2018 WATER QUALITY MONITORING
F.E. WALTER RESERVOIR
WHITE HAVEN, PENNSYLVANIA

U.S. Army Corps of Engineers
Philadelphia District
Environmental Resources Branch

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2018 Water Quality Monitoring
F.E. Walter Reservoir
White Haven, Pennsylvania

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1.0 INTRODUCTION

1.1 DESCRIPTION OF F.E. WALTER RESERVOIR

The U.S. Army Corps of Engineers (USACE) manages F.E. Walter Reservoir located in northeastern Pennsylvania within the Delaware River Basin. F.E. Walter Reservoir is an integral part of the Lehigh River Flood Control Program. The authorized purpose of this project is flood control. The reservoir project was authorized for recreation and specifically white water recreation as part of Public Law 100-676, Section 6, dated November 17, 1988. Located about 9 miles southeast of Wilkes-Barre, PA, the reservoir dams a drainage area of 288 square miles. The dam can impound up to 35.8 billion gallons of floodwater. The primary surface water input into the reservoir is the Lehigh River as it flows west between Luzerne and Carbon Counties. Bear Creek, a secondary surface water input, enters the reservoir from the north. Tobyhanna Creek drains an area to the southeast and joins the Lehigh River near the headwaters of the reservoir. The reservoir is approximately 3 miles long and approximately 50 feet deep when not operating for flood control or recreation. In an effort to maximize recreational potential in the reservoir and on the Lehigh River downstream, specifically recreational boating and fishing, the normal operating pool of 50 feet is raised an additional 70 feet in April of most years. The additional storage is used to augment low flows in the Lehigh River downstream as a fishery management tool and increase the number of recreational boating releases throughout the summer whitewater recreation season.

1.2 PURPOSE OF THE MONITORING PROGRAM

Foremost, F.E. Walter Reservoir provides flood control to downstream communities on the Lehigh River. Additionally, the reservoir provides important habitat for fish, waterfowl, and other wildlife, and recreational opportunities through fishing and boating both within the lake and downstream. Drinking water intakes exist at various locations on the Lehigh River downstream of the dam. Due to the broad range of uses and demands F.E. Walter Reservoir serves, the USACE monitors water quality and other aspects related to reservoir health primarily to ensure public health safety and protection of the environment. Water quality monitoring results are compared to state water quality standards and used to diagnose problems that commonly effect reservoir health such as nutrient enrichment and toxic loadings. This report summarizes the results of water quality monitoring at F.E. Walter Reservoir and its tributaries from June through September 2018.

1.3 ELEMENTS OF THE STUDY

The USACE, Philadelphia District, has been monitoring the water quality of F.E. Walter Reservoir since 1975. Over this time, yearly monitoring program designs have evolved to address new areas of concern such as human health aspects of drinking water, sediment contaminants within the reservoir basin, and a 2002 investigation of a hydrogen sulfide smell near the tail water of the dam. The 2018 monitoring program was similar to those in recent

years. The major element of the monitoring includes monthly physical and chemical water quality and bacteria monitoring from June through September to evaluate compliance with the Pennsylvania state water quality standards and to monitor the overall health of the reservoir.

2.0 METHODS

2.1 PHYSICAL STRATIFICATION MONITORING

Physical stratification monitoring of the water column of F.E. Walter Reservoir was conducted five times between June and September 2018 at all stations (Table 2-1). One additional profile sample was collected at Station WA-2 on 06 June. Physical stratification parameters included temperature, dissolved oxygen (DO), pH, ORP, Chlorophyll a, depth, turbidity, and conductivity. Monitoring was conducted at seven fixed stations located throughout the reservoir watershed (Fig. 2-1). Surface water quality was monitored at stations downstream (outfall discharge) of the reservoir (WA-1S) and upstream tributary stations on Tobyhanna Creek (WA-3S), the Lehigh River (WA-4S), and Bear Creek (WA-5S). Stratification monitoring was conducted within the reservoir at a reservoir tower station (WA-2), Bear Creek arm of the lake (WA-6), and Lehigh River arm of the lake (WA-7) with water quality measured from the water surface to the bottom at 5-ft intervals. All of the water quality monitoring was conducted with a calibrated YSI 6600 V2-4 multi-parameter water quality sonde.

In this report, when applicable, water quality data recorded from stratification monitoring was compared to water quality standards mandated by the Pennsylvania Department of Environmental Protection (PADEP Chapter 93). The standard for DO is a minimum concentration of 5 mg/L, and that for pH is an acceptable range from 6 to 9. Temperatures criteria are based on seasonal guidelines. All of the water quality data collected during physical stratification monitoring is summarized in Appendix A.

2.2 WATER COLUMN CHEMISTRY MONITORING

Water column chemistry monitoring was conducted five times at F.E. Walter Reservoir between June and September 2018 (Table 2-1). Water samples were collected at the seven fixed stations throughout the reservoir drainage area (Fig. 2-1). Surface water samples were collected at stations downstream of the reservoir (WA-1S) and upstream on Tobyhanna Creek (WA-3S), the Lehigh River (WA-4S), and Bear Creek (WA-5S). Surface, middle, and bottom water samples were collected at each of the reservoir-body stations WA-2, WA-6, and WA-7. Surface water samples were collected by opening the sample containers approximately 0.5-1 foot below the water's surface. Middle and bottom samples were collected with a Van Dorn design water bottle sampler. All samples were placed on ice in a cooler and shipped to a certified laboratory for testing. SGS North America Inc. laboratory in Dayton, New Jersey conducted the laboratory water sample analysis for 2018.

Water samples collected from surface, middle, and bottom depths were analyzed for ammonia, nitrite, nitrate, total Kjeldahl nitrogen (TKN), total phosphorus, soluble phosphorus, total dissolved solids (TDS), total suspended solids (TSS), biochemical oxygen demand (BOD), alkalinity, and total organic carbon (TOC). Table 2-2 summarizes the water quality parameters; laboratory method detection limits, laboratory required reporting limits, state water quality standards, and allowable maximum hold times for each.

Table 2-1. F.E. Walter Reservoir water quality schedule for 2018 monitoring

Date of Sample Collection	(3) Physical Stratification Monitoring (All Stations)	Water Column Chemistry Monitoring (All Stations)	Trophic State Determination (WA-2)	Coliform Bacteria Monitoring (All Stations)	(4) Sediment Priority Pollutant Monitoring (WA-2)	(2) Lehigh Temperature Probes	(1) Drinking Water Monitoring
06 June	X (Station WA-2 Only)	NS	NS	NS	NS	NS	NS
27 June	X	X	X	X	NS	NS	NS
11 July	X	X	X	X	NS	NS	NS
31 July	X	X	X	X	NS	NS	NS
15 August	X	X	X	X	NS	NS	NS
05 September	X	X	X	X	NS	NS	NS

(1) Drinking water samples are sampled quarterly by personnel at each reservoir.
(2) Lehigh River temperature probes continuously monitor river temperatures throughout the sampling period. They are periodically downloaded.
(3) Physical stratification monitoring is conducted at all stations during routine monthly sampling.
(4) Sediment Sampling was not conducted in 2018 based on historic sampling results showing low probability of sediment contamination.
NS- Not Sampled

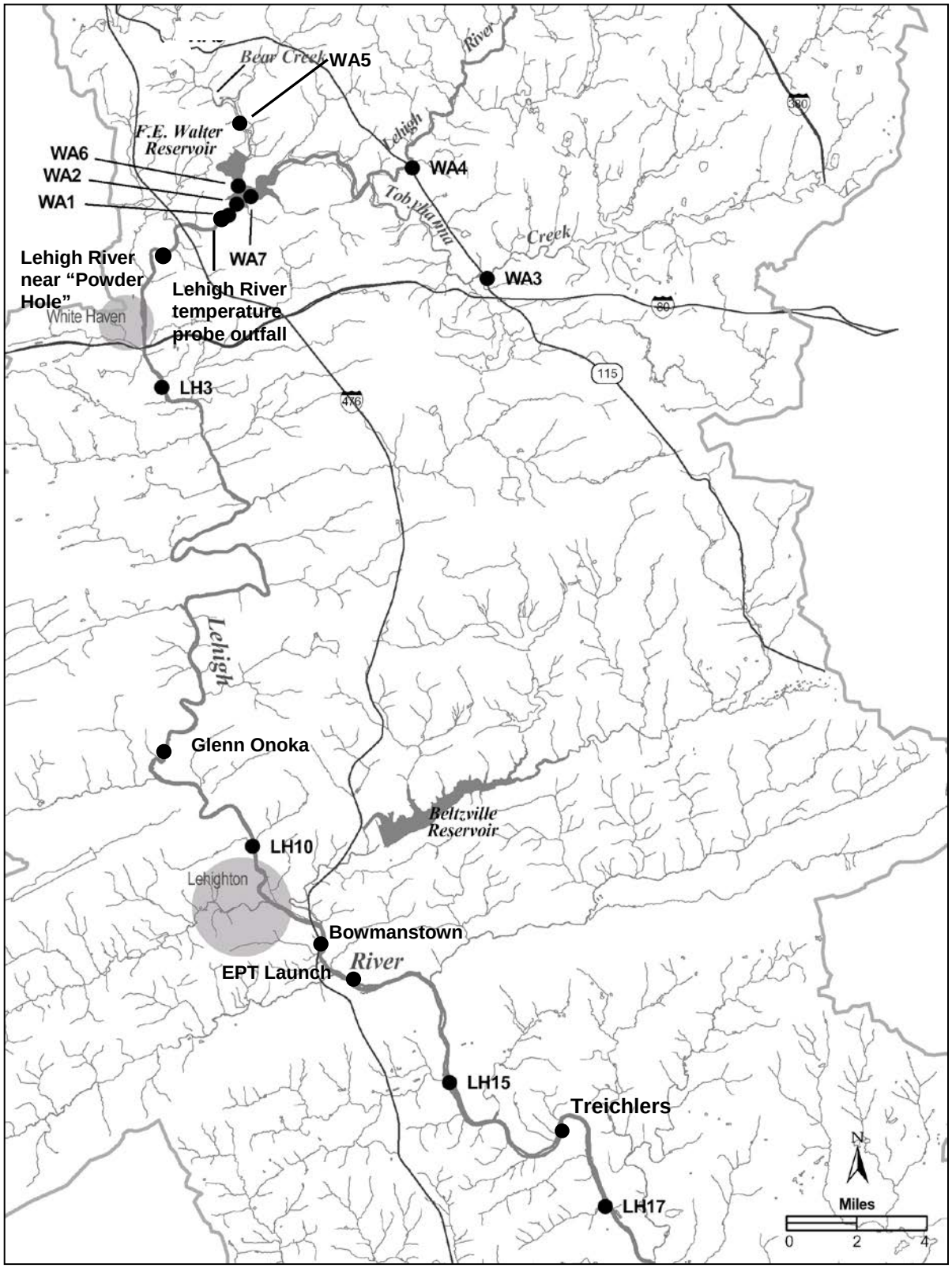

Figure 2-1. Location map for F.E. Walter Reservoir and historically sampled Lehigh River temperature probe monitoring stations.

Table 2-2. Water quality test methods, detection limits, state regulatory criteria, and sample holding times for water quality parameters monitored at F.E. Walter Reservoir in 2018.

Parameter	(2) Method	Limit of Quantification LOQ	PADEP Surface Water Quality Criteria	Allowable Hold Times (Days)
Total Alkalinity	SM20 2320 B-11	5.0 mg/L	Min. 20 mg/L $CaCO_3$	14
Biochemical Oxygen Demand (BOD)	SM5210 B-11	2.0 mg/L	None	2
Total Phosphorus	EPA 365.3	0.05 mg/L	None	28
Diss./Ortho-Phosphate	NA	NA	None	28
Soluble Phosphorus	EPA 365.3	0.05 mg/L	None	28
Total Organic Carbon (TOC)	SM5310 B-11	1.0 mg/L	None	28
Total Inorganic Carbon (TIC) *	NA	NA	None	28
Total Carbon (TOC + TIC) *	NA	NA	None	28
(1) Chlorophyll *a*	YSI Probe	----	None	In Situ
Total Kjeldahl Nitrogen	EPA 351.2/ LACHAT	0.20 mg/L	None	28
Ammonia	SM4500 H-11LACHAT	0.20 mg/L	Temp. and pH dependent	28
Nitrate	EPA 353.2/ SM4500NO2B	0.11 mg/L	Maximum 10 mg/L (nitrate + nitrite)	28
Nitrite	SM4500NO2 B-11	0.01 mg/L		28
Total Dissolved Solids	SM2540 C-11	10.0 mg/L	Maximum 750 mg/L	7
Total Suspended Solids	SM2540 D-11	4.0 mg/L	None	7

(1) Chlorophyll *a* samples were recorded using a YSI 6600 with a chlorophyll sensor.
(2) Laboratory Methods Reference:
EPA- "Methods for Chemical Analysis of Water and Wastes", EPA-600/4-79-020, March 1983 and subsequent revisions.
SM- "Standard Methods for the Examination of Water and Wastewater", 22nd Edition, 2012.
SW846- "Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods", 3rd. Edition, November 1986 and updates.

* Total Inorganic Carbon and Total Carbon were not sampled for in 2018

2.3 TROPHIC STATE DETERMINATION

The trophic state of F.E. Walter Reservoir was determined by methods outlined by Carlson (1977) and EPA (1983). In general, these methods calculate trophic state indices (TSIs) independently for total phosphorus and chlorophyll *a* concentrations, and secchi disk depth. Surface water measures of total phosphorus and chlorophyll *a* from chemistry monitoring were used independently in determining monthly TSI values. Secchi disk depth was measured only in surface waters in the reservoir-body. Trophic state determinations were calculated only for Station WA-2 within the reservoir.

2.4 RESERVOIR BACTERIA MONITORING

Monitoring for coliform bacteria contaminants was conducted five times at each sampling station between June and September 2018 at F.E. Walter Reservoir. Surface water samples were collected in the same manner as for chemical parameter samples, and analyzed for total and fecal coliform contamination. Table 2-3 presents the test methods, detection limits, PADEP standards, and sample holding times for the bacteria parameters monitored at F.E. Walter Reservoir in 2018. The bacteria analytical method was based on a membrane filtration technique. All of the samples were analyzed within their maximum allowable hold times.

Monthly coliform bacteria counts were compared to the PADEP single sample and swimming beach water quality standard for bacteria. The multiple beach sample standards is defined as a maximum geometric mean of 200 colonies/100-ml based on five samples collected on different days within a 30-day period. Application of this standard is not necessary at F.E. Walter because swimming and other human/water contact recreation is prohibited in the reservoir. However, it is used in evaluating the bacteria results.

Table 2-3. Water quality test methods, detection limits, PADEP water quality standards, and sample holding times for bacteria parameters monitored at F.E. Walter Reservoir in 2018.

Parameter	Total coliform	Fecal coliform
Test method	SM 9223 B-06	SM 9222 D-06
Detection limit	10 clns/100-mls	10 clns/100-ml
PADEP standard	None	Geometric mean less than 200 clns/100-ml or a single sample reading of <1000 clns/100-mls (application of this standard is conservative because swimming is not permitted in the reservoir)
Maximum allowable holding time	30 hours	30 hours
Achieved holding time	< 30 hours	< 30 hours

3.0 RESULTS AND DISCUSSION

3.1 STRATIFICATION MONITORING

The following sections describe temporal and spatial patterns for the water quality parameters of temperature, dissolved oxygen (DO) and pH measured throughout the F.E. Walter Reservoir and watershed during 2018. Additionally, patterns related to season and depths are described for station WA-2 which is located near the operations tower and maintains the greatest water depths in the reservoir. Maximum depths for WA-2, during five separate monthly sampling days, vary between approximately 115 to 132 feet depending on 2018 reservoir operations (recreation and flood control) at the time of sampling. All of the stratification data collected during the 2018 monitoring period is presented in Appendix A.

3.1.1 Temperature

Temperature is the primary influencing factor on water density, affects the solubility of many chemicals compounds, and can therefore influence the effect of pollutants on aquatic life. Increased temperatures elevate the metabolic oxygen demand, in conjunction with reduced oxygen solubility, and can impact many species. Vertical temperature stratification patterns naturally occurring in lakes affect the distribution of dissolved and suspended compounds.

Temperatures of the tributary surface waters (Stations WA-3S, -4S, and -5S) of the F.E. Walter Reservoir watershed generally followed a similar seasonal pattern throughout the monitoring period. Monthly sampling showed temperatures rising from early summer with peak surface temperatures seen in September along with a small drop in August temperatures (Fig. 3-1). Downstream release (Station WA-1S) surface water temperatures showed a similar trend with late July and August temperatures slightly warmer than tributary inflow temperatures. A maximum inflow temperature of 21.69 ºC (WA-5S) was measured in September and maximum outflow temperature of 21.09 ºC (WA-1S) was also seen in September. Surface water temperatures of the reservoir-body (Stations WA-2S, -6S, and -7S) were generally warmer than in tributaries and downstream of the dam as a result of warming from the sun and bottom downstream releases. In-lake reservoir surface temperatures peaked in early-July at approximately 25.91 ºC (Station WA-7S). In 2018, tributary and release water temperatures, at times, exceeded the Pennsylvania state water quality criteria for cold water fisheries.

The water column of F.E. Walter Reservoir was temperature stratified during the 2018 sampling season (Fig. 3-2). Due to operations in 2018, specifically the raising of the base pool level and recreational release operations, the temperature stratification within the reservoir was likely affected by bottom flood gate releases and flood control storage on various occasions during the season. This was particular evident in August when the pool level was raised for flood control operations and reservoir profile temperatures showed a breakup of stratification in the water column. The reservoir tower was constructed with bottom flood control gates only and does not have the flexibility to withdrawal water from other locations in the water column. As a result, deeper and typically cooler bottom waters are withdrawn first, likely causing a disruption in stratification and accelerated depletion of cooler bottom waters. Overall, reservoir lake temperatures in 2018 showed a pronounced stratification in early June that extended into

September. Cooler deep water temperatures were available into the early July time period of the recreational season which is typical for most years.

3.1.2 Dissolved Oxygen

Dissolved oxygen (DO) is the measure of the amount of DO in water. Typically, DO concentrations in surface waters are less than 10 mg/L. Dissolved Oxygen concentrations are subject to diurnal and seasonal fluctuations that can be influenced, in part, by temperature, river discharge, and photosynthetic activity. Dissolved Oxygen is essential to the respiratory metabolism of most aquatic organisms. It affects the availability and solubility of nutrients and subsequently the productivity of aquatic ecosystems. Low levels of oxygen can facilitate the release of nutrients from bottom sediments.

In 2018, DO in the tributary surface waters (stations WA-3S, -4S, and -5S) of F.E. Walter Reservoir remained relatively constant from June through September sampling with recorded values ranging from 8.28 mg/L to 9.25 mg/L. These values can be attributed to typically well oxygenated stream and river systems and seasonal changes in water temperature. Station WA-1S located downstream of F.E. Walter Reservoir also maintained a similar seasonal pattern with recorded values ranging from 8.86 mg/L to 9.20 mg/L. This can be attributed, in part, to the aeration of reservoir bottom waters as it passes through the conduit system of the dam and is released downstream.

The water column of F.E. Walter Reservoir was weakly stratified and somewhat erratic with respect to DO during most of the sampling season (Fig. 3-4). July sampling showed the most pronounced evidence of stratification. The reservoir profile showed the formation of a metalimnetic dissolved oxygen minimum. As seen in some oxygen versus depth profiles of lakes or reservoirs, concentrations of dissolved oxygen may be depleted in the metalimnion of the lake profile. This depletion is termed a negative heterograde curve or metalimnetic oxygen minimum. Metalimnetic minimums of dissolved oxygen in deep mesotrophic reservoirs are often seen and have been shown to also exist in the Corps Philadelphia District's Beltzville Reservoir. This water column profile formation may be a natural occurrence and/or man induced. In the case of F.E. Walter Reservoir, the severity of this occurrence appears influenced by seasonal recreational and flood control operations (In 2018 significant storage for flood control was seen in August). In either case, the potential exists for negative impacts on water quality, recreational use, and aquatic species such as fish. The occurrence and severity of this DO formation will be monitored during future sampling efforts. In all months sampled the DO concentrations remained above state epilimnion criteria (minimum 5 mg/l).

The health of aquatic ecosystems can be impaired by low DO concentrations in the water column (<5.0 mg/L). The lowest DO concentration (2.44 mg/L) was recorded at the bottom of the reservoir during the 27 June sampling event (Fig. 3-4). Hypoxia, or conditions of DO concentrations less than 2 mg/L, is generally accepted as the threshold at which the most severe effects on biota occur. F.E. Walter Reservoir did not experience hypoxic conditions during the 2018 sampling season. Low oxygen reservoir waters are re-aerated as they pass through the conduit system of the reservoir during release. As a result, water releases from the

deeper portions of the reservoir containing lower DO concentration did not negatively impact the DO concentrations of the Lehigh River downstream.

3.1.3 pH

PH is the measure of the hydrogen –ion concentration in the water. A pH below 7 is considered acidic and a pH above 7 is basic. The pH scale is 0-14 with the lower numbers being more acidic and the higher numbers being more basic. High pH values tend to facilitate solubilization of ammonia, salts, and heavy metals. Low pH levels tend to increase carbonic acid and carbon dioxide concentrations. Lethal effects of pH on aquatic life typically occur below pH 4.5 and above pH 9.5.

Measures of pH in tributary surface (WA-3S, -4S, and –5S) waters of F.E. Walter Reservoir generally followed a similar pattern during 2018 and remained relatively constant or within a narrow range of values (5.00-6.94) throughout the sampling season. The lowest pH level of 5.00 recorded during the sampling season occurred at station WA-5S during the August sampling and the highest pH reading of 6.94 was recorded at Station WA-5S in early July. Equipment malfunction during the August sampling event may have affected the pH measures during that time period. Measures of pH at the downstream station WA-1S are directly influenced by bottom water column releases from the reservoir. Readings of pH at this station ranged from a high of 6.61 in early July to a low of 5.77 in August (Fig. 3-5).

In 2018, measures of reservoir pH stayed within a tight range of values (5.80-6.99) from the surface to the bottom throughout the sampling season (Fig. 3-6). Slightly higher pH values were measured near the surface and bottom waters of the lake. Many factors can influence the pH of the reservoir water such as geology, wind, acid rain, algal productivity, deep water biological productivity and others. Measures of pH throughout the water column in all months sampled, except for August, remained in compliance with PADEP water quality standards. August experienced a flood storage and release event that disrupted lake stratification patterns causing lower water column pH values to measure below pH value 6.0 as a result of water mixing and chemistry changes. The water quality standard for pH is a range of acceptable measures between 6 and 9.

3.2 WATER COLUMN CHEMISTRY MONITORING

Table 3-1 provides a summary of water column chemistry sampling for all stations and dates sampled at F.E. Walter Reservoir in 2018. The following sections describe the temporal, spatial, and depth related patterns for these water quality measures.

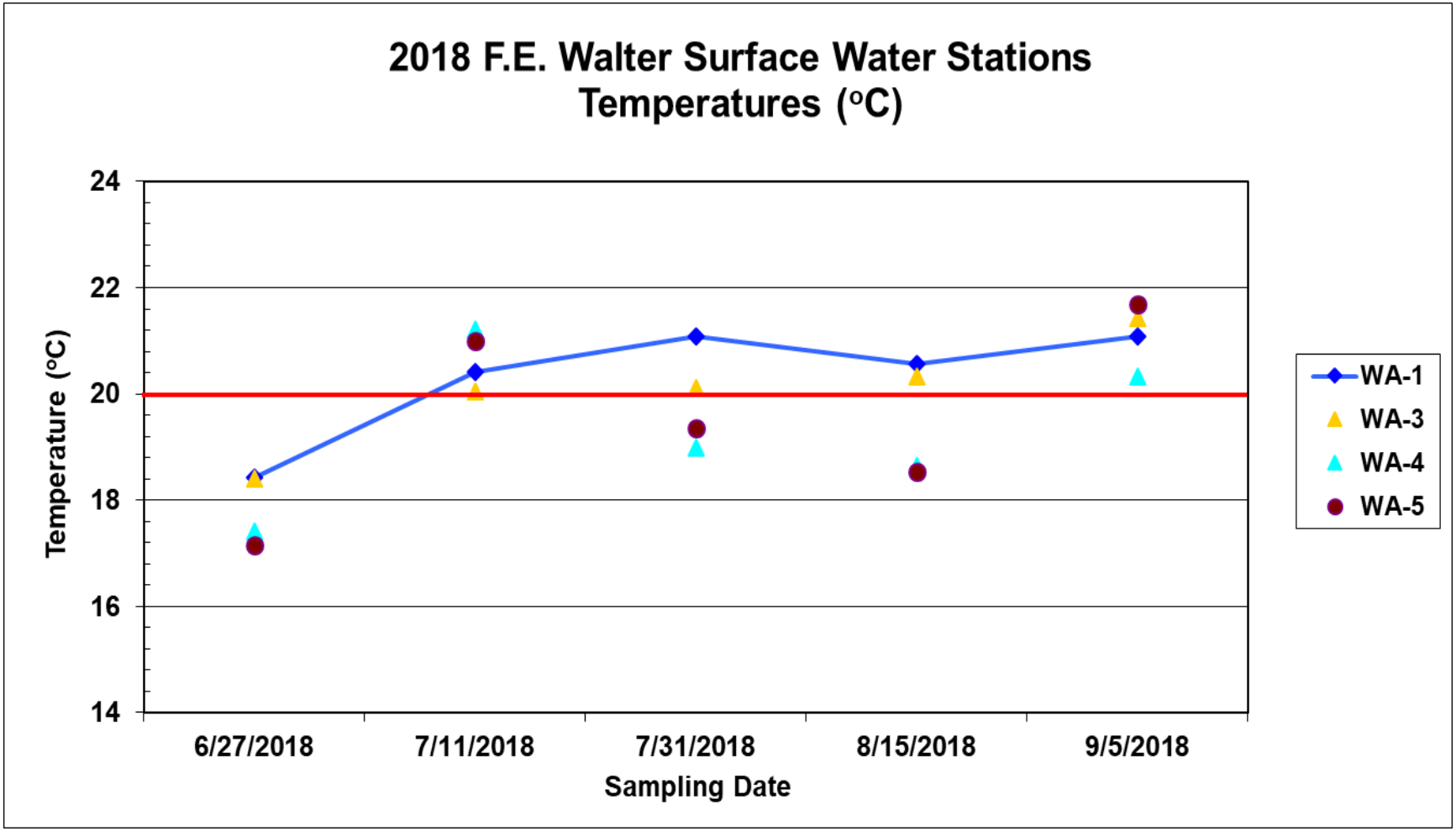

Figure 3-1. Temperature measured in tributary and release (WA-1) surface waters of F.E. Walter Reservoir during 2018. See Appendix A for a summary of the plotted values. The coldwater species preference temperature of 20°C is shown as a red line reference.

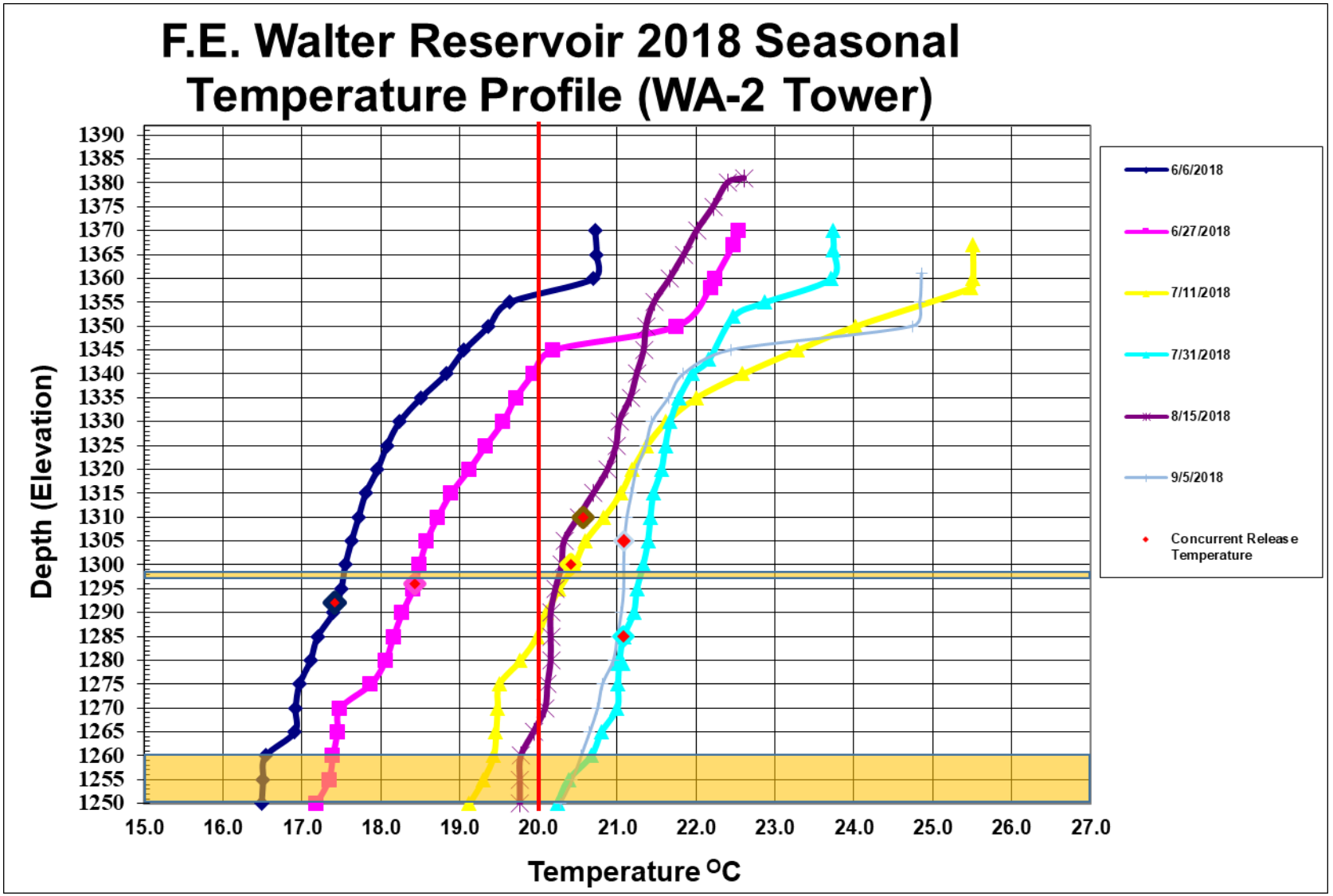

Figure 3-2. Stratification of temperature measured in the water column of F. E. Walter Reservoir at station WA-2 during 2018. See Appendix A for a summary of the plotted values. The coldwater species preference temperature of 20°C is shown as a red line reference.

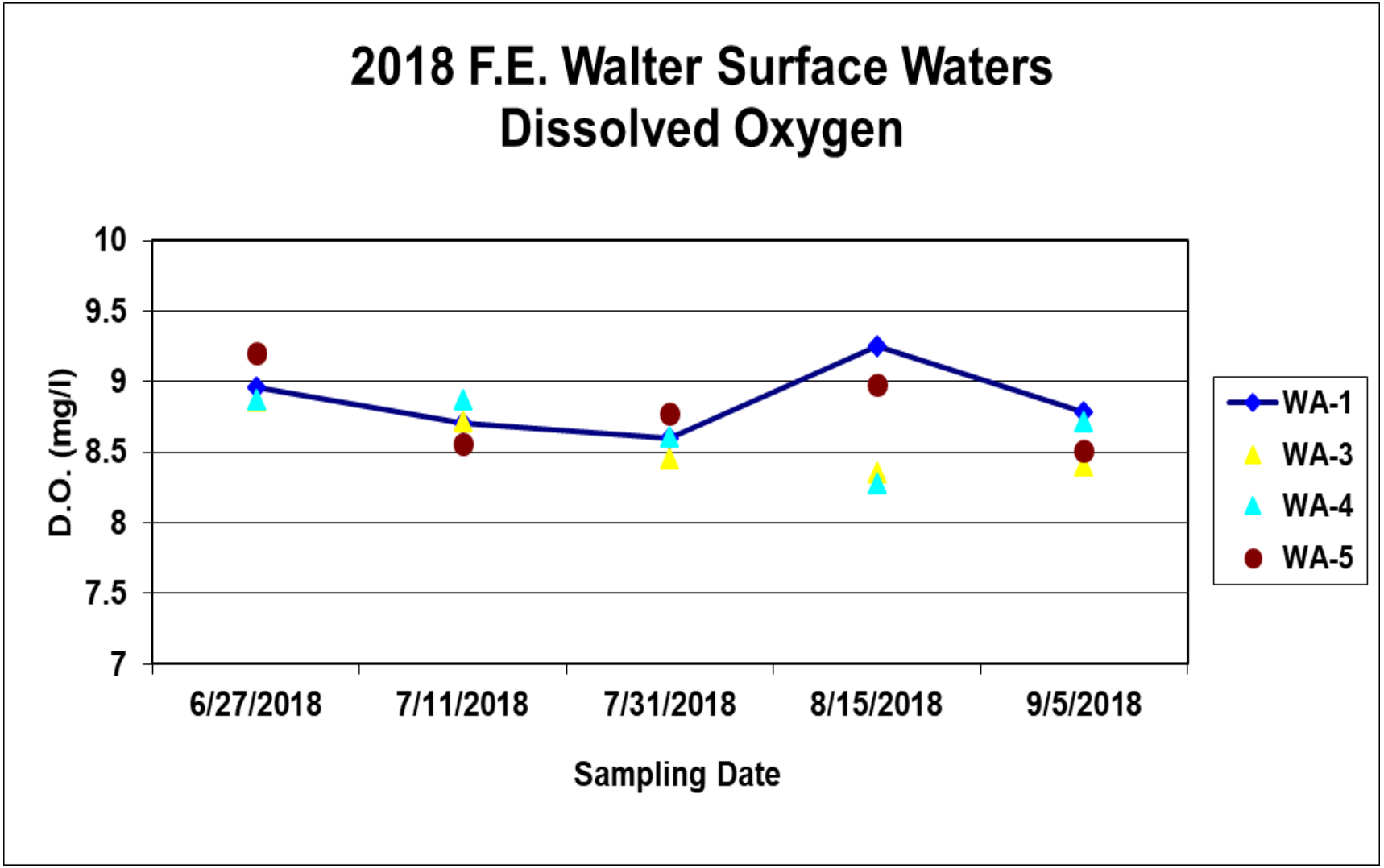

Figure 3-3. Dissolved oxygen measured in tributary and release (WA-1) surface waters of F. E. Walter Reservoir during 2018. See Appendix A for a summary of the plotted value.

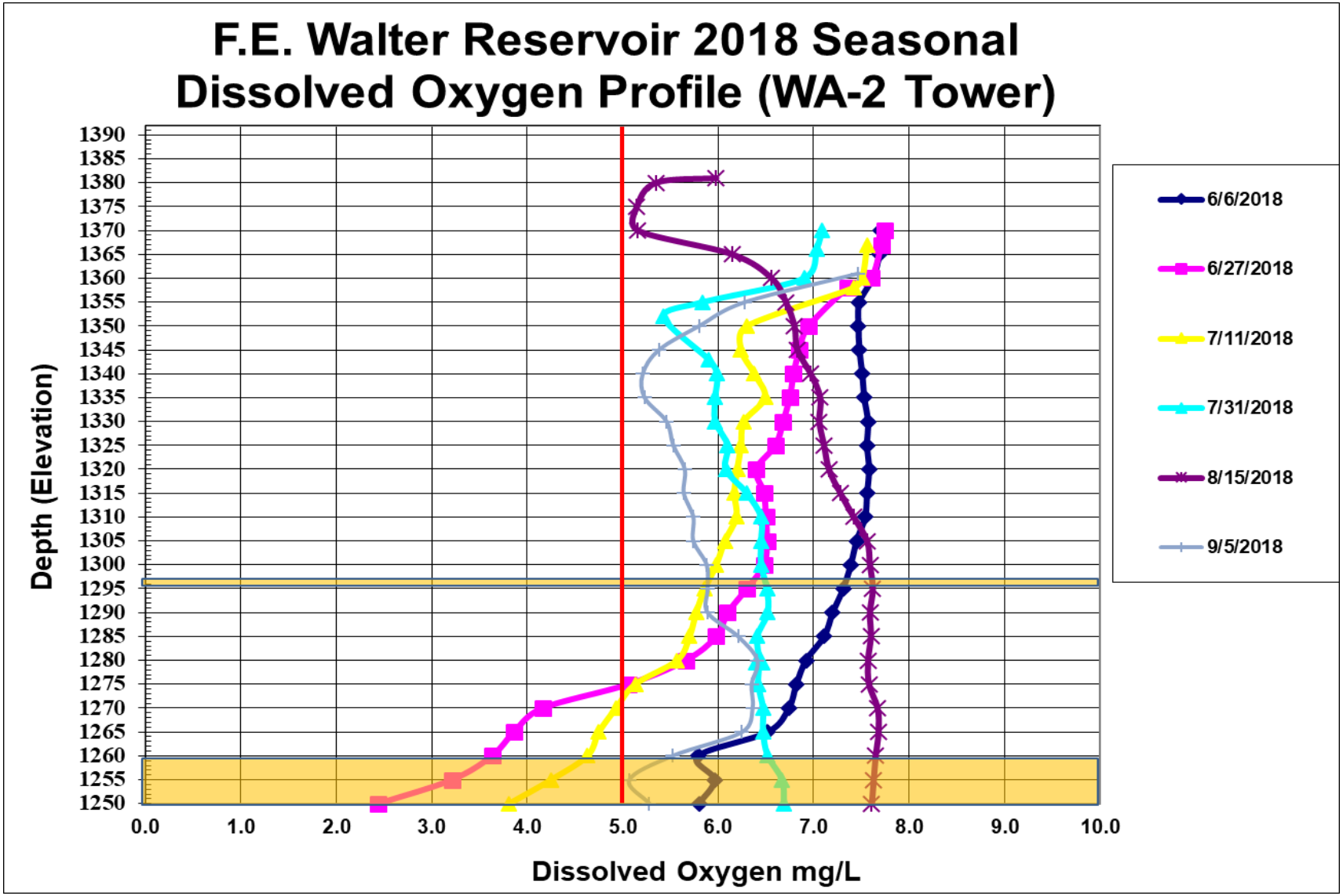

Figure 3-4. Dissolved oxygen measured in the water column of F.E. Walter Reservoir at station WA-2 during 2018. The PADEP WQ standard for DO is an epilimnion minimum concentration of 5 mg/L. See Appendix A for a summary of the plotted values.

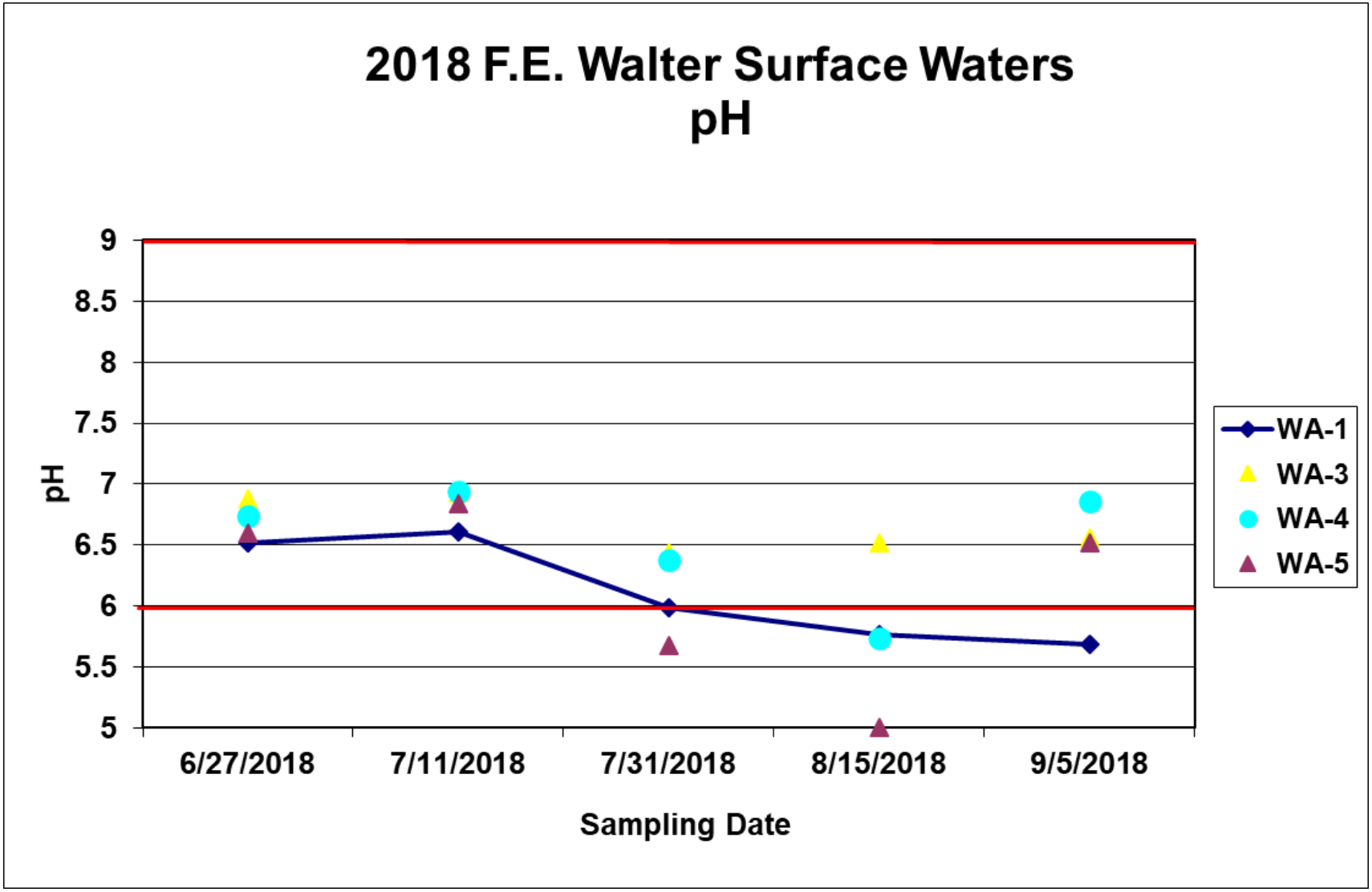

Figure 3-5. Measures of pH in tributary and release (WA-1) surface waters of F.E. Walter Reservoir during 2018. The PADEP WQ standard for pH is an acceptable range from 6 to 9. See Appendix A for a summary of the plotted values

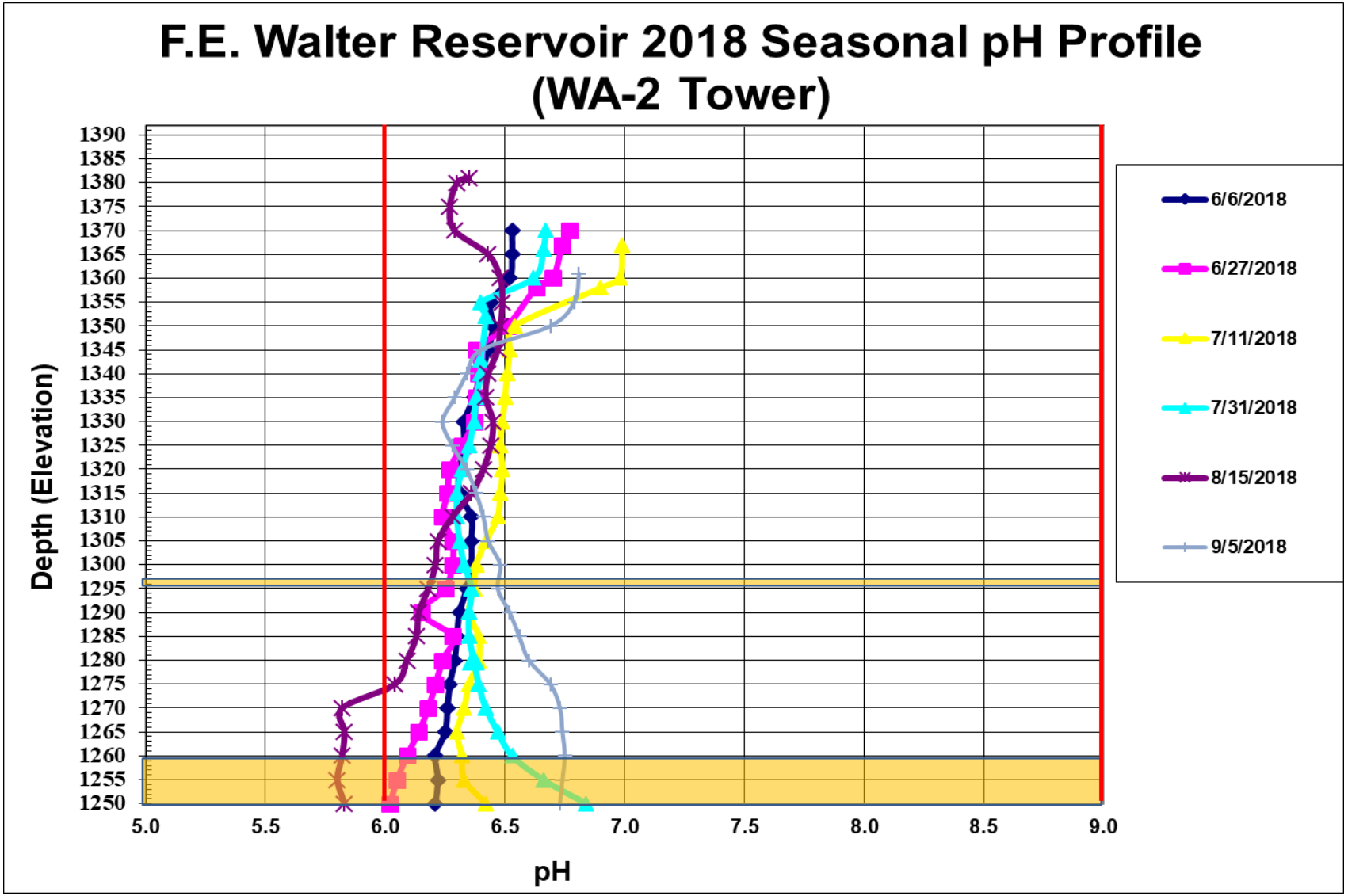

Figure 3-6. Stratification of pH measured in the water column of F.E. Walter Reservoir at station WA-2 during 2018. The PADEP water quality standard pH is an acceptable range from 6 to 9. See Appendix A for a summary of the plotted value.

