ENVIRONMENT, CLIMATE CHANGE AND LAND REFORM COMMITTEE

AGENDA

19th Meeting, 2018 (Session 5)

Tuesday 5 June 2018

The Committee will meet at 9.30 am in the Robert Burns Room (CR1).

1. **Decision on taking business in private:** The Committee will decide whether to take items 6, 7, 8 and 9 in private.

2. **Declaration of interests:** Alex Neil will be invited to declare any relevant interests.

3. **Scottish Government EU Roundtable on Environment and Climate Change:** The Committee will take evidence on the Environmental Governance Report of the Roundtable on Environment and Climate Change from—
   
   Professor Campbell Gemmel, (Chair of the Roundtable), Canopus Scotland;
   
   Lloyd Austin, Royal Society for the Protection of Birds;
   
   Jonny Hughes, Scottish Wildlife Trust;
   
   Professor Colin Reid, University of Dundee.

4. **Subordinate legislation:** The Committee will consider the following instrument—


5. **Petition PE1646:** The Committee will consider a petition by Caroline Hayes on Drinking water supplies in Scotland.

6. **Subordinate legislation:** The Committee will consider a draft report on the Community Right to Buy (Abandoned, Neglected or Detrimental Land) (Eligible Land, Regulators and Restrictions on Transfers and Dealing) (Scotland) Regulations 2018 [draft].
7. **Scottish Government Budget:** The Committee will consider its approach to consideration of the Scottish Government Budget.

8. **Work programme:** The Committee will consider its work programme.

9. **Scottish Government EU Roundtable on Environment and Climate Change:** The Committee will consider evidence heard earlier in the meeting.

Lynn Tullis  
Clerk to the Environment, Climate Change and Land Reform Committee  
Room T3.40  
The Scottish Parliament  
Edinburgh  
Tel: 0131 348 5240  
Email: ecclr.committee@parliament.scot.
The papers for this meeting are as follows—

**Agenda item 3**
EU Environment and Climate Change Round Table

**PRIVATE PAPER**

**Agenda item 4**
Revised Code of Practice on Litter and Refuse

**Agenda item 5**
PE1646 cover note

**Agenda item 6**

**PRIVATE PAPER**

**Agenda item 7**

**PRIVATE PAPER**

**Agenda item 8**

**PRIVATE PAPER**
Environment, Climate Change and Land Reform Committee

19th Meeting, 2018 (Session 5)

Tuesday 5 June 2018

Scottish Government EU Environment and Climate Change Round Table

Introduction

1. At its meeting of 8 May 2018 the Committee agreed to hear from the Scottish Government EU Environment and Climate Change Roundtable. The Committee will take evidence on their report which was published on 1 June 2018, from: Professor Campbell Gemmell, Canopus Scotland; Lloyd Austin, Royal Society for the Protection of Birds; Jonny Hughes, Scottish Wildlife Trust; and Professor Colin Reid, University of Dundee (by video link).

Background

2. In a letter to the ECCLR Committee on 8 January 2018 the Cabinet Secretary referred to the establishment of a group to provide advice to the Scottish Government on environmental governance - “To inform our thinking, I have commissioned the Roundtable on the Environment and Climate Change to provide advice by March 2018 on future environmental governance arrangements in Scotland. This will involve identifying where gaps may emerge in existing powers to monitor and enforce environmental standards in Scotland, and setting out options for providing appropriate levels of scrutiny, reporting and accountability following the UK’s exit from the EU, using international comparisons where appropriate.” The report of the Roundtable is not yet in the public domain.

3. The Committee issued a call for evidence on its inquiry on the EU environmental and animal welfare principles, which closed on 29 March 2018 http://www.parliament.scot/parliamentarybusiness/CurrentCommittees/107913.aspx

4. The Committee then heard from the Cabinet Secretary for Environment, Climate Change and Land Reform on 8 May 2018 http://www.parliament.scot/parliamentarybusiness/report.aspx?r=11517

Clerks
Environment, Climate Change and Land Reform Committee.
Environment, Climate Change and Land Reform Committee

19th Meeting, 2018 (Session 5)

Tuesday 5 June 2018

Revised Code of Practice on Litter and Refuse (COPLAR)

Background
1. On 17 May 2018, the Scottish Government’s Revised Code of Practice on Litter and Refuse (COPLAR) (SG/2018/81) was laid in the Scottish Parliament.

2. This Code of Practice on Litter and Refuse (COPLAR) provides practical guidance on fulfilling the duties under the Environmental Protection Act 1990 (Section 89). These are to, as far as is practicable:
   - keep land clear of litter and refuse (Duty 1)
   - keep certain roads clean (Duty 2).

3. The Delegated Powers and Law Reform Committee considered the document at its meeting on 29 May and determined it had no points to raise.

