

Crowdsource Meeting

September 3, 2024

Dwayne Roadcap, Director, Office of Drinking Water



Background Information

Wilderness Water Treatment Plant (Event 8/21/24 – 8/27/24)



- Typical Surface Water Treatment System (Rapidan River)
- Serves total population of about 13,000 (Typical Demand = 1.2 MGD)
- Typically operates 14 – 18 hours per day
- Multiple subdivisions, few restaurants, commercial, industrial
 - Pre-filter (Alum, Sodium Permanganate)
 - Post-filtration (Soda Ash, Chlorine, Fluoride)
 - Filter Turbidity = 0.06 – 0.08 NTU
 - Filter hours 9.5 to 30.5 hours (head loss before 4.1 to 7.2)

Typical Monthly Operation Report

REVIEWED

By amhipski at 3:54 pm, Feb 07, 2024

Chemical Dosages
WATER TREATMENT PLANT MONTHLY REPORT
WILDERNESS WTP

VDH Received 2- 10 -23

January 2023

PWSID # 6137999

No. Connections Served:
Population Served:

5135
12529

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# of Days	Finished Water Produced MGD	Hours in Service	Pre-Filter Chemicals						Post-Filter Chemicals					
			PACl			NaMnO ₄			Soda Ash		Chlorine		Fluoride	
DATE			Lbs Used	Inches	mg/L	mL/min	Gallons	mg/L	Lbs used	mg/L	Lbs used	mg/l	lbs per Day	mg/L
1	1.148	16.5	87	1.0	9.1	0.0	0.00	0.00	110	11.5	17	1.8	21.3	2.2
2	1.313	23.0	173	2.0	15.8	0.0	0.00	0.00	180	16.4	30	2.7	22.8	2.1
3	1.128	18.0	152	1.8	16.1	0.0	0.00	0.00	160	17.0	18	1.9	22.8	2.4
4	1.161	18.0	152	1.8	15.7	0.0	0.00	0.00	130	13.4	21	2.2	22.6	2.3
5	1.105	16.0	108	1.3	11.8	0.0	0.00	0.00	100	10.9	21	2.3	18.8	2.0
6	1.063	15.0	87	1.0	9.8	0.0	0.00	0.00	110	12.4	20	2.3	16.5	1.9
7	0.997	14.0	87	1.0	10.4	0.0	0.00	0.00	100	12.0	10	1.2	15.3	1.8
8	1.109	17.5	87	1.0	9.4	0.0	0.00	0.00	130	14.1	19	2.1	12.0	1.3
9	1.137	17.0	87	1.0	9.1	0.0	0.00	0.00	120	12.7	21	2.2	17.0	1.8
10	1.119	16.5	108	1.3	11.6	0.0	0.00	0.00	110	11.8	11	1.2	21.8	2.3
11	0.804	12.0	87	1.0	12.9	0.0	0.00	0.00	80	11.9	19	2.8	13.5	2.0
12	1.144	18.0	108	1.3	11.4	0.0	0.00	0.00	120	12.6	12	1.3	17.3	1.8
13	1.006	13.0	43	0.5	5.2	0.0	0.00	0.00	80	9.5	15	1.8	13.5	1.6
14	1.102	16.0	87	1.0	9.4	0.0	0.00	0.00	110	12.0	13	1.4	5.4	0.6
15	1.079	17.0	87	1.0	9.6	0.0	0.00	0.00	110	12.2	19	2.1	14.5	1.6
16	1.104	17.0	173	2.0	18.8	0.0	0.00	0.00	100	10.9	20	2.2	18.4	2.0
17	1.065	18.0	108	1.3	12.2	0.0	0.00	0.00	90	10.1	17	1.9	15.3	1.7
18	0.944	14.0	87	1.0	11.0	0.0	0.00	0.00	60	7.6	14	1.8	11.2	1.4
19	1.153	18.0	108	1.3	11.3	0.0	0.00	0.00	110	11.4	18	1.9	11.1	1.2
20	1.048	16.5	87	1.0	9.9	0.0	0.00	0.00	90	10.3	14	1.6	17.6	2.0
21	1.039	14.0	65	0.8	7.5	0.0	0.00	0.00	80	9.2	18	2.1	18.1	2.1
22	1.076	14.5	87	1.0	9.7	0.0	0.00	0.00	60	6.7	17	1.9	15.5	1.7
23	0.924	15.0	87	1.0	11.3	0.0	0.00	0.00	90	11.7	24	3.1	11.5	1.5
24	1.130	18.0	108	1.3	11.5	0.0	0.00	0.00	90	9.5	15	1.8	10.3	1.1
25	1.035	16.0	130	1.5	15.1	0.0	0.00	0.00	90	10.4	16	1.9	15.5	1.8
26	1.103	18.0	304	3.5	33.0	0.0	0.00	0.00	120	13.0	18	2.0	16.9	1.8
27	1.133	18.0	347	4.0	36.7	0.0	0.00	0.00	120	12.7	22	2.3	18.2	1.9
28	1.065	15.0	260	3.0	29.6	0.0	0.00	0.00	110	12.5	18	2.0	15.2	1.7
29	1.113	17.0	217	2.5	23.4	0.0	0.00	0.00	130	14.0	29	3.1	7.8	0.8
30	1.140	18.0	130	1.5	13.7	0.0	0.00	0.00	120	12.6	27	2.8	18.1	1.9
31	1.019	17.0	130	1.5	15.3	0.0	0.00	0.00	80	9.4	14	1.6	17.3	2.0
Total	33.496	511.5	3968	45.8	437.3		0.00		3290		567		493.1	
Maximum	1.313	23.0	347	4.0	36.7	0.0	0.00	0.00	180	17.0	30	3.1	22.8	2.4
Minimum	0.804	12.0	43	0.5	5.2	0.0	0.00	0.00	60	6.7	10	1.2	5.4	0.6
Average	1.081	16.5	128	1.5	14.1	0.0	0.00	0.00	106	11.7	18	2.0	15.9	1.8

