



US Army Corps  
of Engineers  
Baltimore District




**Washington Aqueduct**

**U.S. ARMY Corps of Engineers**

# **Annual Report of Water Analysis 2011**

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# WASHINGTON AQUEDUCT, US ARMY CORPS OF ENGINEERS ANNUAL REPORT OF WATER ANALYSIS (2011)

## 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	HEXAVALENT CHROMIUM	BROMIDE	CHLORIDE	FLUORIDE	IODIDE	NITRATE - N	NITRITE - N	ORTHOPHOSPHATE - PO4	PERCHLORATE	SULFATE	ALGAE COUNT	TOTAL COLIFORM	E. COLI	GIARDIA	CRYPTOSPORIDIUM
	ppm	uS/cm	ppm	ppm	ppm	°F	ppm	ppm	NTU	ppm	ppb	ppm	ppm	ppm	ppb	ppm	ppm	ppm	ppb	ppm	org/mL	MPN /100mL	MPN /100mL	cysts/L	Oocysts/L	
Jan	8.5	107	436	306	1	307	47	152	2.2	4	ND	0.06	0.06	41	0.10	ND	2.2	ND	ND	0.8	42	184	17	2	ND	ND
Feb	8.0	74	407	259	24	283	52	114	3.1	11	ND	0.05	ND	60	ND	---	2.1	ND	ND	0.5	32	357	313	2	ND	ND
Mar	7.5	53	274	181	2	183	57	85	3.2	40	0.09	---	ND	31	ND	---	1.8	ND	ND	0.3	25	364	69	5	ND	ND
Apr	7.6	61	302	116	46	162	61	97	2.8	29	ND	0.05	ND	18	ND	ND	1.4	ND	ND	0.3	21	616	1737	262	0.038	ND
May	7.7	71	252	137	12	149	68	100	2.4	21	ND	---	ND	17	ND	---	1.5	ND	ND	0.3	23	628	3189	38	ND	ND
Jun	7.9	101	384	272	16	288	78	144	2.5	11	0.06	---	ND	25	0.11	---	1.4	ND	ND	0.3	37	1112	3960	9	ND	ND
Jul	7.8	99	370	234	18	252	84	147	2.8	12	ND	---	ND	27	0.14	ND	0.9	ND	ND	0.7	40	1412	6733	5	ND	ND
Aug	8.1	98	410	271	4	275	81	152	2.7	17	ND	0.05	0.05	33	0.14	---	0.6	ND	ND	0.4	49	1132	6606	14	ND	ND
Sep	7.7	75	330	176	ND	176	73	111	4.3	26	ND	---	ND	23	0.10	---	1.6	ND	ND	0.3	28	824	3168	42	ND	ND
Oct	7.7	77	295	184	12	196	66	110	3.9	20	ND	---	ND	23	0.11	ND	2.0	ND	ND	0.3	21	216	1781	43	ND	ND
Nov	7.7	76	309	135	4	139	61	110	2.5	20	ND	0.08	ND	25	ND	---	1.9	ND	ND	0.4	27	181	714	25	ND	ND
Dec	7.7	67	271	171	ND	171	51	96	2.1	21	ND	---	ND	17	ND	---	2.0	ND	ND	0.4	23	372	719	21	ND	ND

