



US Army Corps  
of Engineers  
Baltimore District



## Washington Aqueduct

## U.S. ARMY Corps of Engineers

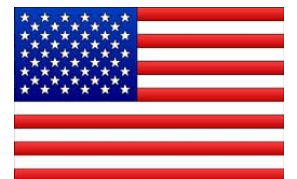
# Annual Report of Water Analysis 2019

Prepared by:

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April 27, 2020

Approved by the Chief, Washington Aqueduct





# WASHINGTON AQUEDUCT, US ARMY CORPS OF ENGINEERS ANNUAL REPORT OF WATER ANALYSIS (2019)

## Potomac River Raw Water Supply

	Miscellaneous Physical Parameters									Inorganic Ions									Microorganisms				
	pH	ALKALINITY	CONDUCTIVITY	DISSOLVED SOLIDS	SUSPENDED SOLIDS	TOTAL SOLIDS	TEMPERATURE	TOTAL HARDNESS	TOTAL ORGANIC CARBON	TURBIDITY	TOTAL AMMONIA - N	BROMIDE	CHLORIDE	FLUORIDE	NITRATE - N	NITRITE - N	ORTHOPHOSPHATE - PO4	PERCHLORATE	SULFATE	TOTAL COLIFORM	E. COLI	GIARDIA Great Falls Intake	CRYPTOSPORIDIUM Great Falls Intake
	ppm	uS/cm	ppm	ppm	ppm	°F	ppm	ppm	NTU	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppb	ppm	MPN/100mL	MPN/100mL	cysts/L	Oocysts/L	
Jan	7.6	69	253	239	3	242	41	108	2.0	15	ND	ND	29	ND	2.1	ND	ND	1.3	20	2498	148	0.56	ND
Feb	7.5	65	303	196	95	291	42	96	1.9	15	ND	ND	39	ND	2.1	ND	ND	ND	19	1332	124	0.56	0.19
Mar	7.5	65	274	120	32	152	46	101	2.3	18	ND	ND	29	ND	2.0	ND	ND	0.4	19	830	47	ND	ND
Apr	7.7	75	280	167	74	241	58	109	2.8	10	ND	ND	25	ND	1.9	ND	ND	0.4	21	5977	1251	0.19	ND
May	7.6	73	243	164	72	236	66	105	3.7	13	ND	ND	21	ND	1.7	ND	ND	0.3	18	15424	678	0.47	ND
Jun	7.7	94	339	232	9	241	75	132	2.2	8	ND	ND	32	ND	2.0	ND	ND	0.3	28	3660	37	ND	0.10
Jul	7.7	82	301	208	15	223	81	118	3.4	13	ND	ND	29	ND	1.6	ND	ND	0.3	24	39860	586	0.28	ND
Aug	8.0	102	310	257	11	268	85	134	2.4	9	ND	ND	29	0.11	1.4	ND	ND	0.4	30	10769	125	0.09	ND
Sep	8.1	111	415	216	4	220	82	165	2.1	6	ND	ND	31	0.12	1.2	ND	ND	0.3	44	2415	17	0.74	ND
Oct	8.1	109	416	254	1	255	70	160	2.2	5	0.05	ND	34	0.11	1.2	ND	ND	0.3	42	1785	48	ND	ND
Nov	8.0	95	388	209	3	212	53	147	3.4	10	0.05	ND	34	ND	2.0	ND	ND	0.3	30	1732	100	0.19	ND
Dec	8.3	75	320	185	5	190	46	118	3.0	6	ND	ND	38	ND	2.1	ND	ND	0.3	24	7819	343	0.19	0.28