Table 3-1. Summary of surface, middle, and bottom water quality monitoring data for F.E. Walter Reservoir in 2018

Station	Date	ALK mg/L	BOD5 mg/L	DISS-P mg/L	NH3 mg/L	NO2 mg/L	NO3 mg/L	PO4 mg/L	TDS mg/L	TKN mg/L	TOC mg/L	TP mg/L	TSS mg/L
WA-01S	6/27/2018	<5.0	<3.4	<.05	<.20	<.01	0.16	NS	42.5	0.21	4.3	<.05	<4.0
	7/11/2018	<5.0	<3.4	<.05	<.20	<.01	0.11	NS	83.3	0.32	4.4	<.05	<4.0
	7/31/2018	<4.0	<3.4	<.05	<.20	<.01	<0.11	NS	13.3	0.66	9.1	<.05	5.1
	8/15/2018	<4.0	<3.4	<.05	<.20	<.01	<0.11	NS	16	0.60	10.6	<.05	7.1
	9/5/2018	4.8	7.0	<.05	<.20	<.01	0.17	NS	80	0.41	8.7	<.05	4.2
	Mean	4.50	4.12	0.05	0.20	0.01	0.13		47.02	0.44	7.42	0.05	4.88
	Stdev	0.46	1.44	0	0	0	0.03		30.08	0.17	2.59	0	1.18
	Max	5.0	7	0.05	0.20	0.01	0.17		83.80	0.66	10.60	0.05	7.10
	Min	4.0	3.4	0.05	0.20	0.01	0.11		13.30	0.21	4.30	0.05	4.0
	No. of Det.	1	1	0	0	0	3		5	5	5	0	3
WA-02S	6/27/2018	<5.0	<3.4	<.05	<.20	<.01	<0.11	NS	17.5	0.24	4.5	<.05	<4.0
	7/11/2018	<5.0	<3.4	<.05	<.20	<.01	0.32	NS	50	0.38	5.6	<.05	<4.0
	7/31/2018	4.7	<3.4	<.05	<.20	<.01	0.13	NS	31.7	0.39	5.7	<.05	<2.0
	8/15/2018	<4.0	<3.4	<.05	<.20	<.01	0.11	NS	26.7	0.42	9.8	<.05	<2.0
	9/5/2018	<4.0	<3.4	<.05	<.20	<.01	<0.11	NS	25	0.46	8.9	<.05	<2.0
	Mean	4.54	3.4	0.05	0.20	0.01	0.16		30.18	0.38	6.90	0.05	2.80
	Stdev	0.54	0	0	0	0	0.08		10.91	0.07	2.06	0	0.98
	Max	5.0	3.4	0.05	0.20	0.01	0.32		50	0.46	9.80	0.05	4
	Min	4.0	3.4	0.05	0.20	0.01	0.11		17.5	0.24	4.50	0.05	2
	No. of Det.	1	0	0	0	0	3		5	5	5	0	0

Table 3-1 continued. Summary of surface, middle, and bottom water quality monitoring data for F.E. Walter Reservoir in 2018

Station	Date	ALK mg/L	BOD5 mg/L	DISS-P mg/L	NH3 mg/L	NO2 mg/L	NO3 mg/L	PO4 mg/L	TDS mg/L	TKN mg/L	TOC mg/L	TP mg/L	TSS mg/L
WA-02M	6/27/2018	<5.0	<3.4	<.05	<.20	<.01	0.13	NS	25	0.23	4.6	<.05	<4.0
	7/11/2018	<5.0	<3.4	<.05	<.20	<.01	0.11	NS	46.7	0.30	4.7	<.05	<4.0
	7/31/2018	<4.0	<3.4	<.05	<.20	<.01	0.29	NS	50	0.43	11.3	<.05	2.5
	8/15/2018	4.7	<3.4	<.05	<.20	<.01	0.53	NS	30	0.45	9.5	<.05	5.0
	9/5/2018	4.8	<3.4	<.05	<.20	<.01	0.10	NS	23.3	0.29	9.1	<.05	1.7
	Mean	4.7	3.4	0.05	0.20	0.01	0.23		35	0.34	7.84	0.05	3.44
	Stdev	0.37	0	0	0	0	0.16		11.17	0.09	2.71	0	1.18
	Max	5	3.4	0.05	0.20	0.01	0.53		50	0.45	11.30	0.05	5.0
	Min	4	3.4	0.05	0.20	0.01	0.10		23.3	0.23	4.60	0.05	1.70
	No. of Det.	2	0	0	0	0	5		5	5	5	0	03
WA-02B	6/27/2018	<5.0	<3.4	<.05	<.20	<.01	0.12	NS	33.3	0.37	5.0	0.08	62.7
	7/11/2018	<5.0	<3.4	<.05	<.20	<.01	0.12	NS	20	0.35	5.8	<.05	12.7
	7/31/2018	<4.0	<3.4	<.05	<.20	<.01	<0.11	NS	20	0.56	10.7	0.05	19
	8/15/2018	11.4	<3.4	<.05	<.20	<.01	<0.11	NS	23.3	0.50	12.1	0.05	5.8
	9/5/2018	5.3	<3.4	.03	.11	<.01	0.15	NS	25	0.30	11.5	0.07	32.7
	Mean	6.14	3.4	0.05	0.18	0.01	0.12		24.32	0.42	9.02	0.06	26.58
	Stdev	2.67	0	0.01	0.04	0	0.01		4.89	0.10	3.0	0.01	20.12
	Max	11.4	3.4	0.05	0.20	0.01	0.15		33.3	0.56	12.1	0.08	62.70
	Min	4	3.4	0.03	0.11	0.01	0.11		20	0.30	5.0	0.05	5.8
	No. of Det.	2	0	1	1	0	3		5	5	5	2	5

Table 3-1 continued. Summary of surface, middle, and bottom water quality monitoring data for F.E. Walter Reservoir in 2018

Station	Date	ALK mg/L	BOD5 mg/L	DISS-P mg/L	NH3 mg/L	NO2 mg/L	NO3 mg/L	PO4 mg/L	TDS mg/L	TKN mg/L	TOC mg/L	TP mg/L	TSS mg/L
WA-03S	6/27/2018	<5.0	<3.4	<.05	<.20	<.01	0.33	NA	43.3	0.25	4.7	<0.05	<4.0
	7/11/2018	5.7	<3.4	<.05	<.20	<.01	0.20	NA	73.3	0.33	5.1	<0.05	<4.0
	7/31/2018	<4.0	<3.4	<.05	<.20	<.01	0.13	NA	105	1.60	13.1	<0.05	2.5
	8/15/2018	5.2	<3.4	<.05	<.20	<.01	0.14	NA	33.3	0.56	15.3	<0.05	5.2
	9/5/2018	<4.0	<3.4	.06	<.20	<.01	0.13	NA	30	0.30	9.1	0.28	1.9
	Mean	4.78	3.4	0.05	0.20	0.01	0.19		56.98	0.61	9.46	0.01	3.52
	Stdev	0.68	0	0	0	0	0.08		28.45	0.51	4.22	0.09	1.18
	Max	5.70	3.4	0.06	0.20	0.01	0.33		105	1.60	15.3	0.28	5.2
	Min	4.0	3.4	0.05	0.20	0.01	0.13		30	0.25	4.7	0.05	1.9
	No. of Det.	2	0	1	0	0	5		5	5	5	1	3
WA-04S	6/27/2018	6.2	<3.4	<.05	<.20	<.01	0.16	NA	57.5	<0.20	4.8	<0.05	<4.0
	7/11/2018	<5.0	<3.4	<.05	<.20	<.01	0.16	NA	86.7	0.23	3.0	<0.05	<4.0
	7/31/2018	21.2	<3.4	<.05	<.20	<.01	0.22	NA	100	0.34	7.0	<0.05	2.1
	8/15/2018	4.1	<3.4	<.05	<.20	<.01	<0.11	NA	20	0.44	10.8	<0.05	3.8
	9/5/2018	7.4	<3.4	<.05	<.20	<.01	0.12	NA	30	0.28	7.9	0.04	1.9
	Mean	8.78	3.4	0.05	0.20	0.01	0.15		58.84	0.30	6.70	0.05	3.16
	Stdev	6.31	0	0	0	0	0.04		31.02	0.09	2.67	0	0.95
	Max	21.2	3.4	0.05	0.20	0.01	0.22		100	0.44	10.80	0.05	4.0
	Min	4.1	3.4	0.05	0.20	0.01	0.11		20	0.20	3.0	0.04	1.90
	No. of Det.	4	0	0	0	0	4		5	4	5	1	3

Table 3-1 continued. Summary of surface, middle, and bottom water quality monitoring data for F.E. Walter Reservoir in 2018

Station	Date	ALK mg/L	BOD5 mg/L	DISS-P mg/L	NH3 mg/L	NO2 mg/L	NO3 mg/L	PO4 mg/L	TDS mg/L	TKN mg/L	TOC mg/L	TP mg/L	TSS mg/L
WA-05S	6/27/2018	<5.0	<3.4	<.05	<.20	<.01	<.11	NS	57.5	0.20	2.9	<0.05	9.6
	7/11/2018	<5.0	<3.4	<.05	<.20	<.01	<.11	NS	60	0.30	3.9	<0.05	<4.0
	7/31/2018	<4.0	<3.4	<.05	<.20	<.01	<.11	NS	6.7	0.31	5.4	<0.05	3.8
	8/15/2018	<4.0	<3.4	<.05	<.20	<.01	<.11	NS	7.5	0.36	8.7	<0.05	3.5
	9/5/2018	<4.0	<3.4	<.05	<.20	<.01	<.11	NS	20	0.19	6.0	<0.05	<2.0
	Mean	4.4	3.4	0.05	0.20	0.01	0.11		30.34	0.27	5.38	0.05	4.58
	Stdev	0.49	0	0	0	0	0		23.68	0.07	1.99	0	2.61
	Max	5	3.4	0.05	0.20	0.01	0.11		60	0.36	8.7	0.05	9.60
	Min	4	3.4	0.05	0.20	0.01	0.11		6.7	0.19	2.9	0.05	2.0
	No. of Det.	0	0	0	0	0	0		5	5	5	0	3
WA-06S	6/27/2018	<5.0	<3.4	<.05	<.20	<.01	<.11	NS	32.5	<0.20	5.2	<0.05	<4.0
	7/11/2018	<5.0	<3.4	<.05	<.20	<.01	.11	NS	63.3	0.53	4.9	<0.05	<4.0
	7/31/2018	4.1	<3.4	<.05	<.20	<.01	<.11	NS	43.3	0.37	5.6	<0.05	<2.0
	8/15/2018	<4.0	<3.4	<.05	<.20	<.01	<.11	NS	35	0.38	8.6	<0.05	<2.0
	9/5/2018	4.8	<3.4	<.05	<.20	<.01	<.11	NS	23.3	0.34	8.4	<0.05	1.5
	Mean	4.58	3.4	0.05	0.20	0.01	0.11		39.48	0.36	6.54	0.05	2.7
	Stdev	0.44	0	0.00	0	0	0		13.51	0.11	1.62	0	1.08
	Max	5	3.4	0.05	0.20	0.01	0.11		63.30	0.53	8.6	0.05	4
	Min	4	3.4	0.05	0.20	0.01	0.11		23.30	0.20	4.9	0.05	1.5
	No. of Det.	2	0	0	0	0	1		5	4	5	0	1

Table 3-1 continued. Summary of surface, middle, and bottom water quality monitoring data for F.E. Walter Reservoir in 2018

Station	Date	ALK mg/L	BOD5 mg/L	DISS-P mg/L	NH3 mg/L	NO2 mg/L	NO3 mg/L	PO4 mg/L	TDS mg/L	TKN mg/L	TOC mg/L	TP mg/L	TSS mg/L
WA-06M	6/27/2018	<5.0	<3.4	<.05	<.20	<.01	0.12	NS	42.5	<.20	4.5	<.05	<4.0
	7/11/2018	<5.0	<3.4	<.05	<.20	<.01	0.12	NS	56.7	0.29	<1.0	<.05	<4.0
	7/31/2018	<4.0	<3.4	<.05	<.20	<.01	<.11	NS	42.5	0.52	8.6	<.05	<2.0
	8/15/2018	<4.0	<3.4	<.05	<.20	<.01	<.11	NS	35	0.40	8.9	<.05	5.5
	9/5/2018	<4.0	<3.4	<.05	<.20	<.01	<.11	NS	20	0.27	8.2	<.05	<2.0
	Mean	4.4	3.4	0.05	0.20	0.01	0.11		39.34	0.34	6.24	0.05	3.5
	Stdev	.49	0	0	0	0	0		11.95	0.11	3.07	0	1.34
	Max	5	3.4	0.05	0.20	0.01	0.12		56.7	0.52	8.9	0.05	5.5
	Min	4	3.4	0.05	0.20	0.01	0.11		20	0.20	1.0	0.05	2.0
	No. of Det.	0	0	0	0	0	2		5	4	4	0	1
WA-06B	6/27/2018	<5.0	<3.4	<.05	<.20	<.01	0.11	NS	43.3	<.20	4.6	<.05	4.5
	7/11/2018	<5.0	<3.4	<.05	<.20	<.01	0.12	NS	40	0.33	5.4	<.05	5.5
	7/31/2018	<4.0	<3.4	<.05	<.20	<.01	<.11	NS	36.7	0.33	9.3	<.05	7.8
	8/15/2018	<4.0	<3.4	<.05	<.20	<.01	0.07	NS	37.5	0.52	11.9	<.05	6.0
	9/5/2018	3.7	<3.4	<.05	<.20	<.01	<0.11	NS	20	0.27	7.8	<.05	7.2
	Mean	4.34	3.4	0.05	0.20	0.01	0.10		35.5	0.33	7.80	0.05	6.2
	Stdev	.55	0	0	0	0	0.02		8.08	0.11	2.65	0	1.18
	Max	5	3.4	0.05	0.20	0.01	0.12		43.3	0.52	11.9	0.05	7.8
	Min	3.7	3.4	0.05	0.20	0.01	0.07		20	0.20	4.6	0.05	4.5
	No. of Det.	1	0	0	0	0	3		5	4	5	0	5

Table 3-1 continued. Summary of surface, middle, and bottom water quality monitoring data for F.E. Walter Reservoir in 2018

Station	Date	ALK mg/L	BOD5 mg/L	DISS-P mg/L	NH3 mg/L	NO2 mg/L	NO3 mg/L	PO4 mg/L	TDS mg/L	TKN mg/L	TOC mg/L	TP mg/L	TSS mg/L
WA-07S	6/27/2018	<5.0	<3.4	<.05	<.20	<.01	0.12	NS	22.5	<0.20	4.7	<.05	<4.0
	7/11/2018	<5.0	<3.4	<.05	<.20	<.01	0.14	NS	40	0.38	4.9	<.05	<4.0
	7/31/2018	<4.0	<3.4	<.05	<.20	<.01	<.11	NS	32.5	0.36	6.4	<.05	<2.0
	8/15/2018	3.6	<3.4	<.05	<.20	<.01	0.06	NS	20	0.39	9.7	<.05	<2.0
	9/5/2018	5.8	<3.4	<.05	<.20	<.01	<.11	NS	73.3	0.35	8.3	<.05	1.8
	Mean	4.68	3.4	0.05	0.20	0.01	0.11		37.66	0.34	6.8	0.05	2.76
	Stdev	.79	0	0.00	0	0	0.03		19.20	0.07	1.94	0	1.02
	Max	5.8	3.4	0.05	0.20	0.01	0.14		73.30	0.39	9.7	0.05	4.0
	Min	3.6	3.4	0.05	0.20	0.01	0.06		20	0.20	4.7	0.05	1.80
	No. of Det.	2	0	0	0	0	3		5	4	5	0	1
WA-07M	6/27/2018	<5.0	<3.4	<.05	<.20	<.01	0.11	NS	22.5	0.35	4.5	<.05	<4.0
	7/11/2018	<5.0	<3.4	<.05	<.20	<.01	0.12	NS	66.7	0.46	5.6	<.05	<4.0
	7/31/2018	<4.0	<3.4	<.05	<.20	<.01	0.12	NS	45.0	0.42	9.7	<.05	<2.0
	8/15/2018	<4.0	<3.4	<.05	<.20	<.01	0.06	NS	22.5	0.46	11.3	<.05	4.2
	9/5/2018	5.8	<3.4	<.05	<.20	<.01	0.15	NS	23.3	0.38	8.8	<.05	2.3
	Mean	4.76	3.4	0.05	0.20	0.01	0.11		36	0.41	7.98	0.05	3.3
	Stdev	.69	0	0	0	0	0.03		17.6	0.04	2.55	0	0.95
	Max	5.8	3.4	0.05	0.20	0.01	0.15		66.7	0.46	11.3	0.05	4.2
	Min	4	3.4	0.05	0.20	0.01	0.06		22.5	0.35	4.5	0.05	2.0
	No. of Det.	1	0	0	0	0	5		5	5	5	0	2

Table 3-1 continued. Summary of surface, middle, and bottom water quality monitoring data for F.E. Walter Reservoir in 2018

Station	Date	ALK mg/L	BOD5 mg/L	DISS-P mg/L	NH3 mg/L	NO2 mg/L	NO3 mg/L	PO4 mg/L	TDS mg/L	TKN mg/L	TOC mg/L	TP mg/L	TSS mg/L
WA-07B	6/27/2018	<5.0	<3.4	<.05	<.20	<.01	0.13	NS	1080	0.71	6.4	<.05	34
	7/11/2018	<5.0	<3.4	<.05	<.20	<.01	0.14	NS	63.3	0.44	6.4	<.05	14
	7/31/2018	<4.0	<3.4	<.05	<.20	<.01	<.11	NS	30	0.54	11.4	<.05	4.2
	8/15/2018	<4.0	<3.4	<.05	<.20	<.01	<.11	NS	25	0.55	13.1	<.05	56.4
	9/5/2018	5.3	<3.4	<.05	<.20	<.01	<.13	NS	20	0.35	8.9	<.05	34.3
	Mean	4.66	3.4	0.05	0.20	0.01	0.12		243.66	0.52	9.24	0.05	28.58
	Stdev	.55	0	0	0	0	0.01		418.44	0.12	2.68	0	18.13
	Max	5.3	3.4	0.05	0.20	0.01	0.14		1080	0.71	13.1	0.05	56.40
	Min	4	3.4	0.05	0.20	0.01	0.11		20	0.35	6.4	0.05	4.20
	No. of Det.	1	0	0	0	0	2		5	5	5	5	5

< Laboratory analysis result was less than the limit of quantification or limit of detection.
NS- Not Sampled

3.2.1 Ammonia

Total Ammonia (NH3) is a measure of the most reduced inorganic form of nitrogen in water and includes dissolved ammonia and the ammonium ion. Ammonia is a small component of the nitrogen cycle but is an essential plant nutrient, it contributes to the trophic status of a water body. Excess ammonia contributes to eutrophication of water bodies. This can result in excessive algal growths and impacts on recreation and drinking water supplies. In high concentrations, ammonia is toxic to aquatic life.

Ammonia in the water column of F.E. Walter Reservoir was consistently low throughout the monitoring period with all samples measuring less than the minimum laboratory reporting limit (<0.20 mg/L). F.E. Walter Reservoir was in compliance with the PADEP water quality standard for ammonia during 2018. The water quality standard of ammonia is dependent on temperature and pH (Table 3-2). Throughout the monitoring period, all measures of ammonia were less than their respective criteria values.

Table 3.2 Environmental Protection Agency Ammonia Freshwater Criteria 2013

2013 Final Aquatic Life Criteria for Ammonia (Magnitude, Frequency, and Duration) (mg TAN/L) pH 7.0, T=20°C	
Acute (1-hour average)	17
Chronic (30-day rolling average)	1.9*

*Not to exceed 2.5 times the CCC as a 4-day average within the 30-days, i.e. 4.8 mg TAN/L at pH 7 and 20°C, more than once in three years on average.
Criteria frequency: Not to be exceeded more than once in three years on average.

3.2.2 Nitrite and Nitrate

Nitrite (NO2) is a measure of a form of nitrogen that occurs as an intermediate in the nitrogen cycle. It is unstable and can rapidly be oxidized to nitrate or reduced to nitrogen gas. Nitrite is a source of nutrients for plants and can be toxic to aquatic life in relatively low concentrations. Concentrations of nitrite at F.E. Walter Reservoir were consistently low at all sampling stations during 2018. Concentrations of nitrite measured at all stations and depths were less than the minimum laboratory reporting limit of 0.01 mg/L (Table 3-1).

Nitrate (NO3) is the measure of the most oxidized and stable form of nitrogen. It is the principal form of combined nitrogen in natural waters. Nitrate is the primary form of nitrogen used by plants as a nutrient to stimulate plant growth. Nitrate was also consistently low at F.E. Walter Reservoir during 2018. For all stations and depths, sample results ranged from less than the laboratory reporting limit of 0.11 mg/L to a maximum of 0.53 mg/L in the mid-depth waters at station WA-2M on 15 August.

In 2018, F.E. Walter Reservoir was in compliance with the PADEP water quality standard for nitrogen. The water quality standard for nitrogen is a summed concentration of nitrite and nitrate of less than 10-mg/L. Throughout the monitoring period, the summed concentrations for each station were well below this standard. The maximum summed concentration for any one sampling station did not exceed 0.54 mg/L.

3.2.3 Total Kjeldahl Nitrogen

Total Kjeldahl nitrogen (TKN) is a measure of organic nitrogen that includes ammonia. Organic nitrogen is not immediately available for biological activity and is therefore not available for plant growth until decomposition to an inorganic form occurs. TKN in the water column of F.E. Walter Reservoir was low during 2018 (Table 3-1). Concentrations measured at all reservoir stations ranged from less than the minimum laboratory reporting limit of 0.20 mg/L to a high of 1.60 mg/L at station WA-3S on 31 July.

3.2.4 Total Phosphorus

Total phosphorus (TP) is a measure of both organic and inorganic forms of phosphorus. It is an essential plant nutrient and is often the most limiting nutrient to plant growth in freshwater systems. Inputs of phosphorus are the prime contributing factors to eutrophication in most freshwater systems. Phosphorus bound to bottom sediments in lakes can be released when oxygen levels are depleted in bottom waters. This phosphorus then becomes available for plant growth.

EPA guidance for nutrient criteria in lakes and reservoirs suggests a maximum concentration for total phosphorus of 0.01-mg/L (EPA 2000). Lakes and reservoirs exceeding this concentration are more likely to experience algal bloom problems during the growing season. In 2018, the laboratory sample analysis method used to measure total phosphorus only allowed a minimum detection limit of 0.05 mg/L. As a result of the detection limit being greater than sample results typically seen at F.E. Walter Reservoir, sample results for all stations and dates, except three, were recorded as <0.05 mg/L (Table 3-1). Many of these samples would have exceeded or been less than the EPA 0.01 mg/L suggested concentration, therefore, these results do not accurately reflect total phosphorus concentrations in F.E. Walter Reservoir and its tributaries. For all stations and depths, concentrations ranged from less than the reporting limit of 0.05 mg/L to a high of 0.28 mg/L. The maximum single sample concentration of 0.28 mg/L was measured on 05 September in the surface waters at station WA-03S.

3.2.5 Dissolved Phosphorus

Dissolved or soluble phosphorus (DISS P) in the water column of F.E. Walter Reservoir remained consistently low during 2018. With the exception of one sample (0.06 mg/L), concentrations at all stations and depths during the sampling season were below the minimum reporting limit of 0.05 mg/L (Table 3-1). In freshwater environments, dissolved phosphorus is usually a limiting nutrient and is utilized by freshwater plants and algae during photosynthesis.

3.2.6 Dissolved Phosphate

Dissolved Phosphate or Orthophosphate (PO4) is a measure of the inorganic oxidized form of soluble phosphorus. This form of phosphorus is the most readily available for uptake during photosynthesis. In 2018, dissolved phosphate concentrations were not measured in samples collected at F.E. Walter Reservoir.

3.2.7 Total Dissolved Solids

Total Dissolved Solids (TDS) is a measure of the amount of filterable dissolved material in the water. Dissolved salts such as sulfate, magnesium, chloride, and sodium contribute to elevated levels. TDS in the lake and tributary stations of F.E. Walter Reservoir remained relatively constant and low during 2018. Concentrations at all stations and depths, excluding one, over the monitoring period ranged from 6.7 to 105 mg/L (Table 3-1). One outlier sample result of 1080 mg/L was collected on 27 June at Station WA-07B. It is believed this elevated result may be the result of sampling or analysis error. With the exception of the one outlier result, F.E. Walter Reservoir and its tributaries were in compliance with the PADEP water quality standard for total dissolved solids during 2018. The water quality standard is a maximum concentration of 500-mg/L.

3.2.8 Total Suspended Solids

Total Suspended Solids (TSS) is a measure of the amount of non-filterable particulate matter that is suspended within the water column. High concentrations increase the turbidity of the water and can hinder photosynthetic activity, result in damage to fish gills, and cause impairment to spawning habitat (smothering). TSS measures in the water column of F.E. Walter Reservoir were low in 2018 with many sample results less than the reporting limit of 4.0 mg/L and ranging to a maximum concentration of 62.7 mg/L (Table 3-1). Elevated results were predominantly seen in the lake bottom water samples. This is likely a result of sampling error and resulting interference of suspended sediment in the sampling apparatus during lake bottom water sampling. On occasion, bottom sediments are re-suspended during the process of collecting a sample from deeper waters. These elevated results do not always accurately reflect conditions at those stations and depths.

3.2.9 Biochemical Oxygen Demand

Five-day biochemical oxygen demand (BOD) is a measure of the oxygen-depleting burden imposed by organic material present in water. It measures the rate of oxygen uptake by organisms in the water sample over a period of time. It is an indicator of the quality of a water body and the degree of pollution by biodegradable organic matter can therefore be inferred. The five-day biochemical oxygen demand and commonly accepted water quality inferences are as follows:

- 1-2 mg/L is associated with very clean water and little biodegradable wastes;
- 3-5 mg/L is associated with moderately clean water with some biodegradable wastes;

- 6-9 mg/L is associated with fairly polluted water, many bacteria, and much biodegradable wastes;
- 10+ mg/L is associated with very polluted water and large amounts of biodegradable wastes.

Measurements of 5-day Biochemical oxygen demand (BOD) for all samples at F.E. Walter Reservoir and its tributary stations in 2018 were below the minimum reporting limit of 3.4 mg/L. It is therefore inferred that F.E. Walter Reservoir and its associated tributaries contain very clean water with little biodegradable organic wastes.

3.2.10 Alkalinity

Alkalinity (ALK) is a measure of the acid-neutralizing capacity of water. Waters that have high alkalinity values are considered undesirable because of excessive hardness and high concentrations of sodium salts. Water with low alkalinity has little capacity to buffer acidic inputs and is susceptible to acidification (low pH). The PADEP standard is a minimum concentration of 20-mg/L $CaCO_3$ except where natural conditions are less.

Alkalinity measurements in the waters of F.E. Walter Reservoir were routinely low during 2018. Concentrations measured at all stations and depths ranged from <4.0 mg/L to 21.2 mg/L $CaCO_3$ throughout the monitoring period (Table 3-1). The natural alkalinity of water is largely dependent on the underlying geology and soils within the surrounding watershed. The low alkalinity typically measured at F.E. Walter Reservoir probably results from the regional geology, which is primarily sandstone and shale (Van Diver 1990).

3.2.11 Total Organic Carbon

Total Organic Carbon (TOC) is a measure of the dissolved and particulate organic carbon in water. The bulk of organic carbon in water is composed of humic substances and partly degraded animal and plant materials. High levels of organic carbon coincide with a lowering of dissolved oxygen concentrations. Carbon is a nutrient required for biological processes.

Total Organic Carbon (TOC) was measured in the water column and tributaries of F.E. Walter Reservoir (Table 3-1). Concentrations of TOC at all stations and depths ranged from 1.0 mg/L to 15.3 mg/L. The highest single measured concentration of 15.3 mg/L was in the surface waters at tributary station WA-03S on 15 August.

3.2.12 Chlorophyll *a*

Chlorophyll a is the measure of the plant chlorophyll “a” primary pigment which helps plants get energy from light. It is found in most plants, algae, and cyanobacteria. Chlorophyll a measures increase in relation to algal densities in a water body. For the entire 2018 sampling season, chlorophyll *a* was low in the surface waters of F.E. Walter Reservoir (Appendix A). Concentrations for all sampling dates for tributary and lake stations at depths from 0-15 feet ranged from 0.0 ug/L to 5.5 ug/L.

3.3 TROPHIC STATE DETERMINATION

Carlson's (1977) trophic state index (TSI) is a method of expressing the extent of eutrophication of a lake, quantitatively. The trophic state analysis calculates separate indices for eutrophication based on measures of total phosphorus, chlorophyll *a*, and secchi disc depth. Index values for each parameter range on the same scale from 0 (least enriched) to 100 (most enriched). The resulting indices can also be compared to qualitative threshold values that correspond to levels of eutrophication. Classification of F.E. Walter Reservoir was based on a single sample each month during the sampling season. It is important to note that variability in measurements not captured between sampling events and the resulting classification can occur. Figure 3-7 graphically shows this potential variability between samples.

TSIs calculated for measures of total phosphorus classified F.E. Walter Reservoir as eutrophic in June (60.56), early July (60.56), late July (60.56), August (60.56) and September (60.56). TSIs calculated for measures of secchi disk depth classified F.E. Walter Reservoir as mesotrophic in June (45.16), early July (44.66), late July (48.0) and September (49.31) and eutrophic in August (51.53). TSIs calculated for measures of chlorophyll *a* classified F.E. Walter Reservoir as oligotrophic in June (37.40) and early July (22.32) and mesotrophic in late July (41.04), August (43.70), and September (40.70).

Carlson (1977) warned against averaging TSI values estimated for different parameters, and instead suggested giving priority to chlorophyll *a* in the summer and to phosphorus in the spring, fall, and winter. The laboratory minimum detection limit for total phosphorus did not accurately reflect levels of total phosphorus in samples collected from F.E. Walter Reservoir in 2018. With this in mind and considering historic sampling results, the trophic state of the reservoir, based on TSI's, was oligotrophic/mesotrophic throughout the 2018 sampling season.

The EPA (1983) also provides criteria for classifying the trophic conditions of lakes of the North Temperate Zone based on concentrations of total phosphorus, chlorophyll *a*, and secchi disk depth (Table 3-3). Taking into account the general agreement between the EPA classifications with that of the Carlson TSIs, the trophic condition of F.E. Walter Reservoir fluctuated between being mesotrophic and oligotrophic throughout much of the 2018 sampling season.

Table 3-3. EPA trophic classification criteria and average monthly measures for F.E. Walter Reservoir in 2018.

Water Quality Variable	Oligo-trophic	Meso-trophic	Eutrophic	27 June	11 July	31 July	15 Aug.	05 Sep.
Total Phosphorus (ppb)	<10	10-20	>20	<50	<50	<50	<50	<50
Chlorophyll a (ppb)	<4	4-10	>10	2.00	0.43	2.90	3.80	2.80
Secchi Depth (m)	>4	2-4	<2	2.80	2.90	2.30	1.80	2.10

3.4 RESERVOIR BACTERIA MONITORING

Two forms of coliform bacteria were monitored in the tributary and lake surface waters at F.E. Walter Reservoir during 2018 including total and fecal coliform (Table 3-4). Total coliform includes *Escherica coliform* (*E. coli*) and related bacteria that are associated with fecal discharges. Fecal coliform bacteria are a subgroup of the total coliform and are normally associated with waste derived from human and other warm-blooded animals and indicate the presence of fecal contamination but not the associated risk. Bacteria in natural waters are common and their presence in the sample is not necessarily a human health concern. With respect to PADEP water quality standards, fecal coliform bacteria has been replaced with an e-coli criteria. For purposes of the 2018 reservoir bacteria sampling, previous fecal coliform criteria was used.

Total coliform measures for all lake and tributary stations at F.E. Walter Reservoir during 2018, ranged from 0-clns/100-ml to 7300-clns/100-ml. Fecal coliform counts ranged from 0-clns/100-ml to 5200-clns/100-ml for the monitoring period. The previous standard for fecal coliform bacteria during the swimming season (from 1 May to 30 September) is a geometric mean not greater than 200 colonies/100-ml. Given that our regular monitoring was completed on one day grab samples, single sample results were then compared to the Pennsylvania Department of Health single sample standard of <1000 colonies/100-ml. Overall, bacteria levels were low at F.E. Walter Reservoir with respect to PADEP water quality standards. Elevated bacteria levels were seen primarily in tributary surface water stations WA-3S, WA-4S, and WA-5S and are directly affected by upstream watershed activity. Two fecal coliform bacteria samples exceeded the PADEP water contact recreation standard. Water contact recreation is not permitted at F.E. Walter Reservoir.

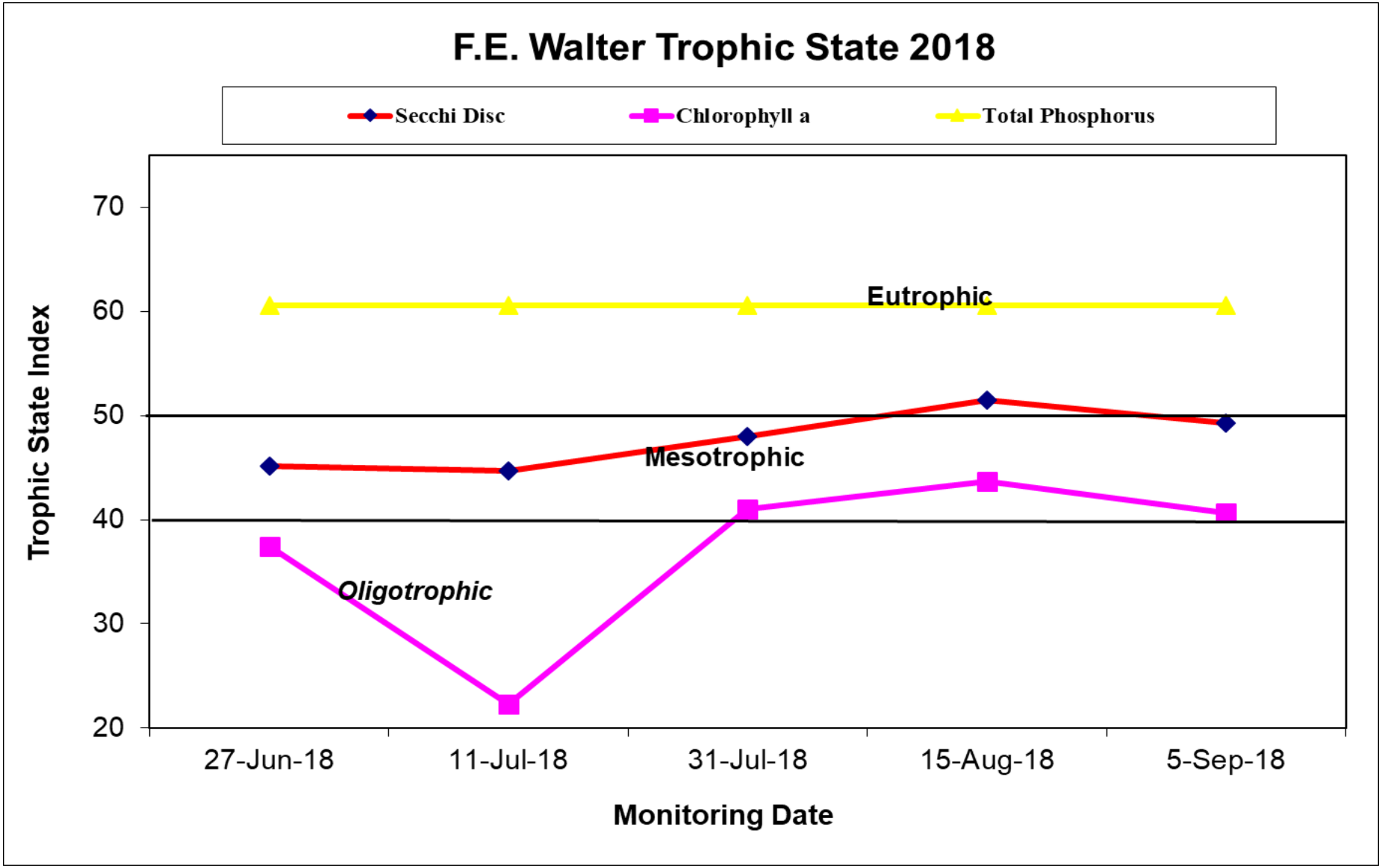

Figure 3-7. Carlson Trophic state indices calculated from secchi disk depth, concentrations of chlorophyll a and Total Phosphorus measured in surface waters of F.E. Walter Reservoir at Station WA-2 during 2018.

Table 3-4. Surface water bacteria counts (colonies/100 ml) at Walter Reservoir during 2018. Shaded values exceed State bacteria criteria. NS = Not Sampled in 2018

STATION	DATE	Total Coliform		Fecal Coliform		Escherichia coli
WA-1S	6/27/2018	37		12		NS
	7/11/2018	0		17		NS
	7/31/2018	809		144		NS
	8/15/2018	7300		5200		NS
	9/5/2018	510		88		NS
WA-2S	6/27/2018	4		0		NS
	7/11/2018	0		31		NS
	7/31/2018	120		20		NS
	8/15/2018	96		191		NS
	9/5/2018	0		0		NS
WA-3S	6/27/2018	100		96		NS
	7/11/2018	112		196		NS
	7/31/2018	194		64		NS
	8/15/2018	6200		5000		NS
	9/5/2018	270		12		NS
WA-4S	6/27/2018	151		197		NS
	7/11/2018	166		164		NS
	7/31/2018	320		12		NS
	8/15/2018	NS		NS		NS
	9/5/2018	136		124		NS
WA-5S	6/27/2018	34		11		NS
	7/11/2018	43		40		NS
	7/31/2018	174		8		NS
	8/15/2018	650		520		NS
	9/5/2018	4		16		NS
WA-6S	6/27/2018	4	<	4		NS
	7/11/2018	8		0		NS
	7/31/2018	92		8		NS
	8/15/2018	80		183		NS
	9/5/2018	124		0		NS
WA-7S	6/27/2018	8		0		NS
	7/11/2018	0		12		NS
	7/31/2018	727		20		NS
	8/15/2018	88		51		NS
	9/5/2018	84		0		NS

4.0 REFERENCES

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APPENDIX A

STRATIFICATION DATA TABLES

2018 F.E. Walter Water Quality Profiles

Station	Date	Time	Depth	Temp	DO	DO	pH	pHmV	ORP	Turbidity	Chloro.	SpCond
	M/D/Y	hh:mm:ss	ft	C	%	mg/L		mV	mV	NTU	ug/L	mS/cm
WA-1 Outfall	6/6/2018	10:32:31	0.5	17.43	95.3	9.13	6.48	14.8	149	4.5	4.7	0.065
	6/27/2018	9:47:49	0.5	18.43	95.6	8.96	6.52	12.6	212.5	3.4	1.9	0.07
	7/11/2018	9:59:34	0.5	20.41	96.6	8.71	6.61	7.6	161.5	5.4	0.6	0.08
	7/31/2018	9:20:06	0.5	21.08	96.7	8.6	5.99	44.6	213.7	9.3	5.0	0.058
	8/15/2018	9:35:03	0.5	20.57	102.9	9.25	5.77	57.4	217.5	26.8	4.4	0.046
	9/5/2018	10:18:14	0.5	21.09	98.7	8.78	5.69	62.1	203.3	75.9	109.7	0.058
WA-2 Lake Tower	6/6/2018	8:39:02	0	20.72	86	7.70	6.53	12.5	207.1	0.1	2.8	0.07
		8:37:39	5	20.74	85.8	7.69	6.53	12.6	207.7	0.0	2.7	0.07
		8:36:49	10	20.7	85	7.62	6.52	13.2	207.7	0.5	2.7	0.07
		8:35:53	15	19.63	81.6	7.48	6.44	17.6	211.2	0.6	2.9	0.071
		8:34:45	20	19.37	81.1	7.47	6.45	17	210.5	0.7	2.7	0.072
		8:33:58	25	19.06	80.8	7.48	6.43	18.1	210.9	0.5	3.1	0.071
		8:32:31	30	18.83	80.7	7.51	6.40	20.1	212	0.5	3.4	0.07
		8:31:56	35	18.51	80.4	7.53	6.37	21.8	211.6	0.5	3.8	0.069
		8:31:17	40	18.24	80.3	7.57	6.33	23.9	211.8	0.6	3.0	0.067
		8:30:26	45	18.08	80	7.56	6.33	23.8	211.2	0.5	4.0	0.067
		8:29:50	50	17.96	80	7.58	6.31	24.9	211	0.7	2.8	0.065
		8:29:00	55	17.81	79.6	7.56	6.31	25.1	210.8	0.0	3.3	0.066
		8:27:25	60	17.72	79.2	7.54	6.36	22	208.5	0.6	3.8	0.067
		8:26:37	65	17.63	78.2	7.45	6.36	21.9	208.6	1.5	3.6	0.067
		8:26:00	70	17.55	77.4	7.39	6.36	22.3	207.9	1.5	3.4	0.067
		8:25:01	75	17.5	76.4	7.31	6.34	23.5	207.3	0.9	3.4	0.064
		8:23:56	80	17.4	75.1	7.20	6.31	25	207.2	1.2	3.2	0.066
		8:23:02	85	17.2	73.9	7.11	6.30	25.4	206.5	2.7	3.0	0.066
		8:22:01	90	17.11	71.8	6.92	6.29	26.2	205.9	2.6	3.3	0.065
		8:21:28	95	16.97	70.5	6.82	6.27	27.1	205.8	3.8	3.7	0.065
		8:20:39	100	16.92	69.6	6.74	6.26	28.1	204.7	3.2	2.4	0.064
		8:18:16	105	16.91	67.3	6.52	6.25	28.4	202.2	5.0	3.3	0.065
		8:16:54	110	16.54	59.3	5.79	6.21	30.9	200.3	22.5	3.1	0.064
		8:12:58	115	16.51	61	5.96	6.22	29.9	195.4	18.7	2.6	0.064
		8:14:43	120	16.49	59.4	5.80	6.21	30.7	198.2	23.2	3.8	0.064

2018 F.E. Walter Water Quality Profiles

Station	Date	Time	Depth	Temp	DO	DO	pH	pHmV	ORP	Turbidity	Chloro.	SpCond
	M/D/Y	hh:mm:ss	ft	C	%	mg/L		mV	mV	NTU	ug/L	mS/cm
		7:49:35	0.5	22.53	89.6	7.75	6.77	-1.7	192.2	0.3	2.1	0.078
		7:48:46	5	22.47	89.0	7.71	6.74	-0.2	193.3	0.2	2.3	0.078
		7:47:41	10	22.24	87.3	7.60	6.70	2.5	194.7	0.1	1.6	0.077
		7:46:32	15	22.18	84.5	7.36	6.63	6.3	196.4	0.3	2.3	0.077
WA-2		7:45:57	20	21.75	79.1	6.95	6.51	13.5	199.3	1.2	2.1	0.079
		7:45:04	25	20.18	75.6	6.85	6.38	21.1	202.5	0.3	2.6	0.071
Lake		7:43:49	30	19.93	74.6	6.79	6.39	20.7	201.3	0.5	2.7	0.073
Tower		7:43:03	35	19.71	73.8	6.75	6.38	21	201.0	0.7	3.3	0.073
		7:41:51	40	19.55	72.8	6.68	6.37	21.9	201.0	0.8	3.3	0.073
Secchi		7:41:04	45	19.33	71.6	6.60	6.32	24.7	201.2	0.6	2.9	0.071
2.8 M	6/27/2018	7:40:10	50	19.12	69.2	6.40	6.27	27.9	201.5	0.6	4	0.07
		7:39:22	55	18.89	69.7	6.48	6.26	28.1	200.9	0.4	3.3	0.069
		7:38:30	60	18.72	69.7	6.50	6.24	29.1	200.2	0.4	3.7	0.068
		7:37:41	65	18.58	69.6	6.51	6.28	27	198.9	0.6	4.1	0.071
		7:37:01	70	18.49	69.2	6.48	6.28	26.9	198.3	0	2.8	0.07
		7:35:45	75	18.41	67.1	6.30	6.25	28.6	197.6	0.6	3.8	0.071
		7:35:00	80	18.27	64.7	6.10	6.15	34.3	197.1	1.9	3.1	0.067
		7:33:04	85	18.16	63.3	5.98	6.28	26.9	191.2	2	3.4	0.071
		7:32:05	90	18.06	59.9	5.66	6.24	29.1	190.5	2.2	2.6	0.071
		7:31:18	95	17.87	53.3	5.06	6.21	31	190.8	3.9	2.4	0.072
		7:30:28	100	17.48	43.5	4.16	6.18	32.6	190.1	17.8	3.3	0.073
		7:28:48	105	17.45	40.4	3.86	6.14	35.2	186.8	49.6	4.4	0.074
		7:27:47	110	17.39	37.8	3.63	6.09	38	184.4	27.5	2.6	0.074
		7:26:47	115	17.34	33.5	3.21	6.05	40.3	179.2	33.2	3.3	0.074
		7:24:41	120	17.18	25.4	2.44	6.02	42	194.6	59.6	2.7	0.076
		7:40:40	0.5	25.51	92.4	7.56	6.99	-15	163.1	0.2	0.1	0.090
		7:40:05	5	25.51	91.8	7.51	6.98	-14	164	0.0	0.4	0.089
		7:38:48	10	25.48	90.6	7.42	6.90	-9.6	165.5	0.5	0.8	0.089
		7:37:37	15	24.02	74.8	6.30	6.54	12.1	174.5	0.7	0.1	0.087
		7:36:48	20	23.28	73.2	6.24	6.52	13.4	174.7	1.2	1.5	0.087
		7:36:02	25	22.59	73.8	6.38	6.51	13.9	174.3	0.6	1.0	0.082
WA-2		7:34:58	30	22.00	74.2	6.49	6.50	14.1	173.2	0.8	2.0	0.078
Lake		7:33:57	35	21.62	71.1	6.27	6.49	15	172.8	0.5	1.1	0.081
Tower		7:32:44	40	21.37	70.5	6.24	6.48	15.2	171.6	0.4	2.2	0.081
		7:31:48	45	21.19	69.9	6.20	6.49	15.1	170.4	0.0	2.1	0.081
Secchi	7/11/2018	7:30:54	50	21.04	69.3	6.17	6.48	15.6	169.9	0.3	1.9	0.082
2.9 M		7:29:59	55	20.83	69.2	6.19	6.47	16	169	1.6	2.4	0.081
		7:28:47	60	20.59	67.5	6.07	6.42	19.2	168.7	0.9	1.6	0.080
		7:28:17	65	20.45	66.3	5.98	6.38	21.4	168.3	0.7	2.2	0.077
		7:27:26	70	20.26	64.8	5.86	6.37	21.8	167	1.5	1.2	0.077
		7:26:19	75	20.10	63.6	5.77	6.35	22.9	165.3	1.5	1.8	0.076
		7:25:27	80	19.98	62.7	5.70	6.39	20.4	163.3	1.6	1.8	0.077
		7:24:45	85	19.77	61.0	5.57	6.39	20.7	162.3	2.1	1.9	0.081
		7:23:42	90	19.50	55.9	5.13	6.35	23.1	161.4	6.6	2.4	0.081
		7:22:40	95	19.48	53.6	4.93	6.33	24	159.3	9.0	1.1	0.081
		7:21:44	100	19.46	51.7	4.75	6.30	25.8	157.4	11.7	2.0	0.082
		7:21:03	105	19.43	50.3	4.63	6.32	24.8	153.9	11.4	1.9	0.082
		7:20:01	110	19.30	46.2	4.25	6.33	24.3	149.9	15.2	1.7	0.082
		7:18:10	115	19.12	41.2	3.81	6.42	18.9	137.4	25.4	1.5	0.082

2018 F.E. Walter Water Quality Profiles

Station	Date	Time	Depth	Temp	DO	DO	pH	pHmV	ORP	Turbidity	Chloro.	SpCond
	M/D/Y	hh:mm:ss	ft	C	%	mg/L		mV	mV	NTU	ug/L	mS/cm
WA-2 Lake Tower Secchi 2.3 M	7/31/2018	7:43:11	0.5	23.73	83.8	7.09	6.67	4.1	198.7	1.20	2.5	0.082
		7:42:13	5	23.74	83.1	7.03	6.66	4.6	199.4	0.80	3.1	0.082
		7:40:46	10	23.71	81.5	6.90	6.62	7.4	200.1	0.60	3.1	0.082
		7:39:04	15	22.87	67.9	5.84	6.4	20.1	204.6	1.30	3.4	0.074
		7:38:10	20	22.47	62.7	5.43	6.42	18.9	204.6	1.40	3.0	0.083
		7:36:45	25	22.16	67.7	5.90	6.4	20.4	204.7	2.30	3.7	0.076
		7:36:13	30	21.95	68.4	5.99	6.4	20.3	204.1	1.90	3.9	0.075
		7:35:23	35	21.78	68	5.97	6.38	21.6	204.2	1.90	4.0	0.074
		7:34:42	40	21.67	67.9	5.97	6.37	22.0	203.6	1.90	2.8	0.072
		7:33:19	45	21.61	69.3	6.10	6.35	23.3	202.7	2.40	2.9	0.068
		7:32:19	50	21.56	69	6.08	6.32	25.0	202.8	1.80	2.6	0.068
		7:31:28	55	21.46	71.4	6.30	6.3	26.4	202.3	2.10	3.6	0.063
		7:30:52	60	21.42	73	6.45	6.3	25.9	200.8	2.00	5.5	0.058
		7:29:50	65	21.39	72.9	6.45	6.31	25.7	199.3	3.00	5.6	0.057
		7:29:06	70	21.33	72.9	6.45	6.33	24.4	197.8	3.60	4.6	0.058
		7:28:20	75	21.25	73.3	6.51	6.36	22.4	195.7	4.10	5.5	0.058
		7:27:17	80	21.21	73.4	6.52	6.35	22.9	194.1	4.60	5.5	0.058
		7:25:55	85	21.08	72.1	6.41	6.35	23.0	191.6	4.80	4.3	0.057
		7:24:49	90	21.03	72.1	6.43	6.37	22.0	188.6	6.10	3.6	0.057
		7:24:02	95	21.01	72.1	6.42	6.39	20.6	186.0	5.70	4.1	0.057
		7:22:54	100	21.00	72.6	6.47	6.42	18.8	182.5	6.10	4.5	0.057
		7:22:09	105	20.80	72.3	6.47	6.47	16.0	179.5	7.60	4.8	0.057
		7:21:15	110	20.67	72.6	6.52	6.53	12.6	175.5	8.80	5.1	0.058
		7:19:43	115	20.38	73.9	6.67	6.66	4.7	165.0	17.40	5.6	0.059
		7:18:27	120	20.24	73.9	6.69	6.84	-5.7	153.4	28.90	5.4	0.059
WA-2 Lake Tower Secchi 1.8 M	8/15/2018	7:33:49	0.5	22.61	69.2	5.98	6.35	23.4	196.7	0.80	4.3	0.062
		7:32:26	5	22.40	61.6	5.35	6.3	26.5	208.5	0.50	3.3	0.065
		7:31:38	10	22.22	59.2	5.15	6.27	28.2	209.3	0.80	3.8	0.066
		7:30:55	15	22.01	59	5.16	6.29	26.6	208.1	0.50	3.3	0.067
		7:29:07	20	21.85	70.1	6.15	6.43	18.6	205.0	2.00	3.7	0.061
		7:28:10	25	21.67	74.5	6.56	6.48	15.7	204.1	2.20	3.9	0.062
		7:27:20	30	21.47	76	6.71	6.49	15.0	203.8	4.30	3.5	0.061
		7:26:32	35	21.37	76.8	6.8	6.48	15.5	203.6	5.90	3.5	0.059
		7:25:43	40	21.34	77.2	6.83	6.47	16.0	203.5	5.80	3.4	0.059
		7:24:48	45	21.25	78.6	6.97	6.43	18.5	204.4	8.60	3.3	0.056
		7:24:09	50	21.17	79.6	7.07	6.42	18.8	203.6	10.20	2.6	0.053
		7:22:50	55	21.03	79.3	7.06	6.45	17.2	204.2	11.70	3.4	0.056
		7:22:19	60	20.99	79.7	7.11	6.44	17.6	204.1	14.90	3.7	0.054
		7:21:27	65	20.88	80.1	7.16	6.41	19.4	204.9	19.20	3.9	0.052
		7:20:35	70	20.70	81.2	7.28	6.36	22.5	206.3	18.30	4.5	0.049
		7:19:28	75	20.51	82.4	7.42	6.28	27.0	208.5	21.50	4.7	0.045
		7:18:33	80	20.33	83.7	7.56	6.22	30.5	210.3	16.70	4.8	0.044
		7:17:44	85	20.30	83.9	7.59	6.21	31.6	211.0	13.50	4.7	0.044
		7:17:02	90	20.22	84.2	7.62	6.18	33.2	211.4	16.70	4.3	0.043
		7:16:05	95	20.16	83.8	7.59	6.14	35.4	212.0	20.00	4.6	0.041
		7:14:52	100	20.16	83.9	7.6	6.13	36.2	212.5	17.90	4.4	0.041
		7:13:30	105	20.16	83.6	7.57	6.09	38.2	213.5	18.80	5.2	0.041
		7:12:52	110	20.12	83.6	7.58	6.04	41.2	215.4	18.60	4.6	0.041
		7:11:43	115	20.09	84.5	7.67	5.82	54.3	224	16.1	4.3	0.038
		7:10:32	120	19.94	84.4	7.68	5.83	53.8	226.4	14.3	4.8	0.041
		7:09:45	125	19.78	83.7	7.65	5.82	54.3	226.9	16.4	4.9	0.042
		7:08:54	130	19.77	83.6	7.63	5.8	55.4	227.4	17.1	5.7	0.041
		7:07:47	132	19.77	83.4	7.61	5.83	54	227.2	25.6	5.5	0.041