4. The Environment, Climate Change and Land Reform Committee will consider this document at its meeting on 5 June 2018.

5. Correspondence from the Cabinet Secretary for Environment, Climate Change and Land Reform is included at Annexe A and the revised code itself can be found here.

6. The Committee is invited to consider the revised code of practice and to agree any further action it may wish to take in relation to the document.

Clerks
Environment, Climate Change and Land Reform Committee
17 May 2018
Dear Conveners,

**Code of Practice on Litter and Refuse**

I am writing to advise you that a new version of the Code of Practice on Litter and Refuse (COPLAR) has been laid in Parliament, to replace the current version which was published in 2006.

COPLAR is issued to support duty holders with fulfilling their responsibilities under Section 89 of the Environmental Protection Act 1990. These are to as far as is practicable keep:

- land clear of litter and refuse (Duty 1)
- roads clean (Duty 2)

Reviewing the Code of Practice was a National Litter Strategy commitment. The project was overseen by a review steering group. Its membership included: COSLA, Keep Scotland Beautiful, Transport Scotland and the Association for Public Service Excellence. Further advice and support for duty holders will be made available through Zero Waste Scotland.

The annex to this letter provides members with further background which I hope you will find helpful.

Roseanna Cunningham

**Code of Practice on Litter and Refuse**

**What is the Code of Practice on Litter and Refuse (COPLAR)?**

COPLAR supports fulfilment of the Environmental Protection Act 1990’s two Section 89 duties which are to, as far as is practicable, keep:

- land clear of litter and refuse (Duty 1)
• roads clean (Duty 2)

Duty 1 covers:

• Local authorities
• Scottish ministers
• Crown authorities
• Crown Estate Commissioners
• Crown Estate Scotland
• Educational institutions
• Any operator of a relevant railway asset (such as a railway station and track)
• Light railway/tramway operators
• Passenger Transport Executives
• Road transport operators, other than taxi or other hire cars
• Canal operators
• Port/dock/harbour/pier operators
• Airport operators

Duty 2 relates to local authorities for relevant roads, and Scottish ministers for motorways and special roads.

COPLAR covers a broad range of advice:

• how to prioritise land and roads
• the standard that demonstrates duty fulfilment
• what to consider as litter, refuse and detritus
• how quickly to restore areas affected by those problems and how to assess the scale of the issues.

The previous version, published in 2006, focused on street cleansing as the main way to fulfil the duties. The update expands this to include wider prevention tactics.

COPLAR is issued under Section 89 (7) and duty holders shall have regard to it, under Section 89 (10).

Why update COPLAR?

The National Litter Strategy committed to reviewing COPLAR following a consultation which identified support for doing so.

The review was an opportunity to align the code with the strategy’s prevention aim and the Commission on the Future Delivery of Public Services (The Christie Commission), which established that prevention in public service is more efficient than treatment.
What was the process for reviewing the document?

The Scottish Government convened a review steering group which included duty holders, key professional bodies and Keep Scotland Beautiful (full membership below).

Zero Waste Scotland held workshops and meetings with stakeholders, including local authorities.

Scottish Government public bodies were invited to contribute their views and a short consultation for duty holders was held in summer 2017. Its findings will be available on the Scottish Government website.

What was the steering group membership?

- COSLA
- Association for Public Service Excellence (APSE)
- Chartered Institute of Wastes Management (CIWM)
- Scottish Canals
- Transport Scotland
- Network Rail
- Keep Scotland Beautiful
- Zero Waste Scotland
- a former member of the Christie Commission took part in earlier meetings

What did the review conclude?

The review identified the following challenges with the 2006 code:

- resources were focused on clear up rather than preventing the problem – which is at odds with recommended prevention approaches to protect public budgets from unnecessary spend
- street cleansing was offered as the solution for fulfilling both duties which missed the opportunity to prevent litter by influencing behaviour of people who litter
- it is written for a local authority audience and does not clearly signal to other duty holders what they need to do
- it doesn’t specifically include litter in trees, bushes, ponds or streams.

What are the principles behind the COPLAR review?

- land that is litter-free, and roads that are clean, meet the standard (Grade A) and do not require restorative action
- large and dangerous build ups of litter and refuse should be removed more quickly than smaller items
- cleansing is one way to fulfil the duty but preventing litter from being dropped is in line with The Christie Commission which established that prevention in public service is more efficient than treatment. The new approach can avoid unnecessary cleaning costs and the wider expense of social, economic and
environmental issues (litter has been shown to be a factor in crime rates and to have an impact on house prices, health and wellbeing).

- preventative tactics influence behaviour and encourage personal responsibility
- flexibility remains - duty holders are free to decide:
  - how and when to monitor their areas
  - which prevention tactics to introduce, and when
  - what they want to evidence as justification if duties are unfulfilled.

