of these are fantastic looking (indeed, fashion items) there is no doubt that the public need training in wearing their face coverings as it is not an uncommon sight to see face-masks being worn on top of the head as a sweatband, below the nose, or as a chin-strap and almost everyone will have a common route of infection via touching their face, contaminated objects and then using their mobile phone. Whilst they regularly gel or wash their hands that phone is often forgotten about.

Lessons learned (so far!)

Some COVID-19 symptoms are similar to those of Legionnaires' Disease (LD) and it is possible that LD was not always clinically tested for at the height of the pandemic. A study by Zhou *et al.*, (2020) showed that half of COVID-19 fatalities had experienced a secondary infection and a further small study by Xing, *et al.*, (2020) showed 20% of patients studied were infected with Legionella pneumophila antibodies. This suggests that COVID-19 patients are at increased risk of secondary infections both during recovery and for some months after, including those caused by waterborne pathogens such as Legionella and Pseudomonas aeruginosa. Many wards designated as "COVID" wards, were not necessarily on the augmented care testing schedule.

We are much more aware of the importance of hand-washing in breaking the onward transmission of the virus. This is important to remember when considering aseptic sampling techniques for taking water samples as cross-contamination from bacteria will be very similar. In the early stages of the COVID-19 water management and monitoring of water systems may not have been as rigorous as it should have been. As a consequence a number of water microbiologists worked with the ESCMID Study Group for Legionella Infections (ESGLI) to produce guidance for hospitals, temporary and converted buildings or parts of buildings and field hospitals as well as care homes and dental surgeries used for treating COVID-19 patients[18–20].

Other safety precautions must include the use of correctly fitted RPE when using or preparing chemicals such as chlorine or chlorine dioxide used in the control of waterborne infections.

In summary, it looks like this pandemic is going

to be with us for some time and the Government is working hard on introducing more testing and improving track and trace. As a water industry we too must play our part in ensuring that we adhere to the precautionary principals to ensure that we are protecting those around us including our families, employees and customers.

WMSoc wish to acknowledge that an earlier version of this article was published in the April 2020 International Biodeterioration and Biodegradation Society (IBBS) newsletter. Dr Jimmy Walker has kindly updated it to make it relevant to the WMSoc membership and to include the latest in ever-changing information and guidance and many thanks to Elise Maynard for her contributions.

References

1. *Lai C-C, Shih T-P, Ko W-C, Tang H-J, Hsueh P-R. Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and coronavirus disease-2019 (COVID-19): The epidemic and the challenges. Int J Antimicrob Agents [Internet]. 2020 Feb 17 [cited 2020 Apr 14]; Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7127800/*

2. *Lauber C, Ziebuhr J, Junglen S, Drosten C, Zirkel F, Nga PT, et al. Mesoniviridae: a proposed new family in the order Nidovirales formed by a single species of mosquito-borne viruses. Arch Virol. 2012;157(8):1623–8.*

3. *Almeida JD, Tyrrell DAJ. The Morphology of Three Previously Uncharacterized Human Respiratory Viruses that Grow in Organ Culture. J Gen Virol. 1967;1(2):175–8.*

4. *Masters PS. The molecular biology of coronaviruses. Adv Virus Res. 2006;66:193–292.*

5. *Li Q, Guan X, Wu P, Wang X, Zhou L, Tong Y, et al. Early Transmission Dynamics in Wuhan, China, of Novel Coronavirus–Infected Pneumonia. N Engl J Med. 2020 Mar 26;382(13):1199–207.*

6. *Fuk-WooChanMDab*ShuofengYuanPhDa*Kin-HangKokPhDa*Kelvin Kai-WangToMDab*HinChuPhDa*JinYangMDbFanfanXingMDbJieingLiuBNursbCyril Chik-YanYipPhDaRosana Wing-ShanPoonPhDaHoi-WahTsoiMPhilaSimon Kam-FaiLoMPhilbKwok-HungChanPhDaVincent Kwok-ManPoonMPhilaWan-MuiChanPhDaJonathan DanielIpMScaJian-PiaoCaiBScaVincent Chi-ChungChengMDa…ProfKwok-YungYuenMD. A familial cluster of pneumonia associated with the 2019 novel coronavirus indicating person-to-person transmission: a study of a family cluster - ScienceDirect [Internet]. [cited 2020 Apr 15]. Available from: https://www.sciencedirect.com/science/article/pii/S0140673620301549*

7. *Coronavirus disease 2019 (COVID-19) pandemic: increased transmission in the EU/EEA and the UK – seventh update. :31.*

8. *van Doremalen N, Bushmaker T, Morris DH, Holbrook MG, Gamble A, Williamson BN, et al. Aerosol and Surface Stability of SARS-CoV-2 as Compared with SARS-CoV-1. N Engl J Med. 2020 Apr 16;382(16):1564–7.*

9. *Public Health Responses to COVID-19 Outbreaks on Cruise Ships — Worldwide, February–March 2020 | MMWR [Internet]. [cited 2020 Apr 19]. Available from: https://www.cdc.gov/mmwr/volumes/69/wr/mm6912e3.htm?s_cid=mm6912e3_w*

10. *Liu J, Liao X, Qian S, Yuan J, Wang F, Liu Y, et al. Early Release - Community Transmission of Severe Acute Respiratory Syndrome Coronavirus 2, Shenzhen, China, 2020 - Volume 26, Number 6—June 2020 - Emerging Infectious Diseases journal - CDC. [cited 2020 Apr 15]; Available from: https://wwwnc.cdc.gov/eid/article/26/6/20-0239_article*

11. *Faridi S, Niazi S, Sadeghi K, Naddafi K, Yavarian J, Shamsipour M, et al. A field indoor air measurement of SARS-CoV-2 in the patient rooms of the largest hospital in Iran. Sci Total Environ. 2020 Apr 6;725:138401.*

12. *Chia PY, Coleman KK, Tan YK, Ong SWX, Gum M, Lau SK, et al. Detection of Air and Surface Contamination by Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) in Hospital Rooms of Infected Patients [Internet]. Infectious Diseases (except HIV/AIDS); 2020 Apr [cited 2020 Apr 17]. Available from: http://medrxiv.org/lookup/doi/10.1101/2020.03.29.20046557*

13. *Davies A, Thompson K-A, Giri K, Kafatos G, Walker J, Bennett A. Testing the efficacy of homemade masks: would they protect in an influenza pandemic? Disaster Med Public Health Prep. 2013 Aug;7(4):413–8.*

14. *Greenhalgh T, Schmid MB, Czypionka T, Bassler D, Gruer L. Face masks for the public during the covid-19 crisis. BMJ. 2020 Apr 9;m1435.*

15. *Mizumoto K, Kagaya K, Zarebski A, Chowell G. Estimating the asymptomatic proportion of coronavirus disease 2019 (COVID-19) cases on board the Diamond Princess cruise ship, Yokohama, Japan, 2020. Eurosurveillance. 2020 Mar 12;25(10):2000180.*

16. *Nishiura H, Kobayashi T, Miyama T, Suzuki A, Jung S, Hayashi K, et al. Estimation of the asymptomatic ratio of novel coronavirus infections (COVID-19). medRxiv. 2020 Feb 17;2020.02.03.20020248.*

17. *Day M. Covid-19: four fifths of cases are asymptomatic, China figures indicate. BMJ [Internet]. 2020 Apr 2 [cited 2020 Apr 17];369. Available from: https://www.bmj.com/content/369/bmj.m1375*

18. *ESGLI. ESGLI Guidance for managing Legionella in dental water systems during the COVID-19 pandemic. 2020; Available from: https://www.escmid.org/fileadmin/src/media/PDFs/3Research_Projects/ESGLI/ESGLI_GUIDANCE_FOR_MANAGING_LEGIONELLA_IN_DENTAL_WATER_SYSTEMS_DURING_THE_COVID-19_PANDEMIC_22042024_v01.01.pdf*

19. *ESGLI. ESGLI Guidance for managing Legionella in nursing & care home water systems during the COVID-19 pandemic. 2020; Available from: https://www.escmid.org/fileadmin/src/media/PDFs/3Research_Projects/ESGLI/ESGLI_GUIDANCE_FOR_MANAGING_LEGIONELLA_IN_DENTAL_WATER_SYSTEMS_DURING_THE_COVID-19_PANDEMIC_22042024_v01.01.pdf*

20. *ESGLI. ESGLI Guidance for managing Legionella in hospital water systems during the COVID-19 pandemic. 2020; Available from: https://www.escmid.org/research_projects/study_groups/study_groups_g_n/legionella_infections/*

GAIN A CPD POINT BY ANSWERING THESE QUESTIONS ON THIS ARTICLE

Q1: What are the similarities in transmission routes between COVID-19 and Pseudomonas aeruginosa?

Q2: What water treatment/hygiene tasks may require the operator to wear RPE?

Q3: What additional HSE guidance should be consulted with regard to RPE?

Q4: What is one important way of minimising cross-contamination when taking water samples?

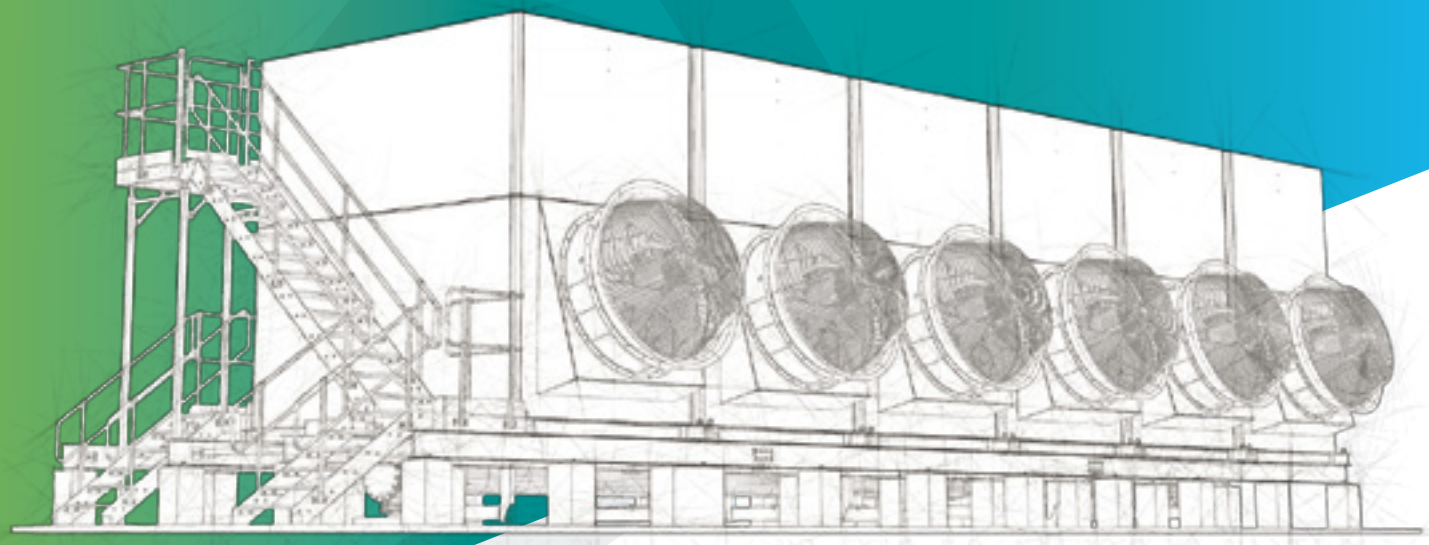
EMAIL YOUR ANSWERS IN TO ADMIN@WMSOC.ORG.UK TO GAIN YOUR CPD POINT

The answers will be published in the Winter 2020-21 edition. A cpd point will be awarded for correct answers received before publication of the next edition of waterline. Extra CPD points will be awarded to members who provide extra research and/or evidence and to those members whose answers are accepted for publication in Waterline.

1 cpd point

Watermiser
water cooling solutions

DESIGN
MANUFACTURE
INSTALL



We are Watermiser

We are innovative leaders in the UK cooler tower and industrial water-cooling market, placing sustainability at the heart of everything we do. We've designed, manufactured, supplied and installed evaporative cooling towers, dry blast and adiabatic coolers, chillers and associated equipment for many years now from our base in Scotland and we're proud to be viewed as something of niche experts in this field.

A solution for every situation

We can flex our offer to suit what our client needs, from servicing and supply of spares through to an adept, end-to-end turnkey service, complete with mechanical pipework, structural and access metalwork.

A partner of Dustacco Engineering

Get in touch with our team of experts

- 01560 320762
- info@watermiser.co.uk
- watermiser.co.uk

PipeLine

Ian E Kershaw, Chairman WMSoc

Hello,
Firstly I should like to extend my sincere thanks to Colin Brown for his sterling stewardship of the Society over the past 27 months, especially the difficult times during this Covid Pandemic. Not that he has got off the hook as I will be seeking his advice in his next 12 months as Immediate Past Chair.

It has been a difficult time over the past seven months especially with the loss of Sue Pipe whose contribution to the Society over the years had been immeasurable and I believe the naming of the PTA to the Sue Pipe Training Centre to be a fitting tribute to that contribution.

Colin alluded to the comings and goings on Council following the recent elections and I would to thank those who have 'departed' and extend a very warm welcome to the new members of Council. It is pleasing to see the number of ladies on the Council increasing and especially another member from North of the Border. I am sure they all will make a contribution to the workings and the future of the Council.

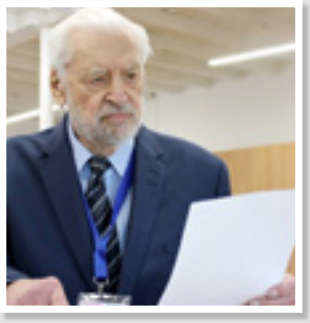
For my part I would like to see an ever increasing membership along with a diversity to the range of members to include those who are currently involved in shall we say 'managing water'. In this way we are not just restricted to water treatment and water hygiene companies. Without those other industries out there we wouldn't have water in premises for us to deal with. Not only that, but without consultation with designers & installers we can end up with systems that present problems from day one which we seem to spend most of our time sorting out.

Over the last few months there have been several changes within the sub committees on Council and this has helped refocus on the priorities of the Society in what have been very challenging times. I refer to a fresh look at training, events, Waterline & membership and I would like to thank the Chairs, and members, of those committees for their continued work for the good of the Society.

I would also like to encourage members of the Society to get involved with the day to day workings of Council. There will be elections next year and if you believe you have something to offer why not stand for Council, write an article or even complain about my Letters to the Editor (although that, not surprisingly has already happened) it is all appreciated.

Finally I would just like to thank the Officers & Council for putting their trust in me to take the Chair of this fabulous Society, I am deeply humbled & honoured and can assure you that I will do my upmost to forward the interests of the Society over the coming months.

Gerry Hill



It is with great sadness that we announce the passing of Gerry Hill on the 18th September 2020 following a long illness. He leaves behind his beloved wife Gwen and a large family, and he will be sorely missed.

Gerry was a formidable contributor to Waterline, with the provision of limitless numbers of articles for both the Waterscan and Contracts, Products and Publications sections over many years, only stepping down from his role in the winter of 2018/19 at the age of 91. Indeed in many editions of Waterline Gerry's articles formed more than 80% of content. He provided all his articles in handwritten content faxed to the office for inclusion and amused many with his quirky approach to news and views.

Waterscan is the part of Waterline that many of us turn to first and without Gerry's contributions this would have been a much more sterile and uninteresting feature.

His input was recognized at the WMSoc AGM held at the Metropole Hotel at the NEC in 2018.

On his 90th birthday the much missed Sue Pipe wrote: "I first became aware of Gerald or GBH 50 years ago when my father [Philip Millington] went to work at Carter Thermal Installations where Mr Hill was his boss. Philip had immense respect for Mr Hill and his knowledge and held him in great esteem. He was also impressed by GBH's prowess as a bridge player, a pastime he followed for many years and as far as I remember represented his club on a regional and national level. When Mr Hill retired from Carters I was contacted by Eddie Pring who was concerned that GBH would need something towards which to direct his talents and asked that I would consider enlisting his help in putting together Waterline. This became a very happy liaison for many years and I also developed a great respect for Gerald's voracious appetite for news both national and technical. His contributions submitted were written in long-hand as he reckoned his mind worked faster than his fingers would on his keyboard. We spent many an hour proof-reading Waterline over cups of coffee followed by lunch and I now miss my trips to his house where both Gerald and Gwen made me so welcome. Gerald and I had many a tussle over grammar and syntax and I was correct sometimes!!"

In his later years the Waterline committee suggested that it should take some of the pressure off him and Geoff Walker took over finding topics of interest for Waterscan, but we didn't want Gerry to feel that he was being frozen out. We needn't have worried! He continued to send through anything up to 40 items for each issue of the journal. Geoff noted that when he first met with Gerry, at Gerry's home, he was warmly welcomed (cappuccino and chocolate biscuits), and personally discovered the wit and gentlemanly courtesy of this wonderful man.

Older members will recall that Gerry co-authored a text book, ***Cooling Towers Principles and Practice. A Practical Guide to Cooling Tower Design and Operation. An Aid to Water conservation***, with W.Stanford, published by Carter Thermal Engineering Ltd, Birmingham, 1967. This 1st edition was updated 3 years later with a 2nd edition titled; ***Cooling Towers - Principles and Practice. A Practical Guide to Cooling Tower Selection and Operation***. Stanford, W. and G. B. Hill, published by Birmingham, Carter Industrial Products, 1970. Some 20 years passed and Gerry felt the need for a 3rd edition, which became a very popular text book, ***Cooling Towers Principles and Practice*** by G. B. Hill; E. J. Pring; Peter D. Osborn. Publisher: Elsevier Butterworth Heinemann.

WMSoc has contacted the publisher for permission to print the Foreword to the 3rd edition, which is a fascinating read and an insight into Gerry's thoughts on water scarcity, rising water costs and Legionnaires' disease. If permission is granted it will be published in the winter edition of Waterline.

Letter to the Editor

Dear Editor

CPD – My Route to Membership

As part of my Continuing Professional Development (CPD) I recently received confirmation that my application for full membership of the Water Management Society had been approved. In the interest of providing an example to new members or those wishing to apply for higher membership grades and to show how CPD can be a valuable tool in career development, what follows is an overview of my CPD journey thus far.

Firstly, it's important to note that I'm not in the early stages of my career – I have previously worked in the oil and gas industry for 16 years, working on offshore drilling installations. However, a change in personal circumstances meant that I took a different direction, and continued to develop my career along a new path. One of the first steps along this path was a Water Management Society training course, which I took in 2016. Upon reflection, I'm confident that in terms of training provider, the course was a wise choice. Having attended various water management training courses held by other providers, I found the expert course tutor and level of content to be a cut above the rest.

During my time working offshore, I had neglected many opportunities for professional development and hadn't realised the importance of recording completed CPD. This meant that, at the time of applying for initial membership, my qualifications and experience weren't sufficient. Despite this, following completion of my first Water Management Society training course, I continued to be inspired by the course tutor's level of knowledge, and set out to develop my own CPD plan, following the society's CPD road map. My plan had the goal of progressing and developing my career in a new direction of engineering.

Since completion of my first Water Management Society training course, and with a better understanding of CPD and its importance to the wider scope of my career, I've taken guidance from the society's CPD road map, which clearly details stages of membership and required levels of CPD. In doing so, I have now progressed to full membership, and the learning process has provided me with a solid foundation for further learning and development.

Commitment to CPD has been the key to my recent membership upgrade. Now, it plays a large part in the development of my current career stage, working as a Compliance Officer in the Estates Department for LPFT. My role includes involvement in all aspects of water management across the Trust, including the Trust's Water Safety Group. As my career in the NHS continues to progress, CPD is sure to enhance my knowledge and skill set along the way.

An important piece of advice I can give is to record your CPD correctly with an appropriate level of information. Ensuring your CPD is updated and noted at the earliest opportunity after any training or learning is completed is an exercise for yourself, and ensuring a good level of detail is included will help with referencing. This is an area I have let myself down with in the past, so I speak from experience when saying how important it is. The CPD log provided by the Water Management Society provides an effective system for record keeping.

Ultimately, everyone will address CPD differently, and no one's journey looks the same. For me, structuring my development to achieve new career goals was fruitful; in doing so a high quality development was possible. Remaining committed throughout the process was important, as my path had many different levels of development, including formal qualifications, short training courses, and small, bite-sized learning from relevant webinars and attending industry conferences. This structure I have found to be effective so it's something I'll carry forward as my career continues to evolve, ensuring my skills and knowledge are enhanced along the way. Over recent years, I've continually reviewed my CPD, ensuring it addresses any skill gaps, and enables me to build knowledge to complement areas of my work.

Across the years of my career development, I have come to realise that CPD is a long term commitment across all stages of your career - one which ensures continual development and on-going learning. When done correctly, commitment and effective structuring with your CPD will not only help you to map out your ambitions for the future, but it will help you to bring them closer within your reach.

Mark Keely,
Lincolnshire Partnership NHS Foundation Trust (LPFT)

WMSoc TRAINING UPDATE

WMSoc would like to thank all our Tutors and delegates who have attended the "New Look" training courses since our reopening in July 2020 – the feedback has been exceptionally positive and the smaller class sizes have been very well received. We are aware that practical training has been very hands on in the past and we have risk assessed those activities to be able to deliver as much as we safely can. There is ample opportunity to visit the Practical Training Area, where required, and the tutors will be on hand to answer any practical questions that you may have during the exercises provided.

As a lasting memorial to Sue Pipe, our honorary secretary and long time supporter of the Cooling Water Association and later the WMSoc, who sadly passed away on the 16th December 2019, we are pleased to announce that the Practical Training Area has been renamed the Sue Pipe Training Centre. The official renaming ceremony will take place with members of Sue's family once restrictions on gatherings are eased. We will bring you pictures of this event once it can safely take place.

WMSoc CPD Road Map

THE WATER MANAGEMENT SOCIETY

The Water Management Society's Continuing Professional Development (CPD) programme is the process of tracking and documenting skills, knowledge and experience gained both formally and informally as your career develops beyond your initial training. The WMSoc CPD Road Map will focus your development and allow you to progress to higher grades of WMSoc Membership as desired. CPD points are awarded for undertaking relevant classroom and vocational training, reading and article submissions, etc., for example:

- **1 CPD point = 1 hour of recorded learning time (e.g. reading relevant technical journals)**
- **6 CPD points = 1 WMSoc Training Course or Conference (*or equivalent)**
- **Up to 12 CPD points may be awarded for writing a technical paper published in waterline**

NON-MEMBER

- Attend a WMSoc training course or conference (6 CPD Points).
- Following your initial WMSoc training course, you become a **Temporary Member** until 31st December of current year.
- To retain membership you should attend at least one WMSoc training course or conference in the following year.