2018 F.E. Walter Water Quality Profiles

Station	Date	Time	Depth	Temp	DO	DO	pH	pHmV	ORP	Turbidity	Chloro.	SpCond
	M/D/Y	hh:mm:ss	ft	C	%	mg/L		mV	mV	NTU	ug/L	mS/cm
		7:59:13	0.5	24.86	93	7.71	6.81	-4.1	195.2	2	2.8	0.061
		7:58:22	5	24.84	92.5	7.67	6.79	-2.6	196.3	2.2	2.5	0.061
		7:56:59	10	24.75	90	7.47	6.69	3.3	198.4	1.9	3	0.061
		7:55:11	15	22.44	72.4	6.28	6.4	20.1	207.3	0.9	2.5	0.058
		7:54:04	20	21.84	66.1	5.8	6.34	23.7	208.6	0.8	3.9	0.057
		7:52:59	25	21.65	61.1	5.38	6.29	26.7	209.3	0.7	3.4	0.055
		7:51:48	30	21.44	59	5.21	6.24	29.8	210.2	0.2	3.8	0.053
WA-2		7:51:21	35	21.36	59	5.23	6.28	27.1	208.4	0	3.8	0.053
		7:49:44	40	21.24	61.6	5.46	6.34	23.8	205.2	0.4	2.4	0.052
Lake		7:48:51	45	21.18	62.3	5.53	6.38	21.1	202.9	1.1	3.2	0.054
Tower	9/5/2018	7:47:45	50	21.12	63.5	5.65	6.41	19.3	201.1	1.6	3.5	0.056
		7:47:07	55	21.09	63.3	5.64	6.43	18.6	200	1.7	2.5	0.054
Secchi		7:45:54	60	21.08	64.4	5.74	6.48	15.5	197.2	0.9	3.6	0.055
2.1 M		7:46:23	65	21.08	64.4	5.74	6.47	16	197.9	1.3	3.4	0.055
		7:44:27	70	21.05	66	5.88	6.52	12.8	194.6	1.6	3.4	0.056
		7:44:11	75	21	66.1	5.89	6.56	10.5	193.1	2.2	2.6	0.058
		7:43:02	80	20.95	66	5.89	6.6	8.5	190.9	2.7	2.8	0.057
		7:42:00	85	20.81	69.4	6.21	6.69	3.2	187.4	3.7	3	0.06
		7:41:09	90	20.75	71.6	6.41	6.73	0.8	185.8	4.4	2.5	0.064
		7:40:27	95	20.65	70.8	6.35	6.74	-0.3	184.8	5.9	2.6	0.064
		7:39:33	100	20.54	70.8	6.36	6.75	-0.8	184.7	7.2	2.1	0.066
		7:38:51	105	20.43	69.4	6.25	6.74	0.1	185.6	10.6	2.8	0.067
		7:37:45	110	20.28	61.1	5.52	6.73	0.4	186.7	22	1.7	0.066
		7:36:09	115	20.18	56	5.07	6.8	-3.8	185.7	37.1	2.5	0.066
		7:35:02	117	20.2	58.3	5.28	6.96	-12.8	183.1	29.9	2.6	0.066
WA-3	6/27/2018	10:47:42	0.5	18.4	94.4	8.86	6.88	-8.6	180.3	3.2	3.1	0.094
Tobyhanna	7/11/2018	10:52:14	0.5	20.05	96.1	8.72	6.93	-11.1	175.7	8.4	0	0.098
Creek	7/31/2018	10:15:29	0.5	20.12	93.2	8.45	6.44	17.7	161.5	4.6	7	0.060
Upstream	8/15/2018	10:36:28	0.5	20.33	92.5	8.36	6.52	12.7	153.4	8.5	6.6	0.062
	9/5/2018	10:45:45	0.5	21.43	95	8.4	6.56	10.5	187.9	3.3	2.9	0.081
WA-4	6/27/2018	10:34:38	0.5	17.42	92.6	8.87	6.74	0.1	170.0	2.5	0.8	0.079
Lehigh	7/11/2018	10:41:31	0.5	21.22	100	8.87	6.94	-11.6	189.0	2.5	0	0.094
River	7/31/2018	9:57:57	0.5	18.99	92.8	8.61	6.38	21.1	209.5	12.9	5.1	0.065
Upstream	8/15/2018	10:17:56	0.5	18.64	88.6	8.28	5.74	58.9	211.5	8.2	4.3	0.042
	9/5/2018	10:55:55	0.5	20.32	96.5	8.72	6.86	-7.3	160.6	1.8	2.5	0.065
	06/27/18	10:11:24	0.5	17.15	95.5	9.20	6.60	8.2	211.1	2.4	0.0	0.077
WA-5	7/11/2018	10:21:14	0.5	20.99	96.1	8.56	6.84	-5.8	179.0	1.1	0.0	0.081
Bear Creek	7/31/2018	9:38:49	0.5	19.36	95.2	8.77	5.68	62.3	231.7	1.5	1.5	0.039
Upstream	8/15/2018	9:56:52	0.5	18.53	95.9	8.98	5	102.1	239.2	8.7	2.4	0.029
	9/5/2018	11:18:22	0.5	21.69	96.8	8.51	6.52	12.9	192.8	5.9	1.0	0.05

2018 F.E. Walter Water Quality Profiles

Station	Date	Time	Depth	Temp	DO	DO	pH	pHmV	ORP	Turbidity	Chloro.	SpCond
	M/D/Y	hh:mm:ss	ft	C	%	mg/L		mV	mV	NTU	ug/L	mS/cm
		8:17:46	0.5	22.83	89.7	7.72	6.75	-0.7	205.0	0.0	2.7	0.078
		8:17:02	5	22.84	89.0	7.65	6.72	1.2	206.2	1.1	1.1	0.078
		8:16:30	10	22.80	86.1	7.41	6.64	6.1	208.8	0.2	2.8	0.078
		8:16:01	15	21.75	80.6	7.08	6.50	14.4	212.5	0.2	3.3	0.078
		8:15:26	20	21.24	78.2	6.94	6.44	17.6	213.9	1.4	2.6	0.077
WA-6		8:14:46	25	20.41	75.9	6.84	6.40	20.0	214.9	0.7	2.5	0.074
Bear Creek		8:14:09	30	19.99	74.7	6.80	6.41	19.3	215.0	0.9	2.8	0.074
Lake Arm		8:13:35	35	19.72	74.0	6.77	6.43	17.9	215.9	1.4	2.3	0.078
	6/27/2018	8:12:53	40	19.54	73.0	6.70	6.40	19.9	216.9	1.4	2.5	0.077
		8:12:06	45	19.29	70.9	6.54	6.32	24.8	218.6	1.5	3.2	0.077
		8:11:35	50	19.18	69.0	6.38	6.18	32.8	219.6	1.2	3.3	0.068
		8:11:04	55	19.05	67.2	6.23	6.11	37.3	221.0	1.7	2.5	0.067
		8:10:24	60	18.90	64.8	6.02	5.99	44.0	225.0	3.2	2.3	0.066
		8:09:45	65	18.69	63.3	5.91	5.89	49.7	228.9	6.6	3.0	0.066
		8:09:15	70	18.32	61.9	5.82	5.90	49.4	228.8	14.0	2.0	0.066
		8:08:39	75	18.21	63.0	5.94	5.96	45.6	228.1	7.8	2.1	0.068
		8:08:24	80	18.17	62.7	5.91	5.99	44.2	227.9	5.3	1.7	0.071
		8:07:12	85	17.95	59.0	5.59	5.95	46.3	228.0	7.2	1.9	0.072
		8:22:30	0.5	25.63	92.6	7.56	6.93	-11.1	202.9	0.1	0.0	0.089
		8:21:54	5	25.64	91.5	7.47	6.88	-8.4	204.6	0.5	0.1	0.089
		8:21:14	10	25.55	86.7	7.1	6.74	0.4	208.5	0.6	0.0	0.089
		8:20:38	15	23.96	75.3	6.34	6.50	14.4	214.9	1.2	0.0	0.086
WA-6		8:19:55	20	23.33	72.9	6.22	6.49	15.3	216.7	1.1	1.5	0.087
Bear Creek		8:19:17	25	22.55	73.2	6.34	6.48	15.7	217.2	1.2	0.3	0.083
Lake Arm		8:18:31	30	22.09	73.0	6.37	6.46	16.4	217.8	1.2	0.0	0.082
	7/11/2018	8:17:34	35	21.71	71.0	6.24	6.40	20	219.2	0.9	0.6	0.079
		8:16:48	40	21.42	69.3	6.13	6.37	21.9	220.5	1	0.0	0.081
		8:16:12	45	21.20	67.2	5.97	6.30	26.3	221.8	1.4	0.0	0.077
		8:15:32	50	20.98	65.3	5.82	6.26	28.7	222.6	1.7	0.0	0.076
		8:14:58	55	20.76	64.7	5.8	6.27	27.8	222.2	1.9	0.0	0.076
		8:14:23	60	20.43	65.8	5.93	6.35	23	221.3	1.7	0.1	0.08
		8:13:51	65	20.18	65.3	5.92	6.37	21.9	220.9	1.7	0.7	0.081
		8:13:14	70	19.99	64.5	5.86	6.36	22.1	220.7	3.2	0.7	0.08
		8:12:47	75	19.90	64.1	5.84	6.38	21	220.4	2.9	0.6	0.08
		8:12:22	80	19.83	64.2	5.86	6.41	19.4	219.9	4.9	0.0	0.083
		8:11:55	85	19.8	64.2	5.86	6.41	19.2	219.3	4.2	0	0.083
		8:05:01	0.5	23.96	84.2	7.09	6.63	6.5	201.9	0.8	3.4	0.082
		8:04:31	5	23.89	83.1	7.01	6.61	7.9	203.3	0.2	2.8	0.082
		8:03:49	10	23.77	78.8	6.66	6.53	12.6	204.7	1.1	2.1	0.082
		8:02:52	15	22.56	63.6	5.50	6.40	20.6	208.5	1.1	2.2	0.083
		8:02:15	20	22.29	64.2	5.58	6.38	21.4	208.6	1.2	2.5	0.083
		8:01:40	25	22.12	65.5	5.72	6.36	22.5	208.8	1.2	2.3	0.082
WA-6		8:01:11	30	21.97	65.7	5.75	6.32	25.2	209.4	1.4	2.4	0.080
Bear Creek		8:00:26	35	21.81	70.2	6.16	6.24	29.7	209.6	2.4	6.3	0.061
Lake Arm	7/31/2018	7:59:48	40	21.73	68.4	6.01	6.29	27.0	207.7	5.0	4.0	0.066
		7:59:15	45	21.65	67.9	5.98	6.30	26.2	206.3	1.7	2.4	0.072
		7:58:13	50	21.57	69.5	6.13	6.23	30.4	206.6	1.8	3.9	0.065
		7:57:26	55	21.51	67.8	5.98	6.19	32.8	206.6	3.0	1.9	0.066
		7:56:38	60	21.42	68.6	6.07	6.10	38.0	208.7	3.1	1.6	0.064
		7:55:58	65	21.32	69.3	6.14	5.99	44.3	212.0	3.0	1.8	0.062
		7:55:05	70	21.20	69.7	6.19	5.85	52.9	215.4	5.2	2.2	0.059
		7:54:31	75	21.01	70.1	6.24	5.85	53.0	212.5	6.0	1.9	0.056
		7:54:02	80	20.85	70.0	6.25	5.87	51.3	208.8	12.0	2.8	0.057
		7:53:21	85	20.81	70.7	6.33	5.91	49.5	202.2	11.0	3.9	0.057

2018 F.E. Walter Water Quality Profiles

Station	Date	Time	Depth	Temp	DO	DO	pH	pHmV	ORP	Turbidity	Chloro.	SpCond
	M/D/Y	hh:mm:ss	ft	C	%	mg/L		mV	mV	NTU	ug/L	mS/cm
WA-6 Bear Creek Lake Arm	8/15/2018	8:17:44	0.5	23.19	76.6	6.54	6.42	19.5	179.1	0.1	4.4	0.064
		8:16:33	5	22.64	65.5	5.66	6.29	27.2	186.5	0.3	3.5	0.064
		8:13:08	10	22.22	64.3	5.59	6.26	28.4	182.3	0.9	4.5	0.061
		8:12:10	15	22.02	61.8	5.40	6.22	30.8	182.2	1.1	4.2	0.065
		8:11:22	20	21.81	64.1	5.63	6.21	31.5	179.7	2.5	1.6	0.061
		8:10:10	25	21.59	70.4	6.21	6.27	28.1	175.1	3.7	2	0.059
		8:09:21	30	21.42	75.9	6.71	6.28	27.4	173.3	7.4	1.6	0.053
		8:08:45	35	21.33	76.0	6.73	6.33	24.4	170.4	7.9	2.6	0.057
		8:07:56	40	21.24	77.9	6.91	6.31	25.8	169.8	9.8	3.3	0.055
		8:07:00	45	21.07	81.6	7.26	6.26	28.7	170.9	12.0	2.8	0.05
		8:06:13	50	20.97	82.4	7.35	6.19	32.9	173.0	13.8	2.8	0.05
		8:05:53	55	20.80	82.6	7.39	6.17	34.0	171.4	15.2	2.9	0.046
		8:04:57	60	20.73	83.7	7.50	6.07	39.6	172.2	14.7	2.2	0.044
		8:04:21	65	20.51	83.8	7.54	6.06	40.5	170.8	16.0	2.7	0.042
		8:03:38	70	20.34	84.2	7.61	6.00	43.9	169.9	15.5	3.3	0.04
		8:03:05	75	20.26	84.2	7.62	5.99	44.4	167.5	18.8	3.7	0.04
		8:02:01	80	20.14	84.1	7.63	5.87	51.4	167.4	17.1	3.2	0.039
		8:01:15	85	19.95	83.9	7.63	5.89	50.3	158.8	15.7	4.2	0.038
		8:00:32	90	19.94	83.6	7.61	5.89	50.3	152.7	16.7	4.6	0.04
		7:59:37	95	19.89	82.8	7.55	5.85	52.3	146.4	17.7	5.1	0.041
		7:58:21	100	19.83	81.7	7.46	5.87	51.5	129.6	16.7	5	0.041
		7:56:11	103	19.76	30	2.74	6.36	22.5	7.3	57.6	5.7	0.042
WA-6 Bear Creek Lake Arm	9/5/2018	8:34:37	0.5	24.87	92.9	7.69	6.68	4.0	212.6	2.3	3.5	0.06
		8:33:42	5	24.78	90.5	7.51	6.58	9.6	215.8	4.5	3.4	0.06
		8:32:25	10	23.14	77.0	6.59	6.3	26.1	226.8	0.9	2.6	0.059
		8:31:41	15	22.20	68.8	5.99	6.17	34.0	231.6	0.2	2.7	0.057
		8:30:49	20	21.86	62.7	5.50	6.06	40.4	235.5	1.1	3.4	0.055
		8:30:08	25	21.57	58.8	5.18	6	43.9	237.4	0.8	3.3	0.054
		8:29:08	30	21.42	59.2	5.24	5.92	48.7	240.8	1.0	2.5	0.052
		8:28:29	35	21.30	59.9	5.31	5.92	48.7	240.5	0.9	1.6	0.051
		8:27:31	40	21.25	60.3	5.35	5.88	50.9	242.1	1.5	2.2	0.051
		8:26:20	45	21.16	61.5	5.47	5.85	52.6	243.3	1.8	1.5	0.05
		8:25:34	50	21.14	61.3	5.45	5.84	53.7	244.5	2.2	2.2	0.051
		8:23:50	55	21.11	61.8	5.49	5.73	60.0	249.7	1.7	2.5	0.055
		8:22:59	60	21.08	60.4	5.37	5.65	64.9	252.7	2.9	2.3	0.051
		8:21:28	65	20.99	62.5	5.58	5.58	69.1	255.9	4.9	1.3	0.051
		8:20:03	70	20.93	62.6	5.59	5.59	68.5	255.2	4.8	1.5	0.052
		8:18:09	75	20.91	63.3	5.66	5.7	61.4	248.4	4.7	2.1	0.053
WA-7 Lehigh Lake Arm	6/27/2018	8:54:40	0.5	22.68	89.3	7.7	6.76	-1.4	222.1	0.5	2.9	0.080
		8:53:52	5	22.67	86.9	7.5	6.72	1.5	224.2	0.6	2.0	0.080
		8:53:11	10	22.44	84.8	7.35	6.66	4.7	226.8	0.7	4.0	0.082
		8:52:31	15	21.89	81.4	7.13	6.56	10.9	229.6	1.2	2.4	0.081
		8:51:41	20	21.29	78.6	6.97	6.46	16.7	231.8	0.8	1.6	0.076
		8:50:50	25	20.48	76.5	6.89	6.45	17.2	233.1	0.7	2.1	0.075
		8:50:07	30	20.00	75.5	6.86	6.47	16.0	233.9	1.1	2.1	0.078
		8:49:28	35	19.64	75.5	6.91	6.48	15.3	233.9	1.7	3.8	0.078
		8:48:49	40	19.50	75.7	6.95	6.52	12.8	234.3	2.6	2.9	0.081
		8:48:01	45	19.29	74.6	6.88	6.51	13.4	235.3	3.2	2.0	0.082
		8:46:10	50	19.09	71.3	6.6	6.35	22.9	238.6	1.7	2.5	0.074
		8:45:23	55	18.81	70.1	6.52	6.29	26.6	239.7	1.9	3.1	0.071
		8:44:36	60	18.71	69.6	6.5	6.30	25.6	239.4	0.1	3.5	0.072
		8:43:54	65	18.57	68.2	6.38	6.32	24.5	239.3	0.4	3.9	0.074
		8:43:03	70	18.48	65.1	6.1	6.33	23.7	239.7	3.2	2.9	0.076
		8:42:16	75	18.45	62.5	5.86	6.32	24.8	240.5	3.9	3.5	0.077
		8:41:32	80	18.35	59.6	5.6	6.30	25.5	241.0	9.4	2.9	0.078
		8:40:13	85	18.17	55.1	5.2	6.29	26.4	243.9	10.8	2.6	0.077

2018 F.E. Walter Water Quality Profiles

Station	Date	Time	Depth	Temp	DO	DO	pH	pHmV	ORP	Turbidity	Chloro.	SpCond
	M/D/Y	hh:mm:ss	ft	C	%	mg/L		mV	mV	NTU	ug/L	mS/cm
		8:55:37	5	25.91	91.8	7.46	6.9	-9.6	216.5	0	0.5	0.092
		8:54:53	5	25.86	90.0	7.32	6.82	-4.7	220.1	0.6	1.2	0.092
		8:54:17	10	25.26	85.4	7.02	6.7	2.4	223.7	0.7	0.5	0.089
		8:53:35	15	23.95	73.2	6.16	6.5	14.7	230.0	1	1.5	0.089
		8:52:54	20	23.04	72.6	6.22	6.48	15.8	231.4	0.6	1.0	0.087
WA-7		8:52:24	25	22.43	72.7	6.30	6.49	15.1	231.2	0.8	1.7	0.083
Lehigh		8:51:21	30	21.98	72.3	6.32	6.47	16.2	232.5	1.1	1.0	0.082
Lake Arm		8:49:31	35	21.78	69.4	6.10	6.45	17.1	233.9	1.8	1.0	0.083
	7/11/2018	8:49:05	40	21.41	68.3	6.04	6.45	17.3	234.5	2.4	1.7	0.085
		8:48:29	45	21.25	68.1	6.04	6.44	17.8	235.0	2.8	1.4	0.085
		8:47:50	50	21.04	67.5	6.02	6.44	18.0	235.5	2	1.7	0.084
		8:47:06	55	20.85	66.3	5.93	6.41	19.7	237.3	2.4	2.9	0.084
		8:46:38	60	20.68	65.5	5.87	6.41	19.6	237.5	2.2	3.3	0.084
		8:45:38	65	20.46	64.3	5.80	6.36	22.6	241.2	2.7	2.0	0.085
		8:44:55	70	20.32	62.8	5.67	6.33	24.1	242.9	4.6	2.8	0.086
		8:44:05	75	20.20	63.3	5.73	6.37	21.7	241.6	6.5	2.4	0.087
		8:42:35	80	19.93	54.5	4.96	6.36	22.6	241.9	18.4	2.1	0.087
		8:36:27	0.5	24.05	84.7	7.13	6.60	8.5	214.9	1.50	3.7	0.081
		8:35:19	5	23.80	82.7	6.99	6.55	11.6	218.7	1.20	3.9	0.081
		8:34:17	10	23.19	71.1	6.07	6.34	23.9	223.7	1.70	3.9	0.074
		8:33:16	15	22.66	68.6	5.92	6.33	24.6	224.2	1.80	4.6	0.073
		8:32:21	20	22.31	67.9	5.91	6.30	26.5	225.3	1.90	4.2	0.075
WA-7		8:31:48	25	22.07	69.0	6.03	6.27	28.2	225.2	2.50	4.8	0.069
Lehigh		8:30:58	30	22.00	69.4	6.07	6.26	28.7	224.7	2.30	4.8	0.067
Lake Arm	7/31/2018	8:29:40	35	21.91	70.2	6.14	6.25	29.1	224.8	2.80	4.2	0.070
		8:28:59	40	21.77	71.8	6.31	6.21	31.9	224.4	3.10	4.8	0.061
		8:28:15	45	21.70	73.0	6.42	6.22	30.8	223.5	3.00	5.3	0.059
		8:27:23	50	21.60	74.0	6.52	6.20	32.2	224.1	4.00	4.7	0.058
		8:26:51	55	21.47	74.2	6.55	6.20	31.8	223.8	4.70	5.5	0.058
		8:26:01	60	21.35	74.6	6.6	6.19	33.0	224.0	3.60	4.4	0.058
		8:25:09	65	21.29	76.2	6.76	6.22	30.8	223.0	5.30	4.5	0.059
		8:24:11	70	21.21	77.3	6.87	6.15	35.3	227.0	6.30	5.8	0.059
		8:23:13	75	21.18	78.6	6.98	6.04	41.8	233.9	6.3	5.4	0.06
		8:22:34	80	20.86	79.8	7.13	6.08	39.2	233.0	10.6	4.9	0.06
		8:21:43	85	20.73	79.6	7.13	6.14	35.8	229.7	14.3	5.3	0.06

2018 F.E. Walter Water Quality Profiles

Station	Date	Time	Depth	Temp	DO	DO	pH	pHmV	ORP	Turbidity	Chloro.	SpCond
	M/D/Y	hh:mm:ss	ft	C	%	mg/L		mV	mV	NTU	ug/L	mS/cm
WA-7 Lehigh Lake Arm	8/15/2018	8:56:34	0.5	23.08	78.6	6.73	6.41	20.1	195	1	5.5	0.062
		8:55:15	5	22.75	71.6	6.17	6.31	25.7	213.8	0.7	3.8	0.062
		8:54:39	10	22.18	67	5.84	6.27	28.1	214.9	0.8	4.2	0.062
		8:53:55	15	22.10	69.7	6.08	6.30	26.5	213.6	2.4	4.3	0.061
		8:53:09	20	21.99	73.1	6.39	6.31	25.6	213.1	4.5	4.2	0.059
		8:52:08	25	21.80	77	6.76	6.31	25.7	212.8	5.0	4.0	0.057
		8:51:16	30	21.58	81.3	7.17	6.31	25.6	212.0	7.4	4.9	0.053
		8:50:05	35	21.39	81.5	7.21	6.29	27	212.6	7.4	4.7	0.051
		8:48:53	40	21.16	84.1	7.48	6.21	31.6	216.2	8.9	5.0	0.049
		8:48:07	45	20.97	85.2	7.60	6.12	36.8	220.8	8.1	4.6	0.048
		8:47:39	50	20.86	85.3	7.62	6.06	40.2	223.9	9.5	4.6	0.047
		8:46:53	55	20.74	85.6	7.67	5.95	46.9	230.1	8.8	4.9	0.046
		8:46:04	60	20.60	85.7	7.70	5.87	51.5	234.0	8.9	5.5	0.045
		8:45:23	65	20.50	85.8	7.72	5.83	54	236.0	9.7	5.5	0.045
		8:44:22	70	20.38	85.4	7.70	5.84	53.2	234.1	9.9	5.7	0.044
		8:43:26	75	20.28	84.8	7.66	6.07	39.6	220.0	10.4	5.4	0.044
		8:39:20	80	20.26	84.5	7.64	5.61	67.1	239.3	77.1	6.9	0.044
		8:38:36	85	20.24	84.2	7.62	5.60	67.7	240.0	31.6	6.1	0.044
		8:37:40	90	20.21	84.3	7.63	5.60	67.7	238.1	155.5	7.4	0.044
		8:37:14	95	20.21	84.3	7.64	5.61	66.8	237.1	102.2	6	0.044
WA-7 Lehigh Lake Arm	9/5/2018	9:06:09	0.5	25.34	96.1	7.89	6.78	-2	200.3	3.2	3.5	0.065
		9:05:10	5	24.84	91.5	7.58	6.64	6	204.2	3	2.9	0.064
		9:04:10	10	23.16	79.2	6.77	6.46	16.7	210.2	1.5	2.4	0.062
		9:03:19	15	22.48	73.3	6.35	6.37	22.4	212.7	1.3	2.8	0.062
		9:02:10	20	21.94	67.6	5.92	6.23	30.2	216.3	0.8	3.5	0.057
		9:01:14	25	21.74	63.3	5.56	6.13	36.5	220.1	1	3	0.056
		9:00:23	30	21.51	61.4	5.42	6.06	40.4	223.1	1.6	3.3	0.056
		8:59:42	35	21.36	62.7	5.55	6.02	43.0	226.0	1.9	3.4	0.057
		8:58:42	40	21.29	64.8	5.74	6.01	43.7	226.8	2.8	3	0.059
		8:57:34	45	21.20	68.3	6.06	5.99	44.5	228.2	2.5	3.7	0.061
		8:56:12	50	21.11	74.4	6.62	5.97	45.5	230.1	3.3	3	0.064
		8:55:43	55	21.06	75.7	6.74	5.97	45.6	230.3	3.1	2.8	0.066
		8:54:38	60	20.98	76.9	6.86	5.92	48.4	231.4	4.1	3	0.067
		8:52:49	65	20.91	76.5	6.84	5.84	53.3	231.7	4.3	3.1	0.067
		8:51:56	70	20.88	76.4	6.82	5.82	54.5	230.1	4.8	3.1	0.067
		8:50:55	75	20.87	76.1	6.80	5.81	55.1	226.8	4.9	2.4	0.068

APPENDIX B

LABORATORY CUSTODY SHEETS

The results set forth herein are provided by SGS North America Inc.

e-Hardcopy 2.0
Automated Report

Technical Report for

USACE-Philadelphia District

Philadelphia District, Reservoir Sampling

061418-199

SGS Job Number: JC68841

Sampling Date: 06/27/18

Report to:

Army Corps of Engineers

joseph.m.loeper@usace.army.mil

ATTN: Joseph Loeper

Total number of pages in report: 46

Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.

A. Paul Ioannidis
General Manager

Client Service contact: Tammy McCloskey 732-329-0200

Certifications: NJ(12129), NY(10983), CA, CT, FL, IL, IN, KS, KY, LA, MA, MD, ME, MN, NC, OH VAP (CL0056), AK (UST-103), AZ (AZ0786), PA, RI, SC, TX, UT, VA, WV, DoD ELAP (ANAB L2248)

Sections: 1 2 3 4 5

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Sample Summary

USACE-Philadelphia District

Job No: JC68841

Philadelphia District, Reservoir Sampling
Project No: 061418-199

Sample Number	Collected Date	Time	By	Received	Matrix Code	Type	Client Sample ID
JC68841-1	06/27/18	09:45	GW	06/27/18	AQ	Surface Water	WA-1S
JC68841-1F	06/27/18	09:45	GW	06/27/18	AQ	Surface Water	WA-1S
JC68841-2	06/27/18	07:00	GW	06/27/18	AQ	Surface Water	WA-2S
JC68841-2F	06/27/18	07:00	GW	06/27/18	AQ	Surface Water	WA-2S
JC68841-3	06/27/18	07:00	GW	06/27/18	AQ	Surface Water	WA-2M
JC68841-3F	06/27/18	07:00	GW	06/27/18	AQ	Surface Water	WA-2M
JC68841-4	06/27/18	07:00	GW	06/27/18	AQ	Surface Water	WA-2D
JC68841-4F	06/27/18	07:00	GW	06/27/18	AQ	Surface Water	WA-2D
JC68841-5	06/27/18	10:50	GW	06/27/18	AQ	Surface Water	WA-3S
JC68841-5F	06/27/18	10:50	GW	06/27/18	AQ	Surface Water	WA-3S
JC68841-6	06/27/18	10:30	GW	06/27/18	AQ	Surface Water	WA-4S
JC68841-6F	06/27/18	10:30	GW	06/27/18	AQ	Surface Water	WA-4S
JC68841-7	06/27/18	10:10	GW	06/27/18	AQ	Surface Water	WA-5S

Sample Summary
(continued)

USACE-Philadelphia District

Job No: JC68841

Philadelphia District, Reservoir Sampling
Project No: 061418-199

Sample Number	Collected Date	Time	By	Received	Matrix Code	Type	Client Sample ID
JC68841-7F	06/27/18	10:10	GW	06/27/18	AQ	Surface Water	WA-5S
JC68841-8	06/27/18	08:15	GW	06/27/18	AQ	Surface Water	WA-6S
JC68841-8F	06/27/18	08:15	GW	06/27/18	AQ	Surface Water	WA-6S
JC68841-9	06/27/18	08:15	GW	06/27/18	AQ	Surface Water	WA-6M
JC68841-9F	06/27/18	08:15	GW	06/27/18	AQ	Surface Water	WA-6M
JC68841-10	06/27/18	08:15	GW	06/27/18	AQ	Surface Water	WA-6D
JC68841-10F	06/27/18	08:15	GW	06/27/18	AQ	Surface Water	WA-6D
JC68841-11	06/27/18	08:45	GW	06/27/18	AQ	Surface Water	WA-7S
JC68841-11F	06/27/18	08:45	GW	06/27/18	AQ	Surface Water	WA-7S
JC68841-12	06/27/18	08:45	GW	06/27/18	AQ	Surface Water	WA-7M
JC68841-12F	06/27/18	08:45	GW	06/27/18	AQ	Surface Water	WA-7M
JC68841-13	06/27/18	08:45	GW	06/27/18	AQ	Surface Water	WA-7D
JC68841-13F	06/27/18	08:45	GW	06/27/18	AQ	Surface Water	WA-7D

CASE NARRATIVE / CONFORMANCE SUMMARY

Client:	USACE-Philadelphia District	**Job No**	JC68841
Site:	Philadelphia District, Reservoir Sampling	**Report Date**	7/11/2018 4:39:24 PM

On 06/27/2018, 26 Sample(s), 0 Trip Blank(s) and 0 Field Blank(s) were received at SGS North America Inc. at a maximum corrected temperature of 3.7 C. Samples were intact and chemically preserved, unless noted below. A SGS North America Inc. Job Number of JC68841 was assigned to the project. Laboratory sample ID, client sample ID and dates of sample collection are detailed in the report's Results Summary Section.

Specified quality control criteria were achieved for this job except as noted below. For more information, please refer to the analytical results and QC summary pages.

Compounds qualified as out of range in the continuing calibration summary report are acceptable as per method requirements when there is a high bias but the sample result is non-detect.

General Chemistry By Method EPA 351.2/LACHAT

Matrix: AQ **Batch ID:** GP14298

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC68840-1DUP, JC68840-1MS were used as the QC samples for Nitrogen, Total Kjeldahl.
- Matrix Spike Recovery(s) for Nitrogen, Total Kjeldahl are outside control limits. Spike recovery indicates possible matrix interference.

Matrix: AQ **Batch ID:** GP14300

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC68841-12MS, JC68841-12DUP were used as the QC samples for Nitrogen, Total Kjeldahl.
- RPD(s) for Duplicate for Nitrogen, Total Kjeldahl are outside control limits for sample GP14300-D1. RPD acceptable due to low duplicate and sample concentrations.

General Chemistry By Method EPA 353.2/LACHAT

Matrix: AQ **Batch ID:** GP14356

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC68831-18DUP, JC68840-6MS were used as the QC samples for Nitrogen, Nitrate + Nitrite.

Matrix: AQ **Batch ID:** GP14357

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC68915-3DUP, JC68915-3MS were used as the QC samples for Nitrogen, Nitrate + Nitrite.

General Chemistry By Method EPA 365.3

Matrix: AQ **Batch ID:** GP14359

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC68841-1DUP, JC68841-1MS were used as the QC samples for Phosphorus, Total.

Matrix: AQ **Batch ID:** GP14360

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC68915-1DUP, JC68915-1MS were used as the QC samples for Phosphorus, Total.

General Chemistry By Method EPA353.2/SM4500NO2B

Matrix: AQ **Batch ID:** R171202

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC68841-1 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R171203

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC68841-2 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R171204

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC68841-3 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R171205

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC68841-4 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R171206

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC68841-5 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R171207

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC68841-6 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R171208

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC68841-7 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R171209

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC68841-8 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R171210

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC68841-9 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R171211

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC68841-10 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R171212

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC68841-11 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R171213

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC68841-12 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R171214

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC68841-13 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

General Chemistry By Method SM2320 B-11

Matrix: AQ	Batch ID: GN82312

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC68841-1DUP were used as the QC samples for Alkalinity, Total as CaCO3.
- RPD(s) for Duplicate for Alkalinity, Total as CaCO3 are outside control limits for sample GN82312-D1. RPD acceptable due to low duplicate and sample concentrations.
- JC68841-3 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC68841-2 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC68841-1 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC68841-9 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC68841-5 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC68841-10 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC68841-11 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC68841-12 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC68841-13 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC68841-4 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC68841-7 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC68841-6 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC68841-8 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.

General Chemistry By Method SM2540 C-11

Matrix: AQ	Batch ID: GN82231

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC68840-6DUP were used as the QC samples for Solids, Total Dissolved.

Matrix: AQ	Batch ID: GN82273

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC68841-12DUP were used as the QC samples for Solids, Total Dissolved.

General Chemistry By Method SM2540 D-11

Matrix: AQ	Batch ID: GN82230

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC68841-12DUP were used as the QC samples for Solids, Total Suspended.
- JC68841-10 for Solids, Total Suspended: Reported sample aliquot obtained from filtration of 750 mL of sample. Volume was reduced from 1 liter due to nature of sample matrix.

General Chemistry By Method SM4500NH3 H-11LACHAT

Matrix: AQ	Batch ID: GP14258

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC69001-1DUP, JC69001-1MS, JC69001-1MSD were used as the QC samples for Nitrogen, Ammonia.

Matrix: AQ	Batch ID: GP14259

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC68911-5DUP, JC68911-5MS, JC68911-5MSD were used as the QC samples for Nitrogen, Ammonia.

General Chemistry By Method SM4500NO2 B-11

Matrix: AQ	Batch ID: GN82076

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC68840-2DUP, JC68840-2MS were used as the QC samples for Nitrogen, Nitrite.

General Chemistry By Method SM5210 B-11

Matrix: AQ	Batch ID: GP14129

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC68841-1DUP were used as the QC samples for BOD, 5 Day.

General Chemistry By Method SM5310 B-11

Matrix: AQ	Batch ID: GP14286

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC68841-1MS, JC68841-1MSD were used as the QC samples for Total Organic Carbon.

Matrix: AQ	Batch ID: GP14287

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC68915-1MS, JC68915-1MSD were used as the QC samples for Total Organic Carbon.

General Chemistry By Method SM9222 B-06

Matrix:	AQ	Batch ID:	MB5292

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC68840-1DUP were used as the QC samples for Coliform, Total.
- JC68841-8 for Coliform, Total: Analysis done out of holding time.
- JC68841-7 for Coliform, Total: Analysis done out of holding time.
- JC68841-6 for Coliform, Total: Analysis done out of holding time.
- JC68841-1 for Coliform, Total: Analysis done out of holding time.
- JC68841-11 for Coliform, Total: Analysis done out of holding time.
- JC68841-5 for Coliform, Total: Analysis done out of holding time.
- JC68841-2 for Coliform, Total: Analysis done out of holding time.

General Chemistry By Method SM9222 D-06

Matrix:	AQ	Batch ID:	MB5289

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC68804-4DUP were used as the QC samples for Coliform, Fecal.
- JC68841-2 for Coliform, Fecal: Analysis done out of holding time.
- JC68841-11 for Coliform, Fecal: Analysis done out of holding time.
- JC68841-8 for Coliform, Fecal: Analysis done out of holding time.

SGS North America Inc. certifies that data reported for samples received, listed on the associated custody chain or analytical task order, were produced to specifications meeting the Quality System precision, accuracy and completeness objectives except as noted.

Estimated non-standard method measurement uncertainty data is available on request, based on quality control bias and implicit for standard methods. Acceptable uncertainty requires tested parameter quality control data to meet method criteria.

SGS North America Inc. is not responsible for data quality assumptions if partial reports are used and recommends that this report be used in its entirety. Data release is authorized by SGS North America Inc indicated via signature on the report cover

Summary of Hits

Job Number: JC68841
Account: USACE-Philadelphia District
Project: Philadelphia District, Reservoir Sampling
Collected: 06/27/18

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
JC68841-1	**WA-1S**					
Coliform, Fecal		12	4		col/100ml	SM9222 D-06
Coliform, Total [a]		37	10		col/100ml	SM9222 B-06
Nitrogen, Nitrate [b]		0.16	0.11		mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		0.16	0.10		mg/l	EPA 353.2/LACHAT
Nitrogen, Total Kjeldahl		0.21	0.20		mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		42.5	10		mg/l	SM2540 C-11
Total Organic Carbon		4.3	1.0		mg/l	SM5310 B-11
JC68841-1F	**WA-1S**					
No hits reported in this sample.						
JC68841-2	**WA-2S**					
Coliform, Total [a]		4	4		col/100ml	SM9222 B-06
Nitrogen, Nitrate + Nitrite		0.10	0.10		mg/l	EPA 353.2/LACHAT
Nitrogen, Total Kjeldahl		0.24	0.20		mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		17.5	10		mg/l	SM2540 C-11
Total Organic Carbon		4.5	1.0		mg/l	SM5310 B-11
JC68841-2F	**WA-2S**					
No hits reported in this sample.						
JC68841-3	**WA-2M**					
Nitrogen, Nitrate [b]		0.13	0.11		mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		0.13	0.10		mg/l	EPA 353.2/LACHAT
Nitrogen, Total Kjeldahl		0.23	0.20		mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		25.0	10		mg/l	SM2540 C-11
Total Organic Carbon		4.6	1.0		mg/l	SM5310 B-11
JC68841-3F	**WA-2M**					
No hits reported in this sample.						
JC68841-4	**WA-2D**					
Nitrogen, Nitrate [b]		0.12	0.11		mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		0.12	0.10		mg/l	EPA 353.2/LACHAT
Nitrogen, Total Kjeldahl		0.37	0.20		mg/l	EPA 351.2/LACHAT
Phosphorus, Total		0.076	0.050		mg/l	EPA 365.3
Solids, Total Dissolved		33.3	10		mg/l	SM2540 C-11

Summary of Hits

Job Number: JC68841
Account: USACE-Philadelphia District
Project: Philadelphia District, Reservoir Sampling
Collected: 06/27/18

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
Solids, Total Suspended		62.7	4.0		mg/l	SM2540 D-11
Total Organic Carbon		5.0	1.0		mg/l	SM5310 B-11
JC68841-4F	**WA-2D**					
No hits reported in this sample.						
JC68841-5	**WA-3S**					
Coliform, Fecal		96	4		col/100ml	SM9222 D-06
Coliform, Total [a]		100	4		col/100ml	SM9222 B-06
Nitrogen, Nitrate [b]		0.33	0.11		mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		0.33	0.10		mg/l	EPA 353.2/LACHAT
Nitrogen, Total Kjeldahl		0.25	0.20		mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		43.3	10		mg/l	SM2540 C-11
Total Organic Carbon		4.7	1.0		mg/l	SM5310 B-11
JC68841-5F	**WA-3S**					
No hits reported in this sample.						
JC68841-6	**WA-4S**					
Alkalinity, Total as CaCO3 [c]		6.2	5.0		mg/l	SM2320 B-11
Coliform, Fecal		197	10		col/100ml	SM9222 D-06
Coliform, Total [a]		151	10		col/100ml	SM9222 B-06
Nitrogen, Nitrate [b]		0.16	0.11		mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		0.16	0.10		mg/l	EPA 353.2/LACHAT
Solids, Total Dissolved		57.5	10		mg/l	SM2540 C-11
Total Organic Carbon		4.8	1.0		mg/l	SM5310 B-11
JC68841-6F	**WA-4S**					
No hits reported in this sample.						
JC68841-7	**WA-5S**					
Coliform, Fecal		11	4		col/100ml	SM9222 D-06
Coliform, Total [a]		34	10		col/100ml	SM9222 B-06
Nitrogen, Total Kjeldahl		0.20	0.20		mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		57.5	10		mg/l	SM2540 C-11
Solids, Total Suspended		9.6	4.0		mg/l	SM2540 D-11
Total Organic Carbon		2.9	1.0		mg/l	SM5310 B-11

Summary of Hits

Job Number: JC68841
Account: USACE-Philadelphia District
Project: Philadelphia District, Reservoir Sampling
Collected: 06/27/18

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
JC68841-7F	**WA-5S**					
No hits reported in this sample.						
JC68841-8	**WA-6S**					
Coliform, Total [a]		4	4		col/100ml	SM9222 B-06
Solids, Total Dissolved		32.5	10		mg/l	SM2540 C-11
Total Organic Carbon		5.2	1.0		mg/l	SM5310 B-11
JC68841-8F	**WA-6S**					
No hits reported in this sample.						
JC68841-9	**WA-6M**					
Nitrogen, Nitrate [b]		0.12	0.11		mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		0.12	0.10		mg/l	EPA 353.2/LACHAT
Solids, Total Dissolved		42.5	10		mg/l	SM2540 C-11
Total Organic Carbon		4.5	1.0		mg/l	SM5310 B-11
JC68841-9F	**WA-6M**					
No hits reported in this sample.						
JC68841-10	**WA-6D**					
Nitrogen, Nitrate [b]		0.11	0.11		mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		0.11	0.10		mg/l	EPA 353.2/LACHAT
Solids, Total Dissolved		43.3	10		mg/l	SM2540 C-11
Solids, Total Suspended [d]		4.5	4.0		mg/l	SM2540 D-11
Total Organic Carbon		4.6	1.0		mg/l	SM5310 B-11
JC68841-10F	**WA-6D**					
No hits reported in this sample.						
JC68841-11	**WA-7S**					
Coliform, Total [a]		8	4		col/100ml	SM9222 B-06
Nitrogen, Nitrate [b]		0.12	0.11		mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		0.12	0.10		mg/l	EPA 353.2/LACHAT
Solids, Total Dissolved		22.5	10		mg/l	SM2540 C-11
Total Organic Carbon		4.7	1.0		mg/l	SM5310 B-11

Summary of Hits

Job Number: JC68841
Account: USACE-Philadelphia District
Project: Philadelphia District, Reservoir Sampling
Collected: 06/27/18

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
JC68841-11F	**WA-7S**					
No hits reported in this sample.						
JC68841-12	**WA-7M**					
Nitrogen, Nitrate [b]		0.11	0.11		mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		0.11	0.10		mg/l	EPA 353.2/LACHAT
Nitrogen, Total Kjeldahl		0.35	0.20		mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		22.5	10		mg/l	SM2540 C-11
Total Organic Carbon		4.5	1.0		mg/l	SM5310 B-11
JC68841-12F	**WA-7M**					
No hits reported in this sample.						
JC68841-13	**WA-7D**					
Nitrogen, Nitrate [b]		0.13	0.11		mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		0.13	0.10		mg/l	EPA 353.2/LACHAT
Nitrogen, Total Kjeldahl		0.71	0.20		mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		1080	10		mg/l	SM2540 C-11
Solids, Total Suspended		34.0	4.0		mg/l	SM2540 D-11
Total Organic Carbon		6.4	1.0		mg/l	SM5310 B-11
JC68841-13F	**WA-7D**					
No hits reported in this sample.						

(a) Analysis done out of holding time.
(b) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)
(c) Sample was titrated to a final pH of 4.2.
(d) Reported sample aliquot obtained from filtration of 750 mL of sample. Volume was reduced from 1 liter due to nature of sample matrix.

