# 2014 WATER QUALITY MONITORING F.E. WALTER RESERVOIR WHITE HAVEN, PENNSYLVANIA



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

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# **2014 Water Quality Monitoring**

F.E. Walter Reservoir White Haven, Pennsylvania

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### 1.0 INTRODUCTION

#### 1.1 DESCRIPTION OF F.E. WALTER RESERVOIR

The U.S. Army Corps of Engineers (USACE) manages F.E. Walter Reservoir located in northeastern Pennsylvania within the Delaware River Basin. F.E. Walter Reservoir is an integral part of the Lehigh River Flood Control Program. The authorized purpose of this project is flood control. The reservoir project was authorized for recreation and specifically white water recreation as part of Public Law 100-676, Section 6, dated November 17, 1988. Located about 9 miles southeast of Wilkes-Barre, PA, the reservoir dams a drainage area of 288 square miles. The dam can impound up to 35.8 billion gallons of floodwater. The primary surface water input into the reservoir is the Lehigh River as it flows west between Luzerne and Carbon Counties. Bear Creek, a secondary surface water input, enters the reservoir from the north. Tobyhanna Creek drains an area to the southeast and joins the Lehigh River near the headwaters of the reservoir. The reservoir is approximately 3 miles long and approximately 50 feet deep when not operating for flood control or recreation. In an effort to maximize recreational potential in the reservoir and on the Lehigh River downstream, specifically recreational boating and fishing, the normal operating pool of 50 feet was raised an additional 70 feet in April of 2014. The additional storage was used to augment low flows in the Lehigh River downstream as a fishery management tool and increase the number of recreational boating releases throughout the summer recreation season.

#### 1.2 PURPOSE OF THE MONITORING PROGRAM

Foremost, F.E. Walter Reservoir provides flood control to downstream communities on the Lehigh River. Additionally, the reservoir provides important habitat for fish, waterfowl, and other wildlife, and recreational opportunities through fishing and boating both within the lake and downstream. Drinking water intakes exist at various locations on the Lehigh River downstream of the dam. Due to the broad range of uses and demands F.E. Walter Reservoir serves, the USACE monitors water quality and other aspects related to reservoir health primarily to ensure public health safety and protection of the environment. Water quality monitoring results are compared to state water quality standards and used to diagnose problems that commonly effect reservoir health such as nutrient enrichment and toxic loadings. This report summarizes the results of water quality monitoring at F.E. Walter Reservoir and its tributaries from May through September 2014.

#### 1.3 ELEMENTS OF THE STUDY

The USACE, Philadelphia District, has been monitoring the water quality of F.E. Walter Reservoir since 1975. Over this time, yearly monitoring program designs have evolved to address new areas of concern such as human health aspects of drinking water, sediment contaminants within the reservoir basin, and a 2002 investigation of a hydrogen sulfide smell near the tail water of the dam. The 2014 monitoring program was similar to those in recent

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

### 2.0 METHODS

#### 2.1 PHYSICAL STRATIFICATION MONITORING

Physical stratification monitoring of the water column of F.E. Walter Reservoir was conducted five times between May and September 2014 at all stations (Table 2-1). Physical stratification parameters included temperature, dissolved oxygen (DO), pH, ORP, Chlorophyll a, depth, turbidity, and conductivity. Monitoring was conducted at seven fixed stations located throughout the reservoir watershed (Fig. 2-1). Surface water quality was monitored at stations downstream (outfall discharge) of the reservoir (WA-1S) and tributary upstream stations on Tobyhanna Creek (WA-3S), the Lehigh River (WA-4S), and Bear Creek (WA-5S). Stratification monitoring was conducted within the reservoir at a reservoir tower station (WA-2), Bear Creek arm of the lake (WA-6), and Lehigh River arm of the lake (WA-7) with water quality measured from the water surface to the bottom at 5-ft intervals. All of the water quality monitoring was conducted with a calibrated YSI 6600 V2-4 multi-parameter water quality sonde.

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

#### 2.2 WATER COLUMN CHEMISTRY MONITORING

Water column chemistry monitoring was conducted five times at F.E. Walter Reservoir between May and September 2014 (Table 2-1). Water samples were collected at the seven fixed stations throughout the reservoir drainage area (Fig. 2-1). Surface water samples were collected at stations downstream of the reservoir (WA-1S) and upstream on Tobyhanna Creek (WA-3S), the Lehigh River (WA-4S), and Bear Creek (WA-5S). Surface, middle, and bottom water samples were collected at each of the reservoir-body stations WA-2, WA-6, and WA-7. Surface water samples were collected by opening the sample containers approximately 1 foot below the water's surface. Middle and bottom samples were collected with a Van Dorn design water bottle sampler. All samples were placed on ice in a cooler and shipped to a certified laboratory for testing. MJ Reider Associates in Reading, Pennsylvania conducted the laboratory water analysis for 2014.

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

Date of Sample Collection	(3) Physical Stratification Monitoring (All Stations)	Water Column Chemistry Monitoring (All Stations)	Trophic State Determination (WA-2)	Coliform Bacteria Monitoring (All Stations)	(4) Sediment Priority Pollutant Monitoring (WA-2)	(2) Lehigh Temperature Probes	(1) Drinking Water Monitoring
21 May	Х	Х	Х	Х	NS	NS	NS
18 June	Х	Х	Х	Х	NS	NS	NS
23 July	Х	Х	Х	Х	NS	NS	NS
12 August	Х	Х	Х	Х	NS	NS	NS
10 September	Х	Х	Х	X	NS	NS	NS

(1) Drinking water samples are sampled quarterly by personnel at each reservoir.(2) Lehigh River temperature probes continuously monitor river temperatures throughout the sampling period. They are periodically downloaded.

 (3) Physical stratification monitoring is conducted at all stations during routine monthly sampling.
(4) Sediment Sampling was not conducted in 2014 based on historic sampling results showing low probability of sediment contamination. NS- Not Sampled



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

Table 2-2.Water qualityholding time2014	Fable 2-2.   Water quality test methods, detection limits, state regulatory criteria, and sample holding times for water quality parameters monitored at F.E. Walter Reservoir in 2014												
Parameter	(2) Method	Reporting Limit	PADEP Surface Water Quality Criteria	Allowable Hold Times (Days)									
Total Alkalinity	SM20 2320B	1.0 mg/L	Min. 20 mg/L CaCO <sub>3</sub>	14									
Biochemical Oxygen Demand (BOD)	SM20 5210B	2.0 mg/L	None	2									
Total Phosphorus	SM20 4500P-E	0.01 mg/L	None	28									
Diss./Ortho-Phosphate	SM20 4500P-E	0.05 mg/L	None	28									
Soluble Phosphorus	SM-20 4500-PE	0.01 mg/L	None	28									
Total Organic Carbon (TOC)	SM-20 5310C	1.0 mg/L	None	28									
Total Inorganic Carbon (TIC)	SM-20 5310B	1.0 mg/L	None	28									
Total Carbon (TOC + TIC)	SM-20 5310B	1.0 mg/L	None	28									
(1) Chlorophyll a			None										
Total Kjeldahl Nitrogen	MCAWW 351.2	0.25 mg/L	None	28									
Ammonia	D6919-03	0.05 mg/L	Temp. and pH dependent	28									
Nitrate	MCAWW 353.2	0.05 mg/L	Maximum	28									
Nitrite	MCAWW 353.2	0.05 mg/L	(nitrate + nitrite)	28									
Total Dissolved Solids	SM20 2540C	5.0 mg/L	Maximum 750 mg/L	7									
Total Suspended Solids	SM20 2540D	3.0 mg/L	None	7									

(1) Chlorophyll a samples were recorded using a YSI 6600 V2-4 with a chlorophyll sensor.

(2) Laboratory Methods Reference: **MCAWW**- "Methods for Chemical Analysis of Water and Wastes", EPA-600/4-79-020, March 1983 and subsequent revisions.

**SM-20**- "Standard Methods for the Examination of Water and Wastewater", 22<sup>nd</sup> Edition, 2012. **SW846**- "Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods", 3<sup>rd</sup>. Edition, November 1986 and updates.

#### 2.3 TROPHIC STATE DETERMINATION

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

#### 2.4 RESERVOIR BACTERIA MONITORING

Monitoring for coliform bacteria contaminants was conducted five times between May and September 2014 at F.E. Walter Reservoir. Surface water samples were collected in the same manner as for chemical parameter samples, and analyzed for total and fecal coliform and e-coli bacteria contamination. Table 2-3 presents the test methods, detection limits, PADEP standards, and sample holding times for the bacteria parameters monitored at F.E. Walter Reservoir in 2014. The bacteria analytical method was based on a membrane filtration technique. All of the samples were analyzed within their maximum allowable hold times. MJ Reider Associates Laboratory in Reading, Pennsylvania conducted the bacteria analysis for 2014.

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

Table 2-3.Water quality test methods, detection limits, PADEP water quality standards, sample holding times for bacteria parameters monitored at F.E. Walter Rese in 2014												
Param	eter	Total coliform	Fecal coliform									
Test me	ethod	SM 9223B	SM9222D									
Detectio	n limit	1 clns/100-mls	2 clns/100-ml									
PADEP st	andard	-	Geometric mean less than 200 clns/100-ml (application of this standard is conservative because swimming is not permitted in the reservoir)									
Maximum a holding	allowable time	30 hours	30 hours									
Achieved ho	lding time	< 30 hours	< 30 hours									

## 3.0 RESULTS AND DISCUSSION

#### 3.1 STRATIFICATION MONITORING

The following sections describe temporal and spatial patterns for the water quality parameters of temperature, dissolved oxygen (DO) and pH measured throughout the F.E. Walter Reservoir watershed during 2014. Additionally, patterns related to season and depths are described for station WA-2 which is located near the operations tower and maintains the greatest water depths in the reservoir. Maximum depths for WA-2, during five monthly sampling days, vary between approximately 63 to 120 feet due to 2014 reservoir operations at the time of sampling. All of the stratification data collected during the 2014 monitoring period is presented in Appendix A.

#### 3.1.1 Temperature

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

Temperatures of the tributary surface waters (Stations WA-3S, -4S, and -5S) of the F.E. Walter Reservoir watershed generally followed a similar pattern throughout the monitoring period. Monthly sampling showed temperatures peaked during late July and gradually decreased through September (Fig. 3-1). Downstream release (station WA-1) surface water temperatures in August and September were typically warmer than tributary inflow temperatures. A maximum inflow temperature of 20.65 °C (WA-5S) in July and maximum outflow temperature of 21.34 °C (WA-1S) was seen in August. Temperatures in surface waters of the reservoir-body (station WA-2S, -6S, and -7S) were generally warmer than in tributaries and downstream of the dam as a result of warming from the sun. In-lake reservoir surface temperatures peaked in late July at approximately 24.99°C (Station WA-2S). In 2014, tributary and release water temperatures, at times, exceeded the Pennsylvania state water quality criteria for cold water fisheries.

The water column of F.E. Walter Reservoir was lightly temperature stratified during May, June, and July of the 2014 sampling season (Fig. 3-2). Due to operations in 2014, specifically the raising of the base pool level and recreational release operations, the temperature stratification within the reservoir was likely affected by bottom flood gate releases on various occasions during the season. The reservoir operations tower was constructed with bottom flood control gates only and does not have the flexibility to withdrawal water from other locations in the water column. As a result, lower and typically cooler bottom waters are withdrawn first, likely causing a disruption in stratification and accelerated depletion of cooler bottom waters. Overall, 2014 reservoir temperatures were slightly warmer those seen during operations in 2013. The entire reservoir body warmed from May through July and maintained a relatively stable temperature range from July through September even with shallower pool elevations as a result of volume depletion for recreational releases.

#### 3.1.2 Dissolved Oxygen

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

In 2014, DO in the tributary surface waters (stations WA-3S, -4S, and -5S) of F.E. Walter Reservoir remained relatively constant from May through September sampling with recorded values ranging from 7.81 mg/L to 10.19 mg/L. These values can be attributed to typically well oxygenated stream and river systems and seasonal changes in water temperature. Station WA-1 located downstream of F.E. Walter Reservoir also maintained a similar seasonal pattern. This can be attributed, in part, to the aeration of reservoir bottom waters as it passes through the conduit system of the dam and is released downstream.

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

The health of aquatic ecosystems can be impaired by low DO concentrations in the water column. The lowest DO concentration (3.43 mg/L) was recorded at the bottom of the reservoir during the 23 July sampling event (Fig. 3-4). Hypoxia, or conditions of DO concentrations less than 2 mg/L, is generally accepted as the threshold at which the most severe effects on biota occur. F.E. Walter Reservoir did not experience hypoxic conditions during the 2014 sampling season. Low oxygen reservoir waters are re-aerated as they pass through the conduit system of the reservoir during release. As a result, water releases from the deeper portions of the reservoir containing lower DO concentration did not directly impact the Lehigh River downstream. Dissolved oxygen concentrations downstream ranged from 8.33 mg/L to 10.19 mg/L throughout the sampling season.

#### 3.1.3 pH

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

Measures of pH in tributary surface (WA-3S, -4S, and -5S) waters of F.E. Walter Reservoir generally followed a similar pattern during 2014 and remained relatively constant or within a narrow range of values (6.27-7.51) throughout the sampling season. The lowest pH level of 6.27 recorded during the sampling season occurred at station WA-5S during the May sampling and the highest pH reading of 7.51 was recorded at Station WA-5S in September. Measures of pH at the downstream station WA-1S are directly influenced by bottom water column releases from the reservoir. Readings of pH at this station ranged from a high of 6.89 in September to a low of 6.58 in May (Fig. 3-5).

In 2014, measures of pH within the lake stayed within a tight range of values (6.05-7.47) from the surface to the bottom (Fig. 3-6). Slightly higher pH values were measured near the surface and bottom waters of the lake. Many factors can influence the pH of the reservoir water such as surrounding rock, acid rain, algal productivity, deep water biological productivity and others. Measures of pH throughout the water column in all months sampled remained in compliance with PADEP water quality standards. The water quality standard for pH is a range of acceptable measures between 6 and 9.

#### 3.2 WATER COLUMN CHEMISTRY MONITORING

Table 3-1 provides a summary of water column chemistry sampling for all stations and dates sampled at F.E. Walter Reservoir in 2014. The following sections describe the temporal, spatial, and depth related patterns for these water quality measures.



**Figure 3-1.** Temperature measured in tributary and release (WA-1) surface waters of F.E. Walter Reservoir during 2014. See Appendix A for a summary of the plotted values.