SIGNED: (OPERATOR IN RESPONSIBLE CHARGE)

Chaz Fisher

PRINTED NAME

Chaz Fisher

TITLE: OPERATOR CLASSIFICATION
DPOR CERTIFICATION NO.

Class 2
1955008019

RAW WATER SOURCE(S) USED DURING MONTH: (SOURCE/DATES)

RAPIDAN RIVER

Entire Month

Source Water

- pH = 7.0 - 7.5
- Iron = 0.40 - 0.6 mg/l
- Mn = 0.03 - 0.098 mg/l
- Alkalinity = 22 - 25 mg/l
- Hardness = 16 - 20 mg/l
- 5.9 - 53.9 NTU, mostly less than 10 NTU

Finished Water

- Free Chlorine Residual = 1.4 - 2.2 mg/l
- Alkalinity = 32 - 35 mg/l
- Hardness = 18 - 22 mg/l

Source of Odor Being Considered

Described by customers in different ways - “WD-40,” “Gasoline,” “Diesel,” “Mechanics shop”

- Water Treatment Plant (WTP) release
 - Checking for fluid leaks with submersible pumps and equipment
 - Physical, integrity inspections of equipment
 - Reviewing MSDS sheets of fluids at WTP
 - Inspected basins, sampling for possible organic cause of odor
- Upstream release (sewage treatment plant, pipeline, industrial, stormwater overflow, farms)
 - No fish kills observed
 - No sheens, no spills
 - No rain events near time of odor
- Upslope release (construction at intake)
 - Interviewed contractor on scene, inspected intake
- Bad actor

Contaminants Observed To Date

BCEE - Bis(2-chloroethyl) ether- (13.7 ug/L) on 8/21/24 (one sample out of many)

* Colorless, non-flammable liquid used as a solvent

Isovanillin (8 - 10 ug/L) on 8/27/24 (preliminary)

- Human nose can detect in range of 8 - 100 ug/L
- Ingredient in WD-40

TPIB (2,2,4-Trimethyl-1,3-pentenediol diisobutyrate) on 8/27/24 (preliminary)

- May be a false positive

Chloromethane (2.38 ug/l) on 8/22/24 (one sample out of many)

* Moves rapidly to air; Half-life of 2.5 hours

Ongoing Investigation

- Additional field investigation (WTP, riverbank, stream, hillside - visual and olfactory)
 - Collected and saved prior sampling to the extent possible
- Chromatograph, spectrometer, high resolution scan performed to date
- Bacterial strain sampling to identify if organic component to odor
- Additional sampling (at each point from plant entry through distribution system)
- Conversations and help from academics and experts in Taste & Odor
- Outreach to law enforcement

Questions for You -

- What questions do you have?
- What other ideas should we consider?