Metals																									
ALUMINUM	ANTIMONY	ARSENIC	BARIUM	BERYLLIUM	CADMIUM	CALCIUM	CHROMIUM	COBALT	COPPER	IRON	LEAD	LITHIUM	MAGNESIUM	MANGANESE	MOLYBDENUM	NICKEL	SELENIUM	SILVER	SODIUM	STRONTIUM	THALLIUM	THORIUM	URANIUM	ZINC	
ppb	ppb	ppb	ppb	ppb	ppb	ppm	ppb	ppb	ppb	ppb	ppb	ppb	ppm	ppb	ppb	ppb	ppb	ppb	ppm	ppb	ppb	ppb	ppb	ppb	
Jan	506	ND	0.3	38	ND	ND	34	ND	0.6	2.4	767	1.2	1.8	6	65	ND	1.7	ND	ND	16	113	ND	ND	ND	6.3
Feb	143	ND	0.4	36	ND	ND	30	ND	ND	1.4	199	0.4	1.6	5	35	ND	1.1	ND	ND	25	121	ND	ND	ND	2.5
Mar	138	ND	0.3	38	ND	ND	30	ND	0.3	1.2	252	0.4	1.8	6	36	ND	1.3	ND	ND	14	121	ND	ND	ND	4.0
Apr	82	ND	ND	39	ND	ND	35	ND	ND	1.2	137	ND	1.8	6	32	ND	0.8	ND	ND	13	144	ND	ND	ND	1.6
May	292	ND	0.3	42	ND	ND	32	ND	0.4	1.6	440	0.6	2.2	6	57	ND	1.2	ND	ND	12	140	ND	ND	0.2	3.1
Jun	192	ND	0.3	44	ND	ND	40	ND	0.3	1.9	275	0.4	2.0	7	39	0.6	0.9	ND	ND	16	159	ND	ND	0.3	2.1
Jul	247	ND	0.6	47	ND	ND	36	ND	0.4	2.1	380	0.5	2.2	7	60	0.7	1.4	ND	ND	14	159	ND	ND	0.3	3.2
Aug	965	ND	0.9	35	ND	ND	40	2.3	1.3	4.2	1458	1.6	1.5	9	79	ND	3.8	ND	ND	15	86	ND	ND	0.2	5.8
Sep	142	ND	ND	46	ND	ND	48	ND	ND	2.0	179	0.9	2.7	11	37	0.9	ND	ND	ND	17	227	ND	ND	0.3	4.3
Oct	110	ND	ND	53	ND	ND	45	ND	0.2	1.7	95	ND	3.3	11	27	1.0	1.0	ND	ND	19	252	ND	ND	0.4	1.5
Nov	296	ND	ND	39	ND	ND	43	ND	0.3	2.3	281	0.4	1.9	10	70	ND	1.0	ND	ND	18	171	ND	ND	ND	4.7
Dec	176	ND	ND	33	ND	ND	34	ND	ND	1.9	205	ND	1.4	8	40	ND	0.7	ND	ND	17	156	ND	ND	ND	4.7

ppm = Parts Per Million      ppb = Parts Per Billion      ND = Not Detected      MPN/100mL = Most Probable Number per 100 milliliters      NTU = Nephelometric Turbidity Units      µS/cm = microSiemens per centimeter      "..." = No Analysis Required



**WASHINGTON AQUEDUCT, US ARMY CORPS OF ENGINEERS  
ANNUAL REPORT OF WATER ANALYSIS (2019)**

EPA MCL*	Inorganic Ions								Metals																												
	TOTAL AMMONIA - N	BROMIDE	CHLORIDE	FLUORIDE	NITRATE - N	NITRITE - N	ORTHOPHOSPHATE - PO4	PERCHLORATE	SULFATE	ALUMINUM	ANTIMONY	ARSENIC	BARIUM	BERYLLIUM	CADMIUM	CALCIUM	CHROMIUM	COBALT	COPPER	IRON	LEAD	LITHIUM	MAGNESIUM	MANGANESE	MERCURY	MOLYBDENUM	NICKEL	SELENIUM	SILVER	SODIUM	STRONTIUM	THALLIUM	THORIUM	URANIUM	VANADIUM	ZINC	
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppb	ppb	ppb	ppb	ppb	ppb	ppm	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppm	ppb	ppb	ppb	ppb	ppb	ppm	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb

