

CHESTER CREEK
CHESTER COUNTY

WATER QUALITY STANDARDS REVIEW
STREAM EVALUATION REPORT

Segment: Basin
Stream Code: 00520
Drainage List: G

WATER QUALITY MONITORING SECTION
WATER QUALITY DIVISION
BUREAU OF CLEAN WATER
DEPARTMENT OF ENVIRONMENTAL PROTECTION

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INTRODUCTION

The Department of Environmental Protection (DEP) conducted an evaluation of Chester Creek from its source to Rocky Run. The evaluation is in response to the Environmental Protection Agency's (EPA) partial approval of the Environmental Quality Board's (EQB) adoption of the 2017 Triennial Review of Water Quality Standards published in the *Pennsylvania Bulletin* at 50 Pa.B. 3426 (July 11, 2020). The partial approval did not include the revision to the designated use for Chester Creek in 25 Pa. Code § 93.9g. EPA requested that the DEP provide a summary of the designated use history of each waterbody and current available data that may include fish assemblage and macroinvertebrate data in support of the use designation corrections in the 2017 Triennial Review. In response, the DEP conducted an evaluation of the Chester Creek watershed including portions 'locally known as Goose Creek' to document the correct stream names and appropriate designated uses.

The first stream segment referenced in rulemakings as Goose Creek is the headwaters of Chester Creek upstream of the confluence with East Branch Chester Creek. In the EQB proposed rulemaking for the Phase 1 Triennial Review, published in the *Pennsylvania Bulletin* on September 22, 1984 (14 Pa.B. 3473), 15 priority waterbodies for construction grant decisions were identified and stream surveys were conducted for several of these streams, including Goose Creek (Chester Creek), to determine if designated uses were attained, and if not, what use is attainable. At the time of this proposed regulation, Goose Creek (Chester Creek) was designated Trout Stocking (TSF) and the Phase 1 Triennial Review provided a summary of the stream survey for Goose Creek (Chester Creek) which noted the degraded water quality and the inability to attain the designated use of TSF. The proposed rulemaking included a less restrictive use of Warm Water Fishes (WWF) as the appropriate attainable use based on the biological, chemical and physical characteristics of Goose Creek (Chester Creek). Publication of the final rulemaking included the Goose Creek (Chester Creek) designated use of WWF in the *Pennsylvania Bulletin* on February 16, 1985 (15 Pa.B. 544). On May 14, 1985 EPA Regional Administrator, James Seif, approved Pennsylvania's Phase 1 Triennial Review which included the redesignation of Goose Creek (Chester Creek) to the less restrictive use of WWF.

The second stream segment in the Chester Creek watershed, referenced in rulemakings as Goose Creek, is an Unnamed Tributary (UNT) to East Branch Chester Creek near River Mile 0.4. This stream is also known as UNT 00605 and in the Pa. Code as Westtown Run (prior to the recent codification of the 2017 Triennial). The original TSF designated use for UNT 00605 was included in the *Pennsylvania Bulletin* on February 16, 1985 (15 Pa.B. 544), being included in the East Branch Chester Creek basin.

On August 3, 1996, the EQB again revisited Goose Creek in a drainage list corrections package published at 26 Pa.B. 3637. The intention was to delete the reference to the name 'Goose Creek' while retaining the February 1985 designation of WWF. Since the name Goose Creek was not listed in *Pennsylvania Gazetteer of Streams* (DEP 2003) the designated use of UNT 00605 was erroneously changed to WWF instead of Chester Creek source to East Branch Chester Creek. Chester Creek source to East Branch Chester Creek retained the TSF designated use. The description of the original evaluation in the 1984 *Pennsylvania Bulletin* (14 Pa.B. 3473) was clearly referencing Chester Creek source to East Branch Chester Creek and not UNT to East Branch Chester Creek (UNT 00605).

Successive attempts to correct the Goose Creek listing in Chapter 93 continued to either omit Goose Creek or incorrectly identify other streams as Goose Creek (Chester Creek).

After extensive research of the EQB's record of rulemakings, the EQB published the designated use of 'Chester Creek from its source to East Branch Chester Creek, which includes Goose Creek, as WWF, MF' in the *Pennsylvania Bulletin* on Saturday, July 11, 2020 (50 Pa.B. 3426). The stream described as UNT to East Branch Chester Creek at River Mile 0.4 (also known as UNT 00605 and in the Pa. Code as 4—Westtown Run prior to the recent codification of the 2017 Triennial Review) would have been corrected to the original (1984) designated use of TSF, MF in the same publication (50 Pa.B. 3426). Table 1 represents the current zone delineations and water uses protected at 25 Pa. Code § 93.9g. This includes '2—Chester Creek Basin (locally known as Goose Creek basin), Source to East Branch Chester Creek' currently designated WWF, MF as a result of corrections made in the 2017 Triennial Review, but was not identified by EPA as a simple correction and was instead identified as a redesignation to a less restrictive use (TSF to WWF). As such, 25 Pa. Code § 93.4(b) and 40 CFR § 131.10(g), (h) & (j) require that less restrictive use redesignations be accompanied by a Use Attainability Analysis (UAA) and public participation.

Table 1. Excerpt from 25 Pa. Code § 93.9g for the Chester Creek Basin.

STREAM	ZONE	COUNTY	WATER USES PROTECTED
2—Chester Creek	Basin (locally known as Goose Creek basin), Source to East Branch Chester Creek	Chester	WWF, MF
3—East Branch Chester Creek	Basin	Chester	TSF, MF
2—Chester Creek	Basin, East Branch Chester Creek to Rocky Run	Delaware	TSF, MF
3—Rocky Run	Basin	Delaware	HQ-CWF, MF
2—Chester Creek	Basin, Rocky Run to Confluence with West Branch	Delaware	TSF, MF
3—West Branch Chester Creek	Basin, Source to Green Creek	Delaware	TSF, MF
4—Green Creek	Basin	Delaware	CWF, MF
3—West Branch Chester Creek	Basin, Green Creek to Mouth	Delaware	TSF, MF
2—Chester Creek	Basin, West Branch to Dutton Mills Road Bridge	Delaware	TSF, MF
2—Chester Creek	Nontidal Portions of Basin, Dutton Mills Road Bridge to Mouth	Delaware	WWF, MF

The stream redesignation process begins with an evaluation of the “existing uses” and the “designated uses” of a stream. “Existing uses” are water uses actually attained in the waterbody. Existing uses are protected through permit or approval actions taken by the DEP. “Designated uses” are water uses identified in regulations that protect a waterbody. Candidates for stream redesignation may be identified

by the DEP based on routine waterbody investigations or based on requests initiated by other agencies or from the general public through a rulemaking petition to the EQB.

GENERAL WATERSHED DESCRIPTION

Chester Creek is a tributary to the Delaware River that originates in Chester County. Chester Creek flows southeast through Delaware County to the confluence with the Delaware River. This entire watershed includes 132.8 stream miles and drains approximately 100 square miles of the Piedmont Upland Plateau. Chester Creek source to East Branch Chester Creek drains approximately 11.5 square miles and UNT to East Branch Chester Creek (UNT 00605) drains 1.2 square miles (Figure 1).

According to the National Land Cover Database (NLCD) 2016, the vast majority of land cover in the Chester Creek watershed is developed (60%), with some forested (28%), agricultural (8%) and the remaining barren lands, open water or wetlands (4%) (Dewitz 2019). There are a total of 89 National Pollutant Discharge Elimination System (NPDES) permits scattered throughout the basin, including one collection system, 5 industrial waste discharges, 43 public and nonpublic sewage facilities, and 41 stormwater activities. There are two surface water withdrawals. There are currently no active permitted gas wells permitted within the watershed.

WATER QUALITY

Discrete Physicochemical

Physicochemical data including comprehensive water chemistry was collected from stations 1CC, 2CC and 3CC at an approximate monthly frequency beginning November 2013 through August 2015, and from stations 4CC, 5CC and 6WCC March 2017 through August 2017 (Appendix A). The data across all stations indicates that water quality is consistent with high percent developed land cover. Chloride concentrations across all stations ranged from <0.5 – 1277 mg/L with highest concentrations found at upstream stations 1CC, 2CC and 3CC. The highest concentrations of barium (138 – 234 ug/L) were consistently found at station 1CC. The highest concentrations of bromide (116 – 317 ug/L) were consistently found at stations 1CC and 2CC. Osmotic pressure results ranged from (<1 – 67 mosm/kg) with the highest results from station 1CC in February 2014 (67 mosm/kg) and in March 2017 (50 mosm/kg) at or exceeding the criterion (50 mosm/kg) at 25 Pa. Code § 93.7. The highest concentration of dissolved nitrate and nitrite (20.185 mg/L, Sept. 2014), total nitrate and nitrite (20.372 mg/L, Sept. 2014), dissolved nitrogen (21.013, May 2015), total nitrogen (21.832, May 2015), dissolved ortho phosphorus (2.345, May 2015), total ortho phosphorus (2.476 mg/L, May 2015), dissolved phosphorus (2.377 mg/L, May 2015), and total phosphorus (2.668 mg/L, May 2015) were found at station 2CC (Appendix A).

Table 2. Stations Locations – Chester Creek Basin.

STATION	DESCRIPTION
1CC	Chester Creek at Mostellar Park West Chester Borough, Chester County Lat: 39.95515 Long: -75.59018
2CC	Chester Creek at Oakbourne Road Westtown Township, Chester County Lat: 39.94324 Long: -75.57285
3CC	Chester Creek at Thornbury Park Thornbury Township, Chester County Lat: 39.93026 Long: -75.55022
4CC	Chester Creek at Dilworthtown Road Thornbury Township, Chester County Lat: 39.92926 Long: -75.53286
5CC	Chester Creek at Darlington Park Middletown Township, Delaware County Lat: 39.90267 Long: -75.468812
6WCC	West Branch Chester Creek at Ivy Mills Road Concord Township, Delaware County Lat: 39.88446 Long: -75.487005

Continuous Physicochemical

Continuous instream monitoring (CIM) was implemented by DEP at all stations. Monitoring occurred at stations 1CC, 2CC and 3CC during various periods from 2013 through 2015, and at stations 4CC, 5CC and 6WCC during various periods in 2017. CIM is implemented according to DEP protocols (Hoger et al. 2017), and data and reports are located on the DEP [CIM website](#).

Biological

Fish data were collected in 2014 and 2017 following DEP's *Fish Data Collection Protocol* (Wertz 2021a) from six stations throughout the Chester Creek watershed. (Figure 1 and Table 2). No fish data were available from UNT 00605. Thermal Fish Index (TFI) scores were calculated following DEP's, *Stream Fish Assemblage Assessment Method* (Wertz 2021b). TFI scores are used here to describe the thermal fish assemblage at each station.