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**Figure 3-2.** Stratification of temperature measured in the water column of F. E. Walter Reservoir at station WA-2 during 2014. See Appendix A for a summary of the plotted values.



**Figure 3-3.** Dissolved oxygen measured in tributary and release (WA-1) surface waters of F. E. Walter Reservoir during 2014. See Appendix A for a summary of the plotted value.

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**Figure 3-4.** Dissolved oxygen measured in the water column of F.E. Walter Reservoir at station WA-2 during 2014. The PADEP WQ standard for DO is a epilimnion minimum concentration of 5 mg/L. See Appendix A for a summary of the plotted values.



**Figure 3-5.** Measures of pH in tributary and release (WA-1) surface waters of F.E. Walter Reservoir during 2014. The PADEP WQ standard for pH is an acceptable range from 6 to 9. See Appendix A for a summary of the plotted values.

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**Figure 3-6.** Stratification of pH measured in the water column of F.E. Walter Reservoir at station WA-2 during 2014. The PADEP water quality standard pH is an acceptable range from 6 to 9. See Appendix A for a summary of the plotted value.

Table 3-1.	Table 3-1. Summary of surface, middle, and bottom water quality monitoring data for F.E. Walter Reservoir in 2014												
		ALK	BOD5	DISS-P	NH3	NO2	NO3	PO4	TDS	TKN	TOC	TP	TSS
Station	Date	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	05/21/2014	4	<2	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	64	< 0.25	7.8	< 0.01	<3
	06/18/2014	5	<2	< 0.05	< 0.05	< 0.05	0.08	0.04	63	< 0.25	6	0.04	3
	07/23/2014	7	<2	< 0.05	< 0.05	< 0.05	0.11	< 0.01	87	0.28	7.4	0.03	<3
	08/12/2014	7	<2	< 0.05	< 0.05	< 0.05	0.12	< 0.01	59	< 0.25	4.8	0.02	16
WA OIS	09/10/2014	8	<2	< 0.05	< 0.05	< 0.05	0.11	0.04	58	0.27	4	0.04	8
WA-015	Mean	6.2	2	0.05	0.05	0.05	0.094	0.022	66.2	0.26	6	0.028	6.6
	Stdev	1.643	0	0	0	0	0.029	0.016	11.904	0.014	1.631	0.013	5.683
	Max	8	2	0.05	0.05	0.05	0.12	0.04	87	0.28	7.8	0.04	16
	Min	4	2	0.05	0.05	0.05	0.05	0.01	58	0.25	4	0.01	3
	No. of Dects	5	0	0	0	0	4	2	5	2	5	4	3
	05/21/2014	3	<2	< 0.05	< 0.05	< 0.05	< 0.05	0.02	57	< 0.25	5.5	0.02	<3
	06/18/2014	4	<2	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	62	< 0.25	4.8	< 0.01	<3
	07/23/2014	6	<2	< 0.05	< 0.05	< 0.05	0.08	< 0.01	65	< 0.25	5.5	< 0.01	<3
	08/12/2014	5	<2	< 0.05	< 0.05	< 0.05	0.08	< 0.01	55	0.31	5.4	< 0.01	<3
WA OOD	09/10/2014	6	<2	< 0.05	< 0.05	< 0.05	0.1	< 0.01	57	0.28	4.7	< 0.01	<3
WA-025	Mean	4.8	2	0.05	0.05	0.05	0.072	0.012	59.2	0.268	5.18	0.012	3
	Stdev	1.304	0	0	0	0	0.022	0.004	4.147	0.027	0.396	0.004	0
	Max	6	2	0.05	0.05	0.05	0.1	0.02	65	0.31	5.5	0.02	3
	Min	3	2	0.05	0.05	0.05	0.05	0.01	55	0.25	4.7	0.01	3
	No. of Dects	5	0	0	0	0	3	1	5	2	5	1	0

Table 3-1 c	Table 3-1 continued. Summary of surface, middle, and bottom water quality monitoring data for F.E. Walter Reservoir in 2014												
		ALK	BOD5	DISS-P	NH3	NO2	NO3	PO4	TDS	TKN	TOC	TP	TSS
Station	Date	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	05/21/2014	3	<2	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	65	< 0.25	8	< 0.01	<3
	06/18/2014	5	<2	< 0.05	< 0.05	< 0.05	0.07	< 0.01	67	< 0.25	6	0.01	3
	07/23/2014	7	<2	< 0.05	< 0.05	< 0.05	0.1	< 0.01	58	< 0.25	6.7	< 0.01	<3
	08/12/2014	5	<2	< 0.05	< 0.05	< 0.05	0.12	0.09	63	< 0.25	5.4	0.1	<3
WA OOM	09/10/2014	5	<2	< 0.05	< 0.05	< 0.05	0.09	< 0.01	53	0.27	4.7	< 0.01	3
WA-02WI	Mean	5	2	0.05	0.05	0.05	0.086	0.026	61.2	0.254	6.16	0.028	3
	Stdev	1.414	0	0	0	0	0.027	0.036	5.675	0.009	1.266	0.04	0
	Max	7	2	0.05	0.05	0.05	0.12	0.09	67	0.27	8	0.1	3
	Min	3	2	0.05	0.05	0.05	0.05	0.01	53	0.25	4.7	0.01	3
	No. of Dects	5	0	0	0	0	4	1	5	1	5	2	2
Station WA-02M WA-02B	05/21/2014	4	<2	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	64	0.58	8.9	0.05	24
	06/18/2014	5	3	< 0.05	< 0.05	< 0.05	0.06	< 0.01	58	< 0.25	6.3	< 0.01	<3
	07/23/2014	8	<2	< 0.05	0.07	< 0.05	0.1	< 0.01	79	0.36	7.5	< 0.01	9
	08/12/2014	7	<2	< 0.05	0.07	< 0.05	0.1	< 0.01	59	< 0.25	5	< 0.01	17
WA OOD	09/10/2014	8	<2	< 0.05	< 0.05	< 0.05	0.1	< 0.01	55	0.37	4	0.06	16
WA-02D	Mean	6.4	2.2	0.05	0.058	0.05	0.082	0.01	63	0.362	6.34	0.028	13.8
	Stdev	1.817	0.447	0	0.011	0	0.025	0	9.513	0.135	1.948	0.025	8.044
	Max	8	3	0.05	0.07	0.05	0.1	0.01	79	0.58	8.9	0.06	24
	Min	4	2	0.05	0.05	0.05	0.05	0.01	55	0.25	4	0.01	3
	No. of Dects	5	1	0	2	0	4	0	5	3	5	2	4

Table 3-1 c	Table 3-1 continued. Summary of surface, middle, and bottom water quality monitoring data for F.E. Walter Reservoir in 2014												
		ALK	BOD5	DISS-P	NH3	NO2	NO3	PO4	TDS	TKN	TOC	TP	TSS
Station	Date	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	05/21/2014	3	<2	< 0.05	< 0.05	< 0.05	0.06	0.03	86	< 0.25	10.1	0.03	<3
	06/18/2014	5	<2	< 0.05	< 0.05	< 0.05	0.12	0.07	73	< 0.25	8.1	0.07	<3
	07/23/2014	7	<2	< 0.05	< 0.05	< 0.05	0.13	< 0.01	92	0.37	7.2	0.02	<3
	08/12/2014	8	<2	< 0.05	< 0.05	< 0.05	0.74	< 0.01	83	< 0.25	4.1	0.08	4
WA 028	09/10/2014	8	<2	< 0.05	< 0.05	< 0.05	0.21	< 0.01	61	< 0.25	4	0.06	<3
WA-055	Mean	6.2	2	0.05	0.05	0.05	0.252	0.026	79	0.274	6.7	0.052	3.2
	Stdev	2.168	0	0	0	0	0.278	0.026	12.186	0.054	2.637	0.026	0.447
	Max	8	2	0.05	0.05	0.05	0.74	0.07	92	0.37	10.1	0.08	4
	Min	3	2	0.05	0.05	0.05	0.06	0.01	61	0.25	4	0.02	3
	No. of Dects	5	0	0	0	0	5	2	5	1	5	5	1
	05/21/2014	5	<2	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	62	< 0.25	8	< 0.01	<3
	06/18/2014	7	<2	< 0.05	< 0.05	< 0.05	0.1	< 0.01	66	< 0.25	5.4	< 0.01	18
	07/23/2014	11	<2	< 0.05	< 0.05	< 0.05	0.12	< 0.01	85	0.3	3.4	0.01	3
	08/12/2014	14	2	< 0.05	< 0.05	< 0.05	0.21	0.02	71	< 0.25	2.8	0.04	77
WA 045	09/10/2014	12	<2	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	57	< 0.25	2.6	< 0.01	<3
WA-045	Mean	9.8	2	0.05	0.05	0.05	0.106	0.012	68.2	0.26	4.44	0.016	20.8
	Stdev	3.701	0	0	0	0	0.066	0.004	10.71	0.022	2.278	0.013	32.081
	Max	14	2	0.05	0.05	0.05	0.21	0.02	85	0.3	8	0.04	77
	Min	5	2	0.05	0.05	0.05	0.05	0.01	57	0.25	2.6	0.01	3
	No. of Dects	5	1	0	0	0	3	1	5	1	5	2	3

Table 3-1 c	Table 3-1 continued. Summary of surface, middle, and bottom water quality monitoring data for F.E. Walter Reservoir in 2014												
		ALK	BOD5	DISS-P	NH3	NO2	NO3	PO4	TDS	TKN	TOC	TP	TSS
Station	Date	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	05/21/2014	1	<2	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	25	< 0.25	5.1	< 0.01	<3
	06/18/2014	2	<2	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	48	0.3	5	0.03	8
	07/23/2014	4	<2	< 0.05	< 0.05	< 0.05	0.11	< 0.01	73	< 0.25	2.6	< 0.01	<3
	08/12/2014	4	<2	< 0.05	< 0.05	< 0.05	0.13	< 0.01	74	< 0.25	2.2	< 0.01	<3
WA 058	09/10/2014	4	<2	< 0.05	< 0.05	< 0.05	0.09	0.02	78	< 0.25	2.2	0.02	<3
WA-035	Mean	3	2	0.05	0.05	0.05	0.086	0.012	59.6	0.26	3.42	0.016	4
	Stdev	1.414	0	0	0	0	0.036	0.004	22.678	0.022	1.497	0.009	2.236
	Max	4	2	0.05	0.05	0.05	0.13	0.02	78	0.3	5.1	0.03	8
	Min	1	2	0.05	0.05	0.05	0.05	0.01	25	0.25	2.2	0.01	3
	No. of Dects	5	0	0	0	0	3	1	5	1	5	2	1
WA-05S WA-06S	05/21/2014	4	<2	< 0.05	< 0.05	< 0.05	0.05	< 0.01	66	< 0.25	5.4	< 0.01	<3
	06/18/2014	4	<2	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	38	< 0.25	4.8	0.01	<3
	07/23/2014	5	<2	< 0.05	< 0.05	< 0.05	0.08	0.02	55	< 0.25	5.2	0.02	<3
	08/12/2014	5	<2	< 0.05	< 0.05	< 0.05	0.08	0.05	62	0.35	5.2	0.06	3
WA OF	09/10/2014	5	<2	< 0.05	< 0.05	< 0.05	0.1	< 0.01	51	< 0.25	4.8	< 0.01	<3
WA-005	Mean	4.6	2	0.05	0.05	0.05	0.072	0.02	54.4	0.27	5.08	0.022	3
	Stdev	0.548	0	0	0	0	0.022	0.017	10.877	0.045	0.268	0.022	0
	Max	5	2	0.05	0.05	0.05	0.1	0.05	66	0.35	5.4	0.06	3
	Min	4	2	0.05	0.05	0.05	0.05	0.01	38	0.25	4.8	0.01	3
	No. of Dects	5	0	0	0	0	4	2	5	1	5	3	1

Table 3-1 c	ontinued. Summar	y of surfa	ce, middl	e, and bot	tom wate	r quality m	nonitoring	data for	F.E. Walter	Reservoir	<sup>.</sup> in 2014		
		ALK	BOD5	DISS-P	NH3	NO2	NO3	PO4	TDS	TKN	TOC	TP	TSS
Station	Date	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	05/21/2014	3	<2	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	45	< 0.25	6.4	0.02	4
	06/18/2014	5	<2	< 0.05	< 0.05	< 0.05	0.06	< 0.01	31	< 0.25	5.1	< 0.01	<3
	07/23/2014	7	<2	< 0.05	< 0.05	< 0.05	0.11	< 0.01	70	< 0.25	6.7	0.02	<3
	08/12/2014	6	<2	< 0.05	< 0.05	< 0.05	0.09	0.07	59	< 0.25	5.3	0.07	3
WA OGM	09/10/2014	6	<2	< 0.05	< 0.05	< 0.05	0.1	< 0.01	50	< 0.25	4.6	< 0.01	3
WA-00M	Mean	5.4	2	0.05	0.05	0.05	0.082	0.022	51	0.25	5.62	0.026	3.2
	Stdev	1.517	0	0	0	0	0.026	0.027	14.68	0	0.893	0.025	0.447
	Max	7	2	0.05	0.05	0.05	0.11	0.07	70	0.25	6.7	0.07	4
	Min	3	2	0.05	0.05	0.05	0.05	0.01	31	0.25	4.6	0.01	3
	No. of Dects	5	0	0	0	0	4	1	5	0	5	3	3
	05/21/2014	2	<2	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	40	0.32	5.8	0.13	252
	06/18/2014	6	<2	< 0.05	< 0.05	< 0.05	0.06	0.04	47	< 0.25	6.6	0.04	3
	07/23/2014	7	<2	< 0.05	< 0.05	< 0.05	0.1	< 0.01	72	< 0.25	7.3	< 0.01	7
	08/12/2014	5	<2	< 0.05	< 0.05	< 0.05	0.1	< 0.01	57	0.25	5.3	< 0.01	<3
WA OCD	09/10/2014	7	<2	< 0.05	< 0.05	< 0.05	0.11	0.01	44	< 0.25	4.1	0.01	<3
WA-00D	Mean	5.4	2	0.05	0.05	0.05	0.084	0.016	52	0.264	5.82	0.04	53.6
	Stdev	2.074	0	0	0	0	0.027	0.013	12.826	0.031	1.228	0.052	110.922
	Max	7	2	0.05	0.05	0.05	0.11	0.04	72	0.32	7.3	0.13	252
	Min	2	2	0.05	0.05	0.05	0.05	0.01	40	0.25	4.1	0.01	3
	No. of Dects	5	0	0	0	0	4	2	5	2	5	3	3