	Metals																										
	ALUMINUM	ANTIMONY	ARSENIC	BARIUM	BERYLLIUM	CADMIUM	CALCIUM	CHROMIUM	COBALT	COPPER	IRON	LEAD	LITHIUM	MAGNESIUM	MANGANESE	MOLYBDENUM	NICKEL	POTASSIUM	SELENIUM	SILVER	SODIUM	STRONTIUM	THALLIUM	THORIUM	URANIUM	VANADIUM	ZINC
	ppb	ppb	ppb	ppb	ppb	ppb	ppm	ppb	ppb	ppb	ppb	ppb	ppb	ppm	ppb	ppb	ppb	ppm	ppb	ppb	ppm	ppb	ppb	ppb	ppb	ppb	ppb
Jan	387	ND	ND	35	ND	ND	47	1.9	ND	1.6	93	ND	2.5	8	20	0.8	2.4	2.8	ND	ND	26	220	ND	ND	ND	ND	6.3
Feb	306	ND	ND	35	ND	ND	36	0.9	ND	2.7	159	ND	1.9	6	34	0.6	2.1	---	ND	ND	33	170	ND	ND	ND	ND	4.2
Mar	734	ND	ND	35	ND	ND	27	1.8	0.7	2.9	822	1.1	2.3	4	73	ND	3.1	---	ND	ND	14	113	ND	ND	ND	0.8	5.5
Apr	542	ND	ND	34	ND	ND	31	1.8	0.6	2.1	707	0.9	2.1	5	61	ND	2.6	2.1	ND	ND	11	113	ND	ND	ND	0.8	5.9
May	329	ND	0.6	37	ND	ND	31	1.2	ND	2.0	425	0.7	2.1	5	47	ND	2.4	---	ND	ND	10	125	ND	ND	ND	ND	3.8
Jun	203	ND	0.6	46	ND	ND	44	1.1	ND	2.0	209	ND	2.9	8	86	0.9	2.4	---	ND	ND	13	200	ND	ND	ND	ND	2.8
Jul	212	ND	0.8	45	ND	ND	43	1.1	ND	2.4	202	ND	3.5	9	94	1.0	2.4	3.7	ND	ND	16	219	ND	ND	ND	ND	2.7
Aug	260	ND	0.9	50	ND	ND	41	1.2	ND	2.1	273	0.7	5.6	12	128	1.3	2.8	---	ND	ND	20	243	ND	ND	ND	0.6	2.8
Sep	322	ND	0.9	34	ND	ND	34	1.2	ND	3.1	353	ND	2.8	6	39	0.8	2.5	---	ND	ND	15	145	ND	ND	ND	0.8	2.9
Oct	255	ND	0.7	37	ND	ND	36	1.2	ND	2.6	318	ND	1.6	5	32	0.6	2.3	3.2	ND	ND	13	120	ND	ND	ND	ND	2.7
Nov	178	ND	ND	35	ND	ND	34	0.8	ND	1.8	165	ND	2.0	6	25	ND	2.0	---	ND	ND	14	133	ND	ND	ND	ND	ND
Dec	316	ND	ND	35	ND	ND	31	1.2	ND	1.3	310	ND	1.8	5	27	ND	2.1	---	ND	ND	10	117	ND	ND	ND	ND	3.0

ppb = Parts Per Billion

ppm = Parts Per Million

ND = Not Detected

"---" = No Analysis Required



## WASHINGTON AQUEDUCT, US ARMY CORPS OF ENGINEERS ANNUAL REPORT OF WATER ANALYSIS (2011)

	Inorganic Ions										Metals																														
	TOTAL AMMONIA - N	BROMIDE	CHLORIDE	FLUORIDE	IODIDE	NITRATE - N	NITRITE - N	ORTHOPHOSPHATE - PO4	PERCHLORATE	SULFATE	ALUMINUM	ANTIMONY	ARSENIC	BARIIUM	BERYLLIUM	CADMIUM	CALCIUM	CHROMIUM	COBALT	COPPER	IRON	LEAD	LITHIUM	MAGNESIUM	MANGANESE	MERCURY	MOLYBDENUM	NICKEL	POTASSIUM	SELENIUM	SILVER	SODIUM	STRONTIUM	THALLIUM	THORIUM	URANIUM	VANADIUM	ZINC			
EPA MCL*				4		10	1				6	10	2000	4	5		100										2				50					2			30		
Units	ppm	ppm	ppm	ppm	ppb	ppm	ppm	ppm	ppb	ppm	ppb	ppb	ppb	ppb	ppb	ppm	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppm	ppb	ppb	ppb	ppb	ppb	ppm	ppb	ppb	ppm	ppb	ppb	ppb	ppb	ppb	ppb	ppb	