**Dalecarlia Water Treatment Plant Finished Water**

	0.8	ND	27	0.6	2.1	ND	2.3	0.7	32	19	ND	ND	29	ND	ND	34	ND	ND	0.7	ND	ND	1.1	6	0.8	ND	ND	0.6	ND	ND	24	100	ND	ND	ND	ND	0.5
Jan	0.8	ND	27	0.6	2.1	ND	2.3	0.7	32	19	ND	ND	29	ND	ND	34	ND	ND	0.7	ND	ND	1.1	6	0.8	ND	ND	0.6	ND	ND	24	100	ND	ND	ND	ND	0.5
Feb	0.6	ND	47	0.6	2.1	ND	2.4	0.6	33	21	ND	ND	33	ND	ND	35	ND	ND	0.9	ND	ND	1.1	6	0.8	ND	ND	0.7	ND	ND	23	129	ND	ND	ND	ND	0.7
Mar	0.6	ND	36	0.6	1.9	ND	2.4	0.5	31	16	ND	ND	32	ND	ND	33	ND	ND	1.2	ND	ND	1.1	6	0.7	ND	ND	0.7	ND	ND	22	112	ND	ND	ND	ND	0.6
Apr	ND	ND	30	0.7	1.9	ND	2.3	0.3	33	22	ND	ND	35	ND	ND	37	ND	ND	0.8	ND	ND	1.1	6	0.5	ND	ND	0.5	ND	ND	18	132	ND	ND	ND	ND	0.5
May	0.6	ND	27	0.7	1.7	ND	2.3	0.2	32	25	ND	ND	36	ND	ND	36	ND	ND	0.8	ND	ND	1.3	5	0.5	ND	ND	ND	ND	ND	18	132	ND	ND	ND	ND	ND
Jun	0.7	ND	36	0.7	2.0	ND	2.4	0.3	37	31	ND	0.2	40	ND	ND	39	ND	ND	1.1	ND	ND	1.4	7	0.9	ND	0.5	0.5	ND	ND	24	148	ND	ND	ND	0.5	ND
Jul	0.8	ND	32	0.8	1.5	ND	2.4	0.4	41	53	ND	0.2	43	ND	ND	38	ND	ND	1.0	ND	ND	1.7	6	1.1	ND	0.8	ND	ND	20	177	ND	ND	ND	0.6	ND	
Aug	0.8	ND	36	0.8	1.4	ND	2.4	0.4	46	58	ND	0.3	43	ND	ND	46	ND	ND	1.0	ND	ND	1.7	9	1.0	ND	0.9	0.6	ND	ND	22	189	ND	ND	ND	0.6	ND
Sep	0.8	ND	37	0.7	1.2	ND	2.4	0.3	54	81	ND	ND	42	ND	ND	50	ND	ND	1.0	ND	ND	1.8	11	1.0	ND	0.9	0.6	ND	ND	23	222	ND	ND	ND	ND	ND
Oct	0.9	ND	41	0.7	1.1	ND	2.4	0.3	57	106	ND	0.3	50	ND	ND	46	ND	ND	1.2	ND	ND	2.7	12	1.0	ND	1.0	0.8	ND	ND	26	252	ND	ND	0.2	0.5	ND
Nov	0.8	ND	35	0.7	1.8	ND	2.4	0.2	46	23	ND	ND	32	ND	ND	42	ND	ND	1.5	ND	ND	1.6	9	0.7	ND	0.6	0.7	ND	ND	20	132	ND	ND	ND	ND	ND
Dec	0.9	ND	37	0.6	2.0	ND	2.4	0.3	43	21	ND	ND	32	ND	ND	40	ND	ND	1.3	ND	ND	1.3	9	0.7	ND	0.6	0.5	ND	ND	21	187	ND	ND	ND	ND	1.0