Sample Results

Report of Analysis

Report of Analysis

Client Sample ID:	WA-1S		
Lab Sample ID:	JC68841-1	**Date Sampled:**	06/27/18
Matrix:	AQ - Surface Water	**Date Received:**	06/27/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	< 5.0	5.0	mg/l	1	07/03/18 13:35	CD	SM2320 B-11
BOD, 5 Day	< 3.4	3.4	mg/l	1	06/28/18 16:00	LS	SM5210 B-11
Coliform, Fecal	12	4	col/100ml	4	06/27/18 16:46	SA	SM9222 D-06
Coliform, Total [b]	37	10	col/100ml	10	06/27/18 22:00	SA	SM9222 B-06
Nitrogen, Ammonia	< 0.20	0.20	mg/l	1	07/05/18 15:12	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [c]	0.16	0.11	mg/l	1	07/10/18 13:35	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.16	0.10	mg/l	1	07/10/18 13:35	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	< 0.010	0.010	mg/l	1	06/27/18 21:56	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.21	0.20	mg/l	1	07/09/18 10:28	BM	EPA 351.2/LACHAT
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/10/18 15:00	LS	EPA 365.3
Solids, Total Dissolved	42.5	10	mg/l	1	07/02/18 14:47	RC	SM2540 C-11
Solids, Total Suspended	< 4.0	4.0	mg/l	1	07/02/18 10:20	RC	SM2540 D-11
Total Organic Carbon	4.3	1.0	mg/l	1	07/06/18 13:38	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(b) Analysis done out of holding time.
(c) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	WA-1S		
Lab Sample ID:	JC68841-1F	**Date Sampled:**	06/27/18
Matrix:	AQ - Surface Water	**Date Received:**	06/27/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/10/18 15:12	LS	EPA 365.3

RL = Reporting Limit

Report of Analysis

Client Sample ID: WA-2S
Lab Sample ID: JC68841-2
Matrix: AQ - Surface Water
Project: Philadelphia District, Reservoir Sampling

Date Sampled: 06/27/18
Date Received: 06/27/18
Percent Solids: n/a

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	< 5.0	5.0	mg/l	1	07/03/18 13:35	CD	SM2320 B-11
BOD, 5 Day	< 3.4	3.4	mg/l	1	06/28/18 16:07	LS	SM5210 B-11
Coliform, Fecal [b]	0	4	col/100ml	4	06/27/18 16:46	SA	SM9222 D-06
Coliform, Total [b]	4	4	col/100ml	4	06/27/18 22:00	SA	SM9222 B-06
Nitrogen, Ammonia	< 0.20	0.20	mg/l	1	07/05/18 15:14	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [c]	< 0.11	0.11	mg/l	1	07/10/18 13:36	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.10	0.10	mg/l	1	07/10/18 13:36	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	< 0.010	0.010	mg/l	1	06/27/18 21:56	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.24	0.20	mg/l	1	07/09/18 10:28	BM	EPA 351.2/LACHAT
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/10/18 15:00	LS	EPA 365.3
Solids, Total Dissolved	17.5	10	mg/l	1	07/02/18 16:57	RC	SM2540 C-11
Solids, Total Suspended	< 4.0	4.0	mg/l	1	07/02/18 10:20	RC	SM2540 D-11
Total Organic Carbon	4.5	1.0	mg/l	1	07/06/18 14:11	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(b) Analysis done out of holding time.
(c) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	WA-2S		
Lab Sample ID:	JC68841-2F	**Date Sampled:**	06/27/18
Matrix:	AQ - Surface Water	**Date Received:**	06/27/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/10/18 15:12	LS	EPA 365.3

RL = Reporting Limit

Report of Analysis

Client Sample ID: WA-2M
Lab Sample ID: JC68841-3
Matrix: AQ - Surface Water
Project: Philadelphia District, Reservoir Sampling

Date Sampled: 06/27/18
Date Received: 06/27/18
Percent Solids: n/a

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	< 5.0	5.0	mg/l	1	07/03/18 13:35	CD	SM2320 B-11
BOD, 5 Day	< 3.4	3.4	mg/l	1	06/28/18 16:11	LS	SM5210 B-11
Nitrogen, Ammonia	< 0.20	0.20	mg/l	1	07/05/18 15:15	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [b]	0.13	0.11	mg/l	1	07/10/18 13:37	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.13	0.10	mg/l	1	07/10/18 13:37	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	< 0.010	0.010	mg/l	1	06/27/18 21:56	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.23	0.20	mg/l	1	07/09/18 10:29	BM	EPA 351.2/LACHAT
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/10/18 15:00	LS	EPA 365.3
Solids, Total Dissolved	25.0	10	mg/l	1	07/02/18 16:57	RC	SM2540 C-11
Solids, Total Suspended	< 4.0	4.0	mg/l	1	07/02/18 10:20	RC	SM2540 D-11
Total Organic Carbon	4.6	1.0	mg/l	1	07/06/18 14:38	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(b) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	WA-2M		
Lab Sample ID:	JC68841-3F	**Date Sampled:**	06/27/18
Matrix:	AQ - Surface Water	**Date Received:**	06/27/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/10/18 15:12	LS	EPA 365.3

RL = Reporting Limit

Report of Analysis

Client Sample ID: WA-2D
Lab Sample ID: JC68841-4
Matrix: AQ - Surface Water
Project: Philadelphia District, Reservoir Sampling

Date Sampled: 06/27/18
Date Received: 06/27/18
Percent Solids: n/a

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	< 5.0	5.0	mg/l	1	07/03/18 13:59	CD	SM2320 B-11
BOD, 5 Day	< 3.4	3.4	mg/l	1	06/28/18 16:14	LS	SM5210 B-11
Nitrogen, Ammonia	< 0.20	0.20	mg/l	1	07/05/18 15:16	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [b]	0.12	0.11	mg/l	1	07/10/18 13:38	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.12	0.10	mg/l	1	07/10/18 13:38	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	< 0.010	0.010	mg/l	1	06/27/18 21:56	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.37	0.20	mg/l	1	07/09/18 10:30	BM	EPA 351.2/LACHAT
Phosphorus, Total	0.076	0.050	mg/l	1	07/10/18 15:00	LS	EPA 365.3
Solids, Total Dissolved	33.3	10	mg/l	1	07/02/18 16:57	RC	SM2540 C-11
Solids, Total Suspended	62.7	4.0	mg/l	1	07/02/18 10:20	RC	SM2540 D-11
Total Organic Carbon	5.0	1.0	mg/l	1	07/06/18 14:57	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(b) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	WA-2D		
Lab Sample ID:	JC68841-4F	**Date Sampled:**	06/27/18
Matrix:	AQ - Surface Water	**Date Received:**	06/27/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/10/18 15:15	LS	EPA 365.3

RL = Reporting Limit

Report of Analysis

Client Sample ID:	WA-3S		
Lab Sample ID:	JC68841-5	**Date Sampled:**	06/27/18
Matrix:	AQ - Surface Water	**Date Received:**	06/27/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	< 5.0	5.0	mg/l	1	07/03/18 13:59	CD	SM2320 B-11
BOD, 5 Day	< 3.4	3.4	mg/l	1	06/28/18 16:20	LS	SM5210 B-11
Coliform, Fecal	96	4	col/100ml	4	06/27/18 16:46	SA	SM9222 D-06
Coliform, Total [b]	100	4	col/100ml	4	06/27/18 22:00	SA	SM9222 B-06
Nitrogen, Ammonia	< 0.20	0.20	mg/l	1	07/05/18 15:18	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [c]	0.33	0.11	mg/l	1	07/10/18 13:39	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.33	0.10	mg/l	1	07/10/18 13:39	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	< 0.010	0.010	mg/l	1	06/27/18 21:56	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.25	0.20	mg/l	1	07/09/18 10:31	BM	EPA 351.2/LACHAT
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/10/18 15:00	LS	EPA 365.3
Solids, Total Dissolved	43.3	10	mg/l	1	07/02/18 16:57	RC	SM2540 C-11
Solids, Total Suspended	< 4.0	4.0	mg/l	1	07/02/18 10:20	RC	SM2540 D-11
Total Organic Carbon	4.7	1.0	mg/l	1	07/06/18 15:08	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(b) Analysis done out of holding time.
(c) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	WA-3S		
Lab Sample ID:	JC68841-5F	**Date Sampled:**	06/27/18
Matrix:	AQ - Surface Water	**Date Received:**	06/27/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/10/18 15:15	LS	EPA 365.3

RL = Reporting Limit

Report of Analysis

Client Sample ID: WA-4S
Lab Sample ID: JC68841-6
Matrix: AQ - Surface Water
Project: Philadelphia District, Reservoir Sampling

Date Sampled: 06/27/18
Date Received: 06/27/18
Percent Solids: n/a

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	6.2	5.0	mg/l	1	07/03/18 13:59	CD	SM2320 B-11
BOD, 5 Day	< 3.4	3.4	mg/l	1	06/28/18 16:24	LS	SM5210 B-11
Coliform, Fecal	197	10	col/100ml	10	06/27/18 16:46	SA	SM9222 D-06
Coliform, Total [b]	151	10	col/100ml	10	06/27/18 22:00	SA	SM9222 B-06
Nitrogen, Ammonia	< 0.20	0.20	mg/l	1	07/05/18 15:22	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [c]	0.16	0.11	mg/l	1	07/10/18 13:40	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.16	0.10	mg/l	1	07/10/18 13:40	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	< 0.010	0.010	mg/l	1	06/27/18 21:56	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	< 0.20	0.20	mg/l	1	07/09/18 10:32	BM	EPA 351.2/LACHAT
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/10/18 15:00	LS	EPA 365.3
Solids, Total Dissolved	57.5	10	mg/l	1	07/02/18 16:57	RC	SM2540 C-11
Solids, Total Suspended	< 4.0	4.0	mg/l	1	07/02/18 10:20	RC	SM2540 D-11
Total Organic Carbon	4.8	1.0	mg/l	1	07/06/18 15:19	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(b) Analysis done out of holding time.
(c) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	WA-4S		
Lab Sample ID:	JC68841-6F	**Date Sampled:**	06/27/18
Matrix:	AQ - Surface Water	**Date Received:**	06/27/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/10/18 15:15	LS	EPA 365.3

RL = Reporting Limit

Report of Analysis

Client Sample ID: WA-5S
Lab Sample ID: JC68841-7
Matrix: AQ - Surface Water
Project: Philadelphia District, Reservoir Sampling

Date Sampled: 06/27/18
Date Received: 06/27/18
Percent Solids: n/a

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	< 5.0	5.0	mg/l	1	07/03/18 13:59	CD	SM2320 B-11
BOD, 5 Day	< 3.4	3.4	mg/l	1	06/28/18 16:27	LS	SM5210 B-11
Coliform, Fecal	11	4	col/100ml	4	06/27/18 16:46	SA	SM9222 D-06
Coliform, Total [b]	34	10	col/100ml	10	06/27/18 22:00	SA	SM9222 B-06
Nitrogen, Ammonia	< 0.20	0.20	mg/l	1	07/05/18 15:24	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [c]	< 0.11	0.11	mg/l	1	07/10/18 13:41	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	< 0.10	0.10	mg/l	1	07/10/18 13:41	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	< 0.010	0.010	mg/l	1	06/27/18 21:56	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.20	0.20	mg/l	1	07/09/18 10:33	BM	EPA 351.2/LACHAT
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/10/18 15:12	LS	EPA 365.3
Solids, Total Dissolved	57.5	10	mg/l	1	07/02/18 16:57	RC	SM2540 C-11
Solids, Total Suspended	9.6	4.0	mg/l	1	07/02/18 10:20	RC	SM2540 D-11
Total Organic Carbon	2.9	1.0	mg/l	1	07/06/18 15:53	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(b) Analysis done out of holding time.
(c) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	WA-5S		
Lab Sample ID:	JC68841-7F	**Date Sampled:**	06/27/18
Matrix:	AQ - Surface Water	**Date Received:**	06/27/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/10/18 15:15	LS	EPA 365.3

RL = Reporting Limit

Report of Analysis

Client Sample ID:	WA-6S		
Lab Sample ID:	JC68841-8	**Date Sampled:**	06/27/18
Matrix:	AQ - Surface Water	**Date Received:**	06/27/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	< 5.0	5.0	mg/l	1	07/03/18 13:59	CD	SM2320 B-11
BOD, 5 Day	< 3.4	3.4	mg/l	1	06/28/18 16:35	LS	SM5210 B-11
Coliform, Fecal [b]	< 4	4	col/100ml	4	06/27/18 16:46	SA	SM9222 D-06
Coliform, Total [b]	4	4	col/100ml	4	06/27/18 22:00	SA	SM9222 B-06
Nitrogen, Ammonia	< 0.20	0.20	mg/l	1	07/05/18 15:25	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [c]	< 0.11	0.11	mg/l	1	07/10/18 13:53	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	< 0.10	0.10	mg/l	1	07/10/18 13:53	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	< 0.010	0.010	mg/l	1	06/27/18 21:56	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	< 0.20	0.20	mg/l	1	07/09/18 10:35	BM	EPA 351.2/LACHAT
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/10/18 15:12	LS	EPA 365.3
Solids, Total Dissolved	32.5	10	mg/l	1	07/02/18 16:57	RC	SM2540 C-11
Solids, Total Suspended	< 4.0	4.0	mg/l	1	07/02/18 10:20	RC	SM2540 D-11
Total Organic Carbon	5.2	1.0	mg/l	1	07/06/18 16:04	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(b) Analysis done out of holding time.
(c) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	WA-6S		
Lab Sample ID:	JC68841-8F	**Date Sampled:**	06/27/18
Matrix:	AQ - Surface Water	**Date Received:**	06/27/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/11/18 09:58	MP	EPA 365.3

RL = Reporting Limit

Report of Analysis

Client Sample ID:	WA-6M		
Lab Sample ID:	JC68841-9	**Date Sampled:**	06/27/18
Matrix:	AQ - Surface Water	**Date Received:**	06/27/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	< 5.0	5.0	mg/l	1	07/03/18 13:59	CD	SM2320 B-11
BOD, 5 Day	< 3.4	3.4	mg/l	1	06/28/18 16:40	LS	SM5210 B-11
Nitrogen, Ammonia	< 0.20	0.20	mg/l	1	07/05/18 15:26	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [b]	0.12	0.11	mg/l	1	07/10/18 13:54	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.12	0.10	mg/l	1	07/10/18 13:54	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	< 0.010	0.010	mg/l	1	06/27/18 21:56	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	< 0.20	0.20	mg/l	1	07/09/18 10:36	BM	EPA 351.2/LACHAT
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/10/18 15:12	LS	EPA 365.3
Solids, Total Dissolved	42.5	10	mg/l	1	07/02/18 16:57	RC	SM2540 C-11
Solids, Total Suspended	< 4.0	4.0	mg/l	1	07/02/18 10:20	RC	SM2540 D-11
Total Organic Carbon	4.5	1.0	mg/l	1	07/06/18 16:15	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(b) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	WA-6M		
Lab Sample ID:	JC68841-9F	**Date Sampled:**	06/27/18
Matrix:	AQ - Surface Water	**Date Received:**	06/27/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/11/18 09:58	MP	EPA 365.3

RL = Reporting Limit

Report of Analysis

Client Sample ID:	WA-6D		
Lab Sample ID:	JC68841-10	**Date Sampled:**	06/27/18
Matrix:	AQ - Surface Water	**Date Received:**	06/27/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	< 5.0	5.0	mg/l	1	07/03/18 13:59	CD	SM2320 B-11
BOD, 5 Day	< 3.4	3.4	mg/l	1	06/28/18 16:45	LS	SM5210 B-11
Nitrogen, Ammonia	< 0.20	0.20	mg/l	1	07/05/18 15:28	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [b]	0.11	0.11	mg/l	1	07/10/18 13:55	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.11	0.10	mg/l	1	07/10/18 13:55	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	< 0.010	0.010	mg/l	1	06/27/18 22:00	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	< 0.20	0.20	mg/l	1	07/09/18 10:37	BM	EPA 351.2/LACHAT
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/10/18 15:12	LS	EPA 365.3
Solids, Total Dissolved	43.3	10	mg/l	1	07/02/18 16:57	RC	SM2540 C-11
Solids, Total Suspended [c]	4.5	4.0	mg/l	1	07/02/18 10:20	RC	SM2540 D-11
Total Organic Carbon	4.6	1.0	mg/l	1	07/06/18 16:26	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(b) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)
(c) Reported sample aliquot obtained from filtration of 750 mL of sample. Volume was reduced from 1 liter due to nature of sample matrix.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	WA-6D		
Lab Sample ID:	JC68841-10F	**Date Sampled:**	06/27/18
Matrix:	AQ - Surface Water	**Date Received:**	06/27/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/11/18 09:58	MP	EPA 365.3

RL = Reporting Limit

Report of Analysis

Client Sample ID:	WA-7S		
Lab Sample ID:	JC68841-11	**Date Sampled:**	06/27/18
Matrix:	AQ - Surface Water	**Date Received:**	06/27/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	< 5.0	5.0	mg/l	1	07/03/18 13:59	CD	SM2320 B-11
BOD, 5 Day	< 3.4	3.4	mg/l	1	06/28/18 16:49	LS	SM5210 B-11
Coliform, Fecal [b]	0	0	col/100ml	1	06/27/18 16:46	SA	SM9222 D-06
Coliform, Total [b]	8	4	col/100ml	4	06/27/18 22:00	SA	SM9222 B-06
Nitrogen, Ammonia	< 0.20	0.20	mg/l	1	07/05/18 15:39	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [c]	0.12	0.11	mg/l	1	07/10/18 13:58	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.12	0.10	mg/l	1	07/10/18 13:58	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	< 0.010	0.010	mg/l	1	06/27/18 22:00	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	< 0.20	0.20	mg/l	1	07/09/18 10:38	BM	EPA 351.2/LACHAT
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/10/18 15:12	LS	EPA 365.3
Solids, Total Dissolved	22.5	10	mg/l	1	07/02/18 16:57	RC	SM2540 C-11
Solids, Total Suspended	< 4.0	4.0	mg/l	1	07/02/18 10:20	RC	SM2540 D-11
Total Organic Carbon	4.7	1.0	mg/l	1	07/06/18 17:00	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(b) Analysis done out of holding time.
(c) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	WA-7S		
Lab Sample ID:	JC68841-11F	**Date Sampled:**	06/27/18
Matrix:	AQ - Surface Water	**Date Received:**	06/27/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/11/18 10:01	MP	EPA 365.3

RL = Reporting Limit

Report of Analysis

Client Sample ID:	WA-7M		
Lab Sample ID:	JC68841-12	**Date Sampled:**	06/27/18
Matrix:	AQ - Surface Water	**Date Received:**	06/27/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	< 5.0	5.0	mg/l	1	07/03/18 13:59	CD	SM2320 B-11
BOD, 5 Day	< 3.4	3.4	mg/l	1	06/28/18 16:58	LS	SM5210 B-11
Nitrogen, Ammonia	< 0.20	0.20	mg/l	1	07/05/18 15:41	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [b]	0.11	0.11	mg/l	1	07/10/18 13:59	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.11	0.10	mg/l	1	07/10/18 13:59	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	< 0.010	0.010	mg/l	1	06/27/18 22:00	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.35	0.20	mg/l	1	07/11/18 11:15	BM	EPA 351.2/LACHAT
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/10/18 15:12	LS	EPA 365.3
Solids, Total Dissolved	22.5	10	mg/l	1	07/02/18 16:57	RC	SM2540 C-11
Solids, Total Suspended	< 4.0	4.0	mg/l	1	07/02/18 10:20	RC	SM2540 D-11
Total Organic Carbon	4.5	1.0	mg/l	1	07/06/18 17:11	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(b) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	WA-7M		
Lab Sample ID:	JC68841-12F	**Date Sampled:**	06/27/18
Matrix:	AQ - Surface Water	**Date Received:**	06/27/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/11/18 10:01	MP	EPA 365.3

RL = Reporting Limit

Report of Analysis

Client Sample ID: WA-7D
Lab Sample ID: JC68841-13
Matrix: AQ - Surface Water
Project: Philadelphia District, Reservoir Sampling

Date Sampled: 06/27/18
Date Received: 06/27/18
Percent Solids: n/a

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	< 5.0	5.0	mg/l	1	07/03/18 13:59	CD	SM2320 B-11
BOD, 5 Day	< 3.4	3.4	mg/l	1	06/28/18 17:02	LS	SM5210 B-11
Nitrogen, Ammonia	< 0.20	0.20	mg/l	1	07/05/18 15:42	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [b]	0.13	0.11	mg/l	1	07/10/18 14:00	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.13	0.10	mg/l	1	07/10/18 14:00	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	< 0.010	0.010	mg/l	1	06/27/18 22:00	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.71	0.20	mg/l	1	07/11/18 11:16	BM	EPA 351.2/LACHAT
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/10/18 15:12	LS	EPA 365.3
Solids, Total Dissolved	1080	10	mg/l	1	07/02/18 16:57	RC	SM2540 C-11
Solids, Total Suspended	34.0	4.0	mg/l	1	07/02/18 10:20	RC	SM2540 D-11
Total Organic Carbon	6.4	1.0	mg/l	1	07/06/18 17:22	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(b) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	WA-7D		
Lab Sample ID:	JC68841-13F	**Date Sampled:**	06/27/18
Matrix:	AQ - Surface Water	**Date Received:**	06/27/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/11/18 10:01	MP	EPA 365.3

RL = Reporting Limit

Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody

SGS

SW

CHAIN OF CUSTODY

SGS North America Inc. - Dayton
2235 Route 130, Dayton, NJ 08810
TEL. 732-329-0200 FAX 732-329-3499
www.sgs.com/ehsusa

FED-EX Tracking #: PD-061418-199
Bottle Order Control #:
SGS Quote #:
SGS Job #: JC68841

Client / Reporting Information

Company Name: USACE - Phila. District
Street Address: 100 Penn Sq. East
City: Phila. State: PA Zip: 19107
Project Contact: Joe Loeper - USACE E-mail:
Phone #: Fax #:
Sampler(s) Name(s): Gregory Wacik Phone #: 610-592-9780

Project Information

Project Name: USACE - F.E. Walter Reservoir
Street:
City: White Haven State: PA
Project #: PD-061418-199
Client Purchase Order #:
Project Manager:

Billing Information (if different from Report to)
Company Name:
Street Address:
City: State: Zip:
Attention:

Requested Analysis (see TEST CODE sheet)

Matrix Codes: DW - Drinking Water; GW - Ground Water; WW - Water; SW - Surface Water; SO - Soil; SL - Sludge; SED - Sediment; OI - Oil; LIQ - Other Liquid; AIR - Air; SOL - Other Solid; WP - Wipe; FB - Field Blank; EB - Equipment Blank; RB - Rinse Blank; TB - Trip Blank

Lab Sample #	Field ID / Point of Collection	MEOH/DI Vial #	Date	Time	Sampled by	Matrix	# of bottles	HCl	NaOH	HNO3	H2SO4	NONE	DI Water	MEOH	ENCORE	NO2&NO3	Alk, Amm, BOD, XNO30, TDS	TSS, TOC, TKN, TPO4	TCF, FCF	Total Phosphorus (From TKN and XNO3 Bottle)	LAB USE ONLY
1F	WA-1S		6/27/18	9:45	GW	SW	10	X			X					X	X	X	X	X	C17
2F	WA-2S		↓	0700	GW	SW	10	X			X					X	X	X	X	X	65YT3
3F	WA-2M		↓	0700	GW	SW	8	X			X						X	X		X	19EY
4F	WA-2D		↓	0700	GW	SW	8	X			X						X	X		X	
5F	WA-3S		↓	1050	GW	SW	10	X			X					X	X	X	X	X	
6F	WA-4S		↓	1030	GW	SW	10	X			X					X	X	X	X	X	
7F	WA-5S		↓	1010	GW	SW	10	X			X					X	X	X	X	X	
8F	WA-6S		↓	815	GW	SW	10	X			X					X	X	X	X	X	
9F	WA-6M		↓	815	GW	SW	8	X			X						X	X		X	
10F	WA-6D		↓	815	GW	SW	8	X			X						X	X		X	

Turnaround Time (Business days)

- ☐ Std. 10 Business Days
- ☐ 5 Day RUSH
- ☐ 3 Day RUSH
- ☐ 2 Day RUSH
- ☐ 1 Day RUSH
- ☐ other

Emergency & Rush T/A data available via Lablink

Approved by (SGS Project Manager)/Date:

Data Deliverable Information

- ☐ Commercial "A" (Level 1)
- ☐ Commercial "B" (Level 2)
- ☐ FULLT1 (Level 3+4)
- ☐ NJ Reduced
- ☐ Commercial "C"
- ☐ NYASP Category A
- ☐ NYASP Category B
- ☐ State Forms
- ☐ EDD Format
- ☐ Other
- ☐ *NJ Data of Known Quality Protocol Reporting*

Commercial "A" = Results Only; Commercial "B" = Results + QC Summary
NJ Reduced = Results + QC Summary + Partial Raw data

Comments / Special Instructions

INITIAL ASESSMENT 3B-3A / JP

LABEL VERIFICATION

Sample inventory is verified upon receipt in the Laboratory

Sample Custody must be documented below each time samples change possession, including courier delivery.

Relinquished by Sampler: 1 [signature]	Date Time: 6/27/18 4:02	Received By: 1 [signature]	Relinquished By: 2 [signature]	Date Time: 6/27/18 1910	Received By: 2 [signature]
Relinquished by Sampler: 3	Date Time:	Received By: 3	Relinquished By: 4	Date Time:	Received By: 4
Relinquished by: 5	Date Time:	Received By: 5	Custody Seal #	☐ Intact ☐ Not intact	Preserved where applicable ☐	On Ice ☐ Cooler Temp. 3.7, 2.9, 2.6, 3.1, 1.9, 2.5, 3.0

Form:SM088-03C (revised 2/12/18)

http://www.sgs.com/en/terms-and-conditions

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JC68841: Chain of Custody
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SGS

CHAIN OF CUSTODY

SGS North America Inc. - Dayton
2235 Route 130, Dayton, NJ 08810
TEL. 732-329-0200 FAX 732-329-3499
www.sgs.com/ehsusa

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FED-EX Tracking # | Bottle Order Control #
SGS Quote # | SGS Job #

Client / Reporting Information

Company Name: USACE - Phila. District
Street Address: 100 Penn Sq. East
City: Phila. State: PA. Zip: 19107
Project Contact: Joe Loeper - USACE E-mail:
Phone #: Fax #:
Sampler(s) Name(s): Gregory Wacik Phone #:

Project Information

Project Name: USACE - F.E. Walter Reservoir
Street:
City: White Haven State: PA
Project #: #PD-061418-199
Client Purchase Order #:
Project Manager:

Billing Information (If different from Report to)

Company Name:
Street Address:
City: State: Zip:
Attention:

Requested Analysis (see TEST CODE sheet): Alk, Amm, BOD, XN030, TDS | TSS, TOC, TKN, TP04 | TCE, FCE | Total Phosphorus (From TKN and XN030 Bottle)

Lab Sample #	Field ID / Point of Collection	MEOH/DI Vial #	Date	Time	Sampled by	Matrix	# of bottles	HCl	NaOH	HNO3	H2SO4	NONE	DI Water	MEOH	ENCORE	NA2S2O3	Alk, Amm, BOD, XN030, TDS	TSS, TOC, TKN, TP04	TCE, FCE	Total Phosphorus	LAB USE ONLY
11F	WA-7S		6/27/18	845	JW	SW	10	X			X					X	X	X	X	X	
12F	WA-7M		〃	845	JW	SW	8	X			X						X	X		X	
13F	WA-7D		〃	845	JW	SW	8	X			X						X	X		X	

Matrix Codes: DW - Drinking Water; GW - Ground Water; WW - Water; SW - Surface Water; SO - Soil; SL - Sludge; SED - Sediment; OI - Oil; LIQ - Other Liquid; AIR - Air; SOL - Other Solid; WP - Wipe; FB - Field Blank; EB - Equipment Blank; RB - Rinse Blank; TB - Trip Blank

Turnaround Time (Business days)

- ☐ Std. 10 Business Days
- ☐ 5 Day RUSH
- ☐ 3 Day RUSH
- ☐ 2 Day RUSH
- ☐ 1 Day RUSH
- ☐ other

Approved by (SGS Project Manager)/Date:

Emergency & Rush T/A data available via LabLink

Data Deliverable Information

- ☐ Commercial "A" (Level 1)
- ☐ Commercial "B" (Level 2)
- ☐ FULLT1 (Level 3+4)
- ☐ NJ Reduced
- ☐ Commercial "C"
- ☐ NYASP Category A
- ☐ NYASP Category B
- ☐ State Forms
- ☐ EDD Format
- ☐ Other
- ☐ *NJ Data of Known Quality Protocol Reporting*

Commercial "A" = Results Only; Commercial "B" = Results + QC Summary
NJ Reduced = Results + QC Summary + Partial Raw data

Comments / Special Instructions

Sample inventory is verified upon receipt in the Laboratory

Sample Custody must be documented below each time samples change possession, including courier delivery.

Relinquished by Sampler:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
1 [signature]	6/27/18 4:00	1 [signature]	2 [signature]	6/27/18 1910	2 [signature]
3		3	4		4
5		5	Custody Seal # ☐ Intact ☐ Not intact	Preserved where applicable ☐	On Ice ☐ Cooler Temp.

Form:SM088-03C (revised 2/12/18)

http://www.sgs.com/en/terms-and-conditions

JC68841: Chain of Custody
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SGS Sample Receipt Summary

Job Number: JC68841 **Client:** USACE-PHILADELPHIA DISTRICT **Project:** PHILADELPHIA DISTRICT, RESERVOIR SAMPL

Date / Time Received: 6/27/2018 7:10:00 PM **Delivery Method:** Accutest Courier **Airbill #'s:**

Cooler Temps (Raw Measured) °C: Cooler 1: (3.7); Cooler 2: (2.9); Cooler 3: (2.6); Cooler 4: (3.1); Cooler 5: (1.9); Cooler 6: (2.5); Cooler 7: (3.0);

Cooler Temps (Corrected) °C: Cooler 1: (3.7); Cooler 2: (2.9); Cooler 3: (2.6); Cooler 4: (3.1); Cooler 5: (1.9); Cooler 6: (2.5); Cooler 7: (3.0);

Cooler Security	Y	N		Y	N
1. Custody Seals Present:	☑	☐	3. COC Present:	☑	☐
2. Custody Seals Intact:	☑	☐	4. Smpl Dates/Time OK	☑	☐

Cooler Temperature	Y	N
1. Temp criteria achieved:	☑	☐
2. Cooler temp verification:	IR Gun	
3. Cooler media:	Ice (Bag)	
4. No. Coolers:	7	

Quality Control Preservation	Y	N	N/A
1. Trip Blank present / cooler:	☐	☑	☐
2. Trip Blank listed on COC:	☐	☑	☐
3. Samples preserved properly:	☑	☐	
4. VOCs headspace free:	☐	☐	☑

Sample Integrity - Documentation	Y	N
1. Sample labels present on bottles:	☑	☐
2. Container labeling complete:	☑	☐
3. Sample container label / COC agree:	☑	☐

Sample Integrity - Condition	Y	N
1. Sample recvd within HT:	☐	☑
2. All containers accounted for:	☑	☐
3. Condition of sample:	Intact	

Sample Integrity - Instructions	Y	N	N/A
1. Analysis requested is clear:	☑	☐	
2. Bottles received for unspecified tests	☐	☑	
3. Sufficient volume recvd for analysis:	☑	☐	
4. Compositing instructions clear:	☐	☐	☑
5. Filtering instructions clear:	☐	☐	☑

Test Strip Lot #s: pH 1-12: 216017 pH 12+: 208717 Other: (Specify)

Comments
1) -1 thru -13 Please note that Total Diss LF Phosphrous was rec'd but COC not noted as such. Per bottle order Diss LF is needed and filtration request has been sent.
2) All TCF/FCF rec'd out of hold.

SM089-02 Rev. Date 12/1/16

Responded to by: Tammy McCloskey

Response Date: 6/28/18

1) Proceed as noted
2) Proceed as noted

per Joseph Loeper

JC68841: Chain of Custody
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The results set forth herein are provided by SGS North America Inc.

e-Hardcopy 2.0
Automated Report

Technical Report for

USACE-Philadelphia District

Philadelphia District, Reservoir Sampling

W25PHS81145379

SGS Job Number: JC69710

Sampling Date: 07/11/18

Report to:

Army Corps of Engineers

joseph.m.loeper@usace.army.mil

ATTN: Joseph Loeper

Total number of pages in report: 45

Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.

A. Paul Ioannidis
General Manager

Client Service contact: Tammy McCloskey 732-329-0200

Certifications: NJ(12129), NY(10983), CA, CT, FL, IL, IN, KS, KY, LA, MA, MD, ME, MN, NC, OH VAP (CL0056), AK (UST-103), AZ (AZ0786), PA, RI, SC, TX, UT, VA, WV, DoD ELAP (ANAB L2248)

Sections: 1 2 3 4 5

Table of Contents

Sample Summary

USACE-Philadelphia District

Job No: JC69710

Philadelphia District, Reservoir Sampling
Project No: W25PHS81145379

Sample Number	Collected Date	Time	By	Received	Matrix Code	Type	Client Sample ID
JC69710-1	07/11/18	10:00	GW	07/11/18	AQ	Surface Water	WA-1S
JC69710-1F	07/11/18	10:00	GW	07/11/18	AQ	Surface H2O Filtered	WA-1S
JC69710-2	07/11/18	07:20	GW	07/11/18	AQ	Surface Water	WA-2S
JC69710-2F	07/11/18	07:20	GW	07/11/18	AQ	Surface H2O Filtered	WA-2S
JC69710-3	07/11/18	07:20	GW	07/11/18	AQ	Surface Water	WA-2M
JC69710-3F	07/11/18	07:20	GW	07/11/18	AQ	Surface H2O Filtered	WA-2M
JC69710-4	07/11/18	07:20	GW	07/11/18	AQ	Surface Water	WA-2D
JC69710-4F	07/11/18	07:20	GW	07/11/18	AQ	Surface H2O Filtered	WA-2D
JC69710-5	07/11/18	11:00	GW	07/11/18	AQ	Surface Water	WA-3S
JC69710-5F	07/11/18	11:00	GW	07/11/18	AQ	Surface H2O Filtered	WA-3S
JC69710-6	07/11/18	10:35	GW	07/11/18	AQ	Surface Water	WA-4S
JC69710-6F	07/11/18	10:35	GW	07/11/18	AQ	Surface H2O Filtered	WA-4S
JC69710-7	07/11/18	10:20	GW	07/11/18	AQ	Surface Water	WA-5S

Sample Summary
(continued)

USACE-Philadelphia District

Job No: JC69710

Philadelphia District, Reservoir Sampling
Project No: W25PHS81145379

Sample Number	Collected Date	Time	By	Received	Matrix Code	Type	Client Sample ID
JC69710-7F	07/11/18	10:20	GW	07/11/18	AQ	Surface H2O Filtered	WA-5S
JC69710-8	07/11/18	08:15	GW	07/11/18	AQ	Surface Water	WA-6S
JC69710-8F	07/11/18	08:15	GW	07/11/18	AQ	Surface H2O Filtered	WA-6S
JC69710-9	07/11/18	08:15	GW	07/11/18	AQ	Surface Water	WA-6M
JC69710-9F	07/11/18	08:15	GW	07/11/18	AQ	Surface H2O Filtered	WA-6M
JC69710-10	07/11/18	08:15	GW	07/11/18	AQ	Surface Water	WA-6D
JC69710-10F	07/11/18	08:15	GW	07/11/18	AQ	Surface H2O Filtered	WA-6D
JC69710-11	07/11/18	08:45	GW	07/11/18	AQ	Surface Water	WA-7S
JC69710-11F	07/11/18	08:45	GW	07/11/18	AQ	Surface H2O Filtered	WA-7S
JC69710-12	07/11/18	08:45	GW	07/11/18	AQ	Surface Water	WA-7M
JC69710-12F	07/11/18	08:45	GW	07/11/18	AQ	Surface H2O Filtered	WA-7M
JC69710-13	07/11/18	08:45	GW	07/11/18	AQ	Surface Water	WA-7D
JC69710-13F	07/11/18	08:45	GW	07/11/18	AQ	Surface H2O Filtered	WA-7D

CASE NARRATIVE / CONFORMANCE SUMMARY

Client:	USACE-Philadelphia District	**Job No**	JC69710
Site:	Philadelphia District, Reservoir Sampling	**Report Date**	7/23/2018 3:28:42 PM

On 07/11/2018, 13 Sample(s), 0 Trip Blank(s) and 0 Field Blank(s) were received at SGS North America Inc. at a maximum corrected temperature of 3.2 C. Samples were intact and chemically preserved, unless noted below. A SGS North America Inc. Job Number of JC69710 was assigned to the project. Laboratory sample ID, client sample ID and dates of sample collection are detailed in the report's Results Summary Section.

Specified quality control criteria were achieved for this job except as noted below. For more information, please refer to the analytical results and QC summary pages.

Compounds qualified as out of range in the continuing calibration summary report are acceptable as per method requirements when there is a high bias but the sample result is non-detect.

General Chemistry By Method EPA 351.2/LACHAT

Matrix: AQ **Batch ID:** GP14623

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC69710-1DUP, JC69710-1MS were used as the QC samples for Nitrogen, Total Kjeldahl.

General Chemistry By Method EPA 353.2/LACHAT

Matrix: AQ **Batch ID:** GP14521

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC69712-1DUP, JC69712-1MS were used as the QC samples for Nitrogen, Nitrate + Nitrite.

General Chemistry By Method EPA 365.3

Matrix: AQ **Batch ID:** GP14506

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC69604-18FDUP, JC69604-18FMS were used as the QC samples for Phosphorus, Total.

Matrix: AQ **Batch ID:** GP14591

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC69710-1FDUP, JC69710-1FMS were used as the QC samples for Phosphorus, Total.

General Chemistry By Method EPA353.2/SM4500NO2B

Matrix: AQ **Batch ID:** R171346

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC69710-1 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R171347

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC69710-2 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R171348

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC69710-3 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R171349

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC69710-4 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R171350

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC69710-5 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R171351

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC69710-6 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R171352

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC69710-7 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R171353

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC69710-8 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R171354

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC69710-9 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R171355

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC69710-10 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R171356

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC69710-11 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R171357

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC69710-12 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R171358

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC69710-13 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

General Chemistry By Method SM2320 B-11

Matrix: AQ **Batch ID:** GN82958

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC69710-1DUP were used as the QC samples for Alkalinity, Total as CaCO3.
- JC69710-6 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC69710-1 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC69710-12 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC69710-2 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC69710-3 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC69710-5 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC69710-10 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC69710-7 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC69710-8 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC69710-9 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC69710-4 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC69710-13 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC69710-11 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.

General Chemistry By Method SM2540 C-11

Matrix: AQ **Batch ID:** GN82832

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC69710-1DUP were used as the QC samples for Solids, Total Dissolved.

General Chemistry By Method SM2540 D-11

Matrix: AQ **Batch ID:** GN82815

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC69710-1DUP were used as the QC samples for Solids, Total Suspended.

Matrix: AQ **Batch ID:** GN82852

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC69710-7DUP were used as the QC samples for Solids, Total Suspended.

General Chemistry By Method SM4500NH3 H-11LACHAT

Matrix: AQ **Batch ID:** GP14566

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC69654-3DUP, JC69654-3MS, JC69654-3MSD were used as the QC samples for Nitrogen, Ammonia.

General Chemistry By Method SM4500NO2 B-11

Matrix: AQ **Batch ID:** GN82714

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC69710-1DUP, JC69710-1MS were used as the QC samples for Nitrogen, Nitrite.

General Chemistry By Method SM5210 B-11

Matrix: AQ **Batch ID:** GP14428

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC69681-1ADUP were used as the QC samples for BOD, 5 Day.

General Chemistry By Method SM5310 B-11

Matrix: AQ **Batch ID:** GP14455

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC69710-12MS, JC69710-12MSD were used as the QC samples for Total Organic Carbon.

Matrix: AQ **Batch ID:** GP14457

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC69710-3MS, JC69710-3MSD were used as the QC samples for Total Organic Carbon.

General Chemistry By Method SM9222 B-06

Matrix: AQ **Batch ID:** MB5299

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC69712-8DUP were used as the QC samples for Coliform, Total.
- JC69710-1 for Coliform, Total: Analysis done out of holding time.
- JC69710-5 for Coliform, Total: Analysis done out of holding time.
- JC69710-6 for Coliform, Total: Analysis done out of holding time.
- JC69710-7 for Coliform, Total: Analysis done out of holding time.
- JC69710-8 for Coliform, Total: Analysis done out of holding time.
- JC69710-11 for Coliform, Total: Analysis done out of holding time.
- JC69710-2 for Coliform, Total: Analysis done out of holding time.

General Chemistry By Method SM9222 D-06

Matrix: AQ **Batch ID:** MB5300

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC69712-8DUP were used as the QC samples for Coliform, Fecal.
- JC69710-7 for Coliform, Fecal: Analysis done out of holding time.
- JC69710-8 for Coliform, Fecal: Analysis done out of holding time.
- JC69710-2 for Coliform, Fecal: Analysis done out of holding time.
- JC69710-5 for Coliform, Fecal: Analysis done out of holding time.
- JC69710-6 for Coliform, Fecal: Analysis done out of holding time.
- JC69710-1 for Coliform, Fecal: Analysis done out of holding time.
- JC69710-11 for Coliform, Fecal: Analysis done out of holding time.

SGS North America Inc. certifies that data reported for samples received, listed on the associated custody chain or analytical task order, were produced to specifications meeting the Quality System precision, accuracy and completeness objectives except as noted.

Estimated non-standard method measurement uncertainty data is available on request, based on quality control bias and implicit for standard methods. Acceptable uncertainty requires tested parameter quality control data to meet method criteria.

SGS North America Inc. is not responsible for data quality assumptions if partial reports are used and recommends that this report be used in its entirety. Data release is authorized by SGS North America Inc indicated via signature on the report cover

Summary of Hits

Job Number: JC69710
Account: USACE-Philadelphia District
Project: Philadelphia District, Reservoir Sampling
Collected: 07/11/18

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
JC69710-1	**WA-1S**					
Coliform, Fecal [a]		17	4		col/100ml	SM9222 D-06
Nitrogen, Nitrate [b]		0.11	0.11		mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		0.11	0.10		mg/l	EPA 353.2/LACHAT
Nitrogen, Total Kjeldahl		0.32	0.20		mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		83.3	10		mg/l	SM2540 C-11
Total Organic Carbon		4.4	1.0		mg/l	SM5310 B-11
JC69710-1F	**WA-1S**					
No hits reported in this sample.						
JC69710-2	**WA-2S**					
Coliform, Fecal [a]		31	4		col/100ml	SM9222 D-06
Nitrogen, Nitrate [b]		0.32	0.11		mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		0.32	0.10		mg/l	EPA 353.2/LACHAT
Nitrogen, Total Kjeldahl		0.38	0.20		mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		50.0	10		mg/l	SM2540 C-11
Total Organic Carbon		5.6	1.0		mg/l	SM5310 B-11
JC69710-2F	**WA-2S**					
No hits reported in this sample.						
JC69710-3	**WA-2M**					
Nitrogen, Nitrate [b]		0.11	0.11		mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		0.11	0.10		mg/l	EPA 353.2/LACHAT
Nitrogen, Total Kjeldahl		0.30	0.20		mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		46.7	10		mg/l	SM2540 C-11
Total Organic Carbon		4.7	1.0		mg/l	SM5310 B-11
JC69710-3F	**WA-2M**					
No hits reported in this sample.						
JC69710-4	**WA-2D**					
Nitrogen, Nitrate [b]		0.12	0.11		mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		0.12	0.10		mg/l	EPA 353.2/LACHAT
Nitrogen, Total Kjeldahl		0.35	0.20		mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		20.0	10		mg/l	SM2540 C-11
Solids, Total Suspended		12.7	4.0		mg/l	SM2540 D-11

Summary of Hits

Job Number: JC69710
Account: USACE-Philadelphia District
Project: Philadelphia District, Reservoir Sampling
Collected: 07/11/18

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
Total Organic Carbon		5.8	1.0		mg/l	SM5310 B-11
JC69710-4F	**WA-2D**					
No hits reported in this sample.						
JC69710-5	**WA-3S**					
Alkalinity, Total as CaCO3 [c]		5.7	5.0		mg/l	SM2320 B-11
Coliform, Fecal [a]		196	10		col/100ml	SM9222 D-06
Coliform, Total [a]		112	4		col/100ml	SM9222 B-06
Nitrogen, Nitrate [b]		0.20	0.11		mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		0.20	0.10		mg/l	EPA 353.2/LACHAT
Nitrogen, Total Kjeldahl		0.33	0.20		mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		73.3	10		mg/l	SM2540 C-11
Total Organic Carbon		5.1	1.0		mg/l	SM5310 B-11
JC69710-5F	**WA-3S**					
No hits reported in this sample.						
JC69710-6	**WA-4S**					
Coliform, Fecal [a]		164	10		col/100ml	SM9222 D-06
Coliform, Total [a]		166	10		col/100ml	SM9222 B-06
Nitrogen, Nitrate [b]		0.16	0.11		mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		0.16	0.10		mg/l	EPA 353.2/LACHAT
Nitrogen, Total Kjeldahl		0.23	0.20		mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		86.7	10		mg/l	SM2540 C-11
Total Organic Carbon		3.0	1.0		mg/l	SM5310 B-11
JC69710-6F	**WA-4S**					
No hits reported in this sample.						
JC69710-7	**WA-5S**					
Coliform, Fecal [a]		40	4		col/100ml	SM9222 D-06
Coliform, Total [a]		43	4		col/100ml	SM9222 B-06
Nitrogen, Total Kjeldahl		0.30	0.20		mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		60.0	10		mg/l	SM2540 C-11
Total Organic Carbon		3.9	1.0		mg/l	SM5310 B-11

Summary of Hits

Job Number: JC69710
Account: USACE-Philadelphia District
Project: Philadelphia District, Reservoir Sampling
Collected: 07/11/18

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
JC69710-7F	**WA-5S**					
No hits reported in this sample.						
JC69710-8	**WA-6S**					
Coliform, Total [a]		8	4		col/100ml	SM9222 B-06
Nitrogen, Nitrate [b]		0.11	0.11		mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		0.11	0.10		mg/l	EPA 353.2/LACHAT
Nitrogen, Total Kjeldahl		0.53	0.20		mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		63.3	10		mg/l	SM2540 C-11
Total Organic Carbon		4.9	1.0		mg/l	SM5310 B-11
JC69710-8F	**WA-6S**					
No hits reported in this sample.						
JC69710-9	**WA-6M**					
Nitrogen, Nitrate [b]		0.12	0.11		mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		0.12	0.10		mg/l	EPA 353.2/LACHAT
Nitrogen, Total Kjeldahl		0.29	0.20		mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		56.7	10		mg/l	SM2540 C-11
JC69710-9F	**WA-6M**					
No hits reported in this sample.						
JC69710-10	**WA-6D**					
Nitrogen, Nitrate [b]		0.12	0.11		mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		0.12	0.10		mg/l	EPA 353.2/LACHAT
Nitrogen, Total Kjeldahl		0.33	0.20		mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		40.0	10		mg/l	SM2540 C-11
Solids, Total Suspended		5.5	4.0		mg/l	SM2540 D-11
Total Organic Carbon		5.4	1.0		mg/l	SM5310 B-11
JC69710-10F	**WA-6D**					
No hits reported in this sample.						
JC69710-11	**WA-7S**					
Coliform, Fecal [a]		12	4		col/100ml	SM9222 D-06
Nitrogen, Nitrate [b]		0.14	0.11		mg/l	EPA353.2/SM4500NO2B

Summary of Hits

Job Number: JC69710
Account: USACE-Philadelphia District
Project: Philadelphia District, Reservoir Sampling
Collected: 07/11/18

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
Nitrogen, Nitrate + Nitrite		0.14	0.10		mg/l	EPA 353.2/LACHAT
Nitrogen, Total Kjeldahl		0.38	0.20		mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		40.0	10		mg/l	SM2540 C-11
Total Organic Carbon		4.9	1.0		mg/l	SM5310 B-11

JC69710-11F WA-7S

No hits reported in this sample.

JC69710-12 WA-7M

Nitrogen, Nitrate [b]		0.12	0.11		mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		0.12	0.10		mg/l	EPA 353.2/LACHAT
Nitrogen, Total Kjeldahl		0.46	0.20		mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		66.7	10		mg/l	SM2540 C-11
Total Organic Carbon		5.6	1.0		mg/l	SM5310 B-11

JC69710-12F WA-7M

No hits reported in this sample.

JC69710-13 WA-7D

Nitrogen, Nitrate [b]		0.14	0.11		mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		0.14	0.10		mg/l	EPA 353.2/LACHAT
Nitrogen, Total Kjeldahl		0.44	0.20		mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		63.3	10		mg/l	SM2540 C-11
Solids, Total Suspended		14.0	4.0		mg/l	SM2540 D-11
Total Organic Carbon		6.4	1.0		mg/l	SM5310 B-11

JC69710-13F WA-7D

No hits reported in this sample.

(a) Analysis done out of holding time.
(b) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)
(c) Sample was titrated to a final pH of 4.2.

