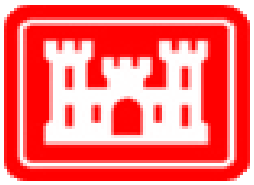
2018 WATER QUALITY MONITORING PROMPTON RESERVOIR PROMPTON, PENNSYLVANIA



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

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2018 Water Quality Monitoring
Prompton Reservoir
Prompton, Pennsylvania

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1.0 INTRODUCTION

1.1 PURPOSE OF THE MONITORING PROGRAM

The U.S. Army Corps of Engineers (USACE) manages Prompton Reservoir located in northeastern Pennsylvania within the Delaware River Basin. Prompton Reservoir provides flood control to downstream communities on the Lackawaxen River. Additionally, the reservoir provides important habitat for fish, waterfowl, and other wildlife, and recreational opportunities through fishing and boating. Because of the broad range of uses and demands that Prompton Reservoir serves, the USACE monitors water quality to compare with state water quality standards and to diagnose other problems that commonly effect reservoir health such as nutrient enrichment and toxic loadings. This report summarizes the results of monthly water quality monitoring at Prompton Reservoir for June to September 2018.

1.2 DESCRIPTION OF PROMPTON RESERVOIR

Prompton Reservoir was designed to provide flood control to downstream communities along the Lackawaxen River. A second authorized project purpose is recreation. The reservoir is located about 3 miles northwest of Honesdale, Pennsylvania, and dams a drainage area of 59.7 square miles. The primary surface water input to Prompton Reservoir originates from the West Branch of the Lackawaxen River. The reservoir is approximately 3 miles long and is about 30 feet deep at the face of the dam near the township of Prompton, Pennsylvania.

1.3 ELEMENTS OF THE STUDY

The USACE, Philadelphia District, has been monitoring water quality of Prompton Reservoir since 1975. Over this time, the yearly monitoring designs have evolved to address new concerns such as health of public drinking water and contamination of sediments. The 2018 monitoring program follows that in most recent years and includes the following major elements:

- Monthly water quality monitoring of reservoir and tributaries - to evaluate compliance with Pennsylvania state water quality standards and potential public health concerns; and

- Monthly profile samples for temperature, dissolved oxygen, chlorophyll, pH, turbidity, and conductivity at all stations in the reservoir and watershed.

2.0 METHODS

2.1 PHYSICAL STRATIFICATION MONITORING

Physical stratification monitoring of the water column at Prompton Reservoir was conducted five times between 27 June and 05 September 2018 (Table 2-1). Physical stratification parameters included temperature, dissolved oxygen (DO), pH, turbidity, and conductivity. Monitoring was conducted at four fixed stations located throughout the Prompton Reservoir watershed (Fig. 2-1). Surface water quality was monitored upstream of the lake at station PR-1S and downstream of the dam at station PR-4S (Fig. 2-1). Stations within the reservoir, PR-2 and PR-3, were monitored at 5-foot intervals from the surface to the bottom. All water quality parameters were measured with a calibrated YSI 6600 V2-4 water quality meter.

The results of stratification monitoring were compared to water quality standards authorized by the Pennsylvania Department of Environmental Protection (PADEP: Chapter 93 Water Quality Standards, 2000), where applicable. The water quality standard for DO is a minimum concentration of 5 mg/L and that for pH is an acceptable range from 6 to 9. 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 of the water column at Prompton Reservoir was conducted five times between 27 June and 05 September 2018 (Table 2-1). Water samples were collected at four fixed stations within the reservoir watershed (Fig. 2-1). Surface water samples were collected at stations upstream (PR-1S) and downstream (PR-4S) of the reservoir. Surface, middle, and bottom water samples were collected at main reservoir body stations (PR-2 and PR-3). Surface water samples were collected by opening the sample containers approximately 1 foot below the water's surface. Middle and bottom water samples were collected with a Van Dorn design horizontal water sampler.

Water samples from all depths were analyzed for ammonia (NH3), nitrite (NO2), nitrate (NO3), total kjeldahl nitrogen (TKN), soluble dissolved phosphorus (DP), total phosphorus (TP), total dissolved solids (TDS), total suspended solids (TSS), biochemical oxygen demand (BOD), alkalinity (ALK) and total organic carbon (TOC). Table 2-2 summarizes the water quality parameters, laboratory methods and reporting detection limits, state water quality standards, and allowable maximum hold times for each during the 2018 monitoring period. Laboratory reporting and custody sheets are provided in Appendix B.

Table 2-1. Prompton Reservoir water quality monitoring schedule for 2018

Date of Sample Collection	Physical Stratification Monitoring (All Stations)	Water Column Chemistry Monitoring (All Stations)	Trophic State Determination (PR-3)	Coliform Bacteria Monitoring (All Surface Stations)
27 June	X	X	X	X
11 July	X	X	X	X
26 July	X	X	X	X
14 August	X	X	X	X
05 September	X	X	X	X

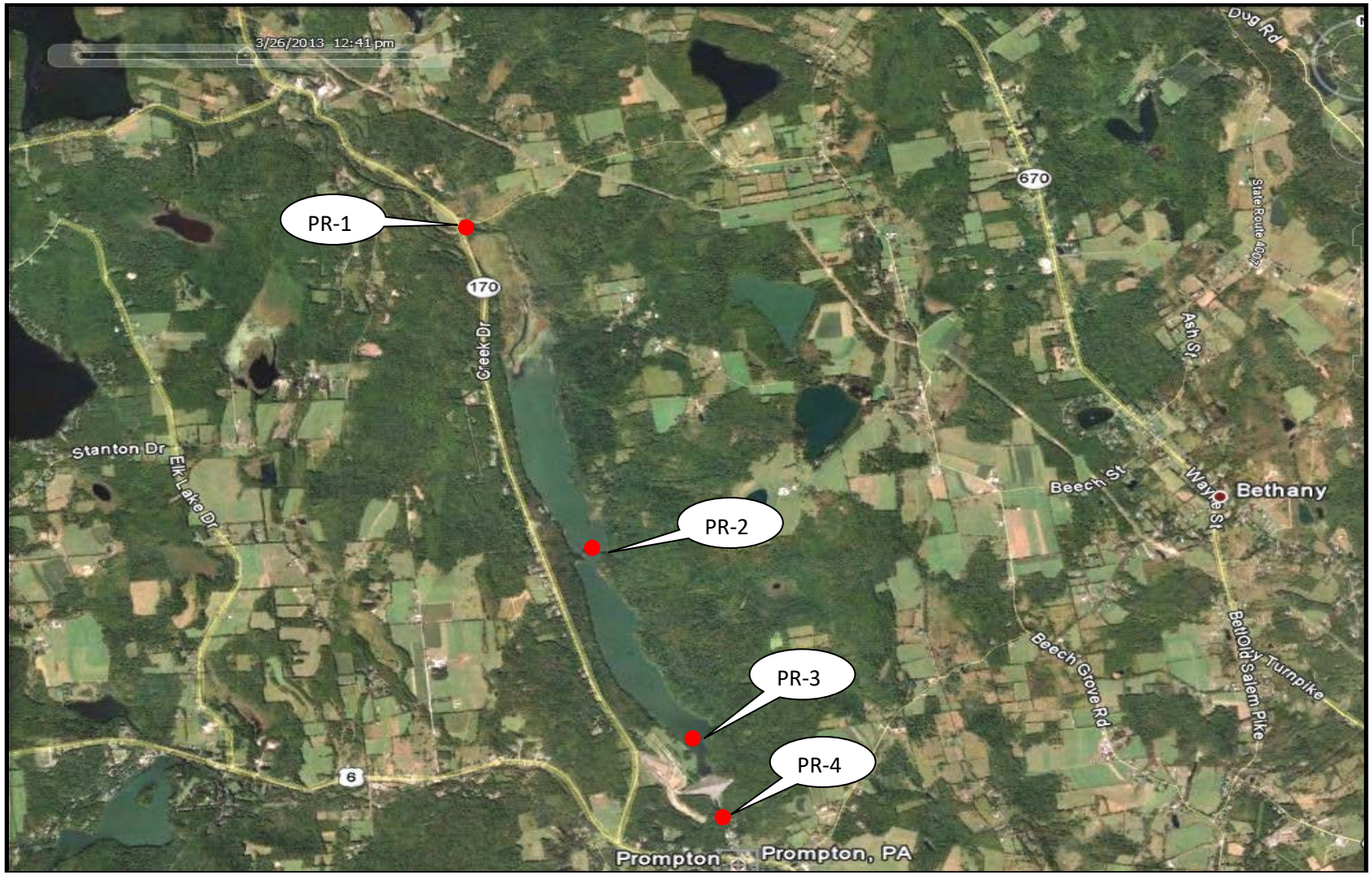

Figure 2-1. Location map for Prompton Reservoir and water quality monitoring stations in 2018.

Table 2-2. Water quality test methods, detection limits, state regulatory criteria, and sample holding times for water quality parameters monitored at Prompton 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 Prompton Reservoir was determined by methods outlined by Carlson (1977) and EPA (1983). In general, these methods calculate trophic state indices (TSIs) independently for measures of total phosphorus, chlorophyll *a*, and secchi disk depth. Surface water measures of total phosphorus and chlorophyll *a* from chemistry monitoring were used independently in the calculations of monthly TSIs (Table-2-1). Secchi disk depth was measured monthly at station PR-3 and used for the TSI calculation. Trophic state determinations were calculated only for Station PR-3 within the reservoir.

2.4 RESERVOIR BACTERIA MONITORING

Monitoring for coliform bacteria contaminants was conducted at Prompton Reservoir five times between 27 June and 05 September 2018. Surface water samples were collected in the same manner as for chemical parameter samples, and analyzed for total coliform 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 Prompton 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 Prompton reservoir 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 standards, and sample holding times for bacteria parameters monitored at Prompton Reservoir in 2018.

Parameter	Total Coliform	Fecal Coliform
Test method	SM 9223 B-06	SM 9222 D-06
Limit of Quantification	10 clns/100-mls	10 clns/100-mls
PADEP standard	None	Geometric mean < 200 clns/100-mls or a single sample reading of < 1000 clns/100-mls
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 summarize the results of water quality monitoring for physical and chemical parameters: temperature, dissolved oxygen (DO), and pH. For each parameter, seasonal and spatial patterns of surface water quality measured throughout the watershed, and seasonal and depth related patterns of the lake water column based on measures from the deepest portion of the reservoir (station PR-3) are described. The discussion on stratification is focused on station PR-3 as water quality problems related to depth are generally most severe in deeper water habitats, thus the evaluation will be a conservative one. All of the physical/chemical parameters were measured with a calibrated YSI 6600 V2-4 water quality monitoring probe and are 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 stratification patterns naturally occurring in lakes affect the distribution of dissolved and suspended compounds.

Temperature of the tributary and downstream surface waters of Prompton Reservoir were influenced by seasonal weather patterns and in lake thermal warming patterns during 2018. Maximum temperatures were recorded during the two July sampling (Fig. 3-1). Upstream tributary temperatures at station PR-1S were generally cooler than downstream release temperatures throughout most of the sampling season with an average temperature of 19.57°C and ranged from 16.06°C in June to 21.93°C in early July. Downstream temperatures at station PR-4S averaged 21.58°C and ranged from 19.96°C in June to 23.59°C in late July. The warmer downstream temperatures likely result from thermally warmed waters being released from the reservoir.

The surface water temperatures (0-5 feet) of the reservoir were generally greater than the upstream station PR-1S as a result of in-lake thermal warming. Surface temperatures for the sampling period at reservoir body station PR-3, near the outlet works of the dam, averaged 24.65°C and ranged from 29.96°C in September to 21.40°C in August. Prompton Reservoir was stratified with respect to temperature in 2018 (Fig. 3-2). In June, the onset of stratification was observed with the surface temperature (22.14°C) approximately 11.23°C warmer than the lower water column (10.91°C). The onset of de-stratification was evident in early September.

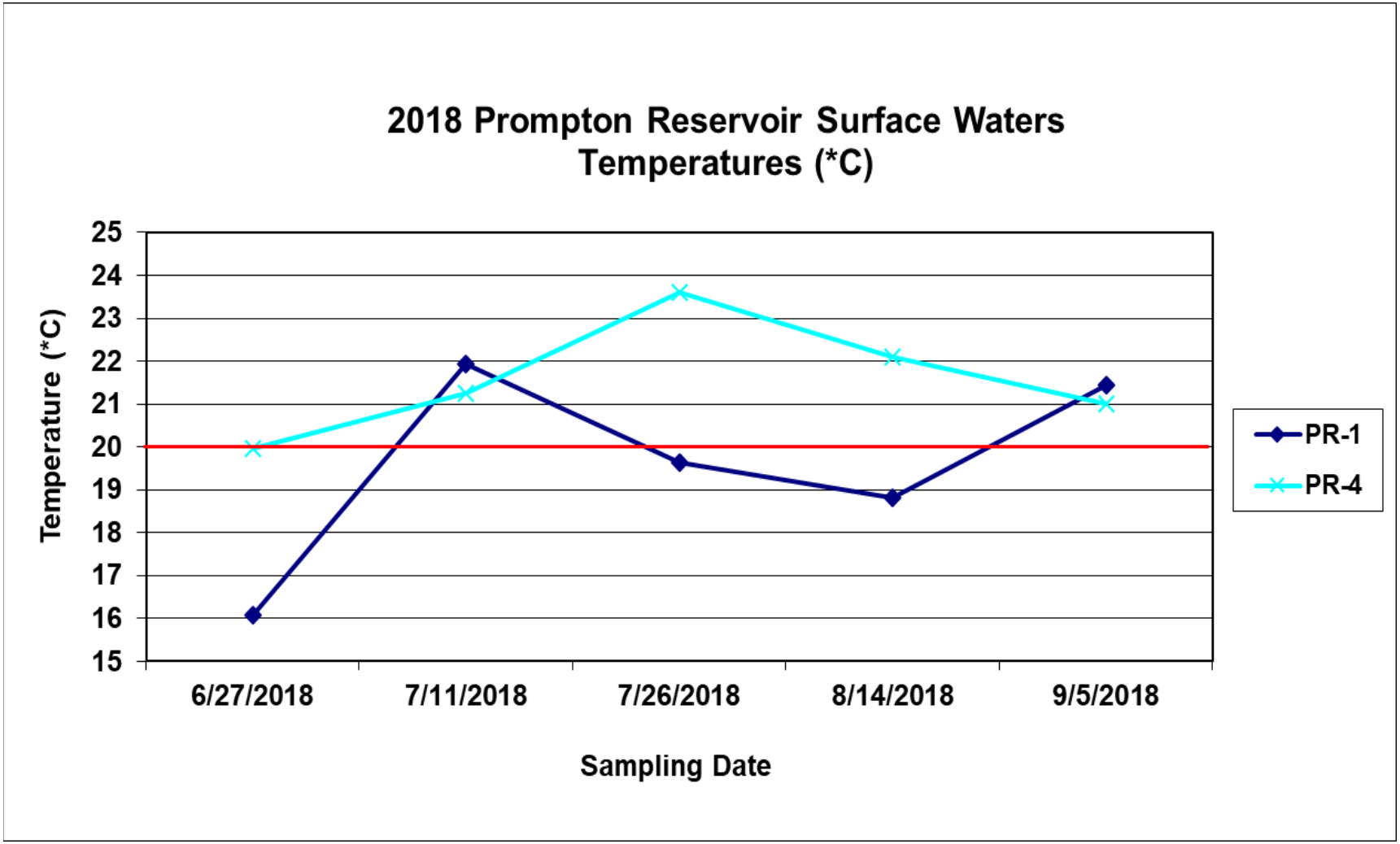

Figure 3-1. Temperature in tributary and outflow surface waters of Prompton Reservoir during 2018. See Appendix A for a summary of plotted values. The coldwater species preference temperature of 20°C is shown as a red line comparison.

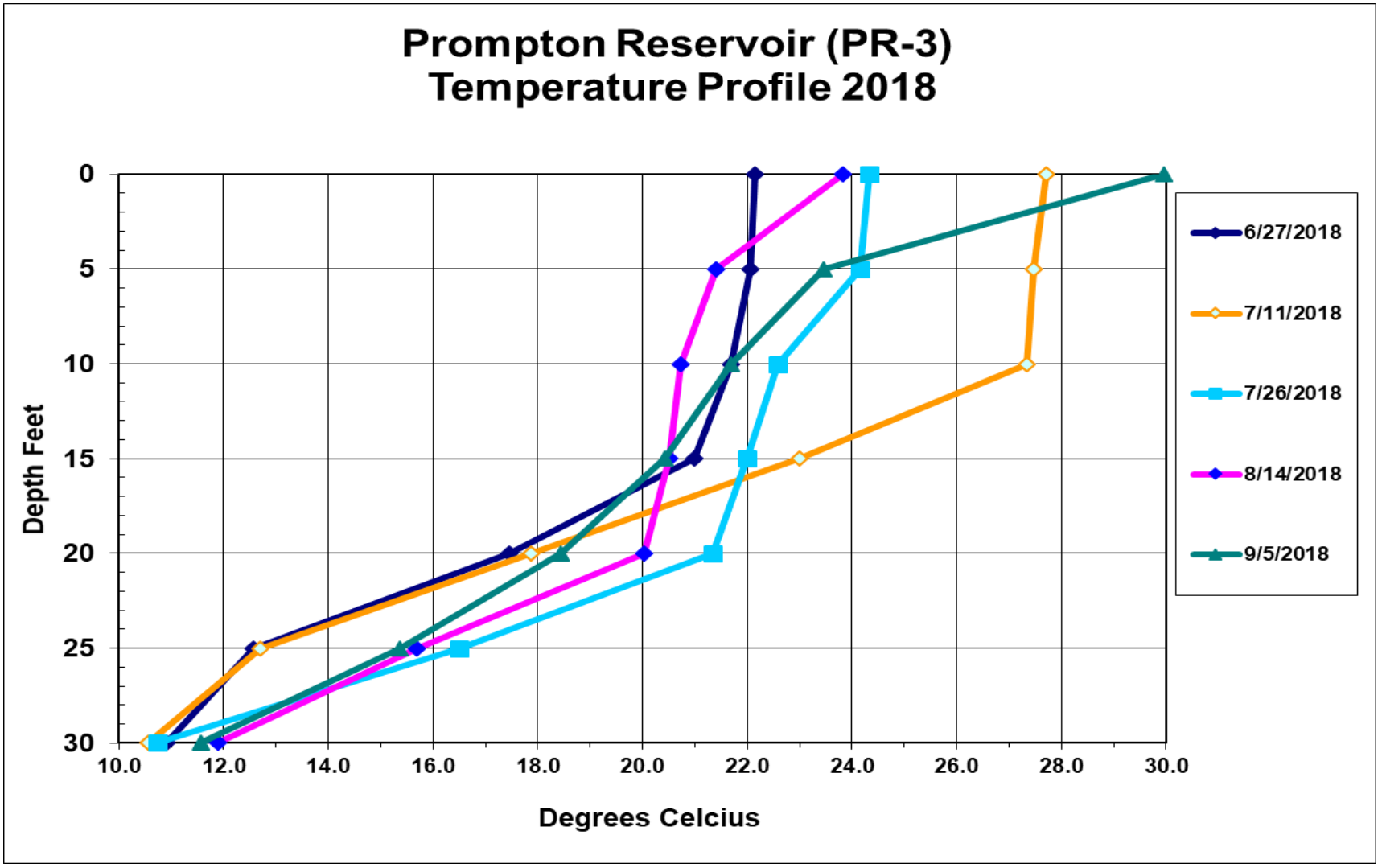

Figure 3-2. Temperature stratification of Prompton Reservoir during 2018 from water quality measured at station PR-3. See Appendix A for a summary of plotted values.

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.

Dissolved oxygen (DO) in the inflow and outflow surface waters of Prompton Reservoir generally followed a similar seasonal pattern throughout most of the 2018 sampling season (Fig. 3-3). Waters released from the reservoir and measured at station PR-4S had consistently lower dissolved oxygen levels then reservoir inflows at tributary station PR-1S as a result of low oxygen levels deeper in the reservoir. The greatest difference of DO readings was recorded on 05 September when inflow (PR-1S) DO was 9.38 mg/L and outflow (PR-4S) DO was 7.10 mg/L. Dissolved oxygen concentrations upstream (PR-1S) ranged from 9.40 mg/L in June to 8.58 mg/L in late July with an average seasonal reading of 9.11 mg/L. Dissolved oxygen concentrations downstream (PR-4S) ranged from 7.10 mg/L in September to 8.50 mg/L in early July with an average seasonal reading of 7.81 mg/L.

The stratification of Prompton Reservoir influenced the distribution of DO in the water column during 2018 (Fig. 3-4). In June, the influence of the onset of stratification was apparent, as DO concentrations decreased from 10.11 mg/L at the surface to 0.34 mg/L at the bottom. From early July and continuing through September, the lower water column from approximately 15 feet to the bottom was severely depleted of oxygen with concentrations less than 5 mg/L. The release of waters downstream containing lower DO concentrations had some lowering effect on DO levels recorded at downstream station PR-4S. However, the re-aeration of the released waters through the dam conduit system elevated DO concentrations above state criteria.

DO concentrations in the water column of Prompton Reservoir were not in compliance with PADEP water quality standards in early September. The Pennsylvania water quality standard for DO is a minimum concentration of 5 mg/L in the epilimnion of stratified lakes. The health of aquatic ecosystems can be impaired by low DO concentrations in the water column. 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. In 2018, the lower water column of Prompton was most affected by hypoxia. Hypoxic water was encountered in all months sampled and commonly occupied the lower half of the water column from a 10 foot depth continuing to the bottom. Hypoxia in the lower water column is a symptom of eutrophication. Nutrients in the water column feed explosive algal growth at the surface photic zone. Dead and decaying algae sink to lower levels of the water column and during the process of decay; oxygen is removed from the water.

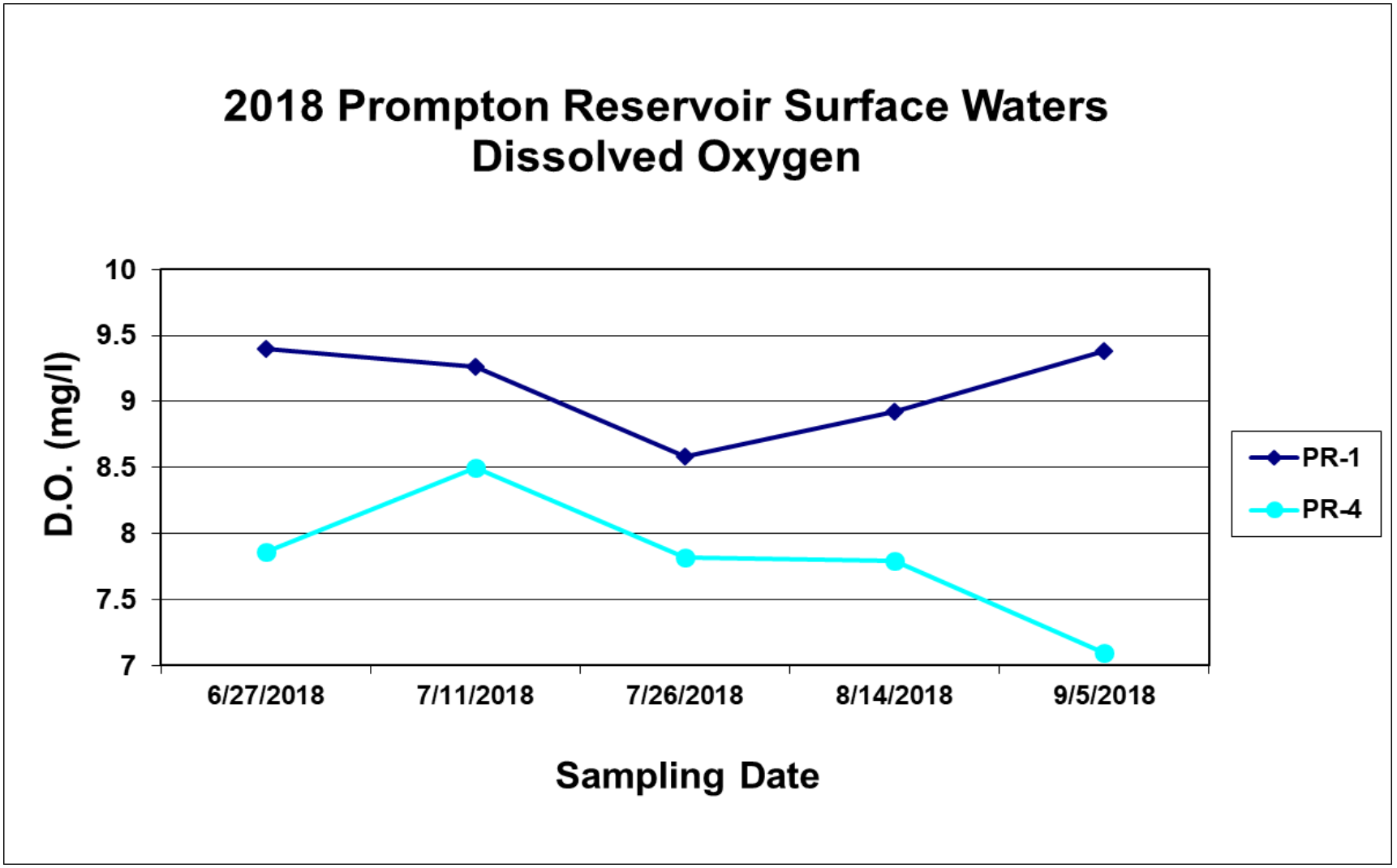

Figure 3-3. Dissolved oxygen in tributary surface waters of Prompton Reservoir during 2018. PADEP minimum DO standard is 5 mg/L. See Appendix A for a summary of plotted values.