TEMPORARY MEMBER

As a **Temporary Member** you can apply for **Temporary Associate** membership immediately following attendance of a WMSoc course or conference to demonstrate your commitment to long term career development provided:

You commit to gaining a further 18 CPD points within the next 12 months, including at least one further WMSoc training course* (worth 6 CPD points). This results in a total of 24 CPD points being accrued over the year.

TEMPORARY ASSOCIATE

As a **Temporary Associate** of two years standing, you may apply for **Associate Membership** providing:

1. You submit your up-to-date CV and relevant experience for review and approval by Council/ Membership Committee.
2. You supply evidence that you have met your commitment of gaining 24 CPD points within the timescale detailed above.
3. You commit to gaining a further 24 CPD points (including 6 CPD points from 1 additional WMSoc training course*) within the next 3 year period.

ASSOCIATE

As an **Associate Member** you may apply for **Full Membership** at the end of Year 4 providing:

1. You submit your up-to-date CV and relevant experience for review and approval by Council/Membership Committee.
2. You supply evidence that you have met your commitment of gaining at least 48 CPD points in total with 24 of these points accrued within the previous 3 years.
3. You are willing to maintain your commitment to CPD during your career (by reading, refresher training, etc.)

FULL MEMBER

As a Full Member you are expected to maintain your commitment to CPD during your career, which can be done by reading, attending industry-relevant conferences, seminars or training courses, or submitting written papers or articles.

cpd

WMSoc CONTINUING PROFESSIONAL DEVELOPMENT

*Undertaking the relevant available WMSoc training courses is preferable and will support your application for higher grades of membership as the Membership Committee can easily verify the quality of your training. However, the validity of other industry-related courses is acknowledged and will also be considered.

Vacuum based ClO_2 generation - the safer way
Legionella control / Process Water Disinfection

Lutz-Jesco GB Ltd., Unit C1 Loades Ecoparc, Blackhorse Road, Coventry CV7 9FW. T: 02477 103306
W: www.lutz-jesco.com/uk **E**: tosh.singh@lutz-jesco.com

Dosing | Liquids
Conveying | Gases
Control | Systems

Waterscan

NEWS FROM THE WHOLE FIELD OF WATER AND ITS EFFECTIVE MANAGEMENT

RNLI complain of antisocial behaviour

Lifeguards are reporting a rise in antisocial behaviour, often due to excess alcohol intake and abuse of the guards, and more people getting into trouble in the water as people head to the UK's beaches this summer. At Southsea in Portsmouth, lifeguards say they have dealt with more incidents than normal, with people staying in the country for holidays and travelling from further away.

The RNLI is running a reduced service this year and staffing 170 UK beaches with lifeguards, when normally the charity would be at 240. New protocols have also been introduced for lifeguards, including putting on PPE before treating casualties.

Ethiopia filling dam in Nile headwaters

Egypt fears that Ethiopia's hydroelectric project will restrict limited waters on which its population of more than 100 million people depends.

The huge project on the Blue Nile, known as the Grand Renaissance dam, is at the centre of Ethiopia's plan to become Africa's biggest power exporter.

"The construction of the dam and the filling of the water go hand in hand," Seleshi Bekele, Ethiopia's water minister, said. He denied that Ethiopia had decided to begin the process of filling the dam, but confirmed analysis of recent satellite images that showed the reservoir swelling.

Egypt's foreign minister, Sameh Shoukry, stated that any "significant harm" to Egypt's water security by the dam constituted "a red line". He said Egyptian authorities would react "firmly."

Ethiopia, Sudan and Egypt have spent a decade negotiating a deal to regulate the flow of water from the £3.6bn mega-project on the Blue Nile river, with talks intensifying in recent months as the end of construction work approached. The dam blocks the river as it runs from Lake Tana in Ethiopia to meet the White Nile in Khartoum, before flowing north into Egypt. It will take several years to fill.

Sudan is less worried than Egypt, and hopes to gain access to cheap electricity that would provide a welcome boost for its troubled economy. Yasser Abbas, Sudan's irrigation minister, said on 13 July that all parties were "keen to find a solution" but technical and legal disagreements persisted over the dam's filling and operation.

SpaceX has landed, with a splash

Two US astronauts made a safe return to earth, after the first manned mission to the International Space Station using a SpaceX rocket and capsule, on the 2nd August. This was the culmination of the first mission in which a commercial spacecraft was used rather than a NASA craft to fly from US soil into space. (For the last 9 years NASA has relied on the Russians to fly American astronauts to the ISS, in Soyuz spaceships). They landed in the Gulf of Mexico, near the Florida panhandle, the first splashdown by an American spacecraft for 45 years, the last being in an Apollo capsule following an Apollo – Soyuz docking mission in1975.

Horseshoe crabs saving humanity

A staggering 500,000 horseshoe crabs are 'bled' by the global pharmaceutical industry each year, as the animal's unique blue blood contains the only natural source of limulus amebocyte lysate, a substance that can be used to detect toxins, which is a process vital to the production of vaccines, including a Covid-19 one.

Now conservationists are calling for a synthetic alternative, known as recombinant Factor C (rFC), to be used instead. The European regulator approved the use of rFC, but the US has called for further testing prior to its use.

Horseshoe crab numbers have dropped dramatically in recent years. The pharmaceutical industry returns all the crabs it uses to the ocean, but various studies suggest that somewhere between 3 and 30% of the returned crabs then die, so the industry appears at least partially to blame for the decline in numbers.

Warm mine water to heat homes

A new garden village in County Durham is hoping that it will soon be getting its heat from a surprising source: it will be warmed by water from a disused mine.

The water temperature is raised naturally, by heat from the Earth's crust. The water is planned to be pumped up from flooded shafts and used to heat the whole district using a single system. The 1,500 residents of South Seaham Garden Village shouldn't notice that the warmth from the radiators derives from the dust-smeared sweat of their forebears.

Surveying work for the scheme is due to happen soon. If the project succeeds, it'll help meet the UK target of virtually zero carbon emissions by 2050.

The potential is large because around a quarter of Britain's homes sit on coalfields. Although some mines won't be suitable, it's hoped that many will supply consistent warm water.

For the Coal Authority, which manages disused pits, the idea could turn a liability into a profit. Selling warm water might cover the costs of pumping mines, which has to be done anyway to prevent them burping dirty mine water up to the surface.

Reefs to be restored to support native oysters

Across the whole UK, wild native oysters have declined by more than 95%, with the decrease due to a combination of over-harvesting, habitat loss, pollution and disease.

The Government has now awarded a fund of £1,180,000 to the Zoological Society of London, the Blue Marine Foundation and British Marine, to help their Wild Oysters Project recover the native population. The project will result in oyster habitats being recreated at three locations that have been lost from the British coastline, bringing some 8,000 square miles of reefs back to life.

Healthy oyster beds are hugely productive and help a rich biodiversity of associated species to thrive. To that end up to 9 billion oyster larvae will be released from pontoons anchored above the three oyster reefs created across the River Conway estuary, the Firth of Forth, and the Tyne & Wear coastal waters, where they will fall to the seabed and settle on the reefs.

Worst Arctic disaster since 1989

Officials in Siberia have warned that it will take years to clean up a massive fuel spill in the Arctic Circle. More than 21,000 tonnes of fuel was released when a fuel reservoir collapsed late in May at a power plant operated by a subsidiary of metals giant Norilsk Nickel in the city of Norilsk. It is the largest ever to have hit the Arctic, say environmentalists.

Thawing permafrost beneath the fuel tank is believed to have caused its collapse.

Investigators said on 3rd June that they had detained the director of the power station and two engineers on suspicion of breaching environmental protection rules. If convicted, they would risk up to five years in prison.

"The company considers this measure to be unjustifiably harsh," Norilsk Nickel said in a statement, adding that the three detainees are all "cooperating with law enforcement authorities [although] they would be much more useful at the scene of the clean-up operation".

Viktor Bronnikov, general director of Transneft Siberia – an oil and gas transportation company involved in the clean-up – said that the situation was stabilising as workers were using booms to contain the reddish-brown diesel on the surface of the Ambarnaya River and pumping it into tanks on the bank. He estimated at least eight to 10 days to clear the river but that it would take many years to completely clean up.

Beavers to become permanent part of England's wildlife

Beavers are native to the UK and used to be widespread in England. They became extinct in the 16th century, mainly because of hunting for their fur, meat and scent glands; a secretion from the glands is used in perfumes, food and medicine.

Beavers are often referred to as 'ecosystem engineers'. They make changes to their habitats, such as digging canal systems, damming water courses, and coppicing tree and shrub species, which create diverse wetlands. In turn these wetlands can bring enormous benefits to other species, such as otters, water shrews, water voles, birds, invertebrates (especially dragonflies) and breeding fish.

In 2009, the Eurasian beaver was reintroduced into England, in controlled trials to assess the long term impact of its presence.

Now the Government has announced that beavers will have a permanent place in the country. A 5 year trial in the River Otter, Devon, has ended and the Wildlife Trust has been told it can take down fencing and allow the beavers to roam the river freely and colonise it. Other trial sites are waiting for approval as the Government finalises a national strategy for the release of beavers that will minimise impact on farmers and local communities.

Fisherman killed by a mackerel

A fishing trip in Australia ended in death when a fish jumped into the boat and hit a 56-year-old. It caused problems with his heart, and the attempt to revive him was unsuccessful. The casualty was fishing in Darwin Harbour with his family and friends when he was hit in the chest by an 18 kg mackerel. A local fisherman told the media that the blow caused "blunt trauma", causing the man's heart to develop arrhythmias.

The others in the boat quickly took the man to the bank, where he died despite chest compressions from ambulance personnel. It was a "freak incident and hugely distressing for the people in the boat and other family and friends of the man," said police.

In a similar incident in 2018, a woman barely survived after her neck was cut open by a jumping mackerel while fishing.

Saved by a lobster pot

Two female cousins, aged 17 and 23, reported missing on the evening of the 12th August, after going paddle-boarding near Galway, Ireland, were found alive 17 hours after they had set off, clinging to the buoy of a lobster pot.

The mother of one of the paddle-boarders called the coast guard as darkness fell, and a major search and rescue operation got underway. The rescue initially involved only the RNLI but, as the situation deteriorated, other resources were brought in, including the Aran life boat, Coast Guard helicopters and the Civil Defence. Later, the Gardaí, the local flying club and volunteers including sailing clubs all pitched in.

Although the cousins had been wearing lifejackets, they were not wearing wetsuits because of the fine weather conditions and their intention to stay in the water for just a short period.

Their eventual rescuers, fishermen Patrick Oliver and son Morgan, said that they had calculated the correct location with the use of tidal and weather information. Mr Oliver, who has also served on the Galway Bay Lifeboat crew for a number of years, said the pair had done everything necessary to survive a night that saw a warm sunny evening give way to tempestuous conditions. "As soon as we got the word they were missing, and with the wind that was there last night and everything else, we kind of predicted where they might have gone," he said. "They did everything right. They held on to one another, they didn't lose touch and it can't have been easy with the night that was in."

Barry Heskin of the RNLI in Galway said the pair were lucky to be alive. It had been a "very dark night" with heavy rain, thunder, lightning and high winds, he said.

Life on Pluto?

Analysis of images from Nasa's New Horizons mission shows that Pluto was hot when it first formed, with a liquid ocean, rather than a celestial snowball as earlier thought.

It is believed that deep below an ice shell more than 60 miles thick, an ancient body of water could hold the ingredients to life outside our planet.

Carver Bierson, a planetary scientist, said: "Even in this cold environment so far from the sun, worlds (like Pluto) might have formed fast and hot, with liquid oceans. Long term chemical interactions between such oceans and the rocky materials below may have implications for the potential habitability of these distant icy worlds." The findings are published in *Nature Geoscience*.

Sailor's distress call to mum

Teenager Timothy Young, 15, set off from Hamble Point Marina, Hampshire, on the 16th July, bidding to become the youngest solo, round-Britain, sailor, beating the record set by 17 year old Tom Webb in 2017.

However, when he reached Haslar Marina, Portsmouth, several hours later, he had to put in an emergency call to his mother. She said his query was "Mum, how do I cook pasta?" As he asked the question the flustered young man knocked over all the sauce, which then apparently ran down the front of his oven.

The voyage is expected to take around 10 weeks, covering some 1,600 miles. Timothy's longest solo sail before this was a mere 40 miles.

He said: "I wanted to do something that was going to push me and take me somewhere new I had never been before, on my own, so I thought why not sail around Britain."

Editor: A pat on the back for trying to avoid the junk food that most 15 year olds would be happy to eat.

Disinfecting booths prompt WHO health warning

Restaurants, bars, retirement homes and airports around the globe have been identified as having installed "disinfecting booths" outside their premises. Also known as "personnel protection tunnels" they work by spraying users for typically 5 seconds with a dry mist containing a solution of water and 1 ppm of hypochlorous acid.

The spray is said to help stop the spread of virus and bacteria, in a similar way to hand sanitizer. However the World Health Organisation has expressed concern that spattering people with disinfectant could be "psychologically and physically harmful." Its website points to the possibility of the chlorine causing eye and skin irritation, bronchospasm due to inhalation, and gastrointestinal effects such as nausea and vomiting.

One major manufacturer is planning to install 9,000 of the booths in the UK by the end of the year and is in talks with two Premier League clubs to have them installed at stadium entrances.

A yard of ale – just right for social distancing

The Leader of the House of Commons (also known as the MP for the 18th Century), Jacob Rees-Mogg, has suggested that pubs serve beer in yard of ale glassware (~2.25 pints) as opposed to the normal one pint glass. This, he noted could be used as a means of adhering to social distancing rules by pub landlords.

Landlord of the Sutton Arms in Clerkenwell, London, Mick Duignan, laughed at the suggestion, saying: "He must be joking. We will definitely not be selling a yard of ale. We used to sell it to students but I was delighted when we got rid of that glass. I smashed it. It's horrible."

Mr Rees-Mogg's favoured tipple is said to be Somerset cider.

Editor: Many years ago I watched a groom on his stag night successfully drink a yard of cider, (in one go, no stopping for a breather), and all was well until someone gave him a congratulatory bear-hug. I'll leave it at that!

Seahorse trust calls for extra care

Neil Garrick-Maidment, executive director and founder of The Seahorse Trust, has called for visitors to take care when visiting the Dorset coast. In particular, he is concerned about the conservation of the protected seahorse population found in Studland Bay as more people head to local beauty spots.

He said: "We ask anybody visiting the area to please respect the natural beauty you have come to see. Seahorses have made a remarkable comeback during lockdown and the seagrass has shown great improvement to the damage it has sustained in previous years but this could easily be undone if people do not take care."

"Please bear in mind Studland Bay is protected, the seagrass is protected and seahorses are protected. In fact if you are looking for seahorses you require a license from Maritime Management Organisation to do this."

Seahorses have been thriving during lockdown, with the local population at a 12-year high in Studland Bay. Before recent surveys, no seahorses had been seen in dives since 2018. The Seahorse Trust found 16 seahorses in one dive earlier this year, including pregnant males and a juvenile which had been born this year and recently a total of 46 have been found. This is attributed to the fact that there have been fewer people, less boat traffic and associated noise and anchors in the area during the coronavirus lockdown.

Studland Bay was finally designated last year as a Marine Conservation Zone (MCZ) in recognition of the importance of its seagrass habitat and its seahorse population. The legal aim of the MCZ is to return both seagrass and seahorses to 'favourable conditions'.

Chinese fishing vessels violate international rules

Ecuador went on the alert on 29th July due to the appearance of a huge fleet of mostly Chinese-flagged fishing vessels off its Galapagos Islands. Patrols are trying to ensure the fleet does not enter the delicate eco-system from international waters.

Chinese vessels travel to the region each year in search of marine species. In 2017, a Chinese vessel was caught in the marine reserve with 300 tonnes of wildlife, most of it sharks. "We are on alert, conducting surveillance, patrolling to avoid an incident such as what happened in 2017," Ecuadorean Defence Minister Oswaldo Jarrin told reporters.

Soon after the alert it was reported that the Chinese vessels were dumping plastic waste overboard, polluting the pristine beaches. The Chinese embassy in Ecuador said: "We have found all Chinese fishing boats are operating in the high seas outside the exclusive economic zone of the Galapagos Islands in a normal and lawful manner."

On the 18th August, the vessels were still in the area and their numbers were thought to be close to 325 ships. Ecuador's Naval Forces reported that more than half of those vessels had violated international rules by turning off their satellite systems and cutting communications to prevent their activities from being tracked. Some vessels have even changed their names.

2 metre rule gives "false sense of security"

Coronavirus could travel much further than previously thought, up to 5 metres, a recent study reveals. Researchers found that tiny droplets containing Covid-19 could remain in the air for extended periods and increase the chances of more people contracting it.

In the study, the scientists used two air samplers located at two metres and 4.8 metres from the patients in a hospital room. They were able to collect the virus at both distances, and the samples were sufficient to infect cells in a dish. The air in the room was regularly being cleaned using specialist equipment.

The study at the University of Florida Health Shands Hospital is yet to be peer reviewed. Commenting on the study, Dr Linsey Marr, an expert in airborne spread of viruses, at Virginia Tech University, said this was "a smoking gun."

CDC identify new risk – Legionnaires' disease

The US Centers for Disease Control and prevention says it has closed several buildings it leases in Atlanta because Legionella bacteria have been found in their water systems, bacteria that likely grew because of the prolonged pandemic shutdown.

It's a problem that people across the country need to be on the lookout for, the CDC says. The bacteria, which can cause deadly pneumonia, grow in warm or stagnant water. The plumbing in buildings that have been closed for months because of the coronavirus pandemic could provide a perfect breeding ground for Legionella and other waterborne pathogens, the CDC cautioned.

As people return to work and start to travel more, hospitals and clinics need to think about the possibility of Legionella. Flu and coronavirus are not the only things that can cause severe pneumonia. If people turn up with pneumonia, it's worth testing them for Legionella – especially as it can be treated with antibiotics, unlike flu or coronavirus, said a spokesperson.

Onlooker falls from cliff...while watching rescue of someone who had fallen from the cliff

A person fell down a cliff as they watched the coastguard rescue of a casualty who suffered the same fate. Both people survived, but were badly injured when they fell about 30ft (9m), near Driffield, Yorkshire.

The coastguard helicopter was brought in to winch the first person to safety after their fall, near Skipsea Sands Holiday Park. As that was happening, an onlooker further south fell off the cliff edge, sustaining "equally severe injuries".

Emergency services airlifted both casualties to Hull Royal Infirmary, after a three-hour rescue mission, for further treatment.

The coastguard said although watching rescues "may seem exciting", people should not place themselves in danger. Bridlington Coastguard Rescue Team were called out just before midnight on Thursday, 30th July, with the rescue concluding in the early hours of Friday. This incident was one of six dealt with by Bridlington Coastguard Rescue that day.

Flushing a toilet can spread COVID-19

As more restaurants, bars, and other public spaces started to re-open this summer, questions were raised around whether using a public toilet could become a more serious health risk in the era of COVID-19. Researchers in China published a study suggesting that flushing a toilet can create a plume of coronavirus-laden particles, which are sprayed about 3ft into the air by the watery vortex inside a toilet bowl. Several studies using genetic tests have previously detected the SARS-CoV-2 virus in stool samples, and at least one investigation shows that the coronaviruses in these faeces can be infectious. "The flushing process can lift the virus out of the toilet and cause cross-infection among people," says Ji-Xiang Wang, a co-author on the paper published in the journal Physics of Fluids.

However, neither the World Health Organisation nor the U.S. Centres for Disease Control and Prevention thinks it's very likely COVID-19 can be spread by bowel movements. Despite these uncertainties, experts say there are precautions you should take before answering nature's call in publicly shared lavatories.

Public bathrooms should have exhaust fans that are constantly running, and if possible, should install touchless features such as taps, soap dispensers, and towel dispensers.

Without these hygiene upgrades, Wang advises wearing a face mask when using a public toilet. And one of the most effective ways to keep potentially infected aerosols of any kind from flying into the air, Wang adds, is to simply install lids on public toilets. "Manufacturers should design a new toilet, in which the lid is automatically put down before flushing," says Wang.

Hands-free holy water

Churches in Lanarkshire, Scotland have installed hands-free Holy Water dispensers in a bid to stop the spread of Covid-19. Parishioners at St Francis Xavier Carfin, at Carfin Grotto, and at The Sacred Heart Church in Bellshill, are now able to bless themselves thanks to a generous parishioner's ingenious idea.

Carfin man Paul Lawlor missed the use of Holy Water fonts, which had been banned from churches due to the risks, but after discussing an idea with his son, Chris Lawlor, of Lawlor Technologies, they came up with a solution.

Paul began building two prototypes in a shed and kindly donated one to St Francis Xavier Carfin and his former parish, The Sacred Heart in Bellshill.

The grotto's Sancta Familia Media posted a video of the dispenser which has since gone viral and led to a lot of requests for more with a further six sold. The video shows the dispenser situated as you go into the church.

John Patrick Mallon of Sancta Familia Media said: "One of the things we've been missing most going into church is almost a natural reaction to bless yourself with Holy Water. One of our parishioners here in Carfin, Paul Lawlor, has come up with an idea which allows us to still have that blessing but without having contact. It's really smart and you can put your hand underneath and you are able to bless yourself."

The 'Pandemic Paradox'

Researchers at the University of Warwick, have analysed the mortality statistics in the United Kingdom during the initial phases of the severe acute respiratory COVID-19 pandemic to understand its impact on national mortality figures.

They carried out a retrospective review of weekly national mortality statistics in the United Kingdom over the previous 5 years, from the end of November until the end of March. It was found that during the first months of 2020, there were consistently fewer deaths each week compared with the previous five years.

Researchers have coined this the Pandemic Paradox, and propose the reasons why the death rate was lower during the early stages of the pandemic in comparison to previous years as being due to guidance released by the Government on February 2nd regarding social distancing, washing of hands, staying home when feeling unwell and coughing or sneezing into a tissue; all likely to reduce the number of cases of other infectious disease and, also, slow the spread of various infectious diseases.

Mortality may have been reduced further, as non-COVID-19 hospital admission numbers fell significantly and this may have reduced the spread of hospital-acquired infections, such as MRSA. Similarly, reductions in elective surgery (in order to prepare intensive care and hospital bed capacity) may have also resulted in fewer deaths.

Absence of tourists helps nesting turtles

The Greek island of Zakynthos (previously known as Zante), is a major nesting area for female loggerhead turtles, and 2020 is showing a significant boost in numbers due to the lack of tourism caused by the global pandemic. The result of less human interference is that this is one of the best years on record for the number of nests dug, with conservationists counting more than 1,400 nests.

Charikleia Minotou, from WWF Greece said: "This year the turtles have had peace and quiet, and plenty of room. We have counted 1,444 nests; a number we haven't seen since 1995."