Sample Results

Report of Analysis

Report of Analysis

Client Sample ID: WA-1S
Lab Sample ID: JC69710-1
Matrix: AQ - Surface Water
Project: Philadelphia District, Reservoir Sampling

Date Sampled: 07/11/18
Date Received: 07/11/18
Percent Solids: n/a

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	< 5.0	5.0	mg/l	1	07/18/18 15:43	MP	SM2320 B-11
BOD, 5 Day	< 3.4	3.4	mg/l	1	07/12/18 21:12	SA	SM5210 B-11
Coliform, Fecal [b]	17	4	col/100ml	10	07/11/18 22:44	SA	SM9222 D-06
Coliform, Total [b]	0	4	col/100ml	1	07/11/18 22:38	SA	SM9222 B-06
Nitrogen, Ammonia	< 0.20	0.20	mg/l	1	07/18/18 10:44	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [c]	0.11	0.11	mg/l	1	07/17/18 11:22	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.11	0.10	mg/l	1	07/17/18 11:22	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	< 0.010	0.010	mg/l	1	07/12/18 18:05	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.32	0.20	mg/l	1	07/20/18 10:25	BM	EPA 351.2/LACHAT
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/19/18 13:25	MP	EPA 365.3
Solids, Total Dissolved	83.3	10	mg/l	1	07/16/18 13:30	RC	SM2540 C-11
Solids, Total Suspended	< 4.0	4.0	mg/l	1	07/16/18 09:56	RC	SM2540 D-11
Total Organic Carbon	4.4	1.0	mg/l	1	07/17/18 01:20	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(b) Analysis done out of holding time.
(c) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	WA-1S		
Lab Sample ID:	JC69710-1F	**Date Sampled:**	07/11/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	07/11/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/20/18 16:36	MP	EPA 365.3

RL = Reporting Limit

Report of Analysis

Client Sample ID: WA-2S
Lab Sample ID: JC69710-2
Matrix: AQ - Surface Water
Project: Philadelphia District, Reservoir Sampling

Date Sampled: 07/11/18
Date Received: 07/11/18
Percent Solids: n/a

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	< 5.0	5.0	mg/l	1	07/18/18 15:43	MP	SM2320 B-11
BOD, 5 Day	< 3.4	3.4	mg/l	1	07/12/18 21:13	SA	SM5210 B-11
Coliform, Fecal [b]	31	4	col/100ml	10	07/11/18 22:44	SA	SM9222 D-06
Coliform, Total [b]	0	4	col/100ml	1	07/11/18 22:38	SA	SM9222 B-06
Nitrogen, Ammonia	< 0.20	0.20	mg/l	1	07/18/18 10:46	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [c]	0.32	0.11	mg/l	1	07/17/18 11:23	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.32	0.10	mg/l	1	07/17/18 11:23	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	< 0.010	0.010	mg/l	1	07/12/18 18:05	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.38	0.20	mg/l	1	07/20/18 10:25	BM	EPA 351.2/LACHAT
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/19/18 13:25	MP	EPA 365.3
Solids, Total Dissolved	50.0	10	mg/l	1	07/16/18 13:30	RC	SM2540 C-11
Solids, Total Suspended	< 4.0	4.0	mg/l	1	07/16/18 09:56	RC	SM2540 D-11
Total Organic Carbon	5.6	1.0	mg/l	1	07/17/18 01:39	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(b) Analysis done out of holding time.
(c) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	WA-2S		
Lab Sample ID:	JC69710-2F	**Date Sampled:**	07/11/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	07/11/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/20/18 16:36	MP	EPA 365.3

RL = Reporting Limit

Report of Analysis

Client Sample ID:	WA-2M		
Lab Sample ID:	JC69710-3	**Date Sampled:**	07/11/18
Matrix:	AQ - Surface Water	**Date Received:**	07/11/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	< 5.0	5.0	mg/l	1	07/18/18 15:43	MP	SM2320 B-11
BOD, 5 Day	< 3.4	3.4	mg/l	1	07/12/18 21:15	SA	SM5210 B-11
Nitrogen, Ammonia	< 0.20	0.20	mg/l	1	07/18/18 10:47	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [b]	0.11	0.11	mg/l	1	07/17/18 11:24	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.11	0.10	mg/l	1	07/17/18 11:24	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	< 0.010	0.010	mg/l	1	07/12/18 18:05	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.30	0.20	mg/l	1	07/20/18 10:26	BM	EPA 351.2/LACHAT
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/19/18 13:40	MP	EPA 365.3
Solids, Total Dissolved	46.7	10	mg/l	1	07/16/18 13:30	RC	SM2540 C-11
Solids, Total Suspended	< 4.0	4.0	mg/l	1	07/16/18 09:56	RC	SM2540 D-11
Total Organic Carbon	4.7	1.0	mg/l	1	07/17/18 01:52	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(b) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	WA-2M		
Lab Sample ID:	JC69710-3F	**Date Sampled:**	07/11/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	07/11/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/20/18 16:36	MP	EPA 365.3

RL = Reporting Limit

Report of Analysis

Client Sample ID: WA-2D
Lab Sample ID: JC69710-4
Matrix: AQ - Surface Water
Project: Philadelphia District, Reservoir Sampling

Date Sampled: 07/11/18
Date Received: 07/11/18
Percent Solids: n/a

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	< 5.0	5.0	mg/l	1	07/18/18 15:43	MP	SM2320 B-11
BOD, 5 Day	< 3.4	3.4	mg/l	1	07/12/18 21:17	SA	SM5210 B-11
Nitrogen, Ammonia	< 0.20	0.20	mg/l	1	07/18/18 10:49	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [b]	0.12	0.11	mg/l	1	07/17/18 11:25	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.12	0.10	mg/l	1	07/17/18 11:25	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	< 0.010	0.010	mg/l	1	07/12/18 18:05	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.35	0.20	mg/l	1	07/20/18 10:27	BM	EPA 351.2/LACHAT
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/19/18 13:40	MP	EPA 365.3
Solids, Total Dissolved	20.0	10	mg/l	1	07/16/18 13:30	RC	SM2540 C-11
Solids, Total Suspended	12.7	4.0	mg/l	1	07/16/18 09:56	RC	SM2540 D-11
Total Organic Carbon	5.8	1.0	mg/l	1	07/17/18 02:26	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(b) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	WA-2D		
Lab Sample ID:	JC69710-4F	**Date Sampled:**	07/11/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	07/11/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/20/18 16:36	MP	EPA 365.3

RL = Reporting Limit

Report of Analysis

Client Sample ID: WA-3S
Lab Sample ID: JC69710-5
Matrix: AQ - Surface Water
Project: Philadelphia District, Reservoir Sampling

Date Sampled: 07/11/18
Date Received: 07/11/18
Percent Solids: n/a

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	5.7	5.0	mg/l	1	07/18/18 15:43	MP	SM2320 B-11
BOD, 5 Day	< 3.4	3.4	mg/l	1	07/12/18 21:18	SA	SM5210 B-11
Coliform, Fecal [b]	196	10	col/100ml	4	07/11/18 22:44	SA	SM9222 D-06
Coliform, Total [b]	112	4	col/100ml	4	07/11/18 22:38	SA	SM9222 B-06
Nitrogen, Ammonia	< 0.20	0.20	mg/l	1	07/18/18 10:50	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [c]	0.20	0.11	mg/l	1	07/17/18 11:26	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.20	0.10	mg/l	1	07/17/18 11:26	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	< 0.010	0.010	mg/l	1	07/12/18 18:05	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.33	0.20	mg/l	1	07/20/18 10:28	BM	EPA 351.2/LACHAT
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/19/18 13:40	MP	EPA 365.3
Solids, Total Dissolved	73.3	10	mg/l	1	07/16/18 13:30	RC	SM2540 C-11
Solids, Total Suspended	< 4.0	4.0	mg/l	1	07/16/18 09:56	RC	SM2540 D-11
Total Organic Carbon	5.1	1.0	mg/l	1	07/17/18 02:59	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(b) Analysis done out of holding time.
(c) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	WA-3S		
Lab Sample ID:	JC69710-5F	**Date Sampled:**	07/11/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	07/11/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/20/18 16:36	MP	EPA 365.3

RL = Reporting Limit

Report of Analysis

Client Sample ID: WA-4S
Lab Sample ID: JC69710-6
Matrix: AQ - Surface Water
Project: Philadelphia District, Reservoir Sampling

Date Sampled: 07/11/18
Date Received: 07/11/18
Percent Solids: n/a

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	< 5.0	5.0	mg/l	1	07/18/18 15:43	MP	SM2320 B-11
BOD, 5 Day	< 3.4	3.4	mg/l	1	07/12/18 21:20	SA	SM5210 B-11
Coliform, Fecal [b]	164	10	col/100ml	4	07/11/18 22:44	SA	SM9222 D-06
Coliform, Total [b]	166	10	col/100ml	10	07/11/18 22:38	SA	SM9222 B-06
Nitrogen, Ammonia	< 0.20	0.20	mg/l	1	07/18/18 10:52	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [c]	0.16	0.11	mg/l	1	07/17/18 11:27	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.16	0.10	mg/l	1	07/17/18 11:27	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	< 0.010	0.010	mg/l	1	07/12/18 18:05	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.23	0.20	mg/l	1	07/20/18 10:29	BM	EPA 351.2/LACHAT
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/19/18 13:40	MP	EPA 365.3
Solids, Total Dissolved	86.7	10	mg/l	1	07/16/18 13:30	RC	SM2540 C-11
Solids, Total Suspended	< 4.0	4.0	mg/l	1	07/16/18 09:56	RC	SM2540 D-11
Total Organic Carbon	3.0	1.0	mg/l	1	07/17/18 03:11	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(b) Analysis done out of holding time.
(c) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	WA-4S		
Lab Sample ID:	JC69710-6F	**Date Sampled:**	07/11/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	07/11/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/20/18 16:36	MP	EPA 365.3

RL = Reporting Limit

Report of Analysis

Client Sample ID:	WA-5S		
Lab Sample ID:	JC69710-7	**Date Sampled:**	07/11/18
Matrix:	AQ - Surface Water	**Date Received:**	07/11/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	< 5.0	5.0	mg/l	1	07/18/18 15:43	MP	SM2320 B-11
BOD, 5 Day	< 3.4	3.4	mg/l	1	07/12/18 21:21	SA	SM5210 B-11
Coliform, Fecal [b]	40	4	col/100ml	10	07/11/18 22:44	SA	SM9222 D-06
Coliform, Total [b]	43	4	col/100ml	10	07/11/18 22:38	SA	SM9222 B-06
Nitrogen, Ammonia	< 0.20	0.20	mg/l	1	07/18/18 10:53	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [c]	< 0.11	0.11	mg/l	1	07/17/18 11:31	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	< 0.10	0.10	mg/l	1	07/17/18 11:31	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	< 0.010	0.010	mg/l	1	07/12/18 18:27	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.30	0.20	mg/l	1	07/20/18 10:31	BM	EPA 351.2/LACHAT
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/19/18 13:40	MP	EPA 365.3
Solids, Total Dissolved	60.0	10	mg/l	1	07/16/18 13:30	RC	SM2540 C-11
Solids, Total Suspended	< 4.0	4.0	mg/l	1	07/16/18 16:25	RC	SM2540 D-11
Total Organic Carbon	3.9	1.0	mg/l	1	07/17/18 03:22	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(b) Analysis done out of holding time.
(c) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	WA-5S		
Lab Sample ID:	JC69710-7F	**Date Sampled:**	07/11/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	07/11/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/20/18 16:46	MP	EPA 365.3

RL = Reporting Limit

Report of Analysis

Client Sample ID: WA-6S
Lab Sample ID: JC69710-8
Matrix: AQ - Surface Water
Project: Philadelphia District, Reservoir Sampling

Date Sampled: 07/11/18
Date Received: 07/11/18
Percent Solids: n/a

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	< 5.0	5.0	mg/l	1	07/18/18 15:43	MP	SM2320 B-11
BOD, 5 Day	< 3.4	3.4	mg/l	1	07/12/18 21:23	SA	SM5210 B-11
Coliform, Fecal [b]	0	4	col/100ml	1	07/11/18 22:44	SA	SM9222 D-06
Coliform, Total [b]	8	4	col/100ml	4	07/11/18 22:38	SA	SM9222 B-06
Nitrogen, Ammonia	< 0.20	0.20	mg/l	1	07/18/18 10:55	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [c]	0.11	0.11	mg/l	1	07/17/18 11:32	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.11	0.10	mg/l	1	07/17/18 11:32	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	< 0.010	0.010	mg/l	1	07/12/18 18:27	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.53	0.20	mg/l	1	07/20/18 10:32	BM	EPA 351.2/LACHAT
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/19/18 13:40	MP	EPA 365.3
Solids, Total Dissolved	63.3	10	mg/l	1	07/16/18 13:30	RC	SM2540 C-11
Solids, Total Suspended	< 4.0	4.0	mg/l	1	07/16/18 16:25	RC	SM2540 D-11
Total Organic Carbon	4.9	1.0	mg/l	1	07/17/18 03:33	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(b) Analysis done out of holding time.
(c) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	WA-6S		
Lab Sample ID:	JC69710-8F	**Date Sampled:**	07/11/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	07/11/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/20/18 16:46	MP	EPA 365.3

RL = Reporting Limit

Report of Analysis

Client Sample ID:	WA-6M		
Lab Sample ID:	JC69710-9	**Date Sampled:**	07/11/18
Matrix:	AQ - Surface Water	**Date Received:**	07/11/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	< 5.0	5.0	mg/l	1	07/18/18 15:43	MP	SM2320 B-11
BOD, 5 Day	< 3.4	3.4	mg/l	1	07/12/18 21:25	SA	SM5210 B-11
Nitrogen, Ammonia	< 0.20	0.20	mg/l	1	07/18/18 10:56	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [b]	0.12	0.11	mg/l	1	07/17/18 11:33	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.12	0.10	mg/l	1	07/17/18 11:33	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	< 0.010	0.010	mg/l	1	07/12/18 18:27	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.29	0.20	mg/l	1	07/20/18 10:33	BM	EPA 351.2/LACHAT
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/19/18 13:40	MP	EPA 365.3
Solids, Total Dissolved	56.7	10	mg/l	1	07/16/18 13:30	RC	SM2540 C-11
Solids, Total Suspended	< 4.0	4.0	mg/l	1	07/16/18 16:25	RC	SM2540 D-11
Total Organic Carbon	< 1.0	1.0	mg/l	1	07/17/18 03:46	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(b) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	WA-6M		
Lab Sample ID:	JC69710-9F	**Date Sampled:**	07/11/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	07/11/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/20/18 16:46	MP	EPA 365.3

RL = Reporting Limit

Report of Analysis

Client Sample ID:	WA-6D		
Lab Sample ID:	JC69710-10	**Date Sampled:**	07/11/18
Matrix:	AQ - Surface Water	**Date Received:**	07/11/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	< 5.0	5.0	mg/l	1	07/18/18 15:43	MP	SM2320 B-11
BOD, 5 Day	< 3.4	3.4	mg/l	1	07/12/18 21:27	SA	SM5210 B-11
Nitrogen, Ammonia	< 0.20	0.20	mg/l	1	07/18/18 11:00	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [b]	0.12	0.11	mg/l	1	07/17/18 11:34	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.12	0.10	mg/l	1	07/17/18 11:34	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	< 0.010	0.010	mg/l	1	07/12/18 18:27	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.33	0.20	mg/l	1	07/20/18 10:34	BM	EPA 351.2/LACHAT
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/19/18 13:40	MP	EPA 365.3
Solids, Total Dissolved	40.0	10	mg/l	1	07/16/18 13:30	RC	SM2540 C-11
Solids, Total Suspended	5.5	4.0	mg/l	1	07/16/18 16:25	RC	SM2540 D-11
Total Organic Carbon	5.4	1.0	mg/l	1	07/17/18 03:55	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(b) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	WA-6D		
Lab Sample ID:	JC69710-10F	**Date Sampled:**	07/11/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	07/11/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/20/18 16:46	MP	EPA 365.3

RL = Reporting Limit

Report of Analysis

Client Sample ID: WA-7S
Lab Sample ID: JC69710-11
Matrix: AQ - Surface Water
Project: Philadelphia District, Reservoir Sampling

Date Sampled: 07/11/18
Date Received: 07/11/18
Percent Solids: n/a

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	< 5.0	5.0	mg/l	1	07/18/18 15:43	MP	SM2320 B-11
BOD, 5 Day	< 3.4	3.4	mg/l	1	07/12/18 21:29	SA	SM5210 B-11
Coliform, Fecal [b]	12	4	col/100ml	4	07/11/18 23:39	SA	SM9222 D-06
Coliform, Total [b]	0	0	col/100ml	1	07/11/18 23:35	SA	SM9222 B-06
Nitrogen, Ammonia	< 0.20	0.20	mg/l	1	07/18/18 11:02	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [c]	0.14	0.11	mg/l	1	07/17/18 11:35	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.14	0.10	mg/l	1	07/17/18 11:35	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	< 0.010	0.010	mg/l	1	07/12/18 18:27	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.38	0.20	mg/l	1	07/20/18 10:35	BM	EPA 351.2/LACHAT
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/19/18 13:40	MP	EPA 365.3
Solids, Total Dissolved	40.0	10	mg/l	1	07/16/18 13:30	RC	SM2540 C-11
Solids, Total Suspended	< 4.0	4.0	mg/l	1	07/16/18 16:25	RC	SM2540 D-11
Total Organic Carbon	4.9	1.0	mg/l	1	07/16/18 16:57	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(b) Analysis done out of holding time.
(c) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	WA-7S		
Lab Sample ID:	JC69710-11F	**Date Sampled:**	07/11/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	07/11/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/20/18 16:46	MP	EPA 365.3

RL = Reporting Limit

Report of Analysis

Client Sample ID: WA-7M
Lab Sample ID: JC69710-12
Matrix: AQ - Surface Water
Project: Philadelphia District, Reservoir Sampling

Date Sampled: 07/11/18
Date Received: 07/11/18
Percent Solids: n/a

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	< 5.0	5.0	mg/l	1	07/18/18 15:43	MP	SM2320 B-11
BOD, 5 Day	< 3.4	3.4	mg/l	1	07/12/18 21:31	SA	SM5210 B-11
Nitrogen, Ammonia	< 0.20	0.20	mg/l	1	07/18/18 11:03	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [b]	0.12	0.11	mg/l	1	07/17/18 11:36	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.12	0.10	mg/l	1	07/17/18 11:36	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	< 0.010	0.010	mg/l	1	07/12/18 18:27	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.46	0.20	mg/l	1	07/20/18 10:35	BM	EPA 351.2/LACHAT
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/19/18 13:40	MP	EPA 365.3
Solids, Total Dissolved	66.7	10	mg/l	1	07/16/18 13:30	RC	SM2540 C-11
Solids, Total Suspended	< 4.0	4.0	mg/l	1	07/16/18 16:25	RC	SM2540 D-11
Total Organic Carbon	5.6	1.0	mg/l	1	07/16/18 17:06	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(b) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	WA-7M		
Lab Sample ID:	JC69710-12F	**Date Sampled:**	07/11/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	07/11/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/20/18 16:46	MP	EPA 365.3

RL = Reporting Limit

Report of Analysis

Client Sample ID: WA-7D
Lab Sample ID: JC69710-13
Matrix: AQ - Surface Water
Project: Philadelphia District, Reservoir Sampling

Date Sampled: 07/11/18
Date Received: 07/11/18
Percent Solids: n/a

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	< 5.0	5.0	mg/l	1	07/18/18 15:43	MP	SM2320 B-11
BOD, 5 Day	< 3.4	3.4	mg/l	1	07/12/18 21:32	SA	SM5210 B-11
Nitrogen, Ammonia	< 0.20	0.20	mg/l	1	07/18/18 11:05	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [b]	0.14	0.11	mg/l	1	07/17/18 11:38	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.14	0.10	mg/l	1	07/17/18 11:38	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	< 0.010	0.010	mg/l	1	07/12/18 18:27	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.44	0.20	mg/l	1	07/20/18 10:36	BM	EPA 351.2/LACHAT
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/19/18 13:40	MP	EPA 365.3
Solids, Total Dissolved	63.3	10	mg/l	1	07/16/18 13:30	RC	SM2540 C-11
Solids, Total Suspended	14.0	4.0	mg/l	1	07/16/18 16:25	RC	SM2540 D-11
Total Organic Carbon	6.4	1.0	mg/l	1	07/16/18 17:40	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(b) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	WA-7D		
Lab Sample ID:	JC69710-13F	**Date Sampled:**	07/11/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	07/11/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/20/18 16:46	MP	EPA 365.3

RL = Reporting Limit

Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody

SW

CHAIN OF CUSTODY

SGS North America Inc. - Dayton
2235 Route 130, Dayton, NJ 08810
TEL. 732-329-0200 FAX 732-329-3499
www.sgs.com/ehsusa

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E
F
PA

FED-EX Tracking #: | Bottle Order Control #: PD-062518-64
SGS Quote #: | SGS Job #: JC69710

Client / Reporting Information

Company Name: USACE-Phila. District
Street Address: 100 Penn Sq. East
City: Philadelphia State: PA Zip: 19107
Project Contact: Joe Looper E-mail:
Phone #: Fax #:
Sampler(s) Name(s): Greg Wacik Phone #: 610-597-9780

Project Information

Project Name: USARMY CORPS of ENG. - FE Walter Reservoir
Street:
City: White Haven State: PA
Project #: PD-062518-64
Client Purchase Order #:
Project Manager:

Billing Information (if different from Report to)

Company Name:
Street Address:
City: State: Zip:
Attention:

Requested Analysis (see TEST CODE sheet)

Matrix Codes: DW - Drinking Water; GW - Ground Water; WW - Water; SW - Surface Water; SO - Soil; SL - Sludge; SED-Sediment; OI - Oil; LIQ - Other Liquid; AIR - Air; SOL - Other Solid; WP - Wipe; FB-Field Blank; EB-Equipment Blank; RB- Rinse Blank; TB-Trip Blank

Lab Sample #	Field ID / Point of Collection	MEOH/DI Vial #	Collection Date	Collection Time	Sampled by	Matrix	# of bottles	Number of preserved bottles: HCl	NaOH	HNO3	H2SO4	NONE	DI Water	MEOH	ENCORE	Na2S2O3	AIK, AMM, BOD, XM030	TDS, TOC, TPO4, TKN	TSS, Total Phosphorus	FCF, TCF	LAB USE ONLY
1F	WA-1S		7/11/18	1000	GW	SW	11	X			X				X		X	X	X	X	C26
2F	WA-2S			7:20		SW	11	X			X				X		X	X	X	X	B4
3F	WA-2M			7:20		SW	9	X			X						X	X	X		G4674
4F	WA-2D			7:20		SW	9	X			X						X	X	X		1901
5F	WA-3S			11:00		SW	11	X			X				X		X	X	X	X	
6F	WA-4S			10:35		SW	11	X			X				X		X	X	X	X	
7F	WA-5S			10:20		SW	11	X			X				X		X	X	X	X	
8F	WA-6S			8:15		SW	11	X			X				X		X	X	X	X	
9F	WA-6M			8:15		SW	9	X			X						X	X	X		
10F	WA-6D			8:15		SW	9	X			X						X	X	X		

Turnaround Time (Business days)

- Std. 10 Business Days
- 5 Day RUSH
- 3 Day RUSH
- 2 Day RUSH
- 1 Day RUSH
- other

Approved by (SGS Project Manager)/Date:

Emergency & Rush T/A data available via LabLink

Data Deliverable Information

- Commercial "A" (Level 1)
- Commercial "B" (Level 2)
- FULLT1 (Level 3+4)
- NJ Reduced
- Commercial "C"
- NJ Data of Known Quality Protocol Reporting
- NYASP Category A
- NYASP Category B
- State Forms
- EDD Format
- Other

Commercial "A" = Results Only; Commercial "B" = Results + QC Summary
NJ Reduced = Results + QC Summary + Partial Raw data

Comments / Special Instructions

INITIAL ASESSMENT 3A | JP
LABEL VERIFICATION
Sample inventory is verified upon receipt in the Laboratory

Sample Custody must be documented below each time samples change possession, including courier delivery.

	Relinquished by Sampler:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
1		7/11/18 1305	1	2	7/11/18 2010	2
2	Relinquished by Sampler:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
			3	4		4
3	Relinquished by:	Date Time:	Received By:	Custody Seal #	Intact / Not intact	Preserved where applicable	On Ice	Cooler Temp.
			5					

1.3, 1.8, 1.2, 2.4
2.0, 1.4, 3.2

Form:SM088-03C (revised 2/12/18)

http://www.sgs.com/en/terms-and-conditions.

5.1.5

CHAIN OF CUSTODY

SGS North America Inc. - Dayton
2235 Route 130, Dayton, NJ 08810
TEL. 732-329-0200 FAX 732-329-3499
www.sgs.com/ehsusa

PAGE ___ OF ___

FED-EX Tracking #: | Bottle Order Control #:
SGS Quote #: | SGS Job #: JC69710

Client / Reporting Information

Company Name: USACE - Phila. District
Street Address: 100 Penn Sq. East
City / State / Zip: Philadelphia PA 19107
Project Contact: Joe Loeper | E-mail:
Phone #: | Fax #:
Sampler(s) Name(s): Greg Wacik | Phone #:

Project Information

Project Name: US Army Corps of Eng. - FE Walter Reservoir
Street:
City / State: White Haven PA
Project #: PD-062518-64
Client Purchase Order #:
Project Manager:

Billing Information (if different from Report to)

Company Name:
Street Address:
City / State / Zip:
Attention:

Requested Analysis (see TEST CODE sheet)

Matrix Codes: ~~DW - Drinking Water~~ GW - Ground Water | WW - Water | SW - Surface Water | SO - Soil | SL- Sludge | SED-Sediment | OI - Oil | LIQ - Other Liquid | AIR - Air | SOL - Other Solid | WP - Wipe | FB-Field Blank | EB-Equipment Blank | RB- Rinse Blank | TB-Trip Blank

Lab Sample #	Field ID / Point of Collection	MEOH/DI Vial #	Collection Date	Collection Time	Sampled by	Matrix	# of bottles	HCl	NaOH	HNO3	H2SO4	NONE	DI Water	MEOH	ENCORE	Na2S2O3	AlK, Amm, BOD, Nitro	TDS, TOC, TP04, TKN	TSS, Total Phosphorus	FCF, TCF	LAB USE ONLY
11F	WA-7S		7/11/18	845	GW	SW	11	X			X					X	X	X	X	X	
12F	WA-7M		7/11/18	845	GW	SW	9	X			X						X	X	X		
13F	WA-7D		7/11/18	845	GW	SW	9	X			X						X	X	X		

Turnaround Time (Business days)

Approved by (SGS Project Manager)/Date:

- ☐ Std. 10 Business Days
- ☐ 5 Day RUSH
- ☐ 3 Day RUSH
- ☐ 2 Day RUSH
- ☐ 1 Day RUSH
- ☐ other

Emergency & Rush T/A data available via LabLink

Data Deliverable Information

- ☐ Commercial "A" (Level 1)
- ☐ Commercial "B" (Level 2)
- ☐ FULLT1 (Level 3+4)
- ☐ NJ Reduced
- ☐ Commercial "C"
- ☐ NJ Data of Known Quality Protocol Reporting
- ☐ NYASP Category A
- ☐ NYASP Category B
- ☐ State Forms
- ☐ EDD Format
- ☐ Other

Commercial "A" = Results Only; Commercial "B" = Results + QC Summary
NJ Reduced = Results + QC Summary + Partial Raw data

Comments / Special Instructions

Sample inventory is verified upon receipt in the Laboratory

Sample Custody must be documented below each time samples change possession, including courier delivery.

Relinquished by Sampler:	Date Time: 7/11/18 1805	Received By: 1	Relinquished By: 2	Date Time: 7/11/18 2015	Received By: 2
Relinquished by Sampler: 3	Date Time:	Received By: 3	Relinquished By: 4	Date Time:	Received By: 4
Relinquished by: 5	Date Time:	Received By: 5	Custody Seal # ☐ Intact ☐ Not intact	Preserved where applicable ☐	On Ice ☐ Cooler Temp. 1.3, 1.3, 1.4, 1.2, 2.5, 2.0, 1.4 (corr 3.2)

Form:SM088-03C (revised 2/12/18)

http://www.sgs.com/en/terms-and-conditions.

5.1.5

SGS Sample Receipt Summary

Job Number: JC69710 **Client:** USACE-PHILADELPHIA DISTRICT **Project:** PHILADELPHIA DISTRICT, RESERVOIR SAMPL

Date / Time Received: 7/11/2018 8:10:00 PM **Delivery Method:** Accutest Courier **Airbill #'s:**

Cooler Temps (Raw Measured) °C: Cooler 1: (1.3); Cooler 2: (1.8); Cooler 3: (1.2); Cooler 4: (2.4); Cooler 5: (2.0); Cooler 6: (1.4); Cooler 7: (3.2);

Cooler Temps (Corrected) °C: Cooler 1: (1.3); Cooler 2: (1.8); Cooler 3: (1.2); Cooler 4: (2.4); Cooler 5: (2.0); Cooler 6: (1.4); Cooler 7: (3.2);

Cooler Security	Y	or	N		Y	or	N
1. Custody Seals Present:	☑		☐	3. COC Present:	☑		☐
2. Custody Seals Intact:	☑		☐	4. Smpl Dates/Time OK	☑		☐

Cooler Temperature	Y	or	N
1. Temp criteria achieved:	☑		☐
2. Cooler temp verification:	IR Gun		
3. Cooler media:	Ice (Bag)		
4. No. Coolers:	7		

Quality Control Preservation	Y	or	N	N/A
1. Trip Blank present / cooler:	☐		☑	☐
2. Trip Blank listed on COC:	☐		☑	☐
3. Samples preserved properly:	☑		☐	
4. VOCs headspace free:	☐		☐	☑

Sample Integrity - Documentation	Y	or	N
1. Sample labels present on bottles:	☑		☐
2. Container labeling complete:	☑		☐
3. Sample container label / COC agree:	☑		☐

Sample Integrity - Condition	Y	or	N
1. Sample recvd within HT:	☐		☑
2. All containers accounted for:	☑		☐
3. Condition of sample:	Intact		

Sample Integrity - Instructions	Y	or	N	N/A
1. Analysis requested is clear:	☑		☐	
2. Bottles received for unspecified tests	☐		☑	
3. Sufficient volume recvd for analysis:	☑		☐	
4. Compositing instructions clear:	☐		☐	☑
5. Filtering instructions clear:	☐		☐	☑

Test Strip Lot #s: pH 1-12: 216017 pH 12+: 208717 Other: (Specify)

Comments
1) All TCF and FCF rec'd out of hold.
2) For all samples, Total Diss LF Phosphorous rec'd but not noted as such on COC. Filtration request sent.

SM089-02 Rev. Date 12/1/16

Responded to by: Tammy Esposito McCloskey Response Date: 7/12/18

Proceed as noted. Joe Loeper notified.

JC69710: Chain of Custody
Page 4 of 4

The results set forth herein are provided by SGS North America Inc.

e-Hardcopy 2.0
Automated Report

Technical Report for

USACE-Philadelphia District

Philadelphia District, Reservoir Sampling

W25PHS81145379

SGS Job Number: JC71017

Sampling Date: 07/31/18

Report to:

Army Corps of Engineers

joseph.m.loeper@usace.army.mil

ATTN: Joseph Loeper

Total number of pages in report: 47

Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.

A. Paul Ioannidis
General Manager

Client Service contact: Tammy McCloskey 732-329-0200

Certifications: NJ(12129), NY(10983), CA, CT, FL, IL, IN, KS, KY, LA, MA, MD, ME, MN, NC, OH VAP (CL0056), AK (UST-103), AZ (AZ0786), PA, RI, SC, TX, UT, VA, WV, DoD ELAP (ANAB L2248)

Sections: 1 2 3 4 5

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Sample Summary

USACE-Philadelphia District

Job No: JC71017

Philadelphia District, Reservoir Sampling
Project No: W25PHS81145379

Sample Number	Collected Date	Time	By	Received	Matrix Code	Type	Client Sample ID
JC71017-1	07/31/18	09:25	GW	07/31/18	AQ	Surface Water	WA-1S
JC71017-1F	07/31/18	09:25	GW	07/31/18	AQ	Surface H2O Filtered	WA-1S
JC71017-2	07/31/18	07:15	GW	07/31/18	AQ	Surface Water	WA-2S
JC71017-2F	07/31/18	07:15	GW	07/31/18	AQ	Surface H2O Filtered	WA-2S
JC71017-3	07/31/18	07:15	GW	07/31/18	AQ	Surface Water	WA-2M
JC71017-3F	07/31/18	07:15	GW	07/31/18	AQ	Surface H2O Filtered	WA-2M
JC71017-4	07/31/18	07:15	GW	07/31/18	AQ	Surface Water	WA-2D
JC71017-4F	07/31/18	07:15	GW	07/31/18	AQ	Surface H2O Filtered	WA-2D
JC71017-5	07/31/18	10:30	GW	07/31/18	AQ	Surface Water	WA-3S
JC71017-5F	07/31/18	10:30	GW	07/31/18	AQ	Surface H2O Filtered	WA-3S
JC71017-6	07/31/18	10:00	GW	07/31/18	AQ	Surface Water	WA-4S
JC71017-6F	07/31/18	10:00	GW	07/31/18	AQ	Surface H2O Filtered	WA-4S
JC71017-7	07/31/18	09:40	GW	07/31/18	AQ	Surface Water	WA-5S

Sample Summary
(continued)

USACE-Philadelphia District

Job No: JC71017

Philadelphia District, Reservoir Sampling
Project No: W25PHS81145379

Sample Number	Collected Date	Time	By	Received	Matrix Code	Type	Client Sample ID
JC71017-7F	07/31/18	09:40	GW	07/31/18	AQ	Surface H2O Filtered	WA-5S
JC71017-8	07/31/18	08:10	GW	07/31/18	AQ	Surface Water	WA-6S
JC71017-8F	07/31/18	08:10	GW	07/31/18	AQ	Surface H2O Filtered	WA-6S
JC71017-9	07/31/18	08:10	GW	07/31/18	AQ	Surface Water	WA-6M
JC71017-9F	07/31/18	08:10	GW	07/31/18	AQ	Surface H2O Filtered	WA-6M
JC71017-10	07/31/18	08:10	GW	07/31/18	AQ	Surface Water	WA-6D
JC71017-10F	07/31/18	08:10	GW	07/31/18	AQ	Surface H2O Filtered	WA-6D
JC71017-11	07/31/18	08:35	GW	07/31/18	AQ	Surface Water	WA-7S
JC71017-11F	07/31/18	08:35	GW	07/31/18	AQ	Surface H2O Filtered	WA-7S
JC71017-12	07/31/18	08:35	GW	07/31/18	AQ	Surface Water	WA-7M
JC71017-12F	07/31/18	08:35	GW	07/31/18	AQ	Surface H2O Filtered	WA-7M
JC71017-13	07/31/18	08:35	GW	07/31/18	AQ	Surface Water	WA-7D
JC71017-13F	07/31/18	08:35	GW	07/31/18	AQ	Surface H2O Filtered	WA-7D

CASE NARRATIVE / CONFORMANCE SUMMARY

Client:	USACE-Philadelphia District	**Job No**	JC71017
Site:	Philadelphia District, Reservoir Sampling	**Report Date**	8/15/2018 9:14:46 AM

On 07/31/2018, 26 Sample(s), 0 Trip Blank(s) and 0 Field Blank(s) were received at SGS North America Inc. at a maximum corrected temperature of 3.1 C. Samples were intact and chemically preserved, unless noted below. A SGS North America Inc. Job Number of JC71017 was assigned to the project. Laboratory sample ID, client sample ID and dates of sample collection are detailed in the report's Results Summary Section.

Specified quality control criteria were achieved for this job except as noted below. For more information, please refer to the analytical results and QC summary pages.

Compounds qualified as out of range in the continuing calibration summary report are acceptable as per method requirements when there is a high bias but the sample result is non-detect.

General Chemistry By Method EPA 351.2/LACHAT

Matrix: AQ **Batch ID:** GP15213

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC71016-2DUP, JC71016-2MS were used as the QC samples for Nitrogen, Total Kjeldahl.

Matrix: AQ **Batch ID:** GP15214

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC71475-2DUP, JC71475-2MS were used as the QC samples for Nitrogen, Total Kjeldahl.
- Matrix Spike Recovery(s) for Nitrogen, Total Kjeldahl are outside control limits. Spike amount low relative to the sample amount. Refer to lab control or spike blank for recovery information.

General Chemistry By Method EPA 353.2/LACHAT

Matrix: AQ **Batch ID:** GP15199

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC71016-2DUP, JC71016-2MS were used as the QC samples for Nitrogen, Nitrate + Nitrite.
- Matrix Spike Recovery(s) for Nitrogen, Nitrate + Nitrite are outside control limits. Spike recovery indicates possible matrix interference.
- RPD(s) for Duplicate for Nitrogen, Nitrate + Nitrite are outside control limits for sample GP15199-D1. RPD acceptable due to low duplicate and sample concentrations.

Matrix: AQ **Batch ID:** GP15200

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC71516-4DUP, JC71516-4MS were used as the QC samples for Nitrogen, Nitrate + Nitrite.
- Matrix Spike Recovery(s) for Nitrogen, Nitrate + Nitrite are outside control limits. Spike recovery indicates possible matrix interference.

General Chemistry By Method EPA 365.3

Matrix: AQ **Batch ID:** GP15187

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC71017-1DUP, JC71017-1MS were used as the QC samples for Phosphorus, Total.

Matrix: AQ **Batch ID:** GP15216

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC71017-1FDUP, JC71017-1FMS were used as the QC samples for Phosphorus, Total.

General Chemistry By Method EPA353.2/SM4500NO2B

Matrix: AQ **Batch ID:** R172128

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC71017-1 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R172129

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC71017-2 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R172130

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC71017-3 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R172131

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC71017-4 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R172132

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC71017-5 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R172133

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC71017-7 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R172134

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC71017-8 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R172135

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC71017-9 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R172136

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC71017-10 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R172137

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC71017-11 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R172138

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC71017-12 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R172139

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC71017-13 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R172142

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC71017-6 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

General Chemistry By Method SM2320 B-11

Matrix: AQ **Batch ID:** GN83850

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC71155-1DUP were used as the QC samples for Alkalinity, Total as CaCO3.
- JC71017-3 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC71017-1 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC71017-4 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC71017-5 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC71017-6 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.5.
- JC71017-10 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC71017-11 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC71017-12 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC71017-13 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC71017-2 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC71017-7 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC71017-8 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC71017-9 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.

General Chemistry By Method SM2540 C-11

Matrix: AQ **Batch ID:** GN83688

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC71016-1DUP were used as the QC samples for Solids, Total Dissolved.

Matrix: AQ **Batch ID:** GN83754

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC71017-3DUP were used as the QC samples for Solids, Total Dissolved.

General Chemistry By Method SM2540 D-11

Matrix: AQ **Batch ID:** GN83682

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC71017-1DUP were used as the QC samples for Solids, Total Suspended.
- JC71017-3 for Solids, Total Suspended: Reported sample aliquot obtained from filtration of 800 mL of sample. Volume was reduced from 1 liter due to nature of sample matrix.

Matrix: AQ **Batch ID:** GN83748

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC71017-4DUP were used as the QC samples for Solids, Total Suspended.
- JC71017-13 for Solids, Total Suspended: Reported sample aliquot obtained from filtration of 550 mL of sample. Volume was reduced from 1 liter due to nature of sample matrix.

General Chemistry By Method SM4500NH3 H-11LACHAT

Matrix: AQ **Batch ID:** GP15169

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC71017-1DUP, JC71017-1MS, JC71017-1MSD were used as the QC samples for Nitrogen, Ammonia.

General Chemistry By Method SM4500NO2 B-11

Matrix: AQ **Batch ID:** GN83553

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC71016-2DUP, JC71016-2MS were used as the QC samples for Nitrogen, Nitrite.

General Chemistry By Method SM5210 B-11

Matrix: AQ **Batch ID:** GP14965

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC71017-1DUP were used as the QC samples for BOD, 5 Day.

General Chemistry By Method SM5310 B-11

Matrix: AQ **Batch ID:** GP15276

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC71017-8MS, JC71017-8MSD were used as the QC samples for Total Organic Carbon.

Matrix: AQ **Batch ID:** GP15277

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC71017-11MS, JC71017-11MSD were used as the QC samples for Total Organic Carbon.

General Chemistry By Method SM9222 B-06

Matrix: AQ **Batch ID:** MB5320

- All method blanks for this batch meet method specific criteria.
- Sample(s) JC71016-1DUP were used as the QC samples for Coliform, Total.
- JC71017-11 for Coliform, Total: Analysis done out of holding time.
- JC71017-2 for Coliform, Total: Analysis done out of holding time.
- JC71017-6 for Coliform, Total: Analysis done out of holding time.
- JC71017-1 for Coliform, Total: Analysis done out of holding time.
- JC71017-7 for Coliform, Total: Analysis done out of holding time.
- JC71017-8 for Coliform, Total: Analysis done out of holding time.
- JC71017-5 for Coliform, Total: Analysis done out of holding time.

General Chemistry By Method SM9222 D-06

Matrix: AQ **Batch ID:** MB5321

- All method blanks for this batch meet method specific criteria.
- Sample(s) JC71016-1DUP were used as the QC samples for Coliform, Fecal.
- JC71017-2 for Coliform, Fecal: Analysis done out of holding time.
- JC71017-6 for Coliform, Fecal: Analysis done out of holding time.
- JC71017-8 for Coliform, Fecal: Analysis done out of holding time.
- JC71017-1 for Coliform, Fecal: Analysis done out of holding time.
- JC71017-7 for Coliform, Fecal: Analysis done out of holding time.
- JC71017-11 for Coliform, Fecal: Analysis done out of holding time.
- JC71017-5 for Coliform, Fecal: Analysis done out of holding time.

SGS North America Inc. certifies that data reported for samples received, listed on the associated custody chain or analytical task order, were produced to specifications meeting the Quality System precision, accuracy and completeness objectives except as noted.

Estimated non-standard method measurement uncertainty data is available on request, based on quality control bias and implicit for standard methods. Acceptable uncertainty requires tested parameter quality control data to meet method criteria.

SGS North America Inc. is not responsible for data quality assumptions if partial reports are used and recommends that this report be used in its entirety. Data release is authorized by SGS North America Inc indicated via signature on the report cover

Summary of Hits

Job Number: JC71017
Account: USACE-Philadelphia District
Project: Philadelphia District, Reservoir Sampling
Collected: 07/31/18

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	LOQ	LOD	Units	Method
JC71017-1	**WA-1S**					
Coliform, Fecal [a]		144	4	[b]	col/100ml	SM9222 D-06
Coliform, Total [a]		809	100	[b]	col/100ml	SM9222 B-06
Nitrogen, Total Kjeldahl		0.66	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		13.3	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended		5.1	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon		9.1	1.0	1.0	mg/l	SM5310 B-11
JC71017-1F	**WA-1S**					
No hits reported in this sample.						
JC71017-2	**WA-2S**					
Alkalinity, Total as CaCO3 [c]		4.7 J	5.0	4.0	mg/l	SM2320 B-11
Coliform, Fecal [a]		20	4	[b]	col/100ml	SM9222 D-06
Coliform, Total [a]		120	4	[b]	col/100ml	SM9222 B-06
Nitrogen, Nitrate [d]		0.13	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		0.13	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Total Kjeldahl		0.39	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		31.7	10	4.0	mg/l	SM2540 C-11
Total Organic Carbon		5.7	1.0	1.0	mg/l	SM5310 B-11
JC71017-2F	**WA-2S**					
No hits reported in this sample.						
JC71017-3	**WA-2M**					
Nitrogen, Nitrate [d]		0.29	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		0.29	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Total Kjeldahl		0.43	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		50.0	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended [e]		2.5 J	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon		11.3	1.0	1.0	mg/l	SM5310 B-11
JC71017-3F	**WA-2M**					
No hits reported in this sample.						
JC71017-4	**WA-2D**					
Nitrogen, Total Kjeldahl		0.56	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		20.0	10	4.0	mg/l	SM2540 C-11

Summary of Hits

Job Number: JC71017
Account: USACE-Philadelphia District
Project: Philadelphia District, Reservoir Sampling
Collected: 07/31/18

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	LOQ	LOD	Units	Method
Solids, Total Suspended		19.0	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon		10.7	1.0	1.0	mg/l	SM5310 B-11
JC71017-4F	**WA-2D**					
No hits reported in this sample.						
JC71017-5	**WA-3S**					
Coliform, Fecal [a]		64	10	[b]	col/100ml	SM9222 D-06
Coliform, Total [a]		194	10	[b]	col/100ml	SM9222 B-06
Nitrogen, Nitrate [d]		0.13	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		0.13	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Total Kjeldahl		1.6	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		105	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended		2.5 J	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon		13.1	1.0	1.0	mg/l	SM5310 B-11
JC71017-5F	**WA-3S**					
No hits reported in this sample.						
JC71017-6	**WA-4S**					
Alkalinity, Total as CaCO3 [f]		21.2	5.0	4.0	mg/l	SM2320 B-11
Coliform, Fecal [a]		12	4	[b]	col/100ml	SM9222 D-06
Coliform, Total [a]		320	10	[b]	col/100ml	SM9222 B-06
Nitrogen, Nitrate [d]		0.22	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		0.22	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Total Kjeldahl		0.34	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		100	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended		2.1 J	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon		7.0	1.0	1.0	mg/l	SM5310 B-11
JC71017-6F	**WA-4S**					
No hits reported in this sample.						
JC71017-7	**WA-5S**					
Coliform, Fecal [a]		8	4	[b]	col/100ml	SM9222 D-06
Coliform, Total [a]		174	10	[b]	col/100ml	SM9222 B-06
Nitrogen, Total Kjeldahl		0.31	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		6.7 J	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended		3.8 J	4.0	2.0	mg/l	SM2540 D-11

Summary of Hits

Job Number: JC71017
Account: USACE-Philadelphia District
Project: Philadelphia District, Reservoir Sampling
Collected: 07/31/18

Lab Sample ID / Client Sample ID / Analyte	Result/ Qual	LOQ	LOD	Units	Method
Total Organic Carbon	5.4	1.0	1.0	mg/l	SM5310 B-11
JC71017-7F WA-5S					
No hits reported in this sample.					
JC71017-8 WA-6S					
Alkalinity, Total as CaCO3 [c]	4.1 J	5.0	4.0	mg/l	SM2320 B-11
Coliform, Fecal [a]	8	4	[b]	col/100ml	SM9222 D-06
Coliform, Total [a]	92	4	[b]	col/100ml	SM9222 B-06
Nitrogen, Total Kjeldahl	0.37	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved	43.3	10	4.0	mg/l	SM2540 C-11
Total Organic Carbon	5.6	1.0	1.0	mg/l	SM5310 B-11
JC71017-8F WA-6S					
No hits reported in this sample.					
JC71017-9 WA-6M					
Nitrogen, Total Kjeldahl	0.52	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved	42.5	10	4.0	mg/l	SM2540 C-11
Total Organic Carbon	8.6	1.0	1.0	mg/l	SM5310 B-11
JC71017-9F WA-6M					
No hits reported in this sample.					
JC71017-10 WA-6D					
Nitrogen, Total Kjeldahl	0.33	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved	36.7	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended	7.8	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon	9.3	1.0	1.0	mg/l	SM5310 B-11
JC71017-10F WA-6D					
No hits reported in this sample.					
JC71017-11 WA-7S					
Coliform, Fecal [a]	20	4	[b]	col/100ml	SM9222 D-06
Coliform, Total [a]	727	100	[b]	col/100ml	SM9222 B-06
Nitrogen, Total Kjeldahl	0.36	0.20	0.15	mg/l	EPA 351.2/LACHAT

Summary of Hits

Job Number: JC71017
Account: USACE-Philadelphia District
Project: Philadelphia District, Reservoir Sampling
Collected: 07/31/18

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	LOQ	LOD	Units	Method
Solids, Total Dissolved		32.5	10	4.0	mg/l	SM2540 C-11
Total Organic Carbon		6.4	1.0	1.0	mg/l	SM5310 B-11
JC71017-11F	**WA-7S**					
No hits reported in this sample.						
JC71017-12	**WA-7M**					
Nitrogen, Nitrate [d]		0.12	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		0.12	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Total Kjeldahl		0.42	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		45.0	10	4.0	mg/l	SM2540 C-11
Total Organic Carbon		9.7	1.0	1.0	mg/l	SM5310 B-11
JC71017-12F	**WA-7M**					
No hits reported in this sample.						
JC71017-13	**WA-7D**					
Nitrogen, Total Kjeldahl		0.54	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		30.0	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended [g]		4.2	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon		11.4	1.0	1.0	mg/l	SM5310 B-11
JC71017-13F	**WA-7D**					
No hits reported in this sample.						

(a) Analysis done out of holding time.
(b) Value reported is laboratory DL (MDL).
(c) Sample was titrated to a final pH of 4.2.
(d) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)
(e) Reported sample aliquot obtained from filtration of 800 mL of sample. Volume was reduced from 1 liter due to nature of sample matrix.
(f) Sample was titrated to a final pH of 4.5.
(g) Reported sample aliquot obtained from filtration of 550 mL of sample. Volume was reduced from 1 liter due to nature of sample matrix.