Table 3-1 c	ontinued. Summar	y of surfa	ice, middl	e, and bot	tom wate	r quality m	nonitoring	data for l	F.E. Walter	Reservoir	<sup>.</sup> in 2014		
		ALK	BOD5	DISS-P	NH3	NO2	NO3	PO4	TDS	TKN	TOC	TP	TSS
Station	Date	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	05/21/2014	4	<2	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	51	< 0.25	5.4	< 0.01	<3
	06/18/2014	5	<2	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	45	< 0.25	5.3	< 0.01	<3
	07/23/2014	5	<2	< 0.05	< 0.05	< 0.05	0.08	< 0.01	57	< 0.25	5.7	< 0.01	5
	08/12/2014	6	<2	< 0.05	< 0.05	< 0.05	0.1	< 0.01	59	< 0.25	5.3	0.02	4
WA 078	09/10/2014	6	<2	< 0.05	< 0.05	< 0.05	0.1	< 0.01	50	< 0.25	4.3	< 0.01	<3
WA-075	Mean	5.2	2	0.05	0.05	0.05	0.076	0.01	52.4	0.25	5.2	0.012	3.6
	Stdev	0.837	0	0	0	0	0.025	0	5.639	0	0.529	0.004	0.894
	Max	6	2	0.05	0.05	0.05	0.1	0.01	59	0.25	5.7	0.02	5
	Min	4	2	0.05	0.05	0.05	0.05	0.01	45	0.25	4.3	0.01	3
	No. of Dects	5	0	0	0	0	3	0	5	0	5	1	2
	05/21/2014	4	<2	< 0.05	< 0.05	< 0.05	< 0.05	0.01	49	0.38	8	0.04	<3
	06/18/2014	5	<2	< 0.05	< 0.05	< 0.05	0.08	0.03	53	< 0.25	5.9	0.04	<3
	07/23/2014	6	<2	< 0.05	< 0.05	< 0.05	0.1	0.03	57	< 0.25	7.6	0.03	<3
	08/12/2014	5	<2	< 0.05	< 0.05	< 0.05	0.08	< 0.01	62	< 0.25	5.5	< 0.01	<3
WA OTM	09/10/2014	6	<2	< 0.05	< 0.05	< 0.05	0.1	< 0.01	45	0.27	4.3	0.01	3
WA-07W	Mean	5.2	2	0.05	0.05	0.05	0.082	0.018	53.2	0.28	6.26	0.026	3
	Stdev	0.837	0	0	0	0	0.02	0.011	6.648	0.057	1.531	0.015	0
	Max	6	2	0.05	0.05	0.05	0.1	0.03	62	0.38	8	0.04	3
	Min	4	2	0.05	0.05	0.05	0.05	0.01	45	0.25	4.3	0.01	3
	No. of Dects	5	0	0	0	0	4	3	5	2	5	4	1

Table 3-1 c	3-1 continued. Summary of surface, middle, and bottom water quality monitoring data for F.E. Walter Reservoir in 2014												
		ALK	BOD5	DISS-P	NH3	NO2	NO3	PO4	TDS	TKN	TOC	TP	TSS
Station	Date	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	05/21/2014	4	<2	< 0.05	< 0.05	< 0.05	< 0.05	0.02	37	0.67	9.5	0.08	149
	06/18/2014	5	<2	< 0.05	< 0.05	< 0.05	0.06	< 0.01	32	< 0.25	7.7	< 0.01	6
	07/23/2014	6	<2	< 0.05	< 0.05	< 0.05	0.1	0.02	51	0.35	7.7	0.02	6
	08/12/2014	7	<2	< 0.05	< 0.05	< 0.05	0.1	< 0.01	63	< 0.25	4.5	< 0.01	8
WA O7D	09/10/2014	8	<2	< 0.05	< 0.05	< 0.05	0.09	< 0.01	50	0.25	3.6	< 0.01	18
WA-0/D	Mean	6	2	0.05	0.05	0.05	0.08	0.014	46.6	0.354	6.6	0.026	37.4
	Stdev	1.581	0	0	0	0	0.023	0.005	12.3	0.182	2.462	0.03	62.584
	Max	8	2	0.05	0.05	0.05	0.1	0.02	63	0.67	9.5	0.08	149
	Min	4	2	0.05	0.05	0.05	0.05	0.01	32	0.25	3.6	0.01	6
	No. of Dects	5	0	0	0	0	4	2	5	3	5	2	5

#### 3.2.1 Ammonia

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

Ammonia in the water column of F.E. Walter Reservoir was consistently low throughout the monitoring period with only two samples of sixty five measuring greater than the laboratory reporting limit (<0.05 mg/L). Two measures of 0.07 mg/L of ammonia were collected at station WA-2B on 23 July and 12 August (Table 3-1). F.E. Walter Reservoir was in compliance with the PADEP water quality standard for ammonia during 2014. The water quality standard of ammonia is dependent on temperature and pH (Table 3-2). Throughout the monitoring period, all measures of ammonia were less than their respective criteria values.

Table 3-2.	PADEP ar	nmonia nitro	ogen criteria	(Pennsylvar	nia Code, Tit	le 25, Chap	ter 93
рц	1984 and	1997). Spec		a criteria de			
FN		5.0	10.0	15 5	20 %	25 0	30 0
6.50	25.5	25.5	25.5	17.4	12.0	8.4	5.9
6.75	23.6	23.6	23.6	16.0	11.1	7.7	5.5
7.00	20.6	20.6	20.6	14.0	9.7	6.8	4.8
7.25	16.7	16.7	16.7	11.4	7.8	5.5	3.9
7.50	12.4	12.4	12.4	8.5	5.9	4.1	2.9
7.75	8.5	8.5	8.5	5.8	4.0	2.8	2.0
8.00	5.5	5.5	5.5	5.8	4.0	2.8	2.0
8.25	3.4	3.4	3.4	2.3	1.6	1.2	0.9
8.50	2.0	2.0	2.0	1.4	1.0	0.7	0.6
8.75	1.2	1.2	1.2	0.9	0.6	0.5	0.4
9.00	0.8	0.8	0.8	0.5	0.4	0.3	0.3

#### 3.2.2 Nitrite and Nitrate

Nitrite (NO2) is a measure of a form of nitrogen that occurs as an intermediate in the nitrogen cycle. It is unstable and can rapidly be oxidized to nitrate or reduced to nitrogen gas. Nitrite is a source of nutrients for plants and can be toxic to aquatic life in relatively low concentrations. Concentrations of nitrite at F.E. Walter Reservoir were consistently low during 2014. Concentrations of nitrite measured at all stations and depths were less than the reporting limit of 0.05 mg/L (Table 3-1).

Nitrate (NO3) is the measure of the most oxidized and stable form of nitrogen. It is the principal form of combined nitrogen in natural waters. Nitrate is the primary form of nitrogen used by plants as a nutrient to stimulate plant growth. Nitrate was also consistently low at F.E. Walter Reservoir during 2014. For all stations and depths, sample results ranged from less than

the reporting limit of 0.05 mg/L to a high of 0.74 mg/L in the surface waters at station WA-3S on 12 August.

In 2014, F.E. Walter Reservoir was in compliance with the PADEP water quality standard for nitrogen. The water quality standard for nitrogen is a summed concentration of nitrite and nitrate of less than 10-mg/L. Throughout the monitoring period, the summed concentrations for each station were well below this standard. The maximum summed concentration for any one sampling station did not exceed 0.79 mg/L.

#### 3.2.3 Total Kjeldahl Nitrogen

Total Kjeldahl nitrogen (TKN) is a measure of organic nitrogen that includes ammonia. Organic nitrogen is not immediately available for biological activity and is therefore not available for plant growth until decomposition to an inorganic form occurs. TKN in the water column of F.E. Walter Reservoir was low during 2014 (Table 3-1). Concentrations measured at all reservoir stations ranged from less than the reporting limit of 0.25 mg/L to a high of .67 mg/L at station WA-7B on 21 May. Higher concentrations were observed in the bottom waters at all lake sampling stations.

#### 3.2.4 Total Phosphorus

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

EPA guidance for nutrient criteria in lakes and reservoirs suggests a maximum concentration for total phosphorus of 0.01-mg/L (EPA 2000). Lakes and reservoirs exceeding this concentration are more likely to experience algal bloom problems during the growing season. Concentrations of total phosphorus were occasionally elevated at many of the reservoir sampling stations throughout the sampling season (Table 3-1). For all stations and depths, concentrations ranged from less than the reporting limit of 0.01 mg/L to a high of 0.08 mg/L. Surface waters of the reservoir tributaries and the Lehigh River outflow routinely had the higher concentrations. The maximum single sample concentration of 0.08 mg/L was measured on 12 August at station WA-03S and in the bottom waters at station WA-07B on 21 May. The highest seasonal mean concentrations of total phosphorus were seen at the deeper waters of the reservoir tower station WA-02B and WA-02M and at Station WA-01S downstream of the reservoir. Higher concentrations in lake bottom waters are attributed to phosphorus sediment release under low oxygen conditions. F.E. Walter Reservoir experienced these conditions in 2014.

#### 3.2.5 Dissolved Phosphorus

Dissolved or soluble phosphorus (DISS P) in the water column of F.E. Walter Reservoir remained consistently low during 2014. Concentrations at all stations and depths during the sampling season were below the reporting limit of 0.05 mg/L (Table 3-1). In freshwater environments, dissolved phosphorus is usually a limiting nutrient and is utilized by freshwater plants and algae during photosynthesis.

#### 3.2.6 Dissolved Phosphate

Dissolved Phosphate or Orthophosphate (PO4) is a measure of the inorganic oxidized form of soluble phosphorus. This form of phosphorus is the most readily available for uptake during photosynthesis. In 2014, concentrations of dissolved phosphate were near or below the reporting limit of 0.01 mg/L at all stations and depths (Table 3-1). The single highest measure of 0.09 mg/L was recorded in the middle of the water column at station WA-2M on 12 August.

#### 3.2.7 Total Dissolved Solids

Total Dissolved Solids (TDS) is a measure of the amount of filterable dissolved material in the water. Dissolved salts such as sulfate, magnesium, chloride, and sodium contribute to elevated levels. TDS in the lake and tributary stations of F.E. Walter Reservoir remained relatively constant and low during 2014. Concentrations at all stations and depths over the monitoring period ranged from 25 to 92 mg/L (Table 3-1). The highest mean seasonal concentration of 79 mg/L was seen at the upstream surface tributary station WA-03S. F.E. Walter Reservoir and its tributaries were in compliance with the PADEP water quality standard for total dissolved solids during 2014. The water quality standard is a maximum concentration of 500-mg/L.

#### 3.2.8 Total Suspended Solids

Total Suspended Solids (TSS) is a measure of the amount of non-filterable particulate matter that is suspended within the water column. High concentrations increase the turbidity of the water and can hinder photosynthetic activity, result in damage to fish gills, and cause impairment to spawning habitat (smothering). TSS measures in the water column of F.E. Walter Reservoir were low in 2014 with most sample results less than the reporting limit of 3.0 mg/L up to 252 mg/L (Table 3-1). Elevated results were most seen in the lake bottom water samples. This is likely a result of sampling error and resulting interference of suspended sediment in the sampling apparatus during lake bottom water sample collection. On occasion, bottom sediments are re-suspended during the process of collecting a sample from deeper waters. These elevated results do not accurately reflect conditions at those stations and depths.

#### 3.2.9 Biochemical Oxygen Demand

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

- 1-2 mg/L is associated with very clean water and little biodegradable wastes;
- 3-5 mg/L is associated with moderately clean water with some biodegradable wastes;
- 6-9 mg/L is associated with fairly polluted water, many bacteria, and much biodegradable wastes;
- 10+ mg/L is associated with very polluted water and large amounts of biodegradable wastes.

Measurements of 5-day Biochemical oxygen demand (BOD) for all but one sample (3.0 mg/L) at F.E. Walter Reservoir and its tributary stations in 2014 were below the reporting limit of 2.0 mg/L. It is therefore inferred that F.E. Walter Reservoir and its associated tributaries contain very clean water with little biodegradable organic wastes.

#### 3.2.10 Alkalinity

Alkalinity (ALK) is a measure of the acid-neutralizing capacity of water. Waters that have high alkalinity values are considered undesirable because of excessive hardness and high concentrations of sodium salts. Water with low alkalinity has little capacity to buffer acidic inputs and is susceptible to acidification (low pH). The PADEP standard is a minimum concentration of 20-mg/L CaCO<sub>3</sub> except where natural conditions are less.

Alkalinity measurements in the waters of F.E. Walter Reservoir were routinely low during 2014. Concentrations measured at all stations and depths ranged from 1.0 mg/L to 14.0 mg/L CaCO<sub>3</sub> throughout the monitoring period (Table 3-1). The greatest mean seasonal concentration of 9.8 mg/L CaCO<sub>3</sub> was measured in the surface waters at Station WA-4S. The natural alkalinity of water is largely dependent on the underlying geology and soils within the surrounding watershed. The low alkalinity measured at F.E. Walter Reservoir probably results from the regional geology, which is primarily sandstone and shale (Van Diver 1990).

#### 3.2.11 Total Organic Carbon

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

Total Organic Carbon (TOC) was measured in the water column and tributaries of F.E. Walter Reservoir (Table 3-1). Concentrations of TOC at all stations and depths ranged from 2.2

mg/L to 10.1 mg/L. The highest single measured concentration of 10.1 mg/L was in the surface waters at tributary station WA-03S on 21 May.

#### 3.2.12 Chlorophyll a

Chlorophyll a is the measure of the plant chlorophyll "a" primary pigment which helps plants get energy from light. It is found in most plants, algae, and cyanobacteria. Chlorophyll a measures increase in relation to algal densities in a water body. For the most part, chlorophyll *a* was low in the surface waters of F.E. Walter Reservoir during 2014 (Appendix A). Concentrations at all tributary and lake stations at depths from 0-15 feet ranged from 0.6 ug/L to 7.2 ug/L for the monitoring season. The highest single lake surface water (0-15 feet) concentration of 6.5 ug/L was measured at station WA-06 on 23 July.

#### 3.3 TROPHIC STATE DETERMINATION

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

TSIs calculated for measures of total phosphorus classified F.E. Walter Reservoir as oligotrophic in June (37.35), July (37.35), August (37.35) and September (37.35), and mesotrophic in May (47.35). TSIs calculated for measures of secchi disk depth classified F.E. Walter Reservoir as mesotrophic in June (49.66), July (49.66) and September (47.09), oligotrophic in May (35.97), and eutrophic in August (51.14). TSIs calculated for measures of chlorophyll *a* classified F.E. Walter Reservoir as mesotrophic in September (39.59), and eutrophic in September (39.59).

