



HEALTH & ENVIRONMENT COMMITTEE

COMMITTEE MEETING

~ MINUTES ~

Wednesday, July 14, 2021

2:00 PM

Remote Meeting

The Health & Environment Committee will meet to discuss the future of the city's water supply and strategies for improving water quality while keeping costs down.

Attendee Name	Present	Absent	Late	Arrived
Quinton Zondervan	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Dennis J. Carlone	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Marc C. McGovern	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Patricia Nolan	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Jivan Sobrinho-Wheeler	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

A communication was received from City Manager, Louis A. DePasquale, transmitting a presentation regarding Water Quality, Costs and the Future.



**CAMBRIDGE CITY COUNCIL HEALTH & ENVIRONMENT
COMMITTEE**

COUNCILLOR QUINTON Y. ZONDERVAN, CHAIR

COMMITTEE MEETING
TRANSCRIPT OF PROCEEDINGS

JULY 14, 2021

2:00 PM, SULLIVAN CHAMBER

COUNCILLOR QUINTON Y. ZONDERVAN: Thank you, Mr. Clerk. Is my audio okay?

CITY CLERK ANTHONY WILSON: I can hear you fine.

COUNCILLOR QUINTON Y. ZONDERVAN: Great. I call this meeting of the Health and Environment Committee to order. The call of the meeting is to discuss the future of the City's water supply and strategies for improving water quality while keeping costs down.

Pursuant to Chapter 20 of the Acts of 2021, adopted by Massachusetts General Assembly and approved by the Governor, the City is authorized to use remote participation at meetings of the Cambridge City Council and its committee.

In addition to having Members of the Council participate remotely, we have also set up Zoom Teleconference for public comment. Please be aware that Zoom is primarily being used for public comment.

In order to watch the meeting, please tune into Channel 22 or visit the Open Meeting Portal on the City's website.

If you would like to provide public comment, please visit the City Council section of the City's webpage.

Instructions for how to sign up to speak are posted there. Once you have completed the sign-up procedure, you will receive a link for the Zoom meeting. We will not allow additional public comment sign-up after 2:30 p.m.

Mr. Clerk, if you would take a roll of the members present.

City Clerk Anthony Wilson called the roll:

Councillor Dennis J. Carlone - Present and audible.

Thank you.

Councillor Marc C. McGovern - Absent

Councillor Patricia M. Nolan - Absent

Councillor Jivan Sobrinho-Wheeler - Present and audible.

Councillor Quinton Y. Zondervan - Present and audible.

Present-3, Absent-2. Quorum established.

COUNCILLOR QUINTON Y. ZONDERVAN: Thank you, Mr. Clerk, and with that any of today's votes will be by roll call.

So, I'd like to welcome everyone to this hearing on our water supply and in a moment, we will hear from the Cambridge Water Department on this topic. As well as there are so many business owners who has had some issues with

the chlorides in our water supply. And from an expert at Northeastern University on PFAS chemicals in our water supply. We will also have public comment, and then some discussion.

So, I do want to start with a little bit of a personal presentation because I have experienced a lot of issues with our water supply. Particularly, the corrosiveness of that. And I've mentioned this before in meetings, but today, I've actually brought some items to show you. I don't know how well you can see on the Zoom, but these are two of the heating elements of my electric water heater. Because we have a solo water heater with an electric backup. You can see that the ends are very corroded and these fail about every two years. You can see the accumulation here of rust and other particles in the bag that I put them in. They've had to be replaced every couple of years, which is well below the expected lifetime of that type of equipment.

In addition to that, the valve on the water heater itself failed a couple of years ago and had to be replaced. You can see how thickly the solids have accumulated inside that valve to the point where it could no longer be

operating and had to be completely replaced.

And then last but not least, this is from my shower, which also has to be replaced. The valve, again, you can see the accumulation of the solids in that little bag. So, the water is definitely having a significant impact on our equipment. And when we ask, why-- why not switch to MWA water which doesn't have those levels of corrosiveness, we are told it's cheaper but of course, in that calculation we're not accounting for the expense for replacing all this equipment, both privately and publicly.

So, we had an appropriation two and a half years ago for \$3 million to make repairs at the police headquarters that were required because of the water issues. And at that meeting, we were also told that there had been previously repairs done because of the water issue, and that there were similar issues at the main library, as well. We don't know - or at least I don't know right now, know how much that cost.

In addition to those costs, we're also spending millions of dollars to acquire land around our water supply in order to protect its integrity. And most recently, in May of this year, the Council approved \$800,000 to buy land

in Lincoln to protect our water supply.

And then as you will hear from a business owner later on in the meeting, private businesses are spending thousands of dollars on equipment to work around some of the limitations of our water supply.

And then last but not least, we heard quite recently that we have PFAS in our water, and we'll hear from an expert on the implications of that. But again, the contrast between our water supply and the Quabbin Reservoir that supplies the MWRA communities is quite stark. Because that reservoir, as far as I am able to determine, has zero PFAS contamination.

So, we are being forced to consume and deal with water that is of lower quality compared to what we could be using and the justification for that is, well, it's cheaper. But is it really?

So, I'm hoping that we can get clear answers to that question today. And we'll start with a presentation from the Water Department. So, I will turn it over to the City Manager and Sam Corda. Mr. Corda, are you available to present?

MR. LOUIS DEPASQUALE: Yeah, I'm here.

COUNCILLOR QUINTON Y. ZONDERVAN: Okay. Thank you.
City Manager, did you want to... ?

MR. LOUIS DEPASQUALE: Yes, sorry, I'm having a hard time getting in. My apologies. So, Sam is with presentation, and if you want to lead with the presentation, Sam, I think that's the way to start. Again, sorry for the confusion. Sam.

MR. SAM CORDA: Sure. Alright. I think, did you want to have me or do you want to have Anthony to put up the presentation?

CITY CLERK ANTHONY WILSON: We have the presenters put up the presentation? We weren't aware that the Water Department wanted us to—wanted us to make the presentation. Do you need...?

MR. SAM CORDA: I can load it up. I can do it as long as I'm put into Participant's Mode.

CITY CLERK ANTHONY WILSON: As a participant, you should be able to share your screen.

MR. SAM CORDA: Okay. Let me see if I can get it up.
[pause] Doesn't seem to be working that well. It says share your screen.

COUNCILLOR QUINTON Y. ZONDERVAN: Wait. We see your

screen.

MR. SAM CORDA: Oh, you do? Okay, good. Let me put it on Slide Show.

COUNCILLOR QUINTON Y. ZONDERVAN: Thank So you could - Yeah, thank you.

MR. SAM CORDA: Okay, so you've got the first... Oh there it is. Okay. Perfect. Does everybody see that?

COUNCILLOR QUINTON Y. ZONDERVAN: Yes. Thank you.

MR. SAM CORDA: Okay. I'm here to present - make a presentation on the Cambridge Water Department. I want to discuss a little bit of background on what the Cambridge Water System is. And then I want to get into, you know, the typical water quality issues that we seem to come across. We'll talk about those. We'll talk about the water system costs. And then talk about the future.

Here's an overall depiction of our water system. There's a 24-square-mile watershed that are in lighter and darker blues to the left. The Hobbs Brook and the Stony Brook Reservoir watershed. There's a 7-mile conduit that connects the Stony Brook Dam to Fresh Pond. And then at Fresh Pond, obviously, we have the water treatment plant. And then we treat the water and we distribute it to our

200-mile distribution system within the City of Cambridge.

One interesting point to note is that the 24-mile watershed that we... because we work with this, we acquire land if we can to do watershed protection. We monitor Stonewater management, we monitor the towns, we work with Mass DoT to deal with run-off, Stonewater run-off and so on and so forth.

So, there is a signif-- besides the fact that we're improving our overall water quality, we're also helping out that local area by doing a lot of management of all these activities in the watershed.

Again, the Cambridge mission statement is to provide a safe and uninterrupted water supply of the highest quality to the citizens of Cambridge. That's been around for decades, that's been our mission statement. Fundamentally, the Cambridge Water System quality exceeds all MassDEP and US-EPA regulations. One of the benefits also is that we have state-certified laboratory so we can perform a lot of free-water quality testing for the Cambridge residents. The most frequent one is lead. We perform hundreds of those, as requested, along the way.