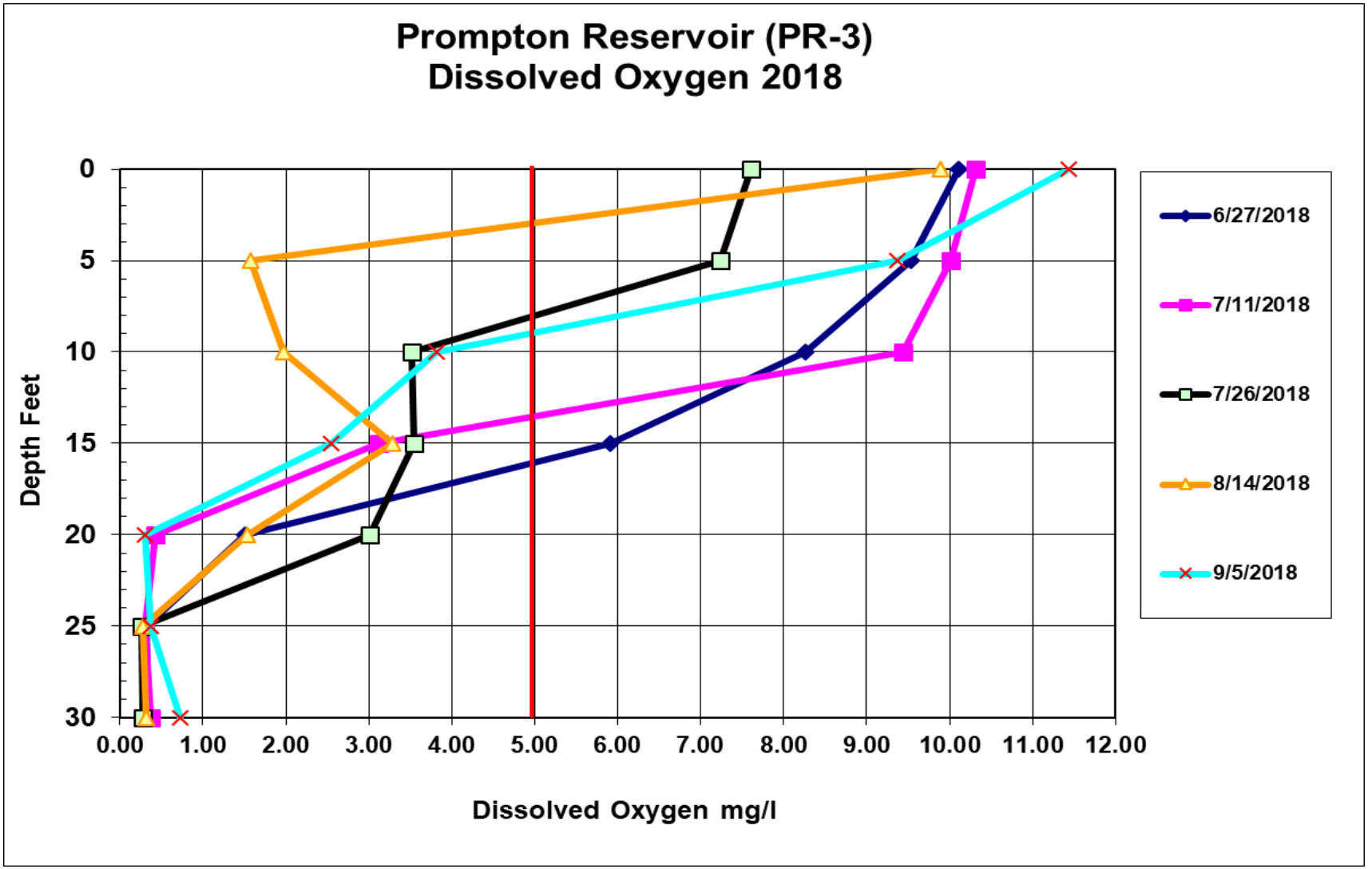

Figure 3-4. Dissolved oxygen stratification of Prompton Reservoir during 2018 from water quality measured at station PR-3. The PADEP minimum DO standard is 5 mg/L. See Appendix A for a summary of plotted value

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 the surface water tributary stations PR-1S and PR-4S at Prompton Reservoir ranged from 6.17 in September to 8.06 in early July (Fig. 3-5). The seasonal pH average for PR-1S and PR-4S were 7.35 and 6.93, respectively.

The water column of Prompton Reservoir maintained a relatively stable pH through most of the sampling season in 2018 with higher lake surface water pH seen in most months sampled (Fig. 3-6). In general the development of stratification and increase in surface temperatures during this time period is reflected with an increase in pH at the surface while the lower water column remained relatively constant. This was seen especially during early July when the upper water column ranged as high as 9.60 and the bottom waters had a reading of 6.85. The elevated pH in surface waters of the reservoir during summer periods is most likely due to algal blooms. As a function of increased productivity, algae remove CO_2 from the water column. Since dissolved CO_2 is slightly acidic, its reduction in the water column is manifested by an increase in pH.

The surface waters of the Prompton Reservoir lake stations were not in compliance with PADEP standards for pH during 2018. The water quality standard for pH is a range of acceptability from 6 to 9. Near surface water readings in June, early July, and September exceeded the pH 9.0 criteria.

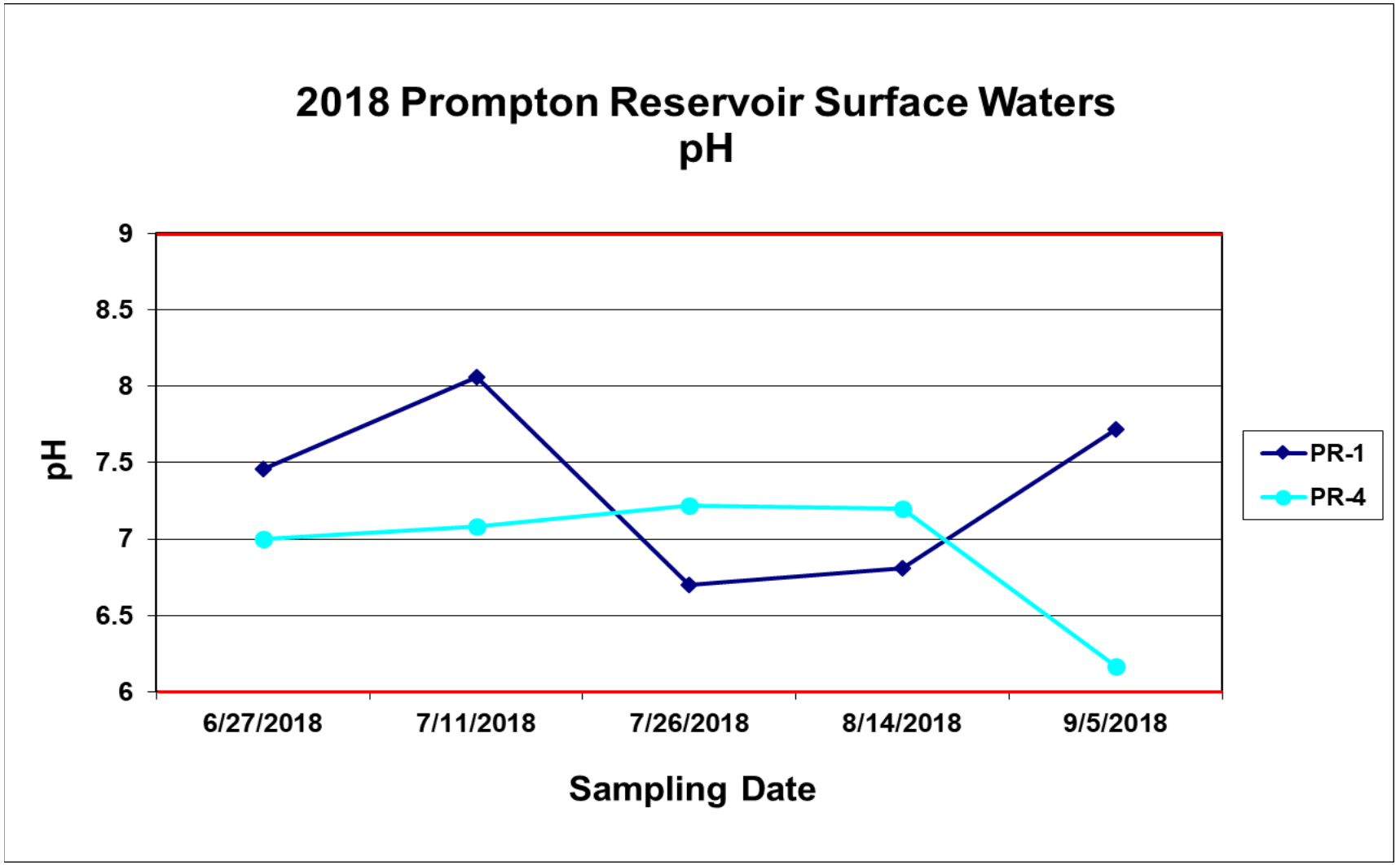

Figure 3-5. Measures of pH in tributary and outflow surface waters of Prompton Reservoir during 2018. PADEP minimum and maximum pH standards are 6 and 9, respectively. See Appendix A for a summary of plotted values.

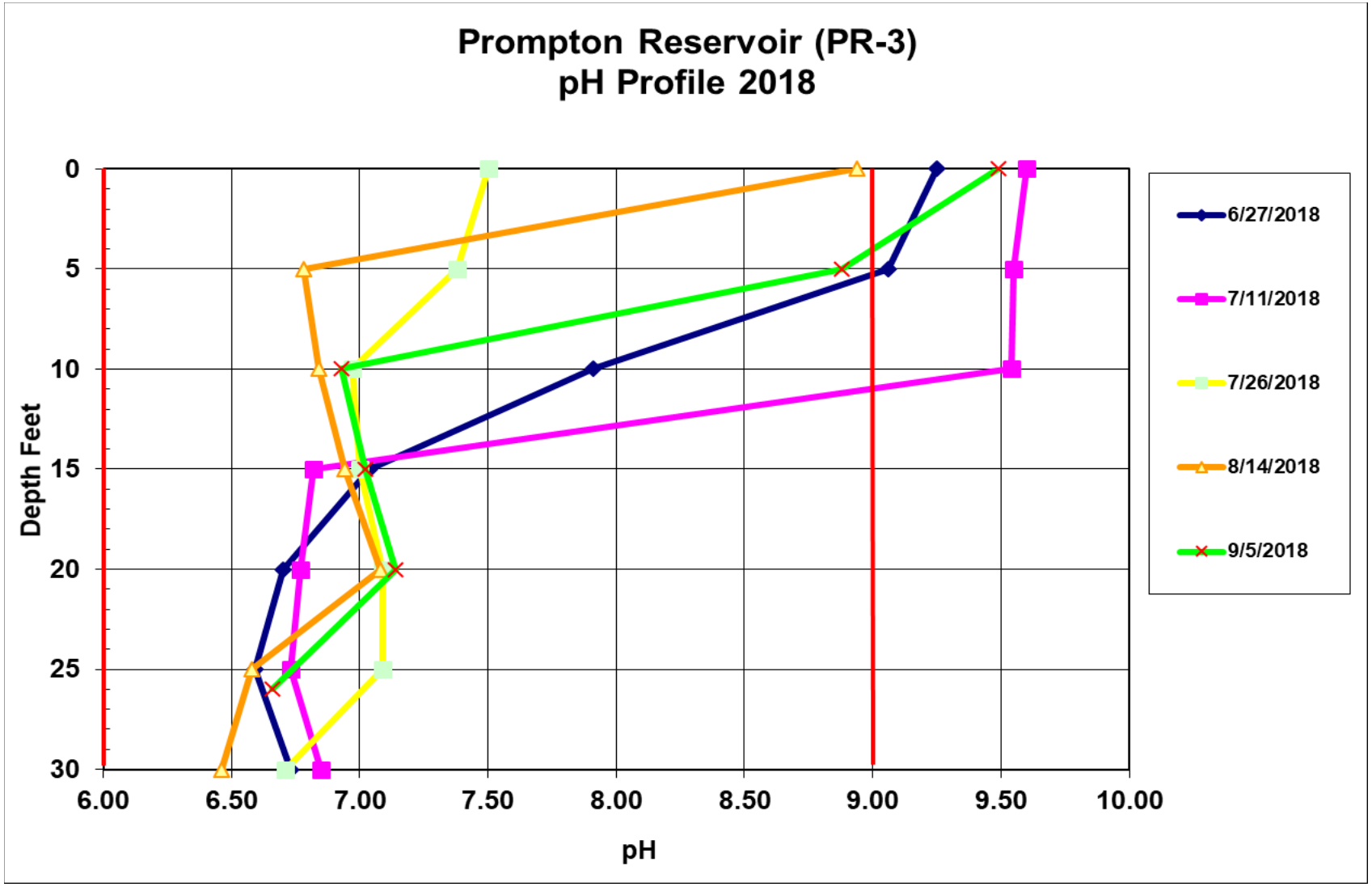

Figure 3-6. Stratification of pH at Prompton Reservoir during 2018, from water quality measured at station PR-3. PADEP minimum and maximum pH standards are 6 and 9, respectively. See Appendix A for a summary of plotted values.

3.2 WATER COLUMN CHEMISTRY MONITORING

The following sections describe temporal, spatial, and depth related patterns for water quality parameters measured at Prompton Reservoir during 2018 (Table 3-2).

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 as 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.

EPA guidance for ambient water quality criteria for Ammonia in freshwater are dependent on temperature and pH (EPA, 2013). Table 3.1 shows the acute and chronic criteria that are expected to protect freshwater aquatic life. The EPA (2013) also provides tables with the temperature and pH-dependent values of the acute criterion magnitude and the temperature and pH-dependent values of the chronic criterion magnitude. These tables provide an expected ammonia criteria over a wide range of pH and temperature values and can be utilized to evaluate field collected samples.

Table 3.1 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.

Ammonia in the water column of Prompton Reservoir was low during 2018 (Table 3-2). Concentrations measured at most surface and middle water column stations were less than the reporting limit (0.20 mg/L). The highest concentration (1.80 mg/L) was measured in August in the bottom waters of the deeper portion of the reservoir located at station PR-3B. Concentrations in the bottom waters at station PR-3B throughout the sampling season averaged 1.02 mg/L. Increased ammonia is characteristic of low dissolved oxygen environments in stratified lakes resulting from the decomposition of organic materials. Prompton Reservoir experienced these conditions in 2018 resulting in elevated levels of Ammonia in the deeper areas of the reservoir. In 2018, Prompton Reservoir was in compliance with the PADEP water quality standard for ammonia, which is dependent on temperature and pH (Table 3-1).

Table 3-2. Summary of surface, middle, and bottom water quality monitoring data for Prompton 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
PR-1S	6/27/2018	28.6	<3.4	<0.05	<0.20	<0.01	0.31	NS	60	0.22	1.9	<0.05	2.1
	7/11/2018	26	<3.4	<0.05	<0.20	<0.01	0.23	NS	37.5	0.25	1.7	<0.05	<4.0
	7/26/2018	13.5	<3.4	<0.05	<0.20	<0.01	0.12	NS	43.3	0.50	5.5	<0.05	11.6
	8/14/2018	31.1	<3.4	<0.05	<0.20	<0.01	0.10	NS	16.7	0.32	6.7	<0.05	11.8
	9/5/2018	30.6	<3.4	<0.05	<0.20	<0.01	0.25	NS	57.5	0.35	5.5	0.03	<2.0
	Mean	25.96	3.4	.05	.20	.01	.20		43	.33	4.26	.05	6.3
	Stdev	6.48	0	0	0	0	.08		15.63	.10	2.06	.01	4.47
	Max	31.1	3.4	.05	.20	.01	.31		60	.50	6.7	.05	11.8
	Min	13.5	3.4	.05	.20	.01	.10		16.7	.22	1.7	.03	2
	No. of Det.	5	0	0	0	0	5		5	5	5	1	3
PR-2S	6/27/2018	11.4	<3.4	<0.05	<0.20	<0.01	<0.11	NS	27.5	0.31	3.4	<0.05	5.0
	7/11/2018	22.9	<3.4	<0.05	<0.20	<0.01	<0.11	NS	65.7	0.58	4.3	<0.05	6.7
	7/26/2018	21.7	<4.0	<0.05	<0.20	<0.01	<0.11	NS	47.5	0.48	3.8	<0.05	6.7
	8/14/2018	21.2	<3.4	<0.05	<0.20	<0.01	<0.11	NS	23.3	0.38	5.4	<0.05	8.3
	9/5/2018	22.7	5.0	0.06	<0.20	<0.01	<0.11	NS	40	0.64	8.3	0.06	9.8
	Mean	19.98	3.84	.05	.20	.01	.11		40.8	.48	5.04	.05	7.3
	Stdev	4.34	.62	0	0	0	0		15.16	.12	1.76	0	1.6
	Max	22.9	5	.06	.20	.01	.11		65.7	.64	8.3	.06	9.8
	Min	11.4	3.4	.05	.20	.01	.11		23.3	.31	3.4	.05	5
	No. of Det.	5	1	1	0	0	0		5	5	5	1	5

Table 3-2 continued. Summary of surface, middle, and bottom water quality monitoring data for Prompton 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
PR-2M	6/27/2018	22.9	<3.4	<0.05	<0.20	<0.01	<0.11	NS	12.5	0.22	2.7	<0.05	7.1
	7/11/2018	23.4	<3.4	<0.05	<0.20	<0.01	<0.11	NS	45.7	0.66	3.3	<0.05	7.0
	7/26/2018	16.0	<3.4	<0.05	<0.20	<0.01	<0.11	NS	50.0	0.46	5.6	<0.05	9.0
	8/14/2018	20.7	<3.4	<0.05	<0.20	<0.01	0.17	NS	33.3	0.36	5.5	<0.05	7.0
	9/5/2018	27.4	<3.4	<0.05	<0.20	<0.01	0.12	NS	54.3	0.50	5.1	<0.05	2.2
	Mean	22.08	3.4	.05	.20	.01	.12		39.16	.44	4.44	.05	6.46
	Stdev	3.73	0	0	0	0	.02		15.06	.15	1.20	0	2.26
	Max	27.4	3.4	.05	.20	.01	.17		54.3	.66	5.6	.05	9
	Min	16.0	3.4	.05	.20	.01	.11		12.5	.22	2.7	.05	2.2
	No. of Det.	5	0	0	0	0	2		5	5	5	0	5
PR-2B	6/27/2018	27	<3.4	<0.05	0.22	<0.01	<0.11	NS	48.6	0.39	3.2	0.32	137
	7/11/2018	25.5	<3.4	<0.05	<0.20	<0.01	<0.11	NS	45.7	0.54	2.7	<0.05	48.7
	7/26/2018	15.0	<3.4	<0.05	<0.20	<0.01	<0.11	NS	40	1.70	5.9	<0.05	10.6
	8/14/2018	20.2	<3.4	<0.05	<0.20	<0.01	<0.11	NS	16.7	0.28	6.9	<0.05	98.5
	9/5/2018	29.5	<3.4	<0.05	0.22	<0.01	0.14	NS	48	0.56	5.7	0.03	32.1
	Mean	23.44	3.4	.05	.21	.01	.12		39.8	.69	4.88	.10	65.38
	Stdev	5.20	0	0	.01	0	.01		11.94	.51	1.64	.11	46.07
	Max	29.5	3.4	.05	.22	.01	.14		48.6	1.7	6.9	.32	137
	Min	15	3.4	.05	.20	.01	.11		16.7	.28	2.7	.03	10.6
	No. of Det.	5	0	0	2	0	1		5	5	5	2	5

Table 3-2 continued. Summary of surface, middle, and bottom water quality monitoring data for Prompton 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
PR-3S	6/27/2018	15.6	<3.4	<0.05	<0.20	<0.01	<0.11	NS	17.5	0.23	3.2	<0.05	5.0
	7/11/2018	21.8	<3.4	<0.05	<0.20	<0.01	<0.11	NS	40	0.80	3.9	<0.05	6.0
	7/26/2018	21.7	<3.4	<0.05	<0.20	<0.01	<0.11	NS	32.5	0.51	3.0	<0.05	7.0
	8/14/2018	21.7	<3.4	0.03	<0.20	<0.01	<0.11	NS	6.7	0.40	5.7	0.13	7.5
	9/5/2018	25.3	5.8	0.03	<0.20	<0.01	<0.11	NS	20	0.70	9.6	<0.05	10.2
	Mean	21.22	3.88	.04	.20	.01	.11		23.34	.53	5.08	.07	7.14
	Stdev	3.13	.96	.01	0	0	0		11.70	.20	2.45	.03	1.75
	Max	25.3	5.8	.05	.20	.01	.11		40	.80	9.6	.13	10.2
	Min	15.6	3.4	.03	.20	.01	.11		6.7	.23	3.0	.05	5
	No. of Det.	5	1	2	0	0	0		5	5	5	1	5
PR-3M	6/27/2018	21.8	<3.4	<0.05	<0.20	<0.01	<0.11	NS	48	0.30	2.9	<0.05	2.2
	7/11/2018	21.8	3.6	<0.05	<0.20	<0.01	<0.11	NS	16.7	0.74	3.4	<0.05	6.3
	7/26/2018	23.8	<3.4	<0.05	<0.20	<0.01	<0.11	NS	55	0.54	3.4	<0.05	<4.0
	8/14/2018	27.9	<3.4	<0.05	0.53	<0.01	0.15	NS	32.5	1.0	6.5	<0.05	2.7
	9/5/2018	22.2	<3.4	<0.05	<0.20	<0.01	<0.11	NS	34	0.51	6.1	<0.05	1.6
	Mean	23.5	3.44	.05	.27	.01	.12		37.24	.62	4.46	.05	3.36
	Stdev	2.32	.08	0	.13	0	.02		13.31	.24	1.52	0	1.67
	Max	27.9	3.6	.05	.53	.01	.15		55	1	6.5	.05	6.3
	Min	21.8	3.4	.05	.20	.01	.11		16.7	.30	2.9	.05	1.6
	No. of Det.	5	1	0	1	0	1		5	5	5	0	4

Table 3-2 continued. Summary of surface, middle, and bottom water quality monitoring data for Prompton 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
PR-3B	6/27/2018	27	<3.4	<0.05	0.79	<0.01	<0.11	NS	<4.0	0.83	5.2	0.09	48.7
	7/11/2018	34.3	<3.4	<0.05	0.44	<0.01	<0.11	NS	<10.0	1.5	8.3	<0.05	52.0
	7/26/2018	42.4	5.4	0.07	1.3	<0.01	<0.11	NS	80	1.3	5.6	0.14	10.3
	8/14/2018	55.9	8.1	0.10	1.8	<0.01	<0.11	NS	10	2.1	8.1	0.15	8.3
	9/5/2018	41.2	<3.4	<0.05	0.76	<0.01	<0.11	NS	73.3	1.1	15.4	0.04	4.7
	Mean	40.16	4.74	.06	1.02	.01	.11		35.46	1.37	8.52	.09	24.8
	Stdev	9.61	1.85	.02	.48	0	0		33.77	.43	3.66	.04	20.96
	Max	55.9	8.1	.10	1.8	.01	.11		80	2.1	15.4	.15	52
	Min	27	3.4	.05	.44	.01	.11		4	.83	5.2	.04	4.7
	No. of Det.	5	2	2	5	0	0		3	5	5	4	5
PR-4S	6/27/2018	17.7	<3.4	<0.05	<0.20	<0.01	<0.11	NS	5.0	0.32	3.4	<0.05	10.4
	7/11/2018	12.5	<3.4	<0.05	<0.20	<0.01	0.13	NS	16.7	0.41	3.0	<0.05	8.2
	7/26/2018	21.2	<3.4	<0.05	<0.20	<0.01	<0.11	NS	30	0.60	3.7	<0.05	<4.0
	8/14/2018	22.3	<3.4	<0.05	<0.20	<0.01	<0.11	NS	10	0.46	6.4	<0.05	2.9
	9/5/2018	24.8	<3.4	<0.05	<0.20	<0.01	0.19	NS	60	0.43	7.4	0.03	5.2
	Mean	19.7	3.4	.05	.20	.01	.13		24.34	.44	4.78	.05	6.14
	Stdev	4.26	0	0	0	0	.03		19.71	.09	1.77	0	2.77
	Max	24.8	3.4	.05	.20	.01	.19		60	.60	7.4	.05	10.4
	Min	12.5	3.4	.05	.20	.01	.11		5	.32	3	.03	2.9
	No. of Det.	5	0	0	0	0	2		5	5	5	1	4

< Indicates a result less than the limit of quantification or limit of detection.
NS – Not Sampled

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. In 2018, nitrite concentrations in the waters of Prompton Reservoir measured at all stations and depths were less than the reporting limit of 0.01 mg/L (Table 3-2).

