Madison Utilities Fluoridation Public Hearing

May 13, 2025

5:30 PM

Madison Utilities Housekeeping

May 13, 2025

5:30 PM

MU Board Members

Terris Tatum - Chairman

Kerry Straub – Vice Chairman

Larry Miles - Director

Al Sullivan - Director

Connie Spears - Director

Board Attorney- Woody Sanderson

May 13, 2025

5:30 PM

MU Management Team

Emory DeBord - General Manager

Gary Sparks - Finance Manager

David Moore - Water Manager

Mark Bland - Wastewater Manager

Misty Leftwich - Customer Service Manager

Jodie Parker - Executive Secretary

Drew Greene - Assistant Finance Manager

Reece Lee – Engineering Services Supervisor

May 13, 2025

5:30 PM

Madison Utilities Mission Statement

Our Mission is to protect the public health and environment by providing abundant, affordable and high quality drinking water; and providing environmentally sound and affordable wastewater treatment and disposal; and providing efficient reliable and courteous service.

May 13, 2025

5:30 PM

United States Water Fluoridation Timeline

1945: Grand Rapids Michigan -first city to fluoridate its drinking water

1958: Madison Water Works Board incorporated (now “Madison Utilities”)

1959: Huntsville authorizes expenditure of funds fluoridation equipment

1960’s: U.S. Public Health Service launches National Fluoridation Program - Controversy over fluoridation began to emerge.

1962: U.S. specified the optimal level of fluoride to range from 0.7 to 1.2 mg/L, (varies based on climate)

May 13, 2025

5:30 PM

Water Fluoridation Timeline Cont.

1980's: Sodium fluoride (NaF) formulations in dentifrices replaced stannous fluoride (SnF2) due to improved effectiveness and stability

1985: 55% of the US population have access to fluoridated water

1990: Madison Water Board authorizes adding fluoride to its water.

1991: Madison Water Board implements addition of fluoride at approximately 1.0 mg/L.

2014: Following public hearing and fluoridation debate MU lowers fluoride dosing rate to 0.7 mg/L

2015: The US government lowers recommended optimal level of fluoride in drinking water to 0.7 mg/L.

2018: MU adopts plan to scale back and eventually retire its Keene WTP as part of long-term water production and distribution system strategy.

Water Fluoridation Timeline Cont.

2020: MU's proposed long-term strategy is changed. Keene WTP to be reconditioned Upgrades were undertaken to bring KWTP to full operational condition knowing that additional significant renovations would be required in the future.

2024:

MU engaged engineers to support the Keene WTP Project.

Significant fluoride-related damage discovered in existing structures and chemical feed equipment.

Project design revised to relocate fluoride storage/dosing systems into a new facility.

Preliminary estimates for new fluoride facility approximately $450,000.

Board was subsequently informed of the escalating costs associated with project and hazardous nature of fluoride chemical to both employees and infrastructure.

2025: **March 17**. MU votes to remove fluoride effective June 16, 2025. Contract for Keene WTP awarded without including fluoride facility

2025: May 5. Board meeting. 71 in attendance. 17 registered speakers and 16 with 3 minutes

Water Fluoridation Timeline Cont.

2025: May 5. Louisiana Senate bill to remove Fluoridation from public water passes and moves to Louisiana House of Representatives.

2025: May 6. Florida governor signed bill banning fluoride Effective July 1, 2025.

2025: May 7. Utah's ban on fluoride went into effect. EPA Administrator and HHS Secretary celebrate announcement at Utah Press Conference and pledge a review of use of fluoride at national level.

2025: May 13. Madison conducts public hearing on fluoridation issue.

Questions From Board Members and Staff Responses

Board Questions and Responses

Question: Have detrimental effects of fluoride on property and employees changed since vote?
Response: No

Question: If we decide to continue fluoridation, what is appropriate course of action if/when EPA/HHS recommends removal of fluoride from water?
Response: Under current Ala. regulations, MU would have to again give 90-day notification. EPA or the ADEM could impose other mandates regarding the timeframe for banning or reducing fluoride, subject to legal requirements of notification statute.

Question: If we remove fluoride from the system, are there any REASONABLE ways for our residents that want fluoride to put it in their health/dental regiment?

Response: Reasonable whole home fluoridation systems are not available on the open market. Proper dental care would be the recommended means of fluoride administration: Fluoride toothpaste, mouth wash, fluoride drops, etc. (added to bottled water or topically applied. Could be subject to prescription by a health care professional).