Another benefit of having a state-certified laboratory

is that we can do a rapid turn-around for, you know, risk identification, problem resolution and process optimization, which is pretty important.

Also, with our lab, we're able to participate in the EPA's unregulated contaminant monitoring rule, the UCMR. And one of the benefits there is that - what that is all about is that the EPA comes up with the recent list of potential contaminants in water systems, so we participate in doing monitoring of all those contaminants. Typically, there is 25 compounds round. There can be more, there can be less, depending on the current year. That's on a five-year cycle, give or take. And we've participated in four of the five UCMR rounds. The first one was in the early 2000's, and the current one, UCMR-5 round, we're working to figure out what those compounds could be. That gives us some benefit of hopefully detecting if there are any in our system early and then working on a resolution to that.

A little more background, again this is - our water consumption, you know, water distribution on a million gallon-per-day basis. And you can see that since '66, we're tracking these and since 1970, we've actually been on a downward trend. We continue to be on that trend through to

2020. We've gone from 24 million gallons a day to, I think the latest information for 2020 was a little under 12 million gallons a day. You know, so we do pay attention to that. There's been a lot of reasons why that happens.

This is a similar slide but it includes a water demand for projection starting in - and we actually did the work in 2014. That's when the projection started and you can see at the end of that graph - from my last graph. And the projections go along typically along 25 years and we're saying, you know, these projections were made again in 2014, that we should be under the registered withdrawal, which is 16.6 million gallons per day, which was established in 1987. And so that's a good thing.

The reality of it is, since 2014 when we started those estimations, we've actually decreased our water consumption from 14 to 12 million gallons a day. And I think the biggest chunk of that at the beginning was the drought and the fact that we did a lot of advertising about the drought or public relations about the fact that we were in a drought. It was almost a drought of record, between 2015, '16 and '17.

We did a lot of water conservation campaigning, as

well. And I think that made a significant impact on our water consumption.

One of the things I need to mention also is that we are initiating another demand study that hopefully, will be done in about a year. We'd like to see what the impacts are from the water conversation and also to see if there are any permanent implications from the pandemic, which the pandemic ended up - from, you know, 19, it was like 12 and a half million or 12.6 million gallons a day to 2020, which was 12 - a little under 12 million gallons a day. So that was a pretty big impact from the pandemic. Again obviously, because universities were closed, most of the hotels were closed.

I do see a slight recovery now in the system, but in water consumption... Again, the whole idea of doing the demand study is to see whether this curve is correct or if it should be some other curve based on that. That should be done in about a year or so. It will include the impacts from the pandemic, if any from that.

The Cambridge Water Department is an enterprise fund, what that means is our water rates pay for all of our operations, capital expenditures, and debt service.

Currently, any excess funds that we have at the end of the year, we put back into our water fund. The balance as of June 30th of last year was \$12.2 million. We'll know what the balance is from last fiscal year probably in September or October. We'll formally have that verified. But a year ago, it was \$12.2 million.

We are a full member of the Massachusetts Water Resources Authority. We have permanent connections to the MWRA. We've used their water on many occasions for a variety of different things. We use it for construction purposes on Huron Avenue. We're replacing our force main. We've also used it um, in the drought for a little bit. A couple of years back in, in late 2016 or early 2017.

One of the things that is unique about our system is the fact that we have our own water supply system but we also have MWRA, which gives us a certain level of redundancy that I think is probably extremely unique in Eastern Massachusetts, that's for sure.

Now I'll start talking about water quality issues. Obviously, PFAS as one of the main topics these days. It's a water repellent and it's used in many everyday products. It's used, you know, these are all examples of where it's

used. It's used in carpets, it's used in furniture, takeout containers, waterproofing clothing, cleaning products, non-stick cookware, *et cetera, et cetera*. And the state regulation is defined as six PFAS compounds and they're called PFAS-6, is the acronym for the six compounds and those six compounds are listed here. I'm not going to actually say what they are. I probably would make a mess of the pronunciations of all those. I certainly can if some of you would like me to later on. But these are the six compounds that are being monitored based on the regulation that has been promulgated in January of this year.

We did start testing for PFAS. One of the interesting things about PFAS is that when we did the UCMR-4, it was a non-detect. But shortly after the UCMR-4 was completed, they were able to increase the ability to detect PFAS compounds. So once that was determined - and I believe that was determined earlier in 2019, we opted on our own to go ahead and start testing it to this new certification - laboratory certification level. And then obviously at that time, we did detect PFAS in our water.

So we did that from August 2019 through December of 2020, and basically, the testing was quarterly. And you

know, their recommendation was to test for the same six PFAS compounds that they did promulgate regulations recently for. We found those levels during that time. There was one time we sampled 20.1 parts-per-trillion of this combination of six PFAS compounds. That was a verification from the original, which as like 19.8, I think, parts-per-trillion for the combination of six PFAS compounds. Subsequently thereon, when we did the quarterly testing, we never exceeded the 20 parts per million - parts-per-trillion, excuse me, level for the six PFAS compounds. So, we really had to average those first two samples, which ended up being 19.9 and so we never exceeded the 20 parts-per-trillion guidelines from the State.

In November, when we initiated pilot testing, we realized that we could use granular activated carbon, which is of filter media in our filters and there was a very high likelihood we could remove at least 50% of the PFAS compounds using that media. DEP required us to initiate and perform bench-scale testing to verify that. We used a variety of grain-activated carbons and we just finished that at the end of June. And we're working on the report to determine - the whole idea was to find--determine

specifically in our water what the removal efficiency was. So, we got that done and from the preliminary results, we were able to seemingly remove mostly up to 80%, which is most if not all the PFAS compounds. Some of the PFAS compounds we tested for were non-detects, meaning that there was no PFAS and that the specific compound that we were testing for was not in the water.

The other thing that we wanted to determine with the pilot testing was what was the replacement cycle for the grain-activated carbons since we're going to go from biologically-active carbon filtration to absorption in particular for the PFAS compounds. It's a different mechanism and we would expect that we would expend the carbon surface area at some point. You know our guesstimate at the beginning was about three years but we'll have that exact number or close to that number as soon as we finalize all of the information we have acquired from the pilot testing.

Again, as I said June we finished it. We need to - it ended up being that the filter media, the GAC carbon filter media that worked the best was the exact filter media that we have now, which makes it really easy in the sense that

we're already using it. It's just a matter of what will the frequent - when can we install it and what will be the frequency of its replacement.

Once we get the report done, which will be shortly, we'll submit that the DEP once they approve that media to be used, the grain-activated carbon media to be used. We will then put it onto bid and go to install the material. I guess I got a little ahead of myself. But anyways, since January, when the regulations were passed and monthly testing was required and these are the results of our PFAS compounds over the January, February, through June. These are the exact results of the PFAS-6 requirement.

Again, as I said, the Regulation Act said that action is required over 20 parts-per-trillion. We have not exceeded that.

Our overriding goal will be, once we replace the media, will be to continuously maintain the PFAS-6 below 10 parts-per-trillion, which is considered no-risk by MassDEP based on their regulation. Once we—again, once we get approval from DEP on particular granular activated carbon to use, we're going to bid it out. Then the plan, at this point, is to replace all of our media by the end of this

calendar year. I was just going to - so that is the plan. We don't expect there to be a problem with that. Again, that will depend on once we get the final approval from DEP then we'll put everything into action.

I'm just going to go back a slide. I just want to show this little graphic here. The media is this gray material in the filter. This is basically a filter. You know, these are the trays and this is the filter be given at the bottom. That's the media that we replace. We take our adjusting amount. We have four feet of granular activated carbon. We'll place it. And then we'll monitor the PFAS components so that we will, you know, have an estimate of what the replacement cycle. We'll replace it based on the performance results of the media itself.

After next slide, next a pretty important topic obviously besides PFAS is lead. We do not have any lead. We do not have any lead in our raw water. We did initiate a program corrosion control program at the begin--at the beginning of the current Lead And Copper Rule Program which was in 1991 and that corrosion control program was to raise the PHA in the water to between 9 and 9.5 and use chloramines as a secondary disinfectant. Well, at that time

we were using chlorine as a primary disinfectant and chloramine as a secondary disinfectant such that in the distribution system we would maintain um, you know, continue eliminate the virus and the bacteria in the water.