Council gives new meaning to 'takeaway'

Eleven privately owned beach huts in Durley Chine, Bournemouth, are to be dismantled and in their place an 'environmental innovation hub' will be built, in part out of plastic materials collected from the sea. Hut owners were served notice to quit in March but were offered neither an alternative location nor a place on the waiting list, which some of the affected owners had previously been on for up to 13 years.

A council spokesperson said: "Beach hut tenants were informed of this in March allowing them five months to plan alternative arrangements if they wished to do so, before the end of August. We understand that this has caused frustrations for some tenants and as an act of goodwill we are being flexible over the payment of this year's invoices. In order to ensure our approach is consistent, fair and complies with our beach hut management policy, both to the 11 affected beach hut tenants and to those who are currently on a beach hut waiting list, we are unable to allocate 11 new spaces along the seafront or place them at the top of the waiting list."

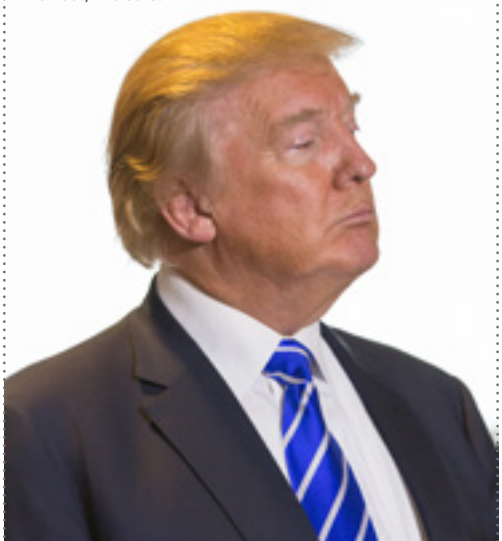
Trump blames low pressure showers for his hair issues

The US government has proposed changing the definition of a showerhead to allow increased water flow, following complaints from President Donald Trump about his hair routine.

Under a 1992 law, showerheads in the US are not allowed to produce more than 2.5 gallons (9.5l) of water per minute. The Trump administration wants this limit to apply to each nozzle, rather than the overall fixture.

Consumer and conservation groups argue that it is wasteful and unnecessary. Andrew de Laski, executive director of the energy conservation group Appliance Standards Awareness Project, said the proposal was "silly". With four or five or more nozzles, "you could have 10, 15 gallons per minute powering out of the showerhead, literally probably washing you out of the bathroom," he told the Associated Press news agency.

The changes were proposed by the Department of Energy on Wednesday following complaints by Mr Trump at the White House last month. "So showerheads - you take a shower, the water doesn't come out. You want to wash your hands, the water doesn't come out. So what do you do? You just stand there longer or you take a shower longer? Because my hair - I don't know about you, but it has to be perfect. Perfect," he said.



Drowned village memorial chapel work to begin

Capel Celyn was flooded over 50 years ago to construct a reservoir supplying drinking water to Liverpool and Wirral. A chapel was built on the site in 1965 to remember the families forced to move from the Welsh speaking community near Bala in Gwynedd. The memorial chapel was constructed using stones from many of the buildings in the village, which along with the village school, post office, homes and the original chapel, sit beneath the Tryweryn reservoir. Last year it was given protection as a Grade II listed building by the Welsh Government's historic monuments body Cadw.

Andrew Dixon, of Welsh Water, said: "As a company we understand how important Celyn Memorial Chapel is to the people of Wales. That's why over the next few months we'll be carrying out conservation work on the chapel to preserve the building's construction and integrity. Over the years water has seeped into the building, and as it was built without electricity or heating, it has meant that over time the building has become damp."

The water company has been working with specialist architects and Cadw on the conservation plans, which will see the building's mortar removed and repointed, and the chapel roof recapped.

Heated railway platforms to end winter slips

Researchers creating railway station platforms that automatically melt ice have been awarded £394,000 in Government funding. The academics at Sheffield Hallam University are developing concrete slabs that come with a built-in heating system that activates in freezing conditions to prevent dangerous icy conditions for passengers.

The slabs will operate on a low voltage of around 24 watts and will automatically turn on when the temperature dips below 0°C.

Rail Safety and Standards Board figures show that 19 people were killed and more than 7,000 were injured in accidents around platform edges on Britain's railways in a recent five-year period.

You can't beat a good 'brew'

The debate of brewing tea recently came to a head after a video was placed on the internet showing a cup of tea being brewed (not warmed up) in a microwave. Fear not, tea drinkers, science has validated the art of tea making after researchers confirmed that boiled water does, in fact, make for a better brew.
Researchers studied the way water boils in a microwave, as against heating from a kettle or a stove, and found that water in a microwave heats up unevenly, leading to a sub-standard cuppa. Heating in a kettle or on a stove means that convection occurs, in which hot water rises from the bottom to the top, and colder water sinks to the bottom where it becomes equally hot. In a microwave the water does not heat from the bottom; the convection process fails and the water at the top becomes hotter than at the bottom.
Chinese scientists have confirmed the 'hot spot' issue in microwaves, but have come up with an intriguing solution by placing a thin silver rim around the top of the cup (or other container), which reduces the impact of the microwave's electric field at the top, effectively blocking the heat at that point and guiding the waves into creating a form of convection.
But isn't metal in a microwave a 'no-no'? Not necessarily say the researchers; if you place the container in the centre of the microwave the possibility of ignition is small. Researcher Baoqing Zeng said: "After designing the metal structure at the appropriate size, the metal edge that may be prone to ignition was located at weak field-strength, where it could avoid ignition, so was still safe."
Editor: I think I'll stick with a kettle!

Two hundred year old wooden water pipe uncovered, in perfect condition

In 1816, when pedestrians, mules and horses travelled the streets, the newly founded York Water Company, in Pennsylvania State, US, installed a wooden water pipe around the Colonial Courthouse, in the centre of the city square.
In February this year, construction crews uncovered that 204-year-old wooden water main while replacing the current water main. The wooden pipe section was a tree-trunk, around 18 inches in diameter with a 4 inch diameter hole cored out of the centre.
The water company had 35 customers in 1816. Today, the business serves more than 70,000. In the early years, the water system was mainly for fighting fires. The buildings in York were made of wood, and many fires broke out. The domestic use for water came later. The firefighters would cut a hole in the water main and use a hand pump to pull the water out of the pipe to fight a fire. After the fire was out, they would drive a wooden plug into the water main to reseal it.

US opens consulate in Greenland

The US has opened a consulate in Greenland less than a year after Donald Trump expressed an interest in buying the vast Arctic land, the world's largest island. In August 2019 he suggested purchasing the Danish autonomous territory because of its abundant natural resources and growing strategic importance. Denmark flatly rejected the idea, calling it "absurd."
Greenland has its own parliament, but foreign relations are run by Copenhagen, and it receives heavy funding from Denmark. The country is rich in natural resources including oil, gas, gold, diamonds, uranium and zinc.
As climate change continues it will become easier to exploit these natural resources, and to export them as new maritime routes become possible due to glacial melting.

Robot boat completes 3 week mission

A UK boat has just provided an impressive demonstration of the future of robotic maritime operations after completing a 22-day-long mission to map an area of seafloor in the Atlantic.
The 12m Uncrewed Surface Vessel (USV) Maxlimer was developed by SEA-KIT International, and "skippered" for the entire outing via satellite from its base in Tollesbury in eastern England. The mission was part-funded by the European Space Agency.
The USV was despatched from Plymouth in late July and sent to a location some 460km (280 miles) to the south-west. With a multi-beam echo-sounder attached to its hull, the boat mapped more than 1,000sq km of continental shelf area, down to about a kilometre in depth. This was a segment of seafloor that had essentially no modern data registered with the UK Hydrographic Office.
Robot boats promise a dramatic change in the way we work at sea. Already, many of the big survey companies that run traditional crewed vessels have started to invest heavily in the new, remotely operated technologies. Freight companies are also acknowledging the cost advantages that will come from running robot ships.
However "over-the-horizon" control has to show it's practical and safe if it's to gain wide acceptance. This was the reason for the demonstration by Maxlimer.

Social media claims that face masks cause Legionnaires' disease

Posts shared thousands of times on social media claim Legionnaires' disease can be contracted through reusable face masks, implying that it could be mistaken for COVID-19. This is false according to experts who say Legionnaires' disease cannot be caught or spread via masks, and that it is not related to spikes in COVID-19.
A Facebook post example of the claim is: "A caller to a radio talk show recently shared that his wife was hospitalized and told she had COVID and only a couple of days left to live. A doctor friend suggested she be tested for Legionnaires disease because she wore the same mask every day all day long. Turns out it WAS Legionnaires' disease from the moisture and bacteria in her mask,".
Not-for-profit organisation Legionella.org states on its website: You cannot contract Legionnaires' disease from wearing face masks. *Legionella* bacteria is transmitted by aspirating drinking water or breathing in water droplets. *Legionella* is not spread from person-to-person in respiratory droplets nor does the bacteria survive on dry surfaces. Your mask would not be a source of transmission for the *Legionella* bacteria.
Editor: I would just add that reusable facemasks need regular laundering. Most guidance calls for daily, or after extended use washing, which therefore requires having at least one spare mask available to you.

Finding 'Oval'

An underwater webcam in the port of Miami has become a lockdown sensation. Marine biologist and artist Colin Foord set up the webcam in the industrial port of Miami, in the city's busiest shipping canal.
Since February the Coral City Camera has documented more than 100 fish species. Foord calls it an "underwater campfire that we can all sit around". It became a sensation during lockdown, thanks in part to its undisputed star, a tailless doctor fish called Oval.

Great Laxey Wheel is turning again

The Great Laxey Wheel, in the Isle of Man, has begun turning again, almost a year after it was stopped due to structural damage. Built in 1854, the 72ft (22m) diameter wheel is the largest working waterwheel of its kind in the world.

Manx National Heritage said the wheel was able to be restarted following the completion of safety checks and increased water levels. The wheel was stopped in August last year after engineers found a problem with a large timber rod, which connects to the main crank, during routine checks.

The Victorian wheel, which was originally used in mining, was restarted without the rod in place. Tests had been carried out to measure the amount of water needed for the wheel to turn without the full mechanism in place.

Greenland's ice melts at record rate

The Greenland ice sheet lost a record amount of ice in 2019, equivalent to a million tonnes per minute across the year, satellite data shows.

The climate crisis is heating the Arctic at double the rate in lower latitudes, and the ice cap is the biggest single contributor to sea level rise, which already imperils coasts around the world. The ice sheet shrank by 532bn tonnes last year as its surface melted and glaciers fell into the ocean and would have filled seven Olympic-sized swimming pools per second.

The satellite data has been collected since 2003. The 2019 loss was double the annual average since then of 255bn tonnes. Almost that amount was lost in July 2019 alone.

Scientists knew that ice loss from Greenland had been accelerating fast in recent decades and that there had been high rates of melting in 2019. But the satellite data accounts for new snowfall and allows the net loss to be calculated. The researchers said the scale of the 2019 loss was shocking and was likely to be the biggest in centuries or even millennia.

The scientists attributed the extreme ice loss in 2019 to "blocking patterns" of weather that kept warm air over Greenland for longer periods. These are becoming increasingly frequent as the world heats up. Almost 96% of the ice sheet underwent melting at some point in 2019, compared with an average of 64% between 1981 and 2010. Snowfall in Greenland was low in 2019, also due to the blocking pattern, meaning relatively little new ice was added.

France to build green sailing ship for international trade

Currently some 50,000 merchant ships trade globally, burning millions of barrels of oil a year, and releasing some 940 million tonnes of CO2. This accounts for 2.5% of total annual global emissions.

Now France is intending to build the world's first sailing ship capable of carrying significant volumes of cargo around the world. The 68 metre vessel will resemble a galleon from the 'Age of Sail' when sailing ships plied the seas and oceans. The ship will be able to carry 1,000 tons of freight, with almost zero greenhouse gas emissions, travelling at a speed of 10 knots. It is expected to cost around £11 million. It has been designed for TransOceanic Wind Transport who have existing vessels of 10, 40 and 80 tonne capacities, and which travel at a modest 5 knots. These ships take 40 days to cross the Atlantic at a cost of several euros per kilo of cargo. The new ship will halve the travel time and cargo costs will fall to a few tens of centimes per kilo.

Microplastic pollution harms lobster larvae

Microplastic fibre pollution in the oceans impacts larval lobsters at each stage of their development, according to new research. A study, published in the Marine Pollution Bulletin, reports that the fibres affect the animals' feeding and respiration, and they could even prevent some larvae from reaching adulthood.

Young lobsters grow to adulthood through four distinct developmental stages, and the researchers found that the physiology of each stage determined how the animals interacted with plastic fibres. The youngest lobsters didn't consume them -- but they were plagued by fibres accumulating under the shells that protect their gills. In experiments where the larvae were exposed to high levels of fibres, the youngest larvae were the least likely to survive.

More mobile and agile, the older lobster larvae did not accumulate fibres under their shells - but they did ingest the particles and keep them in their digestive systems. This could be problematic for lobster larvae coming of age in the ocean. Fresh plastics often leach chemicals, and their surfaces can foster potentially toxic sea life.

Because microplastic fibres tend to remain at the ocean's surface, animals that inhabit surface waters are more likely to come into contact with them -- including larval lobsters.

Fishing threatens sea-birds says RSPB

Puffins are among Britain's rarest seabirds that are under threat of being wiped out by fishermen, an RSPB chief has said, as he called on the Government to tighten the Fisheries Bill, which is before parliament for debate.

Martin Harper, the head of conservation at the bird charity, said it has launched an investigation into bycatch deaths around Britain's coasts, which is estimated to kill 300,000 endangered birds a year worldwide. Bycatch occurs when hooks and nets are left in the sea, and birds are attracted to either the bait or the fish they lure, and they become entangled and drown.

He has urged Environment Minister Rebecca Pow to tighten provisions for bycatch in the Bill. Mr Harper said: "The UK hosts 25pc of Europe's seabird populations and many of them are in trouble. What we are still trying to do is fully understand the scale and extent of the impact of bycatch in the UK. We have some concerns that it's a growing threat in the UK."

Blue Crab invasion

The blue crab may be pretty but it is a menace along Albania's coast. A source of daily anguish for Balkan fishermen struggling to make ends meet, the invasive species is upsetting the region's ecosystems. Native to the Atlantic, the crustacean started emerging in Albania's Adriatic waters over a decade ago, aided by warming sea temperatures.

In the marshy coastal area near the Karavasta Lagoon, the crab clogs nets and weirs, panicking fishermen who say the native marine fauna they rely on for a living are increasingly hard to find.

The crab "takes our daily bread and even the fish in the nets... there is nothing to sell," said fisherman Besmir Hoxha. His colleague Stilian Kisha added: "They are very aggressive and clever, a real curse. This year we are seeing the crab everywhere, on the coast, offshore but also in inland waters, rivers and lagoons. The damage is enormous".

Some days the men collect up to 300 kilogrammes of blue crab -- compared with only five to six kilos of the fish they sell on the market. Stocks of local sea bass, red mullets and eel are disappearing, they say, as the foreign invader disrupts the delicate balance of underwater life.

Fishermen are right to be worried about a species whose females each lay millions of eggs, Sajmir Beqiraj, a professor of hydrobiology at the University of Tirana, stated.

Fishermen are left with boatloads of seafood they can't sell. One kilogramme of crab is worth 40 euro cents compared to 14 euros for red mullets. There is no local market for the crab.

Council and EA agree 'no active involvement' on the Isle of Sheppey

Emma Tullett was sitting on the sofa when her home began to fall apart. A window blind came crashing down and as her partner tried to reattach the fitting, he saw a row of trees slowly sliding over the nearby cliff edge. Over the next four days, they watched from a distance as their home on the Isle of Sheppey, Kent, went over the cliff in stages. "I've got nothing," she said. "All we got out with was the pyjamas we were wearing."

Across England in the next decade, it is estimated that up to 2,000 homes could face a similar fate due to coastal erosion, which is expected to accelerate with climate change. Thousands more properties have been protected by costly coastal defences. So, why are some areas saved and others left to fall into the sea?

Like other small communities nationwide, Ms Tullett and her neighbours on the Isle of Sheppey have been told that their homes are not worth saving. The island's relatively soft cliffs, made mainly of London Clay, have for centuries been slipping into the Thames Estuary. On the north of the island, 124 homes and 1,000 caravans along a four-mile stretch are thought to be at risk in the next century. It would cost more than £25m to protect them all. With this in mind, the council and the Environment Agency - which are jointly responsible for managing coastal defences in the area - agreed on a policy of "no active intervention". Nature would be left to run its course. "This policy has been in place since at least 1996," said a council spokesperson.

Residents are being offered £6,000 towards demolition costs. Properties may not have cover for being lost to the sea and affected owners say they have nowhere to go.

Sharks good at making friends

Sharks may have a reputation as cold-hearted killing machines, but they are actually rather good at making and keeping friends, a study finds. Researchers have found that sharks are highly community-minded, forming social networks built on friendships that can last for years.

This is the first time sharks have been shown to form long-term friendships, which are thought to be based on the need to exchange key nuggets of information, such as where their next meal may be coming from. The study tracked 41 grey reef sharks for four years in the Pacific Ocean and found some pairs stayed together for the entire duration of the research. Sharks don't vocalise or call to one another. They aren't affectionate. They don't care for or raise their young. But sharks do socialise in their own way. The researchers clearly identified a very tight, tangled web of sharks spending their mornings together as large groups, dispersing throughout the day and into the night and reconvening with the same group members the following day.

The secret to their long-term social cohesion boils down to something quite simple and physical – they always meet up in the same place.

Tough breed them Yorkshire folk

Popular with swimmers and families and with support from the majority of locals, an application has been made to the Government to give a section of the River Wharfe, Ilkley, bathing water status, which would require more stringent testing of the water and an end to sewage overflow discharges.

The Government has opened a consultation into the plans which would create the first official bathing water spot, anywhere in the UK. If the proposals are approved the stretch of the River Wharfe will become the only river in the country that would be monitored from May 15th to September 30th (the bathing season) to ensure that the water is of a high quality.

A spokesperson for the Clean River Campaign explained: "People living in Ilkley expect our sewage to be treated, not dumped straight into the river every time it rains. We have stories of children getting sick as a result of dipping in the river. This is a disgrace. Bathing status is a critical step in cleaning up our river."

The Thames – Europe's river with the most microplastic contamination

Although the river has been cleaned of many pollutants in recent decades, with many lost species of fish returning, new research has found that plastic pollution is a growing problem, with a much higher density of micro-plastics than other major European rivers such as the Rhine and the Danube.

Scientists found 94,000 pieces of plastic flowed down the river – every second. They calculate that 18 tonnes of plastic flow into the North Sea every year.

The research which has been published in Science of the Total Environment and Environmental Pollution, showed that the most commonly found pieces originated from food and drink wrappers.

Outside of Europe there are a multitude of rivers with dramatically higher contamination – the world's worst being the Yangtze, in China. Its River mouth has higher plastic concentrations than any other sampled river, with 4,137 particles per cubic metre, leading to an annual discharge to sea of up to 1.5 million tonnes of plastic.

St Mawes ranked as UK's best seaside town

A tiny Cornish village, with a population of fewer than 1,000, has been named Britain's best seaside resort by consumer group Which? Some 4,000 holidaymakers were questioned about their favourite resorts, and asked to rank them on a series of measures, including food and drink options, beaches, parking options and value for money. St Mawes scored top ratings for its scenery, seafront, and peace and quiet.

Making up the rest of the top five were Dartmouth in Devon, Southwold and Aldeburgh in Suffolk, and Bamburgh in Northumberland.

The highest scoring resort in Scotland was St Andrews, and in Wales it was St Davids.

Bringing up the rear, starting from the bottom, were Skegness, Lincolnshire; Great Yarmouth, Norfolk; Clacton-on-Sea, Essex; Bognor Regis, Sussex; and Mablethorpe, also in Lincolnshire. Blackpool in Lancashire just missed out making the bottom five, being marked down for its value for money and peace and quiet.

A day in the life of...

Sophia Kloda

I grew up surrounded by the industry, as various members of my family worked within it, throughout my childhood as the industry grew through the 1980s and 1990s. I got my own first taste of the industry in the summer of 2000 when I landed an administrative role of typing up Legionella Risk Assessment reports, deciphering the handwriting of risk assessors, and downloading and identifying digital photographs, which at the time were cutting edge technology! (Gone were the days of waiting for a film to be developed and sticking the glossy slightly under exposed photograph onto the report carefully with a slightly dried up glue stick.) My career took a change in direction following my time at University and I moved into the education sector but was drawn back to Water Treatment where I've established my career, becoming Managing Director of Aqua Protec Ltd in 2016 and being elected onto the Water Management Society Council in 2019.

My primary focus as a Managing Director is to ensure that my team are suitably resourced and competent to deliver services safely and reliably to our clients. I plan, set targets and audit progress against these, implementing strategies for improvement to continually uphold the Company vision and ethos.

As a Duty Holder myself, the Health and Safety of my team and those impacted by the delivery of the services they provide is of utmost priority. Needless to say, the unprecedented times of late meant that my experience with Health and Safety Management and my specialism in Microbiology made me confident in protecting my team who support the NHS by working on their sites on a daily basis. I could not write this article without acknowledging the work that they, the NHS and the Health and Social Care teams that they work beside have been doing amidst the COVID-19 pandemic.

I'll never forget a valued colleague in my Senior Management team saying to me, 'this is a niche industry, it gets under your skin and then you can't leave it alone' and he is absolutely right. For those that engage with it, there are so many avenues to explore and so much innovation. For me, what started as a job has become a vocation.

This vocational pathway has led me towards my being elected to join the Water Management Society Council, and subsequently one of the reasons why this issue of Waterline has a heavy focus on Microbiology and in particular *Pseudomonas aeruginosa*. Apologies to the non-microbiologists out there! As a member of WMSoc Council I am representing WMSoc as a BSi Committee member, drafting the new British Standard BS8580-2 for risk assessing *P. aeruginosa* and other water borne organisms and assisting in the revision of BS 7592 Sampling for Legionella bacteria in water systems. Code of practice.

I have a keen interest in industry standards, from those that are legislative, to guidelines and standards. Moving a business forwards by developing procedures, then training and assessing the competence of those delivering our services onsite following these processes, gives me the confidence that the work we do really does make a difference to protecting Public Health.

As this article comes to print it will be time for our annual LCA audit. I have to admit that this is a process that I genuinely enjoy. The internal audit phase is so important to me as Managing Director. I conduct the internal audit myself as it gives me opportunity to see into areas of the business I am no longer involved with directly on a day to day basis and really delve into what is going on in my own back yard. Since becoming an LCA Registered Company I have seen year on year improvement, refining the processes that we have in place and the way they are implemented.