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. In 2018, nitrate concentrations in the lake waters of Prompton Reservoir measured at most stations and depths were less than the reporting limit of 0.11 mg/L (Table 3-2). Higher readings were seen in the lake tributary inflow waters (PR-1s). The maximum nitrate measure of 0.31 mg/L was collected at station PR-1S in June. This upstream tributary station also maintained the highest seasonal mean concentration of 0.20 mg/L.

Prompton Reservoir was in compliance with the PADEP water quality standard for nitrite and nitrate during 2018. The standard is a summed concentration of nitrite and nitrate of less than 10 mg/L. Throughout the monitoring period, a maximum summed concentration for all stations and depths of 0.32 mg/L was measured at the upstream tributary surface water station PR-1S on 27 June.

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 inorganic form occurs. Total kjeldahl nitrogen was uniformly low in the water column of Prompton Reservoir during 2018 (Table 3-2). The highest single sample concentration of 2.10 mg/L and seasonal mean concentration of 1.37 mg/L were measured in the bottom water samples at station PR-3B.

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 minimum 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 reporting limit of 0.05 mg/L. As a result of the detection limit being greater than many sample results, sample results for many stations and dates were recorded as <0.05 mg/L (Table 3-2). All sample results therefore exceeded the EPA 0.01 mg/L suggested concentration, however, these results do not accurately reflect total phosphorus concentrations in Prompton Reservoir and its tributaries.

Many of the deep water measures for total phosphorus taken at Prompton Reservoir were greater than the 0.05 mg/L reporting limit (Table 3-2). The highest single concentration of 0.32 mg/L was measured in the lake bottom waters at station PR-2B on 27 June. Higher concentrations of phosphorus in the lower water column are characteristic of temperature-stratified lakes. Low DO conditions in deeper waters create a reducing chemical environment that can mobilize phosphorus from bottom sediment. Prompton Reservoir experiences these conditions annually. Lower measurements of TP in lake surface waters are likely a product of algal phosphorus uptake during photosynthesis.

3.2.5 Dissolved Phosphorus

Dissolved phosphorus (Diss P) concentrations measured at most stations and depths in the water column of Prompton Reservoir were less than the reporting limit of 0.05 mg/L (Table 3-2). The highest single concentration of 0.10 mg/L was measured in the lake bottom waters at station PR-3B on 14 August.

3.2.6 Dissolved Phosphate

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 freshwater environments, dissolved phosphate is usually a limiting nutrient and is readily taken up by freshwater plants and algae. In 2018, dissolved phosphate concentrations were not measured in samples collected at Prompton Reservoir.

3.2.7 Total Dissolved Solids

Total dissolved solids (TDS) is a measure of the amount of non-filterable dissolved material in the water. Dissolved salts such as sulfate, magnesium, chloride, and sodium contribute to elevated levels. Total dissolved solids in the water column of Prompton Reservoir stayed consistently low during 2018. Concentrations measured at all stations and depths ranged from less than the laboratory detection limit (<4.0 mg/L) to 80 mg/L throughout the monitoring period (Table 3-2). Total dissolved solids measured at Prompton Reservoir in 2018 were in compliance with PADEP water quality standards. The Pennsylvania standard for TDS is concentrations less than 500 mg/L as a monthly average with a maximum concentration of 750 mg/L.

3.2.8 Total Suspended Solids

Total suspended solids (TSS) is a measure of the amount of 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). During 2018, total suspended solids (TSS) concentrations at all stations and depths ranged between less than the reporting limit of 2.0 mg/L to 137 mg/L (Table 3-2). The highest single sample measure of 137 mg/L was measured in the bottom waters of station PR-2B on 27 June. Uncharacteristically higher readings in bottom water samples can be attributed to sample collection error caused by disturbing bottom sediments inadvertently during sampling and those suspended materials being included in the sample. The TSS samples at stations PR-3B and PR-2B may reflect this sampling error.

3.2.9 Biochemical Oxygen Demand

Five-day biochemical oxygen demand (BOD5) 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.

Biochemical oxygen demand concentrations in the waters of Prompton Reservoir were consistently low at all but one station in all months sampled (Table 3-2). Five of forty individual samples collected during the season were greater than the 3.4 mg/L reporting limit. The maximum BOD measure for all stations and depths was 8.1 mg/L collected at station PR-3B on 14 August. In considering the overall infrequency of samples showing higher readings, it is inferred that Prompton Reservoir and its associated tributaries contained moderately clean waters with some biodegradable wastes in 2018.

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 of the water's in Prompton Reservoir remained near or greater than the state minimum standard during the 2018 sampling season (Table 3-2). Concentrations measured at all stations and depths during the monitoring period ranged from 11.4 to 55.9 mg/L. The highest measure was taken at station PR-3B on 14 August. The natural alkalinity of water is largely dependent on the underlying geology and soils within the surrounding watershed. The alkalinity

measured at Prompton Reservoir is likely a result of the regional geology and primary productivity. The reservoir waters and surrounding tributaries were in compliance with the PADEP alkalinity criteria in 2018.

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 in the water column of Prompton Reservoir was present in low concentrations during 2018 (Table 3-2). Concentrations of TOC at all stations and depths ranged from 1.7 mg/L to 15.4 mg/L.

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. In all months sampled in 2018, chlorophyll *a* concentrations in the tributary and outflow stream surface waters were low relative to in-lake concentrations (Appendix A). Concentrations measured in upstream and downstream stream surface waters averaged 0.57 ug/L. Concentrations were consistently higher at the in-lake surface stations where algal productivity would be expected to also be higher. Concentrations at lake stations PR-2 and PR-3, from 0-5 feet of depth, ranged between 0.0 ug/L and 6.5 ug/L with a seasonal average of 1.90 ug/L. Chlorophyll a readings were collected using a YSI 6600 V2-4 chlorophyll sensor.

3.3 TROPHIC STATE DETERMINATION

Carlson's (1977) trophic state index (TSI) is a method of quantitatively expressing the magnitude of eutrophication for a lake. The trophic state analysis calculates separate indices for eutrophication based on measures of total phosphorus, chlorophyll *a*, and secchi disk. 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 Prompton Reservoir was based on a single sample taken each month at station PR-3 during the sampling season.

TSIs calculated for measures of total phosphorus (Figure 3-7) classified Beltzville Reservoir as eutrophic in June (60.56), early July (60.56), late July (60.56), August (74.34) and September (60.56). TSIs calculated for measures of secchi disk depth (Figure 3-7) classified Prompton Reservoir as eutrophic in June (55.68), early July (55.68), late July (57.99), August (60), and September (61.52). TSIs calculated for measures of chlorophyll *a* (Figure 3-7) classified Prompton Reservoir as oligotrophic in June (32.39), late July (33.90), August (30.60), and September (34.90) and mesotrophic in early July (40.52). Chlorophyll a was measured with a YSI 6600 V2-4 chlorophyll sensor.

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 Prompton Reservoir in 2018. With this in mind, the trophic state of the reservoir based on TSI's was in the mesotrophic/eutrophic range during most of the 2018 sampling period.

The EPA (1983) also provides criteria for defining the trophic conditions of lakes of the north-temperate zone based on concentrations of total phosphorus, chlorophyll *a*, and secchi depth (Table 3-3). Taking into account the general agreement between the EPA classifications with that of the Carlson (1977) calculated TSI values, the trophic condition of Prompton Reservoir would be considered mesotrophic and borderline eutrophic during most of the 2018 sampling season.

Table 3-3. EPA trophic classification criteria and monthly measures for Prompton Reservoir in 2018.

Water Quality Variable	Oligo-trophic	Meso-trophic	Eutrophic	27 June	11 July	26 July	14 August	05 September
Total phos. (ppb)	<10	10-20	>20	<50	<50	<50	130	<50
Chlorophyll (ppb)	<4	4-10	>10	1.2	2.75	1.4	1.0	1.55
Secchi depth (m)	>4	2-4	<2	1.35	1.35	1.20	1.00	0.09

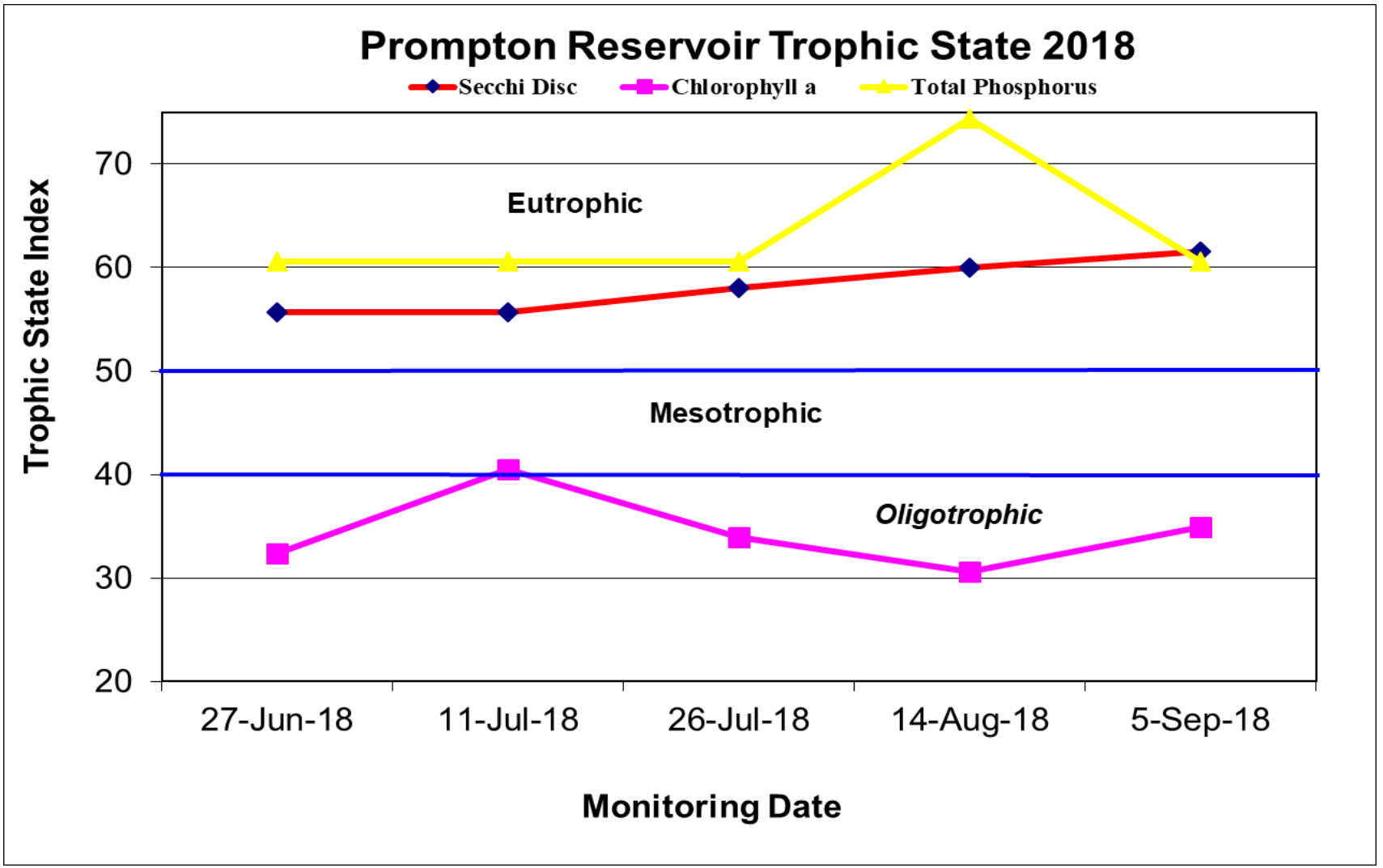

Figure 3-7. Trophic state indices calculated from secchi disk depth, concentrations of chlorophyll *a*, and total phosphorus measured in surface waters of Prompton Reservoir during 2018

3.4 RESERVOIR BACTERIA MONITORING

Two forms of coliform bacteria contamination were monitored in the tributary and lake surface waters at Prompton 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.

Total coliform values for all stations and dates ranged from <4 colonies/100-ml to 4800 colonies/100-ml. 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. Fecal contamination was low in Prompton Reservoir and elevated in its tributaries during 2018. 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. The fecal coliform samples collected at Prompton Reservoir did exceed this standard three times in 2018 at tributary and downstream stations. The cause of these elevated sample results is unknown but may be a result of upstream watershed activities or land use. Water contact recreation is not permitted at Prompton Reservoir.

Table 3-4. Bacteria counts (colonies/100 ml) at Prompton Reservoir during 2018. Shaded values exceed the Pennsylvania Department of Health single sample water quality standard for bathing beaches. NS = Not Sampled in 2018

STATION	DATE	Total Coliform (TC)		Fecal Coliform (FC)		Escherichia coli	
PR-1S	6/27/2018		360		17		NS
	7/11/2018		97		164		NS
	7/26/2018		3000		5900		NS
	8/14/2018		4800		5600		NS
	9/05/2018		294		229		NS
PR-2S	6/27/2018		16		510		NS
	7/11/2018	<	4	<	4		NS
	7/26/2018		16		23		NS
	8/14/2018		186		84		NS
	9/05/2018		8		0		NS
PR-3S	6/27/2018	<	4	<	4		NS
	7/11/2018	<	4	<	4		NS
	7/26/2018		30		32		NS
	8/14/2018		26		37		NS
	9/05/2018		8		0		NS
PR-4S	6/27/2018		450		144		NS
	7/11/2018		4		40		NS
	7/26/2018		2100		809		NS
	8/14/2018		5300		5900		NS
	9/05/2018		782		570		NS

4.0 REFERENCES

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APPENDIX A

STRATIFICATION DATA TABLES

2018 Prompton WQ Profile Summary

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
PR-1S Upstream	6/27/2018	12:15:57	0.5	16.06	95.3	9.4	7.46	-42.5	191.9	3.1	0	0.072
	7/11/2018	12:28:57	0.5	21.93	105.8	9.26	8.06	-78.6	153.2	1.4	0	0.084
	7/26/2018	8:28:56	0.5	19.62	93.7	8.58	6.7	2.3	224.7	25.4	0	0.057
	8/14/2018	8:39:06	0.5	18.82	95.9	8.92	6.81	-4.3	201.1	18.2	3	0.052
	9/5/2018	12:34:09	0.5	21.43	106.1	9.38	7.72	-58.2	163	0.9	0	0.083
PR-2 Mid-Lake	6/27/2018	13:34:00	0.5	22.8	113.8	9.8	9.02	-136	45.3	23.3	1.3	0.069
		13:32:58	5	22.79	108.2	9.32	8.91	-129	43.8	19.4	2.9	0.069
		13:32:08	10	21.94	90.8	7.95	7.53	-46.9	65.1	13.6	1.4	0.067
		13:31:09	15	20.37	71.3	6.43	7.08	-20.3	71.1	12.6	1	0.071
		13:29:35	20	17.86	35.6	3.38	6.9	-9.7	77.7	Error	0	0.075
PR-2 Mid-Lake	7/11/2018	13:58:49	0.5	26.68	123.2	9.87	9.42	-162	64	15.5	0.8	0.082
		13:58:20	5	26.68	117.9	9.45	9.41	-161	67	18.2	3.1	0.082
		13:57:16	10	22.62	53.1	4.59	7.46	-42.7	110.4	9.7	0	0.079
		13:55:50	15	21.32	18.6	1.64	7.23	-29.1	113.1	21.4	2.3	0.081
		13:55:24	18	21.29	31.3	2.77	7.61	-51.7	115.4	28.9	2.5	0.081
PR-2 Mid-Lake	7/26/2018	9:56:19	0.5	24.81	109.7	9.1	8.43	-102	67.6	26	3.4	0.075
		9:55:08	5	23.6	98.7	8.37	7.6	-51.6	83.1	18.6	0.5	0.070
		9:53:18	10	22.41	90.9	7.88	7.33	-35.3	89.8	24.8	1.5	0.065
		9:51:35	15	21.56	85	7.5	7.06	-19.2	93.5	28.4	0.9	0.063
		9:50:17	20	21.2	81.6	7.25	7.09	-20.8	78.8	35	0.4	0.061
		9:49:27	23	21.2	80.2	7.12	7.14	-23.5	68.4	39.1	0	0.062
PR-2 Mid-Lake	8/14/2018	10:06:45	0.5	23.66	121.8	10.32	8.95	-132	74.1	23.6	6.5	0.067
		10:05:20	5	21.42	95.6	8.45	7.31	-33.7	107.2	18.7	2.3	0.062
		10:04:17	10	20.91	88.1	7.87	6.93	-11.5	125.3	13.7	2.6	0.061
		10:03:14	15	20.16	87.4	7.92	6.87	-8	127.8	17.2	2.3	0.06
		10:01:56	20	19.97	86.9	7.9	6.85	-6.6	128.9	19.8	1.9	0.059
		10:00:46	22	19.97	88.3	8.03	7.06	-19.3	117.4	20.8	2.3	0.058
PR-2 Mid-Lake	9/5/2018	13:55:27	0.5	29.58	147.7	11.25	9.5	-168	33.2	26.8	0	0.081
		13:54:18	5	23.47	88.3	7.5	7.31	-34.3	71.8	13.2	1.3	0.066
		13:52:44	10	21.75	51.8	4.55	6.5	14.3	100.8	3.8	0	0.073
		13:50:56	15	20.66	41	3.68	6.17	34	100.6	8.6	0	0.076
		13:49:13	18	20.12	21.3	1.93	6.18	32.8	100.2	12.8	0	0.077

2018 Prompton WQ Profile Summary

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
PR-3 Upstream of Dam Secchi 1.35	6/27/2018	13:08:17	0.5	22.14	116	10.11	9.25	-149	14	12.7	1	0.067
		13:07:17	5	22.05	109.2	9.54	9.06	-138	7.3	17.4	1.4	0.066
		13:06:14	10	21.69	93.9	8.26	7.91	-69.9	19.4	15.3	1.8	0.065
		13:04:14	15	21	66.3	5.91	7.04	-17.7	28	6.4	0	0.068
		13:02:07	20	17.45	15.8	1.51	6.7	1.9	-17.5	9	2	0.069
		13:00:43	25	12.58	2.9	0.31	6.59	8.2	-53.9	16.3	2.5	0.064
		13:00:00	30	10.91	3.1	0.34	6.73	0	-71.8	12.8	9.2	0.072
PR-3 Upstream of Dam Secchi 1.35	7/11/2018	13:28:31	0.5	27.72	131.1	10.31	9.6	-173	-6.5	16.7	3.3	0.085
		13:27:37	5	27.47	126.8	10.02	9.55	-170	-15.5	15.6	2.2	0.084
		13:26:44	10	27.34	119.2	9.44	9.54	-170	-35.6	15.6	2.2	0.083
		13:25:46	15	22.99	36.4	3.12	6.82	-5	-16.8	6.3	2.5	0.072
		13:24:17	20	17.87	4.4	0.42	6.77	-2.1	-93.2	8	0.3	0.076
		13:23:25	25	12.69	2.8	0.3	6.73	0	-120	5.8	2.8	0.076
		13:22:08	30	10.57	3.4	0.37	6.85	-7.1	-135	Error	16.2	0.101
PR-3 Upstream of Dam Secchi 1.2	7/26/2018	9:20:57	0.5	24.33	91	7.61	7.5	-45.8	41.2	20.9	1.4	0.075
		9:19:47	5	24.15	86.2	7.24	7.38	-38.3	39.3	16.4	1.4	0.074
		9:17:22	10	22.59	40.7	3.52	6.97	-13.7	26.6	7.1	2.1	0.078
		9:15:52	15	21.99	40.4	3.54	7	-15.2	4.5	8	0.6	0.077
		9:14:41	20	21.35	34	3.01	7.09	-20.7	-33.7	8.5	0.3	0.076
		9:13:19	25	16.5	2.6	0.26	7.09	-21	-149	1.7	2.6	0.090
		9:11:54	30	10.73	2.5	0.28	6.71	1	-104	23.9	21.4	0.124
PR-3 Upstream of Dam Secchi 1.0	8/14/2018	9:42:00	0.5	23.83	117.1	9.89	8.94	-132	25.1	18.3	2	0.068
		9:39:20	5	21.4	17.9	1.58	6.78	-2.4	41	2.7	0	0.067
		9:37:37	10	20.74	22	1.97	6.84	-5.8	28.7	5.1	1.1	0.067
		9:36:03	15	20.52	36.4	3.28	6.94	-11.8	14.9	6.7	0.7	0.066
		9:33:42	20	20.03	16.8	1.53	7.08	-20.3	-36.6	5.6	0.8	0.067
		9:32:07	25	15.7	2.8	0.28	6.58	9.2	-100	7.8	0.5	0.102
		9:30:48	30	11.89	2.9	0.31	6.46	15.7	-87.5	7.6	0.3	0.122
PR-3 Upstream of Dam Secchi 0.9	9/5/2018	13:29:02	0.5	29.96	151.2	11.43	9.49	-168	9.3	33.1	1.5	0.08
		13:27:41	5	23.45	110.2	9.37	8.88	-128	-1.4	16.1	1.6	0.065
		13:25:40	10	21.69	43.4	3.82	6.93	-11.3	25.1	2.5	0.3	0.064
		13:23:28	15	20.43	28.3	2.55	7.02	-16.7	-10	3.6	0.1	0.065
		13:21:53	20	18.44	3.2	0.3	7.14	-23.9	-70.4	9.2	1	0.073
		13:20:10	25	15.37	3.7	0.37	6.66	4.5	-106	5.7	0.1	0.114
		13:18:09	30	11.56	6.7	0.73	6.49	14	-138	4.2	0.4	0.188
PR-4S Dam Outfall	6/27/2018	11:58:21	0.5	19.96	86.4	7.86	7	-15.2	197	6.2	1.6	0.066
	7/11/2018	12:16:47	0.5	21.26	95.9	8.5	7.08	-20.5	168	5.7	0	0.074
	7/26/2018	8:15:11	0.5	23.59	92.3	7.82	7.22	-28.9	199.9	16.3	0	0.075
	8/14/2018	8:25:35	0.5	22.09	89.3	7.79	7.2	-27.5	177.4	9.4	0.7	0.067
	9/5/2018	12:21:34	0.5	21	79.6	7.1	6.17	33.9	210.1	2.8	0.4	0.067

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

W25PHS81145379

SGS Job Number: JC68840

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: 32

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: JC68840

Philadelphia District, Reservoir Sampling
Project No: W25PHS81145379

Sample Number	Collected Date	Time	By	Received	Matrix Code	Type	Client Sample ID
JC68840-1	06/27/18	12:20	GW	06/27/18	AQ	Surface Water	PR-1S
JC68840-1F	06/27/18	12:20	GW	06/27/18	AQ	Surface H2O Filtered	PR-1S
JC68840-2	06/27/18	13:25	GW	06/27/18	AQ	Surface Water	PR-2S
JC68840-2F	06/27/18	13:25	GW	06/27/18	AQ	Surface H2O Filtered	PR-2S
JC68840-3	06/27/18	13:25	GW	06/27/18	AQ	Surface Water	PR-2M
JC68840-3F	06/27/18	13:25	GW	06/27/18	AQ	Surface H2O Filtered	PR-2M
JC68840-4	06/27/18	13:25	GW	06/27/18	AQ	Surface Water	PR-2D
JC68840-4F	06/27/18	13:25	GW	06/27/18	AQ	Surface H2O Filtered	PR-2D
JC68840-5	06/27/18	12:50	GW	06/27/18	AQ	Surface Water	PR-3S
JC68840-5F	06/27/18	12:50	GW	06/27/18	AQ	Surface H2O Filtered	PR-3S
JC68840-6	06/27/18	12:50	GW	06/27/18	AQ	Surface Water	PR-3M
JC68840-6F	06/27/18	12:50	GW	06/27/18	AQ	Surface H2O Filtered	PR-3M
JC68840-7	06/27/18	12:50	GW	06/27/18	AQ	Surface Water	PR-3D

Sample Summary
(continued)

USACE-Philadelphia District

Job No: JC68840

Philadelphia District, Reservoir Sampling
Project No: W25PHS81145379

Sample Number	Collected Date	Time	By	Received	Matrix Code	Matrix Type	Client Sample ID
JC68840-7F	06/27/18	12:50	GW	06/27/18	AQ	Surface H2O Filtered	PR-3D
JC68840-8	06/27/18	12:00	GW	06/27/18	AQ	Surface Water	PR-4S
JC68840-8F	06/27/18	12:00	GW	06/27/18	AQ	Surface H2O Filtered	PR-4S

CASE NARRATIVE / CONFORMANCE SUMMARY

Client:	USACE-Philadelphia District	**Job No**	JC68840
Site:	Philadelphia District, Reservoir Sampling	**Report Date**	7/11/2018 5:55:38 PM

On 06/27/2018, 16 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 JC68840 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.

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.

General Chemistry By Method EPA 365.3

Matrix: AQ **Batch ID:** GP14323

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC68812-2DUP, JC68812-2MS were used as the QC samples for Phosphorus, Total.

General Chemistry By Method EPA353.2/SM4500NO2B

Matrix: AQ **Batch ID:** R171194

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC68840-1 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R171195

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC68840-2 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R171196

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC68840-3 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R171197

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC68840-4 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R171198

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC68840-5 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R171199

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC68840-6 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R171200

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC68840-7 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R171201

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC68840-8 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

General Chemistry By Method SM2320 B-11

Matrix: AQ **Batch ID:** GN82330

- 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 Alkalinity, Total as CaCO3.
- RPD(s) for Duplicate for Alkalinity, Total as CaCO3 are outside control limits for sample GN82330-D1. RPD acceptable due to low duplicate and sample concentrations.
- JC68840-4 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.5.
- JC68840-5 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC68840-2 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC68840-3 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.5.
- JC68840-6 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.5.
- JC68840-8 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC68840-7 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.5.
- JC68840-1 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.5.