Our um, results from 2020 at 90th percentile content meaning and the top 10% at the bottom of 90%, the four parts per billion in 2020 was, was the level of lead that we have in our water, the total lead in our water and the actual level is 15 parts per billion.

And the chloramine has been continued to be 60 samples uh, tested per year and those samples will be taken from the houses with lead services, so obviously our corrosion control program has been extremely successful and effective. In that we never exceeded the 15 parts per billion limits of action. And it's --it's worked pretty well.

Based on the level of regular water we do our formalized testing and then we retest cycle coming to be a year or three years and if it's a higher part of it, it's above 10, I think we do one year cycle, if it's below the time. We've done extremely well with that.

Another benefit of having our own lab is we're able to

assist school departments since, I think, 1992 or so, we've always sampled water bubblers in the school department and helped them to replace any ones that were of problem.

And also in 2019, we assisted the school department in testing every single element of school tap that they had and gave them results that helped them to, you know, keep everything at the lowest possible level in um, in the schools.

One of the things that is important to understand is since there is no lead in raw water, typically the lead would be found in, in the-- could be in the service line, could be in the house plumbing, and the most prominent place we found in the past is that it's in the faucet. The older style faucets had high content lead in them, and that was a typical place.

If we found someone, you know, you know, probably 90% of the samples and if we would someone that was above the actual level we did sampling and we would typically ask them to replace the faucet and I'd say 90% of the time that solved the problem in the low lead faucet.

And just from statistical perspective in 2020 we performed 171 lead test for home. And then continue to talk

about lead as we, you know, this picture is, there is a copper service area that was replaced an old lead line service with copper. Um, we do that currently, now we do that as a freebie in the street and then we work with the homeowner to replace the property site portion of that.

In Cambridge the water service is the responsibility of the homeowners that's been that way since, since the inception of the water plan. Um, again we started lead service replacement with water in the early 90s. We started with the 11,000 lead service line that we had in the system. We currently have [21.7] lead service lines. We do have for a couple of years. Now we have normally database so people can look and see if they have lead line service, we come out and verify that and then we actually work with them to replace that service, again we try to continue to work to reduce lead, we're limiting all the lead line services in the, in the system.

In the calendar year 2000, we, you know, the water department initiated that we, we purchase only no lead water works material, so that everything, you know, valves, fittings with an extra, you know, couplings or all no lead water with no lead materials and, and well that is defined

as less than 0.25% lead by weight, content by weight. And so, we've been doing that for 21 years. Again, the whole idea is to minimize lead line system.

Another area for general discussion, I guess I would just ask this, can everyone hear me okay. Is that working okay for everybody.

COUNCILLOR QUINTON Y. ZONDERVAN: Yes.

MR. SAM CORDA: Okay, good. Thank you.

COUNCILLOR QUINTON Y. ZONDERVAN: Yeah, we can hear you fine. Thank you.

MR. SAM CORDA: Perfect. Thank you. Um, so just disinfection by-products is another area of concern. Trihalomethanes in the old days used to be a major concern, um, and with ozone as a primary disinfectant that we use, Haloacetic acids to become a problem. But as you can see here, um, that we are significantly below the regulatory standards, you know, trihalomethane limit is 80 parts per billion and Haloacetic acids is 60 and we're half or less in water.

Another area of concern, we heard about them, I'm sure in the media in the past is pharmaceutical and personal care products, we initiated in um, 2008, a voluntary

testing program where we test for 86 compounds in our raw and finished water. We do it twice a year in the warmer waters to see if there's any difference between the warmer water and the colder water. And in general, we have found trace amounts of these. What I mean by 'trace amounts' is typically at the detection limit, which is about one part-per-trillion. And you know, some of the ones we have seen is caffeine, DEET or sucralose or Splenda, which is a sugar product.

And some of these are easily destroyed with ozone, as our primary disinfectant. It works extremely well, which means that it decomposes that particular material so it becomes non-existent in our water system. So that's one of the benefits of using ozone as a primary disinfectant as well.

Another area that's been talked about over the years is chlorides. You know, there's three types of chloride. Typically, that we might find in our system is sodium chloride, calcium chloride, and magnesium chloride. The levels - our level in 2020 that's in the water quality report that was sent out in June, was 170 parts-per-million. In '19, it was higher at 196. In 2018, it was 235.

One of the things to note is that these things will vary based on, you know, drought, precipitation, you know, how tough a winter it was. Because we have found in a study that was done in 1984 by Mass DoT, that 70% of our - of the chlorides that were in our water were from treatment of - de-icing treatments on highways. You know, we are working with Mass DoT there - their resampling of the last two years, and it's ongoing, is to see if indeed that's the same or is it less or is it more. Then the ultimate goal of that work would be to work to see how we can continue to reduce chlorides in our water.

The thing about chloride is also the aesthetic level or the secondary MCL is 250 parts-per-million, and we have never exceeded that level. Obviously in 2018, we were close. We think that's a direct result from the drought of '15, '16 and '17. But again, we continue to monitor that on a regular basis and we plan on working - We will be, not plan on. We will be working with Mass DoT, various towns and businesses to better control their de-icing practices. We do that a lot right now with our watershed division.

Hardness and total dissolved solids is other issues that we've talked - we've all heard about in the past. Our

total hardness is 68 parts-per-million in calcium and magnesium. Total dissolved solids as varied, as you can see here, it's currently from 2020, is 390 parts-per-million and was 416 and 469. The aesthetic level, or secondary MCL, is 500 parts-per-million. We have never exceeded that as well, and it is only an aesthetic and non-regulatory limit.

There's been a lot of discussion about hot water systems and what the effect of hardness or solids or chlorides have on these systems. And the reality of it is, I'm just going to jump to the next slide, just to give you an idea of - and I'll come back to this slide. Of our hardness versus a variety of other hardnesses in the State and/or in the country. Ours is 68, as we have here. The MWRA's is lower. The Woburn is a little lower. Lynnfield is higher. Needham is higher. Andover is lower. Methuen is higher, *et cetera*. And then in the country, there's plenty of places that have two, three and four times the level of hardness as we do.

The reason I'm bringing that up is, it's really all about design. The systems, you know, there are a variety of different hot water systems, hot water heaters, boiler systems and so on and so forth. And you really need to know

what the water quality is and design that system around that water quality.

We've had circumstances that we've worked with the Cambridge Housing Authority on one of their new facilities, you know, ten years ago. And what ended up being, is they put in the cheapest possible mixing valves and materials and so on, and that ended up being a problem. We suggested they replace them with corrosion-resistant materials. And they, you know, they have had zero problems since they upgraded their materials to meet the proper water quality that they're dealing with.

And that has been - that's just a single example. I mean, there are other examples. I'm sure there's many, many stories about people, their plumbers talking about, you know, you replace your water heater in three years, and you know, it's all about the Cambridge water's fault. And again, some of the problem there is some of these older materials and the least expensive hot water heaters aren't really compatible with that.

They have water heaters that you put sacrificial anodes in them that take care of this, other methodologies, there's maintenance that needs to go on with hot water

heaters and hot water systems on a regular basis. That really is the answer to the question.

Because obviously, in the Midwest, where hardness and all these things are significantly higher than here. I mean, those systems are designed and they work extremely well and so on. So, I think it's a matter of designing a hot water system because the increase in the temperature of water will increase the corrosivity of any water, it doesn't really matter which water it is. It's just a natural occurrence.

And then if you have any hardness materials, it can create problems or chlorides. And dissolved solids can all precipitate out and create issues and so on and so forth. So that's why the hot water heaters need to be drained if that is that type of hot water heater on a regular basis, flushed, and so on.

We have a lot of information on our webpage under Water Chemistry. I put the links here in the page here, but again, this is a totally solvable problem based on design.

Again, in the past it has been brought up. You know, why don't we go on MWRA water. One of the issues is costs. MWRA water, as of a recent invoice we got because we did

test out using MWRA water, was \$4,320 per million gallons, which is two times, 2.6 times the cost it takes for us to produce the water.

Using the FY-22 Budget as an example, our budget is \$18.3 million, our operating budget portion of that is \$13, the capital is \$5.3 million. Costs out of that \$18.3 is \$7.5 million or \$1,620 per million gallons for us to produce it. The cost to purchase our MWRA water per year is \$20 million.