May 13, 2025

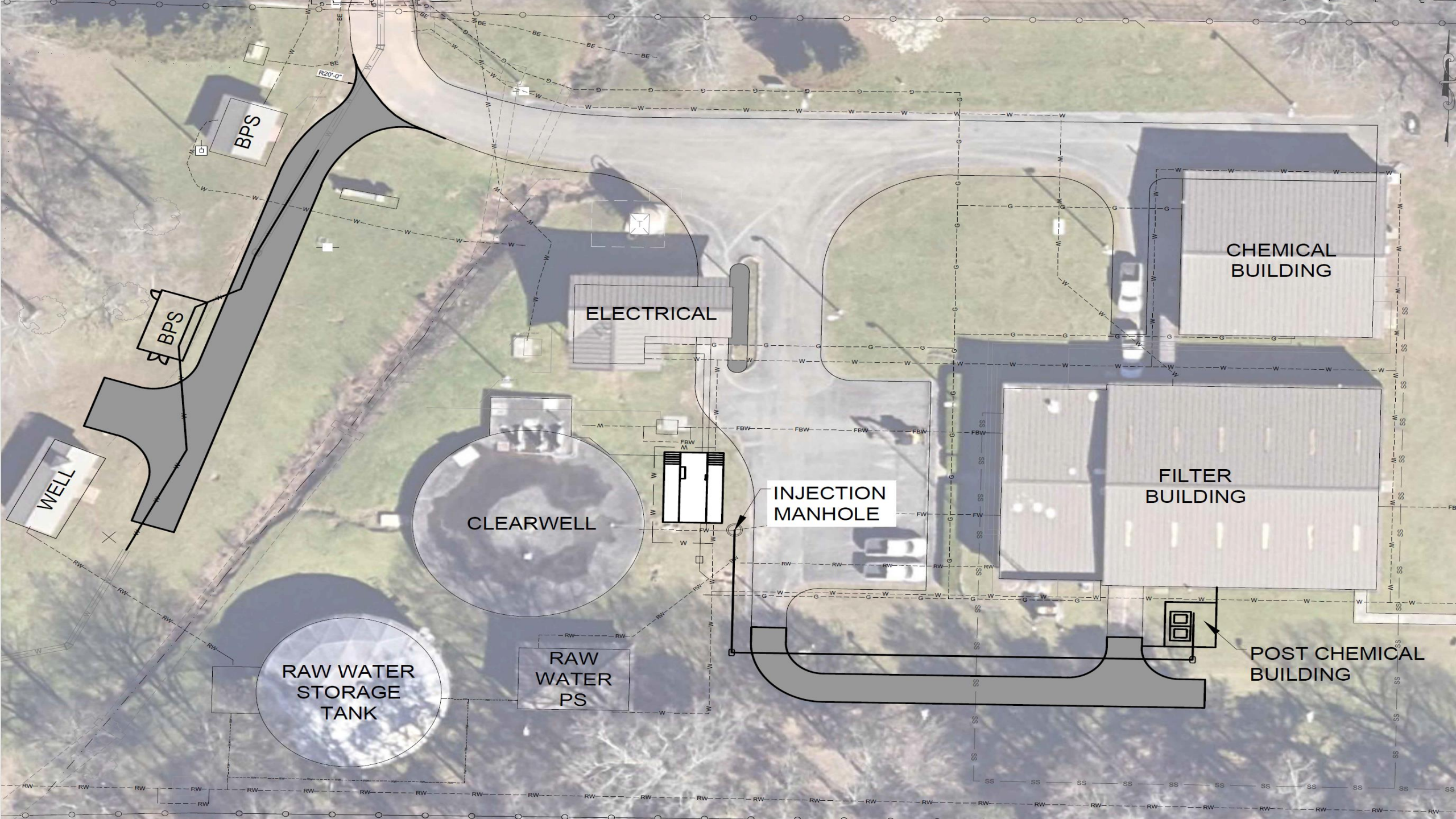
5:30 PM

Board Q/R Cont.

Question: If we leave fluoride in the system, are there any REASONABLE ways for our residents that don't want fluoride to remove it from their water?

Response: The most popular way to remove fluoride from a home water supply is a whole home reverse osmosis (RO) water purification system.

MU Staff Comments


BPS
BPS
WELL
ELECTRICAL
CHEMICAL BUILDING
FILTER BUILDING
CLEARWELL
INJECTION MANHOLE
POST CHEMICAL BUILDING
RAW WATER STORAGE TANK
RAW WATER PS

MU Staff Comments

MU Comment: Madison Utilities does NOT receive taxpayer funds. Operating revenues are generated through commodity (water and wastewater) sales revenues, availability fees, and other fees/income.

MU Comment: Alabama Code Section 22-23-21
Notification of Permanent Change in Fluoridation Status.
90 day notice to State Health Officer required before changing fluoride level from CDC Optimal levels.
Notification requirement does not apply if caused by equipment failure, maintenance, or replacement; temporary chemical supply shortages; placing water sources offline; or other similar unavoidable circumstances.