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.

General Chemistry By Method SM2540 D-11

Matrix: AQ	Batch ID: GN82141

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC68775-10DUP were used as the QC samples for Solids, Total Suspended.
- JC68840-2 for Solids, Total Suspended: Reported sample aliquot obtained from filtration of 400 mL of sample. Volume was reduced from 1 liter as the sample clogged the filter at the higher volume.

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) JC68840-6DUP were used as the QC samples for Solids, Total Suspended.
- JC68840-5 for Solids, Total Suspended: Reported sample aliquot obtained from filtration of 400 mL of sample. Volume was reduced from 1 liter due to nature of sample matrix.
- JC68840-3 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: GP14199

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC68831-17DUP, JC68831-17MS, JC68831-17MSD were used as the QC samples for Nitrogen, Ammonia.

General Chemistry By Method SM4500NO2 B-11

Matrix: AQ	Batch ID: GN82068

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC68804-1DUP, JC68804-1MS were used as the QC samples for Nitrogen, Nitrite.

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.

Matrix: AQ	Batch ID: GP14133

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC68840-8DUP were used as the QC samples for BOD, 5 Day.

General Chemistry By Method SM5310 B-11

Matrix: AQ	Batch ID: GP14238

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC68840-6MS, JC68840-6MSD 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.
- JC68840-2 for Coliform, Total: Analysis done out of holding time.
- JC68840-1 for Coliform, Total: Analysis done out of holding time.
- JC68840-5 for Coliform, Total: Analysis done out of holding time.
- JC68840-8 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.

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: JC68840
Account: USACE-Philadelphia District
Project: Philadelphia District, Reservoir Sampling
Collected: 06/27/18

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	LOQ	LOD	Units	Method
JC68840-1	**PR-1S**					
Alkalinity, Total as CaCO3 [a]		28.6	5.0	4.0	mg/l	SM2320 B-11
Coliform, Fecal		17	4	[b]	col/100ml	SM9222 D-06
Coliform, Total [c]		360	10	[b]	col/100ml	SM9222 B-06
Nitrogen, Nitrate [d]		0.31	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		0.31	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Total Kjeldahl		0.22	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		60.0	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended		2.1 J	4.0	1.0	mg/l	SM2540 D-11
Total Organic Carbon		1.9	1.0	1.0	mg/l	SM5310 B-11
JC68840-1F	**PR-1S**					
No hits reported in this sample.						
JC68840-2	**PR-2S**					
Alkalinity, Total as CaCO3 [e]		11.4	5.0	4.0	mg/l	SM2320 B-11
Coliform, Fecal		510	10	[b]	col/100ml	SM9222 D-06
Coliform, Total [c]		16	4	[b]	col/100ml	SM9222 B-06
Nitrogen, Total Kjeldahl		0.31	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		27.5	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended [f]		5.0	4.0	1.0	mg/l	SM2540 D-11
Total Organic Carbon		3.4	1.0	1.0	mg/l	SM5310 B-11
JC68840-2F	**PR-2S**					
No hits reported in this sample.						
JC68840-3	**PR-2M**					
Alkalinity, Total as CaCO3 [a]		22.9	5.0	4.0	mg/l	SM2320 B-11
Nitrogen, Total Kjeldahl		0.22	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		12.5	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended [g]		7.1	4.0	1.0	mg/l	SM2540 D-11
Total Organic Carbon		2.7	1.0	1.0	mg/l	SM5310 B-11
JC68840-3F	**PR-2M**					
No hits reported in this sample.						
JC68840-4	**PR-2D**					
Alkalinity, Total as CaCO3 [a]		27.0	5.0	4.0	mg/l	SM2320 B-11

Summary of Hits

Job Number: JC68840
Account: USACE-Philadelphia District
Project: Philadelphia District, Reservoir Sampling
Collected: 06/27/18

Lab Sample ID / Client Sample ID / Analyte	Result/ Qual	LOQ	LOD	Units	Method
Nitrogen, Ammonia	0.22	0.20	0.20	mg/l	SM4500NH3 H-11LACHAT
Nitrogen, Total Kjeldahl	0.39	0.20	0.15	mg/l	EPA 351.2/LACHAT
Phosphorus, Total	0.32	0.050	0.050	mg/l	EPA 365.3
Solids, Total Dissolved	48.6	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended	137	4.0	1.0	mg/l	SM2540 D-11
Total Organic Carbon	3.2	1.0	1.0	mg/l	SM5310 B-11
JC68840-4F PR-2D					
No hits reported in this sample.					
JC68840-5 PR-3S					
Alkalinity, Total as CaCO3 [e]	15.6	5.0	4.0	mg/l	SM2320 B-11
Coliform, Fecal	4	4	[b]	col/100ml	SM9222 D-06
Coliform, Total [c]	4	4	[b]	col/100ml	SM9222 B-06
Nitrogen, Total Kjeldahl	0.23	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved	17.5	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended [h]	5.0	4.0	1.0	mg/l	SM2540 D-11
Total Organic Carbon	3.2	1.0	1.0	mg/l	SM5310 B-11
JC68840-5F PR-3S					
No hits reported in this sample.					
JC68840-6 PR-3M					
Alkalinity, Total as CaCO3 [a]	21.8	5.0	4.0	mg/l	SM2320 B-11
Nitrogen, Total Kjeldahl	0.30	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved	48.0	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended	2.2 J	4.0	1.0	mg/l	SM2540 D-11
Total Organic Carbon	2.9	1.0	1.0	mg/l	SM5310 B-11
JC68840-6F PR-3M					
No hits reported in this sample.					
JC68840-7 PR-3D					
Alkalinity, Total as CaCO3 [a]	27.0	5.0	4.0	mg/l	SM2320 B-11
Nitrogen, Ammonia	0.79	0.20	0.20	mg/l	SM4500NH3 H-11LACHAT
Nitrogen, Total Kjeldahl	0.83	0.20	0.15	mg/l	EPA 351.2/LACHAT
Phosphorus, Total	0.086	0.050	0.050	mg/l	EPA 365.3
Solids, Total Suspended	48.7	4.0	1.0	mg/l	SM2540 D-11
Total Organic Carbon	5.2	1.0	1.0	mg/l	SM5310 B-11

Summary of Hits

Job Number: JC68840
Account: USACE-Philadelphia District
Project: Philadelphia District, Reservoir Sampling
Collected: 06/27/18

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	LOQ	LOD	Units	Method
JC68840-7F	**PR-3D**					
No hits reported in this sample.						
JC68840-8	**PR-4S**					
Alkalinity, Total as CaCO3 [e]		17.7	5.0	4.0	mg/l	SM2320 B-11
Coliform, Fecal		144	4	[b]	col/100ml	SM9222 D-06
Coliform, Total [c]		450	10	[b]	col/100ml	SM9222 B-06
Nitrogen, Nitrate + Nitrite		0.10	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Total Kjeldahl		0.32	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		5.0 J	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended		10.4	4.0	1.0	mg/l	SM2540 D-11
Total Organic Carbon		3.4	1.0	1.0	mg/l	SM5310 B-11
JC68840-8F	**PR-4S**					
No hits reported in this sample.						

(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)
(e) Sample was titrated to a final pH of 4.2.
(f) Reported sample aliquot obtained from filtration of 400 mL of sample. Volume was reduced from 1 liter as the sample clogged the filter at the higher volume.
(g) Reported sample aliquot obtained from filtration of 550 mL of sample. Volume was reduced from 1 liter due to nature of sample matrix.
(h) Reported sample aliquot obtained from filtration of 400 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: PR-1S
Lab Sample ID: JC68840-1
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	LOQ	LOD	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	28.6	5.0	4.0	mg/l	1	07/03/18 16:29	CD	SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 [b]	mg/l	1	06/28/18 17:05	LS	SM5210 B-11
Coliform, Fecal	17	4		col/100ml	4	06/27/18 16:46	SA	SM9222 D-06
Coliform, Total [c]	360	10		col/100ml	10	06/27/18 22:00	SA	SM9222 B-06
Nitrogen, Ammonia	0.20 U	0.20	0.20	mg/l	1	07/02/18 15:21	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [d]	0.31	0.11	0.11	mg/l	1	07/10/18 13:23	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.31	0.10	0.10	mg/l	1	07/10/18 13:23	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0050 U	0.010	0.0050	mg/l	1	06/27/18 20:45	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.22	0.20	0.15	mg/l	1	07/09/18 10:18	BM	EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	mg/l	1	07/09/18 19:05	LS	EPA 365.3
Solids, Total Dissolved	60.0	10	4.0	mg/l	1	07/02/18 14:47	RC	SM2540 C-11
Solids, Total Suspended	2.1 J	4.0	1.0	mg/l	1	06/29/18 12:20	RC	SM2540 D-11
Total Organic Carbon	1.9	1.0	1.0	mg/l	1	07/04/18 02:04	JO	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:	PR-1S		
Lab Sample ID:	JC68840-1F	**Date Sampled:**	06/27/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	06/27/18
		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	07/09/18 19:27	LS	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:	PR-2S		
Lab Sample ID:	JC68840-2	**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	LOQ	LOD	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	11.4	5.0	4.0	mg/l	1	07/03/18 16:29	CD	SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 [b]	mg/l	1	06/28/18 17:12	LS	SM5210 B-11
Coliform, Fecal	510	10		col/100ml	4	06/27/18 16:46	SA	SM9222 D-06
Coliform, Total [c]	16	4		col/100ml	4	06/27/18 22:00	SA	SM9222 B-06
Nitrogen, Ammonia	0.20 U	0.20	0.20	mg/l	1	07/02/18 15:23	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [d]	0.11 U	0.11	0.11	mg/l	1	07/10/18 13:25	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.10 U	0.10	0.10	mg/l	1	07/10/18 13:25	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0050 U	0.010	0.0050	mg/l	1	06/27/18 21:40	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.31	0.20	0.15	mg/l	1	07/09/18 10:19	BM	EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	mg/l	1	07/09/18 19:05	LS	EPA 365.3
Solids, Total Dissolved	27.5	10	4.0	mg/l	1	07/02/18 14:47	RC	SM2540 C-11
Solids, Total Suspended [e]	5.0	4.0	1.0	mg/l	1	06/29/18 12:20	RC	SM2540 D-11
Total Organic Carbon	3.4	1.0	1.0	mg/l	1	07/04/18 02:16	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 400 mL of sample. Volume was reduced from 1 liter as the sample clogged the filter at the higher volume.

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:	PR-2S		
Lab Sample ID:	JC68840-2F	**Date Sampled:**	06/27/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	06/27/18
		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	07/09/18 19:27	LS	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: PR-2M
Lab Sample ID: JC68840-3
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	LOQ	LOD	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	22.9	5.0	4.0	mg/l	1	07/03/18 16:29	CD	SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 [b]	mg/l	1	06/28/18 17:14	LS	SM5210 B-11
Nitrogen, Ammonia	0.20 U	0.20	0.20	mg/l	1	07/02/18 15:24	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [c]	0.11 U	0.11	0.11	mg/l	1	07/10/18 13:26	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.10 U	0.10	0.10	mg/l	1	07/10/18 13:26	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0050 U	0.010	0.0050	mg/l	1	06/27/18 21:40	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.22	0.20	0.15	mg/l	1	07/09/18 10:20	BM	EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	mg/l	1	07/09/18 19:05	LS	EPA 365.3
Solids, Total Dissolved	12.5	10	4.0	mg/l	1	07/02/18 14:47	RC	SM2540 C-11
Solids, Total Suspended [d]	7.1	4.0	1.0	mg/l	1	07/02/18 10:20	RC	SM2540 D-11
Total Organic Carbon	2.7	1.0	1.0	mg/l	1	07/04/18 02:26	JO	SM5310 B-11

(a) Sample was titrated to a final pH of 4.5.
(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:	PR-2M		
Lab Sample ID:	JC68840-3F	**Date Sampled:**	06/27/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	06/27/18
		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	07/09/18 19:27	LS	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: PR-2D
Lab Sample ID: JC68840-4
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	LOQ	LOD	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	27.0	5.0	4.0	mg/l	1	07/03/18 16:29	CD	SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 [b]	mg/l	1	06/28/18 17:16	LS	SM5210 B-11
Nitrogen, Ammonia	0.22	0.20	0.20	mg/l	1	07/02/18 15:25	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [c]	0.11 U	0.11	0.11	mg/l	1	07/10/18 13:27	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.10 U	0.10	0.10	mg/l	1	07/10/18 13:27	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0050 U	0.010	0.0050	mg/l	1	06/27/18 21:40	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.39	0.20	0.15	mg/l	1	07/09/18 10:21	BM	EPA 351.2/LACHAT
Phosphorus, Total	0.32	0.050	0.050	mg/l	1	07/09/18 19:05	LS	EPA 365.3
Solids, Total Dissolved	48.6	10	4.0	mg/l	1	07/02/18 14:47	RC	SM2540 C-11
Solids, Total Suspended	137	4.0	1.0	mg/l	1	07/02/18 10:20	RC	SM2540 D-11
Total Organic Carbon	3.2	1.0	1.0	mg/l	1	07/04/18 02:47	JO	SM5310 B-11

(a) Sample was titrated to a final pH of 4.5.
(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:	PR-2D		
Lab Sample ID:	JC68840-4F	**Date Sampled:**	06/27/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	06/27/18
		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	07/09/18 19:27	LS	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:	PR-3S		
Lab Sample ID:	JC68840-5	**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	LOQ	LOD	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	15.6	5.0	4.0	mg/l	1	07/03/18 16:29	CD	SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 [b]	mg/l	1	06/28/18 17:18	LS	SM5210 B-11
Coliform, Fecal	4	4		col/100ml	4	06/27/18 16:46	SA	SM9222 D-06
Coliform, Total [c]	4	4		col/100ml	4	06/27/18 22:00	SA	SM9222 B-06
Nitrogen, Ammonia	0.20 U	0.20	0.20	mg/l	1	07/02/18 15:27	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [d]	0.11 U	0.11	0.11	mg/l	1	07/10/18 13:28	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.10 U	0.10	0.10	mg/l	1	07/10/18 13:28	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0050 U	0.010	0.0050	mg/l	1	06/27/18 21:40	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.23	0.20	0.15	mg/l	1	07/09/18 10:22	BM	EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	mg/l	1	07/09/18 19:05	LS	EPA 365.3
Solids, Total Dissolved	17.5	10	4.0	mg/l	1	07/02/18 14:47	RC	SM2540 C-11
Solids, Total Suspended [e]	5.0	4.0	1.0	mg/l	1	07/02/18 10:20	RC	SM2540 D-11
Total Organic Carbon	3.2	1.0	1.0	mg/l	1	07/04/18 03:01	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 400 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:	PR-3S		
Lab Sample ID:	JC68840-5F	**Date Sampled:**	06/27/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	06/27/18
		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	07/09/18 19:27	LS	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: PR-3M
Lab Sample ID: JC68840-6
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	LOQ	LOD	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	21.8	5.0	4.0	mg/l	1	07/03/18 16:29	CD	SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 [b]	mg/l	1	06/28/18 17:20	LS	SM5210 B-11
Nitrogen, Ammonia	0.20 U	0.20	0.20	mg/l	1	07/02/18 15:28	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [c]	0.11 U	0.11	0.11	mg/l	1	07/10/18 13:31	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.10 U	0.10	0.10	mg/l	1	07/10/18 13:31	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0050 U	0.010	0.0050	mg/l	1	06/27/18 21:40	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.30	0.20	0.15	mg/l	1	07/09/18 10:22	BM	EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	mg/l	1	07/09/18 19:27	LS	EPA 365.3
Solids, Total Dissolved	48.0	10	4.0	mg/l	1	07/02/18 14:47	RC	SM2540 C-11
Solids, Total Suspended	2.2 J	4.0	1.0	mg/l	1	07/02/18 10:20	RC	SM2540 D-11
Total Organic Carbon	2.9	1.0	1.0	mg/l	1	07/04/18 03:12	JO	SM5310 B-11

(a) Sample was titrated to a final pH of 4.5.
(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:	PR-3M		
Lab Sample ID:	JC68840-6F	**Date Sampled:**	06/27/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	06/27/18
		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	07/09/18 19:27	LS	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: PR-3D
Lab Sample ID: JC68840-7
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	LOQ	LOD	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	27.0	5.0	4.0	mg/l	1	07/03/18 16:47	CD	SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 [b]	mg/l	1	06/28/18 17:23	LS	SM5210 B-11
Nitrogen, Ammonia	0.79	0.20	0.20	mg/l	1	07/02/18 15:30	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [c]	0.11 U	0.11	0.11	mg/l	1	07/10/18 13:32	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.10 U	0.10	0.10	mg/l	1	07/10/18 13:32	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0050 U	0.010	0.0050	mg/l	1	06/27/18 21:40	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.83	0.20	0.15	mg/l	1	07/09/18 10:25	BM	EPA 351.2/LACHAT
Phosphorus, Total	0.086	0.050	0.050	mg/l	1	07/09/18 19:27	LS	EPA 365.3
Solids, Total Dissolved	4.0 U	10	4.0	mg/l	1	07/02/18 14:47	RC	SM2540 C-11
Solids, Total Suspended	48.7	4.0	1.0	mg/l	1	07/02/18 10:20	RC	SM2540 D-11
Total Organic Carbon	5.2	1.0	1.0	mg/l	1	07/04/18 04:11	JO	SM5310 B-11

(a) Sample was titrated to a final pH of 4.5.
(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:	PR-3D		
Lab Sample ID:	JC68840-7F	**Date Sampled:**	06/27/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	06/27/18
		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	07/09/18 19:27	LS	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: PR-4S
Lab Sample ID: JC68840-8
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	LOQ	LOD	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	17.7	5.0	4.0	mg/l	1	07/03/18 16:47	CD	SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 [b]	mg/l	1	06/28/18 21:38	SA	SM5210 B-11
Coliform, Fecal	144	4		col/100ml	4	06/27/18 16:46	SA	SM9222 D-06
Coliform, Total [c]	450	10		col/100ml	10	06/27/18 22:00	SA	SM9222 B-06
Nitrogen, Ammonia	0.20 U	0.20	0.20	mg/l	1	07/02/18 15:34	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [d]	0.11 U	0.11	0.11	mg/l	1	07/10/18 13:33	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.10	0.10	0.10	mg/l	1	07/10/18 13:33	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0050 U	0.010	0.0050	mg/l	1	06/27/18 21:56	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.32	0.20	0.15	mg/l	1	07/09/18 10:26	BM	EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	mg/l	1	07/09/18 19:27	LS	EPA 365.3
Solids, Total Dissolved	5.0 J	10	4.0	mg/l	1	07/02/18 14:47	RC	SM2540 C-11
Solids, Total Suspended	10.4	4.0	1.0	mg/l	1	07/02/18 10:20	RC	SM2540 D-11
Total Organic Carbon	3.4	1.0	1.0	mg/l	1	07/04/18 04:20	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
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:	PR-4S		
Lab Sample ID:	JC68840-8F	**Date Sampled:**	06/27/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	06/27/18
		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	07/09/18 19:30	LS	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

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
PN

FED-EX Tracking #:
SGS Quote #:
Bottle Order Control #: PD-061418-199
SGS Job #: JC68840

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 610- 597-9788 Phone #

Project Information

Project Name: USACE-Prompton Reservoir
Street:
City: Prompton 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 #	Collection Date	Collection Time	Sampled by	Matrix	# of bottles	Number of preserved bottles: HCl	NaOH	HNO3	H2SO4	NONE	DI Water	MEOH	ENCORE	Alk, Amm, BOD, xN030, TDS	TSS, TOC, TKN, TP04	TCF, FCF	Total Phosphorus (and TKN Bottle)	LAB USE ONLY
1F	PR-1S		6/27/18	1220	MS	SW	10	X			X					X	X	X	X	X	C27
2F	PR-2S			1225	MS	SW	10	X			X					X	X	X	X	X	C30
3F	PR-2M			1225	MS	SW	8	X			X						X	X		X	G54792
4F	PR-2D			1225	MS	SW	8	X			X						X	X		X	19R1
5F	PR-3S			1250	MS	SW	10	X			X					X	X	X	X	X	
6F	PR-3M			1250	MS	SW	8	X			X						X	X		X	
7F	PR-3D			1250	MS	SW	8	X			X						X	X		X	
8F	PR-4S			1200	MS	SW	10	X			X					X	X	X	X	X	

INITIAL ASSESSMENT 3B/MP

LABEL VERIFICATION

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

Email copies of chain to client

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	6/27/18 4:00	1	2	6/28/18 9:10	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 #	Preserved where applicable	On Ice: 3.7, 2.9, 2.6, 3.1, 1.9, 2.5 Cooler Temp: 3.0 Corr
5		5	☐ Intact ☐ Not intact	☐	

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

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

5.1 5

SGS Sample Receipt Summary

Job Number: JC68840 **Client:** USACE-PHILADELPHIA DISTRICT **Project:** PHILADELPHIA DISTRICT, RESERVOIR SAMPL

Date / Time Received: 6/27/2018 7:10:00 PM **Delivery Method:** **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 -8 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) -2 & -5 TCF/FCF rec'd nearing hold times. Lab to verify if samples.
3) -1 & -8 Sample rec'd in hold processed 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
3) Proceed as noted

Per Joseph Loeper

JC68840: Chain of Custody
Page 3 of 3

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: JC69712

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: 33

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: JC69712

Philadelphia District, Reservoir Sampling
Project No: W25PHS81145379

Sample Number	Collected Date	Time	By	Received	Matrix Code	Type	Client Sample ID
JC69712-1	07/11/18	12:30	GW	07/11/18	AQ	Surface Water	PR-1S
JC69712-1F	07/11/18	12:30	GW	07/11/18	AQ	Surface H2O Filtered	PR-1S
JC69712-2	07/11/18	14:00	GW	07/11/18	AQ	Surface Water	PR-2S
JC69712-2F	07/11/18	14:00	GW	07/11/18	AQ	Surface H2O Filtered	PR-2S
JC69712-3	07/11/18	14:00	GW	07/11/18	AQ	Surface Water	PR-2M
JC69712-3F	07/11/18	14:00	GW	07/11/18	AQ	Surface H2O Filtered	PR-2M
JC69712-4	07/11/18	14:00	GW	07/11/18	AQ	Surface Water	PR-2D
JC69712-4F	07/11/18	14:00	GW	07/11/18	AQ	Surface H2O Filtered	PR-2D
JC69712-5	07/11/18	13:20	GW	07/11/18	AQ	Surface Water	PR-3S
JC69712-5F	07/11/18	13:20	GW	07/11/18	AQ	Surface H2O Filtered	PR-3S
JC69712-6	07/11/18	13:20	GW	07/11/18	AQ	Surface Water	PR-3M
JC69712-6F	07/11/18	13:20	GW	07/11/18	AQ	Surface H2O Filtered	PR-3M
JC69712-7	07/11/18	13:20	GW	07/11/18	AQ	Surface Water	PR-3D

Sample Summary
(continued)

USACE-Philadelphia District

Job No: JC69712

Philadelphia District, Reservoir Sampling
Project No: W25PHS81145379

Sample Number	Collected Date	Time	By	Received	Matrix Code	Type	Client Sample ID
JC69712-7F	07/11/18	13:20	GW	07/11/18	AQ	Surface H2O Filtered	PR-3D
JC69712-8	07/11/18	12:00	GW	07/11/18	AQ	Surface Water	PR-4S
JC69712-8F	07/11/18	12:00	GW	07/11/18	AQ	Surface H2O Filtered	PR-4S

CASE NARRATIVE / CONFORMANCE SUMMARY

Client:	USACE-Philadelphia District	**Job No**	JC69712
Site:	Philadelphia District, Reservoir Sampling	**Report Date**	7/23/2018 3:37:06 PM

On 07/11/2018, 8 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 JC69712 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:** GP14625

- 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, Total Kjeldahl.
- Matrix Spike Recovery(s) for Nitrogen, Total Kjeldahl are outside control limits. Spike recovery indicates possible matrix interference.

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, JC69712-5MS were used as the QC samples for Nitrogen, Nitrate + Nitrite.

Matrix: AQ **Batch ID:** GP14522

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC69467-2DUP, JC69467-2MS were used as the QC samples for Nitrogen, Nitrate + Nitrite.

General Chemistry By Method EPA 365.3

Matrix: AQ **Batch ID:** GP14620

- 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 Phosphorus, Total.

General Chemistry By Method EPA353.2/SM4500NO2B

Matrix: AQ **Batch ID:** R171340

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC69712-3 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R171359

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC69712-1 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R171360

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC69712-2 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R171361

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC69712-4 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R171362

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC69712-5 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R171363

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC69712-6 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R171364

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC69712-7 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R171365

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC69712-8 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

General Chemistry By Method SM2320 B-11

Matrix: AQ **Batch ID:** GN82981

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC69712-1DUP were used as the QC samples for Alkalinity, Total as CaCO3.
- JC69712-1 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.5.
- JC69712-2 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.5.
- JC69712-6 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.5.
- JC69712-8 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC69712-7 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.5.
- JC69712-4 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.5.
- JC69712-3 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.5.
- JC69712-5 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.5.