Sample Results

Report of Analysis

Report of Analysis

Client Sample ID: WA-1S
Lab Sample ID: JC71017-1
Matrix: AQ - Surface Water
Project: Philadelphia District, Reservoir Sampling

Date Sampled: 07/31/18
Date Received: 07/31/18
Percent Solids: n/a

General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	4.0 U	5.0	4.0	mg/l	1	08/06/18 15:14	JO	SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 [b]	mg/l	1	08/01/18 21:28	SA	SM5210 B-11
Coliform, Fecal [c]	144	4		col/100ml	4	07/31/18 23:48	SA	SM9222 D-06
Coliform, Total [c]	809	100		col/100ml	100	07/31/18 23:41	SA	SM9222 B-06
Nitrogen, Ammonia	0.20 U	0.20	0.20	mg/l	1	08/09/18 14:34	RP	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [d]	0.11 U	0.11	0.11	mg/l	1	08/13/18 09:47	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.10 U	0.10	0.10	mg/l	1	08/13/18 09:47	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0050 U	0.010	0.0050	mg/l	1	07/31/18 21:15	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.66	0.20	0.15	mg/l	1	08/13/18 11:14	BM	EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	mg/l	1	08/10/18 16:35	LS	EPA 365.3
Solids, Total Dissolved	13.3	10	4.0	mg/l	1	08/02/18 10:50	RC	SM2540 C-11
Solids, Total Suspended	5.1	4.0	2.0	mg/l	1	08/02/18 11:03	RC	SM2540 D-11
Total Organic Carbon	9.1	1.0	1.0	mg/l	1	08/14/18 18:01	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(b) Value reported is laboratory DL (MDL).
(c) Analysis done out of holding time.
(d) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

LOQ = Limit of Quantitation
LOD = Limit of Detection B = Analyte found in associated blank
U = Indicates a result < LOD
J = Indicates a result > = LOD but < LOQ

Report of Analysis

Client Sample ID:	WA-1S		
Lab Sample ID:	JC71017-1F	**Date Sampled:**	07/31/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	07/31/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Phosphorus, Total	0.050 U	0.050	0.050	mg/l	1	08/14/18 10:39	MP	EPA 365.3

LOQ = Limit of Quantitation
LOD = Limit of Detection B = Analyte found in associated blank

U = Indicates a result < LOD
J = Indicates a result > = LOD but < LOQ

Report of Analysis

Client Sample ID: WA-2S
Lab Sample ID: JC71017-2
Matrix: AQ - Surface Water
Project: Philadelphia District, Reservoir Sampling

Date Sampled: 07/31/18
Date Received: 07/31/18
Percent Solids: n/a

General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	4.7 J	5.0	4.0	mg/l	1	08/06/18 15:14	JO	SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 [b]	mg/l	1	08/01/18 21:32	SA	SM5210 B-11
Coliform, Fecal [c]	20	4		col/100ml	4	07/31/18 23:48	SA	SM9222 D-06
Coliform, Total [c]	120	4		col/100ml	4	07/31/18 23:41	SA	SM9222 B-06
Nitrogen, Ammonia	0.20 U	0.20	0.20	mg/l	1	08/09/18 14:35	RP	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [d]	0.13	0.11	0.11	mg/l	1	08/13/18 09:48	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.13	0.10	0.10	mg/l	1	08/13/18 09:48	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0050 U	0.010	0.0050	mg/l	1	07/31/18 21:15	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.39	0.20	0.15	mg/l	1	08/13/18 11:14	BM	EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	mg/l	1	08/10/18 16:35	LS	EPA 365.3
Solids, Total Dissolved	31.7	10	4.0	mg/l	1	08/02/18 10:50	RC	SM2540 C-11
Solids, Total Suspended	2.0 U	4.0	2.0	mg/l	1	08/02/18 11:03	RC	SM2540 D-11
Total Organic Carbon	5.7	1.0	1.0	mg/l	1	08/14/18 18:13	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(b) Value reported is laboratory DL (MDL).
(c) Analysis done out of holding time.
(d) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

LOQ = Limit of Quantitation
LOD = Limit of Detection B = Analyte found in associated blank
U = Indicates a result < LOD
J = Indicates a result > = LOD but < LOQ

Report of Analysis

Client Sample ID:	WA-2S		
Lab Sample ID:	JC71017-2F	**Date Sampled:**	07/31/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	07/31/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Phosphorus, Total	0.050 U	0.050	0.050	mg/l	1	08/14/18 10:39	MP	EPA 365.3

LOQ = Limit of Quantitation
LOD = Limit of Detection B = Analyte found in associated blank

U = Indicates a result < LOD
J = Indicates a result > = LOD but < LOQ

Report of Analysis

Client Sample ID: WA-2M
Lab Sample ID: JC71017-3
Matrix: AQ - Surface Water
Project: Philadelphia District, Reservoir Sampling

Date Sampled: 07/31/18
Date Received: 07/31/18
Percent Solids: n/a

General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	4.0 U	5.0	4.0	mg/l	1	08/06/18 15:14	JO	SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 [b]	mg/l	1	08/01/18 21:34	SA	SM5210 B-11
Nitrogen, Ammonia	0.20 U	0.20	0.20	mg/l	1	08/09/18 14:40	RP	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [c]	0.29	0.11	0.11	mg/l	1	08/13/18 09:49	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.29	0.10	0.10	mg/l	1	08/13/18 09:49	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0050 U	0.010	0.0050	mg/l	1	07/31/18 21:15	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.43	0.20	0.15	mg/l	1	08/13/18 11:15	BM	EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	mg/l	1	08/10/18 16:35	LS	EPA 365.3
Solids, Total Dissolved	50.0	10	4.0	mg/l	1	08/03/18 15:00	RC	SM2540 C-11
Solids, Total Suspended [d]	2.5 J	4.0	2.0	mg/l	1	08/02/18 11:03	RC	SM2540 D-11
Total Organic Carbon	11.3	1.0	1.0	mg/l	1	08/14/18 18:24	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(b) Value reported is laboratory DL (MDL).
(c) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)
(d) Reported sample aliquot obtained from filtration of 800 mL of sample. Volume was reduced from 1 liter due to nature of sample matrix.

LOQ = Limit of Quantitation
LOD = Limit of Detection
B = Analyte found in associated blank
U = Indicates a result < LOD
J = Indicates a result > = LOD but < LOQ

Report of Analysis

Client Sample ID:	WA-2M		
Lab Sample ID:	JC71017-3F	**Date Sampled:**	07/31/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	07/31/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Phosphorus, Total	0.050 U	0.050	0.050	mg/l	1	08/14/18 10:39	MP	EPA 365.3

LOQ = Limit of Quantitation
LOD = Limit of Detection B = Analyte found in associated blank

U = Indicates a result < LOD
J = Indicates a result > = LOD but < LOQ

Report of Analysis

Client Sample ID: WA-2D
Lab Sample ID: JC71017-4
Matrix: AQ - Surface Water
Project: Philadelphia District, Reservoir Sampling

Date Sampled: 07/31/18
Date Received: 07/31/18
Percent Solids: n/a

General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	4.0 U	5.0	4.0	mg/l	1	08/06/18 15:14	JO	SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 [b]	mg/l	1	08/01/18 21:36	SA	SM5210 B-11
Nitrogen, Ammonia	0.20 U	0.20	0.20	mg/l	1	08/09/18 14:41	RP	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [c]	0.11 U	0.11	0.11	mg/l	1	08/13/18 09:52	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.10 U	0.10	0.10	mg/l	1	08/13/18 09:52	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0050 U	0.010	0.0050	mg/l	1	07/31/18 21:15	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.56	0.20	0.15	mg/l	1	08/13/18 11:18	BM	EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	mg/l	1	08/10/18 16:35	LS	EPA 365.3
Solids, Total Dissolved	20.0	10	4.0	mg/l	1	08/03/18 15:00	RC	SM2540 C-11
Solids, Total Suspended	19.0	4.0	2.0	mg/l	1	08/03/18 10:50	RC	SM2540 D-11
Total Organic Carbon	10.7	1.0	1.0	mg/l	1	08/14/18 18:42	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(b) Value reported is laboratory DL (MDL).
(c) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

LOQ = Limit of Quantitation
LOD = Limit of Detection B = Analyte found in associated blank
U = Indicates a result < LOD
J = Indicates a result > = LOD but < LOQ

Report of Analysis

Client Sample ID:	WA-2D		
Lab Sample ID:	JC71017-4F	**Date Sampled:**	07/31/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	07/31/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Phosphorus, Total	0.050 U	0.050	0.050	mg/l	1	08/14/18 10:39	MP	EPA 365.3

LOQ = Limit of Quantitation
LOD = Limit of Detection B = Analyte found in associated blank

U = Indicates a result < LOD
J = Indicates a result > = LOD but < LOQ

Report of Analysis

Client Sample ID: WA-3S
Lab Sample ID: JC71017-5
Matrix: AQ - Surface Water
Project: Philadelphia District, Reservoir Sampling

Date Sampled: 07/31/18
Date Received: 07/31/18
Percent Solids: n/a

General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	4.0 U	5.0	4.0	mg/l	1	08/06/18 15:14	JO	SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 [b]	mg/l	1	08/01/18 21:38	SA	SM5210 B-11
Coliform, Fecal [c]	64	10		col/100ml	10	07/31/18 23:48	SA	SM9222 D-06
Coliform, Total [c]	194	10		col/100ml	10	07/31/18 23:41	SA	SM9222 B-06
Nitrogen, Ammonia	0.20 U	0.20	0.20	mg/l	1	08/09/18 14:42	RP	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [d]	0.13	0.11	0.11	mg/l	1	08/13/18 09:54	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.13	0.10	0.10	mg/l	1	08/13/18 09:54	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0050 U	0.010	0.0050	mg/l	1	07/31/18 22:20	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	1.6	0.20	0.15	mg/l	1	08/13/18 11:25	BM	EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	mg/l	1	08/10/18 16:35	LS	EPA 365.3
Solids, Total Dissolved	105	10	4.0	mg/l	1	08/03/18 15:00	RC	SM2540 C-11
Solids, Total Suspended	2.5 J	4.0	2.0	mg/l	1	08/03/18 10:50	RC	SM2540 D-11
Total Organic Carbon	13.1	1.0	1.0	mg/l	1	08/14/18 19:06	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(b) Value reported is laboratory DL (MDL).
(c) Analysis done out of holding time.
(d) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

LOQ = Limit of Quantitation
LOD = Limit of Detection B = Analyte found in associated blank
U = Indicates a result < LOD
J = Indicates a result > = LOD but < LOQ

Report of Analysis

Client Sample ID:	WA-3S		
Lab Sample ID:	JC71017-5F	**Date Sampled:**	07/31/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	07/31/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Phosphorus, Total	0.050 U	0.050	0.050	mg/l	1	08/14/18 10:39	MP	EPA 365.3

LOQ = Limit of Quantitation
LOD = Limit of Detection B = Analyte found in associated blank

U = Indicates a result < LOD
J = Indicates a result > = LOD but < LOQ

Report of Analysis

Client Sample ID: WA-4S
Lab Sample ID: JC71017-6
Matrix: AQ - Surface Water
Project: Philadelphia District, Reservoir Sampling

Date Sampled: 07/31/18
Date Received: 07/31/18
Percent Solids: n/a

General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	21.2	5.0	4.0	mg/l	1	08/06/18 15:14	JO	SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 [b]	mg/l	1	08/01/18 21:40	SA	SM5210 B-11
Coliform, Fecal [c]	12	4		col/100ml	4	07/31/18 23:48	SA	SM9222 D-06
Coliform, Total [c]	320	10		col/100ml	10	07/31/18 23:41	SA	SM9222 B-06
Nitrogen, Ammonia	0.20 U	0.20	0.20	mg/l	1	08/09/18 14:44	RP	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [d]	0.22	0.11	0.11	mg/l	1	08/13/18 09:55	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.22	0.10	0.10	mg/l	1	08/13/18 09:55	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0050 U	0.010	0.0050	mg/l	1	07/31/18 22:20	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.34	0.20	0.15	mg/l	1	08/13/18 11:28	BM	EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	mg/l	1	08/10/18 16:35	LS	EPA 365.3
Solids, Total Dissolved	100	10	4.0	mg/l	1	08/03/18 15:00	RC	SM2540 C-11
Solids, Total Suspended	2.1 J	4.0	2.0	mg/l	1	08/03/18 10:50	RC	SM2540 D-11
Total Organic Carbon	7.0	1.0	1.0	mg/l	1	08/14/18 19:18	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.5.
(b) Value reported is laboratory DL (MDL).
(c) Analysis done out of holding time.
(d) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

LOQ = Limit of Quantitation
LOD = Limit of Detection B = Analyte found in associated blank
U = Indicates a result < LOD
J = Indicates a result > = LOD but < LOQ

Report of Analysis

Client Sample ID:	WA-4S		
Lab Sample ID:	JC71017-6F	**Date Sampled:**	07/31/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	07/31/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Phosphorus, Total	0.050 U	0.050	0.050	mg/l	1	08/14/18 10:39	MP	EPA 365.3

LOQ = Limit of Quantitation
LOD = Limit of Detection B = Analyte found in associated blank

U = Indicates a result < LOD
J = Indicates a result > = LOD but < LOQ

Report of Analysis

Client Sample ID: WA-5S
Lab Sample ID: JC71017-7
Matrix: AQ - Surface Water
Project: Philadelphia District, Reservoir Sampling

Date Sampled: 07/31/18
Date Received: 07/31/18
Percent Solids: n/a

General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	4.0 U	5.0	4.0	mg/l	1	08/06/18 15:48	JO	SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 [b]	mg/l	1	08/01/18 21:41	SA	SM5210 B-11
Coliform, Fecal [c]	8	4		col/100ml	4	07/31/18 23:48	SA	SM9222 D-06
Coliform, Total [c]	174	10		col/100ml	10	07/31/18 23:41	SA	SM9222 B-06
Nitrogen, Ammonia	0.20 U	0.20	0.20	mg/l	1	08/09/18 14:45	RP	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [d]	0.11 U	0.11	0.11	mg/l	1	08/13/18 09:56	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.10 U	0.10	0.10	mg/l	1	08/13/18 09:56	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0050 U	0.010	0.0050	mg/l	1	07/31/18 22:20	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.31	0.20	0.15	mg/l	1	08/13/18 11:29	BM	EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	mg/l	1	08/10/18 16:55	LS	EPA 365.3
Solids, Total Dissolved	6.7 J	10	4.0	mg/l	1	08/03/18 15:00	RC	SM2540 C-11
Solids, Total Suspended	3.8 J	4.0	2.0	mg/l	1	08/03/18 10:50	RC	SM2540 D-11
Total Organic Carbon	5.4	1.0	1.0	mg/l	1	08/14/18 19:30	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(b) Value reported is laboratory DL (MDL).
(c) Analysis done out of holding time.
(d) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

LOQ = Limit of Quantitation
LOD = Limit of Detection B = Analyte found in associated blank
U = Indicates a result < LOD
J = Indicates a result > = LOD but < LOQ

Report of Analysis

Client Sample ID:	WA-5S		
Lab Sample ID:	JC71017-7F	**Date Sampled:**	07/31/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	07/31/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Phosphorus, Total	0.050 U	0.050	0.050	mg/l	1	08/14/18 10:39	MP	EPA 365.3

LOQ = Limit of Quantitation
LOD = Limit of Detection B = Analyte found in associated blank

U = Indicates a result < LOD
J = Indicates a result > = LOD but < LOQ

Report of Analysis

Client Sample ID: WA-6S
Lab Sample ID: JC71017-8
Matrix: AQ - Surface Water
Project: Philadelphia District, Reservoir Sampling

Date Sampled: 07/31/18
Date Received: 07/31/18
Percent Solids: n/a

General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	4.1 J	5.0	4.0	mg/l	1	08/06/18 15:48	JO	SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 [b]	mg/l	1	08/01/18 21:46	SA	SM5210 B-11
Coliform, Fecal [c]	8	4		col/100ml	4	07/31/18 23:48	SA	SM9222 D-06
Coliform, Total [c]	92	4		col/100ml	4	07/31/18 23:41	SA	SM9222 B-06
Nitrogen, Ammonia	0.20 U	0.20	0.20	mg/l	1	08/09/18 14:47	RP	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [d]	0.11 U	0.11	0.11	mg/l	1	08/13/18 09:57	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.10 U	0.10	0.10	mg/l	1	08/13/18 09:57	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0050 U	0.010	0.0050	mg/l	1	07/31/18 22:20	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.37	0.20	0.15	mg/l	1	08/13/18 11:30	BM	EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	mg/l	1	08/10/18 16:55	LS	EPA 365.3
Solids, Total Dissolved	43.3	10	4.0	mg/l	1	08/03/18 15:00	RC	SM2540 C-11
Solids, Total Suspended	2.0 U	4.0	2.0	mg/l	1	08/03/18 10:50	RC	SM2540 D-11
Total Organic Carbon	5.6	1.0	1.0	mg/l	1	08/14/18 20:05	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(b) Value reported is laboratory DL (MDL).
(c) Analysis done out of holding time.
(d) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

LOQ = Limit of Quantitation
LOD = Limit of Detection B = Analyte found in associated blank
U = Indicates a result < LOD
J = Indicates a result > = LOD but < LOQ

Report of Analysis

Client Sample ID:	WA-6S		
Lab Sample ID:	JC71017-8F	**Date Sampled:**	07/31/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	07/31/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Phosphorus, Total	0.050 U	0.050	0.050	mg/l	1	08/14/18 10:39	MP	EPA 365.3

LOQ = Limit of Quantitation
LOD = Limit of Detection B = Analyte found in associated blank

U = Indicates a result < LOD
J = Indicates a result > = LOD but < LOQ

Report of Analysis

Client Sample ID: WA-6M
Lab Sample ID: JC71017-9
Matrix: AQ - Surface Water
Project: Philadelphia District, Reservoir Sampling

Date Sampled: 07/31/18
Date Received: 07/31/18
Percent Solids: n/a

General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	4.0 U	5.0	4.0	mg/l	1	08/06/18 15:48	JO	SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 [b]	mg/l	1	08/01/18 21:48	SA	SM5210 B-11
Nitrogen, Ammonia	0.20 U	0.20	0.20	mg/l	1	08/09/18 14:48	RP	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [c]	0.11 U	0.11	0.11	mg/l	1	08/13/18 10:06	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.10 U	0.10	0.10	mg/l	1	08/13/18 10:06	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0050 U	0.010	0.0050	mg/l	1	07/31/18 22:20	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.52	0.20	0.15	mg/l	1	08/13/18 11:30	BM	EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	mg/l	1	08/10/18 16:55	LS	EPA 365.3
Solids, Total Dissolved	42.5	10	4.0	mg/l	1	08/03/18 15:00	RC	SM2540 C-11
Solids, Total Suspended	2.0 U	4.0	2.0	mg/l	1	08/03/18 10:50	RC	SM2540 D-11
Total Organic Carbon	8.6	1.0	1.0	mg/l	1	08/14/18 20:37	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(b) Value reported is laboratory DL (MDL).
(c) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

LOQ = Limit of Quantitation
LOD = Limit of Detection B = Analyte found in associated blank
U = Indicates a result < LOD
J = Indicates a result > = LOD but < LOQ

Report of Analysis

Client Sample ID:	WA-6M		
Lab Sample ID:	JC71017-9F	**Date Sampled:**	07/31/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	07/31/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Phosphorus, Total	0.050 U	0.050	0.050	mg/l	1	08/14/18 10:39	MP	EPA 365.3

LOQ = Limit of Quantitation
LOD = Limit of Detection B = Analyte found in associated blank

U = Indicates a result < LOD
J = Indicates a result > = LOD but < LOQ

Report of Analysis

Client Sample ID:	WA-6D		
Lab Sample ID:	JC71017-10	**Date Sampled:**	07/31/18
Matrix:	AQ - Surface Water	**Date Received:**	07/31/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	4.0 U	5.0	4.0	mg/l	1	08/06/18 15:48	JO	SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 [b]	mg/l	1	08/01/18 21:50	SA	SM5210 B-11
Nitrogen, Ammonia	0.20 U	0.20	0.20	mg/l	1	08/09/18 14:50	RP	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [c]	0.11 U	0.11	0.11	mg/l	1	08/13/18 10:07	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.10 U	0.10	0.10	mg/l	1	08/13/18 10:07	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0050 U	0.010	0.0050	mg/l	1	07/31/18 22:20	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.33	0.20	0.15	mg/l	1	08/13/18 11:31	BM	EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	mg/l	1	08/10/18 16:55	LS	EPA 365.3
Solids, Total Dissolved	36.7	10	4.0	mg/l	1	08/03/18 15:00	RC	SM2540 C-11
Solids, Total Suspended	7.8	4.0	2.0	mg/l	1	08/03/18 10:50	RC	SM2540 D-11
Total Organic Carbon	9.3	1.0	1.0	mg/l	1	08/14/18 20:49	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(b) Value reported is laboratory DL (MDL).
(c) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

LOQ = Limit of Quantitation
LOD = Limit of Detection B = Analyte found in associated blank
U = Indicates a result < LOD
J = Indicates a result > = LOD but < LOQ

Report of Analysis

Client Sample ID:	WA-6D		
Lab Sample ID:	JC71017-10F	**Date Sampled:**	07/31/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	07/31/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Phosphorus, Total	0.050 U	0.050	0.050	mg/l	1	08/14/18 10:39	MP	EPA 365.3

LOQ = Limit of Quantitation
LOD = Limit of Detection B = Analyte found in associated blank

U = Indicates a result < LOD
J = Indicates a result > = LOD but < LOQ

Report of Analysis

Client Sample ID: WA-7S
Lab Sample ID: JC71017-11
Matrix: AQ - Surface Water
Project: Philadelphia District, Reservoir Sampling

Date Sampled: 07/31/18
Date Received: 07/31/18
Percent Solids: n/a

General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	4.0 U	5.0	4.0	mg/l	1	08/06/18 15:48	JO	SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 [b]	mg/l	1	08/01/18 21:52	SA	SM5210 B-11
Coliform, Fecal [c]	20	4		col/100ml	4	07/31/18 23:48	SA	SM9222 D-06
Coliform, Total [c]	727	100		col/100ml	100	07/31/18 23:41	SA	SM9222 B-06
Nitrogen, Ammonia	0.20 U	0.20	0.20	mg/l	1	08/09/18 14:51	RP	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [d]	0.11 U	0.11	0.11	mg/l	1	08/13/18 10:08	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.10 U	0.10	0.10	mg/l	1	08/13/18 10:08	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0050 U	0.010	0.0050	mg/l	1	07/31/18 22:25	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.36	0.20	0.15	mg/l	1	08/13/18 11:32	BM	EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	mg/l	1	08/10/18 16:55	LS	EPA 365.3
Solids, Total Dissolved	32.5	10	4.0	mg/l	1	08/03/18 15:00	RC	SM2540 C-11
Solids, Total Suspended	2.0 U	4.0	2.0	mg/l	1	08/03/18 10:50	RC	SM2540 D-11
Total Organic Carbon	6.4	1.0	1.0	mg/l	1	08/14/18 21:24	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(b) Value reported is laboratory DL (MDL).
(c) Analysis done out of holding time.
(d) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

LOQ = Limit of Quantitation
LOD = Limit of Detection B = Analyte found in associated blank
U = Indicates a result < LOD
J = Indicates a result > = LOD but < LOQ

Report of Analysis

Client Sample ID:	WA-7S		
Lab Sample ID:	JC71017-11F	**Date Sampled:**	07/31/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	07/31/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Phosphorus, Total	0.050 U	0.050	0.050	mg/l	1	08/14/18 10:39	MP	EPA 365.3

LOQ = Limit of Quantitation
LOD = Limit of Detection B = Analyte found in associated blank

U = Indicates a result < LOD
J = Indicates a result > = LOD but < LOQ

Report of Analysis

Client Sample ID:	WA-7M		
Lab Sample ID:	JC71017-12	**Date Sampled:**	07/31/18
Matrix:	AQ - Surface Water	**Date Received:**	07/31/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	4.0 U	5.0	4.0	mg/l	1	08/06/18 15:48	JO	SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 [b]	mg/l	1	08/01/18 21:53	SA	SM5210 B-11
Nitrogen, Ammonia	0.20 U	0.20	0.20	mg/l	1	08/09/18 14:53	RP	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [c]	0.12	0.11	0.11	mg/l	1	08/13/18 10:09	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.12	0.10	0.10	mg/l	1	08/13/18 10:09	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0050 U	0.010	0.0050	mg/l	1	07/31/18 22:25	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.42	0.20	0.15	mg/l	1	08/13/18 11:33	BM	EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	mg/l	1	08/10/18 16:55	LS	EPA 365.3
Solids, Total Dissolved	45.0	10	4.0	mg/l	1	08/03/18 15:00	RC	SM2540 C-11
Solids, Total Suspended	2.0 U	4.0	2.0	mg/l	1	08/03/18 10:50	RC	SM2540 D-11
Total Organic Carbon	9.7	1.0	1.0	mg/l	1	08/14/18 22:22	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(b) Value reported is laboratory DL (MDL).
(c) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

LOQ = Limit of Quantitation
LOD = Limit of Detection B = Analyte found in associated blank
U = Indicates a result < LOD
J = Indicates a result > = LOD but < LOQ

Report of Analysis

Client Sample ID:	WA-7M		
Lab Sample ID:	JC71017-12F	**Date Sampled:**	07/31/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	07/31/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Phosphorus, Total	0.050 U	0.050	0.050	mg/l	1	08/14/18 10:39	MP	EPA 365.3

LOQ = Limit of Quantitation
LOD = Limit of Detection B = Analyte found in associated blank

U = Indicates a result < LOD
J = Indicates a result > = LOD but < LOQ

Report of Analysis

Client Sample ID: WA-7D
Lab Sample ID: JC71017-13
Matrix: AQ - Surface Water
Project: Philadelphia District, Reservoir Sampling

Date Sampled: 07/31/18
Date Received: 07/31/18
Percent Solids: n/a

General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	4.0 U	5.0	4.0	mg/l	1	08/06/18 15:48	JO	SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 [b]	mg/l	1	08/01/18 21:55	SA	SM5210 B-11
Nitrogen, Ammonia	0.20 U	0.20	0.20	mg/l	1	08/09/18 14:57	RP	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [c]	0.11 U	0.11	0.11	mg/l	1	08/13/18 10:10	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.10 U	0.10	0.10	mg/l	1	08/13/18 10:10	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0050 U	0.010	0.0050	mg/l	1	07/31/18 22:25	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.54	0.20	0.15	mg/l	1	08/13/18 11:34	BM	EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	mg/l	1	08/10/18 16:55	LS	EPA 365.3
Solids, Total Dissolved	30.0	10	4.0	mg/l	1	08/03/18 15:00	RC	SM2540 C-11
Solids, Total Suspended [d]	4.2	4.0	2.0	mg/l	1	08/03/18 10:50	RC	SM2540 D-11
Total Organic Carbon	11.4	1.0	1.0	mg/l	1	08/14/18 22:33	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(b) Value reported is laboratory DL (MDL).
(c) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)
(d) Reported sample aliquot obtained from filtration of 550 mL of sample. Volume was reduced from 1 liter due to nature of sample matrix.

LOQ = Limit of Quantitation
LOD = Limit of Detection
B = Analyte found in associated blank
U = Indicates a result < LOD
J = Indicates a result > = LOD but < LOQ

Report of Analysis

Client Sample ID:	WA-7D		
Lab Sample ID:	JC71017-13F	**Date Sampled:**	07/31/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	07/31/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Phosphorus, Total	0.050 U	0.050	0.050	mg/l	1	08/14/18 10:39	MP	EPA 365.3

LOQ = Limit of Quantitation
LOD = Limit of Detection B = Analyte found in associated blank

U = Indicates a result < LOD
J = Indicates a result > = LOD but < LOQ

Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody

SGS

CHAIN OF CUSTODY

SGS North America Inc. - Dayton
2235 Route 130, Dayton, NJ 08810
TEL. 732-329-0200 FAX 732-329-3499
www.sgs.com/ehsusa

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FED-EX Tracking #:
Bottle Order Control #: PD-07918-122
SGS Quote #:
SGS Job #: JC71017

Client / Reporting Information	
Company Name	USACE - Phila. District
Street Address	100 Penn Sq. East
City / State / Zip	Philadelphia PA 19107
Project Contact / E-mail	Joe Loeper
Phone # / Fax #	215-656-6545
Sampler(s) Name(s) / Phone #	Greg Wacik 610-597-9780

Project Information	
Project Name	USACE - Francis E. Walter Reservoir
Street	
City / State	White Haven PA
Project #	PD-07918-122
Client Purchase Order #	
Project Manager	
Billing Information (if different from Report to) Company Name	
Street Address	
City / State / Zip	
Attention	

Requested Analysis (see TEST CODE sheet): AlK, AMN, BOD, TDS / TOC, TSS, TP04 (Total Phosphorus) / TKN, XN030 (TKN/TP04 Bottle) / TP04 (dissolved lab filter) / FCF, TCF

Lab Sample #	Field ID / Point of Collection	MEOH/DI Vial #	Date	Time	Sampled by	Matrix	# of bottles	HCl	NaOH	HNO3	H2SO4	NONE	DI Water	MEOH	ENCORE	Na2S2O3	AlK, AMN, BOD, TDS	TOC, TSS, TP04	TKN, XN030	TP04 (dissolved lab filter)	FCF, TCF	LAB USE ONLY
1F	WA-1S		7/31/18	9:25	GW	SW	10	X			X					X	X	X	X	X	X	626
2F	WA-2S			7:15		SW	10	X			X					X	X	X	X	X	X	638TS
3F	WA-2M			7:15		SW	8	X			X						X	X	X	X		19K2
4F	WA-2D			7:15		SW	8	X			X						X	X	X	X		
5F	WA-3S			10:30		SW	10	X			X					X	X	X	X	X	X	
6F	WA-4S			10:00		SW	10	X			X					X	X	X	X	X	X	
7F	WA-5S			9:40		SW	10	X			X					X	X	X	X	X	X	
8F	WA-6S			8:10		SW	10	X			X					X	X	X	X	X	X	G37
9F	WA-6M			8:10		SW	8	X			X						X	X	X	X		
10F	WA-6D			8:10		SW	8	X			X						X	X	X	X		

INITIAL ASSESSMENT CA 7/31/18
LABEL VERIFICATION

Matrix Codes: DW - Drinking Water; GW - Ground Water; WW - Water; SW - Surface Water; SO - Soil; SL- Sludge; SED-Sediment; OI - Oil; LIQ - Other Liquid; AIR - Air; SOL - Other Solid; WP - Wipe; FB-Field Blank; EB-Equipment Blank; RB- Rinse Blank; TB-Trip Blank

Turnaround Time (Business days)
- ☐ Std. 10 Business Days
- ☐ 5 Day RUSH
- ☐ 3 Day RUSH
- ☐ 2 Day RUSH
- ☐ 1 Day RUSH
- ☐ other

Emergency & Rush T/A data available via LabLink

Approved by (SGS Project Manager)/Date:

Data Deliverable Information
- ☐ Commercial "A" (Level 1)
- ☐ Commercial "B" (Level 2)
- ☐ FULLT1 (Level 3+4)
- ☐ NJ Reduced
- ☐ Commercial "C"
- ☐ NJ Data of Known Quality Protocol Reporting
- ☐ NYASP Category A
- ☐ NYASP Category B
- ☐ State Forms
- ☐ EDD Format
- ☐ Other

Commercial "A" = Results Only; Commercial "B" = Results + QC Summary
NJ Reduced = Results + QC Summary + Partial Raw data

Comments / Special Instructions
One TSS Bottle not filled. One XN030 bottle not used. TP04 dissolved lab filter. XN030 combined with TP04/TKN Bottle.

Sample inventory is verified upon receipt in the Laboratory

Sample Custody must be documented below each time samples change possession, including courier delivery.

Relinquished by Sampler:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
1 [signature]	7/31/18 1418	1 [signature]	2 [signature]	7/31/18 1926	2 [signature]
3		3	4		4
5		5	Custody Seal #	☐ Intact ☐ Not intact	Preserved where applicable ☐ On Ice ☐ Cooler Temp.

2.3, 2.4, 3.2, 2.4, 3.1 °C

Form:SM088-03C (revised 2/12/18)

http://www.sgs.com/en/terms-and-conditions.

JC71017: Chain of Custody
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SGS

CHAIN OF CUSTODY

SGS North America Inc. - Dayton
2235 Route 130, Dayton, NJ 08810
TEL. 732-329-0200 FAX 732-329-3499
www.sgs.com/ehsusa

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FED-EX Tracking # | Bottle Order Control #
SGS Quote # | SGS Job # JC71017

Client / Reporting Information

Company Name: USACE - Phila. District
Street Address: 100 Penn Sq. East
City: Philadelphia State: PA Zip: 19107
Project Contact: Joe Looper E-mail:
Phone #: 215-656-6545 Fax #:
Sampler(s) Name(s): Greg Wacik Phone #: 610-597-9780

Project Information

Project Name: USACE - Francis E. Walter Reservoir
Street:
City: White Haven State: PA
Project #: PD-07918-122
Client Purchase Order #:
Project Manager:

Billing Information (if different from Report to)

Company Name:
Street Address:
City: State: Zip:
Attention:

Requested Analysis (see TEST CODE sheet)

Matrix Codes: DW - Drinking Water; GW - Ground Water; WW - Water; SW - Surface Water; SO - Soil; SL- Sludge; SED-Sediment; OI - Oil; LIQ - Other Liquid; AIR - Air; SOL - Other Solid; WP - Wipe; FB-Field Blank; EB-Equipment Blank; RB- Rinse Blank; TB-Trip Blank

Lab Sample #	Field ID / Point of Collection	MEOH/DI Vial #	Collection Date	Collection Time	Sampled by	Matrix	# of bottles	HCl	NaOH	HNO3	H2SO4	NONE	DI Water	MEOH	ENCORE	25603	AlK, AMN, BOD, TDS	TOC, TSS, TP04 (Total Phosphorus)	TKN, XN030 (TKN/TP04 Bottle)	TP04 (dissolved lab filter)	FCF TCF	LAB USE ONLY
11F	WA-7S		7/31/18	8:35	JG	SW	10	X			X					X	X	X	X	X	X	
12F	WA-7M		7/31/18	8:35	JG	SW	8	X			X						X	X	X	X		
13F	WA-7D		7/31/18	8:35	JG	SW	8	X			X						X	X	X	X		

Turnaround Time (Business days)

Approved by (SGS Project Manager)/Date:

- [ ] Std. 10 Business Days
- [ ] 5 Day RUSH
- [ ] 3 Day RUSH
- [ ] 2 Day RUSH
- [ ] 1 Day RUSH
- [ ] other

Emergency & Rush T/A data available via LabLink

Data Deliverable Information

- [ ] Commercial "A" (Level 1)
- [ ] Commercial "B" (Level 2)
- [ ] FULLT1 (Level 3+4)
- [ ] NJ Reduced
- [ ] Commercial "C"
- [ ] NJ Data of Known Quality Protocol Reporting
- [ ] NYASP Category A
- [ ] NYASP Category B
- [ ] State Forms
- [ ] EDD Format
- [ ] Other

Commercial "A" = Results Only; Commercial "B" = Results + QC Summary
NJ Reduced = Results + QC Summary + Partial Raw data

Comments / Special Instructions

One TSS bottle not filled. One XN030 bottle not used. TP04 dissolved lab filter. XN030 combined with TP04/TKN bottle.

Sample inventory is verified upon receipt in the Laboratory

Sample Custody must be documented below each time samples change possession, including courier delivery.

	Relinquished by Sampler:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
1		7/31/18 4:45	1	2	7/31/18	2
2	Relinquished by Sampler:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
	3		3	4		4
3	Relinquished by:	Date Time:	Received By:	Custody Seal #	Intact / Not intact	Preserved where applicable	On Ice	Cooler Temp.
	5		5					

Form:SM088-03C (revised 2/12/18)

http://www.sgs.com/en/terms-and-conditions.

SGS Sample Receipt Summary

Job Number: JC71017 **Client:** USACE-PHILADELPHIA DISTRICT **Project:** PHILADELPHIA DISTRICT, RESERVOIR SAMPL

Date / Time Received: 7/31/2018 7:30:00 PM **Delivery Method:** Accutest Courier **Airbill #'s:**

Cooler Temps (Raw Measured) °C: Cooler 1: (2.3); Cooler 2: (2.4); Cooler 3: (3.2); Cooler 4: (2.4); Cooler 5: (3.1);

Cooler Temps (Corrected) °C: Cooler 1: (2.2); Cooler 2: (2.3); Cooler 3: (3.1); Cooler 4: (2.3); Cooler 5: (3.0);

Cooler Security	Y	N		Y	N
1. Custody Seals Present:	☑	☐	3. COC Present:	☑	☐
2. Custody Seals Intact:	☑	☐	4. Smpl Dates/Time OK	☑	☐

Cooler Temperature	Y	N
1. Temp criteria achieved:	☑	☐
2. Cooler temp verification:	IR Gun	
3. Cooler media:	Ice (Bag)	
4. No. Coolers:	5	

Quality Control Preservation	Y	N	N/A
1. Trip Blank present / cooler:	☐	☑	☐
2. Trip Blank listed on COC:	☐	☑	☐
3. Samples preserved properly:	☑	☐	
4. VOCs headspace free:	☐	☐	☑

Sample Integrity - Documentation	Y	N
1. Sample labels present on bottles:	☑	☐
2. Container labeling complete:	☑	☐
3. Sample container label / COC agree:	☑	☐

Sample Integrity - Condition	Y	N
1. Sample recvd within HT:	☐	☑
2. All containers accounted for:	☑	☐
3. Condition of sample:	Intact	

Sample Integrity - Instructions	Y	N	N/A
1. Analysis requested is clear:	☑	☐	
2. Bottles received for unspecified tests	☐	☑	
3. Sufficient volume recvd for analysis:	☑	☐	
4. Compositing instructions clear:	☐	☐	☑
5. Filtering instructions clear:	☐	☐	☑

Test Strip Lot #s: pH 1-12: 216017 pH 12+: 208717 Other: (Specify)

Comments: 1) All TCF/FCF re'd out of 8 hour hold.

SM089-02 Rev. Date 12/1/16

Responded to by: Tammy Esposito McCloskey Response Date: 8/1/18

1) Client is following 30 hour hold time for this project on TCF & FCF

JC71017: Chain of Custody
Page 4 of 5

Job Change Order: JC71017

Requested Date:	8/13/2018	**Received Date:**	7/31/2018
Account Name:	USACE-Philadelphia District	**Due Date:**	8/14/2018
Project Description:	Philadelphia District, Reservoir Sampling	**Deliverable:**	FULT1
C/O Initiated By:	TAMMY **PM:** TM	**TAT (Days):**	14

==========

Sample #: JC71017-all

Dept:

TAT: 14

Change:
revise deliverables to REDT2

==========

Above Changes Per: Joseph Loeper **Date/Time:** 8/13/2018 12:38:35 PM

To Client: This Change Order is confirmation of the revisions, previously discussed with the Client Service Representative.

Page 1 of 1

JC71017: Chain of Custody
Page 5 of 5

The results set forth herein are provided by SGS North America Inc.

e-Hardcopy 2.0
Automated Report

Technical Report for

USACE-Philadelphia District

Philadelphia District, Reservoir Sampling

W25PHS81145379

SGS Job Number: JC71961

Sampling Date: 08/15/18

Report to:

Army Corps of Engineers

joseph.m.loeper@usace.army.mil

ATTN: Joseph Loeper

Total number of pages in report: 45

Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.

A. Paul Ioannidis
General Manager

Client Service contact: Tammy McCloskey 732-329-0200

Certifications: NJ(12129), NY(10983), CA, CT, FL, IL, IN, KS, KY, LA, MA, MD, ME, MN, NC, OH VAP (CL0056), AK (UST-103), AZ (AZ0786), PA, RI, SC, TX, UT, VA, WV, DoD ELAP (ANAB L2248)

Sections: 1 2 3 4 5

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Sample Summary

USACE-Philadelphia District

Job No: JC71961

Philadelphia District, Reservoir Sampling
Project No: W25PHS81145379

Sample Number	Collected Date	Time	By	Received	Matrix Code	Type	Client Sample ID
JC71961-1	08/15/18	09:30	GW	08/15/18	AQ	Surface Water	WA-1S
JC71961-1F	08/15/18	09:30	GW	08/15/18	AQ	Surface H2O Filtered	WA-1S
JC71961-2	08/15/18	07:00	GW	08/15/18	AQ	Surface Water	WA-2S
JC71961-2F	08/15/18	07:00	GW	08/15/18	AQ	Surface H2O Filtered	WA-2S
JC71961-3	08/15/18	07:00	GW	08/15/18	AQ	Surface Water	WA-2M
JC71961-3F	08/15/18	07:00	GW	08/15/18	AQ	Surface H2O Filtered	WA-2M
JC71961-4	08/15/18	07:00	GW	08/15/18	AQ	Surface Water	WA-2D
JC71961-4F	08/15/18	07:00	GW	08/15/18	AQ	Surface H2O Filtered	WA-2D
JC71961-5	08/15/18	11:00	GW	08/15/18	AQ	Surface Water	WA-3S
JC71961-5F	08/15/18	11:00	GW	08/15/18	AQ	Surface H2O Filtered	WA-3S
JC71961-6	08/15/18	10:20	GW	08/15/18	AQ	Surface Water	WA-4S
JC71961-6F	08/15/18	10:20	GW	08/15/18	AQ	Surface H2O Filtered	WA-4S
JC71961-7	08/15/18	10:15	GW	08/15/18	AQ	Surface Water	WA-5S

Sample Summary
(continued)

USACE-Philadelphia District

Job No: JC71961

Philadelphia District, Reservoir Sampling
Project No: W25PHS81145379

Sample Number	Collected Date	Time	By	Received	Matrix Code	Type	Client Sample ID
JC71961-7F	08/15/18	10:15	GW	08/15/18	AQ	Surface H2O Filtered	WA-5S
JC71961-8	08/15/18	08:00	GW	08/15/18	AQ	Surface Water	WA-6S
JC71961-8F	08/15/18	08:00	GW	08/15/18	AQ	Surface H2O Filtered	WA-6S
JC71961-9	08/15/18	08:00	GW	08/15/18	AQ	Surface Water	WA-6M
JC71961-9F	08/15/18	08:00	GW	08/15/18	AQ	Surface H2O Filtered	WA-6M
JC71961-10	08/15/18	08:00	GW	08/15/18	AQ	Surface Water	WA-6D
JC71961-10F	08/15/18	08:00	GW	08/15/18	AQ	Surface H2O Filtered	WA-6D
JC71961-11	08/15/18	08:40	GW	08/15/18	AQ	Surface Water	WA-7S
JC71961-11F	08/15/18	08:40	GW	08/15/18	AQ	Surface H2O Filtered	WA-7S
JC71961-12	08/15/18	08:40	GW	08/15/18	AQ	Surface Water	WA-7M
JC71961-12F	08/15/18	08:40	GW	08/15/18	AQ	Surface H2O Filtered	WA-7M
JC71961-13	08/15/18	08:40	GW	08/15/18	AQ	Surface Water	WA-7D
JC71961-13F	08/15/18	08:40	GW	08/15/18	AQ	Surface H2O Filtered	WA-7D

CASE NARRATIVE / CONFORMANCE SUMMARY

Client:	USACE-Philadelphia District	**Job No**	JC71961
Site:	Philadelphia District, Reservoir Sampling	**Report Date**	8/29/2018 5:10:36 PM

On 08/15/2018, 26 Sample(s), 0 Trip Blank(s) and 0 Field Blank(s) were received at SGS North America Inc. at a maximum corrected temperature of 3.8 C. Samples were intact and chemically preserved, unless noted below. A SGS North America Inc. Job Number of JC71961 was assigned to the project. Laboratory sample ID, client sample ID and dates of sample collection are detailed in the report's Results Summary Section.

Specified quality control criteria were achieved for this job except as noted below. For more information, please refer to the analytical results and QC summary pages.

Compounds qualified as out of range in the continuing calibration summary report are acceptable as per method requirements when there is a high bias but the sample result is non-detect.

General Chemistry By Method EPA 351.2/LACHAT

Matrix: AQ **Batch ID:** GP15510

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC71961-1DUP, JC71961-1MS were used as the QC samples for Nitrogen, Total Kjeldahl.

General Chemistry By Method EPA 353.2/LACHAT

Matrix: AQ **Batch ID:** GP15496

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC71961-8MS, JC71961-9MS, JC71961-8DUP were used as the QC samples for Nitrogen, Nitrate + Nitrite.
- RPD(s) for Duplicate for Nitrogen, Nitrate + Nitrite are outside control limits for sample GP15496-D1. RPD acceptable due to low duplicate and sample concentrations.

General Chemistry By Method EPA 365.3

Matrix: AQ **Batch ID:** GP15474

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC71959-8FDUP, JC71959-8FMS were used as the QC samples for Phosphorus, Total.

Matrix: AQ **Batch ID:** GP15537

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC71961-1FDUP, JC71961-1FMS were used as the QC samples for Phosphorus, Total.

General Chemistry By Method EPA353.2/SM4500NO2B

Matrix: AQ **Batch ID:** R172380

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC71961-1 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R172381

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC71961-2 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R172382

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC71961-3 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R172383

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC71961-4 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R172384

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC71961-5 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R172385

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC71961-6 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R172386

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC71961-10 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R172387

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC71961-7 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R172388

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC71961-8 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R172389

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC71961-9 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R172390

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC71961-11 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R172391

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC71961-12 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R172392

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC71961-13 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

General Chemistry By Method SM2320 B-11

Matrix: AQ **Batch ID:** GN84585

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC71863-1DUP were used as the QC samples for Alkalinity, Total as CaCO3.
- JC71961-6 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC71961-10 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC71961-7 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC71961-2 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC71961-4 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC71961-9 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC71961-3 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC71961-5 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC71961-1 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC71961-8 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC71961-11 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.

Matrix: AQ **Batch ID:** GN84715

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC72034-1DUP were used as the QC samples for Alkalinity, Total as CaCO3.
- JC71961-13 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC71961-12 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.

General Chemistry By Method SM2540 C-11

Matrix: AQ **Batch ID:** GN84415

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC71959-1DUP were used as the QC samples for Solids, Total Dissolved.

Matrix: AQ **Batch ID:** GN84449

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC71961-7DUP were used as the QC samples for Solids, Total Dissolved.

General Chemistry By Method SM2540 D-11

Matrix: AQ **Batch ID:** GN84414

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC71959-1DUP were used as the QC samples for Solids, Total Suspended.

Matrix: AQ **Batch ID:** GN84431

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC71961-7DUP were used as the QC samples for Solids, Total Suspended.
- JC71961-7 for Solids, Total Suspended: Reported sample aliquot obtained from filtration of 550 mL of sample. Volume was reduced from 1 liter due to limited volume.

General Chemistry By Method SM4500NH3 H-11LACHAT

Matrix: AQ **Batch ID:** GP15448

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC71959-2DUP, JC71959-2MS, JC71959-2MSD were used as the QC samples for Nitrogen, Ammonia.

Matrix: AQ **Batch ID:** GP15449

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC71984-1DUP, JC71984-1MS, JC71984-1MSD were used as the QC samples for Nitrogen, Ammonia.

General Chemistry By Method SM4500NO2 B-11

Matrix: AQ **Batch ID:** GN84347

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC71961-1DUP, JC71961-1MS were used as the QC samples for Nitrogen, Nitrite.

General Chemistry By Method SM5210 B-11

Matrix: AQ **Batch ID:** GP15341

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC71951-1ADUP were used as the QC samples for BOD, 5 Day.

General Chemistry By Method SM5310 B-11

Matrix: AQ **Batch ID:** GP15504

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC71961-11MS, JC71961-11MSD were used as the QC samples for Total Organic Carbon.

Matrix: AQ **Batch ID:** GP15506

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC71961-9MS, JC71961-9MSD were used as the QC samples for Total Organic Carbon.

General Chemistry By Method SM9222 B-06

Matrix: AQ **Batch ID:** MB5343

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC71959-1DUP were used as the QC samples for Coliform, Total.
- JC71961-1 for Coliform, Total: Analysis done out of holding time.
- JC71961-8 for Coliform, Total: Analysis done out of holding time.
- JC71961-7 for Coliform, Total: Analysis done out of holding time.
- JC71961-5 for Coliform, Total: Analysis done out of holding time.
- JC71961-2 for Coliform, Total: Analysis done out of holding time.
- JC71961-11 for Coliform, Total: Analysis done out of holding time.

General Chemistry By Method SM9222 D-06

Matrix: AQ **Batch ID:** MB5344

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC71959-1DUP were used as the QC samples for Coliform, Fecal.
- JC71961-11 for Coliform, Fecal: Analysis done out of holding time.
- JC71961-1 for Coliform, Fecal: Analysis done out of holding time.
- JC71961-8 for Coliform, Fecal: Analysis done out of holding time.
- JC71961-7 for Coliform, Fecal: Analysis done out of holding time.
- JC71961-5 for Coliform, Fecal: Analysis done out of holding time.
- JC71961-2 for Coliform, Fecal: Analysis done out of holding time.

SGS North America Inc. certifies that data reported for samples received, listed on the associated custody chain or analytical task order, were produced to specifications meeting the Quality System precision, accuracy and completeness objectives except as noted.

Estimated non-standard method measurement uncertainty data is available on request, based on quality control bias and implicit for standard methods. Acceptable uncertainty requires tested parameter quality control data to meet method criteria.