MU Staff Comments Cont.

MU Comment: As professional water treatment providers, MU staff are not qualified to provide comments on questions interpreted as medical advice. Our role is to ensure that source water is treated to meet all applicable safety and regulatory standards. Fluoride is not mandated for delivery of treated water.

MU Comment: The U.S. government, including the CDC and EPA, have not asserted legal authority to require fluoridation by states or communities.

MU Comment: Only 12 states require fluoride in larger communities.

MU Comment: Most bottled water does NOT contain fluoride.

MU Staff Comments Cont.

MU Comment: Although not designed for fluoride removal, standard refrigerator filters remove some fluoride. Internal testing conducted by MU resulted in removal of 22% of the fluoride.

MU Comment: Limestone County Water and Sewer Authority does NOT fluoridate their water. LCWSA purchases some of their water from Decatur Utilities. Decatur Utilities does fluoridate their water. MU does not have values of fluoride levels for sewer-only customers in Limestone County.

MU Comment: Only basic information about MU's systems and operations can be discussed due to Homeland Security Restrictions.

MU Staff Comments Cont.

<u>Natural</u> MU Source Water Fluoride Levels

Fluoride occurs naturally in raw source water in varying degrees:

River- 0.07mg/L to 0.10mg/L

Drake Well- 0.13 mg/L

New Gillespie- 0.03mg/L

McCrary- 0.11mg/L

Fiorentino- 0.22mg/L

Nickelson- 0.02mg/L

Williams- 0.08mg/L

Rock Quarry- 0.88mg/L to 1.09mg/L

Public Questions and Staff Responses

Public Questions and Staff Responses

Public Question: How long before the lack of fluoridation effects are seen in the public?

Response: MU staff cannot provide an answer to this question as it is a medical question beyond the scope of expertise of Madison Utilities' staff.

Public Question: Will the lack of fluoridation affect property values?

Response: There are no known studies which correlate fluoridation of water and property values. Property values may be impacted by many factors.

Public Question: Why are the financial audits not posted on the MU website

Response: Annual Audited Financial Statements are available on the ABOUT US page at https://madisonutilities.org/.

May 13, 2025

5:30 PM

Public Questions and Staff Responses Cont.

Public Question: Can MU post its 2024 water report to its website?
Response: Madison Utilities' 2024 CCR is available on the website.

Public Question: Role of the Mayor and City Council in MU oversite?
Response: The City Council appoints Board members and reviews/approves disposal of tangible assets.

Public Question: Is MU responsible for its decisions impacting Madison public health?
Response: The Board is responsible for making decisions affecting the management and operation of water and wastewater treatment systems; subject to applicable government regulations.

Public Questions and Staff Responses Cont.

Public Comment: Provide an ADPH or county health officer to speak on safety and concerns of water fluoridation.

Response: MU has provided an opportunity for the public to express its views on the fluoridation issue. Any ADPH or County health officer who wishes to attend and speak is welcome to do so. State Health Officer has been advised of the proposed discontinuation of fluoridation and has stated no comment or objection.

Public Comment: Cost estimates for capital and annual fluoride operating costs? (MU financial report indicates $16M available in unrestricted cash.)

Response: Multiple factors were considered in reaching the recommendation to discontinue fluoridation, including costs. Funding for necessary capital improvements could potentially be made available. However, anticipated evolution of guidance from the EPA and CDC regarding fluoridation create uncertainty and make it difficult to justify committing substantial capital resources to support the continued addition of fluoride.

Public Questions and Staff Responses Cont.

Public Question: What are the workers' safety issues in handling and exposure to fluoride.

Response: This will be addressed in more detail in the presentation.

Public Comment: Need for a customer survey.

Response: Customer surveys can assist in gauging public support or opposition to fluoridation. However, they could not shed light on the financial wisdom of making capital upgrades to facilitate fluoride in the face of a possible ban on fluoride from the EPA in the foreseeable future. MU's obligation to provide good stewardship of ratepayer funds, impacts its analysis of this issue given the projected cost of upgrades as weighed against the risk that those funds would be wasted in the event of a fluoride ban. MU is aware of public comment received and will give consideration to those comments.

Public Questions and Staff Responses Cont.

Public Comment: A “Go forward” plan. May 13 meeting should not result in a final decision. MU should develop a short-term (90 day?) plan to document its decisions and answer questions raised in the past two weeks.

Response: MU Board will consider all comments and information from public hearing to inform any possible reconsideration of its announced decision to discontinue fluoride treatment. If Board were to decide to reverse its decision, fluoride treatment of water processed at the Keene WTP would not be available until late 2026.