My days are diverse and interesting with no two the same. My day generally starts with an early morning dog walk with my working cocker spaniel puppy. The walk gives me the opportunity to think through the events of yesterday, make decisions and plan forward. It is a productive and valuable time. When I took on a working cocker spaniel puppy in January I had no idea that she would become my home office companion. Working from home was an easy transition for us to make as a business as the processes and resources to achieve this were already firmly in place. Working from home has increased my ability to be in more places within one working day. Today, for example, I have read and actioned items in my inbox, participated within a meeting with my Operations Team, participated in the BSi Committee for the development of BS8580-2, met with my Accounts Team, assisted a Junior Project Manager in refining RAMS prior to them being sent to our client and audited section 3.1 of our LCA Service Provider commitments.

Tomorrow will be different. This industry excites me. There is considerable energy going into the development of the Internet of Things (IOT) technologies and how this can benefit the efficiency of the management of water in the built environment. I have learnt, and continue to learn, from a wealth of experience from within the industry and I'm so pleased to be at a point in my career where I can utilise this experience to support innovation so it is effectively implemented for the benefit of Public Health.

Sophia Kloda, Managing Director, Aqua Protec Ltd.

Waterline Autumn 2020 Guest Editor

WMSOC EVENTS

It is with regret that WMS have had to postpone all their face to face events in 2020. This is a direct response to comply with Government guidance regarding COVID-19. Nevertheless, we have been very fortunate to have been able to assist with the Royal Society of Public Health (RSPH) "How to ensure your building water system is safe during and post COVID-19":

https://www.rsph.org.uk/events/webinars/how-to-ensure-your-building-water-system-is-safe-during-and-post-covid-19.html

as well with the British Standards Institute (BSI) "Introducing BS 8680:2020 Water quality. Water Safety Plans. Code of Practice":

https://www.bsigroup.com/en-GB/our-services/events/webinars/2020/introducing-bs-86802020-water-quality.-water-safety-plans.-code-of-practice/

Both of these attracted a substantial global audience and the latter is still available on-demand.

WMS delivered their first webinar at the AGM on 16th September, regarding membership, and this is available on the WMS website. The events committee are now planning a series of webinars for the rest of 2020 and into 2021. These will be available on-demand in the members area of the website and if they prove to be a benefit to members then they will continue indefinitely.

The COVID-19 pandemic has provided an opportunity for the WMS to deliver knowledge and provide networking in new ways and via new media. We hope to bring you news of new benefits over the coming weeks and months.

Improving Standards for Risk Assessments of *Pseudomonas aeruginosa* within the Healthcare and Leisure Industries.

Sophia Kloda
Managing Director, Aqua Protec Ltd

With minimal guidance currently available for the risk assessment of *Pseudomonas aeruginosa*, there is a temptation to turn to the *Legionella* risk assessment as a method of controlling the risks also posed by *P. aeruginosa*. However, is a *Legionella* risk assessment suitable and sufficient enough to cover the risks posed by *P. aeruginosa*?

The reality is that *P. aeruginosa* are far more complex to risk assess, they reside in multiple environments and take advantage of multiple modes of transmission. Unfortunately, if there is reliance solely on a *Legionella* risk assessment to control the risk of *P. aeruginosa*, there is a concerning omission of the holistic approach that is required to effectively identify and reduce the risks posed by these opportunistic waterborne pathogens, leaving people at risk and the Duty Holder exposed.

P. aeruginosa are gram-negative bacteria found in water, soil and on plants. They can enter the built environment through a variety of mechanisms. They are easily spread, meaning that cross contamination is a vital aspect to consider in the control of these pathogens. They are incredibly tolerant of a wide range of physical conditions, including resistance to biocides and they are increasingly multidrug resistant. (See *Pseudomonas* Tool Box Talk, page 22).

In 2017 the Secretary of State for Health launched an ambition to halve the number of healthcare-associated gram-negative bloodstream infections by 2021 *(PHE 2017a)*, which included the introduction of mandatory reporting of blood-stream infections by acute NHS providers to Public Health England of *P. aeruginosa* and *Klebsiella* species in addition to *Escherichia coli*.

Acute NHS providers however are not the only organisations responsible to prevent *P. aeruginosa* infections. Within any premises, a Water Safety Plan (WSP) is a good way to ensure that all risks posed by water are effectively managed. BS8680:2020 Water Quality. Water safety plans. Code of practice, published in May this year, defines a WSP as a 'proactive strategic plan which sets out the direction for how a business or organisation, whether large or small, intends to manage risks from water on site to prevent harm arising from all forms of exposure'.

The Water Safety Group (WSG) are responsible for the production and ongoing implementation and management of the WSP. Particularly in larger organisations whereby the risks associated with water are higher, the governance required to ensure water is effectively managed would require the WSG to be a multidisciplinary team with sufficient competence and authority to carry out their role within the team effectively.

The chain of infection should always be considered in risk assessment of pathogenic micro-organisms in order to identify where the causal chain can be broken. As an example, BS8580-1 (2019) cites in risk assessments for *Legionella* control those factors to be considered are:

a) contamination;
b) amplification;
c) transmission;
d) exposure; and
e) susceptibility of individuals exposed.

A *Legionella* risk assessment does provide a key starting point in terms of the engineering aspects of the system. Is the risk assessment up to date? Are there any action points outstanding? Without these vital elements to maintain control of *Legionella*, it is highly likely that *P. aeruginosa*, with its similar favour for warm and stagnant environments would easily colonise the same system. *P. aeruginosa* grows well at 37°C, and can also survive at a wide range of temperatures from 4°C to 42°C *(LaBauve Annette E. and Wargo, Matthew J. 2012)*. Certainly, the practice of keeping your hot water hot, your cold water cold and 'keep it moving keep it clean' resonates as a good starting point to manage the quality of water in any building system by reducing opportunity for amplification of any opportunistic waterborne pathogen.

This, however, is where a *Legionella* risk assessment has reached its limitations in informing the risk from *P. aeruginosa*. PHE *(2017b)* cites it is advisable to 'understand where microorganisms reside as this is an important first step in understanding how to break the chain of infection'. The majority of *Legionella* risk assessments will be focussed primarily on the plant, pipework and terminal fittings of the domestic hot and cold water system as the reservoir of waterborne bacteria. *P. aeruginosa*, however, has many environmental niches and therefore consideration has to be given to other reservoirs where this microorganism normally lives, grows and multiplies, such as environmental surfaces and other humans.

When risk assessing for *P. aeruginosa*, a multidisciplinary approach enables; risks to be effectively identified throughout the causal chain, appropriate interventions designed to break the chain of infection, and for these interventions to be effectively delivered within the areas that will have greatest impact. Ideally involved in the risk assessment team should be representatives from, estates, cleaning, specialist service providers, clinical practitioners, infection prevention control and medical microbiologists as applicable to the organisation. For example, in the leisure and beauty industry, there are unlikely to be medical microbiologists involved as part of the risk assessment team, but it is important to involve and inform those people who are administering treatments to and those responsible for cleaning equipment that has contact with clients.

Healthcare requires in depth input and involvement from the clinical staff. Clinical practitioners can contribute through evaluation of; water outlet usage, patient vulnerability, and identification of practices that can increase risk, such as disposal of waste fluids, as essential components of a *P. aeruginosa* risk assessment. The clinical staff should be informed of the content of the risk assessment and the control measures to be implemented in their day to day working practices, supported by sufficient training and resources to effectively execute these.

HTM04-01 (2016) denotes that the source of P. *aeruginosa* contamination could be attributed to:

- The incoming water supply from the water provider
- The water supply within the building
- The wastewater system
- Or via external retrograde contamination from clinical and operational practices. For example; the disposal of patient fluids down a hand wash basin, poor cleaning processes introducing contamination from the drain or surrounding environment to the outlet fitting, contaminated cloths and mops or splashback from contaminated drains.

What is *Escherichia coli*?

Escherichia coli (*E. coli*) is the most commonly seen Gram-negative blood stream infection and the most common cause of urinary tract infections. They are more prevalent in elderly patients.

Type: Gram Negative Bacteria

Environmental niches: Human gut, water (quite specifically sewage water or that which has become recently contaminated).

Human health effects: Blood stream infections, diarrhoea, urinary tract infections, meningitis, haemorrhagic colitis.

Routes of exposure: Faecal oral, person to person contact, eating contaminated food or drinking contaminated water, contact with contaminated surfaces including contaminated patient contact equipment, e.g. catheters.

Presence in water: Detection in drinking water provides evidence of recent faecal contamination. Detection should lead to consideration of further action, which could include further sampling and investigation of potential sources and any breaches within the distribution system.

Content to manifest in damp conditions, wet plastic surfaces, drains and waste traps, personal hygiene equipment, floatation devices used in swimming pools and cleaning equipment are perfect habitats for *P. aeruginosa* – especially in Leisure environments. Sponges are a particularly favourable environment! A recent study by a major well-known electronics retailer (www.techtalk.currys.co.uk) found that 88% of fridge shelves in the home tested positive for *P. aeruginosa*. The same study noted that *P. aeruginosa* are more prevalent in kitchens than bathrooms. It is feasible that washing contaminated food could cause contamination of the waste trap.

P. aeruginosa thrives in relatively nutrient-poor environments, but contemplate now other items we dispose of down that same waste trap, how many of these are sources of nutrients and the potential impact could be in assisting the population growth of *P. aeruginosa*? Consider the action of using the nearest sink, regardless of design or designated function, to dispose of a half-consumed cup of coffee… a seemingly considerate gesture, after all, carrying liquids to a designated 'safe' point of disposal could be considered a spill risk, a scald risk if still hot, and moving from place to place increases contamination risk as the use of hand sanitizers between touch points is a cumbersome task when your hands are full… but therein lies the introduction of carbon from nutrient sources, such as sugar, to sustain growth of this environmental reservoir.

Kelsey, M.C. (2014) cites 'P. aeruginosa, unlike L. pneumophila, is not nutritionally exacting. It is an auxotroph and acquires its carbon energy sources from the environment'. Considerations therefore have to be given to sources of carbon, including leaching from system components such as ethylene propylene diene monomer (EDPM). In 2010, guidance 'Estates and Facilities Alerts DH (2010) 03 – Flexible water supply hoses' was issued recommending that a risk assessment be conducted and that flexible hoses should be replaced with hard pipe where indicated. In limited circumstances, where they are essential, they should not be lined with ethylene propylene diene monomer (EPDM).

As an aerobic bacterium, *P. aeruginosa* benefits too from iron to carry out its metabolic processes. Iron acquisition is necessary for biofilm formation in *P. aeruginosa (Kang, D and Kirienko N. V 2018)*. It produces compounds called phenazines, endogenous redox-active molecules *(Briard Benoit et al. 2015)* that have the function in binding to and transporting iron to the bacterium for use (an iron chelator). The Phenazines associated with *P. aeruginosa* are responsible in attributing towards their characteristic colouring with pyoverdine generating a yellow-green fluorescent pigment, pyocyanin blue-green and pyorubin generating red-brown. This microbial metabolic activity causes biocorrosion of carbon steel and unfortunately, this same behaviour is demonstrated by *P. aeruginosa* in the lungs of cystic fibrosis patients *(Vasil Michael L. 2002)*.

Another key additional aspect for risk assessment of *P. aeruginosa* is the assessment of risk of transmission. *P. aeruginosa* takes advantage of multiple modes of transmission, including direct contact and indirect contact meaning that the assessment of risk cannot be limited to just the risk posed by the built environment but also the operational processes, ranging from clinical procedures to domestic cleaning. Are the processes in place suitable and sufficient to prevent contamination and transmission? Are these processes clearly communicated in an easy to understand format? Are those expected to carry out these processes suitably trained to execute them? Are these processes being carried out consistently, or does a ringing phone, time constraints, layout of workspace, or absence of someone in a supervisory capacity result in part of the process being overlooked?

Legionella bacteria, by comparison, are not readily transmitted from person to person *(Borges, Victor et.al. 2016)*. Host infection is via droplet transmission, inhalation of droplets of aerosolised or aspirated contaminated water with a typical droplet size of <5µm that can be inhaled deep into the lungs, thus highlighting another limitation in reliance upon a Legionella risk assessment to cover the risks posed by *P. aeruginosa*.

Currently there is very little guidance or standardised practice for the risk assessment of *P. aeruginosa* meaning that the current approach to this process is variable between organisations. British Standard Water quality – Part 2: Risk assessments for *P. aeruginosa* and other waterborne pathogens – Code of practice BS8580-2 is currently being drafted which, upon its publication, will give opportunity for improved consistency in the approach adopted by organisations to control this opportunistic pathogen. WMSoc has representatives on this working group in order to provide feedback on behalf of our members and your input is welcomed.
Please contact admin@wmsoc.org.uk with any relevant queries.

The WMSoc training course HTM 04-01 Water Hygiene Training: Managing & Controlling Risk of Waterborne Pathogens in Healthcare Water Systems - W037 would assist those wishing to improve their knowledge in this area. The latest revision of the course refers to relevant Healthcare legislation and microbiological hazards and focuses on the causal chain of infection i.e. Contamination, Amplification, Transmission, Exposure and Susceptibility by working on practical clinical case studies.

What is *Klebsiella pneumoniae*?

Klebsiella pneumoniae bacteria cause infections that are often prevalent in children and are likely to become antibiotic resistant. Klebsiella bacteria are a type of coliform and can therefore usually be detected by traditional tests for total coliforms. They are natural inhabitants of many water environments, and they may multiply to high numbers in waters particularly rich in nutrients.

Type: Gram Negative Bacteria

Environmental niches: Human gut, soil, water

Human health effects: Blood stream infections, pneumonia, urinary tract infections, skin and wound infections, liver abscesses, meningitis

Routes of exposure: Person to person contact or contaminated patient contact equipment, e.g. catheters or ventilators, contaminated water (including aerosols).

Presence in water: Klebsiella are not considered to represent a source of gastrointestinal illness in the general population through ingestion of drinking-water. Klebsiella can generally be controlled through the same good water hygiene strategies used to minimise biofouling within a water distribution system and are reasonably sensitive to biocides. They are, however, known to produce biofilms and specifically colonise washers in fittings such as taps.

Not all silver stabilised hydrogen peroxides are created equal

The History of Huwa-San

In 2001 Jos Roebben of Roam Chemie (now Roam Technology) bought the formulations for this new generation of disinfectants and improved them producing the Huwa-San biocide that is sold today.

Often imitated, never replicated, Huwa-San continues to dominate the Stabilised Hydrogen Peroxide (SSHP) market due to its unique formulation, unmatched efficacy, and proven heritage in legionella control.

For the past 20 years Roam Technology have continued to expand the global reach of Huwa-San through its approved partner network and unrivalled commitment to R&D. With more approvals than any of its competitors, Huwa-San is the No.1 SSHP across all applications and is trusted by some of largest companies in the world.

The formula for Huwa-San is a closely guarded secret.

The Stabilisation of Huwa-San

Chloride is the most common anion found in water and will react with the silver ion in SSHP forming insoluble silver chloride. This reaction destroys the efficacy of the SSHP product.

Huwa-San's unique formulation ensures that it can slow this ionic reaction down, allowing Huwa-San to be more effective at lower dose rates than its competitors. Huwa-San is proven to be the most advanced and very different from all other SSHPs.

Legionella Control and Huwa-San

Huwa-San has had a huge amount of testing carried out on it. It is proven to be an efficient water, air, and surface disinfectant. Independent tests have shown Huwa-San to be highly effective at killing Legionella Pneumophila. 2000ppm Huwa-San will achieve a 4.8 log reduction in Legionella Pneumophila Sero Group 1 within 60 minutes, 200ppm within 24 hours and 20ppm has been proven as a continuous treatment against Legionella. Independent tests also demonstrate Huwa-San's unrivaled efficacy against biofilms in both preventative and curative treatment

(All test results are available on request)

Huwa-San and the Biocidal Products Regulation (BPR)

Despite misinformation regarding hydrogen peroxide based biocide products. We can confirm that the dossier for Huwa-San family (UA-APP- BC -ND029406-48) of products is included in the BPR process and Roam Technology expect full registration by early summer 2021.

article 95
BPR

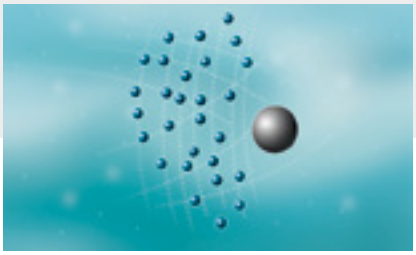
SAFESOL.
THE CLEVER LITTLE CHEMICALS COMPANY

BUY HUWA-SAN ONLINE AT SAFESOL.CO.UK

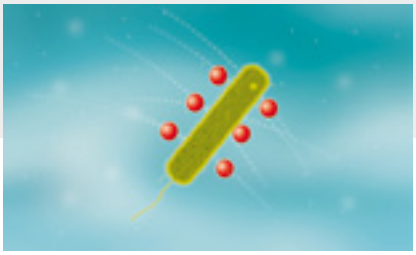
FOR ORDERS, HELP & ADVICE CALL 0191 447 8008 | E-MAIL info@safesol.co.uk

How Huwa-San Reacts with Bacteria

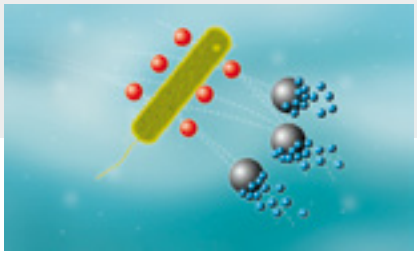
THE MOST ADVANCED SSHP ON THE MARKET



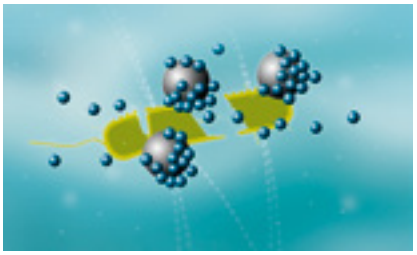
1. Silver ion hydrogen bonds to hydrogen peroxide. Hydrogen peroxide like water is linked by hydrogen bonds.



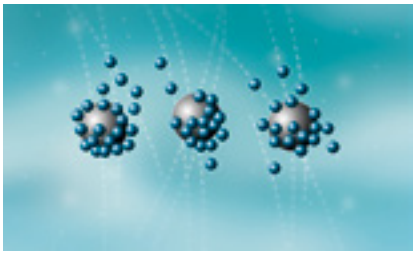
2. A bacterium has a number of thionyl groups on its external wall.



3. Huwa-San is electronically attracted to the bacterium



4. Once at the site of the bacterium, the Hydrogen Peroxide crosses the membrane and physically destroys it. There can be no bacterial resistance to this mode of action



5. When the bacterium is dead silver ion hydrogen bonds to unused hydrogen peroxide ready to kill the next bacterium.

Huwa-San Facts

- ✓ **Most advanced SSHP on the market**
- ✓ **Proven to kill legionella bacteria**
- ✓ **Proven to remove biofilm**
- ✓ **Breaks down to oxygen & water**
- ✓ **Buy online from safesol.co.uk**
- ✓ **Next-day delivery**

Hydrogen Peroxide and the BPR

In 2013 all biocide actives, including hydrogen peroxide had to undergo approval through the BPR so that they could remain on sale.

In February 2017, Hydrogen Peroxide was approved as an active substance for the Product Types (PTs) 1, 2, 3, 4, 5 and 6 (Commission Implementing Regulation (EU) No 2015/1730.

While hydrogen peroxide was registered under PT05, none of the major suppliers supplied a dossier under PT05.

This meant that any company selling a hydrogen peroxide based chemical for water treatment and wishing product registration under PT05 had to submit their own dossier.

Roam therefore had to register each use of the product.and have completed individual dossiers for potable water treatment (human and animals) Legionella control, Swimming pool and spas.

The following link provides details of the other product types.
https://www.hse.gov.uk/biocides/eu-bpr/product-types.htm

SafeSol and Huwa-San

SafeSol introduced Huwa-San for legionella control in the UK 2004. We have chosen Huwa-San as we know it is a safer, more environmentally friendly, and efficient product than chlorine or chlorine dioxide. We do not sell any chlorine based biocides.

We have several examples where Huwa-San has removed legionella from a system where chlorine and chlorine dioxide have failed. We can advise on suitable dose rates and applications for your circumstances.

Contact SafeSol for further information.

Huwa-San Official partner

QMS ISO 9001 : 2015 REGISTERED

Please note: use disinfectants safely. Always read the label and product information before use.

@SafeSol @SafeSolUK

THE WATER MANAGEMENT SOCIETY

TOOLBOX TALKS

Pseudomonas an introduction - What are *Pseudomonas spp.* and *Pseudomonas aeruginosa*?

Pseudomonas bacteria are waterborne pathogens (micro-organisms that cause disease) and are commonly found in wet environments including the incoming municipal water supply.

Once inside the man-made environment, Pseudomonas may contaminate outlets, systems and drains, producing biofilms *(see Biofilms Toolbox Talk)*.

PSEUDOMONAS

It is important to understand the difference between *Pseudomonas aeruginosa* and *Pseudomonas* species (spp.)

Pseudomonas spp. references any species of *Pseudomonas*. *Pseudomonas* spp. are of particular concern in closed water systems as they can form biofilms that may be linked to system failures, e.g. fouling or under deposit corrosion.

Pseudomonads is an alternative collective term that can be used to describe a group of different bacterial species that were once classified as Pseudomonas e.g. *Ralstonia* spp and *Burkholderia* spp.

Why is this important?

Pseudomonas spp. can cause infections, spoil food and create biofilms that can cause damage to system components including blockages at valves and strainers and impact upon flow rate.

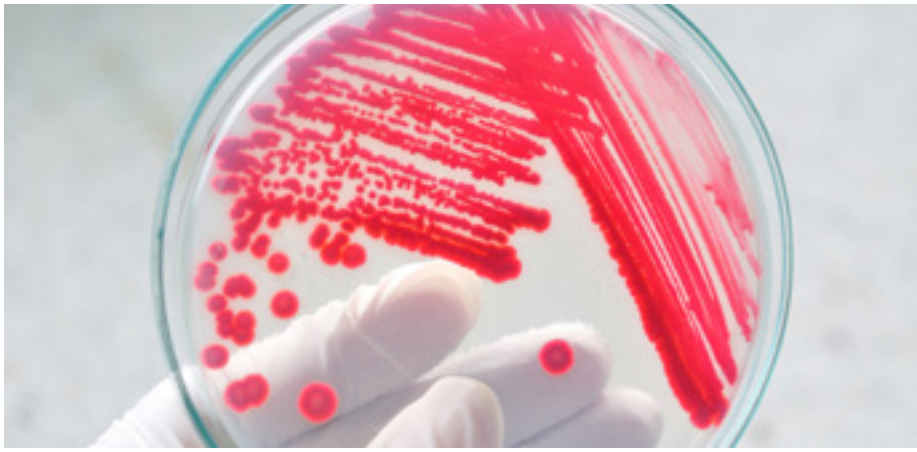
Pseudomonas aeruginosa are a species common within the hospital environment. Whilst infection is generally minor and self-limiting in healthy people they require specific additional measures to be taken to control and minimise the risk presented to patients, particularly those in augmented care. *Pseudomonas aeruginosa* can cause pneumonia, urinary tract, gastro-intestinal, blood and wound infections in susceptible individuals. They may become multidrugresistant (MDR). MDR bacteria are defined as those that are resistant to at least three different antibiotics and consequently there is a high mortality rate associated with infection. Not only can *Pseudomonas aeruginosa* be acquired through contact with contaminated water, but it can also be spread from person to person, meaning that both environmental cleanliness and infection control precautions when handling patients are important.