The TFI scores increase from upstream to downstream. TFI scores between 2.0 and 5.0 represent a cold water fish assemblage. TFI scores between 5.1 and 7.0 represent a transitional fish assemblage, and TFI scores between 7.1 and 10.0 represent a warm water fish assemblage. TFI scores ranged from 6.1 to 7.2. Stations 1CC, 2CC and 6WCC had fish assemblages characterized as a transitional (TFI = 6.1, 6.6, and 6.1 respectively). The dominant species at these stations were the Eastern Blacknose Dace, Creek Chub, Redbreast Sunfish, and Tessellated Darter; all have a cool water preference except the Redbreast Sunfish which has a cool-warm water preference (Table 3). The stations 3CC, 4CC and 5CC all had a fish assemblage characterized as warm water assemblages with TFI scores greater than 7.0 (Wertz 2021b). The warm water assemblages were due to displacement (reduced relative abundance) of species with cool thermal preference by species with cool-warm and warm thermal preference (Coker 2001, Wertz 2021c). The warmwater assemblage at stations 3CC, 4CC, and 5CC demonstrated full replacement by having a total of six warm water (cool-warm and

Table 3. Fish Assemblage Data and Thermal Fish Index (TFI) Scores.

THERMAL PREF.	TAXA		STATIONS ¹					
			1CC	2CC	3CC	4CC	5CC	6WCC
			7/8/2014	7/8/2014	7/8/2014	8/2/2017	8/2/2017	8/2/2017
Cold-Cool	Rosyside Dace	<i>Clinostomus funduloides</i>	-	-	-	2	-	-
Cool	American Eel	<i>Anguilla rostrata</i>	12	26	2	17	17	20
Cool	Creek Chub	<i>Semotilus atromaculatus</i>	49	9	3	6	-	-
Cool	Cutlip Minnow	<i>Exoglossum maxillingua</i>	-	-	-	-	3	21
Cool	Eastern Blacknose Dace	<i>Rhinichthys atratulus</i>	99	72	27	22	1	69
Cool	Longnose Dace	<i>Rhinichthys cataractae</i>	-	-	-	-	1	-
Cool	Swallowtail Shiner	<i>Notropis procne</i>	-	15	2	1	-	-
Cool	Tessellated Darter	<i>Etheostoma olmstedii</i>	-	25	12	27	2	34
Cool	White Sucker	<i>Catostomus commersonii</i>	15	5	30	57	3	2
Cool-Warm	Common Shiner	<i>Luxilus cornutus</i>	-	-	23	9	-	7
Cool-Warm	Fallfish	<i>Semotilus corporalis</i>	-	-	-	-	25	-
Cool-Warm	Pumpkinseed	<i>Lepomis gibbosus</i>	-	4	-	5	-	-
Cool-Warm	Redbreast Sunfish	<i>Lepomis auritus</i>	2	38	6	46	8	-
Cool-Warm	Smallmouth Bass	<i>Micropterus dolomieu</i>	-	-	-	-	1	-
Cool-Warm	Spottail Shiner	<i>Notropis hudsonius</i>	3	1	14	43	-	-
Cool-Warm	Yellow Bullhead	<i>Ameiurus natalis</i>	-	-	-	1	-	-
Warm	Bluegill	<i>Lepomis macrochirus</i>	-	-	-	2	1	-
Warm	Eastern Banded Killifish	<i>Fundulus diaphanus diaphanus</i>	-	6	-	28	-	-
Warm	Goldfish	<i>Carassius auratus</i>	-	-	-	1	-	-
Warm	Green Sunfish	<i>Lepomis cyanellus</i>	-	-	1	-	-	-
Warm	Largemouth Bass	<i>Micropterus salmoides</i>	-	-	-	1	-	-
Warm	Satinfin Shiner	<i>Cyprinella analostana</i>	-	-	16	41	1	-
Warm	Spotfin Shiner	<i>Cyprinella spiloptera</i>	-	1	-	-	-	-
Taxa Richness			6	11	11	17	11	6
Total Individuals			180	202	136	309	64	153
TFI			6.1	6.6	7.1	7.6	7.2	6.1

¹ Refer to Table 1 and Figure 1 for station locations

“-” indicate taxa was not identified at a particular station

warm) species not found at the transitional assemblage stations 1CC, 2CC and 6WCC. Station 4CC had 11 warm water species. The presence of Rosyside Dace, *Clinostomus funduloides*, with a cold-cool thermal preference (Coker 2001, Wertz 2021c) at station 4CC is an indication that fish species representing the colder end of the thermal preference gradient may be present at reduced numbers throughout the basin. No fish species in the family Salmonidae (trout) were present at any of the six stations.

Physical

Instream habitat was evaluated at each station where fish were collected using the DEP's *Stream Habitat Data Collection Protocol* (Lookenbill 2017). The habitat evaluation consists of rating twelve parameters to derive a total habitat score. The total habitat scores ranged from 117 (3CC) to 150 (4CC) and fell within marginal or suboptimal ratings. Low scores for embeddedness and bank condition consistently resulted in marginal condition scores or lower (≤ 10) at all stations, except station 6WCC where the bank condition scored 14. (Table 4).

Table 4. Habitat Evaluation Data – Chester Creek Basin.

PARAMETER	STATIONS ¹					
	1CC	2CC	3CC	4CC	5CC	6WCC
1. INSTREAM COVER	15	14	8	14	14	15
2. EPIFAUNAL SUBSTRATE	12	14	10	10	12	13
3. EMBEDDEDNESS	7	9	5	8	10	10
4. VELOCITY/DEPTH	16	17	18	16	16	10
5. CHANNEL ALTERATIONS	13	7	8	14	16	10
6. SEDIMENT DEPOSITION	11	11	5	12	5	8
7. RIFFLE FREQUENCY	14	12	11	8	13	15
8. CHANNEL FLOW STATUS	8	17	18	16	16	16
9. BANK CONDITION	6	10	7	10	4	14
10. BANK VEGETATIVE PROTECTION	11	11	13	11	6	13
11. GRAZING/DISRUPTIVE PRESSURES	7	7	8	15	15	11
12. RIPARIAN VEG. ZONE WIDTH	5	14	6	16	17	12
Total Score	125	143	117	150	144	147
Rating ²	MAR	SUB	MAR	SUB	SUB	SUB

¹ Refer to Table 1 and Figure 1 for station locations

² OPT = Optimal (≥ 192); SUB = Suboptimal (132-192); MAR = Marginal (72-132)

BIOLOGICAL USE QUALIFICATIONS

The DEP's Biological use qualifying criterion evaluated for Chester Creek were the aquatic life use definitions described at 25 Pa. Code § 93.3, Table 1 – *Protected Water Uses*. Table 1 defines the TSF protected use as;

Maintenance of stocked trout from February 15 to July 31 and maintenance and propagation of fish species and additional flora and fauna which are indigenous to a warm water habitat.

A review of PFBC records indicates that trout stocking has occurred and was scheduled to occur in 2023. Two reaches on Chester Creek have trout stocking records. The first reach is Chester Creek mainstem from Forge Road (39.91590, -75.48470) to the confluence with West Branch Chester Creek. The second reach is Chester Creek from West Branch Chester Creek to Bridgewater Road (39.86430, -75.39730). PFBC stocking records along with the dominance of fish species preferring cool-water habitats indicates that seasonal maintenance of stocked trout is appropriate throughout the watershed.

PUBLIC NOTICE AND REQUEST FOR TECHNICAL DATA

Evaluation Notice

The DEP provided public notice of this redesignation evaluation and requested any technical data from the general public on the DEP website and through publication in the *Pennsylvania Bulletin* on October 2, 2021 (51 Pa.B. 6320). In addition, Chester County, Chester County Conservation District, Lancaster County Conservation District, Lancaster County, Little Britain Township, West Chester Borough, West Goshen Township, Trout Unlimited, and Delaware Riverkeeper Network were notified of the redesignation evaluation in a letter dated October 2, 2021. No data on water chemistry, instream habitat or aquatic communities were received in response to these notices.

Final Draft Notice, Comments and Response

Once the final draft report was completed it was made available to affected municipalities, County Planning Commissions, County Conservation Districts, and the PFBC in a letter dated April 20, 2024 with a public comment period ending 30-days later. In addition, the DEP provided public notice of the draft report comment period on the DEP's website and in the *Pennsylvania Bulletin* on April 20, 2024 (54 Pa.B. 2168). In addition, notifications were distributed through the DEP eNotice.

All comments received were in support of the redesignation recommendations in the draft report. Comments were received from the PFBC and the Theodore Roosevelt Conservation Partnership. All comments and data received throughout the public participation opportunities were considered in the evaluation and recommendations.

RECOMMENDATION

As a result of the 2017 Triennial Review of Water Quality Standards, the designated use of Chester Creek was changed from TSF, MF to WWF, MF in 25 Pa. Code § 93.9g. This change was made to correct errors that had occurred as a result of a 1996 rulemaking. EPA's partial approval of the 2017 Triennial Review did not include the change to the Chester Creek designated use. Subsequently, the DEP performed a more detailed evaluation of Chester Creek.

Based on survey data and PFBC trout stocking records, the DEP recommends the designated use for the Chester Creek basin from source to East Branch Chester Creek be updated to TSF, MF. In addition, the DEP is also recommending the designated use for the Chester Creek basin from Dutton Mills Road Bridge to UNT 00526 be redesignated from WWF, MF to TSF, MF.

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APPENDIX A – PHYSICOCHEMICAL DATA

Table A1. November 2013 Physicochemical Data.

	PARAMETER	UNITS	STATIONS ¹		
			1CC	2CC	3CC
METALS AND IONS	ALUMINUM T	ug/L	56	375	67
	BARIUM T	ug/L	194	77	83
	BORON T	ug/L	30	140	120
	BROMIDE T	ug/L	124.818	125.207	113.62
	CALCIUM T	mg/L	62.7	47.4	43.5
	CHLORIDE T	mg/L	169	143	128
	COPPER T	ug/L	2.25	10.3	7.13
	IRON T	ug/L	207	355	141
	LEAD T	ug/L	1.14	0.277	0.19
	MAGNESIUM T	mg/L	30.1	20.2	18
	MANGANESE T	ug/L	84	125	27
	NICKEL T	ug/L	<13.7856	<13.7856	<13.7856
	SELENIUM T	ug/L	0.911	0.662	0.8
	SODIUM T	mg/L	36.9	60.6	56.6
	STRONTIUM T	ug/L	274	265	276
	SULFATE T	mg/L	39.874	49.69	45.144
	ZINC T	ug/L	28	46	29
NUTRIENTS	AMMONIA D	mg/L	0.082	0.087	0.02
	AMMONIA T	mg/L	0.08	0.086	0.018
	NITRATE & NITRITE D	mg/L	2.862	17.576	16.208
	NITRATE & NITRITE T	mg/L	2.826	17.089	16.227
	NITROGEN D	mg/L	3.201	19.537	18.465
	NITROGEN T	mg/L	3.573	19.526	18.739
	ORTHO PHOSPHORUS D	mg/L	0.095	1.266	1.213
	ORTHO PHOSPHORUS T	mg/L	0.088	1.332	1.228
	PHOSPHORUS D	mg/L	0.113	1.348	1.315
	PHOSPHORUS T	mg/L	0.129	1.647	1.368
PHYSICAL/OTHER	ALKALINITY T	mg/L	110.6	58.8	53.8
	DISCHARGE	CFS	0.78	8.047	12.08
	DISSOLVED OXYGEN	mg/L	11.14	11.26	13.34
	DISSOLVED OXYGEN	%	93	103.6	113
	HARDNESS T	mg/L	281	202	183
	OSMOTIC PRESSURE	mosm/kg	14	14	11
	pH	pH units	7.26	6.91	7.46
	SPECIFIC COND	umhos/cm	809	803	737
	TEMPERATURE	C	7.49	11.55	8.03
	TDS	mg/L	588	532	456
	TSS	mg/L	10	16	<5
	TOC	mg/L	2.303	4.574	3.646

¹ Refer to Table 1 and Figure 1 for station locations

<” indicate concentrations below the reporting limit

-“ indicate parameter was not tested

Table A2. January 2014 Physicochemical Data.

