

Internal Monitoring Report

Policy #: O-2B Water Quality

Date: April 27, 2021

Policy Language:

Madison Water Utility consumers will receive high quality water that meets or is better than all primary and secondary drinking water standards, including their public notification requirements, and complies with board-adopted water quality goals, incorporated by attachment.

Madison Water Utility recognizes that drinking water standards are subject to revision and that new compounds of concern will be determined. This dynamic is a result of health studies being conducted by health organizations and government agencies on the state, national and international level. The technology to quantify compounds at increasingly minute levels is constantly improving.

Madison Water Utility shall maintain and promulgate a Watch List of compounds of concern by unit well of compounds that are increasing and may approach the primary and secondary drinking water standards. The Watch List shall identify which wells require action.

CEO's interpretation and its justification:

Few things are more vital to a community than the availability of high quality drinking water. It promotes public health, public safety, and the economic interests of our community. To that end, the water utility will consistently deliver water that meets the primary, health-based drinking water standards, the secondary (aesthetic) standards, and the additional policy goals established by the Board.

Water Utility Board Procedural Guideline GUIDE 8 – Executive Summary of Water Quality Treatment Policies – establishes monitoring requirements and the utility's approach for responding to increasing contaminant levels. Generally, the policy establishes two thresholds – one when a contaminant exceeds 50% of a maximum contaminant level (MCL), secondary MCL, or other numerical guideline, and two, when it surpasses 80% of this mark.

The first triggers increased monitoring and an investigation into treatment alternatives, operational changes, or other actions to reduce contaminant levels, while the second leads to implementation of a mitigation strategy.

The policy applies to any contaminant, regulated or not, that is capable of impairing the health, safety, or aesthetic quality of drinking water. Utility staff will remain vigilant in following developments related to currently unregulated and emerging contaminants like pharmaceuticals, endocrine disruptors, per and polyfluoroalkyl substances [PFAS], chromium(VI), and 1,4 dioxane that may pose challenges in the future.

The utility will use multiple communication methods to adequately inform consumers of the safety and quality of their drinking water including the federally required Consumer Confidence Report (CCR), the water utility website, e-mail distribution lists, neighborhood listservs, citizen meetings, and through direct staff contact in the field and office.

Data directly addressing the CEO'S interpretation:

Contaminants with a primary MCL, Action Level or Enforcement Standard

Coliform Bacteria - Between October 2020 and March 2021, 1270 water samples were collected from routine monitoring points in the distribution system. No sample tested positive for coliform bacteria. Thirty nine untreated (non-chlorinated) well samples also were collected during this reporting period. All were found to be free of coliform bacteria.

Volatile Organic Compounds -Thirteen wells were sampled during the monitoring period. Six wells are tested once a quarter; they include Wells 6, 7, 9, 11, 14 and 18. PCE is the most commonly detected VOC. During the monitoring period, PCE was found at three wells, all with levels at 1.1 µg/L. The maximum contaminant level (MCL) for PCE is 5 µg/L. A detection summary for each well is shown in **Table 1**.

Low levels of ethyl benzene and xylene were detected intermittently at Well 9 beginning in 2018 after the painting of the interior surface of the reservoir. However, neither of the two chemicals have been detected since the third quarter of 2020.

Table 1. Summary of VOC Detections, October 2020 to March 2021

Well #		#6	#7	#9	#11	#14	#18
Number of Samples		2	2	2	2	2	2
VOC Contaminant	MCL (µg/L)	Maximum Test Result (µg/L)					
1,2-Dichloroethylene (cis)	70	<0.35	<0.35	<0.35	0.41	<0.35	<0.35
Tetrachloroethylene (PCE)	5	1.2	0.89	1.8	0.69	0.33	2.1
Trichlorotrifluoroethane	--	<0.39	<0.39	<0.39	<0.39	0.54	<0.39
Trichlorofluoromethane	--	<0.30	<0.30	<0.30	0.71	<0.30	<0.30

Radium – Radium monitoring follows the guidance provided in GUIDE 8. Well 19 and Well 27, which have higher radium levels, are tested quarterly while five other wells that also exceed 2.5 pCi/L combined radium (226 + 228), or one-half the MCL, are subjected to annual testing.