What are the main changes within COPLAR 2018?

- Duty 1 now encourages duty holders to influence behaviour so that less litter is dropped in the first place
- Duty 1 response times have been extended for duty holders who successfully influence behaviour and have less litter to clear
- a distinction between the two duties has been made with separate grades and response times
- clarity that the standard which reflects duty fulfilment is achieving ‘Grade A’
- refreshed grades and zones include metrics that will support consistency of interpretation between duty holders.

Improved language and structure also make it clear who the duties apply to, where litter should be removed from (extending its focus to include water, bushes and trees) and what to consider as litter, refuse and detritus.

What are the benefits of COPLAR 2018?

- the focus on litter prevention means there should be less to clean up
- effective prevention can off-set litter clear up costs
- the new approach also supports tackling wider social, economic and environmental issues associated with litter and flytipping
- supports easier benchmarking and sharing of best practice between duty holders.

The revised version has been careful to maintain flexibility for duty holder decision making.

What should duty holders do?

- assess how busy their land or roads are, and how likely these are to become littered
- decide the tactics to fulfil their duties
- make monitoring arrangements to assess the condition of their land and or roads
- when duty holders detect that an area has fallen below the standard (Grade A) or receive a complaint, they should restore it within the appropriate response times.
Which of the Scottish Government’s National Outcomes and Indicators does COPLAR support?

Outcomes

- We value and enjoy our built and natural environment and protect it and enhance it for future generations
- We reduce the local and global environmental impact of our consumption and production
- Our public services are high quality, continually improving, efficient and responsive to local people’s needs

Indicators

- Improve people’s perceptions of the quality of public services
- Improve people’s perceptions of their neighbourhood
- Improve the state of Scotland’s marine environment
- Reduce waste generated
Environment, Climate Change and Land Reform Committee

19th Meeting, 2018 (Session 5)

Tuesday 5 June 2018

PE1646: Drinking water supplies in Scotland

Background

1. Petition PE1646, from Caroline Hayes, was lodged on 12 April 2017. It calls on the Scottish Parliament to urge the Scottish Government to:

   i) review the role of the Drinking Water Quality Regulator; and

   ii) commission independent research into the safety of the chloramination of drinking water.

2. The petition stems from an issue in Badenoch and Strathspey where a change of water supply in 2012 led to concerns about the taste and odour of the water as well as possible skin irritation.

Public Petitions Committee consideration

3. Following evidence from the petitioner at the PPC’s meeting on 25 May 2017, the Committee wrote to the Scottish Government, Scottish Water, Drinking Water Quality Regulator, the Scottish Environment Protection Agency, Water Industry Commission for Scotland, NHS Highland, Strathspey & Badenoch Water Action Group. The responses to these letters can be read on the petition’s web page.

4. At its meeting on 26 October 2017, the PPC agreed to again write to Scottish Water, which responded in November 2017.

5. The most recent submission from the petitioner was received by the PPC on 8 March 2018. The submission highlighted continuing concerns about drinking water in Badenoch and Strathspey as well as problems with the Chloramination process in other parts of Scotland.

6. At its meeting on 15 March 2018, the Public Petitions Committee (PPC) agreed to refer the petition to the Environment, Climate Change and Land Reform Committee. A SPICE briefing on the Petition is available here.

Environment, Climate Change and Land Reform Committee consideration

At its meeting on 27 March, the Committee decided to consider the petition as part of a planned session with Scottish Water on 17 April 2018.

7. Ahead of this session, a number of submissions were received by the Committee:

   • Catherine M Phillips 28 March 2018
8. At the meeting on 17 April, the Committee took evidence from Scottish Water and heard that:

- A quarter of households in Scotland currently have chloraminated water.
- Chloramination is supported by the World Health Organisation and is a process used in the USA, Canada, Australia and in some parts of Europe.¹
- It is one of a number of disinfection methods available, and is often used in heavily peated areas².

9. The Committee subsequently wrote to Scottish Water on 19 April and sought further details of the number of complaints they had received about chloramination. The Committee also asked for details of Scottish Water’s involvement in any peatland restoration projects. Scottish Water responded on 2 May.

10. The Petitioner provided a submission to the Committee on 2 June 2018 providing comment on the 17 April 2018 meeting (available at Annexe A).

For consideration

11. The Committee is invited to consider whether it wishes to:

- Review the available information on approaches to chloramination in different countries and which alternatives to chloramination are used.
- Request a briefing from Scottish Water on the range of water treatments currently being used throughout Scotland, the costs associated with these, and the decision-making process used to decide when chloramination is appropriate.
- Review available information on or commission independent advice on the potential safety and health impacts of chloramination.
- Request a briefing from Scottish Water or the Drinking Water Quality Regulator on how they ensure water in Scotland is safe to drink.
- Review the role of the Drinking Water Quality Regulator.