	PARAMETER	UNITS	STATIONS ¹		
			1CC	2CC	3CC
METALS AND IONS	ALUMINUM T	ug/L	64	214	101
	BARIUM T	ug/L	232	98	95
	BORON T	ug/L	40	100	130
	BROMIDE T	ug/L	142.4	120.36	107.21
	CALCIUM T	mg/L	70.9	51	47.6
	CHLORIDE T	mg/L	185	196.85	132
	COPPER T	ug/L	3.2	9.37	6.41
	IRON T	ug/L	251	281	149
	LEAD T	ug/L	0.716	0.246	0.199
	MAGNESIUM T	mg/L	30.9	20.6	19
	MANGANESE T	ug/L	147	110	51
	NICKEL T	ug/L	15	<12	14
	SELENIUM T	ug/L	0.914	0.486	0.519
	SODIUM T	mg/L	146	96.1	88
	STRONTIUM T	ug/L	305	255	270
	SULFATE T	mg/L	35.51	38.3	33.6
	ZINC T	ug/L	41	42	30
NUTRIENTS	AMMONIA D	mg/L	0.095	0.189	0.021
	AMMONIA T	mg/L	0.089	0.188	0.049
	NITRATE & NITRITE D	mg/L	2.293	13.133	11.189
	NITRATE & NITRITE T	mg/L	2.282	12.316	11.128
	NITROGEN D	mg/L	2.838	14.919	12.583
	NITROGEN T	mg/L	2.639	14.778	12.398
	ORTHO PHOSPHORUS D	mg/L	0.03	1.194	1.051
	ORTHO PHOSPHORUS T	mg/L	0.035	1.264	1.093
	PHOSPHORUS D	mg/L	0.031	1.289	1.074
	PHOSPHORUS T	mg/L	0.053	1.464	1.124
PHYSICAL/OTHER	ALKALINITY T	mg/L	110	64.8	48.2
	DISCHARGE	CFS	0.61	6.84	10.05
	DISSOLVED OXYGEN	mg/L	10.04	10.41	13.67
	DISSOLVED OXYGEN	%	-	-	-
	HARDNESS T	mg/L	305	212	197
	OSMOTIC PRESSURE	mosm/kg	22	16	15
	pH	pH units	6.91	6.64	7.8
	SPECIFIC COND	umhos/cm	1389	975.5	911.9
	TEMPERATURE	C	7.84	11.3	15.58
	TDS	mg/L	732	522	544
	TSS	mg/L	6	10	6
	TOC	mg/L	2.684	6.082	5.408

¹ Refer to Table 1 and Figure 1 for station locations

“<” indicate concentrations below the reporting limit

“-” indicate parameter was not tested

Table A3. February 2014 Physicochemical Data.

	PARAMETER	UNITS	STATIONS ¹		
			1CC	2CC	3CC
METALS AND IONS	ALUMINUM T	ug/L	91	62	94
	BARIUM T	ug/L	209	122	132
	BORON T	ug/L	20	80	60
	BROMIDE T	ug/L	317.131	135.809	110.703
	CALCIUM T	mg/L	79.3	50.9	53.4
	CHLORIDE T	mg/L	1277	337	303
	COPPER T	ug/L	3.55	8.47	6.28
	IRON T	ug/L	359	341	313
	LEAD T	ug/L	1.02	0.301	0.329
	MAGNESIUM T	mg/L	27.3	21.3	21.39
	MANGANESE T	ug/L	224	137	119
	NICKEL T	ug/L	<13.7856	<13.7856	<13.7856
	SELENIUM T	ug/L	<0.32605	0.519	0.464
	SODIUM T	mg/L	699	182	171.5
	STRONTIUM T	ug/L	398	274	284
	SULFATE T	mg/L	52.114	41.141	34.485
	ZINC T	ug/L	45	43	35
NUTRIENTS	AMMONIA D	mg/L	0.298	2.723	2.388
	AMMONIA T	mg/L	0.291	2.676	2.353
	NITRATE & NITRITE D	mg/L	2.496	11.613	9.778
	NITRATE & NITRITE T	mg/L	2.489	11.668	9.717
	NITROGEN D	mg/L	3.722	15.713	12.982
	NITROGEN T	mg/L	3.864	14.897	13.03
	ORTHO PHOSPHORUS D	mg/L	0.029	1.759	1.281
	ORTHO PHOSPHORUS T	mg/L	0.049	1.798	1.341
	PHOSPHORUS D	mg/L	0.051	1.904	1.384
	PHOSPHORUS T	mg/L	0.098	2.012	1.465
PHYSICAL/OTHER	ALKALINITY T	mg/L	107.6	87.8	76.4
	DISCHARGE	CFS	3.833	13.011	17.005
	DISSOLVED OXYGEN	mg/L	13.61	12.57	13.52
	DISSOLVED OXYGEN	%	111.2	107.6	105
	HARDNESS T	mg/L	311	215	222
	OSMOTIC PRESSURE	mosm/kg	67	22	20
	pH	pH units	7.36	7.12	7.44
	SPECIFIC COND	umhos/cm	4085	1441	1281
	TEMPERATURE	C	6.09	8.35	4.55
	TDS	mg/L	2188	816	722
	TSS	mg/L	8	6	6
	TOC	mg/L	3.563	5.708	3.89

¹ Refer to Table 1 and Figure 1 for station locations

“<” indicate concentrations below the reporting limit

“-” indicate parameter was not tested

Table A4. March 2014 Physicochemical Data.

	PARAMETER	UNITS	STATIONS ¹		
			1CC	2CC	3CC
METALS AND IONS	ALUMINUM T	ug/L	34	82	78
	BARIUM T	ug/L	216	101	106
	BORON T	ug/L	30	100	60
	BROMIDE T	ug/L	252.54	97.546	79.787
	CALCIUM T	mg/L	69.6	48.1	43.4
	CHLORIDE T	mg/L	888	214	165
	COPPER T	ug/L	2.61	7.42	7.59
	IRON T	ug/L	248	347	242
	LEAD T	ug/L	0.382	0.257	0.373
	MAGNESIUM T	mg/L	27.4	19.5	17.6
	MANGANESE T	ug/L	201	135	97
	NICKEL T	ug/L	<13.7856	<13.7856	<13.7856
	SELENIUM T	ug/L	<0.32605	0.377	0.462
	SODIUM T	mg/L	458	100	70.8
	STRONTIUM T	ug/L	343	257	251
	SULFATE T	mg/L	51.16	40.34	33.278
	ZINC T	ug/L	36	41	28
NUTRIENTS	AMMONIA D	mg/L	0.194	0.187	0.055
	AMMONIA T	mg/L	0.181	0.183	0.061
	NITRATE & NITRITE D	mg/L	2.558	9.283	8.454
	NITRATE & NITRITE T	mg/L	2.54	9.368	8.188
	NITROGEN D	mg/L	3.047	9.899	8.502
	NITROGEN T	mg/L	2.938	10.176	8.671
	ORTHO PHOSPHORUS D	mg/L	0.024	0.63	0.479
	ORTHO PHOSPHORUS T	mg/L	0.034	0.655	0.502
	PHOSPHORUS D	mg/L	0.043	0.683	0.491
	PHOSPHORUS T	mg/L	0.072	0.798	0.568
PHYSICAL/OTHER	ALKALINITY T	mg/L	113.8	82	67.6
	DISCHARGE	CFS	1.78	12.34	20.71
	DISSOLVED OXYGEN	mg/L	13.91	12.45	13.01
	DISSOLVED OXYGEN	%	108.1	103.7	101.5
	HARDNESS T	mg/L	287	201	181
	OSMOTIC PRESSURE	mosm/kg	50	14	13
	pH	pH units	7.25	6.99	7.29
	SPECIFIC COND	umhos/cm	3115	1054	828
	TEMPERATURE	C	4.27	7.31	4.74
	TDS	mg/L	1694	588	472
	TSS	mg/L	8	8	14
	TOC	mg/L	3.525	4.603	3.174

¹ Refer to Table 1 and Figure 1 for station locations

“<” indicate concentrations below the reporting limit

“-” indicate parameter was not tested

Table A5. April 2014 Physicochemical Data.

	PARAMETER	UNITS	STATIONS ¹		
			1CC	2CC	3CC
METALS AND IONS	ALUMINUM T	ug/L	52	143	107
	BARIUM T	ug/L	180	76	85
	BORON T	ug/L	40	130	80
	BROMIDE T	ug/L	127.031	116.101	95.884
	CALCIUM T	mg/L	68.13	47.11	41.1
	CHLORIDE T	mg/L	223	164	153
	COPPER T	ug/L	2.61	15.2	5.5
	IRON T	ug/L	264	317	260
	LEAD T	ug/L	0.468	0.536	0.24
	MAGNESIUM T	mg/L	31.52	20.29	17.8
	MANGANESE T	ug/L	92	81	51
	NICKEL T	ug/L	<13.7856	<13.7856	<13.7856
	SELENIUM T	ug/L	0.569	0.437	0.502
	SODIUM T	mg/L	68.98	72.06	53.3
	STRONTIUM T	ug/L	294	233	267
	SULFATE T	mg/L	38.9	39.06	33.35
	ZINC T	ug/L	10	32	16
NUTRIENTS	AMMONIA D	mg/L	0.039	0.044	0.024
	AMMONIA T	mg/L	0.038	0.046	0.024
	NITRATE & NITRITE D	mg/L	2.447	13.156	9.207
	NITRATE & NITRITE T	mg/L	2.426	13.013	9.253
	NITROGEN D	mg/L	2.829	14.422	10.008
	NITROGEN T	mg/L	3.069	14.632	10.117
	ORTHO PHOSPHORUS D	mg/L	0.04	1.479	0.771
	ORTHO PHOSPHORUS T	mg/L	0.034	1.537	0.803
	PHOSPHORUS D	mg/L	0.05	1.605	0.856
PHYSICAL/OTHER	PHOSPHORUS T	mg/L	0.078	1.792	0.942
	ALKALINITY T	mg/L	113	65	65.8
	DISCHARGE	CFS	1.902	17.781	18.616
	DISSOLVED OXYGEN	mg/L	15.68	12.74	14.41
	DISSOLVED OXYGEN	%	-	-	-
	HARDNESS T	mg/L	300	201	176
	OSMOTIC PRESSURE	mosm/kg	16	12	10
	pH	pH units	8.26	7.25	8.79
	SPECIFIC COND	umhos/cm	100.7	794.1	722.1
	TEMPERATURE	C	17.77	16.31	17.29
	TDS	mg/L	664	560	474
	TSS	mg/L	<5	<5	<5
	TOC	mg/L	3.362	5.489	3.489

¹ Refer to Table 1 and Figure 1 for station locations

“<” indicate concentrations below the reporting limit

“-” indicate parameter was not tested

Table A6. May 2014 Physicochemical Data.