If we take the FY-22 Budget and replace- reduce our existing operating budget to reduce out our operating expenses relating to treatment, which is energy, chemicals, maintenance and staff, the total cost of our water budget will go up from \$18.3 million to \$34.5 million. So that's a \$16.2 million increase in our budget. And that will ultimately reflect as an 88.1% increase in water rates to customers.

So again, just breaking that down a little more, this is what the impact would be on our water rate/block rate structure. We would go, for example, at Block 1, we would go from \$3.05 per unit to \$5.74 per unit. And a unit of water is 100 cubic feet. The increase would be \$2.69, to

give you an example on this one. This is just a straight 88.1% increase.

Then from a comparison perspective, the Cambridge water rates are the lowest in the MWRA system for comparable cities. That's based on the 2020 MWRA rate comparison study that was released earlier this calendar year.

The recommendation - my recommendation and I believe is the City Manager's as well, would be to operate the Cambridge Water System as is. And I have a lot of details to discuss on that. We have - we want to continue to improve and maintain our resilience of the water system that includes reducing energy use.

And again, in the last year, we've reduced our water - our energy consumption from nine million kilowatt hours per year to seven million kilowatt hours per year. We're going to continue to work on that and do that. There are more areas that we can improve and to continue to develop renewable energy sources.

Right now, we have solar panels on the roof. I'm sure we can expand those to different other areas.

Then the next thing on the horizon is to continue to

finalize the design of our hydro-electric power generation. That should be somewhere in the order of a half a million kilowatt hours per year.

We want to continue, as we have been doing, promoting water conservation, because that will help us a lot. And one of the benefits of our system, as I said already, is the MWRA as a redundant water supply. It gives us a very unique position to be able to deal with things relating to. If we have problems, we can obviously purchase MWRA water. If the MWRA have problems, we have - and that's happened about 10 years ago, we were able to still supply water to the City of Cambridge without disruption, as they had when their Hultman Aqueduct had a major failure in 2010 or 2011, I can't remember the exact year.

Water quality, we have a watershed protection division. It's really important we continue that work. And we have been since - here, Route 128 was built working with Mass DoT. We work with the towns. We work with businesses to reduce de-icing materials.

We continually work on Stonewater Management, so as an area is re-developed in our watershed, we make sure that they meet all the Stonewater standards, so re-development

is in a sense has been our friend over the last 25 years. We've been able to work with all these businesses and do that. We've also acquired quite a bit of land over the last 25 years or so, as well, which helps to minimize development and maximize water quality.

We also need to continue working on our watershed facility, which we do on a regular basis, which includes dam maintenance, as well as our gatehouses. Treatment process maintenance and improvements, you know, we've been doing that all along and we continue to do that.

Again, we built our new water treatment facility. It went online, I believe, in 2001, and we have been maintaining well. You come in the building today, you'd think it was just built. The City is gracious enough to give us a good budget and we are able to maintain and do all the things we need to do.

We need to maintain our laboratory. And again, that allows us to do all kinds of routine sampling, quick turnaround, regulatory sampling, process sampling and a variety of different testing for resident of Cambridge.

We need to maintain, as we have, and improve our Fresh Pond Reservation from a water source protection

perspective. All the projects that we do and we've done tens of millions of dollars of projects on the Reservation so the people can have a place to, in a sense, hide and relax and go away, to peruse the water, to be in quiet at Black's Nook and watch the habitat, you know, we work endlessly and relentlessly to improve the Reservation. Again, we've improved and increased our funding for water distribution system maintenance and the mane ability is through rehabilitation and we also, obviously, do service replacements and those kinds of activities so that we can improve our water quality.

Obviously, our distribution system improvements will improve our water quality and improve our consistency in uninterrupted supply of water to residents in Cambridge. And we should continue, as we have since are a full member and should continue to be a full member of the MWRA, excuse me. And the main reason really is the back-up system. Then we can use their water for maintenance. We can use it for drought conditions as we have in the past.

I guess that's end of my presentation. Thank you very much. You know, I can, I can-

COUNCILLOR QUINTON Y. ZONDERVAN: Thank you so much.

MR. SAM CORDA: Sorry, go ahead. What I was saying -- I could leave this up if we had questions relating to it. Or I don't know how would you like to handle that, Councillor Zondervan and/or City Manager DePasquale?

COUNCILLOR QUINTON Y. ZONDERVAN: Thank you, yes. I'll see if my colleagues have any clarifying questions. We'll have time for discussion later. But I don't see any hands raised at this time. So - oh, there's Councillor Carlone. E can't hear you.

COUNCILLOR DENNIS J. CARLONE: That's probably a good thing on some occasions. But thank you for the presentation. Thank you, Mr. Chair. Two questions. I thought the presentation was extremely thorough. Watershed control, because it's a water source for Cambridge, you have jurisdiction overseeing development, I take it? That's how we preserve the quality. Could you describe how you can oversee development to minimize impacts?

MR. SAM CORDA: Yes. For an example, what we do is -- the main avenue is through conservation commissions in each of the towns in the watershed. So, we have a very good relationship with all of them. We do participate in their activity, like a development will go - I'm just going to

make this up. Because a lot of them are in Waltham. We'll go through Waltham, where we'll put a proposal in. We'll participate in the hearings.

We'll participate in making comments and we make them and they're strongly adhered to because again, we do have regulatory authority because we have a Class A water and we have the right to work with all the watershed communities to ensure that nothing - that everything meets the regulations. Like Stonewater Control.

And again, a lot of times, a lot of these companies that are building or re-building these facilities, are happy to comply and we work with them on de-icing. We work with them on Stonewater Management. We work with them on all of these activities that will impact water quality.

And as well, we work, for example, besides a community, we've worked with Mass DoT and the last ten years, they've put a significant amount of retention basins in our watershed, which we requested a while ago and when they are ever revising to four lanes, on Route 128 in the Town of Lincoln, Lexington, Waltham, all the towns that we're working in that we have our watershed in, I should say, they've done that.

So, we not only work with the communities, we work with Mass DoT. And again, this is a very active process that we make comments probably on a weekly basis. We have our Law Department review our activities and make sure that we're meeting all the regulations and so on. And that seems to work extremely well.

COUNCILLOR DENNIS J. CARLONE: Through you, Mr. Chair Mr. Corda, does that include the Alewife Quadrangle and other areas around Fresh Pond?

MR. SAM CORDA: That is usually handled by the Public Works Department. You know, that's in the City. We have our watershed group work strictly in our watershed. Although we have worked with DPW to make sure that of our areas in the Reservation are meeting the codes that we have for the City and the MS-4 Stonewater Management issues but Public Works oversees everything in the City of Cambridge.

OWEN O' RIORDAN: May I talk to just maybe add a couple of comments? Again, be it the Alewife are indeed the Huron Avenue, Concord Avenue area, while they're naturally part of the watershed, the actual draining systems there all divert to the Alewife Brook.

In terms of groundwater, the level of Fresh Pond is

held at a higher level to make sure that groundwater flows away from the Pond rather than toward the Pond. Again, just to make sure we're properly protecting it.

COUNCILLOR DENNIS J. CARLONE: Good information. Through you, Mr. Chair. Mr. Corda, you cited how healthy the water is compared to standard, national standards I assume, or State standards, that you have to follow.

So MWRA water is comparable? We do a better job. How do the two compare?

MR. SAM CORDA: Again, they're totally different types of systems. Our watershed is in an urban environment. The MWRA is in a rural, extremely rural environment. And you know, I would have to say, in general, the overall water quality because of the environment is I'm sure higher than or is better than or has less contaminants, if you want to call it that or however you'd like to word it, than ours would.

COUNCILLOR DENNIS J. CARLONE: I see. Okay. Thank you. Very good presentation. Appreciate it. Thank you, Mr. Chair.

COUNCILLOR QUINTON Y. ZONDERVAN: Thank you, Councillor. And my thanks as well to Mr. Corda. I mean,

that was a very helpful presentation and I do appreciate all the work that, that goes into maintaining our, our water supply. And just to respond briefly to, to my colleague's question.

You know, again, in terms of PFAS, my understanding is that, that the levels in the common reservoir are zero. And, and the chloride levels are much lower because, as Mr. Corda said, that water is, is basically sitting in the forest whereas our water supply is coming in some cases off Route 128 itself.