Prevention

UK Law and Regulations, including the *Health and Safety at Work Act (1974)* and *COSHH Regulations (2002)* define that employers and those responsible for the control of premises have a duty to manage and control the risk of exposure to biological hazards, this includes *Pseudomonas* spp.

HTM 04-01: Safe water in Healthcare premises (2016) details requirements for managing *Pseudomonas aeruginosa* within healthcare premises, *Part B* stipulates the requirement to sample for *Pseudomonas aeruginosa* including a clear methodology. *Part C (2016)* provides specific guidance on protecting augmented care patients, this includes the requirement for Risk Assessment and adequate training.

It is important to control the growth of *Pseudomonas* spp. within closed heating and cooling systems for effective operation. In addition to creating biofilms and sludge that can block up the pipework and components, some *Pseudomonas* spp. are able to use nitrite, therefore degrading nitrite-based corrosion inhibitors and exacerbating colonisation of the system. Further guidance on cleaning, treating, sampling and monitoring of water from closed systems can be found in BSRIA Guidance BG29 (2020), BG50 (2013) and British Standard BS8552 (2012). It is important to take precautions from biological hazards when working with water from closed systems, for example, taking samples.



PSEUDOMONAS

ANSWERS TO THE ARTICLE IN OUR SUMMER ISSUE

MATERIALS IMPACT WARRANTS CAREFUL THOUGHT / DIFFERENT MATERIALS POSE DIFFERENT RISKS / PROBLEMS WITH LEAD NICKEL, AND EPDM EXPLAINED

Q1: What age of buildings are more likely to have lead pipes providing drinking water?

Q2: In the UK how long has lead been prohibited from drinking water plumbing systems?

Q3: What are some of the effects excessive lead can have on the human body?

Q4: What level of nickel is permitted in drinking water systems and its potential effects?

Q5: EPDM is one of the common synthetic materials used in plumbing system components. Testing to which standard is used to establish whether a particular non-metallic material it is safe to be used in drinking water systems?

1 cpd point

A1: Buildings that were built pre 1970 are most likely to have lead pipes.

A2: Lead has been banned for over 30 years.

A3: Lead affects the nervous system and brain but can build up in the body causing joint and muscle pain, memory loss and lowering of IQ.

A4: The limit for nickel is 20ug/L. The effects vary and an individuals sensitivity to nickel also varies. Skin sensitivity is common as contact dermatitis due to nickel is relatively common. At high levels it may induce vomiting, nausea, headaches and weakness however allergy type symptoms may also be reported.

A5: BS6920

Answered by Karen Gerrie, Chivas Brothers Ltd.

If you would like to get involved with this issue's CPD activity, see page 5.

WMSoc COURSE DEVELOPMENT

In line with the WMSoc training committee's ongoing review of training courses there was a need to review and update the current W014 Managing the Risk of Legionella in Cooling Tower Systems course in line with delegate feedback, their identified requirements, and consolidating courses to better suit the delegates.

As such the decision was made to split the current 'W019' Legionella Training for Duty Holders and Responsible Persons into two courses, one focusing on hot & cold water systems and the second (new course) focusing on evaporative cooling systems. In addition to the relevant legislation and legionella awareness elements of the course this has allowed detailed extra focus on the design, management and controls required in evaporative cooling systems. The course also helps duty holders and responsible persons in their understanding of what they should expect from their specialist sub-contractors, and so allows them to manage the sub-contractors effectively, such that legionella risk in the treated system is minimised

If duty holders and responsible persons are responsible for both hot and cold water systems, and evaporative cooling systems they need to attend both courses such that they have the management knowledge of both types of systems. Having the two dedicated courses allows the delegates to achieve this, and also demonstrates that they are suitably trained in both these different legionella control areas, as required by the HSE's Legionnaires' disease 'The control of legionella bacteria in water systems' Approved Code of Practice and guidance on regulations L8 paragraphs 51 & 52.

This new course, Legionella Control & Management for Dutyholders and Responsible Persons – Evaporative Cooling Systems W19C, will be running on the 17th November and is available to book now.

GET TRAINED. GET CERTIFIED. GET WMSoc TRAINING.

Managing water safely during COVID-19 outbreak

Susanne Surman-Lee
Leegionella Ltd

With the COVID-19 outbreak, and associated steps to ensure patient, staff, and visitor safety, currently likely to be uppermost in the minds of healthcare estates teams, Dr Susanne Surman-Lee, a state-registered consultant clinical scientist, and director of independent public health microbiological consultancy, Leegionella Ltd, warns such personnel against any relaxation of stringent water safety policies and procedures in hospitals and other healthcare facilities.

During the current COVID-19 crisis it is understandable that the routine management of water systems and associated equipment within buildings – including hospitals – may not be highest on the list of priorities for Estates and Facilities teams. However, there is a real risk that without effective water system management we will be seeing outbreaks of waterborne infections, including Legionnaires' disease and other waterborne pathogens, unless action is taken now. The European Society for Clinical Microbiology and Infectious Diseases (ESCMID) Study Group for *Legionella* Infections (ESGLI) has produced additional guidance to prevent large outbreaks of waterborne infections, and ensure that patients are correctly diagnosed, by raising awareness and providing practical advice to manage the real risk caused by building water systems during the pandemic.

Many 'stresses' on Estates teams

The current public health crisis has placed many stresses on Estates teams, including the hurried preparations for COVID-19 patients, reductions in normal healthcare services resulting in buildings being closed, or with a significant reduction in use, and reduced staffing as a result of illness and self-isolation. It is understandable then that routine maintenance, management, and monitoring of water systems and associated equipment has not been highest on the list of priorities.

The rapid construction and alteration of facilities for critically ill COVID-19 patients means that there has been little time either for the usual consultation, or adherence to best practice guidance, with all the checks and processes which would normally be taken when developing new, or altering existing, water systems. The process of building a new hospital usually takes many years – from design and specification through the build, installation, and commissioning stages, to handover and full operation, so the amazing accomplishment of those managing the Nightingale hospitals and other rapid response projects should not be underestimated.

Low numbers of microorganisms

Even when the build and design has followed the normal rate of progression and water delivered to a building meets all regulatory standards, it is not sterile, and contains low numbers of naturally-occurring microorganisms, including *Legionella*, Pseudomonas *aeruginosa*, and other waterborne pathogens which, for those of us with competent immune systems, will normally cause no harm. However, where there has been poor design, specification, and management, of system materials, fittings, and components, and there are conditions within a building which affect the temperature and flow of water – such as overstorage and lack of use, microorganisms can grow within the system so that water delivered at the point of use may not be fit for purpose, and may also pose a risk of serious illness and death to susceptible persons. This includes water systems within buildings which are newly completed.[1]

The complexity and size of water systems, and the range of uses of water within the healthcare environment – including water used for patient treatment and diagnosis – increases the number of potential sources and routes of infection. It is therefore vital that appropriate risk assessments and adequate precautions are taken to prevent water system contamination, both during the build, installation, and commissioning of new or altered water systems and associated equipment, and also where buildings have been shut down or have had reduced use. In buildings which have not been used for several weeks, there should have been a flushing programme put in place, or the water systems should have been 'mothballed' to be fully re-commissioned when re-opening.

New British standard

The new British Standard 8680:2020,[2] just published, includes much guidance on the development of Water Safety Plans, to ensure that water systems are designed constructed, commissioned, and managed safely to avoid what are essentially preventable infections. It highlights the importance of the specification stage to ensure there is adequate time built into tenders for consultation with stakeholders, and the whole process is risk assessed and agreed by the Hospital Water Safety Group (WSG) at each stage. It also identifies the need for a high-level gap analysis to ensure that there is the appropriate governance at corporate level, and that the WSG has the necessary training and support, and is empowered to ensure that water safety is managed effectively.

ESGLI is concerned that because there are many similarities between the symptoms and at-risk groups of both Legionnaire's disease and COVID-19, there is an increased likelihood that Legionnaires' disease will be underdiagnosed, resulting in unnecessary deaths. As with COVID-19, those most at risk are the elderly, and those with underlying illness such as heart disease, diabetes, and other respiratory conditions. For both infections, men are more at risk than women. Ensuring that both COVID-19 patients and hospital staff are protected from waterborne infections should not be overlooked.

Evidence from China

Early evidence from China[3] is that COVID-19 patients admitted to hospital could fall into the group at increased risk of waterborne infection, with half of the patients who died having a secondary bacterial infection. While ventilator-associated pneumonia is to be expected in up to 40% of ventilated patients, preliminary findings from a small recent study by Xing *et al.*,[4] indicated that 20% (6/30) were IgM positive for *Legionella pneumophila*. Infection by *Legionella* is usually by inhalation of aerosols derived from contaminated water sources, but in healthcare, infection by aspiration should also be considered.

There is a real risk that water systems which have been extended, altered, or had a reduction in use, could pose a significant risk to highly susceptible patients, both now and in the future, unless immediate action is taken.

Legionella colonisation and growth present the greatest risk, as it can affect patients, staff, and visitors. Worldwide we are seeing an increase in the number of cases, and in Europe the European Centre for Disease Prevention and Control report from 2015[5] resulted in the World Health Organization identifying *Legionella* as causing the highest health burden of all waterborne illness in Europe, [6] with a mortality rate of around 25% in healthcare-acquired cases.[7]

Adequate control measures

The need for *Legionella* risk assessments, and for adequate control measures to be put in place, are required under health and safety legislation, and the current crisis does not absolve those accountable for health and safety from ensuring that these are carried out and implemented. It is important that these risk assessments cover all potential sources, including where additional provisions have been made, e.g. mobile washhand stations – especially if these have been stored with water inside them, and mobile units for additional changing facilities, as well as staff showers etc.

The need for huge numbers of beds for COVID-19 patients has necessitated other patients either being sent home or relocated to residential, nursing, and care homes. It is inevitable that some of these patients will fall into the category of those at higher risk of waterborne infections than the normal population. In an ideal world, these premises would have been pre-checked to ensure that there were effective water safety plans implemented, taking account of patients at higher risk of waterborne infections to minimise the risk of infection. As there was so little time, it is to be expected that such audits were not carried out, so it is essential then

that there is an increased awareness among staff caring for these patients of the precautions needed to prevent waterborne infection. It is also important that there is increased surveillance and appropriate testing to ensure that any potential infections would be recognised and treated in a timely way. The potential consequences of delays in giving appropriate treatment could result not only in severe illness – in many cases requiring intensive care – but also life changing *sequalae*, including the loss of limbs and death.

Buildings lying empty

A huge challenge, which is going to require some innovative management, is the large number of buildings that have been lying empty or have been only partially occupied. Healthcare buildings at risk include dental practices, and other buildings where there is specialist equipment used for treatment or patient diagnosis, where stagnant water in equipment, as well as that within distribution systems, has the potential to pose risks over and above the current crisis. To ensure that these buildings are safe to reopen is going to require planning, and potentially a considerable amount of remedial actions. It is important that not only the water in distribution is risk assessed and managed appropriately, but also where there is any equipment containing water has been left to stagnate. Dental unit water lines are a specific example, and guidance can be found as to how to manage these effectively on the ESGLI (https://www.escmid.org/research_projects/study_groups/legionella_infections/) and Legionella Control Association (https://www.legionellacontrol.org.uk/news/85/) websites.

Infection risk from other waterborne pathogens

The need for many interventions in ventilated patients also increases the risk of infection from other waterborne pathogens, including *P. aeruginosa*, other Gram negative bacteria such as *Stenotrophomonas*, and *Burkholderia* species *etc.* Infections caused by *P. aeruginosa* and other similar bacterial species can affect every part of the body where they can gain access, especially where there are breaches in skin integrity, and these can be life-threatening. No one should forget the outbreak associated with Neonatal Intensive Care in Northern Ireland which killed three babies, which was associated with the colonisation of relatively new tap inserts.[8] *P. aeruginosa* is also inherently resistant to common antibiotics, acting as a reservoir of antibiotic resistance.[9] It is frequently found in drains, including of clinical washhand basins, especially where these are used to dispose of patient fluids, excess infusions, and wastewater.[10,11,12] There is much evidence that infections can be caused directly by splashes from outlets reaching patients if beds are too close to sinks, and indirectly from equipment used for patient treatment, if it has been contaminated by leaving trolleys or infusion sets etc that have been within the splash zone.[13]

Person-to-person transmission

Unlike *Legionella*, person-to-person transmission of *P. aeruginosa* is well documented. The areas designated for treating these patients should therefore be treated as 'augmented care', and extra measures should be implemented, including adherence to strict sink cleaning regimes, together with surveillance and monitoring taken to ensure that patients are adequately protected from waterborne infection. This is a real challenge for hospitals where there is a shortage of trained staff due to self-isolation or illness. Ongoing training to increase awareness is essential, even during the pandemic, as staff and patient support staff not familiar with working in such high-risk care settings may not understand the risks from drains, outlets, and water splashing leading to cross-contamination and patient infection.

While access can be difficult to COVID-19 wards, especially for non-medical staff, testing has already highlighted the risk of outlets colonised with high levels of *P. aeruginosa* (personal communication). A further difficulty I have been made aware of is the reluctance of testing laboratories to accept samples from COVID-19 treatment areas. This means that hospitals may need to carry out the testing 'in house'. Methods are available which can be used which require little training and minimal equipment, such as the IDEXX Quantitray system, which can give some assurance of control.[14]

Be aware of the risks

Both the NHS and private healthcare sector need to be aware of the risks from building water systems and associated equipment which have been affected either directly or indirectly by the COVID-19 pandemic. Where water outlets have not been used, water quality can be adversely affected even after a few hours (**see Figure1**), and remedial measures including the temporary fitting of point-of-use filters should be considered to protect both patients and staff. Resources are required in terms of both finance and staffing to ensure that risk assessments and control measures are put in place to prevent outbreaks of waterborne infection such as Legionnaire's disease and those caused by *P.aeruginosa* and other waterborne pathogens. This will avoid further unnecessary stresses on intensive care units, and help to ensure that the lives of patients and staff are not put at risk. In addition to the information on the ESGLI web pages, additional guidance is available from the Drinking Water Inspectorate.

Figure 1:
A hospital ward outlet after not being used for some hours

Figure 2:
Legionella, shown via atomic force microscopy.

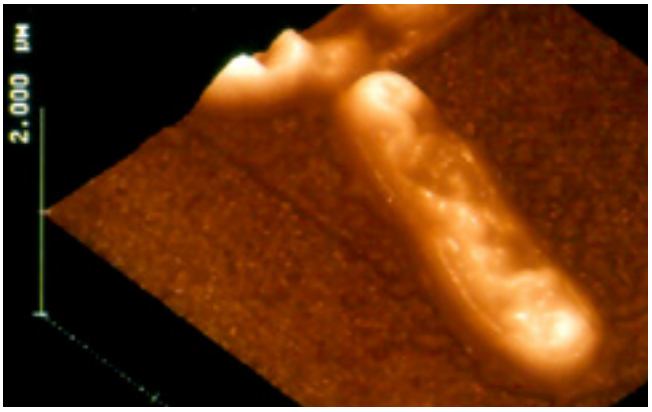


Figure 3:
A thermostatic mixing valve with biofilm.

References

1 Uldum LHK, Krogfelt KA, Albrechtsen HJ, Uldum SA. Cluster of Legionnaires' disease in a newly built block of flats, Denmark, December 2008 – January 2009 2011. Euro Surveill 2011; Jan 6;16 (1). Pii: 19759.

2 (BSI) BSI. BS 8680:2020 Water quality – Water safety plans – Code of practice. UK: BSI; 2020.

3 Zhou F, Yu T, Du R, Fan G, Liu Y, Liu Z et al. Clinical course and risk factors for mortality of adult inpatients with COVID-19 in Wuhan, China: a retrospective cohort study. Lancet 2020;395(10229):1054-62.

4 Xing Q, Li G-j, Xing Y-h, Chen T, Li W-j, Ni W et al. Precautions Are Needed for COVID-19 Patients with Coinfection of Common Respiratory Pathogens. BMJ Yale medRxiv, 2020. https://tinyurl.com/y7xtrfku

5 European Centre for Disease Prevention and Control (ECDC). Surveillance report. Legionnaires' disease – Annual Epidemiological report for 2015. Stockholm; 15 Nov 2017.

6 European Commission. Directive of the European Parliament and of the Council on the quality of water intended for human consumption (recast). 2018. Report No: COM(2017) 753 final.

7 European Centre for Disease Prevention and Control (ECDC). Legionnaires' disease – Annual Epidemiological report for 2017. ECDC, Stockholm; Jan 17 2019 Jan.

8 Walker JT, Jhutty A, Parks S, Willis C, Copley V, Turton JF et al. Investigation of healthcare-acquired infections associated with Pseudomonas aeruginosa biofilms in taps in neonatal units in Northern Ireland. J Hosp Infect. 2014; 86(1):16–23.

9 Breidenstein EB, de la Fuente-Nunez C, Hancock RE. Pseudomonas aeruginosa: All roads lead to resistance. Trends in Microbiology. 2011;19 (8):419-26.

10 Lalancette C, Charron D, Laferriere C, Dolce P, Deziel E, Prevost M et al. Hospital drains as reservoirs of Pseudomonas aeruginosa: Multiple-locus variable-number of tandem repeats analysis genotypes recovered from faucets, sink surfaces and patients. Pathogens 2017; 6(3):36.

11 Breathnach AS, Cubbon MD, Karunaharan RN, Pope CF, Planche TD. Multidrug-resistant Pseudomonas aeruginosa outbreaks in two hospitals: Association with contaminated hospital waste-water systems. J Hosp Infect. 2012;82(1):19-24.

12 Salm F, Deja M, Gastmeier P, Kola A, Hansen S, Behnke M et al. Prolonged outbreak of clonal MDR Pseudomonas aeruginosa on an intensive care unit: Contaminated sinks and contamination of ultra-filtrate bags as possible route of transmission? Antimicrobial Resistance & Infection Control 2016; 5:53.

13 Hota S, Hirji Z, Stockton K, Lemieux C, Dedier H, Wolfaardt G et al. Outbreak of multidrug-resistant Pseudomonas aeruginosa colonization and infection secondary to imperfect intensive care unit room design. Infection Control and Hospital Epidemiology. 2009; 30(1):25-33.

14 Sartory DP, Pauly D, Garrec N, Bonadonna L, Semproni M, Schell C et al. Evaluation of an MPN test for the rapid enumeration of Pseudomonas aeruginosa in hospital waters. J Water Health 2015;13(2): 427-36.

This article first appeared in the June 2020 issue of Health Estate Journal *(www.healthestatejournal.com)*, the monthly magazine of the Institute of Healthcare Engineering and Estate Management *(www.iheem.org.uk)* and reprinted here with their kind permission.

About Dr Susanne Surman-Lee

Dr Susanne Surman-Lee BSc, PHD, CBiol., FRSB, FRSPH, FIHEEM, FWMSoc, MPWTAG, is the chair of the BSI panel that drafted the *BS 8680 Water Safety plans Code of Practice* and *BS 8580 part 2 Code of Practice for risk assessment of Pseudomonas aeruginosa* and other waterborne pathogens. She is a long-standing member of both national and international standards committees producing standards relating to water microbiology.

A State Registered clinical scientist (a public health microbiologist) with over 45 years' experience in clinical and public health microbiology, she is a former director of the HPA (now Public Health England) London Food Water and Environmental Microbiology Laboratory, and now director and Co-owner of Leegionella Ltd – an independent public health consultancy recognised internationally and nationally for both training and its expertise in the detection of waterborne pathogens and prevention of waterborne disease, via the development and implementation of Water Safety Plans, especially in healthcare and the travel industry.

She is the Programme director for the RSPH Water Webinar Series, and chair of the RSPH Water Special Interest Group. For almost 20 years she has been involved with the development of national and international guidelines, including the World Health Organization publications, *Legionella and the Prevention of legionellosis* and *Water Safety in Buildings*, HSG 274, HSG 282, and HTM 04-01, the PWTAG publications, Swimming Pool Water and Hot Tubs for Business, and Water Management Society Guidance. She is the chair of the ESCMID Study group for *Legionella* Infections (ESGLI) working group, which produced the *ESGLI Technical Guidelines for the prevention, control and investigation of infections caused by Legionella*, and *Guidance for managing building water systems during the COPVID-19 pandemic.*

About ESGLI

The European Society for Clinical Microbiology and Infectious Diseases (ESCMID) Study Group for *Legionella* Infections (ESGLI) is a multidisciplinary group of like-minded professionals with the aim of improving the clinical diagnosis, treatment, control, and prevention of legionellosis. The forerunner of ESGLI, the European Working Group for *Legionella* infections (EWGLI), and members of the associated European surveillance network (ELSNET) which was set up to detect travel-associated Legionnaires' disease, have a long history of developing guidance to prevent outbreaks of legionellosis from building water systems. The first EWGLI guidelines were developed almost 20 years ago, and were formally endorsed in 2003 by the Network Committee for the Epidemiological Surveillance and Control of Communicable diseases in the EC. They were developed to be of use both by regulators and epidemiologists investigating cases and outbreaks, and also by the owners/ managers of accommodation sites, to improve the recognition and reduce the risk of Travel Associated Legionnaires Disease (TALD). In 2017 these were expanded and updated to be applicable to all public buildings.

Tina Bradley

It is with immense sadness that WMSoc have to announce that Tina Bradley died on Tuesday 25th August in the Queen Elizabeth Hospital in Birmingham after her long illness.

Her work was well known to the wider healthcare community and we are grateful for her enormous contribution to improving overall standards in all areas of decontamination practice. Tina will be very, very sadly missed by all who knew her.

Amongst many other activities, Tina was a committee member in various positions of the Central Sterilising Club (CSC), culminating in being Chair between 2014-17 and was awarded Honorary Life Membership for her significant contributions to their organisation.

A Book of Remembrance is being compiled for Tina's family and friends to highlight Tina's many accomplishments along with details of her professional career and as an acknowledgement of her dedication and passion for all things decontamination and microbiology.

Could those wishing to add to the Book of Remembrance please send their contributions about how you would like to remember Tina and would wish to celebrate her life to: chairman@centralsterilisingclub.org

https://centralsterilisingclub.org/christina-bradley/

CONTRACTS, PRODUCTS & PUBLICATIONS

River and Canal Trust News

The trust has approached the Government with 30 towpath improvement schemes for inner city and urban areas, as the Government signalled plans for a walking and cycling 'revolution.'