PARAMETER		UNITS	STATIONS ¹		
			1CC	2CC	3CC
METALS AND IONS	ALUMINUM T	ug/L	60	145	106
	BARIUM T	ug/L	186	92	107
	BORON T	ug/L	30	70	50
	BROMIDE T	ug/L	117.666	87.836	79.438
	CALCIUM T	mg/L	69.7	51.02	45.3
	CHLORIDE T	mg/L	209	144	129
	COPPER T	ug/L	3.05	8.12	5.18
	IRON T	ug/L	254	324	279
	LEAD T	ug/L	0.77	0.336	0.377
	MAGNESIUM T	mg/L	30.1	21.24	18.9
	MANGANESE T	ug/L	109	96	79
	NICKEL T	ug/L	<13.7856	<13.7856	<13.7856
	SELENIUM T	ug/L	1.01	0.81	0.813
	SODIUM T	mg/L	73.8	67.69	56.4
	STRONTIUM T	ug/L	310	240	271
	SULFATE T	mg/L	44.46	35.585	32.12
	ZINC T	ug/L	29	33	31
NUTRIENTS	AMMONIA D	mg/L	0.119	0.146	0.144
	AMMONIA T	mg/L	0.116	0.15	0.146
	NITRATE & NITRITE D	mg/L	2.77	11.899	8.659
	NITRATE & NITRITE T	mg/L	2.778	11.938	8.583
	NITROGEN D	mg/L	3.088	12.377	9.211
	NITROGEN T	mg/L	3.068	13.155	9.154
	ORTHO PHOSPHORUS D	mg/L	0.029	0.806	0.469
	ORTHO PHOSPHORUS T	mg/L	0.036	0.847	0.494
	PHOSPHORUS D	mg/L	0.042	0.844	0.516
	PHOSPHORUS T	mg/L	0.057	1.156	0.586
PHYSICAL/OTHER	ALKALINITY T	mg/L	129.8	76.8	73.4
	DISCHARGE	CFS	2.252	17.605	24.932
	DISSOLVED OXYGEN	mg/L	11.36	9.77	11.43
	DISSOLVED OXYGEN	%	-	-	-
	HARDNESS T	mg/L	298	215	191
	OSMOTIC PRESSURE	mosm/kg	15	12	9
	pH	pH units	7.44	7.07	7.63
	SPECIFIC COND	umhos/cm	1027	807	722
	TEMPERATURE	C	16.71	16.22	16.38
	TDS	mg/L	708	558	510
	TSS	mg/L	<5	<5	<5
	TOC	mg/L	2.461	4.248	3.05

¹ Refer to Table 1 and Figure 1 for station locations

“<” indicate concentrations below the reporting limit

“-” indicate parameter was not tested

Table A7. June 2014 Physicochemical Data.

	PARAMETER	UNITS	STATIONS ¹		
			1CC	2CC	3CC
METALS AND IONS	ALUMINUM T	ug/L	54	164	121
	BARIUM T	ug/L	212	75	84
	BORON T	ug/L	20	110	80
	BROMIDE T	ug/L	128.395	126.548	100.187
	CALCIUM T	mg/L	72.3	49.82	43.9
	CHLORIDE T	mg/L	199	138	123
	COPPER T	ug/L	2.29	9.45	6.24
	IRON T	ug/L	197	359	236
	LEAD T	ug/L	0.478	0.317	0.303
	MAGNESIUM T	mg/L	34.7	21.17	19
	MANGANESE T	ug/L	66	94	36
	NICKEL T	ug/L	<13.7856	<13.7856	<13.7856
	SELENIUM T	ug/L	0.958	1.07	0.963
	SODIUM T	mg/L	57.9	61.49	54
	STRONTIUM T	ug/L	312	242	265
	SULFATE T	mg/L	35.673	37.59	32.882
	ZINC T	ug/L	22	33	31
NUTRIENTS	AMMONIA D	mg/L	0.058	0.133	0.035
	AMMONIA T	mg/L	0.056	0.124	0.033
	NITRATE & NITRITE D	mg/L	2.839	13.884	11.678
	NITRATE & NITRITE T	mg/L	2.842	14.005	11.645
	NITROGEN D	mg/L	3.192	14.724	11.81
	NITROGEN T	mg/L	3.168	14.819	12.229
	ORTHO PHOSPHORUS D	mg/L	0.048	1.229	0.802
	ORTHO PHOSPHORUS T	mg/L	0.056	1.286	0.818
	PHOSPHORUS D	mg/L	0.046	1.263	0.828
	PHOSPHORUS T	mg/L	0.062	1.438	0.895
PHYSICAL/OTHER	ALKALINITY T	mg/L	116.4	66.8	59.2
	DISCHARGE	CFS	1.04	5.27	13.04
	DISSOLVED OXYGEN	mg/L	7.84	8.75	9.67
	DISSOLVED OXYGEN	%	-	-	-
	HARDNESS T	mg/L	324	212	188
	OSMOTIC PRESSURE	mosm/kg	13	11	10
	pH	pH units	7.41	7.1	7.61
	SPECIFIC COND	umhos/cm	970.3	775.8	698.9
	TEMPERATURE	C	18.55	19.82	20.78
	TDS	mg/L	656	572	510
	TSS	mg/L	<5	6	8
	TOC	mg/L	1.919	4.456	3.542

¹ Refer to Table 1 and Figure 1 for station locations

“<” indicate concentrations below the reporting limit

“-” indicate parameter was not tested

Table A8. July 2014 Physicochemical Data.

	PARAMETER	UNITS	STATIONS ¹		
			1CC	2CC	3CC
METALS AND IONS	ALUMINUM T	ug/L	24	513	162
	BARIUM T	ug/L	183	66	76
	BORON T	ug/L	30	110	90
	BROMIDE T	ug/L	108.758	121.571	110.383
	CALCIUM T	mg/L	59.8	48.31	45.78
	CHLORIDE T	mg/L	184	138	124
	COPPER T	ug/L	3.17	11.1	7.47
	IRON T	ug/L	301	322	231
	LEAD T	ug/L	0.314	0.391	0.313
	MAGNESIUM T	mg/L	28.1	19.8	18.48
	MANGANESE T	ug/L	79	81	29
	NICKEL T	ug/L	<13.7856	<13.7856	<13.7856
	SELENIUM T	ug/L	0.457	0.447	0.414
	SODIUM T	mg/L	67	62.11	54.79
	STRONTIUM T	ug/L	251	240	250
	SULFATE T	mg/L	34.866	40.566	35.939
	ZINC T	ug/L	17	35	19
NUTRIENTS	AMMONIA D	mg/L	0.104	0.067	0.021
	AMMONIA T	mg/L	0.109	0.065	0.023
	NITRATE & NITRITE D	mg/L	2.196	18.372	15.001
	NITRATE & NITRITE T	mg/L	2.191	18.324	15.249
	NITROGEN D	mg/L	2.794	19.318	16.432
	NITROGEN T	mg/L	2.636	19.399	16.195
	ORTHO PHOSPHORUS D	mg/L	0.057	0.849	0.785
	ORTHO PHOSPHORUS T	mg/L	0.076	0.984	0.806
	PHOSPHORUS D	mg/L	0.054	0.878	0.809
	PHOSPHORUS T	mg/L	0.083	1.33	0.86
PHYSICAL/OTHER	ALKALINITY T	mg/L	117.2	47	49.8
	DISCHARGE	CFS	0.907	10.77	12.26
	DISSOLVED OXYGEN	mg/L	6.31	8.75	9.57
	DISSOLVED OXYGEN	%	-	-	-
	HARDNESS T	mg/L	265	202	191
	OSMOTIC PRESSURE	mosm/kg	13	12	10
	pH	pH units	7.21	6.93	7.55
	SPECIFIC COND	umhos/cm	924.6	796.7	721.7
	TEMPERATURE	C	18.98	20.81	21.32
	TDS	mg/L	604	558	512
	TSS	mg/L	<5	<5	6
	TOC	mg/L	3.258	4.191	3.482

¹ Refer to Table 1 and Figure for station locations

“<” indicate concentrations below the reporting limit

“-” indicate parameter was not tested

Table A9. August 2014 Physicochemical Data.

	PARAMETER	UNITS	STATIONS ¹		
			1CC	2CC	3CC
METALS AND IONS	ALUMINUM T	ug/L	<13.7514	172	144
	BARIUM T	ug/L	210	73	77
	BORON T	ug/L	40	140	120
	BROMIDE T	ug/L	119.177	130.696	111.54
	CALCIUM T	mg/L	73.58	49.9	45.2
	CHLORIDE T	mg/L	199	150	132
	COPPER T	ug/L	2.1	10.6	7.8
	IRON T	ug/L	145	270	290
	LEAD T	ug/L	0.352	0.423	0.721
	MAGNESIUM T	mg/L	34.5	20.8	18.4
	MANGANESE T	ug/L	62	88	33
	NICKEL T	ug/L	<13.7856	<13.7856	<13.7856
	SELENIUM T	ug/L	0.766	0.745	0.772
	SODIUM T	mg/L	49.18	60.5	54.9
	STRONTIUM T	ug/L	302	265	263
	SULFATE T	mg/L	35.859	43.473	40.099
	ZINC T	ug/L	15	35	20
NUTRIENTS	AMMONIA D	mg/L	0.052	0.287	0.026
	AMMONIA T	mg/L	0.06	0.317	0.033
	NITRATE & NITRITE D	mg/L	2.642	16.67	16.569
	NITRATE & NITRITE T	mg/L	2.649	16.534	16.91
	NITROGEN D	mg/L	2.731	17.916	16.279
	NITROGEN T	mg/L	2.887	18.907	16.909
	ORTHO PHOSPHORUS D	mg/L	0.053	1.523	1.309
	ORTHO PHOSPHORUS T	mg/L	0.059	1.573	1.338
	PHOSPHORUS D	mg/L	0.058	1.645	1.447
	PHOSPHORUS T	mg/L	0.081	1.957	1.464
PHYSICAL/OTHER	ALKALINITY T	mg/L	117.4	49	45.4
	DISCHARGE	CFS	0.5644	7.28	3.88
	DISSOLVED OXYGEN	mg/L	7.33	8.4	10.35
	DISSOLVED OXYGEN	%	-	-	-
	HARDNESS T	mg/L	326	210	189
	OSMOTIC PRESSURE	mosm/kg	13	12	12
	pH	pH units	7.23	6.89	7.6
	SPECIFIC COND	umhos/cm	942.6	830.1	748.4
	TEMPERATURE	C	18.81	21.01	21.1
	TDS	mg/L	672	604	482
	TSS	mg/L	<5	<5	<5
	TOC	mg/L	2.656	4.511	3.88

¹ Refer to Table 1 and Figure 1 for station locations

“<” indicate concentrations below the reporting limit

“-” indicate parameter was not tested

Table A10. September 2014 Physicochemical Data.