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Environment, Climate Change and Land Reform Committee

¹ The Environment, Climate Change and Land Reform Committee, Official Report, 17 April 2018
² The Environment, Climate Change and Land Reform Committee, Official Report, 17 April 2018
PE1646 – Chlorination of water supplies

Written submission from Caroline Hayes

The following contains a commentary from petitioner, Caroline Hayes, on the Environment, Climate Change and Land Reform Committee meeting of 17 April 2018 at which it heard from representatives of Scottish Water and Business Stream.

Red text highlights part of the evidence given and the green text indicates the petitioner’s view.

Issue of chloraminated water, on which a number of colleagues want to come in.

Kate Forbes: The witnesses might be aware that a petition on chloramination that is in front of this committee—it was referred to us by the Public Petitions Committee—was sparked by the situation of the water supplied from Aviemore to the Badenoch and Strathspey area. However, my first question is a general one. Why has Scottish Water decided to increase the number of areas that are being supplied with chloraminated water?

Douglas Millican: I will provide a bit of context. We draw water from many different sources across Scotland. We sometimes draw water from rivers and underground aquifers, but we predominantly draw it from upland lochs and reservoirs. We then need to get that water into a high-quality condition and deliver it safely to customers’ properties. The two main challenges for us are the nature or characteristics of that water from lochs and reservoirs and the nature of its distribution—the length and material of the pipes—from where we collect it to where we deliver it to customers’ premises. Those are the two main factors that drive our water treatment activities that ensure that the water that gets to customers’ premises across the network is of a high quality and safe to drink. Use of the words “safe” “safer than” - according to what, safer than what? And what measures are they using to determine “safe”? As in, safer than drinking chlorinated water, or untreated water, or contaminated water? There is a lack of clarification around the word safe. Safe from microorganisms but what about disinfectant by products(DBP's). On chloramination, I will make a general point that does not deal specifically with the Badenoch and Strathspey issue. Over a quarter of Scotland’s water, including the water that we drink here in the Parliament, is now being chloraminated because, as Simon Parsons referenced earlier, a lot of our natural source waters come from upland areas where the soil is quite rich in organic and peat—more so than in most other places in Europe. When that organic material reacts with chlorine, water is produced that is safe to drink. However, there is always a risk that water from an area that is rich in organics might breach the regulatory standards that we are required to achieve. It has been known since the 1930’s DBP’s have been produced, which cause these breaches and consequently have health implications and is it only now SW are doing something about it. Why? The context is that the standards that we need to achieve are broadly three times more demanding than the World Health Organization’s(WHO) guidelines for appropriate health parameters. When water that is rich in organic or peaty material is combined with chlorine, we are at risk of breaching one of those regulatory standards. However, a treatment of chloromine—a
combination of chlorine and ammonia—means that that element is way below the regulatory standards and is even safer for people to drink. WHO only dictates a standard for monochloramine as a disinfectant at 3mg/l. For di and trichloramine there are no standards, because the available information is not satisfactory for the establishment of a health guideline (WHO guidelines for drinking water 3rd edition Chemical aspects), how is it possible to know it’s absolutely safe?

**Kate Forbes:** When Scottish Water decides to chloraminate water in an area, does it engage with consumers prior to the introduction and during the initial phase? How far in advance are consumers notified, and is there a regulatory requirement to notify consumers about changes to their water?