Public Comment: The corrosion which we were told was caused by HFA: how does MU know that HFA is to blame for the corrosion issues? Corrosion due to HFA is caused by evaporation of hydrogen fluoride but that would not happen if the HFA is stored and ventilated properly. Again, thousands of water plants across the country safely store HFA with no corrosion issues. Why is this an issue for Madison Utilities?
Response: Photos and Discussion to follow.

Keene WTP Pictures

May 13, 2025

5:30 PM

Quarry WTP Pictures

May 13, 2025

5:30 PM

Public Questions and Staff Responses Cont.

Public Comment: We have learned that Madison Utilities operates under a $12.5 million surplus. Why then is spending $500,000 on upgrades out of the question?
Response: The issue is not as much whether $500,000 could be made available as whether it is a wise expenditure given (a) the risk to employees in handling a chemical not required in the water supply, and (b) whether spending $500,000 is prudent given the trends relating to fluoride use and regulations as evidenced by statements from the current administration at EPA and HHS.

Public Comment: Does Madison Utilities receive subsidies from City Council?
Response: No

Public Question: Is Madison Utilities required to submit a yearly budget to the City Council?
Response: No

Public Comment: I am concerned that Madison has not been consistently adding the suggested fluoride levels to the City Water.
Response: MU has been adding fluoride to its water. Question addressed in discussion of MOR data to follow.

MOR Data
Monthly Operating Report

May 13, 2025

5:30 PM

MONTHLY PLANT OPERATION DATA REPORT TO ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

Month: January | System Name: Water & Wastewater Board of the City of Madison | Plant Name: Quarry

Year: 2024 | PWS-ID: 0 0 0 0 8 8 5

CHEMICAL FEED RATES

Day	Coagulant		Polymer		Lime, Caustic or Soda Ash (Please Indicate Which One)				Chlorine						Carbon or KMNO4 (Please Indicate Which One)		Fluoride			Corrosion Inhibiter	
					RAW	RAW	TREATED	TREATED	RAW	RAW	SET	SET	TREATED	TREATED							
	LBS/DAY	PPM	LBS/DAY	PPM	LBS/DAY	PPM	LBS/DAY	PPM	LBS/DAY	PPM	LBS/DAY	PPM	LBS/DAY	PPM	LBS/DAY	PPM	LBS/DAY	PPM	Test	LBS/DAY	PPM
1	1130	18.4									81	1.3	86	1.4			0	0.0	0.0	270	1.29
2	1130	18.3									81	1.3	86	1.4			0	0.0	0.2	270	1.29
3	1130	18.4									95	1.6	99	1.6			0	0.0	0.2	270	1.29
4	1130	18.1									100	1.6	98	1.6			0	0.0	0.2	270	1.27
5	1130	18.5									95	1.6	93	1.5			0	0.0	0.2	270	1.30
6	1130	18.4									83	1.4	93	1.5			0	0.0	0.2	0	0.00
7	1130	18.3									76	1.2	93	1.5			0	0.0	0.3	0	0.00
8	1192	18.8									82	1.3	100	1.6			0	0.0	0.2	0	0.00
9	1388	19.3									110	1.5	110	1.5			0	0.0	0.3	0	0.00
10	1344	18.7									106	1.5	107	1.5			0	0.0	0.5	0	0.00
11	1249	19.9									98	1.6	98	1.6			0	0.0	0.2	0	0.00
12	1230	20.1									88	1.4	88	1.4			0	0.0	0.5	0	0.00
13	1230	20.1									86	1.4	86	1.4			0	0.0	0.2	0	0.00
14	1230	20.0									86	1.4	86	1.4			0	0.0	0.1	0	0.00
15	1111	20.0									78	1.4	78	1.4			0	0.0	0.2	0	0.00
16	1011	19.5									71	1.4	71	1.4			0	0.0	0.2	0	0.00
17	1245	20.2									92	1.5	94	1.5			0	0.0	0.0	0	0.00
18	1387	19.6									92	1.3	95	1.4			0	0.0	0.2	0	0.00
19	1487	19.6									92	1.2	95	1.3			0	0.0	0.0	0	0.00
20	1487	19.7									92	1.2	95	1.3			0	0.0	0.1	0	0.00
21	1487	19.2									92	1.2	95	1.2			0	0.0	0.0	0	0.00
22	off										off						off				
23	1787	22.4									120	1.5	123	1.5			0	0.0	0.3	0	0.00
24	1064	19.9									70	1.3	70	1.3			0	0.0	0.1	0	0.00
25	1403	20.5									95	1.4	105	1.5			0	0.0	0.2	0	0.00
26	801	19.7									119	1.5	129	1.6			0	0.0	0.0	0	0.00
27	1547	20.3									119	1.6	114	1.5			0	0.0	0.3	0	0.00
28	1041	18.6									83	1.5	82	1.5			0	0.0	0.5	0	0.00
29	983	19.5									71	1.4	71	1.4			0	0.0	0.2	0	0.00
30	1289	22.1									71	1.2	75	1.3			0	0.0	0.3	0	0.00
31	892	19.9									57	1.3	60	1.3			0	0.0	0.3	0	0.00
Avg	1226.5	19.5	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	89.4	1.4	93	1.4	#DIV/0!	#DIV/0!	0	0.0	0.2	45.0	0.2
Max	1787	22.4	0.0	0.00	0.0	0.0	0.0	0.0	0	0.0	120.0	1.6	129	1.6	0.0	0.0	0	0.0	0.5	270.0	1.3
Min	801	18.1	0.0	0.00	0.0	0.0	0.0	0.0	0	0.0	57.0	1.2	60	1.2	0.0	0.0	0	0.0	0.0	0.0	0.0