Table 2 summarizes the radium results for samples collected during the October to March period at wells that are tested at least annually.

The utility’s Capital Improvement Plan includes construction of an iron and manganese filter at Well 19, currently scheduled for construction in 2023, which is expected to reduce the radium level at the well.

Table 2. Combined Radium (226 + 228) Results Measured in pCi/L.

	Number of Samples	Results	Annual Average of Quarterly Samples
Well 19	4*	3.6 – 4.1	3.9
Well 24	1	3.4	3.4
Well 27	4*	3.6 – 4.8	4.0
Well 28	2*	2.3 – 2.9	3.1

* Includes duplicate samples

Contaminants with a secondary MCL

Iron and Manganese - Monthly well samples are collected when iron and manganese are elevated. During the period from October to March, all three samples taken from Well 8 exceeded the secondary MCL for iron [0.3 mg/L]; in addition, one sample each from Well 8 and Well 19 were at the manganese standard of 50 µg/L. Test results are shown in **Tables 3 and 4**.

Six wells have iron levels above the Board Policy level [0.1 mg/L] that mandates treatment. These wells include 8, 19, 24, 27, 28 and 30. Five of these wells, not including Well 30, also exceed the Board Policy level for manganese [20 µg/L], the level above which treatment is required.

In addition to the wells that are tested monthly, all wells are tested semi-annually. The December 2020 results for the remaining wells had results ranging from non-detect to 0.05 mg/L for iron and non-detect to 6.4 µg/L for manganese.

Table 3. Monthly Iron Test Results, in mg/L

Source	Oct	Nov	Dec	Jan	Feb	Mar
Well 7 – filtered	0.01	<0.01	0.01	0.01	0.01	<0.01
Well 8	0.51	0.55	0.55	n/s	n/s	n/s
Well 19	0.20	0.22	0.21	0.22	0.21	0.23
Well 24	0.22	0.20	0.18	0.21	0.22	0.21
Well 26 – deep well	0.02	0.02	0.01	<0.01	<0.01	<0.01
Well 27	0.14	0.16	0.15	0.13	0.07	0.17
Well 28	0.18	0.17	0.17	0.20	0.19	0.18
Well 29 – filtered	0.01	0.02	0.01	0.01	0.01	0.01
Well 30	0.18	0.19	0.19	0.20	0.20	0.19
Well 31 – filtered	0.01	<0.01	0.01	<0.01	0.01	<0.01

Table 4. Monthly Manganese Test Results, in µg/L

Source	Oct	Nov	Dec	Jan	Feb	Mar
Well 7 – filtered	2.0	2.0	2.0	<0.2	<0.2	<0.2
Well 8	49	49	50	n/s	n/s	n/s
Well 19	37	50	48	46	44	47
Well 24	29	31	26	28	30	29
Well 26 – deep well	2.0	2.0	2.2	4.0	6.3	7.3
Well 27	33	33	33	37	30	30
Well 28	22	22	22	29	23	22
Well 29 – filtered	2.0	2.0	2.0	1.7	0.5	0.3
Well 30	13	13	14	15	14	14
Well 31 – filtered	2.0	2.0	2.0	<0.2	0.3	<0.2

Filters at Well 7, Well 29, and Well 31 continue to show significant iron and manganese reductions. Test results are shown in **Tables 3 and 4**. In all cases,

iron was reduced to <0.02 mg/L and often below the detection limit while manganese was also often lowered to below detection, <2.0 µg/L. These values represent a 92% to 99% reduction in iron and manganese in the filtered water at Well 7, Well 29 and Well 31.

Iron and manganese monitoring also takes place in the distribution system at all coliform sample locations. Test results, summarized in **Table 5**, show iron and manganese did not exceed the established benchmarks during this period and that over 90% of the samples are below one-half the policy goals. These results demonstrate our effective control and management of iron and manganese accumulation in the distribution system.

Table 5. Summary of iron and manganese levels in the distribution system.