Carlson (1977) warned against averaging TSI values estimated for different parameters, and instead suggested giving priority to chlorophyll a during the summer and to phosphorus in the spring, fall, and winter. With this in mind, and based on the pattern of TSI values for secchi disk depth, chlorophyll a and total phosphorus, F.E. Walter Reservoir was oligotrophic/mesotrophic during the 2014 sampling season.

The EPA (1983) also provides criteria for classifying the trophic conditions of lakes of the North Temperate Zone based on concentrations of total phosphorus, chlorophyll *a*, and secchi disk depth (Table 3-3). Taking into account the general agreement between the EPA classifications with that of the Carlson TSIs, the trophic condition of F.E. Walter Reservoir was oligotrophic/mesotrophic throughout much of the 2014 sampling season.

Table 3-3. EPA troph Reservoir	ic classifi in 2014	ication cri	teria and av	erage m	onthly m	easures	for F.E.	Walter
Water Quality Variable	Oligo- trophic	Meso- trophic	Eutrophic	21 May	18 June	23 July	12 Aug.	10 Sep.
Total Phosphorus (ppb)	<10	10-20	>20	20	<10	<10	<10	<10
Chlorophyll a (ppb)	<4	4-10	>10	3.77	3.63	5.23	4.07	2.5
Secchi Depth (m)	>4	2-4	<2	5.3	2.05	2.05	1.85	2.45
					•		•	

#### 3.4 RESERVOIR BACTERIA MONITORING

Three forms of coliform bacteria contamination were monitored in the tributary and lake surface waters at F.E. Walter Reservoir during 2014 including total and fecal coliform (Table 3-4). Total coliform includes Escherica coliform (E. coli) and related bacteria that are associated with fecal discharges. Escherica coliform is used as an indicator of the presence of other potentially dangerous pathogens. 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 measures for all lake and tributary stations at F.E. Walter Reservoir during 2014, ranged from 260-clns/100-ml to greater than the detection limit of 2400 clns/100-ml. Fecal coliform counts ranged from less than the detection limit of 2-clns/100-ml to 450 clns/100-ml for the monitoring period. Escherica coliform counts ranged from less than the detection limit of 1-clns/100-ml to 440-clns/100-ml for the monitoring period. Overall, bacteria levels were low at F.E. Walter Reservoir with respect to PADEP water quality standards. Elevated bacteria levels were seen in tributary surface water stations WA-3S and WA-4S and are directly affected by upstream watershed activity. For waters with contact recreation, the water quality standard for bacterial contamination is a single fecal sample standard of 1000 colonies/100-ml. No single fecal bacteria sample result exceeded the PADEP water contact recreation standard. However, two e-coli sample results did exceed the 235 organisms/ 100 ml (single water sample) Environmental Protection Agency recreational water quality standard. Water contact recreation is not permitted at F.E. Walter Reservoir.



**Figure 3-7.**Carlson Trophic state indices calculated from secchi disk depth, concentrations of chlorophyll a and Total Phosphorus measured in surface waters of F.E. Walter Reservoir at Station WA-2 during 2014.

STATION	DATE		Total Coliform	Fee	cal Coliform	Esc	herichia c
	21-May		2400		76		68
	18-Jun	>	2400		13		13
WA-1S	23-Jul	>	2400	<	2		1
	12-Aug.		1600	<	2		1
	10-Sep.		1000		8		6
	21-May		270		15		13
	18-Jun	>	2400	<	2	<	1
WA-2S	23-Jul	>	2400		3		4
	12-Aug.		2400		2	<	1
	10-Sep.		260		6	<	1
	21-May	>	2400		42		40
	18-Jun		2400		13		6
WA-3S	23-Jul	>	2400		28		22
	12-Aug.	>	2400		310		330
	10-Sep.	>	2400		30		20
	21-May		1700		15		16
	18-Jun		2400		130		130
WA-4S	23-Jul	>	2400		78		73
	12-Aug.	>	2400		450		440
	10-Sep.	>	2400		21		19
	21-May		1000		8		8
	18-Jun	>	2400		31		20
WA-5S	23-Jul	>	2400		11		3
	12-Aug.	>	2400		30		31
	10-Sep.		2400		10		5
	21-May		410		31		24
	18-Jun		2400	<	2		2
WA-6S	23-Jul	>	2400	<	2	<	1
	12-Aug.		980	<	2	<	1
	10-Sep.		1100	<	2	<	1
	21-May		490		16		14
	18-Jun	>	2400	<	2		1
WA-7S	23-Jul	>	2400	<	2		1
	12-Aug.		1100	<	2	<	1
	10-Sep.		920	<	2	<	1

**Table 3-4.** Surface water bacteria counts (colonies/100 ml) at Walter Reservoir during 2014.
### 4.0 REFERENCES

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# **APPENDIX** A

## **STRATIFICATION DATA TABLES**

2014 F.E.	Walter	Water	Quality	<b>Profiles</b>
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Station	Date	Time	Depth	Temp	DO	DO	pН	pHmV	ORP	Turbidity	Chloro.	SpCond
	M/D/Y	hh:mm:ss	ft	С	%	mg/L		mV	mV	NTU	ug/L	mS/cm
	5/21/2014	9:17:09	1.099	14	99	10.19	6.58	-4	187	21	6.1	0.312
	6/18/2014	9:15:03	1	17.76	97	9.23	6.59	-4.1	162	19.4	3.5	0.191
WA-1	7/23/2014	9:07:00	1	21.12	95.6	8.5	6.81	-16.8	148	18.7	5.2	0.135
Outfall	8/12/2014	8:35:59	1	21.34	94.1	8.33	6.85	-19	182	22.3	2.4	0.116
	9/10/2014	9:37:29	1	20.55	94.8	8.52	6.89	-21.3	148.5	22.3	1.7	0.114
		7:35:13	0.5	16.97	91.3	8.82	6.53	-0.8	192	19.1	3.4	0.307
		7:34:29	5	16.93	90.7	8.78	6.49	1.4	194	19.2	3.7	0.305
		7:33:42	10	16.3	88.6	8.68	6.44	4.3	197	19.4	4.2	0.308
		7:32:53	15	15.91	87.5	8.64	6.4	6.5	199	19.5	4.3	0.309
		7:32:18	20	15.65	86.6	8.61	6.41	5.9	198	19.8	5.8	0.31
		7:31:11	25	15.28	85.6	8.57	6.38	7.4	200	20.1	5.9	0.311
		7:30:06	30	15.18	85.7	8.6	6.37	7.9	200	20.3	5.8	0.312
WA-2		7:29:11	35	14.99	85	8.56	6.38	7.6	200	20.3	5.1	0.313
		7:28:01	40	14.91	85.1	8.59	6.37	8	200	20.4	5.8	0.313
Lake		7:26:40	45	14.81	85.6	8.66	6.37	8	199	20.3	6.5	0.311
Tower	5/21/2014	7:25:27	50	14.69	85.9	8.72	6.38	7.2	199	20.4	6.1	0.311
		7:24:10	55	14.6	86	8.74	6.38	7.5	199	20.5	6.3	0.311
Lake		7:23:21	60	14.4	86.3	8.81	6.38	7.1	198	20.5	6.2	0.311
Tower		7:22:32	65	14.29	86.2	8.82	6.4	6.1	198	20.4	6.5	0.311
Secchi		7:21:40	70	14.12	85.8	8.81	6.41	5.4	197	20.4	5.8	0.312
		7:20:50	75	13.94	86.3	8.9	6.43	4.4	196	20.4	6.4	0.312
5.3 m		7:19:54	80	13.86	86.3	8.92	6.44	3.8	196	20.4	6.4	0.312
		7:19:06	85	13.67	85.9	8.91	6.44	3.6	196	20.4	5.6	0.312
		7:18:31	90	13.48	85.6	8.92	6.46	2.5	195	20.5	5.6	0.313
		7:17:44	95	13.45	85.5	8.91	6.49	1.1	194	20.6	5.9	0.313
		7:16:51	100	13.31	85.3	8.92	6.53	-1	192	21	5.5	0.315
		7:15:58	105	13.3	85.5	8.94	6.57	-3.6	190	20.8	6.6	0.316
		7:14:53	110	13.25	84.1	8.81	6.61	-5.9	189	21.1	6.4	0.316
		7:13:56	115	13.24	82.8	8.67	6.65	-7.9	187	21.4	6.2	0.316
$\_$ $\_$ $\_$ $\_$	$  \_ \_ \_ \_$	7:12:50	120	12.93	/9	8.33	6.74	-12.8	184	23.1	6.2	0.319

### 2014 F.E. Walter Water Quality Profiles

Station	Date	Time	Depth	Temp	DO	DO	pН	pHmV	ORP	Turbidity	Chloro.	SpCond
	M/D/Y	hh:mm:ss	ft	C	%	mg/L		mV	mV	NTU	ug/L	mS/cm
		7:42:37	0.5	21.48	92.6	8.18	6.36	9.5	204	17.5	3.7	0.183
		7:41:52	5	20.59	87.5	7.86	6.27	14.2	208	17.6	3.5	0.185
		7:41:14	10	20.34	85.6	7.73	6.24	15.8	208	17.7	3.7	0.186
		7:40:17	15	19.8	82.4	7.52	6.21	17.7	209	17.8	3.4	0.187
WA-2		7:39:40	20	19.44	81	7.44	6.19	19	210	17.9	4.3	0.189
		7:39:04	25	18.96	79.3	7.36	6.18	19.5	210	18.1	4.3	0.192
Lake		7:38:31	30	18.65	78.3	7.31	6.17	19.9	211	18.1	4.3	0.194
Tower		7:37:59	35	18.36	77.8	7.31	6.16	20.2	211	18.1	3.2	0.195
Secchi		7:37:15	40	18.2	78	7.35	6.16	20.3	210	18.2	3.4	0.196
		7:36:42	45	18.08	78.7	7.44	6.17	20	210	18.2	4.4	0.196
2.05 m	6/18/2014	7:36:12	50	17.96	79.1	7.49	6.17	20	210	18.3	5	0.197
		7:35:49	55	17.89	78.9	7.48	6.17	19.6	209	18.2	3.8	0.197
		7:35:04	60	17.79	79.7	7.58	6.16	20.1	209	18.2	5	0.198
		7:34:21	65	17.72	79.8	7.59	6.14	21.2	209	18.3	4.4	0.198
		7:33:27	70	17.64	78.1	7.44	6.1	23.7	209	18.3	4.5	0.197
		7:32:39	75	17.55	75.6	7.22	6.06	26.2	211	18.5	3.7	0.194
		7:32:14	80	17.49	75.5	7.22	6.09	24.4	210	18.4	3.8	0.194
		7:31:25	85	17.43	76.2	7.29	6.1	23.6	208	18.4	4.5	0.197
		7:30:26	90	17.29	75.8	7.28	6.11	23.1	207	18.7	4.4	0.196
		7:29:35	95	16.96	75.5	7.3	6.12	22.5	207	19.1	4.6	0.198
		7:26:31	100	16.59	65.1	6.03	6.07	25.1	205	20.2	3.8	0.198
		7.24.40	105	16.47	65.2	6.27	6.09	20.1	203	20.7	3.0 2.6	0.199
		7.23.30	115	16.43	63.3	6.18	6.11	24.7	199	20.7	3.0	0.199
		7:20:39	120	16.4	45.9	4.53	6.13	21.9	176	36.1	4.5	0.133
		7:21:01	0.5	24.38	94.2	7 87	6.76	-13.5	187	17	51	0.137
		7:20:24	5	24.37	93.7	7.83	6.72	-11.6	187	17	5.1	0.107
		7:19:36	10	24.27	92	77	6.67	-8.4	187	17.1	5.5	0.142
		7:18:53	15	23.61	87.4	7 41	6.6	-4.6	187	17.2	5.4	0.145
		7:17:54	20	23.41	80.4	6.84	6.52	0.1	188	17.2	44	0.147
		7:16:14	25	22.59	61.7	5 33	6.37	9.1 9	190	17.2	4.2	0.152
WΔ-2		7:15:27	30	22.00	60.1	5.00	6.36	96	190	17.1	4	0.152
l ake		7:14:28	35	22.01	61	5 32	6 39	79	188	17.1	4.4	0.154
Tower		7:13:38	40	21.0	62.3	5.46	6.41	6.6	187	17.2	3.6	0.154
TOWER		7:12:39	45	21.0	61.3	5 38	6 38	8.1	187	17.2	<u> </u>	0.155
Secchi	7/23/2014	7:11:55	50	21.68	60.9	5 36	6.41	6.4	184	17.2	3.9	0.156
Occom	1720/2014	7:10:58	55	21.00	59.7	5.00	6.4	7	183	17.1	4	0.156
2 05 m		7:10:00	60	21.00	50.1	5.20	6 30	73	183	17.2	30	0.156
2.05 11		7:09:37	65	21.47	58.6	5.19	6.41	63	180	17.1	3.7	0.150
		7:08:31	70	21.00	57.1	5.06	6.43	5	177	17.2	3.9	0.156
		7:07:18	75	21.21	56.5	5.02	6.47	31	175	17.1	4	0.156
		7:06:17	80	21.17	60.6	5.38	6.53	-0.5	173	17.7	4.3	0.156
		7:05:21	85	21.10	63.4	5.63	6.57	-2.9	168	17.0	4.1	0.156
		7:04:19	90	21.12	62.4	5.55	6.58	-3.6	166	18.3	4.3	0.100
		7:03:05	95	20.98	61.5	5 48	6.6	-4.3	163	18.6	3.8	0.157
		7:02:02	100	20.87	59.3	5.3	6.64	-7.1	157	18.5	4.5	0.157
		7:00:41	105	20.52	55.2	4.96	6.67	-8.6	152	21	4.7	0.158
		6:59:38	110	20.5	51.5	4.63	6.71	-10.8	147	21.8	4.5	0.158
		6:58:07	115	20.32	39.3	3.55	6.74	-13	136	35	5	0.159
		6:56:33	117	20.17	37.9	3.43	6.88	-20.6	143	30	5	0.16