We'll hear from Mr. Aaron MacDougall now who is a businessowner and has had some ongoing issues with the corrosion in our water supply. Aaron, are you available to speak?

MR. AARON MACDOUGALL: Yeah, I am. Are you able to hear me and see me?

MR. SAM CORDA: Yes.

COUNCILLOR QUINTON Y. ZONDERVAN: Yes. You sound and like great.

MR. AARON MACDOUGALL: Okay, well, fantastic. Thank you very much, Councillor Zondervan, for reaching out to me. My name is Aaron MacDougall. I am the owner of

Broadsheet Coffee Roasters at 100 Kirkland Street in Cambridge. The business is a café I opened up in 2017, the summer of 2017. I am also a Cambridge homeowner um, on the Street in Cambridge.

So, I am kind of here last minute to talk about some of the explicit, well its implicit costs of both Cambridge businessowners certainly involved in food and beverages but probably beyond that, as well as perhaps, a couple of thoughts as a Cambridge homeowner.

I totally, you know, concur with the sentiments of Councillor Zondervan. There is a lot of work that goes into supplying a city like Cambridge with high-quality water at an affordable price. So, you know, when it comes to things the relative cost differentials of Cambridge water versus if you're a - that's not my area of expertise whatsoever.

What I can talk about is my experience with Cambridge Water. When I was with - the Cambridge issues prior to signing my lease at 100 Kirkland Street, and I had my water independently tested. This was a number of years back. This was almost five years ago. And you know, as mentioned in the previous presentation, water composition changes on a year-to-year basis, when the water is sampled.

So, at the time, the two most alarming components that jumped out were the total dissolved solvency level at 450 parts per million. And my chloride at 230 milligrams parts per million. Both levels were sort of barely in balance from a regulatory perspective or a guidance perspective. So, they were in balance but somewhat problematic.

And you know, it's as a businessowner, I would say that the chloride level has been quite problematic. And the issue there, and again, I'm not a water scientist. I'm a businessowner but the issue as I understand it is that the chlorides under heat and pressure combine hydrogen or residual sulphur compounds in water, and you end up with relatively acidic water. So, you know, the same hydrochloric acid or sulphuric acid. And this leads to premature corrosion of water tanks.

The secondary issue, which I can talk about a little bit later as well is, you know, the impact particularly of the high TDS level. And perhaps also, from the chloride level on the taste of the water and its impact on beverage quality, which I know is something that tends to get poo-poo'd. But you know, given that it's my livelihood, it is important to me and I think important to a number of other

people. So, it's a lesser issue that I'd like to cover later.

So, Cambridge Water, you know, according to the latest water - the annual water study is that about 390 parts per million TDS, the chlorides are 174 or so. For context, 174 on chloride side is very high. As I mentioned when I tested it at my location a few years back, it was at 230. And I'm not sure to what extent that had to do with water at the source or sort of that last mile which contributed to the higher levels at my physical location, as opposed to the Cambridge Water, sort of the official composition numbers.

But 174 is still an extremely high level. I mean you could compare it to MWRA and MWRA produces monthly reports and MWRA for the three reservoir samples, ranged between eight to 36 parts per million.

If I look at the equipment we use in the coffee shop and of course, an espresso machine is pretty critical piece of equipment... And espresso machines are an expensive piece of equipment, too. An espresso machine will cost \$15 to \$20,000. I use a brand called La Marzocco, which is a very, very common - it's a major espresso machine manufactured used widely throughout Cambridge and the rest of the

country. Their water specifications, you know, when you purchase one of these machines, they give you water testing kits. You're supposed to test your water and their guidelines are that chlorides are supposed to be 30 parts per million or less.

TDS again is - there is a guideline there in the 75 to 150 parts per million range. But it's the chlorides that are problematic from the equipment maintenance perspective. And while La Marzocco will not, for a Cambridge business owner, someone who installs their machine, they will not warranty their equipment unless you go on an RO system, standard filtration, you know, your carbon sediment, what you might purchase, for instance, in the supermarket, the pour-over pitchers, the Brita or the Pura pitchers, will not remove the chlorides.

The only way to address the chlorides really is through an osmosis system. So, you're either forced to purchase an RO system to maintain your equipment life, or you don't get your warranty.

Now, espresso machines are, you know, from an equipment depreciation perspective, generally should last about seven years. Seven years, plus. I know multiple

Cambridge café owners who have had to have serious work done on their machines, or had to replace their machines within the first three years of purchase when they didn't have RO systems in place.

You know, it's fairly well-known in the equipment repair community, certainly within the espresso machine manufacturing community, whenever you talk to a new vendor, the person may ask when they learn you are based in Cambridge is, Do you have an RO system or Osmosis system or not? If you don't, they say, 'Well, you need to get one.'

The RO systems do work. They are expensive. I mean my system costs \$5,000 for my shop. I needed to replace it recently so these things have a life of three to four years. So, you know, you have this rolling cost of \$5,000 or so every three or four years.

There are filters that need to be changed yearly. That's about \$1,000. Maintenance on the machines - the machines pumps break, and the like. You need to buy new pumps. You need labor or yourself and there's a value associated with my time, of course, to repair the equipment. So, there's a running cost there, as well.

One thing that I really hate about using RO systems is

that they are highly efficient. What they do is they separate your water into really two supplies. One is, what I'll call, the 'clear water' and the other is brine. And that ratio is generally, depending on your manufacturer, one gallon of clear to four or five gallons of brine. So that's water that's being quickly flushed down the drain. So, it's highly inefficient and it's costly. No one wants to be wasting resources like this. So, it's, you know, it's something that I certainly would prefer not to have to deal with. I mean, RO systems break down, they're problematic and they're wasteful.

So, it's kind of an unnecessary evil. You either deal with catastrophic equipment failure which invariably happens at the worst time possible. Or you invest in an RO system and maintain the RO system. And that's a cost of doing business, as the previous expert, Mr. Corda, you can deal with the Cambridge water issues through systems' design and this is really the way you need to address the chlorides, through reverse osmosis treatments.

So, it's costly, but the alternative is equipment damage. And that will happen. It's not a method. Your water boilers will burn out.

I can tell you another cost is the water heaters. And again, you know, well I have two water filtration systems. I have a 3M sediment and carbon filter which treats water for the entire house, removes particulate, removes chlorine, things like that. And the RO system for water, which is going to be consumed as beverages.

So, water comes in through the water main, goes through my 3M system, then it's fed into my water boiler. And when I opened my shop in May of 2017, I had a new lean water boiler and a very, very high quality one installed. And I needed to have that replaced in February of this year, so it lasted less than four years, three and a half to four years on that. Which of course is beyond the guaranteed life of that water heater. Commercial water boilers have a three-year guarantee, as opposed to most household water heaters which have a ten-year guarantee on them.

So commercial equipment is expensive. That for me was a \$6,500 repair, if you include the close to \$5,000 cost of the water heater and then the cost of basically, the plumber coming to deal with it.

So, these are real costs to the business. So, I want to be very clear, there are explicit costs involved in

managing the chloride level of the Cambridge water system if you are from a business perspective using Cambridge water for it as one of primary inputs to, to your product. So that is - that's definitely a cost. And you know, for me, when I look at the cost of the equipment I need to replace to filter the labor that gets involved in changing of the filters, replacing pumps, and the like, we are somewhere in the \$9,000 to \$10,000 a year range. If I also factor in the water, which is extra water consumed and wasted in producing RO water, the minerals when you produce RO water, you're producing - it's 100% efficiency so you're not producing distilled water, but you're producing a low TDS, a very bland product, and you need to re-mineralize the water, as well, to palatable level. That costs money.

So, for my business as an example, we're probably running \$9,000 to \$10,000 in costs, coping with the challenges presented by Cambridge water.

The waste is something that, again, it's easy to poo-poo, but beverages are my livelihood. So, dealing with the TDS as well is very important. High TDS means that the water as a solvent is less efficient. You do not extract properly the soluble - the desirable components of coffee

or tea so if you don't treat your water, you're going to end up with a sub-par product. So that's very important.