MONTHLY PLANT OPERATION DATA REPORT TO ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

Month: May | System Name: Water & Wastewater Board of the City of Madison | Plant Name: Quarry

Year: 2024 | PWS-ID: 0 0 0 0 8 8 5

CHEMICAL FEED RATES

Day	Coagulant		Polymer		Lime, Caustic or Soda Ash (Please Indicate Which One)				Chlorine						Carbon or KMNO4 (Please Indicate Which One)		Fluoride			Corrosion Inhibiter	
					RAW	RAW	TREATED	TREATED	RAW	RAW	SET	SET	TREATED	TREATED							
	LBS/DAY	PPM	LBS/DAY	PPM	LBS/DAY	PPM	LBS/DAY	PPM	LBS/DAY	PPM	LBS/DAY	PPM	LBS/DAY	PPM	LBS/DAY	PPM	LBS/DAY	PPM	Test	LBS/DAY	PPM
1	1044	20.8									79	1.6	79	1.6			0	0.0	0.0	201	1.17
2	1213	21.4									92	1.6	92	1.6			0	0.0	0.2	272	1.41
3	1150	21.5									86	1.6	86	1.6			0	0.0	0.1	243	1.33
4	1016	20.6									88	1.8	88	1.8			0	0.0	0.2	202	1.21
5	972	19.7									97	2.0	91	1.9			0	0.0	0.2	189	1.12
6	962	19.2									100	2.0	91	1.8			0	0.0	0.1	189	1.11
7	851	18.6									90	2.0	91	2.0			0	0.0	0.1	189	1.21
8	868	18.5									90	1.9	91	1.9			23	0.5	0.0	189	1.18
9	932	18.6									99	2.0	91	1.8			43	0.9	0.6	189	1.11
10	925	18.2									102	2.0	91	1.8			43	0.8	0.6	189	1.09
11	1006	19.9									111	2.2	92	1.8			43	0.8	0.8	189	1.10
12	1190	20.3									111	1.9	100	1.7			46	0.8	0.9	232	1.17
13	1467	20.4									124	1.7	124	1.7			57	0.8	0.6	297	1.21
14	1054	21.0									89	1.8	86	1.7			43	0.9	0.5	204	1.20
15	1201	20.7									114	2.0	105	1.8			57	1.0	0.9	297	1.50
16	1285	20.6									124	2.0	115	1.8			54	0.9	0.8	284	1.34
17	1086	20.5									106	2.0	96	1.8			51	1.0	0.5	270	1.50
18	1086	21.5									106	2.1	96	1.9			51	1.0	0.8	270	1.57
19	920	20.1									91	2.0	83	1.8			47	1.0	0.9	270	1.73
20	902	19.4									88	1.9	83	1.8			47	1.0	0.8	270	1.70
21	1263	16.5									134	1.8	133	1.7			51	0.7	0.5	422	1.63
22	842	10.4									128	1.6	135	1.7			61	0.8	0.6	447	1.63
23	667	8.4									121	1.5	131	1.7			62	0.8	0.6	432	1.60
24	549	6.9									121	1.5	131	1.7			62	0.8	0.5	432	1.60
25	587	8.2									121	1.7	131	1.8			62	0.9	0.5	391	1.61
26	539	8.9									109	1.8	112	1.8			62	1.0	1.0	313	1.51
27	585	10.3									108	1.9	103	1.8			50	0.9	0.6	228	1.18
28	1037	14.2									150	2.1	141	1.9			72	1.0	0.7	362	1.46
29	1016	13.1									158	2.0	150	1.9			71	0.9	0.8	320	1.21
30	1658	20.8									169	2.1	162	2.0			80	1.0	0.7	351	1.30
31	1394	20.3									143	2.1	138	2.0			68	1.0	0.7	339	1.45
Avg	1008.6	17.4	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	111.3	1.9	108	1.8	#DIV/0!	#DIV/0!	42	0.7	0.5	279.7	1.4
Max	1658	21.5	0.0	0.00	0.0	0.0	0.0	0.0	0	0.0	169.0	2.2	162	2.0	0.0	0.0	80	1.0	1.0	447.0	1.7
Min	539	6.9	0.0	0.00	0.0	0.0	0.0	0.0	0	0.0	79.0	1.5	79	1.6	0.0	0.0	0	0.0	0.0	189.0	1.1