The proposed improvements include places such as Burnley, Wigan, Sheffield, Bradford, Birmingham, Leicester and London. The trust is seeking to secure a combination of government and local authority funding for the schemes.

Towpaths are ideally located to provide traffic-free routes in and through many of the country's towns and cities, connecting people and places. The trust said that the proposed investment will support more active travel - investment in walking is the most green (sustainable) as well as most inclusive (equitable/affordable) option - reducing obesity and encouraging lifestyle changes to support better physical and mental health, notably in the many disadvantaged communities with waterways on their doorstep.

Chief Executive, Richard Parry, said: "Many of Britain's historic canal towpaths saw a significant increase in usage during lock-down as people stayed local and discovered these green/blue linear parks on their doorstep. Post lock-down, for the eight million people living by a canal, this trend has continued."

Water companies record lowest leakage levels from pipes – Press Release from Water UK

Water companies have reduced the amount of water leaked from pipes by 7% to the lowest level since records began in the mid-1990s. This improved picture on leakage is part of a general update to the Discover Water website which also reveals that:

Water quality continues to be maintained at a high standard, passing 99.96% of quality tests; Supply interruptions are down from an average of 13 minutes in 2018/19 to an average of 12 minutes in 2019/20; The amount of water used per person in England and Wales has fallen slightly, from 143 litres to 142 litres per day; Sewer flooding increased by 14%; while some companies saw a reduction, other parts of the country were more affected by extreme weather in the last year, including storms Ciara and Denis.

The overall volume of water being leaked has fallen by 216 million litres per day – enough to fill 86 Olympic size swimming pools – to 2,954 million litres. Reducing leakage presents a significant technological challenge, and with 346,455 kilometres of water pipes, enough to go around the world eight and a half times, water companies are adopting some of this latest technology and innovation to reach every leak. There is still more work to do to meet industry-wide targets to reduce it by 16% by 2025, with a further reduction to half the current levels of leakage by 2050.

As part of the sector's Public Interest Commitments (PIC) set in 2019, water companies have pledged to triple the rate of leakage reduction by 2030 enabling action to be taken faster, for location and repair. Commenting on the new leakage figures, Water UK Chief Executive Christine McGourty said: "Enormous progress has been made in tackling leaky pipes, and that's brought leakage levels down significantly in the last year. But the water industry is committed to doing much more, and companies are putting innovation and technology at the heart of a commitment to radically reduce leakage over the long-term. Intelligent networks, smart sensors, satellite technology and drones are all part of the armoury that's being deployed to detect and fix leaks faster than ever and at lower cost."

Water Hygiene Centre Press Release

While the world outside has been going crazy the Water Hygiene Centre has been working hard behind the scenes to update their Legionella Awareness Training Course to be available On-Line. This course is ideal for those who are not necessarily directly involved with water systems, but still require some understanding of Legionella, for example hotel services, care taking teams, and ward / building / departmental staff.

The online course has been broken down into three modules so that delegates can complete the course at their own pace. This is a new way to learn with the Water Hygiene Centre Academy and certificates are awarded upon completion of the course.

The Water Hygiene Centre hope to develop more of their courses to be available online or delivered over Microsoft Teams in the coming months.

For more information call 01993 840400 or visit: www.waterhygienecentre.com/legionella-awareness-training

White Knight Press Release

White Knight, an East Midlands based company is providing a national service with a revolutionary new disinfection instrument called SteraMist. SteraMist was developed by the US defence department to protect workers from weaponised anthrax attacks and is now being used across the globe to kill COVID-19. SteraMist goes beyond deep cleaning and sterilises all surfaces and the surrounding air within 3 seconds, making it the most effective prevention tool against coronavirus, in the world. White Knight CEO, Phil Edwards, states "As a health and environment focused business, we have never been so excited about the vertical market applications for SteraMist. This revolutionary system is not only 100% safe but has the potential to save lives on a global scale, reducing cross-infection for all types of disease. COVID-19 is our focus today but long term sustainability without using disinfectant pollutants, is essential for our planet." SteraMist kills pathogens by passing low concentration Hydrogen Peroxide (H_2O_2) over a cold plasma arc creating an ionised mist/gas that seeks out the deadly microbes and kills them almost on contact and then reverts to water and oxygen, leaving no residue. Treated spaces and vehicles are safe to use within minutes and being non corrosive, SteraMist can be used on any surface or material, even sensitive electronics.

Thames Water takes masculine words out of job adverts

The company has attracted more female applicants for a job after removing "masculine" words from the advertisement. Thames Water, which is one of the biggest water suppliers in London and southern England, had been looking for a sewage works technician.

Initially, just eight per cent of the applicants were women, prompting the company to use software to scan the advertisement and identify phrases that might put female applicants off. Words including "competitive", "confident" and "champion" were singled out and therefore removed. The requirement "needs to have worked outdoors in a manual role" was also taken out of the advert. Such words and phrases were identified as "masculine coded" by the software and were considered off-putting to female applicants. They were replaced with phrases such as "we welcome people who want to learn and be team players". The changes resulted in a major increase in female applicants. After the new advert was released, 46 per cent of the applicants were women.

Thames Water has since vowed to take a similar approach with future adverts to ensure it has a diverse workforce. Currently, 33 per cent of the company's total headcount is female. That figure puts Thames Water ahead of other utility companies, where, on average, just one-fifth of employees are women.

IDEXX Legiolert® receives UK acceptance for *Legionella pneumophila* testing in waters and other environmental samples Press Release

IDEXX, the global leader in rapid microbiological testing for water, has announced that the Legiolert culture testing method for *Legionella pneumophila (L. pneumophila)*, has been accepted by the UK's Standing Committee of Analysts (SCA). Legiolert, for the accurate analysis of samples from cooling towers, hot and cold water systems, spa pools and a variety of other water sources, is now specified as a recommended method in the Committee's "blue book" publication of "The determination of *Legionella* bacteria in waters and other environmental samples (2020) – Part 2 – Culture Methods for their detection and enumeration."

Legiolert was launched in Europe by IDEXX in 2017 and is a highly sensitive method for the confirmed detection of *L. pneumophila* in water, delivering results up to seven days faster than traditional culture testing methods. *L. pneumophila* is the most common *Legionella* species in water and according to the European Centre for Disease Prevention and Control clinical culture data, causes 97% of all cases of Legionnaires' disease*. Legionnaires' disease is deadly for about 1 in 10 people who contract it and often causes long-lasting symptoms for survivors.

A number of peer reviewed studies* have highlighted superior performance of Legiolert when compared to the standard method for detection of *Legionella pneumophila*. The ISO method has a number of limitations including a significant false negative error rate which can result in undetected contamination and consequent risk to human health, especially in the case of vulnerable populations. In contrast, Legiolert is a culture method which is both accurate and easy to use. It is recognised with AFNOR certification for hot and cold sanitary water and cooling tower water.

The test is based on a bacterial enzyme detection technology that signals the presence of *L. pneumophila* through utilisation of the Legiolert reagent. *L. pneumophila* cells grow rapidly and reproduce using the rich supply of amino acids, vitamins and other nutrients present in the reagent. Actively growing strains of *L. pneumophila* produce a brown colour indicator.

Legiolert is the latest IDEXX method specified as a recognised method by the SCA. Others include Pseudalert for the rapid, accurate testing of *Pseudomonas aeruginosa*, Colilert®-18 for the rapid detection of coliforms and Escherichia coli, and Enterolert®-E for the isolation and enumeration of enterococci.

IDEXX Water is a global provider of water testing solutions that deliver easy, rapid, accurate and cost-effective information on water quality to laboratories and public utilities around the world.

**References supplied to WMSoc.*

For more information, visit: www.idexx.co.uk/water/water-testing-solutions.html

Government unveils long-term plan to tackle flooding

The government has revealed its long-term plan to tackle the risks of flooding and coastal erosion. The measures set out in the new plan are the most comprehensive in a decade, including investment of £5.2 billion to create around 2,000 new flood and coastal defences to better protect 336,000 properties in England by 2027, alongside support to help households and businesses get back on their feet more quickly after flooding.

The plans also include £200 million for innovative projects such as sustainable drainage systems and nature-based solutions like temporary or permanent water storage areas which also boost wildlife. These will support 25 areas at risk of flooding to test and demonstrate innovative actions to adapt to a changing climate and improve their resilience.

In addition, up to £170 million will be spent to accelerate work on shovel-ready flood defence schemes that will begin construction in 2020 or 2021. 22 areas across the country will benefit from this immediate boost to jobs supporting the local economy as communities recover from the impact of coronavirus.

The plan will see the delivery of flood and coastal defences to prevent £32 billion in economic damage, the creation of areas to store water during flooding and greater use of nature based solutions to reduce flood risk.

The plan also sets out proposed changes to the joint government and insurance industry Flood Re scheme. Subject to consultation, this will allow claims to include an additional amount so that flood resilience measures are included in repairs, and allow households that have property flood resilience measures in place to benefit from lower premiums.

Further Information: www.gov.uk/government/news/multi-billion-pound-investment-as-government-unveils-new-long-term-plan-to-tackle-flooding

Flint Water disaster – compensation at last

The US state of Michigan has finally agreed to pay a settlement of $600m to victims of the Flint water crisis. Most of the money will go to children in the city who were exposed to drinking water poisoned with lead.

At least 12 people died after Flint switched its water supply from Lake Huron to the Flint River in 2014 to save money. However, the water from the river was more corrosive than Lake Huron's water and was not treated properly, causing lead - a powerful neurotoxin - to leach from the pipes. Residents started noticing that tap water sometimes came out blue or yellow - and many began to lose their hair, or develop rashes on their arms and face. Despite this, local officials and leaders denied anything was wrong for over a year, even as residents complained that the water tasted and looked strange.

Anyone who lived in Flint between 2014 and 2016 could be eligible for the settlement money. However, almost 80% of the funds will go to residents who were under 18 at the time. Experts say children are particularly vulnerable to lead poisoning, particularly babies and children under five who can experience brain damage before their brains are fully developed.

Thousands of residents filed lawsuits against the state of Michigan - and this settlement will only resolve claims against the state, not individuals including Rick Snyder who was governor at the time, or private companies.

Ousted CEO at Thames given £2.8m payoff

Thames Water's ousted boss left with a £2.8m payoff, despite a disastrous period for the water giant, including fines for sewage leaks. Steve Robertson quit last May after slow progress in turning around Britain's biggest water company, which has been repeatedly fined for poor performance. Robertson was handed £770,500 in "lieu of notice", equivalent to 12 months' pay and perks. He was also given £2m for "loss of office". This comes 2 years after the Government pledged to crack down on exorbitant pay to executives and overseas financial arrangements in England's water companies.

And still it goes on. The replacement officer, Sarah Bentley, who has left her position of chief customer officer at Severn Trent, will receive compensation of £3.1m over the next 3 years in lieu of bonuses she would have received had she stayed at Severn Trent. On top of this, her basic pay of £750,000 and £120,000 in pension contributions takes her total pay to as high as £3.27m each year. Thames defended the remuneration by saying that this "was benchmarked against other water companies and other London and South East utility companies."

SEND IN YOUR CONTRACTS, PRODUCTS & PUBLICATIONS NEWS TO:

waterline@wmsoc.org.uk

Covid-19 outbreak early warning predictor

Sewage testing is being conducted across England in a bid to develop wastewater-based Covid-19 surveillance. Scientists discovered early in the pandemic that infected people "shed" the virus in their faeces. Further research concluded that wastewater sampling could provide a signal of a coronavirus outbreak up to a week earlier than medical testing.

The Department for the Environment, Food and Rural Affairs says this has begun at 44 wastewater treatment sites. A Defra spokesperson said the government was working with scientists, water companies and the devolved governments in Scotland, Wales and Northern Ireland. They would "monitor for fragments of coronavirus genetic material".

Environment Secretary George Eustice said: "The aim of this new research is to give us a head start on where new outbreaks are likely to occur. Sampling is being carried out to further test the effectiveness of this new science. Research remains at an early stage and we are still refining our methods."

Dr Andrew Singer from the UK Centre for Ecology and Hydrology is one of the lead scientists on a UK project to develop a standardised test to "count" the amount of genetic material from the coronavirus in a wastewater sample. He said: "We would like to have confidence in saying that when we have an increase in virus numbers in the sewage from week to week, there are higher number of coronavirus cases. That means we will be able to look for trends.... to see if the release from lockdown maintains infection levels or are things moving in the wrong direction."

UV-C added to air conditioning units Press Release

Blue Diamond Pumps has launched BlueScience UV-C LED technology, a product it says has been developed to provide an easy retrofit system for all existing AC equipment to treat and protect the air, by constant disinfection, every time it passes through the unit.

UV-C light delivers germicidal irradiation, and according to BlueDiamond "attacks the DNA/DNR of microorganisms, killing 99.9 per cent of them and rendering bacteria and viruses harmless and unable to reproduce or spread."

Global AC manufacturers have started to incorporate UV-C primarily into their large ducted AC units. BlueScience, however, is aimed specifically towards both fan coils and mini-splits. A spokesperson said: "People are avoiding switching the AC on, going to shops, restaurants and cafes because they don't trust the AC – they're of the opinion that AC hoovers up everyone's airborne particles and spits them back out across the entire environment."

BlueScience can convert any pre-installed mini split or fan coil unit into a powerful air sanitiser. At the top of the AC unit, as warmed air gets drawn into the unit it flows past a row of LEDs that radiate UV-C, exposing anything in the airflow to the irradiation process. A second row of LEDs close to the drain-pan helps maintain a clean environment in the drain-pan and lower evaporator.

For more information: www.bluescience.co.uk

QEUH Glasgow Independent Review Summary

The Queen Elizabeth University Hospital Independent Review has published its report into the design, build, commissioning and maintenance of the Queen Elizabeth University Hospital (QEUH) and Royal Hospital for Children (RHC).

Chairs Dr Andrew Fraser and Dr Brian Montgomery were asked to investigate if the management and execution of the project had adversely impacted on the risk of healthcare associated infection at the NHS Greater Glasgow and Clyde (NHS GG&C) flagship hospital.

The Review has concluded the hospitals offer a setting for high quality healthcare for patients, staff and visitors and there is no clear evidence linking failures in its design, build commissioning and maintenance to avoidable deaths.

The report details two main high level findings:

"In the course of the Review, through examination of documentation, listening to witnesses, discussion with experts and input from the Review's expert advisers, and site visits, we have not established a sound evidential basis for asserting that avoidable deaths have resulted from failures in the design, build, commissioning or maintenance of the QEUH and RHC;"

"The QEUH and RHC combined have in place the modern safety features and systems that we would expect of a hospital of this type. The general population of patients, staff and visitors can have confidence that the QEUH/RHC offers a setting for high quality healthcare."

Nevertheless there were 9 significant findings and 63 recommendations for improvements.

Grundfos acquires Eurowater Press Release

Grundfos has entered into an agreement to acquire Eurowater. The acquisition aligns closely with Grundfos' strategy to strengthen its innovation leadership within water technology, and supports the company's purpose to pioneer solutions to the world's water and climate challenges.

Headquartered in Skanderborg Denmark, Eurowater serves primarily the European markets with a range of water treatment offerings, with a focus on customers in the industrial and municipal sectors.

Eurowater and Grundfos businesses share many similarities, including a sharp focus on innovation, high-quality products and value-added services to customers. Culturally, the two organisations match well, both being purpose-driven and highly customer-centric.

Managing Director of Eurowater, Torben Buhl commented: "A better buyer does not exist! It is with peace of mind that we leave ownership of our life's work to Grundfos. We took over the company 17 years ago from the Scherfig family, who has owned the company since its foundation in 1936."

The transaction is subject to regulatory approvals and is expected to be closed during autumn 2020.

For more information: www.grundfos.com and Tel: 01525 850000

Eau de source Harrogate achetée par une société française

The takeover of the North Yorkshire mineral water firm has been approved by the competition watchdog. A majority stake in Harrogate Spring Water will be acquired by the French food company Danone. Danone's ownership of the Evian and Volvic brands had prompted concerns the deal would reduce competition. However, the Competition and Markets Authority has said there will be no further investigation and the deal can go ahead.

Harrogate became a fashionable spa town after mineral springs were discovered in the town in the 16th Century. The spring water was first bottled in 1740 and the company claims it is the UK's oldest bottled water company. Harrogate Spring Water's current majority shareholders will retain a minority stake in the company, which achieved sales of £21.6m in the financial year to March 2019.

Managing director James Cain will join Danone Waters UK's management team and continue to lead the Harrogate business.

C4Hydro Press Release

Marseille, July 2020 – A major breakthrough in controlling the health risk: C4Hydro, a specialist in the fast detection of bacteria in water, is launching its new range of tests intended for private individuals who wish to be sure that the water in their home (shower, pools, spas, water tanks or wells) is free from contamination.

All water systems can be colonised by pathogenic bacteria such as legionellae or coliforms (including Escherichia coli). They are the source of serious infections (legionellosis, acute gastroenteritis, meningitis, septicaemia...). To respond to this major health risk, C4Hydro has developed an innovative concept. The principle: take science out of the laboratories and widen access to the tools for scientific analysis in order to allow everyone to effectively check their water reliably, quickly and simply.

The innovation? The Mini-Lab, a pocket laboratory whose key element is a portable incubator. No larger than a smartphone, it reproduces the conditions of culturing microorganisms in a laboratory, which is the most reliable method of detecting bacteria. The technique is the same: C4Hydro has just simplified and adapted it for use at home.

Having been designed by scientists with a background in the highest levels of French academia (CNRS: the French National Centre for Scientific Research) and redesigned for private individuals, two kits are coming onto the market: the legionella detection kit and the coliforms detection kit (including Escherichia coli).

For more information, go to: https://shop.c4hydro.com/our-products/?lang=en

Biochemica keeps it clean - Press Release/Case Study

Biochemica Water Ltd., now part of Veolia Water Technologies UK (VWT UK) recently delivered a bespoke chemical solution to its long standing client, a leading rPET pellet and flake manufacturer. Crucially, it was necessary for the rPET pellets to adhere to the minimum cleanliness requirements of recycled plastic packaging for the food industry. As such the company required a chemical solution with superior cleaning qualities to ensure compliance every time.

The manufacturer in question operates one of the UK's largest and most technically advanced PET bottle reprocessing plants, handling in excess of 100,000 tonnes of PET packaging every year. It produces European Food Safety Authority approved food grade rPET pellets for use by its customers in the manufacture of PET packaging and other products.

The company currently uses two wash lines, both of which require a wash chemical, an antifoam and an alkalinity builder as part of the wash process. However, when using its previous wash chemical solution, pellets and flakes had to be regularly returned through the wash cycle when failing to comply with the maximum parts per million (ppm) level of organic contamination required by the food industry. In particular, a threshold of less than 300 ppm was required. The company also had an issue with foaming, despite the use of an antifoam, caused by turbulence within the system.

Biochemica Water Ltd. already had a long-standing relationship with the company and was providing it with a number of water treatment services. The rPET manufacturer tasked Biochemica with providing a more effective chemical solution that was also cost efficient, and would allow the company to increase flow rate through its wash lines as well as reducing the occurrence of foaming. It was also critical that less product would fail organics analysis, reducing the requirement to return it back through the wash process. Biochemica, worked with a speciality chemicals manufacturer, designed a chemical, named Aquawash, which was then trialled by the company and found to work well with the system, when exposed to low levels of turbulence. However, it was found to generate foaming at higher turbulence caused by the high speed requirement of one of the company's two wash lines. Adjustments were made to the chemical formulation to reduce foaming and the solution was tested again.

Anthony Stubbs, Director of Water Treatment Services at Biochemica Water Ltd. commented: "After extensive trialling, this second batch of Aquawash was found to work well. Although chemical usage levels were found to be the same as with the previous solution, economically, the company was also able to make savings by switching to Aquawash. Furthermore, the level of cleanliness and resultant organic ppm was crucially reduced to an average of less than 150 ppm, meaning far less product was having to be returned and recycled through the system."

For more information on Biochemica Water Ltd., now part of VWT UK, and its water treatment services, please visit www.biochemica.co.uk/.

DOWNLOADABLE RESEARCH PAPERS:

Chlorine-based DUWL disinfectant leads to a different microbial composition of water derived biofilms compared to H2O2-based chemical disinfectants in vitro

PeerJ. 2020; 8: e9503. Published online 2020 Jul 15. doi: 10.7717/peerj.9503

Authors: Charifa Zemouri, Alexa M.G.A. Laheij, Catherine M.C. Volgenant, Bernd W. Brandt, Wim Crielaard, Mark J. Buijs, Egija Zaura, and Johannes J. de Soet

Background: Biofilm formation in dental unit waterlines (DUWL) may lead to health risks for dental staff and patients. Therefore, dental unit waterlines need to be disinfected, for instance by using chemical disinfectants. However, the application of chemical disinfectants may lead to the selection of specific microorganisms. Therefore, the aim of our study was to assess the microbial composition of water-derived biofilms, after a continuous exposure to maintenance doses of commercially available chemical disinfectants, in vitro.

Paper available at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7368430/

Effects of amines on the formation and photodegradation of DCNM under UV/chlorine disinfection

Sci Rep. 2020; 10: 12602. Published online 2020 Jul 28. doi: 10.1038/s41598-020-69426-9

Authors: Lin Deng, Xueying Liao, Jiaxin Shen, and Bohui Xu

Background: Investigations were conducted to examine the effects of amine type and initial concentration, free chlorine concentration, UV light intensity, pH and tert-butyl alcohol (TBA) on the formation of dichloronitromethane (DCNM) under UV/chlorine. Methylamine (MA), dimethylamine (DMA) and poly-dimethyl diallyl ammonium chloride (PolyDADMAC) were selected as the amine precursors of DCNM. And the reaction products of amines were explored through observing the contents of various nitrogen under UV/chlorine.

Paper available at: www.researchgate.net/publication/343259399_Effects_of_amines_on_the_formation_and_photodegradation_of_DCNM_under_UVchlorine_disinfection

Outbreak of *Ralstonia mannitolilytica* bacteraemia in patients undergoing haemodialysis at a tertiary hospital in Pretoria, South Africa

Antimicrob Resist Infect Control. 2020; 9: 117. Published online 2020 Jul 29. doi: 10.1186/s13756-020-00778-7

Authors: Mohamed Said, Wesley van Hougenhouck-Tulleken, Rashmika Naidoo, Nontombi Mbelle, and Farzana Ismail

Background: Ralstonia species are Gram-negative bacilli of low virulence. These organisms are capable of causing healthcare associated infections through contaminated solutions. In this study, we aimed to determine the source of *Ralstonia mannitolilytica* bacteraemia in affected patients in a haemodialysis unit.