I think most people who move Cambridge are surprised by the taste of Cambridge water. I mean I moved from Brooklyn to Cambridge and it was immediately obvious to me when we moved into our new home in Cambridge, that Cambridge tastes a bit like baking soda or baking powder. It is salty. It is metallic-tasting. It does not taste good. So, at my home, I installed a reverse osmosis, it's a home under sink plumbed-in RO system for our drinking water. We felt that strongly about it.

So, you know again, you could say that taste again isn't really relevant but I would argue that it is. It is certainly relevant to business owners. It's also relevant to many homeowners. I mean, clean air and fresh clean water are important aspects to a high-quality life that we have hoped that everyone here in Cambridge can achieve and the infrastructure is capable of providing or helping them to achieve that, as well.

As a homeowner, I have also had to replace my home water heater six years into a ten-year guarantee. I think that's a very common experience amongst Cambridge

homeowners, as well, that water heaters tend to basically start leaking well ahead of their anticipated life. And that can create problems beyond the hassles and the cost even you're under guarantee, you need to pay for the labor necessary to install that new water heater. And sometimes it's hard to procure the time of the contractor. Particularly, in this environment, it's very difficult to get a contractor.

So, you know, as a homeowner, I believe there are costs and inconveniences created because of the water. So, I guess I would leave it there. I do understand there are costs and bigger pictures issues, but I did want to let you know from the perspective of a business owner, there are actual costs to me, fairly significant costs, involved in coping with the water quality we have here in Cambridge. And the MWRA system, I will say, the water is great. I mean, the TDS there is - I just looked at the May study. The TDS range is amongst the three reservoirs between 44 and 132, and as I mentioned, the chloride levels between [836]. It's, it's, it's actually fairly off with water.

COUNCILLOR QUINTON Y. ZONDERVAN: Thank you so much for sharing that with us. Any of my colleagues have

questions for Aaron to clarify? Any questions?

And Aaron, if you're available during discussion to answer some questions, that would be great as well.

MR. AARON MACDOUGALL: Sure.

COUNCILLOR QUINTON Y. ZONDERVAN: Thank you again for joining us.

We have been joined by Dr. Phil Brown from Northeastern University. Dr. Brown will be able to speak a little bit more about the PFAS issue.

DR. PHIL BROWN: Hi. Glad to join you today and hope what I can tell you will be helpful to you. I am not an expert on water supply issues. I have a number of colleagues on my team. And actually, pretty much all of us are spending today from 1:00 to 5:00 p.m. at the National Academy of Science, Engineering and Medicine as part of a multi-session meeting on providing guidance around PFAS. So, I was hoping to get one of my more water expert colleagues to come join, but as I say, we're pretty much all there and I have just taken this site break from it.

So, I want to say that I'm glad the City Council is taking this up. I'm glad that the water system here is below the MCLs. I think we're probably all very happy about

that. And in fact, if you look at the individual PFAS, they are all, except for PFOA under with the most stringent state regulations and other states would be. So, we're doing well.

So, it's good that we're testing. Massachusetts as you know is a leader here. We're one of the few states to have many MCLs and a lot of places are looking to us for guidance.

What is interesting is there is fluctuation. And the measurements were lower before, now they're higher. They are climbing up. And they can fluctuate. So, with - that means, by their fluctuation to the standard - we might not meet the standards in the future. So, we need to be thinking about that. In the long run of course, it would be good for them to be lower. And I was glad to see in the report from the City Manager, that there is a goal of 10 nanograms per liter, which is far below the 20 that the State is requiring. So, I think having goals like that is good.

Many of the affected communities who have organized throughout this and many of the scientists who work with them have said that one nanogram per liter, which is the

same as parts-per-trillion, would be ideal in terms of being health-protected. So, we do need to go lower and lower all the time.

In thinking about the questions that Councillor Zondervan asked me, I did consult with my colleague, Laurel Schaider from Silent Spring Institute and I would say that you should in the future ask her to give you information. Silent Spring has been doing PFAS work in Cambridge - in the Massachusetts water systems, especially in Cape Cod and now in Ayer, for quite a long time and are pretty expert at it.

So, in terms of the questions that I was asked to address, where is this coming from, and why do we see it here and not in the MWRA water? There are many, many sources for PFAS and we really don't know exactly where any particular place is - If we're right next to an industrial source, if we're right next to a military base, if we're right next to an airport, we have a pretty good hunch that we're getting it from either the industrial use or from the firefighting foam, the AFFF. But there are a lot of other sources that we're only just starting to learn about. For instance, landfills, waste treatment plants, and any

agricultural areas that are treated with sludge used as fertilizer, because that sludge is often very full of PFAS.

So, we would have to look at what is affecting us most directly, and really, you need to then map out all the possible sources. And I don't even think that DEP would have all those sources listed because we're only finding out about those day by day. And, you know, not a week goes by that we're not treated to some new set of exposure sources. A couple of days ago, it was found that a massive amount of PFAS are coming in fracking sites, from fracking chemicals. Fortunately, we don't have that here but that's just an example.

But a couple of weeks before, there was a major national study that's been covered very widely showing how many PFAS there are in cosmetics.

So, there's a lot of personal care uses as well as industrial uses and firefighting uses. So, we would have to know where those sources are. We would have to do hydrological studies to see where they are moving in plumes underneath and how they're getting into different aqueducts, how they're getting into streams and rivers that might be feeding into the reservoirs we use. So, there is

no simple answer as to why we're seeing it more in one place than another. Since you could say, well, we don't have industries that are probably using it.

We're also finding there's a lot of use in all kinds of petro-chemical settings. So, oil refineries, we don't have those. Oil storage tanks, we don't have those in Cambridge, but we do have a lot in the Boston area. Any place that handles any kind of petro-chemical could have a chemical fire, a petroleum-based fire, they've got to have these AFFF foams on-hand. And many of them can leak from containers where they're stored. We're starting to see that as a source.

The second question, how concerned should we be? I think I started with my opening comments, we should be happy that we're doing better than other places. There are some places that have literally thousands and tens of thousands of nanograms per liter, because they're next to highly-contaminated areas. So, we're in better shape than those places and we are in a more protective state than most states.

The question about what technologies are the best? I see we are using GAC. It's more expensive approach as like

reverse osmosis and ion exchange have been used. We also know that a lot of the newer PFAS can break through the GAC filters. So, it's important to actually study what comes through them and to look at them over time. And we see that the longer they're around, the more of what we call the newer generation, the next generation, often short-chain PFAS will break through. And it's more designed for things that we know better, the older ones PFOA and PFOS. And as for most research has been, that's where most of the mediation work has been done so far.

Ultimately, the best way to reduce is to prevent the exposure in the first place. So, lots of states are issuing not just MCLs, but also bills to restrict the use of firefighting foam. Our own state, the State House, is looking at bills on food packaging, on consumer products, on protective equipment for firefighters and pesticide spray, which is another new area we found recently in Massachusetts, one of the places that really broke this nationally. Pesticides themselves had PFAS in them, as did the plastic containers in which they were stored. So, a double source of exposure just through pesticide spraying, which lots of people have the case it's usually quite

dangers and ineffective as it's done.

So, the more we prevent these exposures, the less we're going to have in our water that we have to worry about removing.

In terms of examples from other communities that are dealing with it, we could look to some towns that have looked at this very early on, before there were MCLs. Hyannis is a good example, and Ayer as well. Both of them, when we were in the earlier stages before MCLs, when they found that their water was above the EPA's advisory level, which is not regulatory, of 70 nanograms per liter of PFOA or PFOS or the two of them combined, they took action to deal with that.

And in some cases, that meant filtration but it also meant mixing. And their systems have several different municipal wells, so they could mix from a high-concentration well to a low-concentration well, which is also not the greatest approach. But I would say talking to people there who took a very precautionary, proactive, early decision knowing that it would cost money for their communities, and they were not necessarily communities that were very wealthy. I mean, we think of Hyannis as wealthy

because it's on the Cape, but it's also an environmental justice community with a lot of low-income people and a lot of people of color.

And Ayer is not a very wealthy community either but people there took it very seriously. In the case of Ayer, they were able to get the military to actually compensate them for the cost of the filtration system, because that was the source of it. But many towns have not done that.