Manganese, µg/L		Iron, mg/L	
	Oct - March		Oct - March
Policy Goal	50	Policy Goal	0.3
Median	2.0	Median	0.02
Average	3.4	Average	0.03
95th Percentile	17.1	95th Percentile	0.16
Maximum	19	Maximum	0.20
Number of Samples	58	Number of Samples	59
>50	0	>0.3	0

Chloride - Monthly chloride testing continues at Well 14. Eleven samples were collected between October and March with chloride ranging from 150 to 167 mg/L, compared to the secondary MCL of 250 mg/L. Well 14 is the only Madison well with chloride above 100 mg/L; however, some wells (6, 9, 11, and 16) have experienced considerable increases in chloride in recent years.

City Engineering and Water Utility staff continue to work cooperatively to help ensure that stormwater management solutions, including installation of green infrastructure, do not compromise groundwater quality around the City’s municipal wells. Specifically, the two agencies agreed to prohibit the installation of new infiltration basins or the expansion of existing wet ponds in wellhead protection districts. The most vulnerable municipal wells are

now protected by the creation of an additional buffer, which extends beyond the wellhead protection area, where green infrastructure is discouraged.

Finally, water utility staff continue to work with regional partners to help raise awareness on the issue of chloride contamination of the lakes and our ground and drinking water resources. The partnership helped develop and implement a Winter Salt Certification program emphasizing training, equipment calibration, and record keeping. Outreach efforts promote the training workshops that are a prerequisite to individual or organization-level certification.

Unregulated and Emerging Contaminants

Sodium - In accordance with GUIDE 8, monthly sodium testing continues at Well 14. Eleven samples were collected between October and March with samples ranging from 55 to 65 mg/L sodium. Sodium levels above 20 mg/L can be concerning for individuals on severe sodium-restricted diets. Health officials recommend these individuals account for sodium in drinking water when calculating their daily sodium intake.

Water Quality Watch List

The Water Quality Watch List has been updated with current test results for organic, radiological, and unregulated contaminants. Minor changes were made to the list since the last reporting period.

Water Quality Technical Advisory Committee

Due to ongoing COVID-19 concerns, this committee continues to meet virtually. Meetings were held January 11, 2021 and April 12, 2021.

At the January meeting, two topics were covered, fluoridation and PFAS. The utility invited staff from the Wisconsin Department of Health Services to provide fluoridation information to the committee. Dr. Sara Yang presented an evaluation of National Toxicology Program's Draft Report on Fluoride's Neurodevelopmental Effects. The main conclusions of the report were that 1) fluoride is presumed to have cognitive neurodevelopment effects at levels above 1.5 mg/L, 2) there are a variety of issues with the studies under consideration and they cannot be used to determine a safe level of

exposure and 3) more data and studies are needed. Dr. Russell Dunkel of DHS also gave a presentation about two studies of communities that have stopped fluoridation of drinking water. Studies showed both increased dental caries and restoration costs among all age groups in the communities under consideration.

To begin the discussion of PFAS, Joe Grande gave a presentation to the committee on PFAS testing done over the last three years covering all utility wells. Some PFAS compounds were detected in every well, though none as high as Well 15, which has been out of operation since March of 2019. The utility hoped for a recommendation from the committee about resuming operation of Well 15. Though DHS has provided groundwater recommendations, DNR had not yet developed drinking water standards for PFAS. The committee preferred to wait for DNR standards before making any recommendation on restarting Well 15. Meeting notes are included as an attachment to this report.

Like the January meeting, the April 12, 2021 Technical Advisory meeting focused on the topics of fluoridation and PFAS.

The meeting began with a review of the previous two meeting's fluoride presentations. Discussion centered on the current studies of the potential neurotoxicity to fetuses and infants and the limitations of even the best of those studies, including such factors as the absence of controls for social factors. The committee also considered how to balance the potential harm in pre- and post-natal exposure with the documented benefits to dental health from community water fluoridation. The committee expressed frustration with the lack of, and the desire for, quality studies to guide their decision-making process. The committee acknowledged the cost and difficulty in conducting high-quality studies and the nation's current intense focus of resources on COVID-19 would likely mean a policy decision will be required without additional information. One more attempt to schedule National Toxicology Program staff to present their findings on their Draft Report on Fluoride's Neurodevelopmental Effects will be made for the August meeting. The committee declined to make a fluoridation policy recommendation to the Water Utility Board at this time.