	PARAMETER	UNITS	STATIONS ¹		
			1CC	2CC	3CC
METALS AND IONS	ALUMINUM T	ug/L	23	187	130
	BARIUM T	ug/L	234	65	71
	BORON T	ug/L	40	140	130
	BROMIDE T	ug/L	121.72	122.686	108.982
	CALCIUM T	mg/L	63.5	47.4	44.4
	CHLORIDE T	mg/L	154	130	120
	COPPER T	ug/L	1.81	9.83	8.43
	IRON T	ug/L	124	211	166
	LEAD T	ug/L	0.231	0.229	0.254
	MAGNESIUM T	mg/L	30.6	19.4	17.8
	MANGANESE T	ug/L	47	72	19
	NICKEL T	ug/L	<12	<12	<12
	SELENIUM T	ug/L	0.433	0.413	0.377
	SODIUM T	mg/L	42.3	65.1	60.5
	STRONTIUM T	ug/L	317	268	275
	SULFATE T	mg/L	36.096	45.55	41.382
	ZINC T	ug/L	22	41	30
NUTRIENTS	AMMONIA D	mg/L	0.044	0.061	0.023
	AMMONIA T	mg/L	0.046	0.059	0.025
	NITRATE & NITRITE D	mg/L	2.661	20.185	17.974
	NITRATE & NITRITE T	mg/L	2.65	20.372	17.974
	NITROGEN D	mg/L	3.099	20.251	17.575
	NITROGEN T	mg/L	2.799	21.134	17.58
	ORTHO PHOSPHORUS D	mg/L	0.057	1.84	1.72
	ORTHO PHOSPHORUS T	mg/L	0.065	1.885	1.717
	PHOSPHORUS D	mg/L	0.058	1.834	1.696
	PHOSPHORUS T	mg/L	0.072	2.104	1.782
PHYSICAL/OTHER	ALKALINITY T	mg/L	116.2	50.4	49
	DISCHARGE	CFS	0.5638	6.84	7.81
	DISSOLVED OXYGEN	mg/L	8.4	9.73	12.07
	DISSOLVED OXYGEN	%	-	-	-
	HARDNESS T	mg/L	285	198	184
	OSMOTIC PRESSURE	mosm/kg	12	12	12
	pH	pH units	7.27	7.11	8.04
	SPECIFIC COND	umhos/cm	899	850.4	774
	TEMPERATURE	C	14.89	18.32	17.31
	TDS	mg/L	636	552	408
	TSS	mg/L	<5	<5	10
	TOC	mg/L	2.058	4.618	4.089

¹ Refer to Table 1 and Figure 1 for station locations

“<” indicate concentrations below the reporting limit

“-” indicate parameter was not tested

Table A11. October 2014 Physicochemical Data.

	PARAMETER	UNITS	STATIONS ¹		
			1CC	2CC	3CC
METALS AND IONS	ALUMINUM T	ug/L	18	154	67
	BARIUM T	ug/L	189	61	64
	BORON T	ug/L	50	180	150
	BROMIDE T	ug/L	128.487	112.6955	94.3515
	CALCIUM T	mg/L	61	45.2	41.9
	CHLORIDE T	mg/L	179	139	131
	COPPER T	ug/L	2.6	8.32	6.74
	IRON T	ug/L	166	234	129
	LEAD T	ug/L	0.229	0.198	0.169
	MAGNESIUM T	mg/L	29.4	18.6	17.2
	MANGANESE T	ug/L	79	84	19
	NICKEL T	ug/L	15	<12	14
	SELENIUM T	ug/L	0.585	0.486	0.519
	SODIUM T	mg/L	46.5	63.5	57.9
	STRONTIUM T	ug/L	263	240	244
	SULFATE T	mg/L	37.475	46.438	41.615
	ZINC T	ug/L	23	25	24
NUTRIENTS	AMMONIA D	mg/L	0.619	0.375	0.066
	AMMONIA T	mg/L	0.623	0.366	0.072
	NITRATE & NITRITE D	mg/L	2.056	16.129	16.211
	NITRATE & NITRITE T	mg/L	2.049	17.011	16.112
	NITROGEN D	mg/L	2.878	16.765	16.761
	NITROGEN T	mg/L	2.952	16.907	15.931
	ORTHO PHOSPHORUS D	mg/L	0.063	1.697	1.387
	ORTHO PHOSPHORUS T	mg/L	0.075	1.736	1.439
	PHOSPHORUS D	mg/L	0.072	1.721	1.419
	PHOSPHORUS T	mg/L	0.093	1.854	1.444
PHYSICAL/OTHER	ALKALINITY T	mg/L	124.4	62.8	50.6
	DISCHARGE	CFS	0.61	6.84	10.05
	DISSOLVED OXYGEN	mg/L	7.62	9.41	11.78
	DISSOLVED OXYGEN	%	-	-	-
	HARDNESS T	mg/L	274	190	176
	OSMOTIC PRESSURE	mosm/kg	12	11	12
	pH	pH units	7.3	7.01	7.54
	SPECIFIC COND	umhos/cm	887.2	817	744.7
	TEMPERATURE	C	10.67	14.9	13.53
	TDS	mg/L	568	522	480
	TSS	mg/L	<5	<5	<5
	TOC	mg/L	2.969	5.286	4.366

¹ Refer to Table 1 and Figure 1 for station locations

“<” indicate concentrations below the reporting limit

“-” indicate parameter was not tested

Table A12. November 2014 Physicochemical Data.

	PARAMETER	UNITS	STATIONS ¹		
			1CC	2CC	3CC
METALS AND IONS	ALUMINUM T	ug/L	15	153	86
	BARIUM T	ug/L	195	76	78
	BORON T	ug/L	30	130	130
	BROMIDE T	ug/L	122.7815	128.7454	108.1606
	CALCIUM T	mg/L	69.1	50.3	43.5
	CHLORIDE T	mg/L	185	148	132
	COPPER T	ug/L	1.96	12.2	9.16
	IRON T	ug/L	117	224	120
	LEAD T	ug/L	0.258	0.2	0.189
	MAGNESIUM T	mg/L	32.9	20.9	17.6
	MANGANESE T	ug/L	60	91	23
	NICKEL T	ug/L	<12	<12	<12
	SELENIUM T	ug/L	0.914	<0.763	<0.763
	SODIUM T	mg/L	46.8	62.9	55.7
	STRONTIUM T	ug/L	271	269	270
	SULFATE T	mg/L	35.29	45.937	41.704
	ZINC T	ug/L	22	41	34
NUTRIENTS	AMMONIA D	mg/L	0.063	0.069	0.021
	AMMONIA T	mg/L	0.066	0.073	0.019
	NITRATE & NITRITE D	mg/L	2.366	19.301	19.037
	NITRATE & NITRITE T	mg/L	2.343	19.351	19.037
	NITROGEN D	mg/L	2.653	19.286	17.911
	NITROGEN T	mg/L	2.685	19.404	17.636
	ORTHO PHOSPHORUS D	mg/L	0.061	1.861	1.666
	ORTHO PHOSPHORUS T	mg/L	0.07	1.908	1.69
	PHOSPHORUS D	mg/L	0.066	1.795	1.625
	PHOSPHORUS T	mg/L	0.079	1.957	1.646
PHYSICAL/OTHER	ALKALINITY T	mg/L	120.4	55.2	48.2
	DISCHARGE	CFS	-	-	-
	DISSOLVED OXYGEN	mg/L	7.91	9.48	11.76
	DISSOLVED OXYGEN	%	-	-	-
	HARDNESS T	mg/L	308	212	181
	OSMOTIC PRESSURE	mosm/kg	14	14	12
	pH	pH units	7.08	7.01	7.96
	SPECIFIC COND	umhos/cm	889.5	848.3	770.3
	TEMPERATURE	C	13	16.13	15.58
	TDS	mg/L	558	524	470
	TSS	mg/L	6	8	6
	TOC	mg/L	2.256	5.52	5.408

¹ Refer to Table 1 and Figure 1 for station locations

" < " indicate concentrations below the reporting limit

" - " indicate parameter was not tested

Table A13. December 2014 Physicochemical Data.

	PARAMETER	UNITS	STATIONS ¹		
			1CC	2CC	3CC
METALS AND IONS	ALUMINUM T	ug/L	64	214	101
	BARIUM T	ug/L	232	98	95
	BORON T	ug/L	40	100	80
	BROMIDE T	ug/L	142.4	120.36	107.21
	CALCIUM T	mg/L	70.9	51	47.6
	CHLORIDE T	mg/L	<0.5	196.85	183.1
	COPPER T	ug/L	3.2	9.37	6.41
	IRON T	ug/L	251	281	149
	LEAD T	ug/L	0.716	0.246	0.199
	MAGNESIUM T	mg/L	30.9	20.6	19
	MANGANESE T	ug/L	147	110	51
	NICKEL T	ug/L	<12	<12	<12
	SELENIUM T	ug/L	<0.763	<0.763	<0.763
	SODIUM T	mg/L	146	96.1	88
	STRONTIUM T	ug/L	305	255	258
	SULFATE T	mg/L	35.51	38.3	33.6
	ZINC T	ug/L	41	42	30
NUTRIENTS	AMMONIA D	mg/L	0.095	0.189	0.053
	AMMONIA T	mg/L	0.089	0.188	0.049
	NITRATE & NITRITE D	mg/L	2.293	13.133	11.189
	NITRATE & NITRITE T	mg/L	2.282	12.316	11.128
	NITROGEN D	mg/L	2.838	14.919	12.583
	NITROGEN T	mg/L	2.639	14.778	12.398
	ORTHO PHOSPHORUS D	mg/L	0.03	1.194	1.051
	ORTHO PHOSPHORUS T	mg/L	0.035	1.264	1.093
	PHOSPHORUS D	mg/L	0.031	1.289	1.074
	PHOSPHORUS T	mg/L	0.053	1.464	1.124
PHYSICAL/OTHER	ALKALINITY T	mg/L	110	64.8	59.8
	DISCHARGE	CFS	-	-	-
	DISSOLVED OXYGEN	mg/L	10.04	10.41	13.67
	DISSOLVED OXYGEN	%	-	-	-
	HARDNESS T	mg/L	305	212	197
	OSMOTIC PRESSURE	mosm/kg	22	16	15
	pH	pH units	6.91	6.64	7.8
	SPECIFIC COND	umhos/cm	1389	975.5	911.9
	TEMPERATURE	C	7.84	11.3	9.73
	TDS	mg/L	732	522	544
	TSS	mg/L	6	10	<5
	TOC	mg/L	2.684	6.082	4.408

¹ Refer to Table 1 and Figure 1 for station locations

" < " indicate concentrations below the reporting limit

" - " indicate parameter was not tested

Table A14. February 2015 Physicochemical Data.