**Douglas Millican:** Our principal engagement has been with the drinking water quality regulator and local health boards. Both the regulator and NHS Scotland recognise chloramination as very safe and appropriate for water treatment in Scotland. Where are the studies to confirm this and the effects on long terms health? In the DWQR’s study (5) the conclusion on N-Nitrosodimethylamine (NDMA), a member of a group of probable human carcinogens, an unregulated DBP, says ‘more sampling is required’ plus ‘More information on the occurrence of this DBP of health concern is needed’. I think it is important to also highlight that 'However, any risk assessment of the occurrence of NDMA must also consider the significant reduction in halogenated DBP formation that accompanies chloramination'. NDMA is not regulated but THM’s are in my view this causes huge concern. Typically, we engage with the NHS a year ahead of chloramination to make sure that, for any patients who have kidney issues, adjustments can be made to dialysis machines to deal with chloraminated water as opposed to chlorinated water. Rightly or wrongly, we have intentionally taken a low-key approach to informing customers. The drinking water quality regulator said in evidence to the Public Petitions Committee that “using a treatment process which involves the addition of ammonium sulphate to the water may sound alarming, but this is ... recognised,” approved A really important question, who approved it? and safe. We have been low key about it because a person who gets a postcard about the addition of ammonium sulphate might be very anxious. Most customers rely on the whole infrastructure of the national health service to protect public health. The Scottish drinking water quality regulator and Scottish Water work together to give the assurance that water is absolutely safe to drink and of a high quality. We do not alarm customers. The idea that it is easier NOT to inform people of what SW are doing to our water is one that indicates that they are failing in their duty to keep customers/consumers informed of the additions to the product they are providing. Would a manufacturer be allowed to do this? Why are they above the normal consumer laws and regulations? Infants and those with health conditions ARE more at risk, customers need to know. There are NO cumulative risk assessments for all the chemicals that SW add to the water. How can this be right? Historically, we have restricted information to the organisations and people that need to do something about the change: the NHS, for dialysis, and people who keep fish as pets. However, whether that approach is right is an open question. Recently, in East and South Ayrshire, we had kick-back—for the first time—that is not true as you had kick back, as you call it, in the Aviemore meeting held in the Cairn Hotel when chloramination was introduced there—about why we did not do more to inform people in the area, which struck me and posed the question whether we should work with the drinking water quality regulator and Citizens Advice
Scotland to look at the pros and cons of different approaches to the provision of information for customers. On the issue of timing, information is provided a year ahead to the health board and three or four weeks' ahead to customers. If customers knew that by adding iodized table salt to chloraminated water to cook with and that there was a possibility of a chemical reaction which could be toxic, I think that they would want to know? Published in Water Research 2015. That is far enough ahead for them to take action, such as by getting the right filter for a pet fish, but not so far ahead that they may have forgotten about it by the time the change comes along.

The Convener: How do you identify which customers keep fish as pets?

Douglas Millican: We do not try to identify them. We send out A5 postcards to draw the issue to the attention of people who have fish, asking them to look at what to do and to speak to someone at a pet shop or fish shop. The postcard makes it clear that the change is chloramination and includes links to a website with a question and-answer section on all the issues. It does not cover all the issues, what about the number of unregulated DBP'S, including brominated and iodinated DBPs(1) The formation of iodinated DBPs with chloramines was found to be greater than that with chlorine(2) and are known to have health implications? Nitrosamines are known to cause cancer. Thank you for clarifying that point.

Kate Forbes: You mentioned that a quarter of customers are drinking chloraminated water, which means that three quarters of customers are not. Do you plan a further roll-out of the process, or do you decide whether to use it on an area-by area basis? What might be the challenges for areas that do not have chloraminated water?

Douglas Millican: Let us work back the way. Our approach is driven entirely by data on the quality of water at the premises of customers across Scotland. We do 140,000 tests a year on the water supply at customers’ premises and, in more than 99.9 per cent of those cases, the supply meets all the standards. When SW test water at the premises of customers, they run the water through the tap for 5 mins before sampling. Flushing the distribution system immediately before compliance monitoring results in underestimates of the actual exposure to DBP's (THM4 and HAA5) and so distorts the degree of public health protection provided. Does that give a true reflection of the water quality within that premises? Monitoring for lead in the distribution system will not detect contamination in the home. At the same time, a test of home water may miss the problem, because the majority of the lead is suspended in the first flow of water in the morning. there is an area in which there is a fail or there might be a trend towards fail, we consider what more we need to do by way of operational practice or through investment to keep the water absolutely pure. The water is not pure, SW add chemicals to it. Only by using advanced treatment techniques as in the Netherlands which remove impurities and micro-organisms, could they say that. Interestingly, the major driver for chloramination is what are called trihalomethanes, which are one of the parameters that we test for. They are caused by the combination of chlorine with organic material. THM's are tested for but importantly there is an area in which, historically, the trihalomethanes standard has occasionally been exceeded or in which there might be a risk of that happening in the future—perhaps because of climate change, which, as Simon Parsons explained, leads to more storms, which in turn cause more organic material to run off—we will consider whether we might need to change our method of treatment from chlorination to chloramination, to make sure that we are always within
the prescribed limit for trihalomethanes (THM'S). A study published by Li and Mitch December 2017(3) suggests that DBP exposure should be measured using other DBP classes in addition to THMs.

Kate Forbes: That is done on an area-by-area basis.

Douglas Millican: Yes. For example, later this year, we will turn on chloramination in the Oban area, where we are building a new treatment plant. One of the major drivers for doing that is the need to deal with this issue.

The Convener: A number of colleagues want to come in on the same issue.

Finlay Carson: I have a very simple question: can other methods be used to make heavily peated water safe? Are decisions on whether to chloraminate the water taken on the ground of cost effectiveness? Are there alternatives? Could there be heavier screening or filtering of the water, which would remove the requirement to chloraminate?