The second topic was a PFAS update and a summary of the Well 15 PFAS treatment feasibility study, guided by a presentation by Joe Grande. The 2020 test results were reviewed and compared to the drinking water and

groundwater standards proposed by WI DNR. New PFAS-related regulatory developments were outlined:

- 1) EPA: will regulate PFOA and PFOS in drinking water
- 2) EPA: proposes inclusion of 29 PFAS in the Fifth Round of the Unregulated Contaminants Monitoring Rule (UCMR5)
- 3) EPA: releases final Toxicity Health Assessment for PFBS; revises Chronic Reference Dose downward by Factor of 30
- 4) WI DHS: recommends Health-Based Groundwater Standards for an additional 16 PFAS
- 5) WI DNR: adopts WI DHS recommendation to consider cumulative impacts of PFAS on human health - Hazard Index)

The presentation also summarized the UW15 PFAS treatment feasibility study commissioned by the Utility. Granular activated carbon (GAC) filtration and ion exchange were assessed as treatment options with the objectives of 1) reducing total PFAS and VOCs by >90%, 2) maintaining a production rate of 1000 gallons per minute and 3) eliminating the need for the air stripper. Though both treatment methods met the objectives, the study found GAC to be the most cost effective option. The estimated costs for initial construction, equipment and materials is \$825,000. This figure does not include modification to the existing building that would be required to accommodate the filtration system. The Utility's next steps are to apply asset management principles to evaluate different alternatives and determine whether a treatment system at Well 15 is the best and most cost-effective option for meeting water supply needs on Madison's east side.

Annual Water Quality Report – Consumer Confidence Report

The utility is on track to release the annual Consumer Confidence Report (CCR) by the end of May. The report-in-progress details the extensive water quality testing conducted in 2020 and summarizes those test results for our system as a whole. An important conclusion of the report is the utility's full compliance with all federal and state drinking water standards. In addition to reporting results for currently regulated contaminants, the report presents results for other contaminants of concern that are not regulated including PFAS (PFOA & PFOS), chromium (VI), and 1,4 dioxane. The report serves as an important communication tool and directs our customers to our website where there is more detailed water quality information specific to the individual wells that make up our water system.

Rather than deliver a paper copy to each customer or mailing address in the City, the utility opts for “electronic delivery” to satisfy this regulatory requirement. Over 135,000 postcards will be printed and mailed using the US Postal Service “Every Door Direct Mail” saturation mailing lists. The postcards contains a direct link (URL) to the report and encourages our customers to view the report to learn more about their drinking water. The report and information in the notice is translated into Spanish to reach our Spanish-speaking customers. A notice will also appear on the monthly municipal services bill. Finally, an announcement will be posted to our social media platforms to encourage readership of this important report.

Normally, copies of the report, in English and in Spanish, are delivered to public library branches and many community and neighborhood centers throughout the City. This practice was suspended in 2020 due to the pandemic and closure of many public buildings including City libraries. Paper copies are available upon request and will be delivered to libraries and community and neighborhood centers as conditions allow.

Additional Water Quality Outreach

Water Quality Testing – A wealth of water quality data is available on our website, madisonwater.org. The [Water Quality Testing](#) page includes links to updated information on a range of potential biological and chemical contaminants in drinking water. There is information on lead, nitrate, PCE and other volatile organic compounds (VOC), radium, PFAS, hexavalent chromium, and more.

The *Water Quality at My Address* application on our website allows users to enter their address to determine the primary well(s) that serve their home or business. The application also provides links to detailed Well Reports that provide results of the most recent water quality tests at each well. These well reports are updated annually in March. This application is a popular service on our website.