	PARAMETER	UNITS	STATIONS ¹		
			1CC	2CC	3CC
METALS AND IONS	ALUMINUM T	ug/L	52	239	185
	BARIUM T	ug/L	220	113	116
	BORON T	ug/L	30	100	80
	BROMIDE T	ug/L	114.25	92.71	80.06
	CALCIUM T	mg/L	75.1	54.4	50.5
	CHLORIDE T	mg/L	407	276	244
	COPPER T	ug/L	4.87	9.28	5.5
	IRON T	ug/L	456	351	256
	LEAD T	ug/L	0.606	0.325	0.291
	MAGNESIUM T	mg/L	30.9	21	19.7
	MANGANESE T	ug/L	385	159	124
	NICKEL T	ug/L	<12	<12	<12
	SELENIUM T	ug/L	0.849	0.919	<0.763
	SODIUM T	mg/L	180	140	114
	STRONTIUM T	ug/L	306	265	270
	SULFATE T	mg/L	41.137	44.026	36.48
	ZINC T	ug/L	47	60	37
NUTRIENTS	AMMONIA D	mg/L	0.592	0.831	0.562
	AMMONIA T	mg/L	0.594	0.823	0.567
	NITRATE & NITRITE D	mg/L	2.407	14.862	11.651
	NITRATE & NITRITE T	mg/L	2.376	15.032	11.318
	NITROGEN D	mg/L	3.562	16.952	12.79
	NITROGEN T	mg/L	3.705	17.295	12.38
	ORTHO PHOSPHORUS D	mg/L	0.058	1.495	1.018
	ORTHO PHOSPHORUS T	mg/L	0.08	1.644	1.095
	PHOSPHORUS D	mg/L	0.078	1.568	1.098
	PHOSPHORUS T	mg/L	0.157	1.905	1.26
PHYSICAL/OTHER	ALKALINITY T	mg/L	118.6	65.6	62.8
	DISCHARGE	CFS	1.791	10.535	7.27
	DISSOLVED OXYGEN	mg/L	10.56	11.21	13.22
	DISSOLVED OXYGEN	%	-	-	-
	HARDNESS T	mg/L	315	223	207
	OSMOTIC PRESSURE	mosm/kg	24	19	16
	pH	pH units	7.73	6.58	7.27
	SPECIFIC COND	umhos/cm	1588	1272	1096
	TEMPERATURE	C	4.09	7.74	5.46
	TDS	mg/L	942	740	670
	TSS	mg/L	8	8	<5
	TOC	mg/L	2.848	7.026	4.759

¹ Refer to Table 1 and Figure 1 for station locations

" < " indicate concentrations below the reporting limit

" - " indicate parameter was not tested

Table A15. March 2015 Physicochemical Data.

	PARAMETER	UNITS	STATIONS ¹		
			1CC	2CC	3CC
METALS AND IONS	ALUMINUM T	ug/L	106	213	267
	BARIUM T	ug/L	171	101	106
	BORON T	ug/L	20	80	60
	BROMIDE T	ug/L	201.6	134.77	115.04
	CALCIUM T	mg/L	61.8	52	43.2
	CHLORIDE T	mg/L	816	529	459
	COPPER T	ug/L	8.69	9.6	7.27
	IRON T	ug/L	452	321	388
	LEAD T	ug/L	0.721	0.314	0.444
	MAGNESIUM T	mg/L	21	18.2	15.5
	MANGANESE T	ug/L	257	146	123
	NICKEL T	ug/L	<12	<12	<12
	SELENIUM T	ug/L	<0.763	<0.763	<0.763
	SODIUM T	mg/L	471	310	268
	STRONTIUM T	ug/L	255	246	232
	SULFATE T	mg/L	29.347	35.152	27.148
	ZINC T	ug/L	47	43	30
NUTRIENTS	AMMONIA D	mg/L	0.418	0.752	0.415
	AMMONIA T	mg/L	0.405	0.748	0.417
	NITRATE & NITRITE D	mg/L	1.575	9.52	7.091
	NITRATE & NITRITE T	mg/L	1.495	9.382	7.027
	NITROGEN D	mg/L	2.68	11.25	8.308
	NITROGEN T	mg/L	2.557	11.091	8.146
	ORTHO PHOSPHORUS D	mg/L	0.054	1.082	0.659
	ORTHO PHOSPHORUS T	mg/L	0.054	1.141	0.697
	PHOSPHORUS D	mg/L	0.082	1.087	0.695
	PHOSPHORUS T	mg/L	0.119	1.251	0.779
PHYSICAL/OTHER	ALKALINITY T	mg/L	88.8	66	54
	DISCHARGE	CFS	0.59	-	-
	DISSOLVED OXYGEN	mg/L	10.72	12.11	13.86
	DISSOLVED OXYGEN	%	-	-	-
	HARDNESS T	mg/L	241	205	172
	OSMOTIC PRESSURE	mosm/kg	-	14	18
	pH	pH units	7.36	6.91	7.58
	SPECIFIC COND	umhos/cm	2830	1926	1664
	TEMPERATURE	C	3.84	8.09	7.55
	TDS	mg/L	1558	1090	938
	TSS	mg/L	<5	6	10
	TOC	mg/L	3.774	6.036	4.877

¹ Refer to Table 1 and Figure 1 for station locations

" < " indicate concentrations below the reporting limit

" - " indicate parameter was not tested

Table A16. April 2015 Physicochemical Data.

	PARAMETER	UNITS	STATIONS ¹		
			1CC	2CC	3CC
METALS AND IONS	ALUMINUM T	ug/L	55	167	89
	BARIUM T	ug/L	202	95	99
	BORON T	ug/L	20	90	80
	BROMIDE T	ug/L	122.73	106.38	91.33
	CALCIUM T	mg/L	61.3	50.8	46.9
	CHLORIDE T	mg/L	260	184	162
	COPPER T	ug/L	5.12	9.45	6.06
	IRON T	ug/L	481	408	199
	LEAD T	ug/L	1.05	0.386	0.185
	MAGNESIUM T	mg/L	27.9	21.6	19.7
	MANGANESE T	ug/L	390	151	85
	NICKEL T	ug/L	<12	<12	<12
	SELENIUM T	ug/L	1	<0.763	<0.763
	SODIUM T	mg/L	82.2	82.4	68
	STRONTIUM T	ug/L	263	254	261
	SULFATE T	mg/L	38.925	41.206	36.371
	ZINC T	ug/L	91	48	56
NUTRIENTS	AMMONIA D	mg/L	0.337	0.975	1.206
	AMMONIA T	mg/L	0.408	0.932	1.202
	NITRATE & NITRITE D	mg/L	1.71	18.103	14.937
	NITRATE & NITRITE T	mg/L	1.664	17.585	14.938
	NITROGEN D	mg/L	2.584	18.835	13.927
	NITROGEN T	mg/L	2.849	17.81	14.137
	ORTHO PHOSPHORUS D	mg/L	0.043	2.069	1.365
	ORTHO PHOSPHORUS T	mg/L	0.067	2.191	1.434
	PHOSPHORUS D	mg/L	0.055	2.222	1.421
	PHOSPHORUS T	mg/L	0.147	2.533	1.534
PHYSICAL/OTHER	ALKALINITY T	mg/L	122.6	61	56.6
	DISCHARGE	CFS	0.64	14.1	15.1
	DISSOLVED OXYGEN	mg/L	7.96	9.64	12.55
	DISSOLVED OXYGEN	%	-	-	-
	HARDNESS T	mg/L	268	216	198
	OSMOTIC PRESSURE	mosm/kg	15	12	10
	pH	pH units	7.12	6.81	7.42
	SPECIFIC COND	umhos/cm	1099	932.5	823.3
	TEMPERATURE	C	12.5	13.82	13.61
	TDS	mg/L	768	532	594
	TSS	mg/L	<5	6	<5
	TOC	mg/L	5.11	5.318	4.208

¹ Refer to Table 1 and Figure for station locations

“<” indicate concentrations below the reporting limit

“-” indicate parameter was not tested

Table A17. May 2015 Physicochemical Data.

	PARAMETER	UNITS	STATIONS ¹		
			1CC	2CC	3CC
METALS AND IONS	ALUMINUM T	ug/L	247	322	262
	BARIUM T	ug/L	220	85	106
	BORON T	ug/L	25	111	101
	BROMIDE T	ug/L	121.51	126.34	106.75
	CALCIUM T	mg/L	67.2	50.9	47.5
	CHLORIDE T	mg/L	217	170	155
	COPPER T	ug/L	4.27	11.2	8.18
	IRON T	ug/L	760	507	466
	LEAD T	ug/L	2.58	0.518	0.518
	MAGNESIUM T	mg/L	34	22.1	20.2
	MANGANESE T	ug/L	267	118	90
	NICKEL T	ug/L	<12	<12	<12
	SELENIUM T	ug/L	<0.763	<0.763	<0.763
	SODIUM T	mg/L	59.3	80.3	65.4
	STRONTIUM T	ug/L	284	254	281
	SULFATE T	mg/L	37.437	43.764	39.519
	ZINC T	ug/L	35	43	39
NUTRIENTS	AMMONIA D	mg/L	0.617	1.875	1.085
	AMMONIA T	mg/L	0.613	1.898	1.086
	NITRATE & NITRITE D	mg/L	1.835	18.96	17.606
	NITRATE & NITRITE T	mg/L	1.851	18.971	17.461
	NITROGEN D	mg/L	2.675	21.013	18.795
	NITROGEN T	mg/L	2.823	21.832	18.569
	ORTHO PHOSPHORUS D	mg/L	0.057	2.345	1.603
	ORTHO PHOSPHORUS T	mg/L	0.078	2.476	1.677
	PHOSPHORUS D	mg/L	0.056	2.377	1.633
	PHOSPHORUS T	mg/L	0.12	2.668	1.795
PHYSICAL/OTHER	ALKALINITY T	mg/L	119.6	63.4	51
	DISCHARGE	CFS	0.65	8.09	9.39
	DISSOLVED OXYGEN	mg/L	5.54	7.65	8.32
	DISSOLVED OXYGEN	%	-	-	-
	HARDNESS T	mg/L	308	218	202
	OSMOTIC PRESSURE	mosm/kg	16	12	11
	pH	pH units	7.2	6.95	7.2
	SPECIFIC COND	umhos/cm	975	917	816
	TEMPERATURE	C	18.79	20.02	21.73
	TDS	mg/L	728	632	586
	TSS	mg/L	10	12	12
	TOC	mg/L	2.186	5.654	4.774

¹ Refer to Table 1 and Figure for station locations

"<" indicate concentrations below the reporting limit

"-" indicate parameter was not tested

Table A18. June 2015 Physicochemical Data.