**Dalecarlia Water Treatment Plant Finished Water**

Jan	0.7	ND	51	0.8	ND	2.2	ND	2.5	0.7	57	44	ND	ND	31	ND	ND	52	2.5	ND	1.1	ND	ND	2.0	9	1.1	ND	0.8	3.5	3.0	0.6	ND	26	214	ND	ND	ND	0.7	3.3
Feb	0.7	ND	70	0.7	---	2.1	ND	2.4	0.5	47	42	ND	ND	33	ND	ND	45	1.8	ND	1.4	ND	ND	2.3	6	1.1	ND	0.6	2.1	---	0.7	ND	36	177	ND	ND	ND	0.5	2.0
Mar	0.5	ND	33	0.7	---	1.9	ND	2.4	0.3	46	39	ND	ND	30	ND	ND	36	1.2	ND	0.7	ND	ND	1.8	5	0.8	ND	ND	2.1	---	ND	ND	16	125	ND	ND	ND	ND	1.8
Apr	ND	ND	26	0.7	ND	1.5	ND	2.5	0.3	41	39	ND	ND	30	ND	ND	36	1.3	ND	0.6	ND	ND	1.5	6	0.7	ND	ND	1.9	2.0	ND	ND	12	122	ND	ND	ND	ND	1.0
May	0.8	ND	22	0.7	---	1.5	ND	2.5	0.3	41	32	ND	ND	34	ND	ND	40	1.6	ND	0.6	ND	0.6	1.8	6	0.8	ND	ND	1.9	---	ND	ND	10	135	ND	ND	ND	0.7	0.7
Jun	0.8	ND	28	0.7	---	1.4	ND	2.4	0.4	55	44	ND	0.6	42	ND	ND	48	1.9	ND	0.8	ND	ND	2.2	9	1.4	ND	0.8	2.1	---	0.7	ND	17	190	ND	ND	ND	0.9	0.6
Jul	0.8	ND	32	0.7	ND	0.9	ND	2.5	0.6	62	51	ND	0.7	44	ND	ND	48	2.3	ND	1.0	ND	0.6	3.3	9	1.5	ND	1.1	2.2	3.2	0.8	ND	22	218	ND	ND	ND	1.2	1.1
Aug	0.8	ND	37	0.7	---	0.5	ND	2.4	0.6	71	53	ND	0.8	46	ND	ND	45	2.1	ND	1.0	ND	0.7	5.0	12	1.4	ND	1.3	2.3	---	1.0	ND	26	247	ND	ND	ND	1.2	0.6
Sep	0.8	ND	30	0.7	---	1.7	ND	2.5	0.5	51	62	ND	0.5	34	ND	ND	40	2.1	ND	1.2	ND	ND	2.6	6	0.8	ND	0.7	2.1	---	0.7	ND	20	141	ND	ND	ND	1.1	1.2
Oct	0.8	ND	27	0.7	ND	1.9	ND	2.4	0.5	45	23	ND	ND	33	ND	ND	40	1.2	ND	1.2	ND	ND	1.3	5	0.5	ND	0.6	2.0	3.8	0.6	ND	18	123	ND	ND	ND	0.7	0.9
Nov	0.8	ND	28	0.6	---	1.9	ND	2.3	0.4	47	18	ND	ND	33	ND	ND	38	1.0	ND	0.8	ND	ND	1.5	6	0.6	ND	0.5	1.9	---	0.5	ND	19	132	ND	ND	ND	ND	ND
Dec	0.7	ND	21	0.6	---	2.0	ND	2.4	0.4	41	24	ND	ND	30	ND	ND	34	0.9	ND	0.7	ND	ND	1.4	5	0.7	ND	ND	1.8	---	ND	ND	15	112	ND	ND	ND	ND	0.8