Attachments:

Water Quality Watch List

Water Quality Technical Advisory Committee Notes – January 2021

Water Quality Technical Advisory Committee Notes - April 2021

**MADISON WATER UTILITY
WATER QUALITY WATCH LIST**

Organics - Regulated

Contaminant	Maximum*	Units	MCLG	PAL	MCL	Detects Below PAL%	Watch List	Action Plan	Reference
Atrazine	0.04	µg/L	3	0.3	3	#14, #29	none		NR 809.20
1,2-Dichloroethane	0.1	µg/L	zero	0.5	5	#17	none		NR 809.24
1,2-Dichloroethylene (cis)	0.57	µg/L	70	7	70	#8, #9, #11, #27	none		NR 809.24
Ethylbenzene	0.7	µg/L	700	140	700	#9	none		NR 809.24
Tetrachloroethylene [PCE]	3.4	µg/L	zero	0.5	5	#27	#6, #7, #9, #11, #14, #18	Quarterly Monitoring	NR 809.24
Toluene	0.2	µg/L	1000	160	1000	#9, #31	none		NR 809.24
1,1,1-Trichloroethane	0.1	µg/L	200	40	200	#9, #18	none		NR 809.24
Trichloroethylene [TCE]	0.42	µg/L	zero	0.5	5	#11, #14, #18	none		NR 809.24
Xylene, Total	4.5	µg/L	10000	400	10000	#9, #31	none		NR 809.24

* Maximum detection observed at any Madison well from 2017 through 2021

% Detected in at least one sample collected from 2017 through 2021

Organics - Unregulated

Contaminant	Maximum*	Units	HAL	PAL	ES	Detects Below PAL%	Watch List	Action Plan	Reference
Chloromethane	0.72	µg/L	n/a	3	30	#18	none		NR 140.10
1,4-Dioxane	0.41	µg/L	0.35~	0.3	3	#9, #14, #15, #18	#11	Semi-Annual Monitoring	NR 140.10
Metolachlor	0.01	µg/L	n/a	10	100	#14	none		NR 140.10
PFAS: Combined / PFOA + PFOS	0.056 / 0.012	µg/L	0.07^	0.002^#	0.02^#	#6, #7, #9, #11, #13, #17, #18, #24, #25, 26, #27, #29, 30	#8, #14, #15, #16	Annual Monitoring; Feasibility Study - #15	WI DNR Rulemaking
Trichlorofluoromethane	1.1	µg/L	n/a	698	3490	#11	none		NR 140.10
Trichlorotrifluoroethane	0.54	µg/L	--	--	--	#14	none		N.A.

* Maximum detection observed at any Madison well from 2017 through 2021

% Detected in at least one sample collected from 2017 through 2021

~ 10⁻⁶ Cancer Risk Level

^ PFOA + PFOS

Proposed

Radionuclides (2020 data)

Contaminant	Maximum	Units	MCLG	Watch	MCL	Wells with Detects	Watch List	Action Plan	Reference
Gross alpha	11	pCi/L	zero	5	15	All Wells	#7, #18, #19, #25, #27, #28	Annual or Quarterly Monitoring	NR 809.50
Gross beta	10	pCi/L	zero	10	50	All Wells	#27		NR 809.50
Combined Radium	5.0	pCi/L	zero	2.5	5	All Wells	#7, #8, #19, #24 #27, #28, #30	Annual or Quarterly Monitoring	NR 809.50

ES - Enforcement Standard (NR 140 - Groundwater Quality)

HAL - Health Advisory Level

MCL - Maximum Contaminant Level Legal Limit

MCLG - MCL Goal (Public Health Goal)

PAL - Preventive Action Limit (NR 140 - Groundwater Quality)

MADISON WATER UTILITY WATER QUALITY WATCH LIST

Inorganics - Regulated

Substance	Maximum*	Units	MCLG	PAL	MCL	Detects Below PAL	Watch List	Action Plan	Reference
Arsenic	0.52	µg/l	zero	1	10	#6, #8, #9, #11, #13, #14, #17, #19, #24, #26, #27, #28, #30	none		NR 809.11
Barium	64	µg/l	2000	400	2000	All Wells	none		NR 809.11
Chromium, Total	2.2	µg/l	100	10	100	#6, #9, #11, #13, #14, #16, #20, #25	none		NR 809.11
Nickel	2.2	µg/l	100	20	100	#6, #7, #8, #9, #11, #12, #13, #14, #16, #17, #19, #26, #27, #28, #29	none		NR 809.11
Nitrogen-Nitrate	3.8	mg/l	10	2	10	#7, #12, #18, #20, #24, #25, #27, #29	#6, #9, #11, #13, #14, #16, #26	Annual Monitoring	NR 809.11
Selenium	1.0	µg/l	50	10	50	#6, #9, #11, #13, #14, #25, #29	none		NR 809.11
Thallium	0.17	µg/l	0.5	0.4	2	#11, #17, #19, #27	none		NR 809.11