	PARAMETER	UNITS	STATIONS ¹		
			1CC	2CC	3CC
METALS AND IONS	ALUMINUM T	ug/L	245	296	97
	BARIUM T	ug/L	85	69	132
	BORON T	ug/L	65	98	31
	BROMIDE T	ug/L	77.06	102.43	72.92
	CALCIUM T	mg/L	39.164	44.6	51.22
	CHLORIDE T	mg/L	123	146	151
	COPPER T	ug/L	6.84	8.78	4.56
	IRON T	ug/L	476	367	592
	LEAD T	ug/L	1.13	0.889	1.57
	MAGNESIUM T	mg/L	16.13	17.24	19.32
	MANGANESE T	ug/L	53	85	125
	NICKEL T	ug/L	<12	<12	<12
	SELENIUM T	ug/L	<0.763	<0.763	<0.763
	SODIUM T	mg/L	60	70.89	70.92
	STRONTIUM T	ug/L	198	204	183
	SULFATE T	mg/L	29.159	36.733	27.692
	ZINC T	ug/L	26	30	20
NUTRIENTS	AMMONIA D	mg/L	1.684	1.491	0.132
	AMMONIA T	mg/L	1.708	1.487	0.13
	NITRATE & NITRITE D	mg/L	10.441	15.017	1.248
	NITRATE & NITRITE T	mg/L	10.634	15.134	1.225
	NITROGEN D	mg/L	12.47	16.842	1.705
	NITROGEN T	mg/L	12.648	16.426	1.701
	ORTHO PHOSPHORUS D	mg/L	0.769	1.387	0.041
	ORTHO PHOSPHORUS T	mg/L	0.79	1.458	0.063
	PHOSPHORUS D	mg/L	0.8	1.4	0.054
	PHOSPHORUS T	mg/L	0.903	1.597	0.095
PHYSICAL/OTHER	ALKALINITY T	mg/L	57.8	56.2	104.2
	DISCHARGE	CFS	12.718	9.451	2.197
	DISSOLVED OXYGEN	mg/L	7.72	7.25	6.05
	DISSOLVED OXYGEN	%	-	-	-
	HARDNESS T	mg/L	164	183	208
	OSMOTIC PRESSURE	mosm/kg	-	-	-
	pH	pH units	7.43	7.04	7.28
	SPECIFIC COND	umhos/cm	669	792	758
	TEMPERATURE	C	22.8	21.76	20.19
	TDS	mg/L	440	516	466
	TSS	mg/L	8	10	<5
	TOC	mg/L	4.824	5.196	4.036

¹ Refer to Table 1 and Figure 1 for station locations

" < " indicate concentrations below the reporting limit

" - " indicate parameter was not tested

Table A19. July 2015 Physicochemical Data.

PARAMETER		UNITS	STATIONS ¹		
			1CC	2CC	3CC
METALS AND IONS	ALUMINUM T	ug/L	59	127	81
	BARIUM T	ug/L	201	73	83
	BORON T	ug/L	31	109	86
	BROMIDE T	ug/L	118.42	131.56	101.85
	CALCIUM T	mg/L	66.2	47.3	44.6
	CHLORIDE T	mg/L	196.2	152.33	140.59
	COPPER T	ug/L	6.36	11.1	19.6
	IRON T	ug/L	324	228	147
	LEAD T	ug/L	1.06	0.282	0.445
	MAGNESIUM T	mg/L	30.9	20	18.8
	MANGANESE T	ug/L	115	74	20
	NICKEL T	ug/L	13	<12	<12
	SELENIUM T	ug/L	<0.763	<0.763	<0.763
	SODIUM T	mg/L	62.9	65.9	61.9
	STRONTIUM T	ug/L	276	241	248
	SULFATE T	mg/L	34.57	36.39	33.44
	ZINC T	ug/L	23	28	19
NUTRIENTS	AMMONIA D	mg/L	0.083	0.521	0.012
	AMMONIA T	mg/L	0.078	0.535	0.012
	NITRATE & NITRITE D	mg/L	2.39	15.665	12.985
	NITRATE & NITRITE T	mg/L	2.631	15.712	12.977
	NITROGEN D	mg/L	2.713	15.87	13.257
	NITROGEN T	mg/L	2.66	16.374	12.804
	ORTHO PHOSPHORUS D	mg/L	0.046	1.167	0.867
	ORTHO PHOSPHORUS T	mg/L	0.057	1.246	0.884
	PHOSPHORUS D	mg/L	0.049	1.195	0.897
	PHOSPHORUS T	mg/L	0.083	1.298	0.936
PHYSICAL/OTHER	ALKALINITY T	mg/L	117.2	50.6	51.8
	DISCHARGE	CFS	-	-	-
	DISSOLVED OXYGEN	mg/L	6.81	8.76	11.7
	DISSOLVED OXYGEN	%	-	-	-
	HARDNESS T	mg/L	293	201	189
	OSMOTIC PRESSURE	mosm/kg	13	10	9
	pH	pH units	7.11	6.82	7.55
	SPECIFIC COND	umhos/cm	966.9	835.6	767.5
	TEMPERATURE	C	19.57	20.85	21.39
	TDS	mg/L	704	598	556
	TSS	mg/L	8	8	10
	TOC	mg/L	2.252	3.614	3.073

¹ Refer to Table 1 and Figure 1 for station locations

“<” indicate concentrations below the reporting limit

“-” indicate parameter was not tested

Table A20. August 2015 Physicochemical Data.

	PARAMETER	UNITS	STATIONS ¹		
			1CC	2CC	3CC
METALS AND IONS	ALUMINUM T	ug/L	28	95	124
	BARIUM T	ug/L	138	62	76
	BORON T	ug/L	26	104	88
	BROMIDE T	ug/L	104.38	125.83	102.1
	CALCIUM T	mg/L	53.4	47.3	42.4
	CHLORIDE T	mg/L	137	142	125
	COPPER T	ug/L	5.74	9.93	7.74
	IRON T	ug/L	258	238	249
	LEAD T	ug/L	0.514	0.26	0.407
	MAGNESIUM T	mg/L	22.9	18.4	16.4
	MANGANESE T	ug/L	94	74	28
	NICKEL T	ug/L	<12	<12	<12
	SELENIUM T	ug/L	<0.763	<0.763	<0.763
	SODIUM T	mg/L	40.3	58.3	50.2
	STRONTIUM T	ug/L	192	225	228
	SULFATE T	mg/L	37.582	45.176	39.359
	ZINC T	ug/L	13	24	17
NUTRIENTS	AMMONIA D	mg/L	0.092	0.578	0.049
	AMMONIA T	mg/L	0.094	0.578	0.042
	NITRATE & NITRITE D	mg/L	1.887	17.247	15.796
	NITRATE & NITRITE T	mg/L	1.855	17.131	16.459
	NITROGEN D	mg/L	2.16	17.681	15.387
	NITROGEN T	mg/L	2.126	17.463	15.304
	ORTHO PHOSPHORUS D	mg/L	0.059	1.257	1.142
	ORTHO PHOSPHORUS T	mg/L	0.076	1.296	1.168
	PHOSPHORUS D	mg/L	0.057	1.217	1.13
	PHOSPHORUS T	mg/L	0.084	1.338	1.176
PHYSICAL/OTHER	ALKALINITY T	mg/L	103.2	48.6	43.6
	DISCHARGE	CFS	0.835	7.72	9.752
	DISSOLVED OXYGEN	mg/L	6.18	7.32	9.35
	DISSOLVED OXYGEN	%	-	-	-
	HARDNESS T	mg/L	228	194	174
	OSMOTIC PRESSURE	mosm/kg	3	10	9
	pH	pH units	7.2	7.02	7.45
	SPECIFIC COND	umhos/cm	764.9	836.4	761.5
	TEMPERATURE	C	20.056	21.68	22.03
	TDS	mg/L	480	538	516
	TSS	mg/L	<5	<5	<5
	TOC	mg/L	2.906	4.304	3.631

¹ Refer to Table 1 and Figure 1 for station locations

“<” indicate concentrations below the reporting limit

“-” indicate parameter was not tested

Table A21. March 2017 Physicochemical Data.

	PARAMETER	UNITS	STATIONS ¹		
			4CC	5CC	6WCC
METALS AND IONS	ALUMINUM T	ug/L	157	101	162
	BARIUM T	ug/L	104	94	99
	BORON T	ug/L	40	45	38
	BROMIDE T	ug/L	83.568	68.408	50.938
	CALCIUM T	mg/L	36.5	35.05	29.355
	CHLORIDE T	mg/L	158	141	129
	COPPER T	ug/L	4.26	3.243	2.787
	IRON T	ug/L	339	246	339
	LEAD T	ug/L	0.296	0.213	0.228
	MAGNESIUM T	mg/L	15	14.989	11.904
	MANGANESE T	ug/L	76	59	49
	NICKEL T	ug/L	<12	<12	<12
	POTASSIUM	mg/L	5.186	4.792	4.48
	SELENIUM T	ug/L	<0.763	1.193	<0.763
	SODIUM T	mg/L	70.7	66.092	62.555
	STRONTIUM T	ug/L	228	218	187
	SULFATE T	mg/L	22.116	26.8	22.72
	ZINC T	ug/L	16	10	10
NUTRIENTS	AMMONIA D	mg/L	0.424	0.066	0.063
	AMMONIA T	mg/L	0.428	0.069	0.065
	NITRATE & NITRITE D	mg/L	6.145	5.403	1.857
	NITRATE & NITRITE T	mg/L	6.076	5.368	1.868
	NITROGEN D	mg/L	7.869	6.273	2.436
	NITROGEN T	mg/L	7.577	6.271	2.474
	ORTHO PHOSPHORUS D	mg/L	0.543	0.427	0.06
	ORTHO PHOSPHORUS T	mg/L	0.505	0.493	0.065
	PHOSPHORUS D	mg/L	0.616	0.462	0.043
	PHOSPHORUS T	mg/L	0.663	0.508	0.066
PHYSICAL/OTHER	ALKALINITY T	mg/L	54	54.4	52.4
	HARDNESS T	mg/L	153	149	122
	OSMOTIC PRESSURE	mosm/kg	<1	-	-
	pH	pH units	7.6	7.8	7.6
	SPECIFIC COND	umhos/cm	731	672	595
	TEMPERATURE	C	-	-	-
	TDS	mg/L	456	394	352
	TSS	mg/L	12	<5	<5
	TOC	mg/L	4.108	3.704	3.616

¹ Refer to Table 1 and Figure 1 for station locations

" < " indicate concentrations below the reporting limit

" - " indicate parameter was not tested

Table A22. April 2017 Physicochemical Data.

	PARAMETER	UNITS	STATIONS ¹		
			4CC	5CC	6WCC
METALS AND IONS	ALUMINUM T	ug/L	72	77	76
	BARIUM T	ug/L	122	89	103
	BORON T	ug/L	48	35	23
	BROMIDE T	ug/L	82.591	75.117	49.461
	CALCIUM T	mg/L	46.61	41.685	34.899
	CHLORIDE T	mg/L	138	120	103
	COPPER T	ug/L	3.43	2.77	11.2
	IRON T	ug/L	196	167	173
	LEAD T	ug/L	0.187	0.154	0.54
	MAGNESIUM T	mg/L	19.68	16.995	13.462
	MANGANESE T	ug/L	58	35	36
	NICKEL T	ug/L	<12	<12	<12
	POTASSIUM	mg/L	5.689	4.519	4.302
	SELENIUM T	ug/L	<0.763	<0.763	<0.763
	SODIUM T	mg/L	55.94	46.81	44.376
	STRONTIUM T	ug/L	273	220	194
	SULFATE T	mg/L	26.833	27.767	23.4497
	ZINC T	ug/L	20	8	10
NUTRIENTS	AMMONIA D	mg/L	0.323	0.031	0.044
	AMMONIA T	mg/L	0.318	0.033	0.04
	NITRATE & NITRITE D	mg/L	7.799	5.426	2.594
	NITRATE & NITRITE T	mg/L	8.031	5.356	2.591
	NITROGEN D	mg/L	8.831	5.957	3.271
	NITROGEN T	mg/L	8.683	5.939	3.144
	ORTHO PHOSPHORUS D	mg/L	0.645	0.312	0.033
	ORTHO PHOSPHORUS T	mg/L	0.723	0.321	0.03
	PHOSPHORUS D	mg/L	0.723	0.32	0.047
	PHOSPHORUS T	mg/L	0.782	0.358	0.056
PHYSICAL/OTHER	ALKALINITY T	mg/L	59.6	59.2	58
	HARDNESS T	mg/L	198	174	143
	OSMOTIC PRESSURE	mosm/kg	8	8	7
	pH	pH units	7.7	8.2	7.8
	SPECIFIC COND	umhos/cm	705	616	530
	TEMPERATURE	C	-	-	-
	TDS	mg/L	504	416	344
	TSS	mg/L	<5	<5	<5
	TOC	mg/L	2.988	2.81	2.756

¹ Refer to Table 1 and Figure 1 for station locations

"<" indicate concentrations below the reporting limit

"-" indicate parameter was not tested

Table A23. May 2017 Physicochemical Data.