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) JC69712-1DUP were used as the QC samples for Solids, Total Dissolved.

Matrix: AQ	Batch ID: GN82854

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC69712-6DUP were used as the QC samples for Solids, Total Dissolved.

General Chemistry By Method SM2540 D-11

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.
- JC69712-3 for Solids, Total Suspended: Reported sample aliquot obtained from filtration of 400 mL of sample. Volume was reduced from 1 liter due to nature of sample matrix.
- JC69712-2 for Solids, Total Suspended: Reported sample aliquot obtained from filtration of 300 mL of sample. Volume was reduced from 1 liter due to nature of sample matrix.

Matrix: AQ	Batch ID: GN82877

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC69467-1DUP were used as the QC samples for Solids, Total Suspended.
- JC69712-6 for Solids, Total Suspended: Reported sample aliquot obtained from filtration of 300 mL of sample. Volume was reduced from 1 liter due to nature of sample matrix.
- JC69712-5 for Solids, Total Suspended: Reported sample aliquot obtained from filtration of 450 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: 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.

Matrix: AQ	Batch ID: GP14567

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC70031-1DUP, JC70031-1MS, JC70031-1MSD were used as the QC samples for Nitrogen, Ammonia.

Matrix: AQ	Batch ID: GP14600

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC69748-2DUP, JC69748-2MS, JC69748-2MSD 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.

Matrix: AQ	Batch ID: GN82727

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC69467-2DUP, JC69467-2MS were used as the QC samples for Nitrogen, Nitrite.

General Chemistry By Method SM5210 B-11

Matrix: AQ	Batch ID: GP14429

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC69712-1DUP were used as the QC samples for BOD, 5 Day.

General Chemistry By Method SM5310 B-11

Matrix: AQ	Batch ID: GP14458

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC69712-2MS, JC69712-2MSD 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.
- JC69712-2 for Coliform, Total: Analysis done out of holding time.
- JC69712-5 for Coliform, Total: Analysis done out of holding time.
- JC69712-8 for Coliform, Total: Analysis done out of holding time.
- JC69712-1 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.
- JC69712-5 for Coliform, Fecal: Analysis done out of holding time.
- JC69712-2 for Coliform, Fecal: Analysis done out of holding time.
- JC69712-1 for Coliform, Fecal: Analysis done out of holding time.
- JC69712-8 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: JC69712
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
JC69712-1	**PR-1S**					
Alkalinity, Total as CaCO3 [a]		26.0	5.0		mg/l	SM2320 B-11
Coliform, Fecal [b]		164	4		col/100ml	SM9222 D-06
Coliform, Total [b]		97	10		col/100ml	SM9222 B-06
Nitrogen, Nitrate [c]		0.23	0.11		mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		0.23	0.10		mg/l	EPA 353.2/LACHAT
Nitrogen, Total Kjeldahl		0.25	0.20		mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		37.5	10		mg/l	SM2540 C-11
Total Organic Carbon		1.7	1.0		mg/l	SM5310 B-11
JC69712-1F	**PR-1S**					
No hits reported in this sample.						
JC69712-2	**PR-2S**					
Alkalinity, Total as CaCO3 [a]		22.9	5.0		mg/l	SM2320 B-11
Nitrogen, Total Kjeldahl		0.58	0.20		mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		65.7	10		mg/l	SM2540 C-11
Solids, Total Suspended [d]		6.7	4.0		mg/l	SM2540 D-11
Total Organic Carbon		4.3	1.0		mg/l	SM5310 B-11
JC69712-2F	**PR-2S**					
No hits reported in this sample.						
JC69712-3	**PR-2M**					
Alkalinity, Total as CaCO3 [a]		23.4	5.0		mg/l	SM2320 B-11
Nitrogen, Total Kjeldahl		0.66	0.20		mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		45.7	10		mg/l	SM2540 C-11
Solids, Total Suspended [e]		7.0	4.0		mg/l	SM2540 D-11
Total Organic Carbon		3.3	1.0		mg/l	SM5310 B-11
JC69712-3F	**PR-2M**					
No hits reported in this sample.						
JC69712-4	**PR-2D**					
Alkalinity, Total as CaCO3 [a]		25.5	5.0		mg/l	SM2320 B-11
Nitrogen, Total Kjeldahl		0.54	0.20		mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		45.7	10		mg/l	SM2540 C-11
Solids, Total Suspended		48.7	4.0		mg/l	SM2540 D-11

Summary of Hits

Job Number: JC69712
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		2.7	1.0		mg/l	SM5310 B-11
JC69712-4F	**PR-2D**					
No hits reported in this sample.						
JC69712-5	**PR-3S**					
Alkalinity, Total as CaCO3 [a]		21.8	5.0		mg/l	SM2320 B-11
Coliform, Total [b]		4	4		col/100ml	SM9222 B-06
Nitrogen, Total Kjeldahl		0.80	0.20		mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		40.0	10		mg/l	SM2540 C-11
Solids, Total Suspended [f]		6.0	4.0		mg/l	SM2540 D-11
Total Organic Carbon		3.9	1.0		mg/l	SM5310 B-11
JC69712-5F	**PR-3S**					
No hits reported in this sample.						
JC69712-6	**PR-3M**					
Alkalinity, Total as CaCO3 [a]		21.8	5.0		mg/l	SM2320 B-11
BOD, 5 Day		3.6	3.4		mg/l	SM5210 B-11
Nitrogen, Total Kjeldahl		0.74	0.20		mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		16.7	10		mg/l	SM2540 C-11
Solids, Total Suspended [d]		6.3	4.0		mg/l	SM2540 D-11
Total Organic Carbon		3.4	1.0		mg/l	SM5310 B-11
JC69712-6F	**PR-3M**					
No hits reported in this sample.						
JC69712-7	**PR-3D**					
Alkalinity, Total as CaCO3 [a]		34.3	5.0		mg/l	SM2320 B-11
Nitrogen, Ammonia		0.44	0.20		mg/l	SM4500NH3 H-11LACHAT
Nitrogen, Total Kjeldahl		1.5	0.20		mg/l	EPA 351.2/LACHAT
Solids, Total Suspended		52.0	4.0		mg/l	SM2540 D-11
Total Organic Carbon		8.3	1.0		mg/l	SM5310 B-11
JC69712-7F	**PR-3D**					
No hits reported in this sample.						

Summary of Hits

Job Number: JC69712
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
JC69712-8	**PR-4S**					
Alkalinity, Total as CaCO3 [g]		12.5	5.0		mg/l	SM2320 B-11
Coliform, Fecal [b]		40	4		col/100ml	SM9222 D-06
Coliform, Total [b]		4	4		col/100ml	SM9222 B-06
Nitrogen, Nitrate [c]		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		0.41	0.20		mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		16.7	10		mg/l	SM2540 C-11
Solids, Total Suspended		8.2	4.0		mg/l	SM2540 D-11
Total Organic Carbon		3.0	1.0		mg/l	SM5310 B-11
JC69712-8F	**PR-4S**					
No hits reported in this sample.						

(a) Sample was titrated to a final pH of 4.5.
(b) Analysis done out of holding time.
(c) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)
(d) Reported sample aliquot obtained from filtration of 300 mL of sample. Volume was reduced from 1 liter due to nature of sample matrix.
(e) Reported sample aliquot obtained from filtration of 400 mL of sample. Volume was reduced from 1 liter due to nature of sample matrix.
(f) Reported sample aliquot obtained from filtration of 450 mL of sample. Volume was reduced from 1 liter due to nature of sample matrix.
(g) Sample was titrated to a final pH of 4.2.

Sample Results

Report of Analysis

Report of Analysis

Client Sample ID: PR-1S
Lab Sample ID: JC69712-1
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]	26.0	5.0	mg/l	1	07/18/18 16:41	MP	SM2320 B-11
BOD, 5 Day	< 3.4	3.4	mg/l	1	07/12/18 22:42	SA	SM5210 B-11
Coliform, Fecal [b]	164	4	col/100ml	4	07/11/18 23:39	SA	SM9222 D-06
Coliform, Total [b]	97	10	col/100ml	10	07/11/18 23:35	SA	SM9222 B-06
Nitrogen, Ammonia	< 0.20	0.20	mg/l	1	07/18/18 11:06	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [c]	0.23	0.11	mg/l	1	07/17/18 11:39	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.23	0.10	mg/l	1	07/17/18 11:39	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	0.25	0.20	mg/l	1	07/20/18 10:44	BM	EPA 351.2/LACHAT
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/21/18 11:10	LS	EPA 365.3
Solids, Total Dissolved	37.5	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	1.7	1.0	mg/l	1	07/17/18 04:30	CD	SM5310 B-11

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

RL = Reporting Limit

Report of Analysis

Client Sample ID:	PR-1S		
Lab Sample ID:	JC69712-1F	**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	07/21/18 11:30	LS	EPA 365.3

RL = Reporting Limit

Report of Analysis

Client Sample ID: PR-2S
Lab Sample ID: JC69712-2
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]	22.9	5.0	mg/l	1	07/18/18 16:41	MP	SM2320 B-11
BOD, 5 Day	< 3.4	3.4	mg/l	1	07/12/18 22:45	SA	SM5210 B-11
Coliform, Fecal [b]	0	4	col/100ml	1	07/11/18 23:39	SA	SM9222 D-06
Coliform, Total [b]	0	4	col/100ml	1	07/11/18 23:35	SA	SM9222 B-06
Nitrogen, Ammonia	< 0.20	0.20	mg/l	1	07/18/18 11:18	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [c]	< 0.11	0.11	mg/l	1	07/17/18 11:40	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	< 0.10	0.10	mg/l	1	07/17/18 11:40	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	0.58	0.20	mg/l	1	07/20/18 10:45	BM	EPA 351.2/LACHAT
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/21/18 11:10	LS	EPA 365.3
Solids, Total Dissolved	65.7	10	mg/l	1	07/16/18 13:30	RC	SM2540 C-11
Solids, Total Suspended [d]	6.7	4.0	mg/l	1	07/16/18 16:25	RC	SM2540 D-11
Total Organic Carbon	4.3	1.0	mg/l	1	07/17/18 04:43	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.5.
(b) Analysis done out of holding time.
(c) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)
(d) Reported sample aliquot obtained from filtration of 300 mL of sample. Volume was reduced from 1 liter due to nature of sample matrix.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	PR-2S		
Lab Sample ID:	JC69712-2F	**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	07/21/18 11:30	LS	EPA 365.3

RL = Reporting Limit

Report of Analysis

Client Sample ID:	PR-2M		
Lab Sample ID:	JC69712-3	**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]	23.4	5.0	mg/l	1	07/18/18 16:41	MP	SM2320 B-11
BOD, 5 Day	< 3.4	3.4	mg/l	1	07/12/18 22:47	SA	SM5210 B-11
Nitrogen, Ammonia	< 0.20	0.20	mg/l	1	07/18/18 11:19	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [b]	< 0.11	0.11	mg/l	1	07/17/18 11:41	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	< 0.10	0.10	mg/l	1	07/17/18 11:41	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	0.66	0.20	mg/l	1	07/20/18 10:46	BM	EPA 351.2/LACHAT
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/21/18 11:10	LS	EPA 365.3
Solids, Total Dissolved	45.7	10	mg/l	1	07/16/18 13:30	RC	SM2540 C-11
Solids, Total Suspended [c]	7.0	4.0	mg/l	1	07/16/18 16:25	RC	SM2540 D-11
Total Organic Carbon	3.3	1.0	mg/l	1	07/17/18 05:42	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.5.
(b) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)
(c) Reported sample aliquot obtained from filtration of 400 mL of sample. Volume was reduced from 1 liter due to nature of sample matrix.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	PR-2M		
Lab Sample ID:	JC69712-3F	**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	07/21/18 11:30	LS	EPA 365.3

RL = Reporting Limit

Report of Analysis

Client Sample ID: PR-2D
Lab Sample ID: JC69712-4
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]	25.5	5.0	mg/l	1	07/18/18 16:41	MP	SM2320 B-11
BOD, 5 Day	< 3.4	3.4	mg/l	1	07/12/18 22:49	SA	SM5210 B-11
Nitrogen, Ammonia	< 0.20	0.20	mg/l	1	07/18/18 11:20	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [b]	< 0.11	0.11	mg/l	1	07/17/18 11:44	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	< 0.10	0.10	mg/l	1	07/17/18 11:44	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	< 0.010	0.010	mg/l	1	07/12/18 18:30	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.54	0.20	mg/l	1	07/20/18 10:46	BM	EPA 351.2/LACHAT
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/21/18 11:10	LS	EPA 365.3
Solids, Total Dissolved	45.7	10	mg/l	1	07/16/18 13:30	RC	SM2540 C-11
Solids, Total Suspended	48.7	4.0	mg/l	1	07/17/18 11:32	RC	SM2540 D-11
Total Organic Carbon	2.7	1.0	mg/l	1	07/17/18 05:51	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.5.
(b) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	PR-2D		
Lab Sample ID:	JC69712-4F	**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	07/21/18 11:30	LS	EPA 365.3

RL = Reporting Limit

Report of Analysis

Client Sample ID: PR-3S
Lab Sample ID: JC69712-5
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]	21.8	5.0	mg/l	1	07/18/18 16:41	MP	SM2320 B-11
BOD, 5 Day	< 3.4	3.4	mg/l	1	07/12/18 22:50	SA	SM5210 B-11
Coliform, Fecal [b]	0	4	col/100ml	1	07/11/18 23:39	SA	SM9222 D-06
Coliform, Total [b]	4	4	col/100ml	4	07/11/18 23:35	SA	SM9222 B-06
Nitrogen, Ammonia	< 0.20	0.20	mg/l	1	07/18/18 11:22	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [c]	< 0.11	0.11	mg/l	1	07/17/18 11:45	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	< 0.10	0.10	mg/l	1	07/17/18 11:45	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	< 0.010	0.010	mg/l	1	07/12/18 18:30	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.80	0.20	mg/l	1	07/20/18 10:47	BM	EPA 351.2/LACHAT
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/21/18 11:10	LS	EPA 365.3
Solids, Total Dissolved	40.0	10	mg/l	1	07/16/18 13:30	RC	SM2540 C-11
Solids, Total Suspended [d]	6.0	4.0	mg/l	1	07/17/18 11:32	RC	SM2540 D-11
Total Organic Carbon	3.9	1.0	mg/l	1	07/17/18 06:02	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.5.
(b) Analysis done out of holding time.
(c) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)
(d) Reported sample aliquot obtained from filtration of 450 mL of sample. Volume was reduced from 1 liter due to nature of sample matrix.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	PR-3S		
Lab Sample ID:	JC69712-5F	**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	07/21/18 11:30	LS	EPA 365.3

RL = Reporting Limit

Report of Analysis

Client Sample ID:	PR-3M		
Lab Sample ID:	JC69712-6	**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]	21.8	5.0	mg/l	1	07/18/18 16:41	MP	SM2320 B-11
BOD, 5 Day	3.6	3.4	mg/l	1	07/12/18 22:52	SA	SM5210 B-11
Nitrogen, Ammonia	< 0.20	0.20	mg/l	1	07/18/18 11:23	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [b]	< 0.11	0.11	mg/l	1	07/17/18 11:47	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	< 0.10	0.10	mg/l	1	07/17/18 11:47	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	< 0.010	0.010	mg/l	1	07/12/18 18:30	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.74	0.20	mg/l	1	07/20/18 10:48	BM	EPA 351.2/LACHAT
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/21/18 11:10	LS	EPA 365.3
Solids, Total Dissolved	16.7	10	mg/l	1	07/16/18 17:00	RC	SM2540 C-11
Solids, Total Suspended [c]	6.3	4.0	mg/l	1	07/17/18 11:32	RC	SM2540 D-11
Total Organic Carbon	3.4	1.0	mg/l	1	07/17/18 06:14	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.5.
(b) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)
(c) Reported sample aliquot obtained from filtration of 300 mL of sample. Volume was reduced from 1 liter due to nature of sample matrix.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	PR-3M		
Lab Sample ID:	JC69712-6F	**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	07/21/18 11:30	LS	EPA 365.3

RL = Reporting Limit

Report of Analysis

Client Sample ID: PR-3D
Lab Sample ID: JC69712-7
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]	34.3	5.0	mg/l	1	07/18/18 16:41	MP	SM2320 B-11
BOD, 5 Day	< 3.4	3.4	mg/l	1	07/12/18 22:54	SA	SM5210 B-11
Nitrogen, Ammonia	0.44	0.20	mg/l	1	07/19/18 11:42	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [b]	< 0.11	0.11	mg/l	1	07/17/18 11:48	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	< 0.10	0.10	mg/l	1	07/17/18 11:48	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	< 0.010	0.010	mg/l	1	07/12/18 18:30	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	1.5	0.20	mg/l	1	07/20/18 10:49	BM	EPA 351.2/LACHAT
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/21/18 11:30	LS	EPA 365.3
Solids, Total Dissolved	< 10	10	mg/l	1	07/16/18 17:00	RC	SM2540 C-11
Solids, Total Suspended	52.0	4.0	mg/l	1	07/17/18 11:32	RC	SM2540 D-11
Total Organic Carbon	8.3	1.0	mg/l	1	07/17/18 06:23	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.5.
(b) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	PR-3D		
Lab Sample ID:	JC69712-7F	**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	07/21/18 11:30	LS	EPA 365.3

RL = Reporting Limit

Report of Analysis

Client Sample ID: PR-4S
Lab Sample ID: JC69712-8
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]	12.5	5.0	mg/l	1	07/18/18 16:41	MP	SM2320 B-11
BOD, 5 Day	< 3.4	3.4	mg/l	1	07/12/18 22:56	SA	SM5210 B-11
Coliform, Fecal [b]	40	4	col/100ml	4	07/11/18 23:39	SA	SM9222 D-06
Coliform, Total [b]	4	4	col/100ml	4	07/11/18 23:35	SA	SM9222 B-06
Nitrogen, Ammonia	< 0.20	0.20	mg/l	1	07/19/18 11:43	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [c]	0.13	0.11	mg/l	1	07/17/18 11:54	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.13	0.10	mg/l	1	07/17/18 11:54	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	< 0.010	0.010	mg/l	1	07/12/18 22:00	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.41	0.20	mg/l	1	07/20/18 10:52	BM	EPA 351.2/LACHAT
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/21/18 11:30	LS	EPA 365.3
Solids, Total Dissolved	16.7	10	mg/l	1	07/16/18 17:00	RC	SM2540 C-11
Solids, Total Suspended	8.2	4.0	mg/l	1	07/17/18 11:32	RC	SM2540 D-11
Total Organic Carbon	3.0	1.0	mg/l	1	07/17/18 06:35	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:	PR-4S		
Lab Sample ID:	JC69712-8F	**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	07/21/18 11:30	LS	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

PAGE ___ OF ___

FED-EX Tracking #
Bottle Order Control #: PD-062518-64
SGS Quote #
SGS Job #: JC69712

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 #: 610-597-9780

Project Information

Project Name: US Army Corps of Eng. - Prompton Res.
Street:
City: Prompton 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)

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, XN030	TDS, TOC, TPO4, TKN	TSS, Total Phosphorus	FCF, TCF	LAB USE ONLY
1F	PR-1S		7/11/18	1230	[signature]	SW	11	X			X					X	X	X	X	X	C25
2F	PR-2S * See Comments		↓	2:00	↓	SW	11	X			X					X	X	X	X	X	C27
3F	PR-2M			2:00		SW	9	X			X						X	X	X		G46T4
4F	PR-2D * See Comments			2:00		SW	9	X			X						X	X	X		19D1
5F	PR-3S			1:20		SW	11	X			X					X	X	X	X	X	
6F	PR-3M			1:20		SW	9	X			X						X	X	X		
7F	PR-3D			1:20		SW	9	X			X						X	X	X		
8F	PR-4S			12:00		SW	11	X			X					X	X	X	X	X	

INITIAL ASSESSMENT ~~38~~ / [initials] 1100P

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

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

PR-2S is PR-2D (except Bacteria)
PR-2D is PR-2S

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]	7/11/18 1805	1 [signature]	2 [signature]	7/11/18 20:00	2 [signature]
3 Relinquished by Sampler:	Date Time:	3 Received By:	4 Relinquished By:	Date Time:	4 Received By:
5 Relinquished by:	Date Time:	5 Received By:	Custody Seal #	☐ Intact ☐ Not intact	Preserved where applicable ☐ On Ice ☐ Cooler Temp.

1.3, 1.8, 2.2, 2.4, 2.0, 1.4, 3.2

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

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

JC69712: Chain of Custody
Page 1 of 3

SGS Sample Receipt Summary

Job Number: JC69712 **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 or nearing hold time. Samples processed out of hold.
2) For all samples, Total Diss LF Phosphorous was submitted but not noted as such on COC. Filtration request has been sent.
3) -2 and -4 Commenst noted that samples were mislabeled in the Field, Except the TCFand FCF bottles. Samples have been set up as noted.

Bottles labeled "PR-2D" except the TCFand FCF set up as -2.
Bottles labeled "PR-2S" set up as -4.

SM089-02 Rev. Date 12/1/16

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

Proceed as noted. Joe Loeper notified.

JC69712: Chain of Custody
Page 3 of 3

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

PD-07918-122

SGS Job Number: JC70667

Sampling Date: 07/26/18

Report to:

Army Corps of Engineers

joseph.m.loeper@usace.army.mil

ATTN: Joseph Loeper

Total number of pages in report: 31

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: JC70667

Philadelphia District, Reservoir Sampling
Project No: PD-07918-122

Sample Number	Collected Date	Time	By	Received	Matrix Code	Type	Client Sample ID
JC70667-1	07/26/18	08:30	GW	07/26/18	AQ	Surface Water	PR-1S
JC70667-1F	07/26/18	08:30	GW	07/26/18	AQ	Surface H2O Filtered	PR-1S
JC70667-2	07/26/18	10:00	GW	07/26/18	AQ	Surface Water	PR-2S
JC70667-2F	07/26/18	10:00	GW	07/26/18	AQ	Surface H2O Filtered	PR-2S
JC70667-3	07/26/18	10:00	GW	07/26/18	AQ	Surface Water	PR-2M
JC70667-3F	07/26/18	10:00	GW	07/26/18	AQ	Surface H2O Filtered	PR-2M
JC70667-4	07/26/18	10:00	GW	07/26/18	AQ	Surface Water	PR-2D
JC70667-4F	07/26/18	10:00	GW	07/26/18	AQ	Surface H2O Filtered	PR-2D
JC70667-5	07/26/18	09:15	GW	07/26/18	AQ	Surface Water	PR-3S
JC70667-5F	07/26/18	09:15	GW	07/26/18	AQ	Surface H2O Filtered	PR-3S
JC70667-6	07/26/18	09:15	GW	07/26/18	AQ	Surface Water	PR-3M
JC70667-6F	07/26/18	09:15	GW	07/26/18	AQ	Surface H2O Filtered	PR-3M
JC70667-7	07/26/18	09:15	GW	07/26/18	AQ	Surface Water	PR-3D

Sample Summary
(continued)

USACE-Philadelphia District

Job No: JC70667

Philadelphia District, Reservoir Sampling
Project No: PD-07918-122

Sample Number	Collected Date	Time	By	Received	Matrix Code	Matrix Type	Client Sample ID
JC70667-7F	07/26/18	09:15	GW	07/26/18	AQ	Surface H2O Filtered	PR-3D
JC70667-8	07/26/18	08:10	GW	07/26/18	AQ	Surface Water	PR-4S
JC70667-8F	07/26/18	08:10	GW	07/26/18	AQ	Surface H2O Filtered	PR-4S

CASE NARRATIVE / CONFORMANCE SUMMARY

Client:	USACE-Philadelphia District	**Job No**	JC70667
Site:	Philadelphia District, Reservoir Sampling	**Report Date**	8/8/2018 11:59:29 AM

On 07/26/2018, 8 Sample(s), 0 Trip Blank(s) and 0 Field Blank(s) were received at SGS North America Inc. at a maximum corrected temperature of 4.2 C. Samples were intact and chemically preserved, unless noted below. A SGS North America Inc. Job Number of JC70667 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:** GP15005

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC70522-1DUP, JC70522-1MS 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.

General Chemistry By Method EPA 353.2/LACHAT

Matrix: AQ **Batch ID:** GP14976

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC70760-2DUP, JC70760-2MS were used as the QC samples for Nitrogen, Nitrate + Nitrite.
- Matrix Spike Recovery(s) for Nitrogen, Nitrate + Nitrite 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 365.3

Matrix: AQ **Batch ID:** GP14883

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC70858-1DUP, JC70858-1MS were used as the QC samples for Phosphorus, Total.

Matrix: AQ **Batch ID:** GP14943

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC70760-2DUP, JC70760-2MS were used as the QC samples for Phosphorus, Total.

General Chemistry By Method EPA353.2/SM4500NO2B

Matrix: AQ **Batch ID:** R171870

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC70667-1 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R171871

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC70667-2 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R171872

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC70667-3 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R171873

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC70667-4 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R171874

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC70667-5 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R171875

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC70667-6 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R171876

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC70667-7 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R171878

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC70667-8 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

General Chemistry By Method SM2320 B-11

Matrix: AQ **Batch ID:** GN83707

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC70667-2DUP were used as the QC samples for Alkalinity, Total as CaCO3.
- JC70667-4 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.5.
- JC70667-8 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.5.
- JC70667-2 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.5.
- JC70667-3 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.5.
- JC70667-5 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.5.
- JC70667-6 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.5.
- JC70667-7 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.5.
- JC70667-1 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.5.