### 2014 F.E. Walter Water Quality Profiles

Station	Date	Time	Depth	Temp	DO	DO	pН	pHmV	ORP	Turbidity	Chloro.	SpCond
	M/D/Y	hh:mm:ss	ft	C	%	mg/L		mV	mV	NTU	ug/L	mS/cm
		7:12:35	0.5	22.81	87.5	7.53	6.83	-17.8	201	18.4	4	0.114
		7:11:46	5	22.8	86.9	7.48	6.81	-16.7	199	18.4	3.7	0.116
		7:10:59	10	22.78	84	7.23	6.77	-14.1	199	18.4	4.5	0.118
		7:10:02	15	22.64	78.3	6.76	6.7	-10	200	18.3	3.7	0.121
		7:09:09	20	22.55	70	6.06	6.64	-6.9	200	18.4	3.3	0.122
		7:05:59	25	22.48	59.6	5.16	6.6	-4.7	199	18.3	3.7	0.136
		7:05:13	30	22.3	50.4	4.38	6.6	-4.3	199	18.2	3	0.138
		7:04:20	35	22.23	49.5	4.31	6.63	-6.3	198	18.3	3.2	0.139
		7:03:28	40	22.12	51.9	4.52	6.68	-9	196	18.5	2.8	0.14
WA-2		7:02:46	45	22.06	51.4	4.49	6.71	-11.1	195	18.6	3	0.141
Lake	8/12/2014	7:01:55	50	22	51.7	4.52	6.77	-14.5	193	18.7	3.7	0.141
Tower		7:00:59	55	21.91	50.7	4.44	6.82	-17.2	191	18.8	3.2	0.142
		7:00:15	60	21.82	47.2	4.14	6.86	-19.6	190	18.8	3	0.144
Secchi		6:59:27	65	21.72	52.7	4.63	6.96	-25.3	188	19.2	2	0.145
		6:58:49	70	21.65	56.5	4.97	7.04	-29.8	186	19.8	2	0.146
1.85 m												
		6:58:06	80	21.37	56.4	4.99	7.11	-34	184	21.5	1.8	0.149
		6:57:21	85	21.13	57	5.06	7.16	-37.1	183	22.3	3.2	0.152
		6:56:08	90	20.93	48.8	4.36	7.28	-43.9	180	26.5	2.9	0.153
		6:54:18	95	20.89	45.2	4.04	7.47	-55	177	31.6	2.6	0.154
						_						
		7:59:50	0.5	21.93	82.4	7.22	6.98	-26.5	154.3	17.7	3	0.106
		7:59:01	5	21.93	82.2	7.2	6.98	-26.6	152.4	17.7	1.9	0.106
		7:58:26	10	21.91	82.1	7.19	6.99	-27	150.3	17.6	2.6	0.106
WA-2		7:57:01	15	21.89	80.4	7.04	6.97	-26.1	147.4	17.7	3.5	0.106
		7:56:09	20	21.86	78	6.84	6.96	-25.3	145.9	17.7	3.5	0.106
Lake		7:54:57	25	21.54	58.2	5.13	6.88	-20.9	147.6	17.7	2.1	0.109
Tower		7:53:24	30	21.31	61.5	5.45	6.95	-25	140.8	18.3	1.5	0.111
		7:52:35	35	21.12	65.4	5.82	7.01	-28.2	135.1	19.1	1.2	0.113
Secchi		7:51:35	40	20.84	67.6	6.04	7.06	-31	129.6	20.4	1.7	0.114
	9/10/2014	7:50:36	45	20.37	69.6	6.28	7.1	-33.3	124.6	21.9	1.7	0.115
2.45 m		7:49:45	50	20.14	75.9	6.88	7.15	-36.2	117.2	21.6	2.6	0.116
		7:48:35	55	19.98	74.4	6.77	7.17	-37.5	110.3	23.4	1.9	0.116
		7:46:45	60	19.56	74.3	6.81	7.22	-40.6	81.9	27.4	2.7	0.117
		7:45:35	63	19.35	69.5	6.4	7.28	-43.6	81	32.1	11.1	0.118

2014 F.E. Walter Water Quality Profiles												
Station	Date	Time	Depth	Temp	DO	DO	рH	pHmV	ORP	Turbidity	Chloro.	SpCond
	M/D/Y	hh:mm:ss	ft	C	%	mg/L	-	mV	mV	NTU	ug/L	mS/cm
WA-3	5/21/2014	9:38:44	1	14.38	93.9	9.59	7.03	-29.4	175	19.9	7.2	0.367
Tobyhanna	6/18/2014	9:34:46	1	19.09	94.3	8.73	6.73	-12.1	153	18.4	5.7	0.204
Creek	7/23/2014	9:36:01	1	20.1	95	8.62	7.17	-37.7	127	16.5	5.6	0.139
Upstream	8/12/2014	8:56:24	1	17.86	92	8.74	7.04	-29.8	185	19.8	2.7	0.15
	9/10/2014	10:14:09	1	16.72	95.8	9.31	7.16	-37	162.1	19.4	1.6	0.129
WA-4	5/21/2014	9:48:12	1	13.98	93.3	9.61	6.9	-22.3	163	20	4.2	0.364
Lehigh	6/18/2014	9:45:05	1	19.92	93.9	8.55	6.65	-7.7	140	19.2	3.4	0.187
River	7/23/2014	9:47:26	1	20.56	101.9	9.16	7.18	-38	138	16.4	1.9	0.139
Upstream	8/12/2014	9:07:16	1	18.43	83.2	7.81	6.89	-21.2	106	21.2	2.4	0.161
	9/10/2014	10:25:58	1	15.86	100.6	9.95	7.14	-35.8	165.1	18.6	1.5	0.121
	5/21/2014	10:10:23	1	13.3	96.4	10.08	6.27	13.6	184	19.2	2.9	0.36
WA-5	6/18/2014	10:04:17	1	19.75	96.4	8.81	6.67	-8.4	150	18.3	2.8	0.194
Bear Creek	7/23/2014	10:12:04	1	20.65	97.2	8.72	7.12	-34.4	153	16.1	1.5	0.157
Upstream	8/12/2014	9:26:09	1	18.56	93.4	8.74	7.06	-31.1	161	17.9	0.6	0.148
	9/10/2014	10:48:41	1	16.54	98	9.56	7.51	-56.5	170.1	18.4	0.6	0.153
		8:24:03	0.5	16.89	91.8	8.88	6.36	8.6	206	19.1	4.7	0.305
		8:23:18	5	16.87	91.1	8.82	6.32	11	209	19.1	3.6	0.304
		8:22:31	10	16.42	89.2	8.72	6.27	14.1	212	19.3	4.3	0.306
		8:21:51	15	15.89	87.6	8.66	6.24	15.6	213	19.4	4.3	0.308
		8:20:54	20	15.5	86.3	8.6	6.2	17.6	214	19.7	5	0.309
WA-6		8:19:52	25	15.17	85.7	8.61	6.18	18.9	215	20	4.6	0.311
Bear Creek		8:19:01	30	15.05	85.9	8.64	6.17	19.5	214	20	4.1	0.31
Lake Arm	E/21/2014	0.17.42	30	14.91	00.1	0.09	6.10	20.3	215	20	4	0.31
	5/21/2014	0.10.41 8·15·42	40	14.02	86.3	0.71 8.75	6 11	20.0	215	20.2	0.7 / 0	0.311
		8.14.53	40 50	14.72	86.4	8.78	6.12	22.3	210	20.1	4.9	0.31
		8.14.05	55	14.55	86.2	8.77	6.12	22.2	215	201	5.6	0.31
		8:13:25	60	14 45	86.2	8 78	6.12	22.0	215	20.2	5.5	0.311
		8:12:29	65	14.36	86.7	8.86	6.07	24.5	216	20.2	6.1	0.311
		8:11:36	70	14.05	86.9	8.93	6.06	25.5	216	19.8	4.1	0.31
		8:10:13	75	13.91	86.9	8.96	6.06	25.4	216	19.9	3.7	0.311
		8:09:09	80	13.79	86.6	8.96	6.08	23.9	215	19.8	3.9	0.312
		8:07:44	85	13.65	86.6	8.98	6.14	20.5	212	19.9	3.6	0.313
		8:06:21	90	13.61	86.5	8.98	6.24	15.2	209	19.7	3.2	0.315
		8:13:53	0.5	22.55	95.3	8.24	6.5	1.5	187	17.5	3.1	0.179
		8:13:08	5	21.22	90.7	8.05	6.4	7	192	17.6	4.8	0.182
		8:12:24	10	20.65	87.2	7.82	6.35	9.6	192	17.6	4.5	0.182
		8:11:47	15	19.91	83.8	7.63	6.3	12.5	194	17.7	3.7	0.186
		8:10:56	20	19.28	80.4	7.42	6.26	14.9	195	18	4.2	0.188
WA-6		8:10:28	25	18.98	79.1	7.34	6.27	14.3	193	18	3.6	0.19
Bear Creek		8:09:37	30	18.73	/8.4	7.31	6.25	15.3	192	18	3.4 2.0	0.19
Lake Arm	6/10/0014	8:08:43	35	18.46	774	7.26	6.21	11.6	193	17.8	<u> </u>	0.19
	0/10/2014	0.07.44	40	10.27	11.1 77 F	1.20	0.17	19.7	192	17.ŏ	3.3 2.6	0.189
		0.07.05	40 50	18.01	76.9	7.31	0.17	19.0	191	10.1	2.0	0.109
		8.05.20	55	17.90	76.5	7.26	6 17	10.4	180	18.2	2.9	0.191
		8.05.00	60	17.09	76	7.20	6 10	19.0	186	18.2	2.9	0.19
		8:04:06	65	17.02	75.8	7 21	62	18.1	183	18.5	3.1	0.19
		8:03:04	70	17.48	75.6	7.23	6.22	16.8	178	18.7	2.5	0.192

8:02:15

8:00:53

7:59:50

7:58:10

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85

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17.34

17.21

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73.3

10.6

7.02

7.19

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6.32

6.34

6.36

16.2

11.3

10

8.6

175

163

149

148

20.1

19.6

18.8

91.1

3.4

3.8

4.9

7.3

0.191

0.194

0.196

0.197

2014 F.E. Walter	Water	Quality	Profiles
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Station	Date	Time	Depth	Temp	DO	DO	рΗ	pHmV	ORP	Turbidity	Chloro.	SpCond
	M/D/Y	hh:mm:ss	ft	С	%	mg/L		mV	mV	NTU	ug/L	mS/cm
		7:44:40	0.5	24.81	93.7	7.76	6.64	-6.6	180	17	5.1	0.136
		7:43:49	5	24.72	93	7.72	6.59	-3.5	180	17.1	5.4	0.139
		7:42:59	10	23.95	90.3	7.61	6.52	0.5	181	17.2	6.5	0.143
		7:41:49	15	23.44	73.2	6.23	6.33	11.4	184	17.2	5	0.146
		7:41:03	20	22.97	63.5	5.45	6.25	15.7	186	17.4	5.3	0.15
		7:40:13	25	22.79	62	5.34	6.25	15.6	184	17.2	4.2	0.152
WA-6		7:39:14	30	22.42	62	5.38	6.26	15	182	17.2	4.5	0.154
Bear Creek		7:38:13	35	22.15	63	5.49	6.28	14.3	179	17.3	4.8	0.155
Lake Arm	7/23/2014	7:37:01	40	22.02	63.2	5.52	6.27	14.8	176	17.2	4.7	0.155
		7:36:01	45	21.85	61.5	5.39	6.25	16	174	17.2	4.4	0.155
		7:35:12	50	21.69	61.1	5.37	6.23	16.8	172	17.3	4.2	0.155
		7:34:07	55	21.62	56.9	5.01	6.19	19.3	169	17.4	3.5	0.155
		7:33:14	60	21.53	55.3	4.88	6.19	19.1	164	17.5	3.4	0.155
		7:32:14	65	21.41	55	4.87	6.22	17.6	157	17.7	4	0.155
		7:30:41	70	21.24	57.2	5.07	6.28	14	144	18.3	3.8	0.156
		7:29:48	75	21.09	55.9	4.97	6.31	12.2	134	19.4	3.4	0.156
		7:29:09	80	21.04	58.1	5.17	6.37	8.5	123	19.4	3.8	0.157
		7:27:37	87	20.9	52.7	4.71	6.46	3.6	67	44.5	4.4	0.157
		7:31:45	0.5	23.15	89	7.61	6.67	-8.8	191	18.3	3.7	0.113
		7:31:11	5	23.19	88.6	7.57	6.66	-7.6	190	18.4	4.1	0.114
		7:30:32	10	23.18	87.7	7.49	6.62	-5.4	189	18.4	4.8	0.115
		7:29:52	15	23.16	84.4	7.21	6.55	-1.6	188	18.4	3.8	0.117
WA-6		7:29:05	20	22.55	67.5	5.84	6.43	5.5	190	18.3	3.2	0.121
Bear Creek		7:28:16	25	22.43	65.5	5.68	6.39	7.9	190	18.3	3.2	0.122
Lake Arm	8/12/2014	7:27:23	30	22.35	60.4	5.25	6.36	9.7	189	18.4	2.7	0.123
		7:27:12	35	22.26	60	5.22	6.38	8.5	187	18.5	2.2	0.123
		7:26:05	40	22.18	61.2	5.33	6.39	7.6	183	18.7	4	0.123
		7:25:18	45	22.14	58.3	5.09	6.38	8	181	18.5	2.3	0.124
		7:24:46	50	22.06	60.4	5.28	6.41	6.3	178	18.9	3.3	0.124
		7:24:02	55	22	59.4	5.19	6.41	6.2	174	19.1	3.1	0.125
		7:23:31	60	21.92	58.4	5.12	6.43	5.2	170	19.3	2.6	0.126
		7:22:23	65	21.81	55.7	4.89	6.45	4.4	153	38.2	3.8	0.127