Professor Parsons: Yes. We can look at a range of different options for the treatment of water and for the distribution part of the process, and we consider different approaches for removing such organic material from the water before we add the chlorine. Most of our water treatment works seek to remove 80 to 90-plus per cent of it, but many of our source waters contain such high levels of organic material that even removing 80 to 90 per cent of it is still not enough to enable us to guarantee that, when a customer turns on the tap, the water will be free from the byproducts that we are talking about. But not those that are unregulated. We always look at the range of options that exist. We actively engage in research and innovation that looks at new technologies, new approaches and new ways of controlling our processes. Where is the proof of this? In the end, we will make a decision that is based on the best way of ensuring that the water is always of a high quality and great to drink. In doing so, we take a long-term view of the whole-life cost. Of the treatment works not of public health. John Scott: I am impressed by the fact that you carry out more than 400 tests a day to make sure that our water is safe. However, how many complaints have you received about the chloramination process in south and east Ayrshire? What action have you taken to address those complaints, some of which have been made by my constituents?

Douglas Millican: I do not have a figure for the number of complaints about chloramination, but I do not think that there have been many of them. A recent petition on chloramination in Ayrshire at the last count had received 3119 signatures. We introduced chloramination a week past Monday, and it has taken a number of days to get right through the system. I think that, at the absolute peak, we had 20 contacts a day about issues to do with the taste or the smell of water. That figure has now dropped down to four or five a day in an area in which we serve more than 300,000 people. I would say that it is a negligible level of inquiry. We get inquiries about water taste issues every day from customers across Scotland, so the fact that we are down to a handful of inquiries a day in an area of more than 300,000 people, just one week after putting in the supply, suggests that we have a so-far; so-good situation.
John Scott: If possible, could you supply us with those figures?

Douglas Millican: I would be happy to do so. John Scott: When a decision is taken to change a water source or alter a customer’s supply, how do you ensure that you do not inadvertently create further problems?

Professor Parsons: All the approaches, processes, chemicals and treatment options that we use are highly regulated. That means that their impacts are well understood. What about the known unregulated DBP’s (approx 300 of them) and their implications to health long term? A huge amount of sampling, in addition to the 400 samples a day that you mentioned, takes place as part of the commissioning of any new treatment process or putting any new chemical into the supply. That sampling analysis and science goes on in the background to ensure that, before the water goes into the supply, we fully understand that it is safe and of a high quality. A study just published in Feb 2018 showed iodinated disinfection byproducts (I-DBPs) are highly toxic, but few precursors of I-DBPs have been investigated. From a study into DBP’s at the University of Alberta in Canada, the analysis of tap and corresponding raw water samples collected from three cities, identified four iodinated peptides, in the tap waters but not in the raw waters. Precursors were also detected in the same tap and raw water samples. This study demonstrates that iodinated dipeptides exist as DBPs in drinking water. —and, we hope, that it tastes good. How can it? the water we are supplied with from SW I believe to be a chemical cocktail which is much more toxic than the simple sum of the individual chemicals and it’s risks are not calculated, as there is no accumulative risk assessments of chemicals added and their reactions, then look at the impact that the chemical has as it travels through our networks. There are definitely things that we can improve. Some of the learning from a treatment works that was put in this year has helped us to understand more about the interaction between certain types of water and our networks. In the above statements over and over again SW say how highly regulated and safe all this is, and yet here SW say they are learning, Scottish customers ought not be SW’s guineapigs. We use pilot rigs and test methods to understand what any change in treatment or chemicals will have on customers’ supply.

John Scott: Finally, is chloramination universally regarded as good practice worldwide?

Professor Parsons: The chloramination process is supported by the World Health Organization, (WHO) and it is used widely across the United States, a report in May 2017 states America has a drinking water crisis. A National Resources Defense Council study has found that contaminants that may harm human health are found in every state in the nation, Canada, Australia and various places in Europe. It is not universally regarded as good practice, in Germany France and the Netherlands, it is banned. It is one of a number of disinfection methods that we can select from and use, and it is widely acknowledged as being a suitable process. Aviemore’s water comes from an underground aquifer and the water is very low in organic matter, so why is this disinfectant method being used to cover up the taste and odour issues?

Richard Lyle: You say that you “Deliver high quality, great tasting drinking water, every minute of the day.” What right do you have to change my water? I have
noticed that water taste has changed in the 60 years that I have been on the planet. In Strathclyde, you tried to put in fluoridation. I do not know whether that has happened yet, but you have changed our water. What scientific evidence do you have that what you have done in the new input into our water does not affect people? This question was never answered. People have concerns and are putting in petitions that ask the simple question about the costs of water filters. I remind you that Scottish Water made £94 million profit in one year. If someone does not want their water to be affected, given that you have made the change, why should you not pay the cost to ensure that the water that they are drinking is to their taste?