General Chemistry By Method SM2540 C-11

Matrix: AQ	Batch ID: GN83433

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC70652-1DUP were used as the QC samples for Solids, Total Dissolved.

General Chemistry By Method SM2540 D-11

Matrix: AQ	Batch ID: GN83388

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC70773-1DUP were used as the QC samples for Solids, Total Suspended.

Matrix: AQ	Batch ID: GN83432

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC70667-2DUP were used as the QC samples for Solids, Total Suspended.
- JC70667-7 for Solids, Total Suspended: Reported sample aliquot obtained from filtration of 300 mL of sample. Volume was reduced from 1 liter due to nature of sample matrix.
- JC70667-5 for Solids, Total Suspended: Reported sample aliquot obtained from filtration of 500 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: GP15017

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC70760-2DUP, JC70760-2MSD, JC70760-2DUP were used as the QC samples for Nitrogen, Ammonia.
- Matrix Spike Recovery(s) for Nitrogen, Ammonia 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 SM4500NO2 B-11

Matrix: AQ	Batch ID: GN83381

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC70667-1DUP, JC70667-1MS were used as the QC samples for Nitrogen, Nitrite.

General Chemistry By Method SM5210 B-11

Matrix: AQ	Batch ID: GP14809

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC70642-2DUP were used as the QC samples for BOD, 5 Day.

General Chemistry By Method SM5310 B-11

Matrix: AQ	Batch ID: GP14904

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC70667-1MS, JC70667-1MSD were used as the QC samples for Total Organic Carbon.

General Chemistry By Method SM9222 B-06

Matrix:	AQ	Batch ID:	MB5316

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC70667-1DUP were used as the QC samples for Coliform, Total.

General Chemistry By Method SM9222 D-06

Matrix:	AQ	Batch ID:	MB5315

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC70667-1DUP were used as the QC samples for Coliform, Fecal.

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: JC70667
Account: USACE-Philadelphia District
Project: Philadelphia District, Reservoir Sampling
Collected: 07/26/18

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
JC70667-1	**PR-1S**					
Alkalinity, Total as CaCO3 [a]		13.5	5.0		mg/l	SM2320 B-11
Coliform, Fecal		5900	100		col/100ml	SM9222 D-06
Coliform, Total		3000	100		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
Nitrogen, Total Kjeldahl		0.50	0.20		mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		43.3	10		mg/l	SM2540 C-11
Solids, Total Suspended		11.6	4.0		mg/l	SM2540 D-11
Total Organic Carbon		5.5	1.0		mg/l	SM5310 B-11
JC70667-1F	**PR-1S**					
No hits reported in this sample.						
JC70667-2	**PR-2S**					
Alkalinity, Total as CaCO3 [a]		21.7	5.0		mg/l	SM2320 B-11
Coliform, Fecal		23	2		col/100ml	SM9222 D-06
Coliform, Total		16	2		col/100ml	SM9222 B-06
Nitrogen, Total Kjeldahl		0.48	0.20		mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		47.5	10		mg/l	SM2540 C-11
Solids, Total Suspended		6.7	4.0		mg/l	SM2540 D-11
Total Organic Carbon		3.8	1.0		mg/l	SM5310 B-11
JC70667-2F	**PR-2S**					
No hits reported in this sample.						
JC70667-3	**PR-2M**					
Alkalinity, Total as CaCO3 [a]		16.0	5.0		mg/l	SM2320 B-11
Nitrogen, Total Kjeldahl		0.46	0.20		mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		50.0	10		mg/l	SM2540 C-11
Solids, Total Suspended		9.0	4.0		mg/l	SM2540 D-11
Total Organic Carbon		5.6	1.0		mg/l	SM5310 B-11
JC70667-3F	**PR-2M**					
No hits reported in this sample.						
JC70667-4	**PR-2D**					
Alkalinity, Total as CaCO3 [a]		15.0	5.0		mg/l	SM2320 B-11

Summary of Hits

Job Number: JC70667
Account: USACE-Philadelphia District
Project: Philadelphia District, Reservoir Sampling
Collected: 07/26/18

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
Nitrogen, Total Kjeldahl		1.7	0.80		mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		40.0	10		mg/l	SM2540 C-11
Solids, Total Suspended		10.6	4.0		mg/l	SM2540 D-11
Total Organic Carbon		5.9	1.0		mg/l	SM5310 B-11
JC70667-4F	**PR-2D**					
No hits reported in this sample.						
JC70667-5	**PR-3S**					
Alkalinity, Total as CaCO3 [a]		21.7	5.0		mg/l	SM2320 B-11
Coliform, Fecal		32	2		col/100ml	SM9222 D-06
Coliform, Total		30	2		col/100ml	SM9222 B-06
Nitrogen, Total Kjeldahl		0.51	0.20		mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		32.5	10		mg/l	SM2540 C-11
Solids, Total Suspended [c]		7.0	4.0		mg/l	SM2540 D-11
Total Organic Carbon		3.0	1.0		mg/l	SM5310 B-11
JC70667-5F	**PR-3S**					
No hits reported in this sample.						
JC70667-6	**PR-3M**					
Alkalinity, Total as CaCO3 [a]		23.8	5.0		mg/l	SM2320 B-11
Nitrogen, Total Kjeldahl		0.54	0.20		mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		55.0	10		mg/l	SM2540 C-11
Total Organic Carbon		3.4	1.0		mg/l	SM5310 B-11
JC70667-6F	**PR-3M**					
No hits reported in this sample.						
JC70667-7	**PR-3D**					
Alkalinity, Total as CaCO3 [a]		42.4	5.0		mg/l	SM2320 B-11
BOD, 5 Day		5.4	3.4		mg/l	SM5210 B-11
Nitrogen, Ammonia		1.3	0.20		mg/l	SM4500NH3 H-11LACHAT
Nitrogen, Total Kjeldahl		1.3	0.20		mg/l	EPA 351.2/LACHAT
Phosphorus, Total		0.14	0.050		mg/l	EPA 365.3
Solids, Total Dissolved		80.0	10		mg/l	SM2540 C-11
Solids, Total Suspended [d]		10.3	4.0		mg/l	SM2540 D-11
Total Organic Carbon		5.6	1.0		mg/l	SM5310 B-11

Summary of Hits

Job Number: JC70667
Account: USACE-Philadelphia District
Project: Philadelphia District, Reservoir Sampling
Collected: 07/26/18

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
JC70667-7F	**PR-3D**					
Phosphorus, Total		0.068	0.050		mg/l	EPA 365.3
JC70667-8	**PR-4S**					
Alkalinity, Total as CaCO3 [a]		21.2	5.0		mg/l	SM2320 B-11
Coliform, Fecal		809	10		col/100ml	SM9222 D-06
Coliform, Total		2100	100		col/100ml	SM9222 B-06
Nitrogen, Total Kjeldahl		0.60	0.20		mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		30.0	10		mg/l	SM2540 C-11
Total Organic Carbon		3.7	1.0		mg/l	SM5310 B-11
JC70667-8F	**PR-4S**					

No hits reported in this sample.

(a) Sample was titrated to a final pH of 4.5.
(b) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)
(c) Reported sample aliquot obtained from filtration of 500 mL of sample. Volume was reduced from 1 liter due to nature of sample matrix.
(d) Reported sample aliquot obtained from filtration of 300 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: PR-1S
Lab Sample ID: JC70667-1
Matrix: AQ - Surface Water
Project: Philadelphia District, Reservoir Sampling

Date Sampled: 07/26/18
Date Received: 07/26/18
Percent Solids: n/a

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	13.5	5.0	mg/l	1	08/02/18 14:33	JO	SM2320 B-11
BOD, 5 Day	< 3.4	3.4	mg/l	1	07/26/18 19:22	SA	SM5210 B-11
Coliform, Fecal	5900	100	col/100ml	100	07/26/18 15:49	SA	SM9222 D-06
Coliform, Total	3000	100	col/100ml	100	07/26/18 15:50	SA	SM9222 B-06
Nitrogen, Ammonia	< 0.20	0.20	mg/l	1	08/03/18 13:06	RP	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [b]	0.12	0.11	mg/l	1	08/02/18 12:47	RP	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.12	0.10	mg/l	1	08/02/18 12:47	RP	EPA 353.2/LACHAT
Nitrogen, Nitrite	< 0.010	0.010	mg/l	1	07/26/18 20:40	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.50	0.20	mg/l	1	08/04/18 11:08	RP	EPA 351.2/LACHAT
Phosphorus, Total	< 0.050	0.050	mg/l	1	08/02/18 12:25	LS	EPA 365.3
Solids, Total Dissolved	43.3	10	mg/l	1	07/28/18 09:26	RC	SM2540 C-11
Solids, Total Suspended	11.6	4.0	mg/l	1	07/27/18 15:44	RC	SM2540 D-11
Total Organic Carbon	5.5	1.0	mg/l	1	08/01/18 10:13	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.5.
(b) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	PR-1S		
Lab Sample ID:	JC70667-1F	**Date Sampled:**	07/26/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	07/26/18
		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	08/02/18 14:00	LS	EPA 365.3

RL = Reporting Limit

Report of Analysis

Client Sample ID: PR-2S
Lab Sample ID: JC70667-2
Matrix: AQ - Surface Water
Project: Philadelphia District, Reservoir Sampling

Date Sampled: 07/26/18
Date Received: 07/26/18
Percent Solids: n/a

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	21.7	5.0	mg/l	1	08/02/18 14:33	JO	SM2320 B-11
BOD, 5 Day	< 4.0	4.0	mg/l	1	07/26/18 19:24	SA	SM5210 B-11
Coliform, Fecal	23	2	col/100ml	1	07/26/18 15:49	SA	SM9222 D-06
Coliform, Total	16	2	col/100ml	1	07/26/18 15:50	SA	SM9222 B-06
Nitrogen, Ammonia	< 0.20	0.20	mg/l	1	08/03/18 13:35	RP	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [b]	< 0.11	0.11	mg/l	1	08/02/18 12:48	RP	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	< 0.10	0.10	mg/l	1	08/02/18 12:48	RP	EPA 353.2/LACHAT
Nitrogen, Nitrite	< 0.010	0.010	mg/l	1	07/26/18 20:40	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.48	0.20	mg/l	1	08/04/18 11:09	RP	EPA 351.2/LACHAT
Phosphorus, Total	< 0.050	0.050	mg/l	1	08/02/18 12:25	LS	EPA 365.3
Solids, Total Dissolved	47.5	10	mg/l	1	07/28/18 09:26	RC	SM2540 C-11
Solids, Total Suspended	6.7	4.0	mg/l	1	07/28/18 10:32	RC	SM2540 D-11
Total Organic Carbon	3.8	1.0	mg/l	1	08/01/18 10:55	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.5.
(b) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	PR-2S		
Lab Sample ID:	JC70667-2F	**Date Sampled:**	07/26/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	07/26/18
		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	08/02/18 14:00	LS	EPA 365.3

RL = Reporting Limit

Report of Analysis

Client Sample ID: PR-2M
Lab Sample ID: JC70667-3
Matrix: AQ - Surface Water
Project: Philadelphia District, Reservoir Sampling

Date Sampled: 07/26/18
Date Received: 07/26/18
Percent Solids: n/a

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	16.0	5.0	mg/l	1	08/02/18 14:33	JO	SM2320 B-11
BOD, 5 Day	< 3.4	3.4	mg/l	1	07/26/18 19:25	SA	SM5210 B-11
Nitrogen, Ammonia	< 0.20	0.20	mg/l	1	08/03/18 13:37	RP	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [b]	< 0.11	0.11	mg/l	1	08/02/18 12:49	RP	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	< 0.10	0.10	mg/l	1	08/02/18 12:49	RP	EPA 353.2/LACHAT
Nitrogen, Nitrite	< 0.010	0.010	mg/l	1	07/26/18 20:40	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.46	0.20	mg/l	1	08/04/18 11:10	RP	EPA 351.2/LACHAT
Phosphorus, Total	< 0.050	0.050	mg/l	1	08/02/18 12:25	LS	EPA 365.3
Solids, Total Dissolved	50.0	10	mg/l	1	07/28/18 09:26	RC	SM2540 C-11
Solids, Total Suspended	9.0	4.0	mg/l	1	07/28/18 10:32	RC	SM2540 D-11
Total Organic Carbon	5.6	1.0	mg/l	1	08/01/18 11:05	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.5.
(b) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	PR-2M		
Lab Sample ID:	JC70667-3F	**Date Sampled:**	07/26/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	07/26/18
		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	08/02/18 14:00	LS	EPA 365.3

RL = Reporting Limit

Report of Analysis

Client Sample ID: PR-2D
Lab Sample ID: JC70667-4
Matrix: AQ - Surface Water
Project: Philadelphia District, Reservoir Sampling

Date Sampled: 07/26/18
Date Received: 07/26/18
Percent Solids: n/a

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	15.0	5.0	mg/l	1	08/02/18 14:33	JO	SM2320 B-11
BOD, 5 Day	< 3.4	3.4	mg/l	1	07/26/18 19:27	SA	SM5210 B-11
Nitrogen, Ammonia	< 0.20	0.20	mg/l	1	08/03/18 13:38	RP	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [b]	< 0.11	0.11	mg/l	1	08/02/18 12:50	RP	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	< 0.10	0.10	mg/l	1	08/02/18 12:50	RP	EPA 353.2/LACHAT
Nitrogen, Nitrite	< 0.010	0.010	mg/l	1	07/26/18 20:40	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	1.7	0.80	mg/l	1	08/04/18 11:10	RP	EPA 351.2/LACHAT
Phosphorus, Total	< 0.050	0.050	mg/l	1	08/02/18 12:25	LS	EPA 365.3
Solids, Total Dissolved	40.0	10	mg/l	1	07/28/18 09:26	RC	SM2540 C-11
Solids, Total Suspended	10.6	4.0	mg/l	1	07/28/18 10:32	RC	SM2540 D-11
Total Organic Carbon	5.9	1.0	mg/l	1	08/01/18 11:16	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.5.
(b) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	PR-2D		
Lab Sample ID:	JC70667-4F	**Date Sampled:**	07/26/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	07/26/18
		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	08/02/18 14:00	LS	EPA 365.3

RL = Reporting Limit

Report of Analysis

Client Sample ID:	PR-3S		
Lab Sample ID:	JC70667-5	**Date Sampled:**	07/26/18
Matrix:	AQ - Surface Water	**Date Received:**	07/26/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	21.7	5.0	mg/l	1	08/02/18 14:33	JO	SM2320 B-11
BOD, 5 Day	< 3.4	3.4	mg/l	1	07/26/18 19:28	SA	SM5210 B-11
Coliform, Fecal	32	2	col/100ml	1	07/26/18 15:49	SA	SM9222 D-06
Coliform, Total	30	2	col/100ml	1	07/26/18 15:50	SA	SM9222 B-06
Nitrogen, Ammonia	< 0.20	0.20	mg/l	1	08/03/18 13:40	RP	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [b]	< 0.11	0.11	mg/l	1	08/02/18 12:51	RP	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	< 0.10	0.10	mg/l	1	08/02/18 12:51	RP	EPA 353.2/LACHAT
Nitrogen, Nitrite	< 0.010	0.010	mg/l	1	07/26/18 20:40	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.51	0.20	mg/l	1	08/04/18 11:11	RP	EPA 351.2/LACHAT
Phosphorus, Total	< 0.050	0.050	mg/l	1	08/02/18 12:25	LS	EPA 365.3
Solids, Total Dissolved	32.5	10	mg/l	1	07/28/18 09:26	RC	SM2540 C-11
Solids, Total Suspended [c]	7.0	4.0	mg/l	1	07/28/18 10:32	RC	SM2540 D-11
Total Organic Carbon	3.0	1.0	mg/l	1	08/01/18 11:27	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.5.
(b) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)
(c) Reported sample aliquot obtained from filtration of 500 mL of sample. Volume was reduced from 1 liter due to nature of sample matrix.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	PR-3S		
Lab Sample ID:	JC70667-5F	**Date Sampled:**	07/26/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	07/26/18
		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	08/02/18 14:00	LS	EPA 365.3

RL = Reporting Limit

Report of Analysis

Client Sample ID: PR-3M
Lab Sample ID: JC70667-6
Matrix: AQ - Surface Water
Project: Philadelphia District, Reservoir Sampling

Date Sampled: 07/26/18
Date Received: 07/26/18
Percent Solids: n/a

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	23.8	5.0	mg/l	1	08/02/18 14:33	JO	SM2320 B-11
BOD, 5 Day	< 3.4	3.4	mg/l	1	07/26/18 19:30	SA	SM5210 B-11
Nitrogen, Ammonia	< 0.20	0.20	mg/l	1	08/03/18 13:41	RP	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [b]	< 0.11	0.11	mg/l	1	08/02/18 12:53	RP	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	< 0.10	0.10	mg/l	1	08/02/18 12:53	RP	EPA 353.2/LACHAT
Nitrogen, Nitrite	< 0.010	0.010	mg/l	1	07/26/18 20:40	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.54	0.20	mg/l	1	08/04/18 11:12	RP	EPA 351.2/LACHAT
Phosphorus, Total	< 0.050	0.050	mg/l	1	08/02/18 12:30	LS	EPA 365.3
Solids, Total Dissolved	55.0	10	mg/l	1	07/28/18 09:26	RC	SM2540 C-11
Solids, Total Suspended	< 4.0	4.0	mg/l	1	07/28/18 10:32	RC	SM2540 D-11
Total Organic Carbon	3.4	1.0	mg/l	1	08/01/18 12:16	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.5.
(b) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	PR-3M		
Lab Sample ID:	JC70667-6F	**Date Sampled:**	07/26/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	07/26/18
		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	08/02/18 14:05	LS	EPA 365.3

RL = Reporting Limit

Report of Analysis

Client Sample ID: PR-3D
Lab Sample ID: JC70667-7
Matrix: AQ - Surface Water
Project: Philadelphia District, Reservoir Sampling

Date Sampled: 07/26/18
Date Received: 07/26/18
Percent Solids: n/a

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	42.4	5.0	mg/l	1	08/02/18 14:56	JO	SM2320 B-11
BOD, 5 Day	5.4	3.4	mg/l	1	07/26/18 19:32	SA	SM5210 B-11
Nitrogen, Ammonia	1.3	0.20	mg/l	1	08/03/18 13:43	RP	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [b]	< 0.11	0.11	mg/l	1	08/02/18 12:54	RP	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	< 0.10	0.10	mg/l	1	08/02/18 12:54	RP	EPA 353.2/LACHAT
Nitrogen, Nitrite	< 0.010	0.010	mg/l	1	07/26/18 20:45	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	1.3	0.20	mg/l	1	08/04/18 11:13	RP	EPA 351.2/LACHAT
Phosphorus, Total	0.14	0.050	mg/l	1	08/02/18 12:30	LS	EPA 365.3
Solids, Total Dissolved	80.0	10	mg/l	1	07/28/18 09:26	RC	SM2540 C-11
Solids, Total Suspended [c]	10.3	4.0	mg/l	1	07/28/18 10:32	RC	SM2540 D-11
Total Organic Carbon	5.6	1.0	mg/l	1	08/01/18 12:27	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.5.
(b) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)
(c) Reported sample aliquot obtained from filtration of 300 mL of sample. Volume was reduced from 1 liter due to nature of sample matrix.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	PR-3D		
Lab Sample ID:	JC70667-7F	**Date Sampled:**	07/26/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	07/26/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphorus, Total	0.068	0.050	mg/l	1	08/02/18 14:05	LS	EPA 365.3

RL = Reporting Limit

Report of Analysis

Client Sample ID: PR-4S
Lab Sample ID: JC70667-8
Matrix: AQ - Surface Water
Project: Philadelphia District, Reservoir Sampling

Date Sampled: 07/26/18
Date Received: 07/26/18
Percent Solids: n/a

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	21.2	5.0	mg/l	1	08/02/18 14:56	JO	SM2320 B-11
BOD, 5 Day	< 3.4	3.4	mg/l	1	07/26/18 19:34	SA	SM5210 B-11
Coliform, Fecal	809	10	col/100ml	1	07/26/18 15:49	SA	SM9222 D-06
Coliform, Total	2100	100	col/100ml	100	07/26/18 15:50	SA	SM9222 B-06
Nitrogen, Ammonia	< 0.20	0.20	mg/l	1	08/03/18 13:44	RP	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [b]	< 0.11	0.11	mg/l	1	08/02/18 12:55	RP	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	< 0.10	0.10	mg/l	1	08/02/18 12:55	RP	EPA 353.2/LACHAT
Nitrogen, Nitrite	< 0.010	0.010	mg/l	1	07/26/18 20:45	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.60	0.20	mg/l	1	08/04/18 11:14	RP	EPA 351.2/LACHAT
Phosphorus, Total	< 0.050	0.050	mg/l	1	08/02/18 12:30	LS	EPA 365.3
Solids, Total Dissolved	30.0	10	mg/l	1	07/28/18 09:26	RC	SM2540 C-11
Solids, Total Suspended	< 4.0	4.0	mg/l	1	07/28/18 10:32	RC	SM2540 D-11
Total Organic Carbon	3.7	1.0	mg/l	1	08/01/18 12:38	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.5.
(b) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	PR-4S		
Lab Sample ID:	JC70667-8F	**Date Sampled:**	07/26/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	07/26/18
		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	08/02/18 14:05	LS	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

PAGE ___ OF ___ E/F

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 # 1MPULSE | Bottle Order Control #
SGS Quote # | SGS Job # JC70667

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 #: 215-656-6545 | Fax #:
Sampler(s) Name(s): Greg Wacik 610-597-9780 | Phone #:

Project Information

Project Name: USACE - Prompton Reservoir
Street:
City: Prompton | 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)

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	8260SIM03	Alk, Amn, BOD, TDS	TOC, TSS, TP04 (phosphorus) (Total)	TKN, XN030 (Total)	TP04 (dissolved lab filter)	FCF, TCF	LAB USE ONLY
1F	PR-1S		7/26/18	0830	GW	SW	10	X			X					X	X	X	X	X	X	C21
2F	PR-2S			1000	GW	SW	10	X			X					X	X	X	X	X	X	C38T
3F	PR-2M			1000	GW	SW	8	X			X						X	X	X	X		19D3
4F	PR-2D			1000	GW	SW	8	X			X						X	X	X	X		
5F	PR-3S			0915	GW	SW	10	X			X					X	X	X	X	X	X	X	
6F	PR-3M			0915	GW	SW	8	X			X						X	X	X	X		
7F	PR-3D			0915	GW	SW	8	X			X						X	X	X	X		
8F	PR-4S			0810	GW	SW	10	X			X					X	X	X	X	X	X	X	

INITIAL ASSESSMENT 3 5 0

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)

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 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:
	7/26/18 1239	1 Impulse; AS # 73	2 Impulse; AS # 73	7/26/18 1430	2
3	Date Time:	3	4	Date Time:	4
5	Date Time:	5	Custody Seal #	Intact / Not intact	Preserved where applicable / On Ice / Cooler Temp.

4.3, 3.7, 3.9 °C

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

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

SGS Sample Receipt Summary

Job Number: JC70667 **Client:** USACE-PHILADELPHIA DISTRICT **Project:** PHILADELPHIA DISTRICT, RESERVOIR SAMPL

Date / Time Received: 7/26/2018 2:30:00 PM **Delivery Method:** **Airbill #'s:**

Cooler Temps (Raw Measured) °C: Cooler 1: (4.3); Cooler 2: (3.7); Cooler 3: (3.9);

Cooler Temps (Corrected) °C: Cooler 1: (4.2); Cooler 2: (3.6); Cooler 3: (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:	3		

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

SM089-03
Rev. Date 12/7/17

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: JC71863

Sampling Date: 08/14/18

Report to:

Army Corps of Engineers

joseph.m.loeper@usace.army.mil

ATTN: Joseph Loeper

Total number of pages in report: 32

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)

Table of Contents

Sample Summary

USACE-Philadelphia District

Job No: JC71863

Philadelphia District, Reservoir Sampling
Project No: W25PHS81145379

Sample Number	Collected Date	Time	By	Received	Matrix Code	Type	Client Sample ID
JC71863-1	08/14/18	08:40	GW	08/14/18	AQ	Surface Water	PR-1S
JC71863-1F	08/14/18	08:40	GW	08/14/18	AQ	Surface H2O Filtered	PR-1S
JC71863-2	08/14/18	10:15	GW	08/14/18	AQ	Surface Water	PR-2S
JC71863-2F	08/14/18	10:15	GW	08/14/18	AQ	Surface H2O Filtered	PR-2S
JC71863-3	08/14/18	10:15	GW	08/14/18	AQ	Surface Water	PR-2M
JC71863-3F	08/14/18	10:15	GW	08/14/18	AQ	Surface H2O Filtered	PR-2M
JC71863-4	08/14/18	10:15	GW	08/14/18	AQ	Surface Water	PR-2D
JC71863-4F	08/14/18	10:15	GW	08/14/18	AQ	Surface H2O Filtered	PR-2D
JC71863-5	08/14/18	09:15	GW	08/14/18	AQ	Surface Water	PR-3S
JC71863-5F	08/14/18	09:15	GW	08/14/18	AQ	Surface H2O Filtered	PR-3S
JC71863-6	08/14/18	09:15	GW	08/14/18	AQ	Surface Water	PR-3M
JC71863-6F	08/14/18	09:15	GW	08/14/18	AQ	Surface H2O Filtered	PR-3M
JC71863-7	08/14/18	09:15	GW	08/14/18	AQ	Surface Water	PR-3D

Sample Summary
(continued)

USACE-Philadelphia District

Job No: JC71863

Philadelphia District, Reservoir Sampling
Project No: W25PHS81145379

Sample Number	Collected Date	Time	By	Received	Matrix Code	Matrix Type	Client Sample ID
JC71863-7F	08/14/18	09:15	GW	08/14/18	AQ	Surface H2O Filtered	PR-3D
JC71863-8	08/14/18	08:15	GW	08/14/18	AQ	Surface Water	PR-4S
JC71863-8F	08/14/18	08:15	GW	08/14/18	AQ	Surface H2O Filtered	PR-4S

CASE NARRATIVE / CONFORMANCE SUMMARY

Client:	USACE-Philadelphia District	**Job No**	JC71863
Site:	Philadelphia District, Reservoir Sampling	**Report Date**	8/28/2018 3:52:12 PM

On 08/14/2018, 16 Sample(s), 0 Trip Blank(s) and 0 Field Blank(s) were received at SGS North America Inc. at a maximum corrected temperature of 3.6 C. Samples were intact and chemically preserved, unless noted below. A SGS North America Inc. Job Number of JC71863 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:** GP15413

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC71863-1DUP, JC71863-1MS 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.