**McMillan Water Treatment Plant Finished Water**

	0.8	ND	26	0.7	2.1	ND	2.4	0.4	33	15	ND	ND	29	ND	ND	28	ND	ND	3.5	ND	ND	1.2	6	ND	ND	ND	0.7	ND	ND	20	96	ND	ND	ND	ND	0.5
Jan	0.8	ND	26	0.7	2.1	ND	2.4	0.4	33	15	ND	ND	29	ND	ND	28	ND	ND	3.5	ND	ND	1.2	6	ND	ND	ND	0.7	ND	ND	20	96	ND	ND	ND	ND	0.5
Feb	0.6	ND	42	0.7	2.2	ND	2.4	0.6	33	18	ND	ND	31	ND	ND	29	ND	ND	2.8	ND	ND	1.3	6	0.2	ND	ND	0.8	ND	ND	27	109	ND	ND	ND	ND	0.8
Mar	0.6	ND	37	0.7	1.8	ND	2.5	0.6	32	14	ND	ND	30	ND	ND	28	ND	ND	2.3	ND	ND	1.1	6	ND	ND	0.6	ND	ND	22	106	ND	ND	ND	ND	0.7	
Apr	ND	ND	32	0.7	1.8	ND	2.4	0.5	34	17	ND	ND	31	ND	ND	29	ND	ND	2.5	ND	ND	1.0	6	ND	ND	ND	ND	ND	19	108	ND	ND	ND	ND	1.2	
May	0.6	ND	27	0.7	1.6	ND	2.4	0.3	35	29	ND	ND	34	ND	ND	29	ND	ND	6.1	ND	ND	1.5	4	ND	ND	ND	ND	ND	18	118	ND	ND	ND	ND	ND	
Jun	0.7	ND	37	0.8	1.8	ND	2.4	0.8	38	55	ND	ND	41	ND	ND	36	ND	ND	7.6	ND	ND	1.3	7	0.5	ND	ND	ND	ND	20	152	ND	ND	ND	ND	ND	
Jul	0.8	ND	34	0.7	1.5	ND	2.4	0.4	42	55	ND	ND	41	ND	ND	27	ND	ND	6.9	ND	ND	1.6	7	0.3	ND	0.7	ND	ND	20	165	ND	ND	ND	ND	ND	
Aug	0.9	ND	35	0.7	1.3	ND	2.4	0.3	48	54	ND	0.2	41	ND	ND	37	ND	ND	6.8	ND	ND	1.3	9	0.2	ND	0.8	ND	ND	21	189	ND	ND	ND	ND	ND	
Sep	0.8	ND	38	0.8	1.3	ND	2.3	0.4	54	52	ND	ND	40	ND	ND	45	ND	ND	6.4	ND	ND	1.5	10	ND	ND	0.8	ND	ND	22	210	ND	ND	ND	ND	ND	
Oct	0.8	ND	40	0.7	1.0	ND	2.4	0.3	59	83	ND	0.3	47	ND	ND	44	ND	ND	8.0	ND	ND	2.1	13	ND	ND	1.0	ND	ND	24	244	ND	ND	ND	ND	ND	
Nov	0.8	ND	37	0.7	1.7	ND	2.5	0.2	48	37	ND	ND	38	ND	ND	38	ND	ND	12.5	ND	ND	2.2	9	ND	ND	0.8	0.7	ND	ND	23	186	ND	ND	ND	ND	ND
Dec	0.8	ND	40	0.6	1.9	ND	2.5	0.4	43	16	ND	ND	32	ND	ND	30	ND	ND	9.5	ND	ND	1.4	9	ND	ND	0.6	0.5	ND	ND	24	183	ND	ND	ND	ND	0.7

\*EPA MCL = Environmental Protection Agency's Maximum Contaminant Level for regulated parameters      ppm = Parts Per Million      ppb = Parts Per Billion      ND = Not Detected      "----" = No Analysis Required