* Based on 2020 annual test data

Inorganics - Unregulated

Substance	Maximum*	Units	MCLG	Watch	SMCL	Wells with Detects	Watch List	Action Plan	Reference
Chloride	160	mg/l	n/a	125	250	All Wells	#14	GW Investigation; Mitigation (20XX)	NR 809.70
Iron	0.46	mg/l	n/a	0.1	0.3	All Wells	#8, #17, #19, #24, #27, #28, #30	Install Filtration: Well #8 (2026) Well #19 (2023) Well #24 (20XX) Well #28 (20XX) Well #30 (20XX)	NR 809.70
Manganese	48	µg/l	n/a	20	50	#11, #12, #13, #18, #25, #30	#8, #17, #19, #24, #27, #28		NR 809.70
Sodium	60	mg/l	n/a	20	n/a	All Wells	#6, #9, #11, #14, #16, #27	Annual Monitoring	EPA DWEL
Sulfate	38	mg/l	n/a	125	250	All Wells	none		NR 809.70
Zinc	13	µg/l	n/a	2500	5000	#8, #12, #16, #17, #24, #26, #27, #28	none		NR 809.70

* Based on 2020 annual test data

DWEL - Drinking Water Equivalency Level MCL - Maximum Contaminant Level (Legal Limit) MCLG - MCL Goal Public Health Goal PAL - Preventive Action Limit (NR 140 - Groundwater Quality) SMCL - Secondary MCL (Aesthetic Guideline)

Water Quality Technical Advisory Committee

Meeting Notes: Virtual Meeting (Zoom)

January 11, 2021 – 5:00 p.m.

Attending: Henry Anderson, Janet Battista, Joseph Grande, Greg Harrington, Jocelyn Hemming, Al Larson, Gary Krinke, Dan Rodefeld, Kelly Miess, John Gibbons, Amy Barrilleaux

Absent: Joe Demorett, Sharon Long

Guests: Jeff Lafferty (Public Health Madison Dane County), Russell Dunkel (WI Dept of Health Services), Dr. Beth Neary (local pediatrician), Sarah Yang (WI Dept of Health Services), Ezra Menon (WI Dept of Health Services), members of the public

CALL TO ORDER: 5:04pm

AGENDA REPAIR / ANNOUNCEMENTS

Public comment: not on agenda, submit to MWU by email

Remaining 2021 meetings: April 12, July 12, October 11

1. Personnel Changes at Madison Water Utility

Former GM Tom Heikkinen no longer at MWU, Joe Grande appointed interim GM

Engineer Kelly Miess is assisting with MWU Water Quality supervision and administration

Chief Engineer Al Larson retiring next month after 20+ years at MWU

Recruiting Financial Manager, interviews this week

APPROVAL OF MEETING NOTES

No discussion, approval of Oct 2020 minutes

NEW BUSINESS

1. Water Utility Board Fluoride Review: A Presentation by WI DHS Staff

Joe Grande provided short review of issues raised at past TAC meetings, current regulation (NR 811)

Introduction of DHS Staff:

- Dr. Russell Dunkel, State Dental Director
- Dr. Sarah Yang, Groundwater Toxicologist
- Ezra Menon, Oral Health Epidemiologist

Dr. Sara Yang presentation: Evaluation of National Toxicology Program's Draft Report on Fluoride's Neurodevelopmental Effects

- NTP is part of U.S. Dept of Health & Human Services
- Report: Draft NTP Monograph on the systematic Review Of Fluoride Exposure And Neurodevelopmental and Cognitive Health Effects

- Reviewed 159 studies in total
- 10 highest quality studies used to draw conclusions
- Animal studies and lower quality studies were not used to draw conclusions
- Conclusion : Fluoride is presumed to have cognitive neurodevelopment effect; binary: looking for a yes/no answer after review of recent studies
- Lots of issues with types of studies, not able to determine “safe” level, more data and studies needed