Douglas Millican: I will let Simon Parsons deal with most of the question, but the first thing to say is that filters can give customers a superficial confidence. Depending on the type of filter they do not remove chloramine. To be clear, it is absolutely the customer’s choice whether to put in a filter. Our concern is that, unless those filters are changed regularly, there is a risk of bacterial growth inside a customer’s property and that would undermine the safe, high-quality water that we supply. I disagree it is the cost.

Professor Parsons: The improvements in water quality since the formation of Scottish Water have been fairly significant. That improvement in water quality has been proven both from a scientific point of view in the number of contacts and people’s concerns about the quality and taste of the water. We have had a tenfold decrease in the number of failures to meet drinking water standards and a significant reduction in the number of contacts from customers. There is no doubt that the quality of the water that customers get across Scotland today is significantly better than it was 10 or 15 years ago, which is the result of significant investment in treatment processes, operations, skills and capabilities and science. There has been a significant improvement in the quality, from the perspective of safety and that of consistency across Scotland. There is no doubt that the taste of water is affected by where it comes from. Anywhere else in the UK, the water tastes very different from the phenomenally good-tasting water that we have here today. The taste of water is affected by the source. We always look for the most sustainable source that can provide water for the long term. The water in Scotland today is of an incredibly high standard and it is safe. I hope that we achieve the statement in the strategic projections that it is good to drink.

Richard Lyle: I agree that Scottish water is the best, but I have noticed a change in the taste over the years that I have been on the planet. In London, my goodness, the water down there is—well, I will leave it at that. I will go back to my point, which is to address the petitions that are in front of us. There are products out there—I will not mention the brand name—that you put in your fridge to filter water, although those come at an extreme cost. If Scottish Water is changing people’s water and they do not want that because they are fearful of skin allergies, for their children or because of their dialysis, but it would cost them £2,000 to buy a filter and they do not have that, why can you not pay for that?

Douglas Millican: In very simple terms, it is because our obligation is to provide safe high quality drinking water. There is a risk that providing filters would undermine the safety of the water because of the risk of bacterial formation on the filters. In my
view conventional filters don’t remove chloramination you have to use reverse osmosis which uses carbon and bacteria will not grow on it.

Richard Lyle: I do not accept that. If I go to a doctor, I can get a prescription every so often. If I go to a pharmacy or a company that supplies me with something, they can send it to me every so often. If I get a filter from Scottish Water, you could supply me with a new filter. The operative word is a four-letter one: safe. Scottish Water says that it will deliver safe water to me. If I do not believe that that is happening, I should be safeguarded by your providing me with a means to get safe water.

Douglas Millican: I absolutely agree, and that is why it is so important that we have an independent drinking water quality regulator who gives that assurance to people across Scotland that the water, not just in aggregate but area by area, is safe to drink. For 5 years in Aviemore it may have been safe but the taste and smell was terrible.

Richard Lyle: I will leave it there.

The Convener: There are people who have concerns about the process, and we hear suggestions that difficulties arise in relation to skin conditions and breathing difficulties. Do you accept any of those claims as appropriate and accurate?

Douglas Millican: Potentially, there are lots of complex issues. The area that probably caused me most distress was Badenoch and Strathspey, where there were issues for a whole bunch of reasons. Historically, we did not handle that situation well and we took too long to get on top of it. SW never did ‘get on top of it’ it took the intervention of the local MP. The skin issue was a particular concern there. We had changed the source water from a loch in the Cairngorms to an aquifer under the River Spey. Undoubtedly, there were people who presented as having skin issues that they had not had before. The only way that we could deal with that properly was to engage NHS Highland, which looked really hard at the data. It spoke to all the local general practitioners in the area and compared the data on skin issues after the new supply came in with the data under the old supply and at the instance of skin issues in Badenoch and Strathspey compared with that elsewhere in the Highlands. NHS Highland’s two key conclusions were that there was a negligible difference between the instance of skin issues under the new and old supplies and that, overall, the instance of issues was about 20 to 30 per cent lower in Badenoch and Strathspey than in the Highlands as a whole. The “negligible difference” is one that needs clarified. The 20-30% lower than the rest of the Highlands is NO indication of a comparison of then (pre-water change) and now - only like for like comparisons can provide measurable understanding of how the picture has changed. Especially (mentioned in relation to recently introduced chloramination) considering dropping from 20 a day complaining to 5 a day complaining is seen to be acceptable - that is still 5 complaints a day! The skin issues are still ongoing. One residents story who for 40 years previous to the change in 2012 had no skin issues. ‘Since the change I have had more than several visits to my GP, with a variety of creams making no long-term difference. They escalated me to the skin clinic in Raigmore where I received an intensive (2 creams, zinc bandages to be worn all night for 2 weeks then further creams for 2 weeks following that) treatment that resulted in my skin condition clearing up, then returning again. Why would I
continue to pursue treatment courses after this? I now live with a permanent skin condition. I cannot affect the cause, the water - so therefore have given up reporting the problem. None of this means I am happy with my supply - I just accept that I have no alternative. They (SW) have no idea of the fuller picture of their customers’ habits and how it would change their data.’ That was part of the evidence that NHS Highland gave to the Public Petitions Committee in July 2017, and that is the area where we have looked hardest at the issue. I was struck by the part of the evidence that showed the significant percentage of the population that suffers from skin issues. NHS Highland highlighted the complex interaction of factors that can give rise to such issues. It is very much a matter for the health services rather than for us.