General Chemistry By Method EPA 353.2/LACHAT

Matrix: AQ **Batch ID:** GP15420

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC72054-7ADUP, JC72054-7AMS were used as the QC samples for Nitrogen, Nitrate + Nitrite.

Matrix: AQ **Batch ID:** GP15421

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC71868-4DUP, JC71868-4MS 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.
- RPD(s) for Duplicate for Nitrogen, Nitrate + Nitrite are outside control limits for sample GP15421-D1. RPD acceptable due to low duplicate and sample concentrations.

General Chemistry By Method EPA 365.3

Matrix: AQ **Batch ID:** GP15404

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC71872-1DUP, JC71872-1MS were used as the QC samples for Phosphorus, Total.

General Chemistry By Method EPA353.2/SM4500NO2B

Matrix: AQ **Batch ID:** R172302

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC71863-1 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R172303

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC71863-2 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R172304

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC71863-3 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R172305

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC71863-4 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R172306

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC71863-5 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R172307

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC71863-6 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R172308

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC71863-7 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R172309

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC71863-8 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.
- JC71863-5 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.5.
- JC71863-8 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.5.
- JC71863-6 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.5.
- JC71863-2 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.5.
- JC71863-7 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.5.
- JC71863-4 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.5.
- JC71863-3 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.5.
- JC71863-1 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.5.

General Chemistry By Method SM2540 C-11

Matrix: AQ **Batch ID:** GN84291

- 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 Solids, Total Dissolved.

General Chemistry By Method SM2540 D-11

Matrix: AQ **Batch ID:** GN84304

- 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 Solids, Total Suspended.
- JC71863-8 for Solids, Total Suspended: Reported sample aliquot obtained from filtration of 800 mL of sample. Volume was reduced from 1 liter as the sample clogged the filter at the higher volume.
- JC71863-6 for Solids, Total Suspended: Reported sample aliquot obtained from filtration of 700 mL of sample. Volume was reduced from 1 liter as the sample clogged the filter at the higher volume.

General Chemistry By Method SM4500NH3 H-11LACHAT

Matrix: AQ **Batch ID:** GP15390

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC71827-1DUP, JC71827-1MS, JC71827-1MSD were used as the QC samples for Nitrogen, Ammonia.

General Chemistry By Method SM4500NO2 B-11

Matrix: AQ **Batch ID:** GN84269

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC71810-8DUP, JC71810-8MS were used as the QC samples for Nitrogen, Nitrite.

General Chemistry By Method SM5210 B-11

Matrix: AQ **Batch ID:** GP15287

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC71827-2DUP were used as the QC samples for BOD, 5 Day.

General Chemistry By Method SM5310 B-11

Matrix: AQ **Batch ID:** GP15437

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC71863-6MS, JC71863-6MSD were used as the QC samples for Total Organic Carbon.

General Chemistry By Method SM9222 B-06

Matrix: AQ **Batch ID:** MB5338

- All method blanks for this batch meet method specific criteria.
- Sample(s) JC71863-2DUP were used as the QC samples for Coliform, Total.
- JC71863-8 for Coliform, Total: Analysis done out of holding time.
- JC71863-5 for Coliform, Total: Analysis done out of holding time.
- JC71863-1 for Coliform, Total: Analysis done out of holding time.
- JC71863-2 for Coliform, Total: Analysis done out of holding time.

General Chemistry By Method SM9222 D-06

Matrix: AQ **Batch ID:** MB5339

- All method blanks for this batch meet method specific criteria.
- Sample(s) JC71863-2DUP were used as the QC samples for Coliform, Fecal.
- JC71863-8 for Coliform, Fecal: Analysis done out of holding time.
- JC71863-5 for Coliform, Fecal: Analysis done out of holding time.
- JC71863-2 for Coliform, Fecal: Analysis done out of holding time.
- JC71863-1 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: JC71863
Account: USACE-Philadelphia District
Project: Philadelphia District, Reservoir Sampling
Collected: 08/14/18

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	LOQ	LOD	Units	Method
JC71863-1	**PR-1S**					
Alkalinity, Total as CaCO3 [a]		31.1	5.0	4.0	mg/l	SM2320 B-11
Coliform, Fecal [b]		5600	100	[c]	col/100ml	SM9222 D-06
Coliform, Total [b]		4800	100	[c]	col/100ml	SM9222 B-06
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		0.32	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		16.7	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended		11.8	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon		6.7	1.0	1.0	mg/l	SM5310 B-11
JC71863-1F	**PR-1S**					
No hits reported in this sample.						
JC71863-2	**PR-2S**					
Alkalinity, Total as CaCO3 [a]		21.2	5.0	4.0	mg/l	SM2320 B-11
Coliform, Fecal [b]		84	4	[c]	col/100ml	SM9222 D-06
Coliform, Total [b]		186	10	[c]	col/100ml	SM9222 B-06
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		8.3	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon		5.4	1.0	1.0	mg/l	SM5310 B-11
JC71863-2F	**PR-2S**					
No hits reported in this sample.						
JC71863-3	**PR-2M**					
Alkalinity, Total as CaCO3 [a]		20.7	5.0	4.0	mg/l	SM2320 B-11
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		0.36	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		7.0	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon		5.5	1.0	1.0	mg/l	SM5310 B-11
JC71863-3F	**PR-2M**					
No hits reported in this sample.						

Summary of Hits

Job Number: JC71863
Account: USACE-Philadelphia District
Project: Philadelphia District, Reservoir Sampling
Collected: 08/14/18

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	LOQ	LOD	Units	Method
JC71863-4	**PR-2D**					
Alkalinity, Total as CaCO3 [a]		20.2	5.0	4.0	mg/l	SM2320 B-11
Nitrogen, Nitrate [d]		0.099 J	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		0.099 J	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
Solids, Total Dissolved		16.7	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended		98.5	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon		6.9	1.0	1.0	mg/l	SM5310 B-11
JC71863-4F	**PR-2D**					
No hits reported in this sample.						
JC71863-5	**PR-3S**					
Alkalinity, Total as CaCO3 [a]		21.7	5.0	4.0	mg/l	SM2320 B-11
Coliform, Fecal [b]		37	10	[c]	col/100ml	SM9222 D-06
Coliform, Total [b]		26	4	[c]	col/100ml	SM9222 B-06
Nitrogen, Total Kjeldahl		0.40	0.20	0.15	mg/l	EPA 351.2/LACHAT
Phosphorus, Total		0.13	0.050	0.050	mg/l	EPA 365.3
Solids, Total Dissolved		6.7 J	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended		7.5	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon		5.7	1.0	1.0	mg/l	SM5310 B-11
JC71863-5F	**PR-3S**					
Phosphorus, Total		0.029 J	0.050	0.050	mg/l	EPA 365.3
JC71863-6	**PR-3M**					
Alkalinity, Total as CaCO3 [a]		27.9	5.0	4.0	mg/l	SM2320 B-11
Nitrogen, Ammonia		0.53	0.20	0.20	mg/l	SM4500NH3 H-11LACHAT
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		1.0	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		32.5	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended [e]		2.7 J	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon		6.5	1.0	1.0	mg/l	SM5310 B-11
JC71863-6F	**PR-3M**					
No hits reported in this sample.						

Summary of Hits

Job Number: JC71863
Account: USACE-Philadelphia District
Project: Philadelphia District, Reservoir Sampling
Collected: 08/14/18

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	LOQ	LOD	Units	Method
JC71863-7	**PR-3D**					
Alkalinity, Total as CaCO3 [a]		55.9	5.0	4.0	mg/l	SM2320 B-11
BOD, 5 Day		8.1	3.4	3.4 [c]	mg/l	SM5210 B-11
Nitrogen, Ammonia		1.8	0.20	0.20	mg/l	SM4500NH3 H-11LACHAT
Nitrogen, Total Kjeldahl		2.1	0.20	0.15	mg/l	EPA 351.2/LACHAT
Phosphorus, Total		0.15	0.050	0.050	mg/l	EPA 365.3
Solids, Total Dissolved		10.0	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended		8.3	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon		8.1	1.0	1.0	mg/l	SM5310 B-11
JC71863-7F	**PR-3D**					
Phosphorus, Total		0.095	0.050	0.050	mg/l	EPA 365.3
JC71863-8	**PR-4S**					
Alkalinity, Total as CaCO3 [a]		22.3	5.0	4.0	mg/l	SM2320 B-11
Coliform, Fecal [b]		5900	100	[c]	col/100ml	SM9222 D-06
Coliform, Total [b]		5300	100	[c]	col/100ml	SM9222 B-06
Nitrogen, Ammonia		0.097 J	0.20	0.20	mg/l	SM4500NH3 H-11LACHAT
Nitrogen, Total Kjeldahl		0.46	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		10.0	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended [f]		2.9 J	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon		6.4	1.0	1.0	mg/l	SM5310 B-11
JC71863-8F	**PR-4S**					

No hits reported in this sample.

(a) Sample was titrated to a final pH of 4.5.
(b) Analysis done out of holding time.
(c) Value reported is laboratory DL (MDL).
(d) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)
(e) Reported sample aliquot obtained from filtration of 700 mL of sample. Volume was reduced from 1 liter as the sample clogged the filter at the higher volume.
(f) Reported sample aliquot obtained from filtration of 800 mL of sample. Volume was reduced from 1 liter as the sample clogged the filter at the higher volume.

Sample Results

Report of Analysis

Report of Analysis

Client Sample ID:	PR-1S		
Lab Sample ID:	JC71863-1	**Date Sampled:**	08/14/18
Matrix:	AQ - Surface Water	**Date Received:**	08/14/18
		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]	31.1	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	08/14/18 22:13	SA	SM5210 B-11
Coliform, Fecal [c]	5600	100			col/100ml	100	08/14/18 18:32	SA	SM9222 D-06
Coliform, Total [c]	4800	100			col/100ml	100	08/14/18 18:25	SA	SM9222 B-06
Nitrogen, Ammonia	0.20 U	0.20	0.20	0.089	mg/l	1	08/20/18 10:26	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [d]	0.10 J	0.11	0.11	0.046	mg/l	1	08/21/18 14:07	RP	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.10	0.10	0.10	0.043	mg/l	1	08/21/18 14:07	RP	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0050 U	0.010	0.0050	0.0030	mg/l	1	08/14/18 17:45	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.32	0.20	0.15	0.12	mg/l	1	08/22/18 10:18	BM	EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	08/21/18 11:16	MP	EPA 365.3
Solids, Total Dissolved	16.7	10	4.0	1.8	mg/l	1	08/15/18 12:15	RC	SM2540 C-11
Solids, Total Suspended	11.8	4.0	2.0	1.5	mg/l	1	08/15/18 15:33	RC	SM2540 D-11
Total Organic Carbon	6.7	1.0	1.0	0.72	mg/l	1	08/22/18 05:55	JO	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 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:	PR-1S		
Lab Sample ID:	JC71863-1F	**Date Sampled:**	08/14/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	08/14/18
		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	08/21/18 11:32	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:	PR-2S		
Lab Sample ID:	JC71863-2	**Date Sampled:**	08/14/18
Matrix:	AQ - Surface Water	**Date Received:**	08/14/18
		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]	21.2	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	08/14/18 22:14	SA	SM5210 B-11
Coliform, Fecal [c]	84	4			col/100ml	4	08/14/18 18:32	SA	SM9222 D-06
Coliform, Total [c]	186	10			col/100ml	10	08/14/18 18:25	SA	SM9222 B-06
Nitrogen, Ammonia	0.20 U	0.20	0.20	0.089	mg/l	1	08/20/18 10:28	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [d]	0.11 U	0.11	0.11	0.046	mg/l	1	08/21/18 14:16	RP	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.10 U	0.10	0.10	0.043	mg/l	1	08/21/18 14:16	RP	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0050 U	0.010	0.0050	0.0030	mg/l	1	08/14/18 17:45	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.38	0.20	0.15	0.12	mg/l	1	08/22/18 10:19	BM	EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	08/21/18 11:16	MP	EPA 365.3
Solids, Total Dissolved	23.3	10	4.0	1.8	mg/l	1	08/15/18 12:15	RC	SM2540 C-11
Solids, Total Suspended	8.3	4.0	2.0	1.5	mg/l	1	08/15/18 15:33	RC	SM2540 D-11
Total Organic Carbon	5.4	1.0	1.0	0.72	mg/l	1	08/22/18 06:06	JO	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 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:	PR-2S		
Lab Sample ID:	JC71863-2F	**Date Sampled:**	08/14/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	08/14/18
		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	08/21/18 11:32	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: PR-2M
Lab Sample ID: JC71863-3
Matrix: AQ - Surface Water
Project: Philadelphia District, Reservoir Sampling

Date Sampled: 08/14/18
Date Received: 08/14/18
Percent Solids: n/a

General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	20.7	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	08/14/18 22:16	SA	SM5210 B-11
Nitrogen, Ammonia	0.20 U	0.20	0.20	0.089	mg/l	1	08/20/18 10:29	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [c]	0.17	0.11	0.11	0.046	mg/l	1	08/21/18 14:18	RP	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.17	0.10	0.10	0.043	mg/l	1	08/21/18 14:18	RP	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0050 U	0.010	0.0050	0.0030	mg/l	1	08/14/18 17:45	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.36	0.20	0.15	0.12	mg/l	1	08/22/18 10:20	BM	EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	08/21/18 11:16	MP	EPA 365.3
Solids, Total Dissolved	33.3	10	4.0	1.8	mg/l	1	08/15/18 12:15	RC	SM2540 C-11
Solids, Total Suspended	7.0	4.0	2.0	1.5	mg/l	1	08/15/18 15:33	RC	SM2540 D-11
Total Organic Carbon	5.5	1.0	1.0	0.72	mg/l	1	08/22/18 06:17	JO	SM5310 B-11

(a) Sample was titrated to a final pH of 4.5.
(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:	PR-2M		
Lab Sample ID:	JC71863-3F	**Date Sampled:**	08/14/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	08/14/18
		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	08/21/18 11:32	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:	PR-2D		
Lab Sample ID:	JC71863-4	**Date Sampled:**	08/14/18
Matrix:	AQ - Surface Water	**Date Received:**	08/14/18
		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]	20.2	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	08/14/18 22:18	SA	SM5210 B-11
Nitrogen, Ammonia	0.20 U	0.20	0.20	0.089	mg/l	1	08/20/18 10:31	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [c]	0.099 J	0.11	0.11	0.046	mg/l	1	08/21/18 14:19	RP	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.099 J	0.10	0.10	0.043	mg/l	1	08/21/18 14:19	RP	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0050 U	0.010	0.0050	0.0030	mg/l	1	08/14/18 17:45	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.28	0.20	0.15	0.12	mg/l	1	08/22/18 10:21	BM	EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	08/21/18 11:32	MP	EPA 365.3
Solids, Total Dissolved	16.7	10	4.0	1.8	mg/l	1	08/15/18 12:15	RC	SM2540 C-11
Solids, Total Suspended	98.5	4.0	2.0	1.5	mg/l	1	08/15/18 15:33	RC	SM2540 D-11
Total Organic Carbon	6.9	1.0	1.0	0.72	mg/l	1	08/22/18 06:28	JO	SM5310 B-11

(a) Sample was titrated to a final pH of 4.5.
(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:	PR-2D		
Lab Sample ID:	JC71863-4F	**Date Sampled:**	08/14/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	08/14/18
		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	08/21/18 11:32	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: PR-3S
Lab Sample ID: JC71863-5
Matrix: AQ - Surface Water
Project: Philadelphia District, Reservoir Sampling

Date Sampled: 08/14/18
Date Received: 08/14/18
Percent Solids: n/a

General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	21.7	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	08/14/18 22:20	SA	SM5210 B-11
Coliform, Fecal [c]	37	10			col/100ml	10	08/14/18 18:32	SA	SM9222 D-06
Coliform, Total [c]	26	4			col/100ml	10	08/14/18 18:25	SA	SM9222 B-06
Nitrogen, Ammonia	0.20 U	0.20	0.20	0.089	mg/l	1	08/20/18 10:32	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [d]	0.11 U	0.11	0.11	0.046	mg/l	1	08/21/18 14:20	RP	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.10 U	0.10	0.10	0.043	mg/l	1	08/21/18 14:20	RP	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0050 U	0.010	0.0050	0.0030	mg/l	1	08/14/18 17:45	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.40	0.20	0.15	0.12	mg/l	1	08/22/18 10:22	BM	EPA 351.2/LACHAT
Phosphorus, Total	0.13	0.050	0.050	0.027	mg/l	1	08/21/18 11:32	MP	EPA 365.3
Solids, Total Dissolved	6.7 J	10	4.0	1.8	mg/l	1	08/15/18 12:15	RC	SM2540 C-11
Solids, Total Suspended	7.5	4.0	2.0	1.5	mg/l	1	08/15/18 15:33	RC	SM2540 D-11
Total Organic Carbon	5.7	1.0	1.0	0.72	mg/l	1	08/22/18 06:40	JO	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 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:	PR-3S		
Lab Sample ID:	JC71863-5F	**Date Sampled:**	08/14/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	08/14/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By	Method
Phosphorus, Total	0.029 J	0.050	0.050	0.027	mg/l	1	08/21/18 11:32	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:	PR-3M		
Lab Sample ID:	JC71863-6	**Date Sampled:**	08/14/18
Matrix:	AQ - Surface Water	**Date Received:**	08/14/18
		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]	27.9	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	08/14/18 22:22	SA	SM5210 B-11
Nitrogen, Ammonia	0.53	0.20	0.20	0.089	mg/l	1	08/20/18 10:34	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [c]	0.15	0.11	0.11	0.046	mg/l	1	08/21/18 14:21	RP	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.15	0.10	0.10	0.043	mg/l	1	08/21/18 14:21	RP	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0050 U	0.010	0.0050	0.0030	mg/l	1	08/14/18 17:48	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	1.0	0.20	0.15	0.12	mg/l	1	08/22/18 10:23	BM	EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	08/21/18 11:32	MP	EPA 365.3
Solids, Total Dissolved	32.5	10	4.0	1.8	mg/l	1	08/15/18 12:15	RC	SM2540 C-11
Solids, Total Suspended [d]	2.7 J	4.0	2.0	1.5	mg/l	1	08/15/18 15:33	RC	SM2540 D-11
Total Organic Carbon	6.5	1.0	1.0	0.72	mg/l	1	08/22/18 06:51	JO	SM5310 B-11

(a) Sample was titrated to a final pH of 4.5.
(b) Value reported is laboratory DL (MDL).
(c) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)
(d) Reported sample aliquot obtained from filtration of 700 mL of sample. Volume was reduced from 1 liter as the sample clogged the filter at the higher 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:	PR-3M		
Lab Sample ID:	JC71863-6F	**Date Sampled:**	08/14/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	08/14/18
		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	08/21/18 11:44	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:	PR-3D		
Lab Sample ID:	JC71863-7	**Date Sampled:**	08/14/18
Matrix:	AQ - Surface Water	**Date Received:**	08/14/18
		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]	55.9	5.0	4.0	3.6	mg/l	1	08/21/18	ST	SM2320 B-11
BOD, 5 Day	8.1	3.4	3.4 [b]	3.4	mg/l	1	08/14/18 22:25	SA	SM5210 B-11
Nitrogen, Ammonia	1.8	0.20	0.20	0.089	mg/l	1	08/20/18 10:38	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [c]	0.11 U	0.11	0.11	0.046	mg/l	1	08/21/18 14:22	RP	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.10 U	0.10	0.10	0.043	mg/l	1	08/21/18 14:22	RP	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0050 U	0.010	0.0050	0.0030	mg/l	1	08/14/18 17:48	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	2.1	0.20	0.15	0.12	mg/l	1	08/22/18 10:25	BM	EPA 351.2/LACHAT
Phosphorus, Total	0.15	0.050	0.050	0.027	mg/l	1	08/21/18 11:32	MP	EPA 365.3
Solids, Total Dissolved	10.0	10	4.0	1.8	mg/l	1	08/15/18 12:15	RC	SM2540 C-11
Solids, Total Suspended	8.3	4.0	2.0	1.5	mg/l	1	08/15/18 15:33	RC	SM2540 D-11
Total Organic Carbon	8.1	1.0	1.0	0.72	mg/l	1	08/22/18 07:47	JO	SM5310 B-11

(a) Sample was titrated to a final pH of 4.5.
(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:	PR-3D		
Lab Sample ID:	JC71863-7F	**Date Sampled:**	08/14/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	08/14/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By	Method
Phosphorus, Total	0.095	0.050	0.050	0.027	mg/l	1	08/21/18 11:44	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:	PR-4S		
Lab Sample ID:	JC71863-8	**Date Sampled:**	08/14/18
Matrix:	AQ - Surface Water	**Date Received:**	08/14/18
		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]	22.3	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	08/14/18 22:26	SA	SM5210 B-11
Coliform, Fecal [c]	5900	100			col/100ml	100	08/14/18 18:32	SA	SM9222 D-06
Coliform, Total [c]	5300	100			col/100ml	100	08/14/18 18:25	SA	SM9222 B-06
Nitrogen, Ammonia	0.097 J	0.20	0.20	0.089	mg/l	1	08/20/18 10:39	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [d]	0.11 U	0.11	0.11	0.046	mg/l	1	08/21/18 14:23	RP	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.10 U	0.10	0.10	0.043	mg/l	1	08/21/18 14:23	RP	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0050 U	0.010	0.0050	0.0030	mg/l	1	08/14/18 17:48	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.46	0.20	0.15	0.12	mg/l	1	08/22/18 10:26	BM	EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	08/21/18 11:32	MP	EPA 365.3
Solids, Total Dissolved	10.0	10	4.0	1.8	mg/l	1	08/15/18 12:15	RC	SM2540 C-11
Solids, Total Suspended [e]	2.9 J	4.0	2.0	1.5	mg/l	1	08/15/18 15:33	RC	SM2540 D-11
Total Organic Carbon	6.4	1.0	1.0	0.72	mg/l	1	08/22/18 08:07	JO	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)
(e) Reported sample aliquot obtained from filtration of 800 mL of sample. Volume was reduced from 1 liter as the sample clogged the filter at the higher 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:	PR-4S		
Lab Sample ID:	JC71863-8F	**Date Sampled:**	08/14/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	08/14/18
		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	08/21/18 11:44	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

3 coolers

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FED-EX Tracking #: | Bottle Order Control #: PD-081518-142
SGS Quote #: | SGS Job #: JC71863

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- Prompton Reservoir
Street:
City: Prompton 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	XN025L03	AlK, AMN, BOD, TDS	TOC, TSS, TPO4 (Total Phosphorus)	TKN, XN030 (TKN/TPO4 Bottle)	TPO4 (dissolved lab filter)	FCF, TCF	LAB USE ONLY
1F	PR-1S		8/14/18	0840	[initials]	SW	11	X			X					X	X	X	X	X	X	M24
2F	PR-2S			1015	[initials]	SW	11	X			X					X	X	X	X	X	X	G14T1
3F	PR-2M			1015	[initials]	SW	9	X			X						X	X	X	X		19B
4F	PR-2D			1015	[initials]	SW	9	X			X						X	X	X	X		
5F	PR-3S			0915	[initials]	SW	11	X			X					X	X	X	X	X	X	
6F	PR-3M			0915	[initials]	SW	9	X			X						X	X	X	X		
7F	PR-3D			0915	[initials]	SW	9	X			X						X	X	X	X		
8F	PR-4S		↓	0815	[initials]	SW	11	X			X					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 ASSESSMENT
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. TPO4 dissolved lab filter. XN030 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: 8/14/18 12:40	Received By: 1 J Schau	8/14/18 1230	Relinquished By: 2 J Schau	8/14/18 Date Time: 1640	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. 3.6 3.6 3.7

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

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

5.1
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JC71863: Chain of Custody
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SGS Sample Receipt Summary

Job Number: JC71863 **Client:** USACE-PHILADELPHIA DISTRICT **Project:** PHILADELPHIA DISTRICT, RESERVOIR SAMPL

Date / Time Received: 8/14/2018 4:42:00 PM **Delivery Method:** Accutest Courier **Airbill #'s:**

Cooler Temps (Raw Measured) °C: Cooler 1: (3.6); Cooler 2: (3.6); Cooler 3: (3.7);

Cooler Temps (Corrected) °C: Cooler 1: (3.5); Cooler 2: (3.5); Cooler 3: (3.6);

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:	3		

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) -1, -5, -8 TCF/FCF rec'd out of hold/processed out of hold.