You may know that we do have a Massachusetts inter-agency task force that I actually testified at recently. They've had a series of meetings, all of which are recorded and available. The next one on July 19th is in fact going to be on the very subject of how have local communities dealt with this problem. So, I think it's probably worthwhile going to that. And also seeing all the rest of the work that they've done through the task force.

So those are the things that you asked me to speak about, Councillor Zondervan, and if I can tell you anything more, I'm happy to do so.

COUNCILLOR QUINTON Y. ZONDERVAN: Thank you so much, Dr. Brown. Any questions from my colleagues for Dr. Brown? Clarifying questions? Seeing none, Dr. Brown, again thank

you so much and if you are available for questions later on, that would be great. And if not, that's okay and again, we really appreciate you joining us.

DR. PHIL BROWN: Yes, and as I've said, I'd be happy to point you to my colleagues who are the real experts in municipal water systems. And again, I am very appreciative of the fact that I live in a city where we take this very seriously.

COUNCILLOR QUINTON Y. ZONDERVAN: Thank you so much again.

So, Mr. Clerk, has anyone signed up for further comment?

CITY CLERK ANTHONY WILSON: We have one person signed up for public comment.

COUNCILLOR QUINTON Y. ZONDERVAN: Thank you. So, if we could hear from them.

GARY MELLO: Hello. Can you hear me?

COUNCILLOR QUINTON Y. ZONDERVAN: Yes. Yes, we can.

PUBLIC COMMENTS:

Gary Mello, a Cambridge resident, spoke about water supply and drinking water issues, but praised the water department's efforts to make water available to every

citizen in Cambridge. Raised concern about the quality of tap water that is non-drinkable.

COUNCILLOR QUINTON Y. ZONDERVAN: Thank you so much. Anyone else in--?

CITY CLERK ANTHONY WILSON: Councillor Zondervan, we have one more person. Gary Mello.

[UNNAMED SPEAKER]: Gary Mello does not appear to have joined the Zoom.

COUNCILLOR QUINTON Y. ZONDERVAN: Okay. Thanks. So, if anyone else in the audience would like to speak, please raise your hand and I will call on you. So, we'll now have general discussion so any questions or comments from my colleagues, please raise your hand and I will call on you to speak.

Councillor Carlone.

COUNCILLOR DENNIS J. CARLONE: Thank you, Mr. Chair. My question focuses on the business owners' concerns, and I'm sorry, Mr. MacDougall's concerns about his equipment and I would imagine - I would love to hear Mr. Corda's thoughts on that, on whether or not that's a matter that on a city level can't be dealt with or there are recommendations. But on top of that, I would assume

industry would have similar concerns and we've not heard any of that at any time. So, Mr. Chair, I would ask Mr. Corda to - or the City's administration to respond.

COUNCILLOR QUINTON Y. ZONDERVAN: Thank you, Councillor, and just to briefly respond myself, as well. Having run out a biotech lab in Cambridge for several years, um, we had to put in place very expensive water fountain but that's standard practice. That's not dependent on Cambridge's water versus anybody else's water.

COUNCILLOR DENNIS J. CARLONE: Sure.

COUNCILLOR QUINTON Y. ZONDERVAN: You can't use municipal water for biotech experiments, so I think that's a little different in terms of expectations from what coffee shops and other food providers might have.

Mr. Corda or Mr. DePasquale?

LOUIS DEPASQUALE: Sam, you want to start? And Arthur, I think you should also jump in on this.

MR. SAM CORDA: I'm muting. Nothing seems to go that easy. [laughs]

Again, as I said before, obviously we have a certain water quality in Cambridge. I'm going to say that again. It's really up to the design. Again, I've worked with a lot

of entities on this, and the key is really understanding what the water quality is and then designing for that. Mixing valves, I've had direct experience with that, standard items like that, or regular valves and so on. And again, if you buy the correct valve, there isn't a lot of problems.

Hot water heaters, again, the same thing. If you have one that has the appropriate items, whether it's a cathartic and a sacrificial anode, or whatever that may be, or proper maintenance, those things have worked very successfully. I can give you an example.

Here at the water treatment plant, we recently replaced - we have two hot water heaters. We had four hot water heaters. Two electric and two gas, to have back-ups so we can always have hot water. And they've all been replaced but it was at about 18 to 20-year time period, we had to replace the four hot water heaters. And again, they were properly maintained, you know, they're not the least expensive water heater you can buy, I'm sure. They're good quality. And they worked fine. I've had - again, I believe strongly that it's about the design, you know.

The coffee is a different issue in the sense that it's

unfortunate, you know, if indeed the manufacturers don't warranty above 30 parts per million, then the reality is that MWRA isn't going to meet that requirement either, because you know, the numbers I've looked at are in, you know, above 30 parts per million. Obviously, it's a lot closer than ours but again, you're going to run into a similar problem from a warranty perspective.

Then the other thing you can do too with the reverse osmosis system is, you know, you could theoretically blend some water. You could take 25% of regular Cambridge water because my understanding also is that the minerals in the water, the total solids, can be a plus and can add a taste to the water. You know, I've heard that complaint. That one of the problems with the RO is that it takes everything out of the water so there is no taste left whatsoever. So that's an option to help it. Unfortunately, you know, if you want to maintain the warranty, you're going to need the RO system and there is obviously a cost to that.

But again, I think we have a certain water quality and everything that needs to be understood and again, old school individuals or plumbers just kind of replace - if you had a hot water heater, replace it with the same one. I

mean I've seen that many, many times. Hopefully, that isn't the case, they look, pay attention. If they failed, there's got to be a problem with it. We should probably do something different here. And there's absolutely nothing wrong with the water quality in Cambridge.

Again, I'm going to discuss the taste issue that was brought up as well. I drink Cambridge water every day and I totally disagree with both people that said - I don't have a baking soda issue. I drink it every day and I think it tastes fine. Again, that's my personal preference. And again, we all do have personal preferences, as well.

LOUIS DEPASQUALE: I'm going to turn it over to Arthur. And I do think Cambridge water is below every test that we need to be in a state that's frequently regulated. And again, I understand tastes are different for every individual. But as someone who has lived in this city my entire life, most if not all the people I deal with drink Cambridge water. So, we have not heard this outrage of the taste of water. If we did, I would know about it. And if there's something we need to hear, then we should hear about it. But from my point of view, that really hasn't been a factor in all my years with the City.

And Arthur, I don't know if you want get into anything about the question of what impact our water may have had or some damage to the property of someone's house?

ARTHUR GOLDBERG: Thank you, Mr. Manager. I guess the issue is whether the City would be liable for any particular damage related to the provision of city water that meets all guidelines. And I mean, I can't comment on any individual case but as a general matter, the City would not be legally responsible for managing its water supply in a legally compliant manner. And you know, as Mr. Corda pointed out, there may be individual circumstances where people have to maintain their lines that serve their property and take certain measures to maintain equipment they've purchased. But that is not something that the City is responsible to do.

LOUIS DEPASQUALE: Owen, anything you want to add?

OWEN O. RIORDAN: Not at this time, thank you very much.

COUNCILLOR QUINTON Y. ZONDERVAN: Thank you.
Councillor Carlone.

COUNCILLOR DENNIS J. CARLONE: My question had nothing to do with liability. It was more with clearly sharing

information for business owners, homeowners... Is there -if someone moves in, they open a business, they inquire, there's a point-person or website that outlines what Mr. Corda said, makes recommendations. That's all I'm getting at.

You know, we all have problems with new locations, whatever you learn. You don't repeat those problems. You don't repeat that action to avoid the problem. But if you're not sure what the problem is, you do repeat it and you get even more frustrated.

So, my question was focussing on information and recommendations. I think what Mr. Corda said as an architect, makes all the sense in the world, but I don't know about the coffee industry and you know, I certainly want every - I mean, I think the water's fine. I'm from New York where the water was bragged about, New York City. And they have their system and that was considered a highlight.

So, I just want to make sure this isn't a problem that repeats for other people. As much as we can forward that information to say, don't buy a certain level of equipment. Buy one that will last like the Water Department's water heaters. I mean, 19 years is remarkable. I'm sure it was a

high-end system, but that's remarkable.

So that's all I'm getting at. It's not liability. Who's fault it is. It's knowledge and sharing it. Thank you, Mr. Chair.