Paper available at: aricjournal.biomedcentral.com/articles/10.1186/s13756-020-00778-7

A Comparative Study on the Clinical Features of Coronavirus 2019 (COVID-19) Pneumonia With Other Pneumonias

Clinical Infectious Diseases, Volume 71, Issue 15, 1 August 2020, Pages 756–761, https://doi.org/10.1093/cid/ciaa247

Authors: Dahai Zhao, Feifei Yao, Lijie Wang, Ling Zheng, Yongjun Gao, Jun Ye, Feng Guo, Hui Zhao, Rongbao Gao,

Background: A novel coronavirus (COVID-19) has raised world concern since it emerged in Wuhan, China in December 2019. The infection may result in severe pneumonia with clusters of illness onsets. Its impacts on public health make it paramount to clarify the clinical features with other pneumonias. Nineteen COVID-19 and 15 other patients with pneumonia (non-COVID-19) in areas outside of Hubei were involved in this study. Both COVID-19 and non-COVID-19 patients were confirmed to be infected using throat swabs and/or sputa with/without COVID-2019 by real-time RT-PCR.

Paper available at: https://academic.oup.com/cid/article/71/15/756/5803302

Transmission of Legionnaires' disease through toilet flushing

Emerg Infect Dis. 2020 Jul; 26(7): 1526–1528. doi: 10.3201/eid2607.190941

Authors: Jeanne Couturier, Christophe Ginevra, Didier Nesa, Marine Adam, Cyril Gouot, Ghislaine Descours, Christine Campèse, Giorgia Battipaglia, Eolia Brissot, Laetitia Beraud, Anne-Gaëlle Ranc, Sophie Jarraud, and Frédéric Barbut

Two cases described of healthcare-associated Legionnaires' disease in patients in France hospitalized 5 months apart in the same room. Whole-genome sequencing analyses showed that clinical isolates from the patients and isolates from the room's toilet clustered together. Toilet contamination by *Legionella pneumophila* could lead to a risk for exposure through flushing.

Paper available at: www.medscape.com/viewarticle/932826

Particle sizes of infectious aerosols: implications for infection control

Lancet Respir Med. 2020 Jul 24. doi: 10.1016/S2213-2600(20)30323-4 [Epub ahead of print].

Author: Kevin P Fennelly

The global pandemic of COVID-19 has been associated with infections and deaths among health-care workers. This viewpoint of infectious aerosols is intended to inform appropriate infection control measures to protect health-care workers. Studies of cough aerosols and of exhaled breath from patients with various respiratory infections have shown striking similarities in aerosol size distributions, with a predominance of pathogens in small particles (<5 µm). These are immediately respirable, suggesting the need for personal respiratory protection (respirators) for individuals in close proximity to patients with potentially virulent pathogens. There is no evidence that some pathogens are carried only in large droplets. Surgical masks might offer some respiratory protection from inhalation of infectious aerosols, but not as much as respirators. However, surgical masks worn by patients reduce exposures to infectious aerosols to health-care workers and other individuals.

Paper available at: www.thelancet.com/journals/lanres/article/PIIS2213-2600(20)30323-4/fulltext#:~:text=Airborne%20transmission%20has%20often%20been,and%20a%20few%20other%20pathogens

Comparative efficacy of hospital disinfectants against nosocomial infection pathogens

Antimicrob Resist Infect Control. 2020; 9: 115. Published online 2020 Jul 22. doi: 10.1186/s13756-020-00781-y

Authors: Fahim Amini Tapouk, Ramin Nabizadeh, Nezam Mirzaei, Nima Hosseini Jazani, Mahmood Yousefi, and Mohamad Amin Valizade Hasanloei

Background: Due to the increasing rate of hospital-acquired infections, it is essential to select appropriate disinfectant agents. In this study, the efficacy of hospital disinfectants against nosocomial infection pathogens was compared.

Paper available at: aricjournal.biomedcentral.com/articles/10.1186/s13756-020-00781-y

Legionella pneumophila

IDEXX Legiolert®

Confirmed, accurate results for *Legionella pneumophila* in 7 days.

- Specifically detects *Legionella pneumophila*, the primary cause of Legionnaires' disease
- Simplified sample preparation and streamlined work flow versus traditional culture methods
- Minimises time-consuming Quality Control (QC)
- Eliminates subjective interpretation and reduces read time compared to traditional culture methods

BLUE BOOK Acceptance

Legiolert® is now specified in the SCA *Legionella* 'Blue Book' - The determination of *Legionella* bacteria in waters and other environmental samples (2020) Part 2.

www.idexx.co.uk/onsitewatertesting

To Learn more about Legiolert call IDEXX today on **+44 (0) 1638 676800** or visit **idexx.co.uk/water** or send an email to **wateruk@idexx.com**

IDEXX

ISO **9001:2015** CERTIFIED
ISO **14001:2015** CERTIFIED

INDUSTRY UPDATES

Legionella Control Association

Conference and Standards Update
The LCA has just completed a root and branch review of our Code of Conduct, Areas of Interest and Service Delivery Standards together with the guidance documents that accompany them. These changes were due to be presented at our conference, titled The Times They Are Changing in May 2020. We didn't realise quite how prophetic that title would be! We had to postpone the event from May to October but now we have taken the decision to postpone again until next year.

In the absence of a conference event we are presenting a number of short webinars on the upcoming changes for the new registration year 2021-22. The first of these is scheduled for the 14th of October 2020 with new webinars approximately every two weeks through to April. LCA members will be expected to review their procedures to meet the revised standards for the 2021-22 registration year.

The reason for reviewing what we ask of our members is:

- To make sure what we require is up to date with current industry practice
- To reduce the blue tape burden on members
- To improve standards in the industry

Impacts of COVID-19
The pandemic has had some impact on our members with some service providers. Those involved in training and consultancy have reportedly seen an initial drop in business and an increase in cost due to the need for social distancing. Many other service providers have seen a huge increase in demand as management of empty or partially occupied buildings requires their services.

The LCA has limited the face to face meetings we traditionally used for audits and has moved to remote auditing wherever possible. This has been very successful and most members have welcomed it.

Membership Numbers
The LCA has also received an increase in applications over the last six months with 15 companies awarded membership since March. We currently have 373 full members and 20 companies going through the application and audit process for membership.

CSCA

Why Join the CSCA?
The CSCA is a non-profit membership organisation for companies who actively support and demonstrate a sound approach to the control of water quality in closed systems. Membership is open to all parties with an interest in cleaning and maintenance of closed water systems and currently includes suppliers to the industry, consultants and service providers as either Foundation, Sponsor or Service Provider members.

Service Provider Membership of the CSCA is recognised in the joint publication with BSRIA/CSCA of BG29/2020 as follows:
The management procedures of companies offering or overseeing pre-commission cleaning services in compliance with this guide should ideally be certified to ISO 9001[3] or be audited by an independent trade association such as the Closed Systems Control Association (CSCA – www.cscassociation.org.uk).

Benefits of membership include: opportunity to stand for election to management committee, chance to influence guidance and regulations regarding water treatment and cleaning operations, obtain information on latest industry updates, listing on CSCA website, use of CSCA logo for publicity, a free copy of BG 29/2020, access to CSCA Q&A and members' area, discounted members' rates to CSCA events, etc.

For more information, please contact admin@cscassociation.org.uk tel: 01827 219508 or visit www.cscassociation.org.uk

BSI

BSI EH 3/4 - Meeting Update
BS 8680 – Water Safety Planning: Following it's publication on 29th May 2020, Dr Susanne Lee, Chair of the BSI panel that drafted the BS8680 presented a webinar on 8th July 2020 to explain the content and purpose of the document and how to put it into practice.

The webinar is available to replay through the BSi Website:
https://www.bsigroup.com/en-GB/our-services/events/webinars/2020/introducing-bs-86802020-water-quality.-water-safety-plans.-code-of-practice/form/

BS 8580 Part 2 – Risk Assessments for Pseudomonas aeruginosa and other organisms. Code of practice: This standard is making significant progress as members of the panel continue to meet remotely and is well on track from completion. (see separate article in this edition – Page 20).

BS 7592 – Sampling for Legionella bacteria in water systems. Code of Practice: The kickoff meeting to begin the revision of BS7592 took place on 5th August 2020. The panel met remotely, discussed the plan and agreed objectives. Subsequent drafting meetings have taken place.

Next meeting October 2020.

PHE

Public Health England

Government creates new National Institute for Health Protection
The National Institute for Health Protection (NIHP) will start work immediately, with a single command structure to advance the country's response to the COVID-19 pandemic.

From today (18/8/20) it will bring together Public Health England (PHE) and NHS Test and Trace, as well as the analytical capability of the Joint Biosecurity Centre (JBC) under a single leadership team. This is the first step towards becoming a single organisation, focused on tackling COVID-19 and protecting the nation's health.

In order to minimise disruption to the vital work dealing with the pandemic, the organisation will be formalised and operating from spring 2021.
For more information: www.gov.uk/government/news/government-creates-new-national-institute-for-health-protection

RSPH

RSPH organises a variety of public health related events throughout the year. There are two scheduled for the remainder of 2020. More details can be found online at: www.rsph.org.uk/events.html

25 November 2020
Back to Basics: Outbreak Management – a Practical Experience

2 December 2020
Source Tracking of Antimicrobial Resistance in Emerging Countries

UKAS

Like many organisations, UKAS has made significant adjustments to the way we work to ensure accreditations can be awarded and maintained in spite of the ongoing pandemic. Before COVID-19 hit, UKAS had already made in-roads into the delivery of a remote element to some assessments, so we were prepared to be able to switch to remote assessments rapidly. Since March, UKAS's primary assessment technique has been remote assessment. We have considered this essential to ensure organisations are able to continue their vital work during challenging times, delivering confidence and assurance to their customers and users regarding the quality, competence and accuracy of all that they do.

UKAS has made steps towards a return to on-site and blended assessments that will continue to allow accredited organisations to demonstrate this quality and consistency in a way that is convenient, efficient and safe, all without compromising the rigor or integrity of the assessment process.

NECLFG

NECLFG will be hosting a Webinar on Thursday 26th November from 12-1pm.
This event, sponsored by SMS Environmental, is entitled "Legionella – What we learned in lockdown".
Further information on speakers will be announce in due course on their LinkedIn page (North East Councils Legionella Focus Group).

bsi.

15% off for WMSoc members!

Purchase BS8680:2020 at a discounted price. USE CODE: WMS8680

Purchase online at the BSI shop and apply the code on checkout to receive the discount. Offer ends 30/11/2020!

BS 8680:2020 Water Quality. Water Safety Plans. Code of Practice. NOW AVAILABLE
It's often thought water systems in buildings are safe when connected to public supplies – but this ignores the potential for contamination (both chemical and microbial) and the growth of waterborne opportunistic pathogens within building water systems. BS 8680:2020 sets out guidance and recommendations for developing a Water Safety Plan (WSP) for building water systems. This brand new British Standard gives recommendations and guidance on the development of a Water Safety Plan (WSP). The standard is intended to be used as a code of practice to demonstrate current good practice and compliance.

Intended users include all of those involved in ensuring water is safe and fit for purpose at the point of use, including those responsible for:

- Design and specification
- Construction and installation
- Commissioning
- Maintenance
- Operation
- Alteration and refurbishment
- Deconstruction

NOTE: This British Standard does not give recommendations for the development of WSPs for regulated drinking water supplies from either a public or private supply, as these are covered in national water quality regulations. For risk assessment for Legionella or Pseudomonas aeruginosa, see BS 8580.

Appreciation of those standing down

With thanks…
The WMSoc council would like to extend their thanks to the following people who have now stepped down from council roles after many years of service.

John Lindeman

It is with a sense of great sadness but also with immense gratitude that we announce that John Lindeman has decided that it is now time to withdraw from the Council of the Water Management Society and also to stand down as a Director of the society.

Sadness, because the society has lost the wise counselling that John has brought to the table over many decades of service.

Immense gratitude, because John has contributed so much, not only to the Water Management Society, but also to our industry.

He has spent over 40 years in the water treatment industry and has been a member of the society since its creation in the 1970s. He has been Chairman on three occasions, which is a record unlikely to be broken. He has contributed tirelessly to numerous committees of the society, including Technical, Membership, Waterline, Training and Accreditation, and Conferences and Events as well as serving on many of the subcommittees formed over the years to deal with specific issues as they arose. For some time, he has been the elder stateman of Council and also the Board of Directors and his wisdom, honed over so many years of experience, will be sorely missed.

John represented us on many activities outside the Water Management Society. He made a major contribution to the briefing committees of L8 and HSG274 and before that, EH48. He has also been involved over the years on several committees of the British Standards Institution.

He represented his company at meetings of the British Association for Chemical Specialities (BACS), to which he contributed with enthusiasm equal to that given to the Water Management Society. He was involved with the BACS Biocides Group and from this contributed to the formation of the BACS Water Treatment Group. He worked through BACS on the EU Biocidal Products Directive (BPD) and later, on the EU Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) through his Chairmanship of the BACS Regulatory Affairs Forum.

In the late 1990s, he turned his talents to the creation and development of the Code of Conduct Association (CCA), later renamed the Legionella Control Association (LCA), contributing to the writing of the Code of Conduct and its subsequent further development. He served on the committee from its inception and later became responsible for coordinating the work of the LCA Assessors.

Our industry comprises a large number of fiercely competitive companies. Members of the various committees of the Water Management Society are in competition with each other. One quality that shines through strongly in the huge contribution that John Lindeman has made to the welfare of both the society and our industry in general is his unerring dedication to working for the benefit of our industry as a whole. His example is an inspiration to all who serve on the various committees and subcommittees of our society, and to everyone in the water treatment community!

- John Alvey F.W.M.Soc

Graham Thompson

Graham's background is in science and he came into water treatment from an industrial laboratory company in 1989/90. When we first met his nickname was 'Forklift' as he used to load/unload 200 Litre drums of chemical from the back of lorries. Working at Rentokil one of Graham's main water treatment accounts was Welcome Smith Kline\Glaxo Welcome and he was very successful in developing that and other accounts and won the prestigious annual salesman of the year award for the Water & Ventilation Division.

Graham joined the WMSoc in 1998, quickly joining council in 1999 where he has sat for many years, briefly standing down in 2014 and returning in 2016. During this time Graham has been heavily involved in the WMSoc technical committee where he has represented us for a number of years on the BSi EH 3/6 and EH 3/4 committees, feeding back useful information from these committees to the WMSoc technical team. Graham was also very actively involved in writing HSG274 with the HSE, and was a major contributor on behalf of WMSoc in the working party for HTM 04-01 'safe water in healthcare premises'. He has also spoken at many events on behalf of both the WMSoc & LCA.

His contributions to Council and Technical have been well received by his peers. 'He always has a sensible approach based on his real-life experiences in the field, has a good manner and deals with council members with civility and respect' reported John Lindeman.

'Graham has the ability to sit quietly in the background and listen to the discussion in progress and would then make a very grounded observation which would restore the discussion back to reality' felt Giles Green.

Graham and I have worked together for the past 20 years or so in our separate Companies and he has proved to be a very valuable colleague.

He has always shown a professional attitude to every role he has undertaken throughout his career and will always try to support and assist anyone in need. We have many years of history together both personal and professional and I have always been proud to be able to work alongside Graham and to also call him a friend.

On behalf of the WMSoc I would like to thank Graham for his continual service to the Water Management Technical Committee and the years he has served on the Council.

- Alan Greaves F.W.M.Soc

Dr William Thomas

Bill has more than 30 years' experience in Legionella risk assessment and control and water quality and environmental analysis, working in a wide range of industrial sectors in the UK and overseas.

He has a strong technical background and extensive knowledge of water quality and treatment, and is a recognised expert in risk assessment and control of Legionella bacteria and other waterborne agents. He has broad experience in developing corporate policies and practices for managing health, safety and environmental issues across a wide range of businesses. Through his professional activities, Bill has advised Government departments and professional bodies in the UK and overseas on public health and environmental issues, has been part of BSi standards committees, sat as a diretor of the LCA and has published over 50 technical papers.

Bill has acted as expert witness on behalf of several clients, preparing expert statements and reports to assist clients in understanding their liabilities and resolving legal disputes. He has worked within the industry to support and promote the WMSoc through sub-committee involvement, and networking with other professional bodies to promote both membership and training courses. Bill has been a member since 1983, served on council since 1996, and has been both a conference speaker and tutor for the society.

Although Bill is stepping back from an active role in the society he is still promoting the activities of ISHEM, the company he founded in 2002.

- Tom Laffey F.W.M.Soc

NEW members

Since the last edition of Waterline was printed the WMSoc has approved 25 new membership applications. We welcome members from the following sectors of the industry:
Water Hygiene – 13, **Water Treatment** – 4, **Consultancy** – 7, **Plumbing** – 1.

The following new members have given permission for their names to be printed:
John Austin, Mandie Birch, Michael Cormacey, Mark Curtis, Michael Darby, Daniel Dixon, Alison Dring, Stephan Gardner-Bushell, Philip Gowan, Chloe Jennings, Stephen Kershaw, Adam Lewis, Antony MacDonald, Steven Mannion, Seamus Mckeown, Steve Moore, Ian Murray, Liam Pirrie, Christopher Putt, Alicia Maria Mira Tejado, Craig Whitlock.

Preventing Legionella contamination and Legionnaires' disease outbreaks in the UK

by Nigel Richardson, Managing Director, Collaton Consultancy Limited

In November 2019, two Birmingham business owners were sentenced to 12 weeks in prison for failing to control for Legionella in their building's cooling tower[i]. Legionella is bacteria that can cause Legionnaires' disease—a pneumonia that kills 1 in 10 infected people[ii]. This lack of Legionella protocol could have resulted in serious and potentially fatal consequences for the employees of the business, as well as Birmingham residents. Additionally, the outbreak caused significant negative media attention and fines for the business owners.

In the UK, the Health and Safety Executive mandates that every cooling tower must have a Legionella management program that includes weekly dipslide and quarterly culture testing. These regulations have enabled the UK to become the leader in Legionella prevention. However, there are still hundreds of reported Legionnaires' cases in the UK each year. For example, 9 people were hospitalized after contracting Legionnaires' disease from Legionella bacteria that was traced back to a health spa in Bournemouth in July 2019[iii].

One reason for these continued outbreaks is that the existing testing methods are too slow or inaccurate to rapidly identify Legionella contamination. Legionella culture testing is slow, taking up to 2 weeks to generate a result. It can also be inaccurate. A study published in the *Journal of Water & Health* found that more than 62% of Legionella bacteria die in shipping to the lab[iv]. Additionally, the United States' Centers for Disease Control and Prevention (US CDC) found that Legionella culture testing underestimates the true amount of Legionella bacteria by 17-fold[v].

Traditional on-site testing methods such as dipslides and lateral flow tests also have their drawbacks. For example, dipslides do not distinguish between Legionella and other bacteria and lateral flow tests are not quantitative[vi]. This means that facilities managers cannot use these tests to make informed decisions because there are action levels for water treatment depending on the amount of Legionella in a water sample.

After decades of continued Legionella deaths, the Legionella and water safety industry has innovated to finally find a solution. A North American company has developed the first on-site qPCR test that provides accurate quantification of live Legionella bacteria from a water sample in 45 minutes. Frequent testing of water sources such as cooling towers, humidifiers and domestic hot water systems has the potential to quickly identify Legionella contamination and allow facility managers to treat the problem in real time. Unlike off-site laboratory qPCR tests that may detect free-floating DNA from dead bacteria, the on-site test has proprietary technology that allows it to detect the amount of living Legionella bacteria and is calibrated so that 1 GU/L = 1 CFU/L.

quantitative Polymerase Chain Reaction (qPCR) is a Nobel Prize-winning chemistry that collects data during PCR amplification by utilizing fluorescence signals emitted by either special probes or DNA binding dyes. During this process, the reaction is heated to a specific temperature, cooled to a specific temperature, heated again, and finally fluorescence signals are captured. This technique is used to make multiple copies of a DNA segment of interest, generating a large number of copies from a small initial simple. Then, the amplification of DNA segments make it possible to detect a pathogenic virus or bacteria.

For Legionella detection, the test has DNA target pieces that look for a specific region of the macrophage infectivity potentiator (MIP) gene, on the Legionella bacterial genome, which is conserved across all Legionella *pneumophila* serogroups and not other Legionella species. During PCR, the only part of the Legionella DNA that is being copied is that specific part of the MIP gene. The on-site qPCR test is validated according to ISO 12869 and won North America's top innovation award for Indoor Air Quality (IAQ), as judged by the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE). The test is also being used by the top North American water treatment companies, property management companies, data centers, healthcare organizations, hospitality groups, as well as leading public health authorities such as the US CDC. Now the on-site qPCR test is coming to the UK and is in use by innovative, industry-leading companies.

Other technologies are also coming to light, such as a roving scanning device for checking the cleanliness of cooling tower packs[vii]. This team has been developing inspection technology over the last few years, developing a remotely operated underwater vehicle (ROV) for the rapid and accurate inspection of cooling tower fill pack. This equipment is a novel means of overcoming poor accessibility in cooling towers and allows the operator to create a 3D view of the tower pack and any fouling.

Such technology will help any cooling tower user to be able to compare year on year results and also create a visual evidence of tower cleanliness.

In the 21st century, the Legionella industry has a responsibility to investigate new and innovative methods for Legionella detection. There may finally be a method that can help us prevent Legionnaires' outbreaks – on-site qPCR testing. This award-winning technology has already been proven in North America. Now, with widespread adoption, the UK has the opportunity to prevent Legionella contamination. Over time, it may even be possible to eradicate Legionnaires' outbreaks all together.

References

[i] https://www.hsmsearch.com/Double-sentence-for-Legionella-failure

[ii] Bartram J et al. (Eds.). (2007). *Legionella and the prevention of legionellosis*. World Health Organization: WHO Press.

[iii] https://www.bbc.com/news/uk-england-dorset-48892538

[iv] Ahmed S et al. (2019). Validation and in-field testing of a new on-site qPCR system for quantification of Legionella pneumophila according to ISO/TS 12869:2012 in HVAC cooling towers. *J Water Health*. 17(2): 237–253.

[v] Lucas CE, Taylor TH, Fields BS. (2011). Accuracy and precision of Legionella isolation by US laboratories in the ELITE program pilot study. *Water Res*. 45(15): 4428–4436.

[vi] Claressa E. Lucas*, Thomas H. Taylor Jr., Barry S. Fields (2011). Accuracy and precision of Legionella isolation by US laboratories in the ELITE program pilot study. Water research 45 (2011) 4428e4436. doi:10.1016/j.watres.2011.05.030

[vii] http://www.packscan.co.uk/

Clean Water Proven Results

*ECHA PT05 compliant: approval pending for drinking water disinfection (for humans and animals) and for legionella control.