Dr. Russell Dunkel presentation: When Communities Stop CWF (Community Water Fluoridation)

- What happens when CWF ends?
- Juneau AL, BMC Oral Health Study:
 - 2007 stopped CWF
 - 2012 mean cost restoration cost increase, especially in younger children 0-6
 - ~80% -300% increase adjusted for inflation for all age groups
- Calgary Canada and Windsor Canada studies all showed increase in cavity rates
- Some communities have decided to reintroduce CWF
- Not yet reviewed by NSF
- Only found neurotoxicology at levels about 1.5 mg/l

Dr. Beth Neary provided additional information:

- Benefit of Fluoride is mostly topical not systemic
- New pediatrician practice for topical fluoride varnishes, applied during office visit.

Discussion ensued about types of studies and what can be concluded from them. Consensus that data is lacking and conclusion that the committee should wait for the NPT report finalization before making any recommendations.

2. PFAS Update and Discussion

Joe Grande provided the following updates:

- Last 3+ years extensive PFAS testing done at MWU wells
- Past TAC input: Wait for further info to make decision
- Now we have new info: test results and DHS GW recommendation for 16 PFAS compounds
- All recommended levels above those at UW15 and other wells
- Request for recommendation by next meeting about UW15 operation
- Table of results for WU wells vs WI DHS recommendation
- UW15 and all other wells below all PFAS recommended levels

Joe asked the committee if the testing results and the DHS guidance would allow the committee to make a recommendation on restarting UW15.

Discussion ensued on the difference between GW and DW standards, DNR rulemaking processes, cumulative risks from multiple forms of PFAS compounds, lack of DNR standard, importance of UW15 as supply point to east side.

Conclusion: need to wait for DNR guidance; premature to make decision on bringing UW15 back on line. MWU looking to TAC for guidance, UW15 specifically, but also a policy for all unregulated contaminants. Feasibility study report to be available at future meeting, maybe next. Will have info on treatment alternatives and rough costs.

3. Introduction of Future Agenda Items

None

Request to hear from MMSD or Sewer Utility about PFAS & other contaminants leaking from sewer pipes into GW.

ADJOURNMENT 6:40pm

DRAFT

Water Quality Technical Advisory Committee

Meeting Notes: Virtual Meeting (Zoom)

January 11, 2021 – 5:00 p.m.

Attending: Jocelyn Heming, Greg Harrington, Janet Battista, Henry Anderson, Joe Grande, Dan Rodefeld, Amy Deming, Kelly Miess, John Gibbons

Absent: Sharon Long, Gary Krinke

Guests: Jeff Lafferty (Public Health Madison Dane County), Russel Dunkel (WI Dept of Health Services), DHS, Robin Kuester

CALL TO ORDER: 5:04pm

AGENDA REPAIR/ANNOUNCEMENTS

- Public comment: not on agenda, submit to MWU by email
- July meeting moved to August 9 @ 5pm
- Remaining meetings for 2021: August 9, October 11

APPROVAL OF MEETING NOTES

- No discussion, approval of January 2021 minutes.

NEW BUSINESS

1. Water Utility Board Fluoride Review Update & Discussion

- Review of previous meeting's 2 presentations about fluoride – findings in those studies suggest 1.5mg/L or higher concentrations may be neurotoxic. Limited study of fluoride's effects of prenatal development and IQ reduction showed limited but some correlation.
- Dr. Dunkel has looked for data or studies and has not found much scientific literature with regard to whether or not pregnant women should avoid fluoride. American College of OB/GYN recommends that pregnant women drink fluoridated water.
- Fluoride residual levels in urine are not directly based on fluoride exposure, and studies have not shown urine fluoride levels correlated with IQ reduction or other health issues, and studies are absent controls for social factors which could also impact overall health.
 - Very difficult to control for every variable to even conduct a study about fluoridation, confounding factors make it difficult to track or even collect data.
- Medicare and other government healthcare doesn't have the resources to collect and process patient treatment data and the private sector insurance companies do not collect data reliably and completely for all patients. Juneau study on fluoride only looked at Medicaid data because that's all that was available.
- No recommendation made by the committee to the board at this time.