SM089-02 Rev. Date 12/1/16

Responded to by: Tammy Esposito McCloskey Response Date: 8/14/18

Please proceed with analysis. TCF and FCF have 30 hour hold time for this project per Joseph Loeper.

JC71863: 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: JC73160

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: 32

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: JC73160

Philadelphia District, Reservoir Sampling
Project No: W25PHS81145379

Sample Number	Collected Date	Time	By	Received	Matrix Code	Type	Client Sample ID
JC73160-1	09/05/18	12:45	GW	09/05/18	AQ	Surface Water	PR-1S
JC73160-1F	09/05/18	12:45	GW	09/05/18	AQ	Surface H2O Filtered	PR-1S
JC73160-2	09/05/18	13:45	GW	09/05/18	AQ	Surface Water	PR-2S
JC73160-2F	09/05/18	13:45	GW	09/05/18	AQ	Surface H2O Filtered	PR-2S
JC73160-3	09/05/18	13:45	GW	09/05/18	AQ	Surface Water	PR-2M
JC73160-3F	09/05/18	13:45	GW	09/05/18	AQ	Surface H2O Filtered	PR-2M
JC73160-4	09/05/18	13:45	GW	09/05/18	AQ	Surface Water	PR-2D
JC73160-4F	09/05/18	13:45	GW	09/05/18	AQ	Surface H2O Filtered	PR-2D
JC73160-5	09/05/18	13:20	GW	09/05/18	AQ	Surface Water	PR-3S
JC73160-5F	09/05/18	13:20	GW	09/05/18	AQ	Surface H2O Filtered	PR-3S
JC73160-6	09/05/18	13:20	GW	09/05/18	AQ	Surface Water	PR-3M
JC73160-6F	09/05/18	13:20	GW	09/05/18	AQ	Surface H2O Filtered	PR-3M
JC73160-7	09/05/18	13:20	GW	09/05/18	AQ	Surface Water	PR-3D

Sample Summary
(continued)

USACE-Philadelphia District

Job No: JC73160

Philadelphia District, Reservoir Sampling
Project No: W25PHS81145379

Sample Number	Collected Date	Time	By	Received	Matrix Code	Matrix Type	Client Sample ID
JC73160-7F	09/05/18	13:20	GW	09/05/18	AQ	Surface H2O Filtered	PR-3D
JC73160-8	09/05/18	13:20	GW	09/05/18	AQ	Surface Water	PR-4S
JC73160-8F	09/05/18	13:20	GW	09/05/18	AQ	Surface H2O Filtered	PR-4S

CASE NARRATIVE / CONFORMANCE SUMMARY

Client:	USACE-Philadelphia District	**Job No**	JC73160
Site:	Philadelphia District, Reservoir Sampling	**Report Date**	9/19/2018 8:56:27 AM

On 09/05/2018, 16 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 JC73160 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:** GP15882

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC73160-1MS, JC73160-1DUP were used as the QC samples for Nitrogen, Total Kjeldahl.
- RPD(s) for Duplicate for Nitrogen, Total Kjeldahl are outside control limits for sample GP15882-D1. RPD acceptable due to low duplicate and sample concentrations.

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, JC73160-2MS were used as the QC samples for Nitrogen, Nitrate + Nitrite.

General Chemistry By Method EPA 365.3

Matrix: AQ **Batch ID:** GP15834

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC73156-1DUP, JC73156-1MS were used as the QC samples for Phosphorus, Total.

General Chemistry By Method EPA353.2/SM4500NO2B

Matrix: AQ **Batch ID:** R172718

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC73160-4 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R172719

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC73160-1 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R172720

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC73160-2 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R172721

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC73160-3 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R172722

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC73160-5 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R172723

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC73160-6 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R172724

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC73160-7 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R172725

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC73160-8 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

General Chemistry By Method SM2320 B-11

Matrix: AQ **Batch ID:** GN85600

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC73159-12DUP were used as the QC samples for Alkalinity, Total as CaCO3.
- JC73160-1 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.5.
- JC73160-5 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.5.
- JC73160-3 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.5.
- JC73160-4 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.5.
- JC73160-6 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.5.
- JC73160-8 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.5.
- JC73160-2 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.5.
- JC73160-7 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.5.

General Chemistry By Method SM2540 C-11

Matrix: AQ	Batch ID: GN85336

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC73160-1DUP, JC73160-2DUP were used as the QC samples for Solids, Total Dissolved.

General Chemistry By Method SM2540 D-11

Matrix: AQ	Batch ID: GN85352

- 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 Solids, Total Suspended.
- JC73160-7 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: 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.

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.

Matrix: AQ	Batch ID: GN85360

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC73246-1DUP, JC73246-1MS were used as the QC samples for Nitrogen, Nitrite.

General Chemistry By Method SM5210 B-11

Matrix: AQ	Batch ID: GP15774

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC73084-21DUP were used as the QC samples for BOD, 5 Day.

General Chemistry By Method SM5310 B-11

Matrix: AQ	Batch ID: GP15948

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC73160-5MS, JC73160-5MSD were used as the QC samples for Total Organic Carbon.

General Chemistry By Method SM9222 B-06

Matrix: AQ **Batch ID:** MB5372

- All method blanks for this batch meet method specific criteria.
- Sample(s) JC73160-1DUP were used as the QC samples for Coliform, Total.
- JC73160-1 for Coliform, Total: Analysis done out of holding time.

General Chemistry By Method SM9222 D-06

Matrix: AQ **Batch ID:** MB5373

- All method blanks for this batch meet method specific criteria.
- Sample(s) JC73160-1DUP were used as the QC samples for Coliform, Fecal.
- JC73160-1 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: JC73160
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
JC73160-1	**PR-1S**					
Alkalinity, Total as CaCO3 [a]		30.6	5.0	4.0	mg/l	SM2320 B-11
Coliform, Fecal [b]		229	4	[c]	col/100ml	SM9222 D-06
Coliform, Total [b]		294	10	[c]	col/100ml	SM9222 B-06
Nitrogen, Nitrate [d]		0.25	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		0.25	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
Phosphorus, Total		0.029 J	0.050	0.050	mg/l	EPA 365.3
Solids, Total Dissolved		57.5	10	4.0	mg/l	SM2540 C-11
Total Organic Carbon		5.5	1.0	1.0	mg/l	SM5310 B-11
JC73160-1F	**PR-1S**					
No hits reported in this sample.						
JC73160-2	**PR-2S**					
Alkalinity, Total as CaCO3 [a]		22.7	5.0	4.0	mg/l	SM2320 B-11
BOD, 5 Day		5.0	3.4	3.4 [c]	mg/l	SM5210 B-11
Coliform, Total		8	4	[c]	col/100ml	SM9222 B-06
Nitrogen, Total Kjeldahl		0.64	0.20	0.15	mg/l	EPA 351.2/LACHAT
Phosphorus, Total		0.060	0.050	0.050	mg/l	EPA 365.3
Solids, Total Dissolved		40.0	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended		9.8	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon		8.3	1.0	1.0	mg/l	SM5310 B-11
JC73160-2F	**PR-2S**					
Phosphorus, Total		0.062	0.050	0.050	mg/l	EPA 365.3
JC73160-3	**PR-2M**					
Alkalinity, Total as CaCO3 [a]		27.4	5.0	4.0	mg/l	SM2320 B-11
Nitrogen, Ammonia		0.15 J	0.20	0.20	mg/l	SM4500NH3 H-11LACHAT
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		0.50	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		54.3	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended		2.2 J	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon		5.1	1.0	1.0	mg/l	SM5310 B-11
JC73160-3F	**PR-2M**					
No hits reported in this sample.						

Summary of Hits

Job Number: JC73160
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
JC73160-4	**PR-2D**					
Alkalinity, Total as CaCO3 [a]		29.5	5.0	4.0	mg/l	SM2320 B-11
Nitrogen, Ammonia		0.22	0.20	0.20	mg/l	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [d]		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
Phosphorus, Total		0.031 J	0.050	0.050	mg/l	EPA 365.3
Solids, Total Dissolved		48.0	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended		32.1	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon		5.7	1.0	1.0	mg/l	SM5310 B-11
JC73160-4F	**PR-2D**					
No hits reported in this sample.						
JC73160-5	**PR-3S**					
Alkalinity, Total as CaCO3 [a]		25.3	5.0	4.0	mg/l	SM2320 B-11
BOD, 5 Day		5.8	3.4	3.4 [c]	mg/l	SM5210 B-11
Coliform, Total		8	4	[c]	col/100ml	SM9222 B-06
Nitrogen, Total Kjeldahl		0.70	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		10.2	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon		9.6	1.0	1.0	mg/l	SM5310 B-11
JC73160-5F	**PR-3S**					
Phosphorus, Total		0.029 J	0.050	0.050	mg/l	EPA 365.3
JC73160-6	**PR-3M**					
Alkalinity, Total as CaCO3 [a]		22.2	5.0	4.0	mg/l	SM2320 B-11
Nitrogen, Ammonia		0.091 J	0.20	0.20	mg/l	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [d]		0.097 J	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		0.097 J	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Total Kjeldahl		0.51	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		34.0	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended		1.6 J	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon		6.1	1.0	1.0	mg/l	SM5310 B-11
JC73160-6F	**PR-3M**					
No hits reported in this sample.						

Summary of Hits

Job Number: JC73160
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
JC73160-7	**PR-3D**					
Alkalinity, Total as CaCO3 [a]		41.2	5.0	4.0	mg/l	SM2320 B-11
Nitrogen, Ammonia		0.76	0.20	0.20	mg/l	SM4500NH3 H-11LACHAT
Nitrogen, Total Kjeldahl		1.1	0.20	0.15	mg/l	EPA 351.2/LACHAT
Phosphorus, Total		0.041 J	0.050	0.050	mg/l	EPA 365.3
Solids, Total Dissolved		73.3	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended [e]		4.7	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon		15.4	1.0	1.0	mg/l	SM5310 B-11
JC73160-7F	**PR-3D**					
No hits reported in this sample.						
JC73160-8	**PR-4S**					
Alkalinity, Total as CaCO3 [a]		24.8	5.0	4.0	mg/l	SM2320 B-11
Coliform, Fecal		570	10	[c]	col/100ml	SM9222 D-06
Coliform, Total		782	100	[c]	col/100ml	SM9222 B-06
Nitrogen, Ammonia		0.16 J	0.20	0.20	mg/l	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [d]		0.19	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		0.20	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite		0.0068 J	0.010	0.0050	mg/l	SM4500NO2 B-11
Nitrogen, Total Kjeldahl		0.43	0.20	0.15	mg/l	EPA 351.2/LACHAT
Phosphorus, Total		0.033 J	0.050	0.050	mg/l	EPA 365.3
Solids, Total Dissolved		60.0	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		7.4	1.0	1.0	mg/l	SM5310 B-11
JC73160-8F	**PR-4S**					
No hits reported in this sample.						

(a) Sample was titrated to a final pH of 4.5.
(b) Analysis done out of holding time.
(c) Value reported is laboratory DL (MDL).
(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 nature of sample matrix.

Sample Results

Report of Analysis

Report of Analysis

Client Sample ID: PR-1S
Lab Sample ID: JC73160-1
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]	30.6	5.0	4.0	3.6	mg/l	1	09/13/18 12:35	ST	SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 [b]	3.4	mg/l	1	09/05/18 22:58	SA	SM5210 B-11
Coliform, Fecal [c]	229	4			col/100ml	4	09/05/18 20:58	SA	SM9222 D-06
Coliform, Total [c]	294	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 15:36	RP	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [d]	0.25	0.11	0.11	0.093	mg/l	1	09/12/18 15:07	RP	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.25	0.10	0.10	0.090	mg/l	1	09/12/18 15:07	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 12:18	BM	EPA 351.2/LACHAT
Phosphorus, Total	0.029 J	0.050	0.050	0.027	mg/l	1	09/13/18 18:35	LS	EPA 365.3
Solids, Total Dissolved	57.5	10	4.0	1.8	mg/l	1	09/06/18 14:45	RC	SM2540 C-11
Solids, Total Suspended	2.0 U	4.0	2.0	1.5	mg/l	1	09/06/18 16:00	RC	SM2540 D-11
Total Organic Carbon	5.5	1.0	1.0	0.72	mg/l	1	09/18/18 15:32	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 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:	PR-1S		
Lab Sample ID:	JC73160-1F	**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	09/13/18 18:55	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: PR-2S
Lab Sample ID: JC73160-2
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]	22.7	5.0	4.0	3.6	mg/l	1	09/13/18 12:35	ST	SM2320 B-11
BOD, 5 Day	5.0	3.4	3.4 [b]	3.4	mg/l	1	09/05/18 23:01	SA	SM5210 B-11
Coliform, Fecal	0	0			col/100ml	1	09/05/18 20:58	SA	SM9222 D-06
Coliform, Total	8	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 17:47	RP	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [c]	0.11 U	0.11	0.11	0.093	mg/l	1	09/12/18 15:08	RP	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.10 U	0.10	0.10	0.090	mg/l	1	09/12/18 15:08	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	0.64	0.20	0.15	0.12	mg/l	1	09/13/18 12:18	BM	EPA 351.2/LACHAT
Phosphorus, Total	0.060	0.050	0.050	0.027	mg/l	1	09/13/18 18:35	LS	EPA 365.3
Solids, Total Dissolved	40.0	10	4.0	1.8	mg/l	1	09/06/18 14:45	RC	SM2540 C-11
Solids, Total Suspended	9.8	4.0	2.0	1.5	mg/l	1	09/06/18 16:00	RC	SM2540 D-11
Total Organic Carbon	8.3	1.0	1.0	0.72	mg/l	1	09/18/18 15:43	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.5.
(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:	PR-2S		
Lab Sample ID:	JC73160-2F	**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	0.062	0.050	0.050	0.027	mg/l	1	09/13/18 18:55	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: PR-2M
Lab Sample ID: JC73160-3
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]	27.4	5.0	4.0	3.6	mg/l	1	09/13/18 12:35	ST	SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 [b]	3.4	mg/l	1	09/05/18 23:03	SA	SM5210 B-11
Nitrogen, Ammonia	0.15 J	0.20	0.20	0.089	mg/l	1	09/10/18 15:39	RP	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [c]	0.12	0.11	0.11	0.093	mg/l	1	09/12/18 15:09	RP	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.12	0.10	0.10	0.090	mg/l	1	09/12/18 15:09	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	0.50	0.20	0.15	0.12	mg/l	1	09/13/18 12:19	BM	EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	09/13/18 18:55	LS	EPA 365.3
Solids, Total Dissolved	54.3	10	4.0	1.8	mg/l	1	09/06/18 14:45	RC	SM2540 C-11
Solids, Total Suspended	2.2 J	4.0	2.0	1.5	mg/l	1	09/06/18 16:00	RC	SM2540 D-11
Total Organic Carbon	5.1	1.0	1.0	0.72	mg/l	1	09/18/18 15:54	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.5.
(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:	PR-2M		
Lab Sample ID:	JC73160-3F	**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	09/13/18 18:55	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: PR-2D
Lab Sample ID: JC73160-4
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]	29.5	5.0	4.0	3.6	mg/l	1	09/13/18 12:35	ST	SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 [b]	3.4	mg/l	1	09/05/18 23:04	SA	SM5210 B-11
Nitrogen, Ammonia	0.22	0.20	0.20	0.089	mg/l	1	09/10/18 15:41	RP	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [c]	0.14	0.11	0.11	0.093	mg/l	1	09/12/18 15:10	RP	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.14	0.10	0.10	0.090	mg/l	1	09/12/18 15:10	RP	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0050 U	0.010	0.0050	0.0030	mg/l	1	09/05/18 20:50	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.56	0.20	0.15	0.12	mg/l	1	09/13/18 12:20	BM	EPA 351.2/LACHAT
Phosphorus, Total	0.031 J	0.050	0.050	0.027	mg/l	1	09/13/18 18:55	LS	EPA 365.3
Solids, Total Dissolved	48.0	10	4.0	1.8	mg/l	1	09/06/18 14:45	RC	SM2540 C-11
Solids, Total Suspended	32.1	4.0	2.0	1.5	mg/l	1	09/06/18 16:00	RC	SM2540 D-11
Total Organic Carbon	5.7	1.0	1.0	0.72	mg/l	1	09/18/18 16:06	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.5.
(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:	PR-2D		
Lab Sample ID:	JC73160-4F	**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	0.050 U	0.050	0.050	0.027	mg/l	1	09/13/18 18:55	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:	PR-3S		
Lab Sample ID:	JC73160-5	**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]	25.3	5.0	4.0	3.6	mg/l	1	09/13/18 12:35	ST	SM2320 B-11
BOD, 5 Day	5.8	3.4	3.4 [b]	3.4	mg/l	1	09/05/18 23:06	SA	SM5210 B-11
Coliform, Fecal	0	0			col/100ml	1	09/05/18 20:58	SA	SM9222 D-06
Coliform, Total	8	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 15:46	RP	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [c]	0.11 U	0.11	0.11	0.093	mg/l	1	09/12/18 15:11	RP	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.10 U	0.10	0.10	0.090	mg/l	1	09/12/18 15:11	RP	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0050 U	0.010	0.0050	0.0030	mg/l	1	09/05/18 20:50	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.70	0.20	0.15	0.12	mg/l	1	09/13/18 12:21	BM	EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	09/13/18 18:55	LS	EPA 365.3
Solids, Total Dissolved	20.0	10	4.0	1.8	mg/l	1	09/06/18 14:45	RC	SM2540 C-11
Solids, Total Suspended	10.2	4.0	2.0	1.5	mg/l	1	09/06/18 16:00	RC	SM2540 D-11
Total Organic Carbon	9.6	1.0	1.0	0.72	mg/l	1	09/18/18 16:17	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.5.
(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:	PR-3S		
Lab Sample ID:	JC73160-5F	**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	0.029 J	0.050	0.050	0.027	mg/l	1	09/13/18 19:00	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:	PR-3M		
Lab Sample ID:	JC73160-6	**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]	22.2	5.0	4.0	3.6	mg/l	1	09/13/18 12:35	ST	SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 [b]	3.4	mg/l	1	09/05/18 23:08	SA	SM5210 B-11
Nitrogen, Ammonia	0.091 J	0.20	0.20	0.089	mg/l	1	09/10/18 15:52	RP	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [c]	0.097 J	0.11	0.11	0.093	mg/l	1	09/12/18 15:14	RP	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.097 J	0.10	0.10	0.090	mg/l	1	09/12/18 15:14	RP	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0050 U	0.010	0.0050	0.0030	mg/l	1	09/05/18 20:50	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.51	0.20	0.15	0.12	mg/l	1	09/13/18 12:22	BM	EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	09/13/18 18:55	LS	EPA 365.3
Solids, Total Dissolved	34.0	10	4.0	1.8	mg/l	1	09/06/18 14:45	RC	SM2540 C-11
Solids, Total Suspended	1.6 J	4.0	2.0	1.5	mg/l	1	09/06/18 16:00	RC	SM2540 D-11
Total Organic Carbon	6.1	1.0	1.0	0.72	mg/l	1	09/18/18 17:21	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.5.
(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:	PR-3M		
Lab Sample ID:	JC73160-6F	**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	09/13/18 19:00	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:	PR-3D		
Lab Sample ID:	JC73160-7	**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]	41.2	5.0	4.0	3.6	mg/l	1	09/13/18 12:35	ST	SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 [b]	3.4	mg/l	1	09/05/18 23:10	SA	SM5210 B-11
Nitrogen, Ammonia	0.76	0.20	0.20	0.089	mg/l	1	09/10/18 15:55	RP	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [c]	0.11 U	0.11	0.11	0.093	mg/l	1	09/12/18 15:16	RP	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.10 U	0.10	0.10	0.090	mg/l	1	09/12/18 15:16	RP	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0050 U	0.010	0.0050	0.0030	mg/l	1	09/05/18 20:50	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	1.1	0.20	0.15	0.12	mg/l	1	09/13/18 12:24	BM	EPA 351.2/LACHAT
Phosphorus, Total	0.041 J	0.050	0.050	0.027	mg/l	1	09/13/18 18:55	LS	EPA 365.3
Solids, Total Dissolved	73.3	10	4.0	1.8	mg/l	1	09/06/18 14:45	RC	SM2540 C-11
Solids, Total Suspended [d]	4.7	4.0	2.0	1.5	mg/l	1	09/06/18 16:00	RC	SM2540 D-11
Total Organic Carbon	15.4	1.0	1.0	0.72	mg/l	1	09/18/18 17:33	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.5.

(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 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:	PR-3D		
Lab Sample ID:	JC73160-7F	**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	09/13/18 19:00	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:	PR-4S		
Lab Sample ID:	JC73160-8	**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]	24.8	5.0	4.0	3.6	mg/l	1	09/13/18 12:35	ST	SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 [b]	3.4	mg/l	1	09/05/18 23:12	SA	SM5210 B-11
Coliform, Fecal	570	10			col/100ml	10	09/05/18 20:58	SA	SM9222 D-06
Coliform, Total	782	100			col/100ml	100	09/05/18 20:50	SA	SM9222 B-06
Nitrogen, Ammonia	0.16 J	0.20	0.20	0.089	mg/l	1	09/10/18 15:56	RP	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [c]	0.19	0.11	0.11	0.093	mg/l	1	09/12/18 15:17	RP	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.20	0.10	0.10	0.090	mg/l	1	09/12/18 15:17	RP	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0068 J	0.010	0.0050	0.0030	mg/l	1	09/06/18 00:15	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.43	0.20	0.15	0.12	mg/l	1	09/13/18 12:25	BM	EPA 351.2/LACHAT
Phosphorus, Total	0.033 J	0.050	0.050	0.027	mg/l	1	09/13/18 18:55	LS	EPA 365.3
Solids, Total Dissolved	60.0	10	4.0	1.8	mg/l	1	09/06/18 14:45	RC	SM2540 C-11
Solids, Total Suspended	5.2	4.0	2.0	1.5	mg/l	1	09/06/18 16:00	RC	SM2540 D-11
Total Organic Carbon	7.4	1.0	1.0	0.72	mg/l	1	09/18/18 17:44	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.5.
(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:	PR-4S		
Lab Sample ID:	JC73160-8F	**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	09/13/18 19:00	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 PAGE 1 OF 1 E/F/L

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-08318-113
SGS Quote # | SGS Job # JC73160

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 - Prompton Reservoir
Street:
City: Prompton 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): W625203; Alk, AMN, BOD, TDS; TOC, TSS, TPO4 (Total Phosphorus); TKN, XN030 (TKN/TPO4 Bottle); TPO4 (dissolved lab filter); FCF TCF

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	W625203	Alk, AMN, BOD, TDS	TOC, TSS, TPO4	TKN, XN030	TPO4 (dissolved)	FCF TCF	LAB USE ONLY
1F	PR-1S		9/5/18	1245	GW	SW	11	X			X					X	X	X	X	X	X	
2F	PR-2S			1345			11	X			X					X	X	X	X	X	X	C30
3F	PR-2M			1345			9	X			X						X	X	X	X		M18
4F	PR-2D			1345			9	X			X						X	X	X	X		M20
5F	PR-3S			1320			11	X			X					X	X	X	X	X	X	637
6F	PR-3M			1320			9	X			X						X	X	X	X		646 T4
7F	PR-3D			1320			9	X			X						X	X	X	X		19D2
8F	PR-4S			1220			11	X			X					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 ASSESSMENT 38 BAE

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"
- ☐ 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
One TSS Bottle not filled, one XN030 Bottle not used, TPO4 dissolved lab filter. XN030 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 1630	1 Wade Smith Impulse Sol	2 Wade Smith Impulse	9/5/18 18:45	2 Jamie Walker
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. 4.1, 3.1, 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

5.1 5

JC73160: Chain of Custody
Page 1 of 3

SGS Sample Receipt Summary

Job Number: JC73160 **Client:** USACE-PHILADELPHIA DISTRICT **Project:** PHILADELPHIA DISTRICT, RESERVOIR SAMPL

Date / Time Received: 9/5/2018 6:45:00 PM **Delivery Method:** **Airbill #'s:**

Cooler Temps (Raw Measured) °C: Cooler 1: (1.7); Cooler 2: (3.2); Cooler 3: (4.1); Cooler 4: (3.1); Cooler 5: (2.6); Cooler 6: (2.9); Cooler 7: (3.4);

Cooler Temps (Corrected) °C: Cooler 1: (1.1); Cooler 2: (2.6); Cooler 3: (3.5); Cooler 4: (2.5); Cooler 5: (2.0); 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
-1, -8: Received volumes for TCF/FCF outside of hold time.
-2, -5: Received volumes for TCF/FCF within hold time. Lab will need to verify if run within 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.

JC73160: Chain of Custody
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