MONTHLY PLANT OPERATION DATA REPORT TO ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

Month: July | System Name: Water & Wastewater Board of the City of Madison | Plant Name: Quarry

Year: 2022 | PWS-ID: 0 0 0 0 8 8 5

CHEMICAL FEED RATES

Day	ALUM		Polymer		Lime, Caustic or Soda Ash (Please Indicate Which One)				Chlorine						Carbon or KMNO4 (Please Indicate Which One)		Fluoride			Corrosion Inhibiter	
					RAW	RAW	TREATED	TREATED	RAW	RAW	SET	SET	TREATED	TREATED							
	LBS/DAY	PPM	LBS/DAY	PPM	LBS/DAY	PPM	LBS/DAY	PPM	LBS/DAY	PPM	LBS/DAY	PPM	LBS/DAY	PPM	LBS/DAY	PPM	LBS/DAY	PPM	Test	LBS/DAY	PPM
1	2223	22.1									181	1.8	200	2.0			77	0.8	0.8	340	0.99
2	2223	22.2									181	1.8	200	2.0			77	0.8	0.9	340	1.00
3	2223	22.0									181	1.8	200	2.0			77	0.8	0.7	340	0.99
4	1836	21.7									181	2.1	182	2.1			66	0.8	0.7	286	0.99
5	1412	21.5									154	2.3	157	2.4			49	0.7	0.7	210	0.94
6	1475	20.8									167	2.4	173	2.5			56	0.8	0.7	241	1.00
7	1731	21.9									126	1.6	143	1.8			60	0.8	0.8	276	1.03
8	1974	21.7									121	1.3	169	1.9			69	0.8	0.7	322	1.04
9	2041	20.9									131	1.3	193	2.0			73	0.7	0.7	340	1.03
10	2041	20.7									131	1.3	173	1.8			73	0.7	0.9	340	1.02
11	2041	21.0									133	1.4	167	1.7			73	0.7	0.7	340	1.03
12	2041	21.1									133	1.4	162	1.7			73	0.8	0.9	340	1.04
13	1987	21.7									132	1.4	148	1.6			71	0.8	0.7	326	1.05
14	1684	21.8									130	1.7	124	1.6			64	0.8	1.0	272	1.04
15	1682	20.9									131	1.6	131	1.6			64	0.8	0.7	272	1.00
16	2011	21.1									133	1.4	162	1.7			71	0.8	0.6	329	1.01
17	2062	21.1									140	1.4	167	1.7			73	0.7	0.7	340	1.02
18	1908	21.0									136	1.5	155	1.7			67	0.7	0.7	306	0.99
19	1492	20.2									119	1.6	133	1.8			56	0.8	0.7	246	0.98
20	1317	20.8									114	1.8	120	1.9			48	0.8	0.7	219	1.01
21	1415	20.3									114	1.6	117	1.7			53	0.8	0.6	236	1.00
22	1556	20.4									123	1.6	127	1.7			57	0.8	0.6	266	1.03
23	1657	20.8									131	1.7	138	1.7			58	0.7	0.6	287	1.06
24	1741	21.2									131	1.6	138	1.7			58	0.7	0.7	287	1.03
25	1741	20.3									131	1.5	138	1.6			58	0.7	0.8	287	0.98
26	1388	19.3									98	1.4	102	1.4			49	0.7	0.8	217	0.89
27	1627	18.8									115	1.3	117	1.4			51	0.6	0.6	253	0.86
28	1928	20.4									133	1.4	138	1.5			68	0.7	0.8	335	1.04
29	1627	19.9									106	1.3	127	1.6			51	0.6	0.6	253	0.91
30	1597	22.8									98	1.4	124	1.8			56	0.8	0.7	257	1.08
31	1233	21.3									73	1.3	116	2.0			48	0.8	0.7	204	1.03
Avg	1771.4	21.0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	132.5	1.6	150	1.8	#DIV/0!	#DIV/0!	63	0.7	0.7	287.3	1.0
Max	2223	22.8	0.0	0.00	0.0	0.0	0.0	0.0	0	0.0	181.0	2.4	200	2.5	0.0	0.0	77	0.8	1.0	340.0	1.1
Min	1233	18.8	0.0	0.00	0.0	0.0	0.0	0.0	0	0.0	73.0	1.3	102	1.4	0.0	0.0	48	0.6	0.6	204.0	0.9

BUREAU OF CLINICAL LABORATORIES - FLUORIDE RESULTS OF DRINKING WATER

Please print clearly and check all copies for legibility.