# WASHINGTON AQUEDUCT, US ARMY CORPS OF ENGINEERS ANNUAL REPORT OF WATER ANALYSIS (2019)

### Synthetic Organic Compounds

		CHRYSENE	2,4-D	DALAPON	2,4-DB	DCPA MONO & DIACID DEGRADATE	2,4'-DDD	2,4'-DDE	2,4'-DDT	4,4'-DDD	4,4'-DDE	4,4'-DDT	DIBENZ(a,h)ANTHRAcene	DICAMBA	3,5-DICHLOROBENZOIC ACID	DICHLORPROP	DICHLORVOS (DDVP)	DIELDRIN	DIETHYLPHthalate	di-(2-ETHYLHEXYL)ADIPATE	di-(2-ETHYLHEXYL)PHthalate	DIMETHOATE	DIMETHYLPHthalate	DI-N-BUTYLPHthalate	DI-N-OCTYLPHthalate	2,4-DINITROTOLUENE	2,6-DINITROTOLUENE	DINOSEB	DIQUAT	ENDOTHALL	ENDRIN	ENDRIN ALDEHYDE	EPTC	FLUORANTHENE	FLUORENE	GLYPHOSATE	HEPTACHLOR	HEPTACHLOR EPOXIDE	HEXACHLOROBENZENE	HEXACHLOROCYCLOPENTADIENE	3-HYDROXYCARBOFURAN	INDENO(1,2,3-c,d)PYRENE	ISOPHORONE			
EPA MCL*			70	200																	400	6							7	20	100	2														
Units		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb

### Dalecarlia Water Treatment Plant Finished Water

Jan	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND					
Feb	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---			
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Apr	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND				
May	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---		
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Jul	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			
Aug	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
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Oct	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
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### McMillan Water Treatment Plant Finished Water

Jan	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND					
Feb	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---		
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Apr	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			
May	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---		
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Jul	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND				
Aug	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
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\*EPA MCL = Environmental Protection Agency's Maximum Contaminant Level for regulated parameters

ppb = Parts Per Billion

ND = Not Detected

"---" = No Analysis Required



# WASHINGTON AQUEDUCT, US ARMY CORPS OF ENGINEERS ANNUAL REPORT OF WATER ANALYSIS (2019)

	Synthetic Organic Compounds																									Miscellaneous				Nitrosamines																									
	LINDANE	ENDOSULFAN I (alpha)	ENDOSULFAN II (beta)	ENDOSULFAN SULFATE	MALATHION	METHIOCARB	METHOMYL	METHOXYCHLOR	METOLACHLOR	METRIBUZIN	MOLINATE	trans-NONACHLOR	OXAMYL	PARAQUAT	PARATHION	PENDIMETHALIN	PERMETHRIN	PENTACHLOROPHENOL	PHENANTHRENE	PICLORAM	PROPACHLOR	PYRENE	SIMAZINE	TERBACIL	TERBUTHYLAZINE	THIOBENCARB	TRIFLURALIN	TOXAPHENE	2,4,5-T	2,4,5-TP (SILVEX)	DIBROMOCHLOROPROPANE (DBCP)	ETHELYNE DIBROMIDE (EDB)	CYANIDE	2,3,7,8-TCDD (DIOXIN)	N-NITROSODIMETHYLAMINE (NDMA)	N-NITROSO-n-PROPYLAMINE (NDPA)	N-NITROSODIBUTYLAMINE (NDBA)	N-NITROSODIETHYLAMINE (NDEA)	N-NITROSOMETHYLETHYLAMINE (NMEA)	N-NITROSOPIRIDINE (NPNR)															
EPA MCL*	0.2						40					200					1		500			4						3		50	200	50	0.2	30																					
Units	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppt	ppt	ppm	ppq	ppt	ppt	ppt	ppt	ppt	ppt	ppt														
<b>Dalecarlia Water Treatment Plant Finished Water</b>																																																							
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<b>McMillan Water Treatment Plant Finished Water</b>																																																							
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EPA MCL\* = Environmental Protection Agency's Maximum Contaminant Level for regulated parameters

ppm = Parts Per Million (mg/L)

ppb = Parts Per Billion (µg/L)

ppt = Parts Per Trillion (ng/L)