SGS North America Inc. is not responsible for data quality assumptions if partial reports are used and recommends that this report be used in its entirety. Data release is authorized by SGS North America Inc indicated via signature on the report cover

Summary of Hits

Job Number: JC71961
Account: USACE-Philadelphia District
Project: Philadelphia District, Reservoir Sampling
Collected: 08/15/18

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	LOQ	LOD	Units	Method
JC71961-1	**WA-1S**					
Coliform, Fecal [a]		5200	100	[b]	col/100ml	SM9222 D-06
Coliform, Total [a]		7300	100	[b]	col/100ml	SM9222 B-06
Nitrogen, Nitrate + Nitrite		0.044 J	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Total Kjeldahl		0.60	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		16.0	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended		7.1	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon		10.6	1.0	1.0	mg/l	SM5310 B-11
JC71961-1F	**WA-1S**					
No hits reported in this sample.						
JC71961-2	**WA-2S**					
Coliform, Fecal [a]		191	10	[b]	col/100ml	SM9222 D-06
Coliform, Total [a]		96	4	[b]	col/100ml	SM9222 B-06
Nitrogen, Nitrate [c]		0.11	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		0.11	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Total Kjeldahl		0.42	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		26.7	10	4.0	mg/l	SM2540 C-11
Total Organic Carbon		9.8	1.0	1.0	mg/l	SM5310 B-11
JC71961-2F	**WA-2S**					
No hits reported in this sample.						
JC71961-3	**WA-2M**					
Alkalinity, Total as CaCO3 [d]		4.7 J	5.0	4.0	mg/l	SM2320 B-11
Nitrogen, Nitrate [c]		0.053 J	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		0.053 J	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Total Kjeldahl		0.45	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		30.0	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended		5.0	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon		9.5	1.0	1.0	mg/l	SM5310 B-11
JC71961-3F	**WA-2M**					
No hits reported in this sample.						
JC71961-4	**WA-2D**					
Alkalinity, Total as CaCO3 [d]		11.4	5.0	4.0	mg/l	SM2320 B-11

Summary of Hits

Job Number: JC71961
Account: USACE-Philadelphia District
Project: Philadelphia District, Reservoir Sampling
Collected: 08/15/18

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	LOQ	LOD	Units	Method
Nitrogen, Total Kjeldahl		0.50	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		23.3	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended		5.8	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon		12.1	1.0	1.0	mg/l	SM5310 B-11
JC71961-4F	**WA-2D**					
No hits reported in this sample.						
JC71961-5	**WA-3S**					
Alkalinity, Total as CaCO3 [d]		5.2	5.0	4.0	mg/l	SM2320 B-11
Coliform, Fecal [a]		5000	100	[b]	col/100ml	SM9222 D-06
Coliform, Total [a]		6200	100	[b]	col/100ml	SM9222 B-06
Nitrogen, Nitrate [c]		0.14	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		0.14	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Total Kjeldahl		0.56	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		33.3	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended		5.2	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon		15.3	1.0	1.0	mg/l	SM5310 B-11
JC71961-5F	**WA-3S**					
No hits reported in this sample.						
JC71961-6	**WA-4S**					
Alkalinity, Total as CaCO3 [d]		4.1 J	5.0	4.0	mg/l	SM2320 B-11
Nitrogen, Total Kjeldahl		0.44	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		20.0	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended		3.8 J	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon		10.8	1.0	1.0	mg/l	SM5310 B-11
JC71961-6F	**WA-4S**					
No hits reported in this sample.						
JC71961-7	**WA-5S**					
Coliform, Fecal [a]		520	10	[b]	col/100ml	SM9222 D-06
Coliform, Total [a]		650	10	[b]	col/100ml	SM9222 B-06
Nitrogen, Total Kjeldahl		0.36	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		7.5 J	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended [e]		3.5 J	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon		8.7	1.0	1.0	mg/l	SM5310 B-11

Summary of Hits

Job Number: JC71961
Account: USACE-Philadelphia District
Project: Philadelphia District, Reservoir Sampling
Collected: 08/15/18

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	LOQ	LOD	Units	Method
JC71961-7F	**WA-5S**					
No hits reported in this sample.						
JC71961-8	**WA-6S**					
Coliform, Fecal [a]		183	10	[b]	col/100ml	SM9222 D-06
Coliform, Total [a]		80	4	[b]	col/100ml	SM9222 B-06
Nitrogen, Total Kjeldahl		0.38	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		35.0	10	4.0	mg/l	SM2540 C-11
Total Organic Carbon		8.6	1.0	1.0	mg/l	SM5310 B-11
JC71961-8F	**WA-6S**					
No hits reported in this sample.						
JC71961-9	**WA-6M**					
Nitrogen, Total Kjeldahl		0.40	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		35.0	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended		5.5	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon		8.9	1.0	1.0	mg/l	SM5310 B-11
JC71961-9F	**WA-6M**					
No hits reported in this sample.						
JC71961-10	**WA-6D**					
Nitrogen, Nitrate [c]		0.072 J	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		0.072 J	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Total Kjeldahl		0.52	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		37.5	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended		6.0	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon		11.9	1.0	1.0	mg/l	SM5310 B-11
JC71961-10F	**WA-6D**					
No hits reported in this sample.						
JC71961-11	**WA-7S**					
Alkalinity, Total as CaCO3 [d]		3.6 J	5.0	4.0	mg/l	SM2320 B-11
Coliform, Fecal [a]		51	10	[b]	col/100ml	SM9222 D-06

Summary of Hits

Job Number: JC71961
Account: USACE-Philadelphia District
Project: Philadelphia District, Reservoir Sampling
Collected: 08/15/18

Lab Sample ID / Client Sample ID / Analyte	Result/ Qual	LOQ	LOD	Units	Method
Coliform, Total [a]	88	4	[b]	col/100ml	SM9222 B-06
Nitrogen, Nitrate [c]	0.061 J	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.061 J	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Total Kjeldahl	0.39	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved	20.0	10	4.0	mg/l	SM2540 C-11
Total Organic Carbon	9.7	1.0	1.0	mg/l	SM5310 B-11
JC71961-11F WA-7S					
No hits reported in this sample.					
JC71961-12 WA-7M					
Nitrogen, Nitrate [c]	0.060 J	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.060 J	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Total Kjeldahl	0.46	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved	22.5	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended	4.2	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon	11.3	1.0	1.0	mg/l	SM5310 B-11
JC71961-12F WA-7M					
No hits reported in this sample.					
JC71961-13 WA-7D					
Nitrogen, Total Kjeldahl	0.55	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved	25.0	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended	56.4	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon	13.1	1.0	1.0	mg/l	SM5310 B-11
JC71961-13F WA-7D					
No hits reported in this sample.					

(a) Analysis done out of holding time.
(b) Value reported is laboratory DL (MDL).
(c) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)
(d) Sample was titrated to a final pH of 4.2.
(e) Reported sample aliquot obtained from filtration of 550 mL of sample. Volume was reduced from 1 liter due to limited volume.

Sample Results

Report of Analysis

Report of Analysis

Client Sample ID:	WA-1S		
Lab Sample ID:	JC71961-1	**Date Sampled:**	08/15/18
Matrix:	AQ - Surface Water	**Date Received:**	08/15/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	4.0 U	5.0	4.0	3.6	mg/l	1	08/21/18	ST	SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 [b]	3.4	mg/l	1	08/16/18 18:46	SA	SM5210 B-11
Coliform, Fecal [c]	5200	100			col/100ml	100	08/15/18 23:02	SA	SM9222 D-06
Coliform, Total [c]	7300	100			col/100ml	100	08/15/18 22:53	SA	SM9222 B-06
Nitrogen, Ammonia	0.20 U	0.20	0.20	0.089	mg/l	1	08/22/18 12:39	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [d]	0.11 U	0.11	0.11	0.046	mg/l	1	08/23/18 17:15	RP	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.044 J	0.10	0.10	0.043	mg/l	1	08/23/18 17:15	RP	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0050 U	0.010	0.0050	0.0030	mg/l	1	08/15/18 21:45	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.60	0.20	0.15	0.12	mg/l	1	08/24/18 13:38	RP	EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	08/25/18 14:55	LS	EPA 365.3
Solids, Total Dissolved	16.0	10	4.0	1.8	mg/l	1	08/17/18 14:36	RC	SM2540 C-11
Solids, Total Suspended	7.1	4.0	2.0	1.5	mg/l	1	08/17/18 11:02	RC	SM2540 D-11
Total Organic Carbon	10.6	1.0	1.0	0.72	mg/l	1	08/24/18 04:47	JO	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(b) Value reported is laboratory DL (MDL).
(c) Analysis done out of holding time.
(d) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

LOQ = Limit of Quantitation DL = Detection Limit U = Indicates a result < LOD
LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = DL (MDL) but < LOQ

Report of Analysis

Client Sample ID:	WA-1S		
Lab Sample ID:	JC71961-1F	**Date Sampled:**	08/15/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	08/15/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By	Method
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	08/27/18 09:54	MP	EPA 365.3

LOQ = Limit of Quantitation DL = Detection Limit U = Indicates a result < LOD
LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = DL (MDL) but < LOQ

Report of Analysis

Client Sample ID: WA-2S
Lab Sample ID: JC71961-2
Matrix: AQ - Surface Water
Project: Philadelphia District, Reservoir Sampling

Date Sampled: 08/15/18
Date Received: 08/15/18
Percent Solids: n/a

General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	4.0 U	5.0	4.0	3.6	mg/l	1	08/21/18	ST	SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 [b]	3.4	mg/l	1	08/16/18 18:47	SA	SM5210 B-11
Coliform, Fecal [c]	191	10			col/100ml	10	08/15/18 23:02	SA	SM9222 D-06
Coliform, Total [c]	96	4			col/100ml	4	08/15/18 22:53	SA	SM9222 B-06
Nitrogen, Ammonia	0.20 U	0.20	0.20	0.089	mg/l	1	08/22/18 12:40	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [d]	0.11	0.11	0.11	0.046	mg/l	1	08/23/18 17:20	RP	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.11	0.10	0.10	0.043	mg/l	1	08/23/18 17:20	RP	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0050 U	0.010	0.0050	0.0030	mg/l	1	08/15/18 21:45	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.42	0.20	0.15	0.12	mg/l	1	08/24/18 13:39	RP	EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	08/25/18 14:55	LS	EPA 365.3
Solids, Total Dissolved	26.7	10	4.0	1.8	mg/l	1	08/17/18 14:36	RC	SM2540 C-11
Solids, Total Suspended	2.0 U	4.0	2.0	1.5	mg/l	1	08/17/18 11:02	RC	SM2540 D-11
Total Organic Carbon	9.8	1.0	1.0	0.72	mg/l	1	08/24/18 04:58	JO	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(b) Value reported is laboratory DL (MDL).
(c) Analysis done out of holding time.
(d) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

LOQ = Limit of Quantitation DL = Detection Limit U = Indicates a result < LOD
LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = DL (MDL) but < LOQ

Report of Analysis

Client Sample ID:	WA-2S		
Lab Sample ID:	JC71961-2F	**Date Sampled:**	08/15/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	08/15/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By	Method
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	08/27/18 09:54	MP	EPA 365.3

LOQ = Limit of Quantitation DL = Detection Limit U = Indicates a result < LOD
LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = DL (MDL) but < LOQ

Report of Analysis

Client Sample ID:	WA-2M		
Lab Sample ID:	JC71961-3	**Date Sampled:**	08/15/18
Matrix:	AQ - Surface Water	**Date Received:**	08/15/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	4.7 J	5.0	4.0	3.6	mg/l	1	08/21/18	ST	SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 [b]	3.4	mg/l	1	08/16/18 18:50	SA	SM5210 B-11
Nitrogen, Ammonia	0.20 U	0.20	0.20	0.089	mg/l	1	08/22/18 12:42	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [c]	0.053 J	0.11	0.11	0.046	mg/l	1	08/23/18 17:21	RP	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.053 J	0.10	0.10	0.043	mg/l	1	08/23/18 17:21	RP	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0050 U	0.010	0.0050	0.0030	mg/l	1	08/15/18 22:05	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.45	0.20	0.15	0.12	mg/l	1	08/24/18 13:40	RP	EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	08/25/18 14:55	LS	EPA 365.3
Solids, Total Dissolved	30.0	10	4.0	1.8	mg/l	1	08/17/18 14:36	RC	SM2540 C-11
Solids, Total Suspended	5.0	4.0	2.0	1.5	mg/l	1	08/17/18 11:02	RC	SM2540 D-11
Total Organic Carbon	9.5	1.0	1.0	0.72	mg/l	1	08/24/18 05:09	JO	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(b) Value reported is laboratory DL (MDL).
(c) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

LOQ = Limit of Quantitation DL = Detection Limit U = Indicates a result < LOD
LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = DL (MDL) but < LOQ

Report of Analysis

Client Sample ID:	WA-2M		
Lab Sample ID:	JC71961-3F	**Date Sampled:**	08/15/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	08/15/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By	Method
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	08/27/18 09:54	MP	EPA 365.3

LOQ = Limit of Quantitation DL = Detection Limit U = Indicates a result < LOD
LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = DL (MDL) but < LOQ

Report of Analysis

Client Sample ID:	WA-2D		
Lab Sample ID:	JC71961-4	**Date Sampled:**	08/15/18
Matrix:	AQ - Surface Water	**Date Received:**	08/15/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	11.4	5.0	4.0	3.6	mg/l	1	08/21/18	ST	SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 [b]	3.4	mg/l	1	08/16/18 19:30	SA	SM5210 B-11
Nitrogen, Ammonia	0.20 U	0.20	0.20	0.089	mg/l	1	08/22/18 12:43	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [c]	0.11 U	0.11	0.11	0.046	mg/l	1	08/23/18 17:23	RP	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.10 U	0.10	0.10	0.043	mg/l	1	08/23/18 17:23	RP	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0050 U	0.010	0.0050	0.0030	mg/l	1	08/15/18 22:05	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.50	0.20	0.15	0.12	mg/l	1	08/24/18 13:40	RP	EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	08/25/18 14:55	LS	EPA 365.3
Solids, Total Dissolved	23.3	10	4.0	1.8	mg/l	1	08/17/18 14:36	RC	SM2540 C-11
Solids, Total Suspended	5.8	4.0	2.0	1.5	mg/l	1	08/17/18 11:02	RC	SM2540 D-11
Total Organic Carbon	12.1	1.0	1.0	0.72	mg/l	1	08/24/18 05:20	JO	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(b) Value reported is laboratory DL (MDL).
(c) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

LOQ = Limit of Quantitation DL = Detection Limit U = Indicates a result < LOD
LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = DL (MDL) but < LOQ

Report of Analysis

Client Sample ID:	WA-2D		
Lab Sample ID:	JC71961-4F	**Date Sampled:**	08/15/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	08/15/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By	Method
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	08/27/18 09:54	MP	EPA 365.3

LOQ = Limit of Quantitation DL = Detection Limit U = Indicates a result < LOD
LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = DL (MDL) but < LOQ

Report of Analysis

Client Sample ID: WA-3S
Lab Sample ID: JC71961-5
Matrix: AQ - Surface Water
Project: Philadelphia District, Reservoir Sampling

Date Sampled: 08/15/18
Date Received: 08/15/18
Percent Solids: n/a

General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	5.2	5.0	4.0	3.6	mg/l	1	08/21/18	ST	SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 [b]	3.4	mg/l	1	08/16/18 19:32	SA	SM5210 B-11
Coliform, Fecal [c]	5000	100			col/100ml	100	08/15/18 23:02	SA	SM9222 D-06
Coliform, Total [c]	6200	100			col/100ml	100	08/15/18 22:53	SA	SM9222 B-06
Nitrogen, Ammonia	0.20 U	0.20	0.20	0.089	mg/l	1	08/22/18 12:44	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [d]	0.14	0.11	0.11	0.046	mg/l	1	08/23/18 17:24	RP	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.14	0.10	0.10	0.043	mg/l	1	08/23/18 17:24	RP	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0050 U	0.010	0.0050	0.0030	mg/l	1	08/15/18 22:05	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.56	0.20	0.15	0.12	mg/l	1	08/24/18 13:41	RP	EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	08/25/18 14:55	LS	EPA 365.3
Solids, Total Dissolved	33.3	10	4.0	1.8	mg/l	1	08/17/18 14:36	RC	SM2540 C-11
Solids, Total Suspended	5.2	4.0	2.0	1.5	mg/l	1	08/17/18 11:02	RC	SM2540 D-11
Total Organic Carbon	15.3	1.0	1.0	0.72	mg/l	1	08/24/18 05:31	JO	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(b) Value reported is laboratory DL (MDL).
(c) Analysis done out of holding time.
(d) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

LOQ = Limit of Quantitation DL = Detection Limit U = Indicates a result < LOD
LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = DL (MDL) but < LOQ

Report of Analysis

Client Sample ID:	WA-3S		
Lab Sample ID:	JC71961-5F	**Date Sampled:**	08/15/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	08/15/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By	Method
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	08/27/18 09:54	MP	EPA 365.3

LOQ = Limit of Quantitation DL = Detection Limit U = Indicates a result < LOD
LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = DL (MDL) but < LOQ

Report of Analysis

Client Sample ID: WA-4S
Lab Sample ID: JC71961-6
Matrix: AQ - Surface Water
Project: Philadelphia District, Reservoir Sampling

Date Sampled: 08/15/18
Date Received: 08/15/18
Percent Solids: n/a

General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	4.1 J	5.0	4.0	3.6	mg/l	1	08/21/18	ST	SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 [b]	3.4	mg/l	1	08/16/18 19:34	SA	SM5210 B-11
Nitrogen, Ammonia	0.20 U	0.20	0.20	0.089	mg/l	1	08/22/18 12:56	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [c]	0.11 U	0.11	0.11	0.046	mg/l	1	08/23/18 17:25	RP	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.10 U	0.10	0.10	0.043	mg/l	1	08/23/18 17:25	RP	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0050 U	0.010	0.0050	0.0030	mg/l	1	08/15/18 22:05	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.44	0.20	0.15	0.12	mg/l	1	08/24/18 13:42	RP	EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	08/25/18 14:55	LS	EPA 365.3
Solids, Total Dissolved	20.0	10	4.0	1.8	mg/l	1	08/17/18 14:36	RC	SM2540 C-11
Solids, Total Suspended	3.8 J	4.0	2.0	1.5	mg/l	1	08/17/18 12:42	RC	SM2540 D-11
Total Organic Carbon	10.8	1.0	1.0	0.72	mg/l	1	08/24/18 05:44	JO	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(b) Value reported is laboratory DL (MDL).
(c) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

LOQ = Limit of Quantitation DL = Detection Limit U = Indicates a result < LOD
LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = DL (MDL) but < LOQ

Report of Analysis

Client Sample ID:	WA-4S		
Lab Sample ID:	JC71961-6F	**Date Sampled:**	08/15/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	08/15/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By	Method
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	08/27/18 09:54	MP	EPA 365.3

LOQ = Limit of Quantitation DL = Detection Limit U = Indicates a result < LOD
LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = DL (MDL) but < LOQ

Report of Analysis

Client Sample ID:	WA-5S		
Lab Sample ID:	JC71961-7	**Date Sampled:**	08/15/18
Matrix:	AQ - Surface Water	**Date Received:**	08/15/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	4.0 U	5.0	4.0	3.6	mg/l	1	08/21/18	ST	SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 [b]	3.4	mg/l	1	08/16/18 19:35	SA	SM5210 B-11
Coliform, Fecal [c]	520	10			col/100ml	10	08/15/18 23:02	SA	SM9222 D-06
Coliform, Total [c]	650	10			col/100ml	10	08/15/18 22:53	SA	SM9222 B-06
Nitrogen, Ammonia	0.20 U	0.20	0.20	0.089	mg/l	1	08/22/18 12:57	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [d]	0.11 U	0.11	0.11	0.046	mg/l	1	08/23/18 17:27	RP	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.10 U	0.10	0.10	0.043	mg/l	1	08/23/18 17:27	RP	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0050 U	0.010	0.0050	0.0030	mg/l	1	08/15/18 22:05	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.36	0.20	0.15	0.12	mg/l	1	08/24/18 13:45	RP	EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	08/25/18 14:55	LS	EPA 365.3
Solids, Total Dissolved	7.5 J	10	4.0	1.8	mg/l	1	08/17/18 16:35	RC	SM2540 C-11
Solids, Total Suspended [e]	3.5 J	4.0	2.0	1.5	mg/l	1	08/17/18 12:42	RC	SM2540 D-11
Total Organic Carbon	8.7	1.0	1.0	0.72	mg/l	1	08/24/18 06:18	JO	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(b) Value reported is laboratory DL (MDL).
(c) Analysis done out of holding time.
(d) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)
(e) Reported sample aliquot obtained from filtration of 550 mL of sample. Volume was reduced from 1 liter due to limited volume.

LOQ = Limit of Quantitation DL = Detection Limit U = Indicates a result < LOD
LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = DL (MDL) but < LOQ

Report of Analysis

Client Sample ID:	WA-5S		
Lab Sample ID:	JC71961-7F	**Date Sampled:**	08/15/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	08/15/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By	Method
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	08/27/18 10:04	MP	EPA 365.3

LOQ = Limit of Quantitation DL = Detection Limit U = Indicates a result < LOD
LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = DL (MDL) but < LOQ

Report of Analysis

Client Sample ID:	WA-6S		
Lab Sample ID:	JC71961-8	**Date Sampled:**	08/15/18
Matrix:	AQ - Surface Water	**Date Received:**	08/15/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	4.0 U	5.0	4.0	3.6	mg/l	1	08/21/18	ST	SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 [b]	3.4	mg/l	1	08/16/18 19:37	SA	SM5210 B-11
Coliform, Fecal [c]	183	10			col/100ml	10	08/15/18 23:02	SA	SM9222 D-06
Coliform, Total [c]	80	4			col/100ml	4	08/15/18 22:53	SA	SM9222 B-06
Nitrogen, Ammonia	0.20 U	0.20	0.20	0.089	mg/l	1	08/22/18 12:59	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [d]	0.11 U	0.11	0.11	0.046	mg/l	1	08/23/18 17:28	RP	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.10 U	0.10	0.10	0.043	mg/l	1	08/23/18 17:28	RP	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0050 U	0.010	0.0050	0.0030	mg/l	1	08/15/18 22:05	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.38	0.20	0.15	0.12	mg/l	1	08/24/18 13:45	RP	EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	08/25/18 14:55	LS	EPA 365.3
Solids, Total Dissolved	35.0	10	4.0	1.8	mg/l	1	08/17/18 16:35	RC	SM2540 C-11
Solids, Total Suspended	2.0 U	4.0	2.0	1.5	mg/l	1	08/17/18 12:42	RC	SM2540 D-11
Total Organic Carbon	8.6	1.0	1.0	0.72	mg/l	1	08/24/18 06:29	JO	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(b) Value reported is laboratory DL (MDL).
(c) Analysis done out of holding time.
(d) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

LOQ = Limit of Quantitation DL = Detection Limit U = Indicates a result < LOD
LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = DL (MDL) but < LOQ

Report of Analysis

Client Sample ID:	WA-6S		
Lab Sample ID:	JC71961-8F	**Date Sampled:**	08/15/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	08/15/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By	Method
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	08/27/18 10:04	MP	EPA 365.3

LOQ = Limit of Quantitation DL = Detection Limit U = Indicates a result < LOD
LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = DL (MDL) but < LOQ

Report of Analysis

Client Sample ID:	WA-6M		
Lab Sample ID:	JC71961-9	**Date Sampled:**	08/15/18
Matrix:	AQ - Surface Water	**Date Received:**	08/15/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	4.0 U	5.0	4.0	3.6	mg/l	1	08/21/18	ST	SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 [b]	3.4	mg/l	1	08/16/18 19:39	SA	SM5210 B-11
Nitrogen, Ammonia	0.20 U	0.20	0.20	0.089	mg/l	1	08/22/18 13:00	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [c]	0.11 U	0.11	0.11	0.046	mg/l	1	08/23/18 17:29	RP	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.10 U	0.10	0.10	0.043	mg/l	1	08/23/18 17:29	RP	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0050 U	0.010	0.0050	0.0030	mg/l	1	08/15/18 22:05	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.40	0.20	0.15	0.12	mg/l	1	08/24/18 13:46	RP	EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	08/25/18 14:55	LS	EPA 365.3
Solids, Total Dissolved	35.0	10	4.0	1.8	mg/l	1	08/17/18 16:35	RC	SM2540 C-11
Solids, Total Suspended	5.5	4.0	2.0	1.5	mg/l	1	08/17/18 12:42	RC	SM2540 D-11
Total Organic Carbon	8.9	1.0	1.0	0.72	mg/l	1	08/24/18 06:48	JO	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(b) Value reported is laboratory DL (MDL).
(c) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

LOQ = Limit of Quantitation DL = Detection Limit U = Indicates a result < LOD
LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = DL (MDL) but < LOQ

Report of Analysis

Client Sample ID:	WA-6M		
Lab Sample ID:	JC71961-9F	**Date Sampled:**	08/15/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	08/15/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By	Method
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	08/27/18 10:04	MP	EPA 365.3

LOQ = Limit of Quantitation DL = Detection Limit U = Indicates a result < LOD
LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = DL (MDL) but < LOQ

Report of Analysis

Client Sample ID:	WA-6D		
Lab Sample ID:	JC71961-10	**Date Sampled:**	08/15/18
Matrix:	AQ - Surface Water	**Date Received:**	08/15/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	4.0 U	5.0	4.0	3.6	mg/l	1	08/21/18	ST	SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 [b]	3.4	mg/l	1	08/16/18 19:40	SA	SM5210 B-11
Nitrogen, Ammonia	0.20 U	0.20	0.20	0.089	mg/l	1	08/22/18 13:02	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [c]	0.072 J	0.11	0.11	0.046	mg/l	1	08/23/18 17:30	RP	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.072 J	0.10	0.10	0.043	mg/l	1	08/23/18 17:30	RP	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0050 U	0.010	0.0050	0.0030	mg/l	1	08/15/18 22:05	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.52	0.20	0.15	0.12	mg/l	1	08/24/18 13:47	RP	EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	08/25/18 14:55	LS	EPA 365.3
Solids, Total Dissolved	37.5	10	4.0	1.8	mg/l	1	08/17/18 16:35	RC	SM2540 C-11
Solids, Total Suspended	6.0	4.0	2.0	1.5	mg/l	1	08/17/18 12:42	RC	SM2540 D-11
Total Organic Carbon	11.9	1.0	1.0	0.72	mg/l	1	08/24/18 07:22	JO	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(b) Value reported is laboratory DL (MDL).
(c) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

LOQ = Limit of Quantitation DL = Detection Limit U = Indicates a result < LOD
LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = DL (MDL) but < LOQ

Report of Analysis

Client Sample ID:	WA-6D		
Lab Sample ID:	JC71961-10F	**Date Sampled:**	08/15/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	08/15/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By	Method
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	08/27/18 10:04	MP	EPA 365.3

LOQ = Limit of Quantitation DL = Detection Limit U = Indicates a result < LOD
LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = DL (MDL) but < LOQ

Report of Analysis

Client Sample ID:	WA-7S		
Lab Sample ID:	JC71961-11	**Date Sampled:**	08/15/18
Matrix:	AQ - Surface Water	**Date Received:**	08/15/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	3.6 J	5.0	4.0	3.6	mg/l	1	08/21/18	ST	SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 [b]	3.4	mg/l	1	08/16/18 19:43	SA	SM5210 B-11
Coliform, Fecal [c]	51	10			col/100ml	10	08/15/18 23:02	SA	SM9222 D-06
Coliform, Total [c]	88	4			col/100ml	4	08/15/18 22:53	SA	SM9222 B-06
Nitrogen, Ammonia	0.20 U	0.20	0.20	0.089	mg/l	1	08/22/18 13:03	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [d]	0.061 J	0.11	0.11	0.046	mg/l	1	08/23/18 17:33	RP	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.061 J	0.10	0.10	0.043	mg/l	1	08/23/18 17:33	RP	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0050 U	0.010	0.0050	0.0030	mg/l	1	08/15/18 22:05	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.39	0.20	0.15	0.12	mg/l	1	08/24/18 13:48	RP	EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	08/25/18 15:00	LS	EPA 365.3
Solids, Total Dissolved	20.0	10	4.0	1.8	mg/l	1	08/17/18 16:35	RC	SM2540 C-11
Solids, Total Suspended	2.0 U	4.0	2.0	1.5	mg/l	1	08/17/18 12:42	RC	SM2540 D-11
Total Organic Carbon	9.7	1.0	1.0	0.72	mg/l	1	08/23/18 23:06	JO	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(b) Value reported is laboratory DL (MDL).
(c) Analysis done out of holding time.
(d) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

LOQ = Limit of Quantitation DL = Detection Limit U = Indicates a result < LOD
LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = DL (MDL) but < LOQ

Report of Analysis

Client Sample ID:	WA-7S		
Lab Sample ID:	JC71961-11F	**Date Sampled:**	08/15/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	08/15/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By	Method
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	08/27/18 10:04	MP	EPA 365.3

LOQ = Limit of Quantitation DL = Detection Limit U = Indicates a result < LOD
LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = DL (MDL) but < LOQ

Report of Analysis

Client Sample ID:	WA-7M		
Lab Sample ID:	JC71961-12	**Date Sampled:**	08/15/18
Matrix:	AQ - Surface Water	**Date Received:**	08/15/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	4.0 U	5.0	4.0	3.6	mg/l	1	08/23/18 16:04	ST	SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 [b]	3.4	mg/l	1	08/16/18 19:45	SA	SM5210 B-11
Nitrogen, Ammonia	0.20 U	0.20	0.20	0.089	mg/l	1	08/22/18 13:05	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [c]	0.060 J	0.11	0.11	0.046	mg/l	1	08/23/18 17:34	RP	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.060 J	0.10	0.10	0.043	mg/l	1	08/23/18 17:34	RP	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0050 U	0.010	0.0050	0.0030	mg/l	1	08/15/18 22:05	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.46	0.20	0.15	0.12	mg/l	1	08/24/18 13:49	RP	EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	08/25/18 15:00	LS	EPA 365.3
Solids, Total Dissolved	22.5	10	4.0	1.8	mg/l	1	08/17/18 16:35	RC	SM2540 C-11
Solids, Total Suspended	4.2	4.0	2.0	1.5	mg/l	1	08/17/18 12:42	RC	SM2540 D-11
Total Organic Carbon	11.3	1.0	1.0	0.72	mg/l	1	08/23/18 23:39	JO	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(b) Value reported is laboratory DL (MDL).
(c) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

LOQ = Limit of Quantitation DL = Detection Limit U = Indicates a result < LOD
LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = DL (MDL) but < LOQ

Report of Analysis

Client Sample ID:	WA-7M		
Lab Sample ID:	JC71961-12F	**Date Sampled:**	08/15/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	08/15/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By	Method
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	08/27/18 10:04	MP	EPA 365.3

LOQ = Limit of Quantitation DL = Detection Limit U = Indicates a result < LOD
LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = DL (MDL) but < LOQ

Report of Analysis

Client Sample ID:	WA-7D		
Lab Sample ID:	JC71961-13	**Date Sampled:**	08/15/18
Matrix:	AQ - Surface Water	**Date Received:**	08/15/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	4.0 U	5.0	4.0	3.6	mg/l	1	08/23/18 16:04	ST	SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 [b]	3.4	mg/l	1	08/16/18 19:46	SA	SM5210 B-11
Nitrogen, Ammonia	0.20 U	0.20	0.20	0.089	mg/l	1	08/22/18 13:06	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [c]	0.11 U	0.11	0.11	0.046	mg/l	1	08/23/18 17:36	RP	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.10 U	0.10	0.10	0.043	mg/l	1	08/23/18 17:36	RP	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0050 U	0.010	0.0050	0.0030	mg/l	1	08/15/18 22:10	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.55	0.20	0.15	0.12	mg/l	1	08/24/18 13:50	RP	EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	08/25/18 15:00	LS	EPA 365.3
Solids, Total Dissolved	25.0	10	4.0	1.8	mg/l	1	08/17/18 16:35	RC	SM2540 C-11
Solids, Total Suspended	56.4	4.0	2.0	1.5	mg/l	1	08/17/18 12:42	RC	SM2540 D-11
Total Organic Carbon	13.1	1.0	1.0	0.72	mg/l	1	08/23/18 23:50	JO	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(b) Value reported is laboratory DL (MDL).
(c) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

LOQ = Limit of Quantitation DL = Detection Limit U = Indicates a result < LOD
LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = DL (MDL) but < LOQ

Report of Analysis

Client Sample ID:	WA-7D		
Lab Sample ID:	JC71961-13F	**Date Sampled:**	08/15/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	08/15/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By	Method
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	08/27/18 10:04	MP	EPA 365.3

LOQ = Limit of Quantitation DL = Detection Limit U = Indicates a result < LOD
LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = DL (MDL) but < LOQ

Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody

SGS

SW

CHAIN OF CUSTODY

SGS North America Inc. - Dayton
2235 Route 130, Dayton, NJ 08810
TEL. 732-329-0200 FAX 732-329-3499
www.sgs.com/ehsusa

FED-EX Tracking #
Bottle Order Control # PD-073018-47
SGS Quote #
SGS Job # JC71961

Client / Reporting Information

Company Name: ~~USACE~~-Philadelphia District
Street Address: 100 Penn Square East
City: Philadelphia State: PA Zip: 19107
Project Contact: Joe Loeper E-mail:
Phone #: 215-656-6545 Fax #:
Sampler(s) Name(s): Greg Wacik Phone #: 610-597-9780

Project Information

Project Name: USACE - Francis Walter Reservoir
Street:
City: White Haven State: PA
Project #:
Client Purchase Order #: PD-073018-47
Project Manager:

Billing Information (if different from Report to)
Company Name:
Street Address:
City: State: Zip:
Attention:

Requested Analysis (see TEST CODE sheet)

Matrix Codes: DW - Drinking Water; GW - Ground Water; WW - Water; SW - Surface Water; SO - Soil; SL- Sludge; SED-Sediment; OI - Oil; LIQ - Other Liquid; AIR - Air; SOL - Other Solid; WP - Wipe; FB-Field Blank; EB-Equipment Blank; RB- Rinse Blank; TB-Trip Blank

Lab Sample #	Field ID / Point of Collection	MEOH/DI Vial #	Date	Time	Sampled by	Matrix	# of bottles	HCl	NaOH	HNO3	H2SO4	NONE	DI Water	MEOH	ENCORE	Na2S2O3	AIK, AMN, BOD, TDS	TOC, TSS, TPO4 (Total Phosphorus)	TKN, XNO30 (TKN/TPO4 Bottle)	TPO4 (dissolved lab filter)	FCF, TCF	LAB USE ONLY
1F	WA-1S		8/15/18	0930	[signature]	SW	11	X			X					X	X	X	X	X	X	B5
2F	WA-2S		↓	0700	↓	SW	11	X			X					X	X	X	X	X	X	B11
3F	WA-2M			0700		SW	9	X			X						X	X	X	X		B12
4F	WA-2D			0700		SW	9	X			X						X	X	X	X		B16
5F	WA-3S			1100		SW	11	X			X					X	X	X	X	X	X	G37
6F	WA-4S			1020		SW	11	X			X					X	X	X	X	X	X	G6274
7F	WA-5S			1015		SW	11	X			X					X	X	X	X	X	X	19E4
8F	WA-6S			0800		SW	11	X			X					X	X	X	X	X	X	
9F	WA-6M			0800		SW	9	X			X						X	X	X	X		
10F	WA-6D			0800		SW	9	X			X						X	X	X	X		

Turnaround Time (Business days)

- ☐ Std. 10 Business Days
- ☐ 5 Day RUSH
- ☐ 3 Day RUSH
- ☐ 2 Day RUSH
- ☐ 1 Day RUSH
- ☐ other

Approved by (SGS Project Manager)/Date:

Emergency & Rush T/A data available via LabLink

Data Deliverable Information

- ☐ Commercial "A" (Level 1)
- ☐ Commercial "B" (Level 2)
- ☐ FULLT1 (Level 3+4)
- ☐ NJ Reduced
- ☐ Commercial "C"
- ☐ NJ Data of Known Quality Protocol Reporting
- ☐ NYASP Category A
- ☐ NYASP Category B
- ☐ State Forms
- ☐ EDD Format
- ☐ Other

Commercial "A" = Results Only; Commercial "B" = Results + QC Summary
NJ Reduced = Results + QC Summary + Partial Raw data

Comments / Special Instructions

One TSS Bottle not filled. One XNO30 Bottle not used. TPO4 dissolved lab filter. XNO30 combined with TPO4/TKN Bottle

Sample inventory is verified upon receipt in the Laboratory

Sample Custody must be documented below each time samples change possession, including courier delivery.

Relinquished by Sampler: 1 [signature]	Date Time: 8/15/18 4:00	Received By: 1 [signature]	Relinquished By: 2 [signature]	Date Time: 8/16/18 1422	Received By: 2 [signature]
Relinquished by Sampler: 3	Date Time:	Received By: 3	Relinquished By: 4	Date Time:	Received By: 4
Relinquished by: 5	Date Time:	Received By: 5	Custody Seal # ☐ Intact ☐ Not intact	Preserved where applicable ☐	On Ice ☐ Cooler Temp. 3.3 3.1°IR; 3.7 2.6 cf0.3 3.9°IR

Form:SM088-03C (revised 2/12/18)

http://www.sgs.com/en/terms-and-conditions.

JC71961: Chain of Custody
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5.1
5

CHAIN OF CUSTODY

PAGE 2 OF 2

SGS North America Inc. - Dayton
2235 Route 130, Dayton, NJ 08810
TEL. 732-329-0200 FAX 732-329-3499
www.sgs.com/ehsusa

FED-EX Tracking # | Bottle Order Control #
SGS Quote # | SGS Job # JC71961

Client / Reporting Information

Company Name: USACE - Philadelphia District
Street Address: 100 Penn Square East
City / State / Zip: Philadelphia PA 19107
Project Contact: Joe Loeper | E-mail:
Phone #: 215-656-6545 | Fax #:
Sampler(s) Name(s): Greg Wacik 610 - 5979780 | Phone #:

Project Information

Project Name: USACE - Francis Walter Reservoir
Street:
City / State: White Haven PA
Project #:
Client Purchase Order #: PD-073018-47
Project Manager:

Billing Information (if different from Report to)

Company Name:
Street Address:
City / State / Zip:
Attention:

Requested Analysis (see TEST CODE sheet)

Matrix Codes: DW - Drinking Water; GW - Ground Water; WW - Water; SW - Surface Water; SO - Soil; SL- Sludge; SED- Sediment; OI - Oil; LIQ - Other Liquid; AIR - Air; SOL - Other Solid; WP - Wipe; FB-Field Blank; EB-Equipment Blank; RB- Rinse Blank; TB-Trip Blank

Lab Sample #	Field ID / Point of Collection	MEOH/DI Vial #	Collection Date	Collection Time	Sampled by	Matrix	# of bottles	Preserved: HCl	NaOH	HNO3	H2SO4	NONE	DI Water	MEOH	ENCORE	MA035203	AIK, Amm, BOD, TDS	TOC, TSS, TP04(total/wash)	TKN, NO30 (TKN/TP04 bottle)	TP04 (dissolved lab filter)	FCF, TCF	LAB USE ONLY
11F	WA-7S		8/15/18	0840	JL	SW	11	X			X					X	X	X	X	X	X	
12F	WA-7M		"	0840	"	SW	9	X			X						X	X	X	X		
13F	WA-7D		"	0840	"	SW	9	X			X						X	X	X	X		

Turnaround Time (Business days)

Approved by (SGS Project Manager)/Date:

- Std. 10 Business Days
- 5 Day RUSH
- 3 Day RUSH
- 2 Day RUSH
- 1 Day RUSH
- other

Emergency & Rush T/A data available via LabLink

Data Deliverable Information

- Commercial "A" (Level 1)
- Commercial "B" (Level 2)
- FULLT1 (Level 3+4)
- NJ Reduced
- Commercial "C"
- NJ Data of Known Quality Protocol Reporting

Commercial "A" = Results Only; Commercial "B" = Results + QC Summary
NJ Reduced = Results + QC Summary + Partial Raw data

- NYASP Category A
- NYASP Category B
- State Forms
- EDD Format
- Other

Comments / Special Instructions

One TSS bottle not filled. One NO30 Bottle not used. TP04 dissolved lab filter. NO30 combined with TP04/TKN bottle.

Sample inventory is verified upon receipt in the Laboratory

Sample Custody must be documented below each time samples change possession, including courier delivery.

Relinquished by Sampler:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
1	8/15/18 1610	1	2	8/15/18 1810	2
Relinquished by Sampler:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
3		3	4		4
Relinquished by:	Date Time:	Received By:	Custody Seal #	Intact / Not intact	Preserved where applicable	On Ice	Cooler Temp.
5		5					3.3 3.0 °C IR 3.7 3.9 °C IR 2.6 °C IR

Form:SM088-03C (revised 2/12/18)

http://www.sgs.com/en/terms-and-conditions.

SGS Sample Receipt Summary

Job Number: JC71961 **Client:** USACE-PHILADELPHIA DISTRICT **Project:** PHILADELPHIA DISTRICT, RESERVOIR SAMPL

Date / Time Received: 8/15/2018 6:22:00 PM **Delivery Method:** **Airbill #'s:**

Cooler Temps (Raw Measured) °C: Cooler 1: (3.3); Cooler 2: (3.7); Cooler 3: (2.6); Cooler 4: (3.8); Cooler 5: (3.9);

Cooler Temps (Corrected) °C: Cooler 1: (3.2); Cooler 2: (3.6); Cooler 3: (2.5); Cooler 4: (3.7); Cooler 5: (3.8);

Cooler Security	Y	or	N		Y	or	N
1. Custody Seals Present:	☑		☐	3. COC Present:	☑		☐
2. Custody Seals Intact:	☑		☐	4. Smpl Dates/Time OK	☑		☐

Cooler Temperature	Y	or	N
1. Temp criteria achieved:	☑		☐
2. Cooler temp verification:	IR Gun		
3. Cooler media:	Ice (Bag)		
4. No. Coolers:	5		

Quality Control Preservation	Y	or	N	N/A
1. Trip Blank present / cooler:	☐		☑	☐
2. Trip Blank listed on COC:	☐		☑	☐
3. Samples preserved properly:	☑		☐	
4. VOCs headspace free:	☐		☐	☑

Sample Integrity - Documentation	Y	or	N
1. Sample labels present on bottles:	☑		☐
2. Container labeling complete:	☑		☐
3. Sample container label / COC agree:	☑		☐

Sample Integrity - Condition	Y	or	N
1. Sample recvd within HT:	☑		☐
2. All containers accounted for:	☑		☐
3. Condition of sample:	Intact		

Sample Integrity - Instructions	Y	or	N	N/A
1. Analysis requested is clear:	☑		☐	
2. Bottles received for unspecified tests	☐		☑	
3. Sufficient volume recvd for analysis:	☑		☐	
4. Compositing instructions clear:	☐		☐	☑
5. Filtering instructions clear:	☐		☐	☑

Test Strip Lot #s: pH 1-12: 216017 pH 12+: 208717 Other: (Specify)

Comments
1) All TCF/FCF rec'd out of hold/processed out of hold.
2) -6 The TCF and FCF bottles rec'd were not filled with any water. No volume available.

SM089-02 Rev. Date 12/1/16

Responded to by: Tammy Esposito McCloskey Response Date: 8/15/18

1) Proceed as noted, TCF and FCF for this project are following 30 hour hold to per Joseph Loeper
2) Joseph Loeper notified. Please proceed with remaining analyses on this sample.

JC71961: Chain of Custody
Page 4 of 4

The results set forth herein are provided by SGS North America Inc.

e-Hardcopy 2.0
Automated Report

Technical Report for

USACE-Philadelphia District

Philadelphia District, Reservoir Sampling

W25PHS81145379

SGS Job Number: JC73161

Sampling Date: 09/05/18

Report to:

Army Corps of Engineers

joseph.m.loeper@usace.army.mil

ATTN: Joseph Loeper

Total number of pages in report: **46**

Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.

A. Paul Ioannidis
General Manager

Client Service contact: Tammy McCloskey 732-329-0200

Certifications: NJ(12129), NY(10983), CA, CT, FL, IL, IN, KS, KY, LA, MA, MD, ME, MN, NC, OH VAP (CL0056), AK (UST-103), AZ (AZ0786), PA, RI, SC, TX, UT, VA, WV, DoD ELAP (ANAB L2248)

Sections: 1 2 3 4 5

Table of Contents

Sample Summary

USACE-Philadelphia District

Job No: JC73161

Philadelphia District, Reservoir Sampling
Project No: W25PHS81145379

Sample Number	Collected Date	Time	By	Received	Matrix Code	Type	Client Sample ID
JC73161-1	09/05/18	10:15	GW	09/05/18	AQ	Surface Water	WA-1S
JC73161-1F	09/05/18	10:15	GW	09/05/18	AQ	Surface H2O Filtered	WA-1S
JC73161-2	09/05/18	07:30	GW	09/05/18	AQ	Surface Water	WA-2S
JC73161-2F	09/05/18	07:30	GW	09/05/18	AQ	Surface H2O Filtered	WA-2S
JC73161-3	09/05/18	07:30	GW	09/05/18	AQ	Surface Water	WA-2M
JC73161-3F	09/05/18	07:30	GW	09/05/18	AQ	Surface H2O Filtered	WA-2M
JC73161-4	09/05/18	07:30	GW	09/05/18	AQ	Surface Water	WA-2D
JC73161-4F	09/05/18	07:30	GW	09/05/18	AQ	Surface H2O Filtered	WA-2D
JC73161-5	09/05/18	10:45	GW	09/05/18	AQ	Surface Water	WA-3S
JC73161-5F	09/05/18	10:45	GW	09/05/18	AQ	Surface H2O Filtered	WA-3S
JC73161-6	09/05/18	11:00	GW	09/05/18	AQ	Surface Water	WA-4S
JC73161-6F	09/05/18	11:00	GW	09/05/18	AQ	Surface H2O Filtered	WA-4S
JC73161-7	09/05/18	11:15	GW	09/05/18	AQ	Surface Water	WA-5S

Sample Summary
(continued)

USACE-Philadelphia District

Job No: JC73161

Philadelphia District, Reservoir Sampling
Project No: W25PHS81145379

Sample Number	Collected Date	Time	By	Received	Matrix Code	Type	Client Sample ID
JC73161-7F	09/05/18	11:15	GW	09/05/18	AQ	Surface H2O Filtered	WA-5S
JC73161-8	09/05/18	08:15	GW	09/05/18	AQ	Surface Water	WA-6S
JC73161-8F	09/05/18	08:15	GW	09/05/18	AQ	Surface H2O Filtered	WA-6S
JC73161-9	09/05/18	08:15	GW	09/05/18	AQ	Surface Water	WA-6M
JC73161-9F	09/05/18	08:15	GW	09/05/18	AQ	Surface H2O Filtered	WA-6M
JC73161-10	09/05/18	08:15	GW	09/05/18	AQ	Surface Water	WA-6D
JC73161-10F	09/05/18	08:15	GW	09/05/18	AQ	Surface H2O Filtered	WA-6D
JC73161-11	09/05/18	08:50	GW	09/05/18	AQ	Surface Water	WA-7S
JC73161-11F	09/05/18	08:50	GW	09/05/18	AQ	Surface H2O Filtered	WA-7S
JC73161-12	09/05/18	08:50	GW	09/05/18	AQ	Surface Water	WA-7M
JC73161-12F	09/05/18	08:50	GW	09/05/18	AQ	Surface H2O Filtered	WA-7M
JC73161-13	09/05/18	08:50	GW	09/05/18	AQ	Surface Water	WA-7D
JC73161-13F	09/05/18	08:50	GW	09/05/18	AQ	Surface H2O Filtered	WA-7D

CASE NARRATIVE / CONFORMANCE SUMMARY

Client:	USACE-Philadelphia District	**Job No**	JC73161
Site:	Philadelphia District, Reservoir Sampling	**Report Date**	9/19/2018 2:48:49 PM

On 09/05/2018, 13 Sample(s), 0 Trip Blank(s) and 0 Field Blank(s) were received at SGS North America Inc. at a maximum corrected temperature of 3.5 C. Samples were intact and chemically preserved, unless noted below. A SGS North America Inc. Job Number of JC73161 was assigned to the project. Laboratory sample ID, client sample ID and dates of sample collection are detailed in the report's Results Summary Section.

Specified quality control criteria were achieved for this job except as noted below. For more information, please refer to the analytical results and QC summary pages.

Compounds qualified as out of range in the continuing calibration summary report are acceptable as per method requirements when there is a high bias but the sample result is non-detect.

General Chemistry By Method EPA 351.2/LACHAT

Matrix: AQ **Batch ID:** GP15883

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC73161-3DUP, JC73161-3MS were used as the QC samples for Nitrogen, Total Kjeldahl.

General Chemistry By Method EPA 353.2/LACHAT

Matrix: AQ **Batch ID:** GP15905

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC73160-1DUP, JC73160-1MS were used as the QC samples for Nitrogen, Nitrate + Nitrite.

Matrix: AQ **Batch ID:** GP15906

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC73295-1DUP, JC73295-1MS were used as the QC samples for Nitrogen, Nitrate + Nitrite.

General Chemistry By Method EPA 365.3

Matrix: AQ **Batch ID:** GP15865

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC73125-1DUP, JC73125-1MS were used as the QC samples for Phosphorus, Total.

Matrix: AQ **Batch ID:** GP15888

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC73322-1DUP, JC73322-1MS were used as the QC samples for Phosphorus, Total.

Matrix: AQ **Batch ID:** GP15923

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC73161-1FDUP, JC73161-1FMS were used as the QC samples for Phosphorus, Total.