Station	Date	Time	Depth	Temp	DO	DO	pН	pHmV	ORP	Turbidity	Chloro.	SpCond
	M/D/Y	hh:mm:ss	ft	С	%	mg/L		mV	mV	NTU	ug/L	mS/cm
		8:18:39	0.5	22.02	83.3	7.28	6.82	-17.1	156.9	19	3.8	0.106
WA-6		8:17:32	5	22.02	83.2	7.27	6.8	-16.4	154.7	19.1	3.9	0.106
Bear Creek		8:16:28	10	22.02	82.6	7.21	6.76	-13.8	153.6	19	2.8	0.106
Lake Arm		8:15:41	15	21.99	77.5	6.78	6.72	-11.5	152.5	19.1	3.2	0.106
		8:14:57	20	21.7	68.5	6.03	6.66	-8.2	152.4	18.9	0.7	0.11
		8:14:22	25	21.62	65	5.73	6.64	-7.1	151.1	19.7	2.5	0.108
	9/10/2014	8:13:01	30	21.48	71.1	6.28	6.67	-8.5	138.1	25.7	2.6	0.108
		8:11:25	32	21.46	63.6	5.62	6.71	-11	126.8	43.6	4.5	0.108
		7:59:02	0.5	16.98	91.6	8.85	6.47	2.4	196	19	4.4	0.305
		7:58:08	5	16.94	91.3	8.83	6.41	5.7	200	19.1	3.8	0.305
		7:57:18	10	16.27	89.3	8.76	6.35	9.2	203	19.2	4.4	0.308
		7:56:20	15	15.81	88.3	8.75	6.31	11.5	205	19.6	5.1	0.308
		7:55:44	20	15.48	87.7	8.75	6.31	11.6	205	19.8	5.8	0.309
		7:55:00	25	15.21	86.7	8.7	6.3	12	205	20.1	6	0.31
WA-7		7:54:06	30	15.12	86.1	8.65	6.29	12.5	205	20.2	6	0.311
Lehigh	5/21/2014	7:53:12	35	15.03	85.7	8.62	6.29	12.5	205	20.3	6.2	0.312
Lake Arm		7:52:15	40	14.94	86	8.67	6.28	13	205	20.2	5.9	0.312
		7:51:25	45	14.77	86	8.71	6.29	12.6	204	20.4	6	0.312
		7:50:20	50	14.69	86.6	8.78	6.3	11.9	203	20.4	6.5	0.311
		7:49:18	55	14.56	86.4	8.79	6.3	11.9	203	20.3	6.5	0.311
		7:48:16	60	14.37	87	8.89	6.3	12.1	203	20.2	6.7	0.311
		7:47:04	65	14.07	86.6	8.9	6.3	12	203	20.1	6.9	0.312
		7:45:45	70	13.82	86.6	8.96	6.29	12	203	20.2	6.3	0.314
		7:44:58	/5	13./1	٥/.۵ ۵۰.4	9.1	0.34	9.6	201	20	0	0.314
		7:44:02	ÖU or	13.59	00.1	9.16	0.35	0.0 6.0	200	20.3	0./	0.314
		7:43:17	00 00	13.20	07.1	9.18	6.39	0.ð	198	20.3	0.5	0.317
		1:42:34	00	13.18	C.10	9.17	0.43	4.2	195	20.5	1	0.319
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2014 F.E. Walter Water Quality Profiles

Station	Date	Time	Depth	Temp	DO	DO	pН	pHmV	ORP	Turbidity	Chloro.	SpCond
	M/D/Y	hh:mm:ss	ft	С	%	mg/L		mV	mV	NTU	ug/L	mS/cm
		8:36:16	0.5	22.71	95.2	8.21	6.52	-0.1	179	17.6	4	0.179
		8:35:33	5	22.11	92.7	8.08	6.44	4.5	182	17.7	4	0.179
		8:34:49	10	20.77	88.1	7.89	6.39	7.4	183	17.8	4.7	0.182
		8:34:17	15	19.85	84.8	7.73	6.36	9.2	184	18	4.6	0.185
		8:33:36	20	19.41	82	7.54	6.34	10.4	184	17.9	4.2	0.186
WA-7		8:33:04	25	19.03	80.7	7.48	6.33	10.5	183	18.2	4.5	0.188
Lehigh		8:32:29	30	18.78	79.9	7.44	6.34	9.9	182	18.2	4.6	0.189
Lake Arm		8:31:38	35	18.59	79.7	7.45	6.33	10.7	182	18.2	4.4	0.191
	6/18/2014	8:31:01	40	18.4	81	7.61	6.34	9.8	180	18.4	5.5	0.192
		8:30:09	45	18.21	80.6	7.59	6.34	10.1	178	18.4	5.2	0.192
		8:29:25	50	18.05	79.8	7.54	6.34	10.3	176	18.5	4.9	0.193
		8:28:22	55	17.95	79.1	7.49	6.31	11.6	175	18.2	4.2	0.193
		8:27:48	60	17.89	78.8	7.47	6.33	10.6	172	18.2	4.3	0.193
		8:26:54	65	17.8	80.1	7.61	6.34	9.9	168	18.5	4.9	0.194
		8:25:58	70	17.74	80.9	7.7	6.35	9.4	163	18.6	5.4	0.193
		8:24:55	75	17.64	80.1	7.63	6.35	9.6	157	18.6	6	0.194
		8:23:45	80	17.3	76.5	7.34	6.35	9.5	145	20.2	5.3	0.194
		8:22:38	85	17.23	73.1	7.03	6.38	7.5	127	28	5.5	0.195
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		8:11:50	0.5	24.99	94	7.77	6.63	-5.9	188	17.1	4.4	0.137
		8:10:51	5	24.22	91.8	7.7	6.56	-2.2	189	17	5.4	0.142
		8:09:59	10	23.89	88.7	7.48	6.51	1.2	189	17.1	5.7	0.144
		8:08:51	15	23.58	79.4	6.73	6.4	7.5	190	17	4.5	0.146
		8:07:15	20	23.23	68.2	5.83	6.29	13.5	191	17.1	6.1	0.149
WA-7		8:05:51	25	22.82	65.6	5.64	6.28	14	189	17.4	5.4	0.152
Lehigh		8:04:44	30	22.43	64.1	5.56	6.28	14.2	188	17.2	5.1	0.154
Lake Arm	7/23/2014	8:03:47	35	22.04	66.6	5.82	6.28	13.8	187	17.4	4.5	0.155
		8:02:36	40	21.84	66.5	5.83	6.28	14	185	17.5	5.1	0.155
		8:02:03	45	21.73	67.7	5.95	6.29	13.2	183	17.7	4.5	0.155
		8:00:45	50	21.65	64	5.63	6.26	14.9	182	17.3	4.5	0.156
		8:00:09	55	21.57	63.9	5.63	6.28	13.7	179	17.4	4.3	0.156
		7:59:09	60	21.52	64.7	5.71	6.29	13.4	176	17.4	5.3	0.156
		7:58:14	65	21.42	65.6	5.8	6.3	13	173	17.6	5.2	0.156
		7:56:33	70	21.36	65.9	5.84	6.31	12.3	166	17.8	5.1	0.156
		7:55:14	75	21.29	66.4	5.88	6.31	12	160	18	4.9	0.156
		7:54:10	80	21.19	65.5	5.82	6.32	11.9	153	18.3	5.1	0.157
		7:52:24	85	20.96	59.5	5.31	6.31	12.1	130	37.5	6	0.159
		L								L	L	

2014 F.E. Walter Water Quality Profiles

Station	Date	Time	Depth	Temp	DO	DO	рΗ	pHmV	ORP	Turbidity	Chloro.	SpCond
	M/D/Y	hh:mm:ss	ft	C	%	mg/L		mV	mV	NTU	ug/L	mS/cm
		7:54:30	0.5	22.9	88.6	7.61	6.65	-7.2	209	18.3	4.2	0.112
		7:53:54	5	22.93	87.8	7.54	6.64	-6.7	208	18.3	3.8	0.113
		7:53:09	10	22.93	86.7	7.44	6.58	-3.5	207	18.3	4.2	0.114
		7:52:03	15	22.7	73.8	6.37	6.45	4.5	209	18.2	3.8	0.116
		7:51:21	20	22.56	64.7	5.59	6.39	8	210	18.1	3.3	0.119
		7:50:49	25	22.5	61.9	5.36	6.38	8.2	209	18.2	3.6	0.121
WA-7		7:50:12	30	22.39	59.1	5.13	6.38	8	209	18.4	3.5	0.123
Lehigh		7:49:16	35	22.28	62.8	5.46	6.4	7.1	208	18.7	3	0.125
Lake Arm		7:48:40	40	22.23	62.9	5.47	6.42	5.9	207	18.9	2.6	0.126
	8/12/2014	7:47:57	45	22.06	54.2	4.73	6.39	7.5	207	18.5	2.8	0.127
		7:47:20	50	21.92	54	4.72	6.42	6.1	206	18.7	3.1	0.127
		7:46:34	55	21.79	57.3	5.03	6.45	4	206	18.9	2.5	0.128
		7:45:50	60	21.7	63.4	5.58	6.52	0.3	204	20.1	2.4	0.13
		7:45:09	65	21.58	67.1	5.92	6.55	-1.7	204	21.7	3	0.132
		7:44:15	70	21.42	67.7	5.99	6.57	-2.6	204	23.5	3.1	0.134
								[				
		8:39:47	0.5	21.81	80.9	7.1	6.82	-17.5	172.4	18.5	3.8	0.107
		8:38:57	5	21.81	80.7	7.08	6.83	-17.7	171.3	18.6	5.3	0.107
		8:38:13	10	21.81	80.2	7.04	6.83	-17.9	170	18.6	3.9	0.107
WA-7		8:36:30	15	21.8	79.5	6.98	6.83	-18	166.6	18.7	4.1	0.106
Lehigh	9/10/2014	8:35:41	20	21.77	76.7	6.74	6.83	-18	165.4	18.7	4	0.107
Lake Arm		8:34:35	25	21.33	78.6	6.96	6.87	-19.9	161.7	18.8	2.8	0.109
		8:33:01	30	21.07	81.8	7.28	6.9	-21.9	155.4	19	3.8	0.11
		8:31:51	32	20.59	83.2	7.47	6.89	-21.4	150.5	21.1	2.2	0.112

2014 F.E. Walter Water Quality Profiles

## **APPENDIX B**

## LABORATORY CUSTODY SHEETS





Attention: Gregory Wacik Reported To: USACE, Philadelphia District Environmental Resources Branch					Date of F Lab ID:	eport:	06/05 2295	/14 -140015773
100 Penn Square East Philadelphia PA 19107					Date Coll Collected	.ected:   By:	05/21 Clier	/14 09:20 it
Sample Desc: WA-1 Surface					Date Rece	eived:	05/21	/14 17:00
PWSID: 3130843	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI					aran dan kasi kasi kapi tang pan pan pan dan		ن به ما <del>نه</del>	
MICROBIOLOGY								
Escherichia coli	68	mpn/100ml	1	1	SM 9223B	05/22	12:30	PLW
Fecal Coliform	76	/100mL	2	1	SM 9222D	, 05/21	18:00	PLW
Total Coliform	2400	mpn/100mL	1	1	SM 9223B	05/22	12:30	PLW
CHEMISTRY						·		
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	05/22	12:00	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	06/02	14:45	HRG
Phosphorus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	05/28	14:15	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	06/04	21:07	JCL
Nitrogen, Nitrate	<.05	mg/l	.05	1	EPA 353.2	05/22	18:15	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	05/22	16:50	JCL
Nitrogen, Total Kjeldahl	<.25	mg/l	.25	1	EPA 351.2	05/29	16:08	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	05/22	12:10	EMW
Total Organic Carbon	7.8	mg/l	1	1	SM5310 C	05/27	16:29	ALD
RESIDUES								
Solids, Total Dissolved	64	mg/l	5	1	SM 2540C	05/22	12:20	ТМН
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	05/22	12:20	тмн
TITRATIONS								
Alkalinity, Total to pH 4.5	4	mg/l	1	1	SM 2320 B	05/27	11:30	HRG

Reviewed and Approved by:

Wisting m. 'eV

Christina Kistler Account Executive

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Attention:	Gregory Wacik					Date of I	Report:	06/05	5/14
Reported To:	USACE, Philadelphia District					Lab ID:		2295	5-14-0015773
	Environmental Resources Branch								
	100 Penn Square East					Date Col	lected:	05/21	/14 09:20
	Philadelphia PA 19107					Collected	d By:	Clier	nt
Sample Desc:	WA-1 Surface					Date Reco	eived:	05/21	/14 17:00
PWSID: 313084	43			Rep	Dilutn		Test	Test	
		Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst

O1 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

O2 The total coliform sample was placed in the incubator at 05/21/14 at 18:00.

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Attention: Gregory Wacik					Date of F	Report:	06/05	5/14
Reported To: USACE, Philadelphia District					Lab ID:		2295	-14-0015774
Environmental Resources Branch								
100 Penn Square East					Date Coll	.ected:	05/21	/14 07:10
Philadelphia PA 19107					Collected	By:	Clier	it
Sample Desc: WA-2 Surface					Date Rece	eived:	05/21	/14 17:00
PWSID: 3130843			Rep	Dilutn		Test	Test	
	Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst
BACTI								
MICROBIOLOGY								
Escherichia coli	13	mpn/100mL	1	1	SM 9223B	05/22	12:30	PLW
Fecal Coliform	15	/100ml	2	1	SM 9222D	05/21	18:00	PLW
Total Coliform	270	mpn/100ml	1	1	SM 9223B	05/22	12:30	PLW
CHEMISTRY		•				,		
COLORMETRIC								
Phosphate as P, Ortho	0.02	mg/l	.01	1	SM 4500P-E	05/22	12:00	HRG
Phosphorus as P, Dissolved	<.05	mg/L	.05	1	SM 4500P-E	06/02	14:45	HRG
Phosphorus as P, Total	0.02	mg/l	.01	1	SM 4500P-E	05/28	14:15	HRG
NITROGENS						,		
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	06/04	21:22	JCL
Nitrogen, Nitrate	<.05	mg/l	. 05	1	EPA 353.2	05/22	18:16	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	05/22	16:53	JCL
Nitrogen, Total Kjeldahl	<.25	mg/l	.25	1	EPA 351.2	05/29	16:09	JCL
OTHER		·				,		
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	05/22	12:10	EMW
Total Organic Carbon	5.5	mg/l	1	1	SM5310 C	05/27	16:42	ALD
RESIDUES						,		
Solids, Total Dissolved	57	mg/L	5	1	SM 2540C	05/22	12:20	тмн
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	05/22	12:20	тмн
TITRATIONS		-,				, -		
Alkalinity, Total to pH 4.5	3	mg/L	1	1	SM 2320 B	05/27	11:30	HRG

Reviewed and Approved by:

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Christina Kistler

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Reported To: USACE, Philadelphia District	, _1/,_001577/
	-14-0012774
Environmental Resources Branch	
100 Penn Square East Date Collected: 05/2'	/14 07:10
Philadelphia PA 19107 Collected By: Clier	t
Sample Desc: WA-2 Surface Date Received: 05/2'	/14 17:00
PWSID: 3130843 Rep Dilutn Test Test	
Result Unit Limit Factor Procedure Date Time	Analyst

01 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

O2 The total coliform sample was placed in the incubator at 05/21/14 at 18:00.