Huwa·San©

A sustainable way of disinfection

Choose the Original, Silver Stabilised Hydrogen Peroxide Trusted for Over 20 Years

Often imitated, never replicated. The unique formulation makes Huwa-San a powerful, highly effective, broad spectrum disinfectant that is both stable and safe. Huwa-San can be used in cold as well as hot water circuits, both preventively and curatively. Easy to measure, safe to dose and totally non-corrosive in use. The most advanced, highly developed, accredited silver stabilised hydrogen peroxide. Roam Technology, your partner in disinfection control:

- **Trusted legionella control product for over 20 years**
- Market leading technology
- 100's of constant dosing sites across UK & EU
- **100% Brexit ready - dedicated and well stocked UK based distribution centre**
- Unrivaled UK on-site support
- Customised practical training & tailor-made advice
- EU validated BPR dossier
- HSE recognised for legionella control (HSG274 & HSG282)
- Completely removes biofilms & safe for constant dosing
- Totally non-corrosive at recommended dose rates
- Highly effective at low volume dosage

NSF defra ECOCERT NATURAL DETERGENT SGS SGS SGS

Huwa-San TR-50 (PCS 98876) is a recognised biocidal product. Use biocides safely. Before use, read the label and product information.

More information: www.roamtechnology.com • info-uk@roamtechnology.com

Roam Technology
YOUR PARTNER IN HYGIENE CONTROL

From the Archive: This paper first printed in **Waterline** Summer 2016

Addressing Antibiotic Resistance

Sophia Kloda BEd (HONS) MWMSoc,
Aqua Protec Ltd

Less than a century after Alexander Fleming's Nobel Prize worthy discovery of Penicillin, we find the News headlines citing "antibiotic apocalypse" and "post-antibiotic era" due to the "reckless" use of antibiotics. With a race between medical sciences to develop new effective antibiotics against the emergence of these resistant "super bugs", is it reasonable to suggest that the Water Hygiene Industry has a role to play in helping with this problem?

Antimicrobial resistance (AMR) is a substantial concern for the future of medical treatment. Bacterial infections that have been easily treated in the past by a short course of antibiotics are developing into life threatening infections. It was estimated in 2009 by the European Centre for Disease Prevention and Control that in the EU 25,000 patients died from multidrug-resistant (MDR) bacteria. MDR bacteria are defined as those that are resistant to at least three different antibiotics. These MDR strains are most commonly found to be prevalent in ICU and nursing home patients, consequently causing increased lengths of hospitalisation due to increased morbidity. The cost is not only financial with regards to the care service providers, but for the patient there is a high mortality rate associated with catching an infection caused by one of these MDR strains *(Mathers AJ et al, 2011)*.

Darwin's theory of natural selection plays a role in the development of MDR bacteria. Natural selection allows those bacteria with 'protection' from the antibiotic to reproduce, causing a resistant strain. This is due to the occurrence of mutations during the replication of the bacteria's DNA. *Pseudomonas aeruginosa* exhibits such behaviour; with a large genome encoding between 5500 and 6500 genes dependent on the strain; compare this to *Escherichia coli* with just 2594, *P. aeruginosa* 'possesses considerable genetic capacity compared with other organisms' *(P A Lambert, 2002)* making it adaptable, and able to respond to changes in its environment and consequently difficult to control with antibiotics or disinfectants.

Notable bacteria such as *E. Coli, Klebsiella* spp. and *Enterobacter* spp. live, under normal circumstances, harmlessly in the gut of all animals, including humans. However, they are a major cause of healthcare associated infections including intra-abdominal, urinary tract and blood stream *(PHE, 2013)*. Additionally, some species from this family of bacteria have the ability to produce an enzyme called Carbapenmase which is capable of destroying Carbapenem antibiotics, which are usually reserved for serious infections caused by MDR bacteria. Pseudomonas and Acinetobacter species also demonstrate this same ability to produce Carbapenmase.

The detection, management and control of *Carbapenemase-Producing Enterobacteriaceae* (CPE) in hospitals and long-term care settings is fundamental to impede the development of AMR. Environmental cleanliness is a key contributory factor as an appropriate infection and control precaution in addition to the standard infection control precautions that are to be used by all staff when handling patients. Contamination of the hospital water system by *P. aeruginosa* can 'cause infections in multiple patients in a unit or hospital, often without obvious links, over a prolonged period, sometimes extending over several years and with gaps of months between cases' *(Wilson APR et al, 2015)*, therefore control measures for reducing the risk of proliferation of *P. aeruginosa* in the water system must be considered.

A study in 2013 by *Kotsanas D1 et al*, looked to find the source of Gram-negative bacteria that harboured a gene associated with carbapenmase production (*metallo-ß-lactamase*) in an intensive care unit (ICU) that was possibly associated with contaminated hand wash basins. Using samples from the ICU hand wash basins and taps, analytical testing identified that the CPE were 'isolated persistently from the grating and drain of eight central sinks. Molecular typing confirmed that clinical and environmental isolates were related'. Bacteria are important vectors of antibiotic resistance and can be disseminated from hospital effluent to aquatic environments, *(Vaz-Moreira et al 2015)*. *Kotsanas et al (2013)* noted the several unsuccessful attempts to decontaminate the sinks using both detergents and steam; therefore consideration should be given to reducing the proliferation within the healthcare setting, for example, by reducing shower flow rates to minimise flooding.

Wilson APR et al (2015) identified strong evidence to support the following recommendations regarding cleaning and the environment to prevent and control MDR gram-negative bacteria:

- Environmental screening should be considered where there is unexplained transmission of MDR Gram-negative organisms or a possible common source for an outbreak.
- Respiratory and other contaminated equipment should be decontaminated (or respiratory secretions discarded) away from the immediate bed area in designated cleaning sinks and not in hand-wash sinks.
- For *P. aeruginosa*, including MDR strains, at a minimum in accordance with the organisations water safety plan, a risk assessment should be made when levels of patient colonisation or infection rise in order to determine if point of use filters should be installed or if taps need to be changed.

There is also evidence to suggest that 'terminal disinfection of vacated areas with hypochlorite should be used in the control of outbreaks of infection due to MDR Gram-negative bacteria'.

Of increasing concern as a threat to human and animal health, is the growing evidence to support that MDR bacteria are beginning to proliferate outside healthcare settings. Studies conducted in Greek water bodies have identified resistant isolates of *P. aeruginosa*. These isolates have potentially originated from treated waste water, identified to have a high prevalence of MDR bacteria, continuously being discharged into natural water basins *(Olga P et al, 2016 & Osinska A et al, 2016)*. Whilst this study has been conducted in Greek water bodies (ironic given the word Pseudomonas derives from the Greek – Pseudo, meaning 'false' and Monas meaning 'single unit') this proliferation has been noted in most European countries, that suggests a risk of occurrence in the UK *(Wilson APR et al 2015)*.

We have relished in nearly a century of drugs that are able to treat serious bacterial infections with relative ease. Taking control of MDR bacteria within the aquatic environment, coupled with the mindful management of the use of antibiotics, is integral for a sustainable future to prevent an "antibiotic apocalypse". This is where the Water Hygiene Industry has a huge role to play. Prevention of bacterial proliferation within the water system is the Holy Grail and certainly prevention of these MDR organisms from entering the municipal water supply is a "Must". In reality, compromises have to be made to provide water of the correct quality for the various applications within an Hospital environment and so that is where the "Control" aspect applies. High quality risk assessments by suitably trained and qualified personnel, excellent communications between the client and the provider and engagement with the water safety groups are pre-requisite in order to fully understand the complexities of water management. The absolute goal is the prevention of as many water-borne infections as possible and then the risk from MDR strains will automatically be mitigated. The industry already has many tools at its disposal to enable prevention of infection from many water sources and the advancement of microbiological analysis techniques will only help discover these in a more timely manner.

Acronyms:

AMR - Antimicrobial Resistance

MDR - Multi Drug Resistance

CPE - Carbapenemase-Producing Enterobacteriaceae

References

Mathers AJ et al (2011) 'Molecular dissection of an outbreak of carbapenem-resistant enterobacteriaceae reveals Intergenus KPC capanpenemase transmission through a promiscuous plasmid.'

P A Lambert (2002) 'Mechanisms of antibiotic resistance in Pseudomonas aeruginosa' Journal of the Royal Society of Medicine Supplement No. 41 Volume 95

PHE (2013) ' Acute trust toolkit for the early detection, management and control of carbapenemase – producing Enterobacteriaceae' (*https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/329227/Acute_trust_toolkit_for_the_early_detection.pdf*)

A P R Wilson et al (2015) 'Prevention and control of multi-drug resistant Gram negative bacteria: recommendations from a Joint Working Party' Journal of Hospital Infection (*http://dx.doi.org/10.1016/j.jhin.2015.08.007*)

Vaz-Moreira et al (2015) 'Microb Drug Resist' 2015 Oct 15 (Epub ahead of print)

Kotsanas D1 et al (2013) 'Down the drain' 2013 Mar 18

Olga P et al (2016) 'Antibiotic resistance profiles of Pseudomonas aeruginosa isolated from various Greek aquatic environments' FEMS Microbiol Ecol 2016 Feb 24 (Epub ahead of print)

Osinska A et al (2016) 'Prevalence of plasmid-mediated multidrug resistance determinants in fluoroquinolone-resistant bacteria isolated from sewage and surface water' Environ Sci Pollut Res Int 2016 Feb 19 (Epub ahead of print)

accepta

The Water Treatment Products Company

More than just a chemical manufacturer...

OWN LABEL CHEMICALS

Extensive catalogue of water treatment chemicals and Toll Blending options labelled to your specification.

BESPOKE EQUIPMENT

Make use of our engineering expertise with innovative and bespoke dosing equipment to add value to your offering.

DELIVERED DISCREETLY

Save time & money by getting your chemicals delivered direct to site. With options for handsfree chemical pump-over into onsite tanks.

UNRIVALLED TECHNICAL ASSISTANCE

Here to help you succeed with expert assistance available from in-house chemists & microbiologists including access to our chemistry and UKAS accredited micro labs.

- Save Time
- Save Money
- Add Value
- Keep your Customers Compliant

0161 877 2334 | info@accepta.com | www.accepta.com

event report

WMSoc 2020 AGM

Wednesday 16th September 2020

A first for the Water Management Society, this year's AGM was delivered remotely on 16th September 2020 with great success, and the 30 attendees did not need to brave the weather or the virus to attend in person.

The outgoing chairman, Colin Brown, delivered details of the Society to those members present and dispatched the legal affairs with brio. Full minutes of the AGM can be found on the member's portal for review.

Following a member's vote prior to the AGM, three of our existing council members return to their posts in 2020: Simon Hughes, Garry Kerin and Jonathan Waggott with three new members also voted onto council. These new members are welcomed to the council and will be introduced to you in coming issues: Emma Jorgenson, John Sandford and Jemma Tennant.

Each year Council reviews the membership list and identifies individuals who qualify for Fellow status, having been a member for more than 10 years and having contributed significantly to the society or the industry as a whole, and this year we were pleased to award this status to Simon Hughes. In addition, changes to the bylaws have now made available the grades of Honorary Fellow for those members of greater than 10 years who have made an exceptional contribution to the industry or the society. This new grade was awarded to Dr Bill Thomas and Professor Clive Thompson.

It should be noted that none of these membership grades can be applied for and care is taken that the honour is carefully bestowed.

Finally, in memory of Sue Pipe, a new award has been created this year which will be given on an exceptional basis to those persons who have shown a dedication to the Water Management Society over many years. Their commitment and unique achievements both for the Society, the industry as a whole and also in support and development of others will be recognised with the Sue Pipe Lifetime Achievement Award. We are pleased to present this award to Mr John Lindeman and thank him for his dedication to the society for the past 40 years and wish him all the very best in his retirement.

And so to the future, and welcome to our new chairman Ian E Kershaw who will be driving the Society forward for the next 2 years.

Colin Brown

Ian E Kershaw

www.towersystems.co.uk

The Cooling Tower Specialists

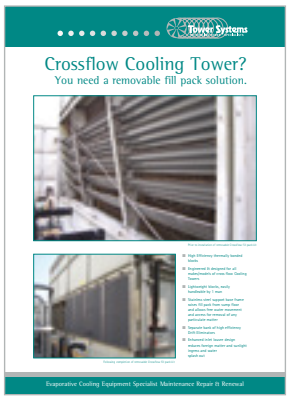
Stay cool, we're on top of it.

Tower Systems

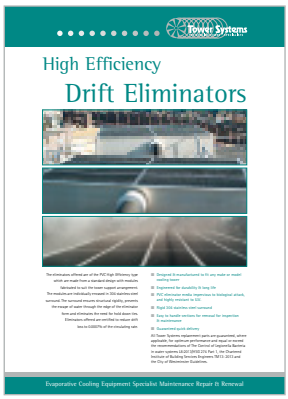
What we do: Products and Services

New Equipment/Turnkey Installation Solution

Removable Crossflow Fill Pack Solution



High Efficiency Drift Eliminators

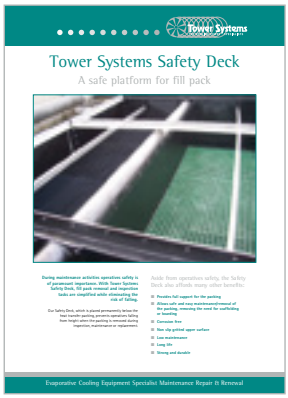


Routine Maintenance Visits

Replacement Parts

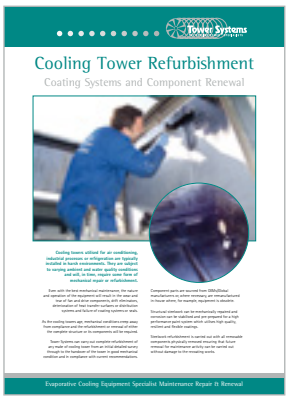
Maintenance Access

Safety Deck



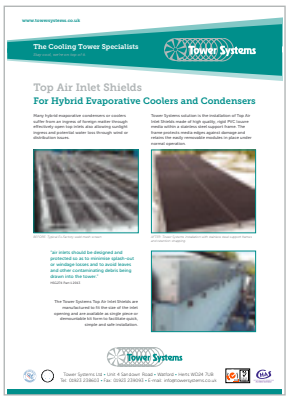
Condition Surveys

Refurbishment

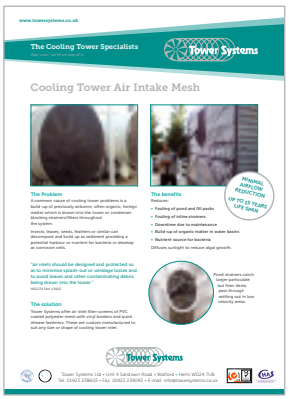


Leak Repairs

Top Air Inlet Shields



Cooling Tower Air Intake Mesh



Tower Systems

Tower Systems Ltd • Unit 4 Sandown Road • Watford • Herts WD24 7UB
Tel: 01923 238603 • Fax: 01923 239093 • E-mail: info@towersystems.co.uk

Accredited Contractor

EndoSan®

ADVANCING WATER HYGIENE

With Stabilised Hydrogen Peroxide

ECHA BPR PT5 COMPLIANT

Safe and legally recognised for use in the disinfection of drinking water for both humans and animals

- Proven to kill legionella bacteria
- Highly effective biofilm remover
- Non-corrosive at dose rates
- Degrades into water and oxygen
- Odour, colour and taste free
- Alcohol and chlorine free
- pH Neutral when dosed
- Effective between 0-95˚C

"Silver stabilised hydrogen peroxide has a history of use in the control of legionella in water systems. A silver hydrogen peroxide solution is injected directly into the water system and if applied and maintained according to the manufacturers' instructions, can be an effective means of control." **HSE - HSG274 Part 2: The control of legionella bacteria in hot and cold water systems**

ALSO AVAILABLE

WATER TESTING KITS | TEST STRIPS | DOSING SOLUTIONS

Certified to NSF/ANSI/CAN 60 | HALAL | Department for Environment Food & Rural Affairs | FOOD SAFE DISINFECTANT

Cert No: 12560 ISO 9001

Use biocides safely. Always read the label and product information before use

ADVANCING WATER HYGIENE | www.endosan.com | +44 (0)1925 747 101

THE WATER MANAGEMENT SOCIETY

TRAINING COURSE PROGRAMME 2021

AUTUMN & WINTER PROGRAMME 2020/21

Tuesday 3rd November	Temperature Monitoring, Sampling & Inspection of Water Systems for Technicians ●
Wednesday 4th November	Spas and Swimming Pool Chemical Control and Management
Tuesday 10th November	Management and Control of Closed Systems ●
Wednesday 11th November	Temperature Monitoring, Sampling & Inspection of Water Systems for Technicians ●
Tuesday 17th November	Legionella Control & Management for Dutyholders and Responsible Persons - Evaporative Cooling Systems
Wednesday 18th November	Management and Control of Closed Systems ●
Tuesday 24th November	Practical Legionella Risk Assessment ** ●
Wednesday 25th November	Cleaning & Disinfection ●
Tuesday 1st December	Legionella Risk Assessment of Water Systems – Basic
Wednesday 2nd December	Legionella Control & Management for Dutyholders and Responsible Persons - Hot & Cold Water Systems
Thursday 3rd December	Temperature Monitoring, Sampling & Inspection of Water Systems for Technicians ●
Tuesday 8th December	Cleaning & Disinfection ●
Wednesday 9th December	Practical Legionella Risk Assessment ** ●
Tuesday 26th January 2021	HTM 04-01 Water Hygiene Training: Managing & Controlling Risk of Waterborne Pathogens in Healthcare Water Systems ●
Wednesday 27th January	Practical Legionella Risk Assessment ** ●
Tuesday 2nd February	Cooling Water Chemistry Part 1
Wednesday 3rd February	Cooling Water Chemistry (Follow on) *
Tuesday 9th February	Cleaning & Disinfection ●
Wednesday 10th February	Legionella Risk Assessment of Water Systems – Basic
Tuesday 23rd February	Temperature Monitoring, Sampling & Inspection of Water Systems for Technicians ●
Wednesday 24th February	Legionella Control & Management for Dutyholders and Responsible Persons - Hot & Cold Water Systems

SPRING & SUMMER PROGRAMME 2021

Tuesday 9th March	Legionella Control & Management for Dutyholders and Responsible Persons - Evaporative Cooling Systems
Wednesday 10th March	Legionella Risk Assessment in Cooling Systems **
Tuesday 23rd March	Cleaning & Disinfection ●
Wednesday 24th March	Foundation Course in Water Treatment Chemistry
Tuesday 30th March	Practical Legionella Risk Assessment ** ●
Wednesday 31st March	Management and Control of Closed Systems ●
Tuesday 20th April	Cleaning & Disinfection ●
Tuesday 27th April	Temperature Monitoring, Sampling & Inspection of Water Systems for Technicians ●
Wednesday 28th April	Legionella Risk Assessment of Water Systems – Basic
Tuesday 11th May	Practical Legionella Risk Assessment ** ●
Wednesday 12th May	Spas and Swimming Pool Chemical Control and Management
Tuesday 18th May	Legionella Control & Management for Dutyholders and Responsible Persons - Hot & Cold Water Systems
Tuesday 25th May	Cleaning & Disinfection ●
Tuesday 8th June	Temperature Monitoring, Sampling & Inspection of Water Systems for Technicians ●
Tuesday 15th June	Practical Legionella Risk Assessment ** ●
Wednesday 16th June	Legionella Risk Assessment in Cooling Systems **
Tuesday 22nd June	Cleaning & Disinfection ●
Tuesday 29th June	Legionella Risk Assessment of Water Systems – Basic
Wednesday 30th June	Legionella Control & Management for Dutyholders and Responsible Persons - Evaporative Cooling Systems
Tuesday 6th July	HTM 04-01 Water Hygiene Training: Managing & Controlling Risk of Waterborne Pathogens in Healthcare Water Systems ●
Tuesday 13th July	Management and Control of Closed Systems ●
Tuesday 20th July	Cleaning & Disinfection ●
Wednesday 21st July	Foundation Course in Water Treatment Chemistry
Tuesday 10th August	Legionella Risk Assessment of Water Systems – Basic
Wednesday 11th August	Legionella Control & Management for Dutyholders and Responsible Persons - Hot & Cold Water Systems

AUTUMN & WINTER PROGRAMME 2021

Tuesday 14th September	Boiler Water Chemistry Part 1
Wednesday 15th September	Boiler Water Chemistry (Follow on)*
Tuesday 21st September	Cleaning & Disinfection ●
Wednesday 22nd September	Practical Legionella Risk Assessment ** ●
Wednesday 29th September	Temperature Monitoring, Sampling & Inspection of Water Systems for Technicians ●
Tuesday 5th October	Legionella Risk Assessment of Water Systems – Basic
Wednesday 6th October	Legionella Control & Management for Dutyholders and Responsible Persons - Hot & Cold Water Systems
Tuesday 12th October	Management and Control of Closed Systems ●
Wednesday 13th October	Cooling Water Chemistry (Follow on)*
Tuesday 2nd November	Cleaning & Disinfection ●
Tuesday 9th November	Practical Legionella Risk Assessment ** ●
Wednesday 10th November	Legionella Risk Assessment in Cooling Systems **
Tuesday 16th November	Temperature Monitoring, Sampling & Inspection of Water Systems for Technicians ●
Wednesday 17th November	Spas and Swimming Pool Chemical Control and Management
Tuesday 23rd November	HTM 04-01 Water Hygiene Training: Managing & Controlling Risk of Waterborne Pathogens in Healthcare Water Systems ●
Tuesday 30th November	Legionella Risk Assessment of Water Systems – Basic
Wednesday 1st December	Legionella Control & Management for Dutyholders and Responsible Persons - Evaporative Cooling Systems
Tuesday 7th December	Cleaning & Disinfection ●
Wednesday 8th December	Foundation Course in Water Treatment Chemistry

WHERE INDICATED ● COURSE WILL USE THE WMSOC PRACTICAL TRAINING AREA

PRACTICAL TRAINING AREA

* Delegates attending these courses should first attend the Cooling & Boiler Water Chemistry Part 1 course or have a good working knowledge of basic terminology.

** Delegates attending the Practical or Cooling Systems course will be asked to prove that they have previously attended the Legionella Risk Assessment of Water Systems – Basic course or equivalent.

It is generally agreed that training should be refreshed on a regular basis; the recommended interval is every 3 years. The WMSoc has replaced its refresher courses with revamped training modules using the Practical Training Area (PTA); this gives attendees the opportunity to prove an ability to follow instructions and demonstrate their ability to work safely under test conditions. Anyone who attended training more than 3 years ago would benefit from attending a course currently shown on the programme to refresh their training.

ALL OF OUR COURSES ARE

City & Guilds

ACCREDITED PROGRAMME

BOOK ONLINE AT: www.wmsoc.org.uk/training

CALL US ON: 01827 289 558 OR EMAIL: training@wmsoc.org.uk

The Water Management Society, 6 Sir Robert Peel Mill, Hoye Walk, Fazeley, Tamworth, Staffs B78 3QD