General Chemistry By Method EPA353.2/SM4500NO2B

Matrix: AQ **Batch ID:** R172726

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC73161-1 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R172727

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC73161-2 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R172728

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC73161-3 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R172729

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC73161-4 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R172730

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC73161-5 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R172731

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC73161-6 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R172732

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC73161-7 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R172733

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC73161-8 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R172734

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC73161-9 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R172735

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC73161-10 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R172736

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC73161-11 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R172737

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC73161-12 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R172738

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC73161-13 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

General Chemistry By Method SM2320 B-11

Matrix: AQ	Batch ID: GN85631

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC73236-5DUP were used as the QC samples for Alkalinity, Total as CaCO3.
- JC73161-9 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC73161-6 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC73161-4 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC73161-3 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC73161-7 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC73161-1 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC73161-5 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC73161-2 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC73161-8 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC73161-11 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC73161-12 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC73161-13 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC73161-10 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.

General Chemistry By Method SM2540 C-11

Matrix: AQ	Batch ID: GN85382

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC73161-1DUP were used as the QC samples for Solids, Total Dissolved.

General Chemistry By Method SM2540 D-11

Matrix: AQ	Batch ID: GN85381

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC73161-1DUP were used as the QC samples for Solids, Total Suspended.

General Chemistry By Method SM4500NH3 H-11LACHAT

Matrix: AQ	Batch ID: GP15863

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC73160-2DUP, JC73160-2MS, JC73160-2MSD were used as the QC samples for Nitrogen, Ammonia.

Matrix: AQ	Batch ID: GP15864

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC73237-1DUP, JC73237-1MSD were used as the QC samples for Nitrogen, Ammonia.

General Chemistry By Method SM4500NO2 B-11

Matrix: AQ	Batch ID: GN85303

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC73161-1DUP, JC73161-1MS were used as the QC samples for Nitrogen, Nitrite.

General Chemistry By Method SM5210 B-11

Matrix: AQ	Batch ID: GP15793

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC73151-1ADUP were used as the QC samples for BOD, 5 Day.

General Chemistry By Method SM5310 B-11

Matrix: AQ	Batch ID: GP16022

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC73161-7MS, JC73161-7MSD were used as the QC samples for Total Organic Carbon.

Matrix: AQ	Batch ID: GP16023

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC73161-11MS, JC73161-11MSD were used as the QC samples for Total Organic Carbon.

General Chemistry By Method SM9222 B-06

Matrix: AQ	Batch ID: MB5372

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC73160-1DUP were used as the QC samples for Coliform, Total.
- JC73161-6 for Coliform, Total: Analysis done out of holding time.
- JC73161-1 for Coliform, Total: Analysis done out of holding time.
- JC73161-11 for Coliform, Total: Analysis done out of holding time.
- JC73161-2 for Coliform, Total: Analysis done out of holding time.
- JC73161-5 for Coliform, Total: Analysis done out of holding time.
- JC73161-8 for Coliform, Total: Analysis done out of holding time.
- JC73161-7 for Coliform, Total: Analysis done out of holding time.

General Chemistry By Method SM9222 D-06

Matrix: AQ **Batch ID:** MB5373

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC73160-1DUP were used as the QC samples for Coliform, Fecal.
- JC73161-7 for Coliform, Fecal: Analysis done out of holding time.
- JC73161-6 for Coliform, Fecal: Analysis done out of holding time.
- JC73161-5 for Coliform, Fecal: Analysis done out of holding time.
- JC73161-11 for Coliform, Fecal: Analysis done out of holding time.
- JC73161-2 for Coliform, Fecal: Analysis done out of holding time.
- JC73161-1 for Coliform, Fecal: Analysis done out of holding time.
- JC73161-8 for Coliform, Fecal: Analysis done out of holding time.

SGS North America Inc. certifies that data reported for samples received, listed on the associated custody chain or analytical task order, were produced to specifications meeting the Quality System precision, accuracy and completeness objectives except as noted.

Estimated non-standard method measurement uncertainty data is available on request, based on quality control bias and implicit for standard methods. Acceptable uncertainty requires tested parameter quality control data to meet method criteria.

SGS North America Inc. is not responsible for data quality assumptions if partial reports are used and recommends that this report be used in its entirety. Data release is authorized by SGS North America Inc indicated via signature on the report cover

Summary of Hits

Job Number: JC73161
Account: USACE-Philadelphia District
Project: Philadelphia District, Reservoir Sampling
Collected: 09/05/18

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	LOQ	LOD	Units	Method
JC73161-1	**WA-1S**					
Alkalinity, Total as CaCO3 [a]		4.8 J	5.0	4.0	mg/l	SM2320 B-11
BOD, 5 Day		7.0	3.4	3.4 [b]	mg/l	SM5210 B-11
Coliform, Fecal [c]		88	4	[b]	col/100ml	SM9222 D-06
Coliform, Total [c]		510	10	[b]	col/100ml	SM9222 B-06
Nitrogen, Nitrate [d]		0.17	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		0.17	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Total Kjeldahl		0.41	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		80.0	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended		4.2	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon		8.7	1.0	1.0	mg/l	SM5310 B-11
JC73161-1F	**WA-1S**					
No hits reported in this sample.						
JC73161-2	**WA-2S**					
Nitrogen, Total Kjeldahl		0.46	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		25.0	10	4.0	mg/l	SM2540 C-11
Total Organic Carbon		8.9	1.0	1.0	mg/l	SM5310 B-11
JC73161-2F	**WA-2S**					
No hits reported in this sample.						
JC73161-3	**WA-2M**					
Alkalinity, Total as CaCO3 [a]		4.8 J	5.0	4.0	mg/l	SM2320 B-11
Nitrogen, Nitrate [d]		0.10 J	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		0.10	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Total Kjeldahl		0.29	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		23.3	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended		1.7 J	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon		9.1	1.0	1.0	mg/l	SM5310 B-11
JC73161-3F	**WA-2M**					
No hits reported in this sample.						
JC73161-4	**WA-2D**					
Alkalinity, Total as CaCO3 [a]		5.3	5.0	4.0	mg/l	SM2320 B-11
Nitrogen, Ammonia		0.11 J	0.20	0.20	mg/l	SM4500NH3 H-11LACHAT

Summary of Hits

Job Number: JC73161
Account: USACE-Philadelphia District
Project: Philadelphia District, Reservoir Sampling
Collected: 09/05/18

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	LOQ	LOD	Units	Method
Nitrogen, Nitrate [d]		0.15	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		0.15	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Total Kjeldahl		0.30	0.20	0.15	mg/l	EPA 351.2/LACHAT
Phosphorus, Total		0.074	0.050	0.050	mg/l	EPA 365.3
Solids, Total Dissolved		25.0	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended		32.7	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon		11.5	1.0	1.0	mg/l	SM5310 B-11
JC73161-4F	**WA-2D**					
Phosphorus, Total		0.031 J	0.050	0.050	mg/l	EPA 365.3
JC73161-5	**WA-3S**					
Coliform, Fecal [c]		12	4	[b]	col/100ml	SM9222 D-06
Coliform, Total [c]		270	4	[b]	col/100ml	SM9222 B-06
Nitrogen, Nitrate [d]		0.13	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		0.13	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Total Kjeldahl		0.30	0.20	0.15	mg/l	EPA 351.2/LACHAT
Phosphorus, Total		0.28	0.050	0.050	mg/l	EPA 365.3
Solids, Total Dissolved		30.0	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended		1.9 J	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon		9.1	1.0	1.0	mg/l	SM5310 B-11
JC73161-5F	**WA-3S**					
Phosphorus, Total		0.060	0.050	0.050	mg/l	EPA 365.3
JC73161-6	**WA-4S**					
Alkalinity, Total as CaCO3 [a]		7.4	5.0	4.0	mg/l	SM2320 B-11
Coliform, Fecal [c]		124	4	[b]	col/100ml	SM9222 D-06
Coliform, Total [c]		136	4	[b]	col/100ml	SM9222 B-06
Nitrogen, Nitrate [d]		0.12	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		0.12	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Total Kjeldahl		0.28	0.20	0.15	mg/l	EPA 351.2/LACHAT
Phosphorus, Total		0.043 J	0.050	0.050	mg/l	EPA 365.3
Solids, Total Dissolved		30.0	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended		1.9 J	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon		7.9	1.0	1.0	mg/l	SM5310 B-11
JC73161-6F	**WA-4S**					

No hits reported in this sample.

Summary of Hits

Job Number: JC73161
Account: USACE-Philadelphia District
Project: Philadelphia District, Reservoir Sampling
Collected: 09/05/18

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	LOQ	LOD	Units	Method
JC73161-7	**WA-5S**					
Coliform, Fecal [c]		16	4	[b]	col/100ml	SM9222 D-06
Coliform, Total [c]		4	4	[b]	col/100ml	SM9222 B-06
Nitrogen, Total Kjeldahl		0.19 J	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		20.0	10	4.0	mg/l	SM2540 C-11
Total Organic Carbon		6.0	1.0	1.0	mg/l	SM5310 B-11
JC73161-7F	**WA-5S**					
No hits reported in this sample.						
JC73161-8	**WA-6S**					
Alkalinity, Total as CaCO3 [a]		4.8 J	5.0	4.0	mg/l	SM2320 B-11
Coliform, Total [c]		124	4	[b]	col/100ml	SM9222 B-06
Nitrogen, Total Kjeldahl		0.34	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		23.3	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended		1.5 J	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon		8.4	1.0	1.0	mg/l	SM5310 B-11
JC73161-8F	**WA-6S**					
No hits reported in this sample.						
JC73161-9	**WA-6M**					
Nitrogen, Total Kjeldahl		0.27	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		20.0	10	4.0	mg/l	SM2540 C-11
Total Organic Carbon		8.2	1.0	1.0	mg/l	SM5310 B-11
JC73161-9F	**WA-6M**					
No hits reported in this sample.						
JC73161-10	**WA-6D**					
Alkalinity, Total as CaCO3 [a]		3.7 J	5.0	4.0	mg/l	SM2320 B-11
Nitrogen, Total Kjeldahl		0.27	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		20.0	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended		7.2	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon		7.8	1.0	1.0	mg/l	SM5310 B-11

Summary of Hits

Job Number: JC73161
Account: USACE-Philadelphia District
Project: Philadelphia District, Reservoir Sampling
Collected: 09/05/18

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	LOQ	LOD	Units	Method
JC73161-10F	**WA-6D**					
No hits reported in this sample.						
JC73161-11	**WA-7S**					
Alkalinity, Total as CaCO3 [a]		5.8	5.0	4.0	mg/l	SM2320 B-11
Coliform, Total [c]		84	4	[b]	col/100ml	SM9222 B-06
Nitrogen, Total Kjeldahl		0.35	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		73.3	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended		1.8 J	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon		8.3	1.0	1.0	mg/l	SM5310 B-11
JC73161-11F	**WA-7S**					
No hits reported in this sample.						
JC73161-12	**WA-7M**					
Alkalinity, Total as CaCO3 [a]		5.8	5.0	4.0	mg/l	SM2320 B-11
Nitrogen, Nitrate [d]		0.15	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		0.15	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Total Kjeldahl		0.38	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		23.3	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended		2.3 J	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon		8.8	1.0	1.0	mg/l	SM5310 B-11
JC73161-12F	**WA-7M**					
No hits reported in this sample.						
JC73161-13	**WA-7D**					
Alkalinity, Total as CaCO3 [a]		5.3	5.0	4.0	mg/l	SM2320 B-11
Nitrogen, Nitrate [d]		0.13	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		0.13	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Total Kjeldahl		0.35	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		20.0	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended		34.3	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon		8.9	1.0	1.0	mg/l	SM5310 B-11
JC73161-13F	**WA-7D**					
No hits reported in this sample.						

Summary of Hits

Job Number: JC73161
Account: USACE-Philadelphia District
Project: Philadelphia District, Reservoir Sampling
Collected: 09/05/18

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	LOQ	LOD	Units	Method

(a) Sample was titrated to a final pH of 4.2.
(b) Value reported is laboratory DL (MDL).
(c) Analysis done out of holding time.
(d) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Sample Results

Report of Analysis

Report of Analysis

Client Sample ID: WA-1S
Lab Sample ID: JC73161-1
Matrix: AQ - Surface Water
Project: Philadelphia District, Reservoir Sampling

Date Sampled: 09/05/18
Date Received: 09/05/18
Percent Solids: n/a

General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	4.8 J	5.0	4.0	3.6	mg/l	1	09/13/18 14:50	ST	SM2320 B-11
BOD, 5 Day	7.0	3.4	3.4 [b]	3.4	mg/l	1	09/06/18 19:20	SA	SM5210 B-11
Coliform, Fecal [c]	88	4			col/100ml	4	09/05/18 20:58	SA	SM9222 D-06
Coliform, Total [c]	510	10			col/100ml	10	09/05/18 20:50	SA	SM9222 B-06
Nitrogen, Ammonia	0.20 U	0.20	0.20	0.089	mg/l	1	09/10/18 15:58	RP	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [d]	0.17	0.11	0.11	0.093	mg/l	1	09/12/18 15:18	RP	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.17	0.10	0.10	0.090	mg/l	1	09/12/18 15:18	RP	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0050 U	0.010	0.0050	0.0030	mg/l	1	09/05/18 20:15	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.41	0.20	0.15	0.12	mg/l	1	09/13/18 12:47	BM	EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	09/11/18 15:00	LS	EPA 365.3
Solids, Total Dissolved	80.0	10	4.0	1.8	mg/l	1	09/07/18 17:30	RC	SM2540 C-11
Solids, Total Suspended	4.2	4.0	2.0	1.5	mg/l	1	09/07/18 11:40	RC	SM2540 D-11
Total Organic Carbon	8.7	1.0	1.0	0.72	mg/l	1	09/18/18 21:58	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(b) Value reported is laboratory DL (MDL).
(c) Analysis done out of holding time.
(d) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

LOQ = Limit of Quantitation DL = Detection Limit U = Indicates a result < LOD
LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = DL (MDL) but < LOQ

Report of Analysis

Client Sample ID:	WA-1S		
Lab Sample ID:	JC73161-1F	**Date Sampled:**	09/05/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	09/05/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By	Method
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	09/15/18 17:10	LS	EPA 365.3

LOQ = Limit of Quantitation DL = Detection Limit U = Indicates a result < LOD
LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = DL (MDL) but < LOQ

Report of Analysis

Client Sample ID:	WA-2S		
Lab Sample ID:	JC73161-2	**Date Sampled:**	09/05/18
Matrix:	AQ - Surface Water	**Date Received:**	09/05/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	4.0 U	5.0	4.0	3.6	mg/l	1	09/13/18 14:50	ST	SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 [b]	3.4	mg/l	1	09/06/18 19:22	SA	SM5210 B-11
Coliform, Fecal [c]	0	0			col/100ml	1	09/05/18 20:58	SA	SM9222 D-06
Coliform, Total [c]	0	0			col/100ml	1	09/05/18 20:50	SA	SM9222 B-06
Nitrogen, Ammonia	0.20 U	0.20	0.20	0.089	mg/l	1	09/10/18 15:59	RP	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [d]	0.11 U	0.11	0.11	0.093	mg/l	1	09/12/18 15:19	RP	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.10 U	0.10	0.10	0.090	mg/l	1	09/12/18 15:19	RP	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0050 U	0.010	0.0050	0.0030	mg/l	1	09/05/18 20:15	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.46	0.20	0.15	0.12	mg/l	1	09/13/18 12:48	BM	EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	09/11/18 15:00	LS	EPA 365.3
Solids, Total Dissolved	25.0	10	4.0	1.8	mg/l	1	09/07/18 17:30	RC	SM2540 C-11
Solids, Total Suspended	2.0 U	4.0	2.0	1.5	mg/l	1	09/07/18 11:40	RC	SM2540 D-11
Total Organic Carbon	8.9	1.0	1.0	0.72	mg/l	1	09/18/18 22:09	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(b) Value reported is laboratory DL (MDL).
(c) Analysis done out of holding time.
(d) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

LOQ = Limit of Quantitation DL = Detection Limit U = Indicates a result < LOD
LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = DL (MDL) but < LOQ

Report of Analysis

Client Sample ID:	WA-2S		
Lab Sample ID:	JC73161-2F	**Date Sampled:**	09/05/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	09/05/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By	Method
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	09/15/18 17:10	LS	EPA 365.3

LOQ = Limit of Quantitation DL = Detection Limit U = Indicates a result < LOD
LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = DL (MDL) but < LOQ

Report of Analysis

Client Sample ID: WA-2M
Lab Sample ID: JC73161-3
Matrix: AQ - Surface Water
Project: Philadelphia District, Reservoir Sampling

Date Sampled: 09/05/18
Date Received: 09/05/18
Percent Solids: n/a

General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	4.8 J	5.0	4.0	3.6	mg/l	1	09/13/18 14:50	ST	SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 [b]	3.4	mg/l	1	09/06/18 19:24	SA	SM5210 B-11
Nitrogen, Ammonia	0.20 U	0.20	0.20	0.089	mg/l	1	09/10/18 16:01	RP	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [c]	0.10 J	0.11	0.11	0.093	mg/l	1	09/12/18 15:20	RP	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.10	0.10	0.10	0.090	mg/l	1	09/12/18 15:20	RP	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0050 U	0.010	0.0050	0.0030	mg/l	1	09/05/18 20:15	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.29	0.20	0.15	0.12	mg/l	1	09/13/18 12:36	BM	EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	09/11/18 15:00	LS	EPA 365.3
Solids, Total Dissolved	23.3	10	4.0	1.8	mg/l	1	09/07/18 17:30	RC	SM2540 C-11
Solids, Total Suspended	1.7 J	4.0	2.0	1.5	mg/l	1	09/07/18 11:40	RC	SM2540 D-11
Total Organic Carbon	9.1	1.0	1.0	0.72	mg/l	1	09/18/18 22:20	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(b) Value reported is laboratory DL (MDL).
(c) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

LOQ = Limit of Quantitation DL = Detection Limit U = Indicates a result < LOD
LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = DL (MDL) but < LOQ

Report of Analysis

Client Sample ID:	WA-2M		
Lab Sample ID:	JC73161-3F	**Date Sampled:**	09/05/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	09/05/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By	Method
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	09/15/18 17:10	LS	EPA 365.3

LOQ = Limit of Quantitation DL = Detection Limit U = Indicates a result < LOD
LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = DL (MDL) but < LOQ

Report of Analysis

Client Sample ID: WA-2D
Lab Sample ID: JC73161-4
Matrix: AQ - Surface Water
Project: Philadelphia District, Reservoir Sampling

Date Sampled: 09/05/18
Date Received: 09/05/18
Percent Solids: n/a

General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	5.3	5.0	4.0	3.6	mg/l	1	09/13/18 14:50	ST	SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 [b]	3.4	mg/l	1	09/06/18 19:26	SA	SM5210 B-11
Nitrogen, Ammonia	0.11 J	0.20	0.20	0.089	mg/l	1	09/10/18 16:02	RP	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [c]	0.15	0.11	0.11	0.093	mg/l	1	09/12/18 15:21	RP	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.15	0.10	0.10	0.090	mg/l	1	09/12/18 15:21	RP	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0050 U	0.010	0.0050	0.0030	mg/l	1	09/05/18 20:15	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.30	0.20	0.15	0.12	mg/l	1	09/13/18 12:37	BM	EPA 351.2/LACHAT
Phosphorus, Total	0.074	0.050	0.050	0.027	mg/l	1	09/11/18 15:04	LS	EPA 365.3
Solids, Total Dissolved	25.0	10	4.0	1.8	mg/l	1	09/07/18 17:30	RC	SM2540 C-11
Solids, Total Suspended	32.7	4.0	2.0	1.5	mg/l	1	09/07/18 11:40	RC	SM2540 D-11
Total Organic Carbon	11.5	1.0	1.0	0.72	mg/l	1	09/18/18 22:31	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(b) Value reported is laboratory DL (MDL).
(c) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

LOQ = Limit of Quantitation DL = Detection Limit U = Indicates a result < LOD
LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = DL (MDL) but < LOQ

Report of Analysis

Client Sample ID:	WA-2D		
Lab Sample ID:	JC73161-4F	**Date Sampled:**	09/05/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	09/05/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By	Method
Phosphorus, Total	0.031 J	0.050	0.050	0.027	mg/l	1	09/15/18 17:10	LS	EPA 365.3

LOQ = Limit of Quantitation DL = Detection Limit U = Indicates a result < LOD
LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = DL (MDL) but < LOQ

Report of Analysis

Client Sample ID: WA-3S
Lab Sample ID: JC73161-5
Matrix: AQ - Surface Water
Project: Philadelphia District, Reservoir Sampling

Date Sampled: 09/05/18
Date Received: 09/05/18
Percent Solids: n/a

General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	4.0 U	5.0	4.0	3.6	mg/l	1	09/13/18 14:50	ST	SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 [b]	3.4	mg/l	1	09/06/18 19:27	SA	SM5210 B-11
Coliform, Fecal [c]	12	4			col/100ml	4	09/05/18 20:58	SA	SM9222 D-06
Coliform, Total [c]	270	4			col/100ml	4	09/05/18 20:50	SA	SM9222 B-06
Nitrogen, Ammonia	0.20 U	0.20	0.20	0.089	mg/l	1	09/10/18 16:04	RP	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [d]	0.13	0.11	0.11	0.093	mg/l	1	09/12/18 15:22	RP	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.13	0.10	0.10	0.090	mg/l	1	09/12/18 15:22	RP	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0050 U	0.010	0.0050	0.0030	mg/l	1	09/05/18 20:15	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.30	0.20	0.15	0.12	mg/l	1	09/13/18 12:38	BM	EPA 351.2/LACHAT
Phosphorus, Total	0.28	0.050	0.050	0.027	mg/l	1	09/11/18 15:04	LS	EPA 365.3
Solids, Total Dissolved	30.0	10	4.0	1.8	mg/l	1	09/07/18 17:30	RC	SM2540 C-11
Solids, Total Suspended	1.9 J	4.0	2.0	1.5	mg/l	1	09/07/18 11:40	RC	SM2540 D-11
Total Organic Carbon	9.1	1.0	1.0	0.72	mg/l	1	09/18/18 22:43	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(b) Value reported is laboratory DL (MDL).
(c) Analysis done out of holding time.
(d) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

LOQ = Limit of Quantitation DL = Detection Limit U = Indicates a result < LOD
LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = DL (MDL) but < LOQ

Report of Analysis

Client Sample ID:	WA-3S		
Lab Sample ID:	JC73161-5F	**Date Sampled:**	09/05/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	09/05/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By	Method
Phosphorus, Total	0.060	0.050	0.050	0.027	mg/l	1	09/15/18 17:10	LS	EPA 365.3

LOQ = Limit of Quantitation DL = Detection Limit U = Indicates a result < LOD
LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = DL (MDL) but < LOQ

Report of Analysis

Client Sample ID:	WA-4S		
Lab Sample ID:	JC73161-6	**Date Sampled:**	09/05/18
Matrix:	AQ - Surface Water	**Date Received:**	09/05/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	7.4	5.0	4.0	3.6	mg/l	1	09/13/18 15:27	ST	SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 [b]	3.4	mg/l	1	09/06/18 19:29	SA	SM5210 B-11
Coliform, Fecal [c]	124	4			col/100ml	1	09/05/18 20:58	SA	SM9222 D-06
Coliform, Total [c]	136	4			col/100ml	1	09/05/18 20:50	SA	SM9222 B-06
Nitrogen, Ammonia	0.20 U	0.20	0.20	0.089	mg/l	1	09/10/18 16:08	RP	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [d]	0.12	0.11	0.11	0.093	mg/l	1	09/12/18 15:23	RP	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.12	0.10	0.10	0.090	mg/l	1	09/12/18 15:23	RP	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0050 U	0.010	0.0050	0.0030	mg/l	1	09/05/18 20:15	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.28	0.20	0.15	0.12	mg/l	1	09/13/18 12:39	BM	EPA 351.2/LACHAT
Phosphorus, Total	0.043 J	0.050	0.050	0.027	mg/l	1	09/11/18 15:04	LS	EPA 365.3
Solids, Total Dissolved	30.0	10	4.0	1.8	mg/l	1	09/07/18 17:30	RC	SM2540 C-11
Solids, Total Suspended	1.9 J	4.0	2.0	1.5	mg/l	1	09/07/18 11:40	RC	SM2540 D-11
Total Organic Carbon	7.9	1.0	1.0	0.72	mg/l	1	09/18/18 22:54	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(b) Value reported is laboratory DL (MDL).
(c) Analysis done out of holding time.
(d) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

LOQ = Limit of Quantitation DL = Detection Limit U = Indicates a result < LOD
LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = DL (MDL) but < LOQ

Report of Analysis

Client Sample ID:	WA-4S		
Lab Sample ID:	JC73161-6F	**Date Sampled:**	09/05/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	09/05/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By	Method
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	09/15/18 17:10	LS	EPA 365.3

LOQ = Limit of Quantitation DL = Detection Limit U = Indicates a result < LOD
LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = DL (MDL) but < LOQ

Report of Analysis

Client Sample ID:	WA-5S		
Lab Sample ID:	JC73161-7	**Date Sampled:**	09/05/18
Matrix:	AQ - Surface Water	**Date Received:**	09/05/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	4.0 U	5.0	4.0	3.6	mg/l	1	09/13/18 15:27	ST	SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 [b]	3.4	mg/l	1	09/06/18 19:31	SA	SM5210 B-11
Coliform, Fecal [c]	16	4			col/100ml	1	09/05/18 20:58	SA	SM9222 D-06
Coliform, Total [c]	4	4			col/100ml	4	09/05/18 20:50	SA	SM9222 B-06
Nitrogen, Ammonia	0.20 U	0.20	0.20	0.089	mg/l	1	09/10/18 16:09	RP	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [d]	0.11 U	0.11	0.11	0.093	mg/l	1	09/12/18 15:25	RP	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.10 U	0.10	0.10	0.090	mg/l	1	09/12/18 15:25	RP	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0050 U	0.010	0.0050	0.0030	mg/l	1	09/05/18 20:45	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.19 J	0.20	0.15	0.12	mg/l	1	09/13/18 12:39	BM	EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	09/12/18 17:25	LS	EPA 365.3
Solids, Total Dissolved	20.0	10	4.0	1.8	mg/l	1	09/07/18 17:30	RC	SM2540 C-11
Solids, Total Suspended	2.0 U	4.0	2.0	1.5	mg/l	1	09/07/18 11:40	RC	SM2540 D-11
Total Organic Carbon	6.0	1.0	1.0	0.72	mg/l	1	09/18/18 23:05	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(b) Value reported is laboratory DL (MDL).
(c) Analysis done out of holding time.
(d) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

LOQ = Limit of Quantitation DL = Detection Limit U = Indicates a result < LOD
LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = DL (MDL) but < LOQ

Report of Analysis

Client Sample ID:	WA-5S		
Lab Sample ID:	JC73161-7F	**Date Sampled:**	09/05/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	09/05/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By	Method
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	09/15/18 17:25	LS	EPA 365.3

LOQ = Limit of Quantitation DL = Detection Limit U = Indicates a result < LOD
LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = DL (MDL) but < LOQ

Report of Analysis

Client Sample ID: WA-6S
Lab Sample ID: JC73161-8
Matrix: AQ - Surface Water
Project: Philadelphia District, Reservoir Sampling

Date Sampled: 09/05/18
Date Received: 09/05/18
Percent Solids: n/a

General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	4.8 J	5.0	4.0	3.6	mg/l	1	09/13/18 15:27	ST	SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 [b]	3.4	mg/l	1	09/06/18 19:33	SA	SM5210 B-11
Coliform, Fecal [c]	0	0			col/100ml	1	09/05/18 20:58	SA	SM9222 D-06
Coliform, Total [c]	124	4			col/100ml	4	09/05/18 20:50	SA	SM9222 B-06
Nitrogen, Ammonia	0.20 U	0.20	0.20	0.089	mg/l	1	09/10/18 16:11	RP	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [d]	0.11 U	0.11	0.11	0.093	mg/l	1	09/12/18 15:28	RP	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.10 U	0.10	0.10	0.090	mg/l	1	09/12/18 15:28	RP	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0050 U	0.010	0.0050	0.0030	mg/l	1	09/05/18 20:45	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.34	0.20	0.15	0.12	mg/l	1	09/13/18 12:40	BM	EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	09/12/18 17:25	LS	EPA 365.3
Solids, Total Dissolved	23.3	10	4.0	1.8	mg/l	1	09/07/18 17:30	RC	SM2540 C-11
Solids, Total Suspended	1.5 J	4.0	2.0	1.5	mg/l	1	09/07/18 11:40	RC	SM2540 D-11
Total Organic Carbon	8.4	1.0	1.0	0.72	mg/l	1	09/19/18 00:01	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(b) Value reported is laboratory DL (MDL).
(c) Analysis done out of holding time.
(d) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

LOQ = Limit of Quantitation DL = Detection Limit U = Indicates a result < LOD
LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = DL (MDL) but < LOQ

Report of Analysis

Client Sample ID:	WA-6S		
Lab Sample ID:	JC73161-8F	**Date Sampled:**	09/05/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	09/05/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By	Method
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	09/15/18 17:25	LS	EPA 365.3

LOQ = Limit of Quantitation DL = Detection Limit U = Indicates a result < LOD
LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = DL (MDL) but < LOQ

Report of Analysis

Client Sample ID: WA-6M
Lab Sample ID: JC73161-9
Matrix: AQ - Surface Water
Project: Philadelphia District, Reservoir Sampling

Date Sampled: 09/05/18
Date Received: 09/05/18
Percent Solids: n/a

General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	4.0 U	5.0	4.0	3.6	mg/l	1	09/13/18 15:27	ST	SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 [b]	3.4	mg/l	1	09/06/18 19:35	SA	SM5210 B-11
Nitrogen, Ammonia	0.20 U	0.20	0.20	0.089	mg/l	1	09/10/18 16:12	RP	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [c]	0.11 U	0.11	0.11	0.093	mg/l	1	09/12/18 15:29	RP	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.10 U	0.10	0.10	0.090	mg/l	1	09/12/18 15:29	RP	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0050 U	0.010	0.0050	0.0030	mg/l	1	09/05/18 20:45	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.27	0.20	0.15	0.12	mg/l	1	09/13/18 12:41	BM	EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	09/12/18 17:25	LS	EPA 365.3
Solids, Total Dissolved	20.0	10	4.0	1.8	mg/l	1	09/07/18 17:30	RC	SM2540 C-11
Solids, Total Suspended	2.0 U	4.0	2.0	1.5	mg/l	1	09/07/18 11:40	RC	SM2540 D-11
Total Organic Carbon	8.2	1.0	1.0	0.72	mg/l	1	09/19/18 00:12	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(b) Value reported is laboratory DL (MDL).
(c) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

LOQ = Limit of Quantitation DL = Detection Limit U = Indicates a result < LOD
LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = DL (MDL) but < LOQ

Report of Analysis

Client Sample ID:	WA-6M		
Lab Sample ID:	JC73161-9F	**Date Sampled:**	09/05/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	09/05/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By	Method
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	09/15/18 17:25	LS	EPA 365.3

LOQ = Limit of Quantitation DL = Detection Limit U = Indicates a result < LOD
LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = DL (MDL) but < LOQ

Report of Analysis

Client Sample ID:	WA-6D		
Lab Sample ID:	JC73161-10	**Date Sampled:**	09/05/18
Matrix:	AQ - Surface Water	**Date Received:**	09/05/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	3.7 J	5.0	4.0	3.6	mg/l	1	09/13/18 15:27	ST	SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 [b]	3.4	mg/l	1	09/06/18 19:37	SA	SM5210 B-11
Nitrogen, Ammonia	0.20 U	0.20	0.20	0.089	mg/l	1	09/10/18 16:14	RP	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [c]	0.11 U	0.11	0.11	0.093	mg/l	1	09/12/18 15:30	RP	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.10 U	0.10	0.10	0.090	mg/l	1	09/12/18 15:30	RP	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0050 U	0.010	0.0050	0.0030	mg/l	1	09/05/18 20:45	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.27	0.20	0.15	0.12	mg/l	1	09/13/18 12:42	BM	EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	09/12/18 17:25	LS	EPA 365.3
Solids, Total Dissolved	20.0	10	4.0	1.8	mg/l	1	09/07/18 17:30	RC	SM2540 C-11
Solids, Total Suspended	7.2	4.0	2.0	1.5	mg/l	1	09/07/18 11:40	RC	SM2540 D-11
Total Organic Carbon	7.8	1.0	1.0	0.72	mg/l	1	09/19/18 00:23	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(b) Value reported is laboratory DL (MDL).
(c) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

LOQ = Limit of Quantitation DL = Detection Limit U = Indicates a result < LOD
LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = DL (MDL) but < LOQ

Report of Analysis

Client Sample ID:	WA-6D		
Lab Sample ID:	JC73161-10F	**Date Sampled:**	09/05/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	09/05/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By	Method
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	09/15/18 17:25	LS	EPA 365.3

LOQ = Limit of Quantitation DL = Detection Limit U = Indicates a result < LOD
LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = DL (MDL) but < LOQ

Report of Analysis

Client Sample ID: WA-7S
Lab Sample ID: JC73161-11
Matrix: AQ - Surface Water
Project: Philadelphia District, Reservoir Sampling

Date Sampled: 09/05/18
Date Received: 09/05/18
Percent Solids: n/a

General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	5.8	5.0	4.0	3.6	mg/l	1	09/13/18 15:27	ST	SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 [b]	3.4	mg/l	1	09/06/18 19:39	SA	SM5210 B-11
Coliform, Fecal [c]	0	0			col/100ml	1	09/05/18 20:58	SA	SM9222 D-06
Coliform, Total [c]	84	4			col/100ml	4	09/05/18 20:50	SA	SM9222 B-06
Nitrogen, Ammonia	0.20 U	0.20	0.20	0.089	mg/l	1	09/10/18 16:15	RP	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [d]	0.11 U	0.11	0.11	0.093	mg/l	1	09/12/18 15:31	RP	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.10 U	0.10	0.10	0.090	mg/l	1	09/12/18 15:31	RP	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0050 U	0.010	0.0050	0.0030	mg/l	1	09/05/18 20:45	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.35	0.20	0.15	0.12	mg/l	1	09/13/18 12:44	BM	EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	09/12/18 17:25	LS	EPA 365.3
Solids, Total Dissolved	73.3	10	4.0	1.8	mg/l	1	09/07/18 17:30	RC	SM2540 C-11
Solids, Total Suspended	1.8 J	4.0	2.0	1.5	mg/l	1	09/07/18 11:40	RC	SM2540 D-11
Total Organic Carbon	8.3	1.0	1.0	0.72	mg/l	1	09/19/18 01:05	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(b) Value reported is laboratory DL (MDL).
(c) Analysis done out of holding time.
(d) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

LOQ = Limit of Quantitation DL = Detection Limit U = Indicates a result < LOD
LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = DL (MDL) but < LOQ

Report of Analysis

Client Sample ID:	WA-7S		
Lab Sample ID:	JC73161-11F	**Date Sampled:**	09/05/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	09/05/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By	Method
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	09/15/18 17:25	LS	EPA 365.3

LOQ = Limit of Quantitation DL = Detection Limit U = Indicates a result < LOD
LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = DL (MDL) but < LOQ

Report of Analysis

Client Sample ID:	WA-7M		
Lab Sample ID:	JC73161-12	**Date Sampled:**	09/05/18
Matrix:	AQ - Surface Water	**Date Received:**	09/05/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	5.8	5.0	4.0	3.6	mg/l	1	09/13/18 15:27	ST	SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 [b]	3.4	mg/l	1	09/06/18 19:40	SA	SM5210 B-11
Nitrogen, Ammonia	0.20 U	0.20	0.20	0.089	mg/l	1	09/10/18 16:17	RP	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [c]	0.15	0.11	0.11	0.093	mg/l	1	09/12/18 15:32	RP	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.15	0.10	0.10	0.090	mg/l	1	09/12/18 15:32	RP	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0050 U	0.010	0.0050	0.0030	mg/l	1	09/05/18 20:45	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.38	0.20	0.15	0.12	mg/l	1	09/13/18 12:45	BM	EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	09/12/18 17:30	LS	EPA 365.3
Solids, Total Dissolved	23.3	10	4.0	1.8	mg/l	1	09/07/18 17:30	RC	SM2540 C-11
Solids, Total Suspended	2.3 J	4.0	2.0	1.5	mg/l	1	09/07/18 11:40	RC	SM2540 D-11
Total Organic Carbon	8.8	1.0	1.0	0.72	mg/l	1	09/19/18 02:01	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(b) Value reported is laboratory DL (MDL).
(c) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

LOQ = Limit of Quantitation DL = Detection Limit U = Indicates a result < LOD
LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = DL (MDL) but < LOQ

Report of Analysis

Client Sample ID:	WA-7M		
Lab Sample ID:	JC73161-12F	**Date Sampled:**	09/05/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	09/05/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By	Method
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	09/15/18 17:25	LS	EPA 365.3

LOQ = Limit of Quantitation DL = Detection Limit U = Indicates a result < LOD
LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = DL (MDL) but < LOQ

Report of Analysis

Client Sample ID:	WA-7D		
Lab Sample ID:	JC73161-13	**Date Sampled:**	09/05/18
Matrix:	AQ - Surface Water	**Date Received:**	09/05/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	5.3	5.0	4.0	3.6	mg/l	1	09/13/18 15:27	ST	SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 [b]	3.4	mg/l	1	09/06/18 19:42	SA	SM5210 B-11
Nitrogen, Ammonia	0.20 U	0.20	0.20	0.089	mg/l	1	09/10/18 16:31	RP	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [c]	0.13	0.11	0.11	0.093	mg/l	1	09/12/18 15:41	RP	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.13	0.10	0.10	0.090	mg/l	1	09/12/18 15:41	RP	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0050 U	0.010	0.0050	0.0030	mg/l	1	09/05/18 20:45	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.35	0.20	0.15	0.12	mg/l	1	09/13/18 12:46	BM	EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	09/12/18 17:30	LS	EPA 365.3
Solids, Total Dissolved	20.0	10	4.0	1.8	mg/l	1	09/07/18 17:30	RC	SM2540 C-11
Solids, Total Suspended	34.3	4.0	2.0	1.5	mg/l	1	09/07/18 11:40	RC	SM2540 D-11
Total Organic Carbon	8.9	1.0	1.0	0.72	mg/l	1	09/19/18 02:12	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(b) Value reported is laboratory DL (MDL).
(c) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

LOQ = Limit of Quantitation DL = Detection Limit U = Indicates a result < LOD
LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = DL (MDL) but < LOQ

Report of Analysis

Client Sample ID:	WA-7D		
Lab Sample ID:	JC73161-13F	**Date Sampled:**	09/05/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	09/05/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By	Method
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	09/15/18 17:25	LS	EPA 365.3

LOQ = Limit of Quantitation DL = Detection Limit U = Indicates a result < LOD
LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = DL (MDL) but < LOQ

Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody

SGS

SW

CHAIN OF CUSTODY

IMPULSE

SGS North America Inc. - Dayton
2235 Route 130, Dayton, NJ 08810
TEL. 732-329-0200 FAX 732-329-3499
www.sgs.com/ehsusa

5/9/18

FED-EX Tracking #

Bottle Order Control # PD-08318-113

SGS Quote # 13

SGS Job # JC73161

Client / Reporting Information

Company Name: USACE-Philadelphia District

Street Address: 100 Penn Sq. East

City / State / Zip: Philadelphia, PA 19107

Project Contact / E-mail: Joe Loeper

Phone # / Fax #: 215-656-6545

Sampler(s) Name(s) / Phone #: Greg Wacik 610.597.9750

Project Information

Project Name: USACE - Francis E. Walter Reservoir

Street:

City / State: White Haven PA

Project #: PD-08318-113

Client Purchase Order #:

Project Manager:

Billing Information (if different from Report to)

Company Name:

Street Address:

City / State / Zip:

Attention:

Requested Analysis (see TEST CODE sheet)

Lab Sample #	Field ID / Point of Collection	MEOH/DI Vial #	Collection Date	Collection Time	Sampled by	Matrix	# of bottles	Number of preserved bottles: HCl	NaOH	HNO3	H2SO4	NONE	DI Water	MEOH	ENCORE	46233203	AIK, AMN, BOD, TDS	TOC, TSS, TP04 (Total Phosphate)	TKN, XN030 (TKN/TP04 Bottle)	TP04 (dissolved lab filter)	FCF, TCF	LAB USE ONLY
1F	WA-1S		9/5/18	1015	GW	SW	11	X			X				X	X	X	X	X	X	X	
2F	WA-2S			0730			11	X			X				X	X	X	X	X	X	X	633
3F	WA-2M			0730			9	X			X					X	X	X	X			M20
4F	WA-2D			0730			9	X			X					X	X	X	X			M12
5F	WA-3S			1045			11	X			X				X	X	X	X	X	X	X	637
6F	WA-4S			1100			11	X			X				X	X	X	X	X	X	X	646 TY
7F	WA-5S			1115			11	X			X				X	X	X	X	X	X	X	1914
8F	WA-6S			0815			11	X			X				X	X	X	X	X	X	X	
9F	WA-6M			0815			9	X			X					X	X	X	X			
10F	WA-6D			0815			9	X			X					X	X	X	X			

Turnaround Time (Business days)

- Std. 10 Business Days
- 5 Day RUSH
- 3 Day RUSH
- 2 Day RUSH
- 1 Day RUSH
- other

Approved by (SGS Project Manager)/Date:

INITIAL ASESSMENT 5/9 GE

LABEL VERIFICATION

Emergency & Rush T/A data available via LabLink

Data Deliverable Information

- Commercial "A" (Level 1)
- Commercial "B" (Level 2)
- FULLT1 (Level 3+4)
- NJ Reduced
- Commercial "C"
- NJ Data of Known Quality Protocol Reporting
- NYASP Category A
- NYASP Category B
- State Forms
- EDD Format
- Other

Commercial "A" = Results Only; Commercial "B" = Results + QC Summary

NJ Reduced = Results + QC Summary + Partial Raw data

Comments / Special Instructions

One TSS Bottle NOT filled, One XN030 Bottle NOT used, TP04 dissolved lab filter. XN030 combined with TP04/TKN Bottle

Sample inventory is verified upon receipt in the Laboratory

Sample Custody must be documented below each time samples change possession, including courier delivery.

	Relinquished by Sampler:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
1		9/5/18 1630	Wanda Smith Impulse	Wanda Smith Impulse	9/5/18 18:45	
2						
3						
4						
5						

Custody Seal # ☐ Intact ☐ Not intact

Preserved where applicable ☐

On Ice ☐

Cooler Temp. 4.1, 3.9, 3.2, 2.6, 1.7, 2.9, 3.4

Form:SM088-03C (revised 2/12/18)

http://www.sgs.com/en/terms-and-conditions

SGS

CHAIN OF CUSTODY

PAGE 2 OF 2

SGS North America Inc. - Dayton
2235 Route 130, Dayton, NJ 08810
TEL. 732-329-0200 FAX 732-329-3499
www.sgs.com/ehsusa

FED-EX Tracking #:
Bottle Order Control #:
SGS Quote #:
SGS Job #: JC73161

Client / Reporting Information

Company Name: USACE Philadelphia District
Street Address: 100 Penn Square East
City, State, Zip: Philadelphia, PA 19107
Project Contact: Joe Leper
E-mail:
Phone #: 215-656-6545
Fax #:
Sampler(s) Name(s): Greg Wacik
Phone #: 610-597-9780

Project Information

Project Name: USACE - Francis E. Walter Reservoir
Street:
City: White Haven
State: PA
Project #: PD-08318-113
Client Purchase Order #:
Project Manager:

Billing Information (If different from Report to)
Company Name:
Street Address:
City: State: Zip:
Attention:

Requested Analysis (see TEST CODE sheet)

Matrix Codes: DW - Drinking Water, GW - Ground Water, WW - Water, SW - Surface Water, SO - Soil, SL- Sludge, SED-Sediment, OI - Oil, LIQ - Other Liquid, AIR - Air, SOL - Other Solid, WP - Wipe, FB-Field Blank, EB-Equipment Blank, RB- Rinse Blank, TB-Trip Blank

Lab Sample #	Field ID / Point of Collection	MEOH/DI Vial #	Collection Date	Collection Time	Sampled by	Matrix	# of bottles	HCl	NaOH	HNO3	H2SO4	NONE	DI Water	MEOH	ENCORE	$Na_2S_2O_3$	Alk, AMN, BOD, TDS	TOC, TSS, TPO4 (Total Phosphorus)	TKN, XX030 (TKN/TPO4 Bottle)	TPO4 (dissolved lab Filter)	FCF, TCF								LAB USE ONLY
11F	WA-7S		9/5/18	0850	[initials]	SW	11	X			X					X	X	X	X	X	X								
12F	WA-7M		9/5/18	0850	[initials]	SW	9	X			X						X	X	X	X									
13F	WA-7D		9/5/18	0850	[initials]	SW	9	X			X						X	X	X	X									

Turnaround Time (Business days)

- ☐ Std. 10 Business Days
- ☐ 5 Day RUSH
- ☐ 3 Day RUSH
- ☐ 2 Day RUSH
- ☐ 1 Day RUSH
- ☐ other

Approved by (SGS Project Manager)/Date:

Emergency & Rush T/A data available via LabLink

Data Deliverable Information

- ☐ Commercial "A" (Level 1)
- ☐ Commercial "B" (Level 2)
- ☐ FULLT1 (Level 3+4)
- ☐ NJ Reduced
- ☐ Commercial "C"
- ☐ NJ Data of Known Quality Protocol Reporting
- ☐ NYASP Category A
- ☐ NYASP Category B
- ☐ State Forms
- ☐ EDD Format
- ☐ Other

Commercial "A" = Results Only; Commercial "B" = Results + QC Summary
NJ Reduced = Results + QC Summary + Partial Raw data

Comments / Special Instructions

One TSS Bottle not filled. One XX030 Bottle not used. TPO4 dissolved lab filter. XX030 combined with TPO4/TKN Bottle

Sample inventory is verified upon receipt in the Laboratory

Sample Custody must be documented below each time samples change possession, including courier delivery.

Relinquished by Sampler:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
1 [signature]	9/5/18 1330	1 Wanda Amaral Impulse Sfe	2 Wanda Amaral Impulse	9/5/18 18:45	2 Laurgia Clark
3		3	4		4
5		5	Custody Seal #	☐ Intact ☐ Not intact	Preserved where applicable ☐

On Ice ☑ Cooler Temp. 4.1, 3.9, 3.2, 2.6, 1.7, 2.9, 3.4

Form:SM088-03C (revised 2/12/18)

http://www.sgs.com/en/terms-and-conditions

JC73161: Chain of Custody
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SGS Sample Receipt Summary

Job Number: JC73161 **Client:** USACE-PHILADELPHIA DISTRICT **Project:** PHILADELPHIA DISTRICT, RESERVOIR SAMPL

Date / Time Received: 9/5/2018 6:45:00 PM **Delivery Method:** Accutest Courier **Airbill #'s:**

Cooler Temps (Raw Measured) °C: Cooler 1: (4.1); Cooler 2: (3.9); Cooler 3: (3.2); Cooler 4: (2.6); Cooler 5: (1.7); Cooler 6: (2.9); Cooler 7: (3.4);

Cooler Temps (Corrected) °C: Cooler 1: (3.5); Cooler 2: (3.3); Cooler 3: (2.6); Cooler 4: (2.0); Cooler 5: (1.1); Cooler 6: (2.3); Cooler 7: (2.8);

Cooler Security	Y	or	N		Y	or	N
1. Custody Seals Present:	☑		☐	3. COC Present:	☑		☐
2. Custody Seals Intact:	☑		☐	4. Smpl Dates/Time OK	☑		☐

Cooler Temperature	Y	or	N
1. Temp criteria achieved:	☑		☐
2. Cooler temp verification:	IR Gun		
3. Cooler media:	Ice (Bag)		
4. No. Coolers:	7		

Quality Control Preservation	Y	or	N	N/A
1. Trip Blank present / cooler:	☐		☑	☐
2. Trip Blank listed on COC:	☐		☑	☐
3. Samples preserved properly:	☑		☐	
4. VOCs headspace free:	☐		☐	☑

Sample Integrity - Documentation	Y	or	N
1. Sample labels present on bottles:	☑		☐
2. Container labeling complete:	☑		☐
3. Sample container label / COC agree:	☑		☐

Sample Integrity - Condition	Y	or	N
1. Sample recvd within HT:	☐		☑
2. All containers accounted for:	☑		☐
3. Condition of sample:	Intact		

Sample Integrity - Instructions	Y	or	N	N/A
1. Analysis requested is clear:	☑		☐	
2. Bottles received for unspecified tests	☐		☑	
3. Sufficient volume recvd for analysis:	☑		☐	
4. Compositing instructions clear:	☐		☐	☑
5. Filtering instructions clear:	☐		☐	☑

Test Strip Lot #s: pH 1-12: 216017 pH 12+: 208717 Other: (Specify)

Comments: All samples: TCF/FCF volumes received outside of hold time.

SM089-02 Rev. Date 12/1/16

Responded to by: Pete Dobi Response Date: 9/6/18

Please proceed with analysis. TCF and FCF have 30 hour hold time for this project per Joseph Loeper.

JC73161: Chain of Custody
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