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Attention: Gregory Wacik Reported To: USACE, Philadelphia District Environmental Resources Branch					Date of R Lab ID:	eport:	06/05 2295	/14 -14-0015775
100 Penn Square East Philadelphia PA 19107					Date Coll Collected	.ected:   By:	05/21 Clien	/14 07:10 t
Sample Desc: WA-2 Mid-Depth					Date Rece	eived:	05/21	/14 17:00
PWSID: 3130843	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY			ہم جب سے بند اسا نہا تھا ہ		بجر بحر سد مد مد اعد این چند بالد کر			يرميز تحت منعة المتار المتار المتار المتار
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	05/22	12:00	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	06/02	14:45	HRG
Phosphorus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	05/28	14:15	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	06/04	22:06	JCL
Nitrogen, Nitrate	<.05	mg/l	.05	1	EPA 353.2	05/22	18:17	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	05/22	16:54	JCL
Nitrogen, Total Kjeldahl	<.25	mg/l	.25	1	EPA 351.2	05/29	16:09	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	05/22	12:10	EMW
Total Organic Carbon	8.0	mg/l	1	1	SM5310 C	05/27	16:56	ALD
RESIDUES								
Solids, Total Dissolved	65	mg/l	5	1	SM 2540C	05/22	12:20	ТМН
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	05/22	12:20	тмн
TITRATIONS								
Alkalinity, Total to pH 4.5	3	mg/l	1	1	SM 2320 B	05/27	11:30	HRG

01 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

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Attention: Gregory Wacik



Attention: Gregory Wacik Reported To: USACE, Philadelphia District Environmental Resources Branch 100 Penn Square East					Date of R Lab ID:	eport:	06/05 2295	5/14 5-14-0015776
100 Penn Square East					Date Coll	ected:	05/21	/14 07:10
Philadelphia PA 19107					Collected	By:	Clien	nt
Sample Desc: WA-2 Deep					Date Rece	ived:	05/21	/14 17:00
PWSID: 3130843	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY				• <b>• • • • • • • • • • • • • • • • • • </b>				
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	05/22	12:00	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	06/02	14:45	HRG
Phosphorus as P, Total	0.05	mg/l	.01	1	SM 4500P-E	05/28	14:15	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	06/04	22:20	JCL
Nitrogen, Nitrate	<.05	mg/l	.05	1	EPA 353.2	05/22	18:18	JCL
Nitrogen, Nitrite	<.05	mg/L	.05	1	EPA 353.2	05/22	16:55	JCL
Nitrogen, Total Kjeldahl	0.58	mg/l	.25	1	EPA 351.2	05/29	16:10	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	05/22	12:10	EMW
Total Organic Carbon	8.9	mg/l	1	1	SM5310 C	05/27	17:10	ALD
RESIDUES								
Solids, Total Dissolved	64	mg/l	5	1	SM 2540C	05/22	12:20	тмн
Solids, Total Suspended	24	mg/l	3	1	SM 2540D	05/22	12:20	тмн
TITRATIONS								
Alkalinity, Total to pH 4.5	4	mg/l	1	1	SM 2320 B	05/27	11:45	HRG

#### COMMENTS

01 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

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Attention: Gregory Wacik Reported To: USACE, Philadelphia District					Date of R Lab ID:	eport:	06/05 2295	/14 14001577
100 Penn Square East Philadelphia PA 19107					Date Coll Collected	ected: By:	05/21 Clien	/14 09:40 it
Sample Desc: WA-3 Surface					Date Rece	ived:	05/21	/14 17:00
PWSID: 3130843	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Escherichia coli	40	mpn/100ml	1	1	SM 9223B	05/22	12:30	PLW
Fecal Coliform	42	/100ml	2	1	SM 9222D	05/21	18:00	PLW
Total Coliform	>2400	mpn/100ml	1	1	SM 9223B	05/22	12:30	PLW
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	0.03	mg/l	.01	1	SM 4500P-E	05/22	12:00	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	06/02	14:45	HRG
Phosphorus as P, Total	0.03	mg/l	.01	1	SM 4500P-E	05/28	14:15	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	06/04	22:35	JCL
Nitrogen, Nitrate	0.06	mg/l	.05	1	EPA 353.2	05/22	18:21	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	05/22	16:56	JCL
Nitrogen, Total Kjeldahl	<.25	mg/l	.25	1	EPA 351.2	05/29	16:11	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	05/22	12:10	EMW
Total Organic Carbon	10.1	mg/l	1	1	SM5310 C	05/27	17:24	ALD
RESIDUES								
Solids, Total Dissolved	86	mg/l	5	1	SM 2540C	05/22	12:20	TMH
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	05/22	12:20	ТМН
TITRATIONS								
Alkalinity, Total to pH 4.5	3	mg/l	1	1	SM 2320 B	05/27	11:45	HRG

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PW3101 31308	45	Result	Unit	кер Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
PUSTD - 31308	/3			D	<b>D</b> & Louis			<b>.</b>	
Sample Desc:	WA-3 Surface					Date Rec	eived:	05/2′	1/14 17:00
	Philadelphia PA 19107					Collected	d By:	Clier	nt
	100 Penn Square East					Date Col	lected:	05/2′	1/14 09:40
	Environmental Resources Branch								
Reported To:	USACE, Philadelphia District					Lab ID:		2295	5-14-0015777
Attention:	Gregory Wacik					Date of I	Report:	06/05	5/14

O1 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

O2 The total coliform sample was placed in the incubator at 05/21/14 at 18:00.

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Attention: Gregory Wacik Reported To: USACE, Philadelphia District					Date of Report Lab ID:		06/05 2295	/14 -14-0015778
Environmental Resources Branch					<b>b</b> ( <b>b</b> 11		07/04	14.1 40 00
100 Penn Square East					Date Coll	ected:	05/21	/14 10:00
Philadelphia PA 19107					Collected	By:	Clien	t
Sample Desc: WA-4 Surface					Date Rece	ived:	05/21	/14 17:00
PWSID: 3130843			Rep	Dilutn		Test	Test	
	Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst
BACTI	، جبر صر ایک بین کا							
MICROBIOLOGY								
Escherichia coli	16	mpn/100ml	1	1	SM 9223B	05/22	12:30	PLW
Fecal Coliform	15	/100mL	2	1	SM 9222D	05/21	18:00	PLW
Total Coliform	1700	, mpn/100mL	1	1	SM 9223B	05/22	12:30	PLW
CHEMISTRY		• •				,		
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	05/22	12:00	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	06/02	14:45	HRG
Phosphorus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	05/28	14:15	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	06/04	22:49	JCL
Nitrogen, Nitrate	<.05	mg/l	.05	1	EPA 353.2	05/22	18:22	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	05/22	16:57	JCL
Nitrogen, Total Kjeldahl	<.25	mg/l	.25	1	EPA 351.2	05/29	16:14	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	05/22	12:10	EMW
Total Organic Carbon	8.0	mg/l	1	1	SM5310 C	05/27	17:37	ALD
RESIDUES								
Solids, Total Dissolved	62	mg/l	5	1	SM 2540C	05/22	12:20	тмн
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	05/22	12:20	тмн
TITRATIONS								
Alkalinity, Total to pH 4.5	5	mg/l	1	1	SM 2320 B	05/27	11:45	HRG

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		Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst
PWSID: 31308	43			Rep	Dilutn		Test	Test	
Sample Desc:	WA-4 Surface					Date Rece	eived:	05/2′	1/14 17:00
	Philadelphia PA 19107					Collected	ł By:	Clier	nt.
	100 Penn Square East					Date Col	lected:	05/2′	/14 10:00
	Environmental Resources Branch								
Reported To:	USACE, Philadelphia District					Lab ID:	•	229	5–14–0015778
Attention:	Gregory Wacik					Date of I	Report:	06/05	5/14

01 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

O2 The total coliform sample was placed in the incubator at 05/21/14 at 18:00.

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Attention: Gregory Wacik Reported To: USACE, Philadelphia District					Date of R Lab ID:	eport:	06/05 2295	/14 -14-0015779
Environmental Resources Branch 100 Penn Square East Philadelphia PA 19107					Date Coll Collected	ected: By:	05/21 Clien	/14 10:10 t
Sample Desc: WA-5 Surface					Date Rece	ived:	05/21	/14 17:00
PWSID: 3130843			Rep	Dilutn		Test	Test	
	Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst
BACTI	بسير حمية بعمل المن عمل الميز الملة الملة الملة				رسم سند است است رسه است اعلم الخط الخط المعا			
MICROBIOLOGY								
Escherichia coli	8	mpn/100ml	1	1	SM 9223B	05/22	12:30	PLW
Fecal Coliform	8	/100ml	2	1	SM 9222D	05/21	18:00	PLW
Total Coliform	1000	, mpn/100ml	1	1	SM 9223B	05/22	12:30	PLW
CHEMISTRY		. ,				,		
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	05/22	12:00	HRG
Phosphorus as P, Dissolved	<.05	mg/L	.05	1	SM 4500P-E	06/02	14:45	HRG
Phosphorus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	05/28	14:15	HRG
NITROGENS						•		
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	06/04	23:04	JCL
Nitrogen, Nitrate	<.05	mg/l	.05	1	EPA 353.2	05/22	18:23	JCL
Nitrogen, Nitrite	<.05	mg/l	. 05	1	EPA 353.2	05/22	16:58	JCL
Nitrogen, Total Kjeldahl	<.25	mg/l	.25	1	EPA 351.2	05/29	16:15	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/L	2	1	SM 5210B	05/22	12:10	EMW
Total Organic Carbon	5.1	mg/l	1	1	SM5310 C	05/27	17:51	ALD
RESIDUES								
Solids, Total Dissolved	25	mg/l	5	1	SM 2540C	05/22	12:20	тмн
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	05/22	12:20	тмн
TITRATIONS								
Alkalinity, Total to pH 4.5	1	mg/l	1	1	SM 2320 B	05/27	12:00	HRG

Reviewed and Approved by:

Mistina 7 Ger)

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		Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst
PWSID: 31308	43			Rep	Dilutn		Test	Test	
Sample Desc:	WA-5 Surface					Date Rece	ived:	05/21	/14 17:00
	Philadelphia PA 19107					Collected	Ву:	Clier	it
	100 Penn Square East					Date Coll	ected:	05/21	/14 10:10
	Environmental Resources Branch								
Reported To:	USACE, Philadelphia District					Lab ID:		2295	-14-0015779
Attention:	Gregory Wacik					Date of R	eport:	06/05	/14

O1 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

O2 The total coliform sample was placed in the incubator at 05/21/14 at 18:00.

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Attention: Gregory Wacik Reported To: USACE, Philadelphia District Environmental Resources Branch					Date of Report: Lab ID:		06/05 2295	/14 -14-0015780
100 Penn Square East					Date Coll	ected:	05/21	/14 08:15
Philadelphia PA 19107					Collected	By:	Clien	t serie
Sample Desc: WA-6 Surface					Date Rece	ived:	05/21	/14 17:00
PWSID: 3130843			Rep	Dilutn		Test	Test	
	Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst
BACTI		وسير ومن بعنه (عند نعنه نعل الله الله الله الله الله الله الله ال	<u> </u>					
MICROBIOLOGY								
Escherichia coli	24	mpn/100ml	1	1	SM 9223B	05/22	12:30	PLW
Fecal Coliform	31	/100mL	2	1	SM 9222D	05/21	18:00	PLW
Total Coliform	410	mpn/100ml	1	1	SM 9223B	05/22	12:30	PLW
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	05/22	12:00	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	06/02	14:45	HRG
Phosphorus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	05/28	14:15	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	06/04	23:19	JCL
Nitrogen, Nitrate	0.05	mg/l	.05	1	EPA 353.2	05/22	18:24	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	05/22	16:59	JCL
Nitrogen, Total Kjeldahl	<.25	mg/l	.25	1	EPA 351.2	05/29	16:16	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	05/22	12:10	EMW
Total Organic Carbon	5.4	mg/l	1	1	SM5310 C	05/27	20:51	ALD
RESIDUES								
Solids, Total Dissolved	66	mg/l	5	1	SM 2540C	05/22	12:20	тмн
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	05/22	12:20	тмн
TITRATIONS						-		
Alkalinity, Total to pH 4.5	4	mg/l	1	1	SM 2320 B	05/27	12:00	HRG

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						Date of I	Report:	06/05	5/14
Reported To:	USACE, Philadelphia District					Lab ID:		229	5-14-0015780
	Environmental Resources Branch								
	100 Penn Square East					Date Col	lected:	05/2′	1/14 08:15
	Philadelphia PA 19107					Collected	d By:	Clier	nt
Sample Desc:	WA-6 Surface					Date Rec	eived:	05/2′	1/14 17:00
PWSID: 31308	343			Rep	Dilutn		Test	Test	
		Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst

01 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

- O2 The total coliform sample was placed in the incubator at 05/21/14 at 18:00.
- 03 One TOC CCV was 111% recovery.

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Attention: Gregory Wacik Reported To: USACE, Philadelphia District Environmental Resources Branch					Date of R Lab ID:	eport:	06/05 2295	/14 -14-0015781
100 Penn Square East Philadelphia PA 19107					Date Coll Collected	ected:   By:	05/21 Clien	/14 08:15 t
Sample Desc: WA-6 Mid-Depth					Date Received:		05/21/14 17:00	
PWSID: 3130843	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								NY UN ROTATION
Phosphate as P, Ortho	<.01	ma/l	.01	1	SM 4500P-F	05/22	12:00	HRG
Phosphorus as P, Dissolved	<.05	ma/L	.05	1	SM 4500P-E	06/02	14:45	HRG
Phosphorus as P, Total	0.02	mg/l	.01	1	SM 4500P-E	05/28	14:15	HRG
NITROGENS		-,				,		
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	06/04	23:33	JCL
Nitrogen, Nitrate	<.05	mg/l	.05	1	EPA 353.2	05/22	18:27	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	05/22	17:02	JCL
Nitrogen, Total Kjeldahl	<.25	mg/l	.25	1	EPA 351.2	05/29	16:19	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	05/22	12:10	EMW
Total Organic Carbon	6.4	mg/l	1	1	SM5310 C	05/27	21:16	ALD
RESIDUES								
Solids, Total Dissolved	45	mg/L	5	1	SM 2540C	05/22	12:20	тмн
Solids, Total Suspended	4	mg/l	3	1	SM 2540D	05/22	12:20	ТМН
TITRATIONS								
Alkalinity, Total to pH 4.5	3	mg/L	1	1	SM 2320 B	05/27	12:15	HRG

01 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

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Vustina M. istle

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Attention:	Gregory Wacik					Date of R	eport:	06/05	/14
Reported To:	USACE, Philadelphia District					Lab ID:	•	2295	, -14-0015781
	Environmental Resources Branch								
	100 Penn Square East					Date Coll	ected:	05/21	/14 08:15
	Philadelphia PA 19107					Collected	By:	Clien	t
Sample Desc:	WA-6 Mid-Depth					Date Rece	ived:	05/21	/14 17:00
PWSID: 31308	43			Rep	Dilutn		Test	Test	
		Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst
		میں ریش ہونے ہیں ، سے است است اسا کہ اور اور میں میں ہیں ہیں ہیں							

02 One TOC CCV was 111% recovery.

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1.1. . . . .