**McMillan Water Treatment Plant Finished Water**

Jan	0.7	ND	45	0.9	ND	2.3	ND	2.5	0.8	59	22	ND	ND	32	ND	ND	44	1.9	ND	2.4	ND	ND	2.2	8	ND	ND	0.8	2.4	3.1	0.7	ND	27	209	ND	ND	ND	0.6	2.7
Feb	0.7	ND	71	0.7	---	2.1	ND	2.5	0.5	51	29	ND	ND	32	ND	ND	35	1.6	ND	2.6	ND	ND	2.0	6	0.8	ND	0.7	2.1	---	0.6	ND	41	178	ND	ND	ND	ND	2.4
Mar	0.6	ND	38	0.8	---	1.9	ND	2.4	0.4	50	62	ND	ND	30	ND	ND	24	0.9	ND	1.6	ND	ND	1.5	5	1.2	ND	ND	1.9	---	ND	ND	22	122	ND	ND	ND	ND	1.1
Apr	ND	ND	26	0.8	ND	1.5	ND	2.5	0.3	45	39	ND	ND	30	ND	ND	28	0.8	ND	1.7	ND	ND	1.5	6	ND	ND	ND	1.8	2.1	ND	ND	15	118	ND	ND	ND	ND	0.9
May	0.8	ND	21	0.7	---	1.3	ND	2.4	0.3	45	37	ND	ND	34	ND	ND	28	0.9	ND	7.9	ND	0.5	1.8	5	ND	ND	ND	1.8	---	ND	ND	14	127	ND	ND	ND	ND	0.7
Jun	0.8	ND	26	0.7	---	1.2	ND	2.4	0.3	56	56	ND	ND	42	ND	ND	33	1.4	ND	9.7	ND	ND	2.0	7	1.1	ND	0.6	1.8	---	0.6	ND	17	176	ND	ND	ND	0.6	ND
Jul	0.7	ND	32	0.7	ND	0.9	ND	2.5	0.5	69	71	ND	0.5	45	ND	ND	42	1.9	ND	8.3	ND	0.6	2.7	9	1.5	ND	0.8	1.9	3.0	0.8	ND	23	220	ND	ND	ND	0.8	ND
Aug	0.7	ND	37	0.6	---	0.5	ND	2.4	0.5	74	62	ND	0.7	44	ND	ND	38	2.1	ND	7.9	ND	ND	3.9	11	1.7	ND	1.0	1.9	---	1.1	ND	27	232	ND	ND	ND	1.0	ND
Sep	0.8	ND	33	0.7	---	1.5	ND	2.4	0.6	60	29	ND	ND	38	ND	ND	30	2.0	ND	10.9	ND	ND	3.6	7	0.6	ND	0.8	1.9	---	0.8	ND	26	153	ND	ND	ND	0.9	0.6
Oct	0.8	ND	27	0.7	ND	1.8	ND	2.5	0.5	50	24	ND	ND	35	ND	ND	29	1.4	ND	20.2	ND	ND	1.4	5	ND	ND	0.6	1.9	3.3	0.5	ND	21	115	ND	ND	ND	0.7	1.0
Nov	0.7	ND	29	0.7	---	1.8	ND	2.4	0.4	51	21	ND	ND	33	ND	ND	28	0.8	ND	14.0	ND	ND	1.7	7	ND	ND	0.5	1.8	---	0.5	ND	22	126	ND	ND	ND	ND	0.6
Dec	0.8	ND	20	0.7	---	1.9	ND	2.4	0.4	44	27	ND	ND	33	ND	ND	26	0.8	ND	4.4	ND	ND	1.4	5	ND	ND	ND	1.7	---	ND	ND	18	110	ND	ND	ND	ND	0.9

\*EPA MCL = Environmental Protection Agency's Maximum Contaminant Level for regulated parameters      ppb = Parts Per Billion      ppm = Parts Per Million      "----" = No Analysis Required









**WASHINGTON AQUEDUCT, US ARMY CORPS OF ENGINEERS  
ANNUAL REPORT OF WATER ANALYSIS (2011)**

**Synthetic Organic Compounds**

EPA MCL*	Synthetic Organic Compounds																																																			
	2,4-DB	DCPA MONO & DIACID DEGRADATE	4,4'-DDD	4,4'-DDE	4,4'-DDT	DIBENZ(a,h)ANTHRACENE	DICAMBA	3,5-DICHLORO BENZOIC 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	LINDANE	ENDOSULFAN I (alpha)	ENDOSULFAN II (beta)	ENDOSULFAN SULFATE	MALATHION	METHIOCARB	METHOMYL	METHOXYCHLOR								
													400	6								7	20	100	2													0.2											40			
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	ppb	ppb	ppb	ppb	ppb	ppb	ppb

**Dalecarlia Water Treatment Plant Finished Water**

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
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ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
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ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
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ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
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**McMillan Water Treatment Plant Finished Water**

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec			
ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			
---	---	---	---	---	---	---	---	---	---	---	---	---			
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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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ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			
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\*EPA MCL = Environmental Protection Agency's Maximum Contaminant Level for regulated parameters      ppb = Parts Per Billion      ppm = Parts Per Million      ND = Not Detected      "—" = No Analysis Required