COUNCILLOR QUINTON Y. ZONDERVAN: Thank you, Councillor. And you know, I do want to - I'll show my water heater valve here now again. I'm not sure that you were able to see it earlier, Mr. Corda, but that's the level of calcification that I had to deal with.

And you know, I mean, I understand totally where you're coming from. But I don't think it's reasonable to say to a homeowner that, you know, that we have to somehow anticipate that and then we have to, you know, spend extra dollars and extra time and find the right contractor... all that extra work that we have to do in order to avoid that kind of problem, right. I mean, there's no design that I myself can do that would avoid that level of calcification in that water heater mixing valve.

So that's really the challenge for me is that if the advantage to us is, well, it's cheaper to do our own water compared to the MWRA and that may be true if you don't account for the cost to us as property owners in terms of

the work and expense that we have to do to manage that level of water quality. And I totally understand except where Mr. Goldberg is coming from. As long as you're below the state and federal limits, then obviously, there's no liability claims.

But there's still the question of full-cost accounting. Is it really cheaper if we have to spend all this money in the private sector, and in the public sector, right. I mean there's money that the City has to spend from time to time because of these water quality issues that, you know, are totally accounted for when you say that it's cheaper for us to have MWRA water. So, I think there is a question there.

And also, as we discover these new contaminants and these new regulations like the PFAS situation, we have to spend more to pull those contaminants out of the water. Where with MWRA, it's not even in the water to begin with. So, I think that's a real challenge that we need to grapple with going forward. Does it continue to make sense to supply our drinking water this way if we have to constantly manage these water quality issues.

LOUIS DEPASQUALE: I think no matter where we're at,

Councillor, they're managing water quality. I think it's something we're proud of that we manage our water quality. And I'm sure in other cities and towns, when hot water heaters don't last their expiration dates, people can be criticizing the water for that, too. And again, I think this is a discussion we're always going to find ways we can do things better. Sam has been a leader of trying to address things ahead of time, but again, I think to think about leaving the city's water system at this point would be a bad, bad decision for our residents and for the City of Cambridge.

COUNCILLOR QUINTON Y. ZONDERVAN: Mr. O'Reardan. Now we'll hear from Mr. O'Reardan.

OWEN O. RIORDAN: Thank you very much, Mr. Chair. Just a couple of questions about a couple of comments about the fundamental question.

I think Sam alluded to resiliency and the fact that we have redundancy in our system. And as we begin to think about the future in terms of climate change, and looking at the broader environment which means protection of 24 square miles of a watershed upstream, seems to my mind might be a very important consideration, as we think about those

issues.

Recognizing that there are water quality issues at the moment for homeowners. Recognizing that, the City is also investing to ensure that we continue to address those as best we can. But at a fundamental level, as one thinks about the fundamental need for water from a public health perspective, the City's water quality, it's a fine water.

And so, I just go back to that fundamental question and just thinking about all of the challenges that we are going to face. And I cannot set aside the need for redundancy and the resilience that it provides to us as we look into the future. So those are the only comments that I wanted to make. Thank you.

COUNCILLOR QUINTON Y. ZONDERVAN: Thank you, Commissioner. And I agree with you that, that the redundancy is a benefit, sort of upstream benefits of maintaining that watershed. I agree with all of that. I think that the flip side is also true that, you know, because of the water level issues at Fresh Pond which we experienced with the recent drought. And climate change may present us with more of those types of situations, also, right.

So, you know, I don't think of it as an either-or. I'm not thinking of it as we should get rid of our water supply and switch to MWRA. I'm thinking about it, how can we get to a better place where we have the benefits of the, you know, high quality that MWRA water can provide in terms of drinking, but you know, we don't drink most of the water that we produce, right. So, there's lots of other uses for that water that we could contemplate now and in the future that people benefit from, as well.

I do want to recognize Mr. MacDougall.

MR. AARON MACDOUGALL: Thanks. If I could go back to the point that one of the Councillors made before about resources available to business owners, that would be very helpful.

I mean, coming into Cambridge, it's something that business owners speak about. I mean, no one likes to talk about these - this type of problem is obviously deep-seated. It's not easy to solve. I think we all recognize that. I think we all recognize that the water system, the job that everyone's doing is an immense job.

And so, I think we're appreciative of the cost benefits, the redundancy and all of that. So, everyone is

loathe to point out problems with it. So, there isn't a lot of information available to business owners. We all, you know, if you know somebody, you talk to them about how they dealt with it and what people are doing. Five, six, seven years ago, no one had RO systems. Their machines were just breaking down left and right. Then the industry caught on to figure out what the issue was. And that was just, you know, equipment manufacturers speaking to retailers, other shopowners speaking to other shopowners.

So, I mean certainly we would benefit by having some sort of centralized recommendations. And you know, real, I think thoughtful workarounds would be helpful, too. I mean the reality is, despite what Mr. Corda said about, you know, MWRA water not requiring - you know, still being above 30 parts per millions on the chloride count. No, it's - you don't find people in the western suburbs with RO systems for their shops. Normal filtration seems to do just fine for them. They don't have the same water issues that we have in BlendBack, things like that.

Again, number one, a BlendBack system, you know, you have straight RO systems, you have BlendBack systems where you combine a portion of your RO with a portion of the

straight water coming in from the water system, whether that's filtered through a normal filtration system or not. Or you have a re-mineralization system like ours, BlendBack doesn't really help for Cambridge water - a Cambridge business owner who is grappling with the water issues because of the high chloride count.

RO, again, is not a 100% efficient process. You need to get 95% efficiency, which means you still end up with some TDS. You do end up with some level of chloride, so BlendBack is not really going to be saving you a lot of money.

I mean if somebody could tell me another way besides RO for addressing these issues, and it's really a chloride issue which is doing the most financial damage to us. If we could address that, that would make a huge difference I think. We would all love the best of both worlds. We would love to have, you know, dependable, affordable, high-quality water, right. Without the chlorides and you know, if we could lower the TDS and calcium levels, that would be wonderful, too. But you know, we'd be more than delighted with the Cambridge water if we could get the chloride count down. So...

COUNCILLOR QUINTON Y. ZONDERVAN: Thank you for that. You know, we also can think a little bit out of the box. We get a lot of rainfall here and as Commissioner O'Reardon knows, I've done a lot of work on rain water collection systems for residents, which they use in their gardens, which can help to reduce the demand for water from the Water Department. But that could even be used for drinking and other purposes, as well, with proper filtration.

And in some places in the world, it's actually required for people to collect rain water as another way to help supply the water or offset the water supply and to have more redundancy.

So, there are lots of different solutions that we can think of. If we're creative without having to think about it as all-or-nothing that we should have our own water supply. I think there are clearly a lot of benefits to having our own water supply.

But it would be great if we can think about ways to work around some of these issues that are being presented and to address the concern that comes with it which then people don't necessarily know when they move into Cambridge or open a business in Cambridge, that they're going to be

faced with some of these issues and it kind of would be helpful to help them know that.

Any other comments or questions for my colleagues?

Alright. So, we can obtain a motion to adjourn.

City Clerk Anthony Wilson called the roll to adjourn.

Councillor Dennis J. Carlone - Yes.

Councillor Marc C. McGovern - Absent.

Councillor Patricia M. Nolan - Absent.

Councillor JIVAN Sobrinho-Wheeler - Yes.

Councillor Quinton Y. Zondervan - Yes.

Yes-3, Absent-2. Motion Passed.

COUNCILLOR QUINTON Y. ZONDERVAN: Thank you, everyone.

COUNCILLOR DENNIS J. CARLONE: Thank you.

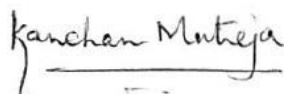
The Cambridge City Council Health & Environment

Committee adjourned at approximately 3:40 p.m.

C E R T I F I C A T E

I, **Kanchan Mutreja**, a transcriber for Datagain, do hereby certify: That said proceedings were listened to and transcribed by me and were prepared using standard electronic transcription equipment under my direction and supervision; and I hereby certify that the foregoing transcript of the proceedings is a full, true, and accurate transcript to the best of my ability.

In witness whereof, I have hereunto subscribed my name this **13th day of January, 2023**.

A handwritten signature in cursive script that reads "Kanchan Mutreja". The signature is written in black ink and is positioned above a horizontal line.

Signature of Transcriber