2. PFAS Update and Discussion

- EPA PFOA and PFOS regulations are forthcoming but we don't know what the levels will be, or which compounds will be regulated. EPA proposed 29 PFAS compounds to be included in future monitoring. WI DHS recommends health-based groundwater standards for additional 16 PFAS compounds.
- WI DNR adopted WI DHS recommendation to consider Cumulative Impacts of PFAS on Human Health – **Hazard Index** – meant to incorporate total PFAS exposure per-compound per-person.
- US EPA releases final toxicity health assessment for PFBS; revises chronic reference dose downward by factor of 30.

- **Well 15 – Removed from service March 2019**
- Elevated levels of PFAS compounds ~55 ng/L. Combined PFOA+PFOS = 12 ng/L. Hazard index 1.13. Levels not above WI safe drinking water levels but are above some New England state's drinking water standards. If this was a private well the DNR would recommend bottled water for well owners. PCE and TCE present at well 15. Feasibility study of Well 15 conducted: Objectives reduce TCE, PCE, PFAS, 1000gal/minute, remove air scrubbing for TCE/PCE.
- Well 15 treatment feasibility study
 - Used Wisconsin State Lab of Hygiene to test for 3 dozen PFAS compounds. Total PFAS levels per well are under 20ppm and most under 10ppm. Dept of Health Services and most other bodies agree that these low concentrations are unlikely to affect human health.
 - Shorter chain PFAS molecules have shorter half-lives and more volatile but their health effects seem to require higher concentrations to be dangerous.
 - Rapid Small Scale Column Testing (RSSCT) on two Granular Activated Carbon (GAC) media. Used computer modeling to assess predictive performance of Ion Exchange (IX). Removal of TCE & PCE to below detectable levels for duration of RSSCT
 - **Results:** GAC's removed all PFAS to below detectable levels. Shorter chain carboxylic acid PFAS, PFBA, & PFPeA consumed filter media fastest. 90% reduction achieved for 30,000 bed volumes (218-225 days of pumping; 315 Million Gallons).
 - Alternate treatment objectives can decrease replacement frequency: **20 ng/L total PFAS:** 70,000 to 85,000 bed volumes treated (735 – 892 MG). **PFOA + PFOS < 2ng/L:** 90,000 to 99,000 bed volumes.
 - Ion Exchange resin estimated to treat 42,000 bed volumes (93 days; 133 MG)
 - Advantage: smaller vessels, shorter contact time (3 vs 10 minutes for GAC)
 - Disadvantage: Does not remove PCE or TCE (uncharged molecules)
 - Similar to GAC, performance limited by shorter chain PFAS
 - Would require continued use of air stripper for PCE/TCE or addition of GAC polishing vessel to help with filtering.
- Cost Comparison: GAC-1, GAC-2, IX. Highest costs are media replacement every 225 days/7.5 months and initial building construction of \$825,000 for the cheapest treatment method.

- Filtration to current EPA standards can extend the life of the filtration media to 20 months/618 days of 720 days 24 months. Still significant O&M of \$50,000 year at minimum on top of current electricity and maintenance and service of wells.
- Next steps: Apply asset management principles to evaluate different alternatives and determine whether treatment at Well 15 is the best and most cost effective option for meeting water supply needs on Madison's East Side.
- Study tried to reduce costs by reducing capacity of Well 15, and trying to re-use existing building infrastructure whenever possible (air stripper building not tall enough). Mix of PFAS and other contaminants like VOCs determine what filtration methods, IX will remove PFAS but not VOCs. Some utilities use a hybrid version with carbon filters initially followed by IX.

Well 15 water does not currently exceed EPA water standards, but when testing the pumps at the well and doing extensive samplings to send out to external labs, the sewer dept didn't want the overage water dumped into sanitary sewer citing PFAS contamination concerns.

3. Introduction of Future Agenda Items

- Study recommended to see if sanitary sewer is a source of PFAS contaminants. Neighbor of committee member claims to be in Air Natl Guard and working on microorganism treatment of PFAS contaminants.

ADJOURNMENT

Meeting adjourned 6:43pm