	PARAMETER	UNITS	STATIONS ¹		
			4CC	5CC	6WCC
METALS AND IONS	ALUMINUM T	ug/L	98	74	68
	BARIUM T	ug/L	109	105	106
	BORON T	ug/L	46	40	29
	BROMIDE T	ug/L	72.446	67.359	56.603
	CALCIUM T	mg/L	45.159	41.1	34.6
	CHLORIDE T	mg/L	130	118	92.1
	COPPER T	ug/L	3.81	2.78	2.83
	IRON T	ug/L	191	190	209
	LEAD T	ug/L	0.233	0.207	0.149
	MAGNESIUM T	mg/L	20.267	17.2	13.1
	MANGANESE T	ug/L	33	30	30
	NICKEL T	ug/L	<12	<12	<12
	POTASSIUM	mg/L	5.274	4.82	4.676
	SELENIUM T	ug/L	<0.763	<0.763	<0.763
	SODIUM T	mg/L	57.834	46.8	36.1
	STRONTIUM T	ug/L	258	246	208
	SULFATE T	mg/L	26.7516	25.4221	25.0522
	ZINC T	ug/L	10	6	5
NUTRIENTS	AMMONIA D	mg/L	0.07	0.019	0.038
	AMMONIA T	mg/L	0.073	0.023	0.04
	NITRATE & NITRITE D	mg/L	7.939	5.932	2.394
	NITRATE & NITRITE T	mg/L	7.861	5.931	2.385
	NITROGEN D	mg/L	8.267	6.521	2.939
	NITROGEN T	mg/L	8.19	6.348	2.991
	ORTHO PHOSPHORUS D	mg/L	0.501	0.4	0.12
	ORTHO PHOSPHORUS T	mg/L	0.511	0.395	0.106
	PHOSPHORUS D	mg/L	0.58	0.338	0.08
	PHOSPHORUS T	mg/L	0.611	0.36	0.1
PHYSICAL/OTHER	ALKALINITY T	mg/L	64.8	63.6	57.2
	HARDNESS T	mg/L	196	174	140
	OSMOTIC PRESSURE	mosm/kg	9	7	3
	pH	pH units	8.1	7.9	7.8
	SPECIFIC COND	umhos/cm	680	601	491
	TEMPERATURE	C	-	-	-
	TDS	mg/L	436	370	532
	TSS	mg/L	<5	10	14
	TOC	mg/L	2.759	2.608	2.974

¹ Refer to Table 1 and Figure 1 for station locations

"<" indicate concentrations below the reporting limit

"-" indicate parameter was not tested

Table A24. June 2017 Physicochemical Data.

	PARAMETER	UNITS	STATIONS ¹		
			4CC	5CC	6WCC
METALS AND IONS	ALUMINUM T	ug/L	85	123	66
	BARIUM T	ug/L	115	106	116
	BORON T	ug/L	83	52	40
	BROMIDE T	ug/L	93.488	81.387	60.394
	CALCIUM T	mg/L	47	40.201	37.503
	CHLORIDE T	mg/L	134	116	101
	COPPER T	ug/L	4.46	4.02	3.46
	IRON T	ug/L	186	167	133
	LEAD T	ug/L	0.235	0.155	0.138
	MAGNESIUM T	mg/L	20.1	17.573	14.88
	MANGANESE T	ug/L	28	20	21
	NICKEL T	ug/L	<12	<12	<12
	POTASSIUM	mg/L	6.991	5.75	6.379
	SELENIUM T	ug/L	<0.763	<0.763	<0.763
	SODIUM T	mg/L	52.6	47.729	45.877
	STRONTIUM T	ug/L	288	266	238
	SULFATE T	mg/L	29.183	27.396	29.917
	ZINC T	ug/L	10	9	10
NUTRIENTS	AMMONIA D	mg/L	0.04	0.068	0.047
	AMMONIA T	mg/L	0.037	0.075	0.056
	NITRATE & NITRITE D	mg/L	10.7	7.266	3.306
	NITRATE & NITRITE T	mg/L	10.711	7.278	3.358
	NITROGEN D	mg/L	11.751	8.08	4.017
	NITROGEN T	mg/L	11.978	7.951	4.002
	ORTHO PHOSPHORUS D	mg/L	0.87	0.531	0.705
	ORTHO PHOSPHORUS T	mg/L	0.875	0.567	0.703
	PHOSPHORUS D	mg/L	0.95	0.583	0.736
	PHOSPHORUS T	mg/L	0.983	0.601	0.737
PHYSICAL/OTHER	ALKALINITY T	mg/L	57.4	56.6	71.4
	HARDNESS T	mg/L	200	173	155
	OSMOTIC PRESSURE	mosm/kg	9	7	3
	pH	pH units	7.6	7.8	8
	SPECIFIC COND	umhos/cm	715	633	579
	TEMPERATURE	C	-	-	-
	TDS	mg/L	508	458	386
	TSS	mg/L	<5	<5	<5
	TOC	mg/L	3.039	2.467	3.39

¹ Refer to Table 1 and Figure 1 for station locations

" < " indicate concentrations below the reporting limit

" - " indicate parameter was not tested

Table A25. July 2017 Physicochemical Data.

	PARAMETER	UNITS	STATIONS ¹		
			4CC	5CC	6WCC
METALS AND IONS	ALUMINUM T	ug/L	109	49	116
	BARIUM T	ug/L	100	97	109
	BORON T	ug/L	61	51	42
	BROMIDE T	ug/L	81.11	72.016	57.415
	CALCIUM T	mg/L	43.146	40.4	38.6
	CHLORIDE T	mg/L	129	117	96
	COPPER T	ug/L	5.77	4.71	4.16
	IRON T	ug/L	205	116	238
	LEAD T	ug/L	0.231	0.115	0.179
	MAGNESIUM T	mg/L	19.041	17	13.8
	MANGANESE T	ug/L	25	15	32
	NICKEL T	ug/L	<12	<12	<12
	POTASSIUM	mg/L	6.537	5.693	6.455
	SELENIUM T	ug/L	<0.763	1.22	1.19
	SODIUM T	mg/L	53.053	43.5	41.7
	STRONTIUM T	ug/L	277	244	227
	SULFATE T	mg/L	27.7358	28.0045	31.202
	ZINC T	ug/L	17	6	11
NUTRIENTS	AMMONIA D	mg/L	<0.012	<0.012	0.03
	AMMONIA T	mg/L	0.015	<0.012	0.03
	NITRATE & NITRITE D	mg/L	7.917	7.312	4.081
	NITRATE & NITRITE T	mg/L	7.924	7.295	4.094
	NITROGEN D	mg/L	8.447	7.17	4.43
	NITROGEN T	mg/L	8.319	7.151	4.496
	ORTHO PHOSPHORUS D	mg/L	0.55	0.437	0.653
	ORTHO PHOSPHORUS T	mg/L	0.553	0.442	0.655
	PHOSPHORUS D	mg/L	0.634	0.45	0.687
	PHOSPHORUS T	mg/L	0.636	0.448	0.721
PHYSICAL/OTHER	ALKALINITY T	mg/L	64.4	63	68.4
	HARDNESS T	mg/L	186	171	153
	OSMOTIC PRESSURE	mosm/kg	8	7	6
	pH	pH units	7.8	7.8	7.8
	SPECIFIC COND	umhos/cm	681	619	547
	TEMPERATURE	C	-	-	-
	TDS	mg/L	460	432	352
	TSS	mg/L	6	<5	<5
	TOC	mg/L	3.038	2.726	3.726

¹ Refer to Table 1 and Figure 1 for station locations

"<" indicate concentrations below the reporting limit

"-" indicate parameter was not tested

Table A26. August 2017 Physicochemical Data.

	PARAMETER	UNITS	STATIONS ¹		
			4CC	5CC	6WCC
METALS AND IONS	ALUMINUM T	ug/L	88	56	67
	BARIUM T	ug/L	88	94	111
	BORON T	ug/L	43	45	38
	BROMIDE T	ug/L	54.018	54.827	55.49
	CALCIUM T	mg/L	33.7	38.2	36
	CHLORIDE T	mg/L	93.2	90.7	91.1
	COPPER T	ug/L	3.96	3.74	4.28
	IRON T	ug/L	292	154	170
	LEAD T	ug/L	0.293	0.151	0.371
	MAGNESIUM T	mg/L	14	15.1	13
	MANGANESE T	ug/L	22	12	22
	NICKEL T	ug/L	<12	<12	<12
	POTASSIUM	mg/L	4.938	5.332	5.642
	SELENIUM T	ug/L	<0.763	<0.763	<0.763
	SODIUM T	mg/L	36.5	37.8	36.9
	STRONTIUM T	ug/L	202	220	214
	SULFATE T	mg/L	18.155	29.335	25.555
	ZINC T	ug/L	5	6	11
NUTRIENTS	AMMONIA D	mg/L	0.09	0.026	0.027
	AMMONIA T	mg/L	0.094	0.021	0.037
	NITRATE & NITRITE D	mg/L	6.484	5.934	3.13
	NITRATE & NITRITE T	mg/L	6.504	5.863	3.102
	NITROGEN D	mg/L	6.874	6.683	3.719
	NITROGEN T	mg/L	6.878	6.399	3.702
	ORTHO PHOSPHORUS D	mg/L	0.399	0.312	0.275
	ORTHO PHOSPHORUS T	mg/L	0.404	0.312	0.284
	PHOSPHORUS D	mg/L	0.442	0.36	0.32
	PHOSPHORUS T	mg/L	0.469	0.54	0.34
PHYSICAL/OTHER	ALKALINITY T	mg/L	55.2	57	58.6
	HARDNESS T	mg/L	142	158	144
	OSMOTIC PRESSURE	mosm/kg	5	6	6
	pH	pH units	7.8	7.8	7.7
	SPECIFIC COND	umhos/cm	507	519	496
	TEMPERATURE	C	-	-	-
	TDS	mg/L	346	350	356
	TSS	mg/L	8	<5	<5
	TOC	mg/L	3.659	2.986	3.333

¹ Refer to Table 1 and Figure 1 for station locations

" < " indicate concentrations below the reporting limit

" - " indicate parameter was not tested