The Convener: What about the breathing issues?

Douglas Millican: I must say that that is not an issue that I have heard of. Why not?

Professor Parsons: The science behind chloramination is really well understood. There is a huge amount of academic research, as well as research by organisations such as the drinking water quality regulator. One of the conclusions in this study says ‘Although work is underway in Scotland to reduce THM formation, for a number of the works there is a need to increase precursor removal as chloramination alone is not enough to minimise the risk’ and other health boards, which identifies unregulated DBP’s do have implications to health long term. a huge amount of data and information that gives us the confidence that the process is safe for us to use. I am not aware of specific concerns about breathing, and yet Professor Simon Parsons himself quoted in his Cranfield Uni study for the DWQR, ‘Into the formation of disinfection by product of chloramination, potential health implications and techniques for minimisation,’(5) “There is evidence to suggest that there is a significant degree of DBP exposure via inhalation during showering; indeed higher THM4 blood concentrations were noted in individuals after taking a 10 minute shower (n = 11) when compared to THM4 blood concentrations in individuals after drinking 1L of water (n = 10); (Backer et al., 2000). It is acknowledged that inhalation and dermal exposure to DBPs may constitute an important proportion of the total DBP exposure of some individuals, it is not possible within the constraints of the current study design to estimate the extent of such exposures in the populations considered here. Therefore, the current assessment of risk posed by the various DBPs is restricted solely to consideration of oral exposure through consumption of drinking water.” but I take a lot from the research that was undertaken by NHS Highland what research? that talks about the underlying science that says that monochloramine and chloramination are safe to use, even though chloramines are the least efficient of ALL disinfectants when considering the contact time to kill microorganisms.

Mark Ruskell: Is the need to chloraminate waters from a particular catchment in any way related to land management practices? For example, at Loch Katrine, which is a major drinking water supply for Glasgow, you took the sheep off the hills a number of years ago and you are reforesting the area. I understand that that is not just about biodiversity or economics; it is about improving drinking water quality. I am interested to know whether there is a link with the chloramination issue.
**Professor Parsons:** There is less of a link with chloramination; the specific issue that it is associated with is cryptosporidium, which is another thing that we have to control in the water and which is ubiquitous across landscapes in the UK. Those measures allow us to manage that catchment better. Elsewhere, we look at the impact of peatland, for example, and whether the peat in the source has been deteriorated by sheep or other uses. That can lead to more organic material coming into the water, which means a different treatment challenge for us and, as such, we might consider how we control that. However, the measures at Loch Katrine are primarily driven by cryptosporidium rather than other issues.

**Douglas Millican:** We are very active in the whole area of land management. As much as anything, it is about trying to improve the source water, but it is also about stabilising it from further deterioration as the climate changes. A really good example is the super peatland restoration job that we did in the past year with the local community around our loch supplying Lerwick in Shetland.

**The Convener:** Do you put money directly into peatland restoration?

**Douglas Millican:** Yes, we do that where it will deliver benefit to the source waters.

**The Convener:** Could you write to us with the details of that?

**Douglas Millican:** Do you mean on the example in Shetland? The Convener: Yes, and on any other peat restoration projects that you are involved in, because they obviously have climate change benefits, too.

**Douglas Millican:** Absolutely—we can do that.

From the UN “Safe”: The water required for each personal or domestic use must be safe, therefore free from micro-organisms, chemical substances and radiological hazards that constitute a threat to a person’s health. Measures of drinking-water safety are usually defined by national and/or local standards for drinking-water quality. SW seem to have lost sight of what is important.

Ref:
(1) (Kritsch and Weinberg, 2010; Zhai et al., 2014; Richardson and Ternes, 2014).
(2) (Hua and Reckhow, 2007; Kristiana et al., 2009; Criquet et al., 2012; (3) Li and Mitch https://pubs.acs.org/doi/abs/10.1021/acs.est.7b05440
(4) Kristi Pullen Fedinick & Mae Wu & Erik D. Olson states )
https://www.nrdc.org/resources/threats-tap-widespread-violations-water-infrastructure