COLLECTOR'S NAME			SYSTEM NAME	SYSTEM'S COUNTY LOCATION
Shaun Chandler			Madison Utilities	Madison
DATE COLLECTED			SAMPLE COLLECTION POINT	SYSTEM'S SPLIT SAMPLE RESULTS
MONTH	DAY	YEAR		
08	12	2024	Entry Point to distribution System	.71

For Lab Use Only:

DATE ANALYZED			LAB NUMBER	RESULTS - PPM	UNSATISFACTORY CODE
MONTH	DAY	YEAR			
8	30	24	[illegible]	0.83	

SEND REPORT TO: (PRINT LEGIBLY)

Chris Rose
101 Ray Sanderson Dr.
Madison AL 35758

ANALYZED BY

INITIALS

10070
LAB ID NO.

ADPH-F-BCL-25.01.17.ch

Public Questions and Staff Responses Cont.

Public Question: If you decide to eliminate fluoride from the water, will you offer fluoride tablets at no charge to residents that request it?

Response: No. That is not an appropriate expenditure of a public water system. MU does not have an obligation to provide medication to its customers.

Public Question: Will residents see a reduction in their water bills if you eliminate this public health service?

Response: No. It may help with keeping future rate increases lower.

Public Question: Tell me what metrics will be used to track if the change is a success. For example, will Madison Utilities be getting information from local dentists to identify changes to dental health of our community? Similar for whatever health problem(s) this is aiming to solve.

Response: No. That is not the appropriate role of a public water system.

Public Questions and Staff Responses Cont.

Public Question: Have you shared the most recent records with the public?

Response: Yes

Public Question: What are your safety operating procedures for workers with the use of fluoride in the water system?

Response: Workers must wear the appropriate PPE when handling all chemicals.

Public Question: Are there any other annual costs to operate the fluoridation system, e.g., safety equipment for the workers in the water treatment facility?

Response: Average annual chemical cost is $14,000. Other charges include training, certification, safety equipment, electricity for pumps, additional testing and supplies, infrastructure maintenance and replacement, lab costs, etc.

Public Questions and Staff Responses Cont.

Public Question: If fluoride repairs are made at Keene, how long do you estimate the repairs to last, ~5 years, ~10 years, more than 10 years?

Response: MU would hope to get between 5 and 10 years of life out of the equipment.

Public Question: What have you done to ensure the fluoride feed system is interlocked with the water pumps to prevent overfeeding and that the metering pump is installed correctly?

Response: Fluoride is pumped from totes to the day tank by weight according to current feed rates. Daily drawn down calibrations are performed to verify feed rate after lab test.

Fluoride and Safety

Fluoride

Fluorosilicic acid (H_2SiF_6) is the most commonly used additive for water fluoridation in the United States. It is an inexpensive liquid by-product of phosphate fertilizer manufacture. It comes in varying strengths, typically 23–25%; because it contains so much water, shipping can be expensive. It is also known as hexafluorosilicic, hexafluosilicic, hydrofluosilicic, and silicofluoric acid.

May 13, 2025

5:30 PM

Fluoride Cont.

Hydrofluosilicic acid may contain other constituents
Some suppliers have labels on HFS that states:
The finished drinking water shall be monitored to ensure that levels of manganese do not exceed 0.05 mg/l
The finished drinking water shall be monitored to ensure that levels of copper do not exceed 1.3 mg/l
Only products bearing the NSF mark on the product, packing, and/or documentation shipped with the product are Certified.
This product is designed to be used off-line and flushed out prior to using the system for drinking water, following manufacturer's use instructions. The pH of the influent and effluent water should be monitored to ensure that all traces of the product have been removed before placing into service. (Univar Solutions Canada)
Only products bearing the NSF 60 designation are certified by NSF International.
https://info.nsf.org/Certified/PwsChemicals/Listings.asp?ChemicalName=Fluorosilicic+Acid&

Fluoride Safety

Employee Dangers of Hydrofluorisilicic acid exposure from gassing off

A **1-Quart leak** of **23% H_2SiF_6** occurs in a **small 8ft x 8ft x10ft room**.
Assuming (~5%) volatilizes as HF

Room Volume

- $8\,\text{ft} \times 8\,\text{ft} \times 10\,\text{ft} = 640\,\text{ft}^3$
- $640\,\text{ft}^3 = 18,119.5\,\text{L}$ (since $1\,\text{ft}^3 = 28.3168\,\text{L}$)

Spill Volume

- 1 quart = 0.946 L

Assume **23% H_2SiF_6 solution** (common commercial concentration):

- $0.946 \times 0.23 = 0.2176\,\text{L}$ of pure H_2SiF_6

May 13, 2025

5:30 PM

Fluoride Safety Cont.

Employee Dangers of Hydrofluorisilicic acid exposure from gassing off

Moles of Hydrofluorisilicic Acid

- Density ≈ 1.3 g/mL → 0.2176 L = 282.9 g
- Molar mass H_2SiF_6 ≈ 144.1 g/mol

$$\text{Moles } H_2SiF_6 = \frac{282.9}{144.1} \approx 1.96 \text{ mol}$$

Each mole of H_2SiF_6 can release **6 moles of HF**:

$$1.96 \times 6 = 11.76 \text{ mol HF (potential)}$$

Estimated Volatized HF:

Assume **only 5%** of HF ends up airborne due to surface decomposition or evaporation:

$$0.05 \times 11.76 = 0.588 \text{ mol HF gas}$$

May 13, 2025

5:30 PM

Fluoride Safety Cont.

Employee Dangers of Hydrofluorisilicic acid exposure from gassing off

Convert Moles of HF to PPM in air:

Use ideal gas behavior at room temperature:

- 1 mol gas ≈ 24.45 L at 25°C and 1 atm
- Total HF gas = $0.588 \times 24.45 \approx 14.37\,\mathrm{L}$

Now, calculate PPM (parts per million by volume):

$$\mathrm{PPM} = \left(\frac{14.37\,\mathrm{L}}{18,119.5\,\mathrm{L}}\right) \times 10^6 \approx \boxed{793\,\mathrm{ppm}}$$

May 13, 2025

5:30 PM

Fluoride Safety Cont.

Employee Dangers of Hydrofluorisilicic acid exposure from gassing off

Estimated airborne HF concentration from a **1-quart spill** of 23% hydrofluorosilicic acid in an 8ft x 8ft x 10ft room.
793 ppm of HF gas

Estimated airborne HF concentration from a 1-cup spill of 23% hydrofluorosilicic acid in an 8ft X 8ft x 10 ft
199 ppm of HF gas

OSHA PEL for HF is **3 ppm** (ceiling), and **NIOSH IDLH** is **30 ppm**.
Current room does not have ventilation
Employee Exposure / ventilation to spill not on-going leak
Using **first-order decay equation** for airborne contaminants

May 13, 2025

5:30 PM

Fluoride Safety Cont.

Employee Dangers of Hydrofluorisilicic acid exposure from gassing off

$$C(t) = C_0 \cdot e^{-kt}$$

Where:

- C_0 = initial concentration (ppm)
- $C(t)$ = concentration after time t
- $k = \frac{\text{ACH}}{60}$, where ACH = air changes per hour

1 ACH – 166 ppm concentration after 10 minutes

6 ACH – 73 ppm concentration after 10 minutes

12 ACH – 27 ppm concentration after 10 minutes

OSHA PEL for HF is **3 ppm** (ceiling), and **NIOSH IDLH** is **30 ppm**.

May 13, 2025

5:30 PM

Fluoride Safety Cont.

Fluoridation Institute
Offers no training or literature on safe handling of chemicals
https://americanfluoridationinstitute.org/giving/shop/

Hydrogen Fluoride Industry Practices Institute
Offers no training or guideline for Hydrofluorsilicic acid only Hydrofluoric acid/gas
https://www.americanchemistry.com/industry-groups/hydrogen-fluoride-industry-practices-institute-hfipi/hydrogen-fluoride-guidelines

Chlorine Institute
Offers training, and 13 pages of materials for operator education of aspects of safe handling. Including First Aid, Medical Mgmnt/Medical Evaluation, Occupational Hygiene Monitoring, and Sodium Hypochlorite release fact sheets.
https://www.chlorineinstitute.org/products/https://www.chlorineinstitute.org/products/fact-2-bleach-release-naocl-fact-sheet-download

May 13, 2025

5:30 PM

CLOSING COMMENTS

Board staff considered factors relating to employee safety and good stewardship of the Board's funds in making its presentation to the Board regarding Keene Plant Improvements.

These factors supported not investing in fluoride facilities at the Keene WTP facility.

Similar structural damage and employee risks at the Quarry facility also support the recommendation not to continue feeding fluoride.

Pros and cons of fluoridation from the perspective of public health are fairly debatable and beyond the expertise of staff.

Given that the benefits/risks of fluoridation are controversial and fluoride may be further limited or banned by EPA or the CDC, investment in fluoridation infrastructure is not deemed responsible at this time.

10 Minute Break

Public Comment Period