Attention: Gregory Wacik Reported To: USACE, Philadelphia District Environmental Resources Branch					Date of F Lab ID:	eport:	06/05 2295	/14 140015782
100 Penn Square East Philadelphia PA 19107					Date Coll Collected	ected: By:	05/21 Clien	/14 08:15 t
Sample Desc: WA-6 Deep					Date Rece	ived:	05/21	/14 17:00
PWSID: 3130843	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								یہ ہے جا سا تھا ہے تھا
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	05/22	12:15	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	06/02	14:45	HRG
Phosphorus as P, Total	0.13	mg/l	.01	1	SM 4500P-E	05/28	14:15	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	06/04	23:48	JCL
Nitrogen, Nitrate	<.05	mg/l	.05	1	EPA 353.2	05/22	18:28	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	05/22	17:03	JCL
Nitrogen, Total Kjeldahl	0.32	mg/l	.25	1	EPA 351.2	05/29	16:20	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	05/22	12:10	EMW
Total Organic Carbon	5.8	mg/l	1	1	SM5310 C	05/27	21:56	ALD
RESIDUES								
Solids, Total Dissolved	40	mg/l	5	1	SM 2540C	05/22	12:20	тмн
Solids, Total Suspended	252	mg/l	3	1	SM 2540D	05/22	12:20	ТМН
TITRATIONS								
Alkalinity, Total to pH 4.5	2	mg/l	1	1	SM 2320 B	05/27	12:45	HRG

#### COMMENTS

01 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

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Attention:	Gregory Wacik					Date of R	eport:	06/05	/14
Reported To:	USACE, Philadelphia District					Lab ID:		, 2295	, -14-0015782
	Environmental Resources Branch								
	100 Penn Square East					Date Coll	ected:	05/21	/14 08:15
	Philadelphia PA 19107					Collected	By:	Clien	t
Sample Desc:	WA-6 Deep					Date Rece	ived:	05/21	/14 17:00
PWSID: 313084	43			Rep	Dilutn		Test	Test	
		Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst

02 One TOC CCV was 111% recovery.

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Mistixa n tłw

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Reported To: USACE, Philadelphia District					Date of Report: Lab ID:		06/05/14 2295-14-0015783	
100 Penn Square East Philadelphia PA 19107					Date Coll Collected	ected:   By:	05/21 Clien	/14 07:45 t
Sample Desc: WA-7 Surface					Date Rece	ived:	05/21	/14 17:00
PWSID: 3130843			Rep	Dilutn		Test	Test	
	Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst
BACTI								وموجود معا تفا خط اعا العا
MICROBIOLOGY								
Escherichia coli	14	mpn/100ml	1	1	SM 9223B	05/22	12:30	PĹW
Fecal Coliform	16	/100mL	2	1	SM 9222D	05/21	18:00	PLW
Total Coliform	490	mpn/100ml	1	1	SM 9223B	05/22	12:30	PLW
CHEMISTRY		·						
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	. 01	1	SM 4500P-E	05/22	12:15	HRG
Phosphorus as P, Dissolved	<.05	mg/l	. 05	1	SM 4500P-E	06/02	14:45	HRG
Phosphorus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	05/28	14:15	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	06/05	00:02	JCL
Nitrogen, Nitrate	<.05	mg/l	.05	1	EPA 353.2	05/22	18:29	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	05/22	17:04	JCL
Nitrogen, Total Kjeldahl	<.25	mg/L	.25	1	EPA 351.2	05/30	14:36	ALD
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	05/22	12:10	EMW
Total Organic Carbon	5.4	mg/l	1	1	SM5310 C	05/27	22:44	ALD
RESIDUES								
Solids, Total Dissolved	51	mg/l	5	1	SM 2540C	05/22	12:50	тмн
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	05/22	12:50	тмн
TITRATIONS								
Alkalinity, Total to pH 4.5	4	mg/l	1	1	SM 2320 B	05/27	12:45	HRG

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Attention:	Gregory Wacik					Date of R	eport:	06/05	/14
Reported To:	USACE, Philadelphía District					Lab ID:		2295-	-14-0015783
	Environmental Resources Branch								
	100 Penn Square East					Date Coll	ected:	05/21	/14 07:45
	Philadelphia PA 19107					Collected	By:	Client	t
Sample Desc:	WA-7 Surface					Date Rece	ived:	05/21,	/14 17:00
PWSID: 313084	43			Rep	Dilutn		Test	Test	
		Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst

- 01 The TKN matrix spike was high indicating possible sample matrix interference.
- O2 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.
- O3 The total coliform sample was placed in the incubator at O5/21/14 at 18:00.

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Attention: Gregory Wacik Reported To: USACE, Philadelphia District					Date of F Lab ID:	eport:	06/05 2295	/14 140015784
100 Penn Square East					Date Coll	ected:	05/21	/14 07:45
Philadelphia PA 19107					Collected	By:	Client	
Sample Desc: WA-7 Mid-Depth					Date Rece	ived:	05/21	/14 17:00
PWSID: 3130843			Rep	Dilutn		Test	Test	
	Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst
CHEMISTRY		ر همه است النبا التي التي التي التي التي التي التي الت						New Colo Land Land Links And Land
COLORMETRIC								
Phosphate as P, Ortho	0.01	mg/l	.01	1	SM 4500P-E	05/22	12:15	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	06/02	14:45	HRG
Phosphorus as P, Total	0.04	mg/l	.01	1	SM 4500P-E	05/28	14:15	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	06/05	00:17	JCL
Nitrogen, Nitrate	<.05	mg/l	.05	1	EPA 353.2	05/22	18:30	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	05/22	17:07	JCL
Nitrogen, Total Kjeldahl	0.38	mg/l	.25	1	EPA 351.2	05/30	14:39	ALD
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	05/22	12:10	EMW
Total Organic Carbon	8.0	mg/l	1	1	SM5310 C	05/27	22:57	ALD
RESIDUES								
Solids, Total Dissolved	49	mg/l	5	1	SM 2540C	05/22	12:50	ТМН
Solids, Total Suspended	<3	mg/L	3	1	SM 2540D	05/22	12:50	ТМН
TITRATIONS								
Alkalinity, Total to pH 4.5	4	mg/l	1	1	SM 2320 B	05/27	12:45	HRG

01 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

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Attention:	Gregory Wacik					Date of F	eport:	06/05	/14
Reported To: USACE, Philadelphia District Environmental Resources Branch						Lab ID:		2295	-14-0015785
	100 Penn Square East					Date Coll	ected:	05/21	/14 07:45
Philadelphia PA 19107						Collected	By:	Clier	t
Sample Desc:	WA-7 Deep					Date Rece	ived:	05/21	/14 17:00
PWSID: 31308	343			Rep	Dilutn		Test	Test	
		Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst
CHEMISTRY		، ہم جو بہ اور اور اور اور اور اور				پسر پس سے پھا سا اسا اس اس اس اس			
COLORMETRI	C								
Phosph	ate as P, Ortho	0.02	mg/l	.01	1	SM 4500P-E	05/22	12:15	HRG
Phosph	orus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P⊸E	06/02	14:45	HRG
Phosph	orus as P, Total	0.08	mg/l	.01	1	SM 4500P-E	05/28	14:15	HRG
NITROGENS									
Nitrog	jen, Ammonia	<.05	mg/l	.05	1	D6919-03	06/05	00:32	JCL
Nitrog	Jen, Nitrate	<.05	mg/l	.05	1	EPA 353.2	05/22	18:32	JCL
Nitrog	jen, Nitríte	<.05	mg/l	.05	1	EPA 353.2	05/22	17:08	JCL
Nitrog	jen, Total Kjeldahl	0.67	mg/l	.25	1	EPA 351.2	05/30	14:40	AL.D
OTHER									
Bioche	mical Oxygen Demand	<2	mg/l	2	1	SM 5210B	05/22	12:10	EMW
Total	Organic Carbon	9.5	mg/l	1	1	SM5310 C	05/27	23:11	ALD
RESIDUES									
Solids	, Total Dissolved	37	mg/l	5	1	SM 2540C	05/22	12:50	TMH
Solids	, Total Suspended	149	mg/l	3	1	SM 2540D	05/22	12:50	тмн
TITRATIONS	1								
Alkali	nity, Total to pH 4.5	4	mg/l	1	1	SM 2320 B	05/27	13:00	HRG

01 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

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5774 15773 Sample No: Date: Relinquished by: Sample No: sqf 04/17/14 3:47:33 PM Samplers: Customer: Address: Account: FC, EČ, TC, NO2-N, NO3-N, Phone: NH3-N, tkn, Alk, tds, tss, po4-p, toc, NH3-N, tkn, Alk, tds, tss, po4-p, toc, NO2-N, NO3-N, FC, EC, TC, 5121/14 2 3 Gregory Wacik Philadelphia PA 19107 USACE, Philadelphia District 215-656-6561 100 Penn Square East Environmental Resources Branch 2295 N ч WACIK d-p04-p, HG d-<u>po4-p</u>, John Star Desc: Desc: o-po4, BOD e te Time: 330 WA-2 Surface o-po4, BOD WA-1 Surface F Ext: 1540 Work Order: 004035 Pr Work Order Description: Walter Reservoir Received by: Μ Total Sampling Time Laboratory Receipt Temp: Remarks: Chain of Custody J. REIDER ASSOCIATES, into Sterile Budi saved and powed bottle, Ecc 5/22/14 Ref. Im Conn gowick **Project Leader:** broken Approved By: 06 Date: Received, for laboratory by: (hours) : HNC. 5/21/14 ч H I I Deg C. 9 Q ω ₽ ΩШ A ß 1 X 250mlMicro P w/ Sterile/Na25203; 1 X L Bod p w/ Cool to 6 C; 1 X 16ozNO2NO3 p w/ Cool to 6 C; 1 X 500ml NH3 p w/ H2SO4 (pH<2); 1 X 250mlMicro P w/ Sterile/Na2S 1 X L Bod p w/ Cool to 6 C; 1 X 16ozNO2NO3 p w/ Cool to 6 C; 0001 1 X 2xambervoa g w/ H3PO4/zero headspace; 1 X 8oz Alk p w/ Cool to 6 C/Zero Headspace; 1 X 500ml NH3 p w/ 1 X 2xambervoa g w/ H3PO4/zero headspace; 1 X 8oz Alk p w/ Matrix: 0 Matrix: 0 If Temp Unacceptable, On Ice? to 6 C/Zero Headspace; Time: Sample entered by: 100 Bottle Prep H2SO4 (pH<2); Sterile/Na2S2O3; No: Time: Date: Time: Date: 236462 ЪХ: 5721/14 51214 Page: 0710 0920 ч COFC.PRT z Ч

15777 3776 5775 7 Sample No: 5 FC. AEC, TC, He K6 NO2-N, NO3-N, d-po4-p, o-po4, BOP M. M. + hn, Alk, tds, tss, po4-p, toc Sample No: Date: <u>SZVIII</u> Sample No: Relinquished by: sqL Samplers: Customer: 04/17/14 3:47:33 PM Address: Account: Phone: NC2-N, NO3-N, d-po4-p, o-po4, BODA NH3-N, tkn, Alk, tds, tss, po4-p, toc, JA D NH3-N, tkn, Alk, tds, tss, po4-p, toc, NH3-N, tkn, Alk, tds, tss, po4-p, toc, NO2-N, NO3-N, d-р64-р, 8 Gregory Wacik USACE, Philadelphia District 215-656-6561 100 Penn Square East Philadelphia PA 19107 Environmental Resources Branch 2295 ω CACK C R Desc: Time: 330 o-po4, BOD WA-2 Mid-Depth Ð Ext: Work Order Description: Walter Reservoir Work Order: 004035 ISHD Received by: Total Sampling Time (hours): M Laboratory Receipt Temp: Remarks: Chain of Custody J. REIDER ASSOCIATES, INC. **Project Leader:** Approved By: Date: Received for laboratory by: SIS IN 5 PC-, , , , , ДСВЪ с ¤ Ъ দ্য দে A υBÞ μU ы т C MB 1 X 250mlMicro P w/ Sterile/Na25203; 1 X L Bod p w/ Cool to 6 C; 1 X 16ozNO2NO3 p w/ Cool to 6 C; 1 X 500ml NH3 p w/ H2SO4 (pH<2); 1 X L Bod p w/ Cool to 6 C; 1 X 16ozNO2NO3 p w/ Cool to 6 C; 1 X 500ml NH3 p w/ H2SO4 (pH<2); 1 X L Bod p w/ Cool to 6 C; 1 X 16ozNO2NO3 p w/ Cool to 6 C; 1 X 500ml NH3 p w/ H2SO4 (pH<2); 1 X 8oz Alk p w/ Cool to 6 C/Zero Headspare; 0001 н Cool to 6 C/Zero Headspace; Matrix: 0 Matrix: 0 М X 8oz Alk p w/ X 8oz Alk p w/ Matrix: 0 X 2xambervoa g w/ H3PO4/zero headspace; × If Temp Unacceptable, On Ice? 2xambervoa g w/ H3PO4/zero headspace; 2xambervoa g w/ H3PO4/zero headspace; to 6 C/Zero Headspace; Time: Sample entered by:\_\_\_\_\_\_ 1700 Bottle No: Date: Time: Time: Date: Time: Date: Prep by: 236462 5/21/14 5/21 5/21/14 Page: 0940 К COFC.PRT z N

15778 sample No: FC, EC, TC, Hopdy-p, 6-po4, Bondy NO2-N, NO3-N, d-po4-p, 6-po4, Bondy MC Alk, tds, tss, po4-p, toc 12779 Sample No: Date: 5121114 Relinquished by: sqf Samplers: Customer: 04/17/14 3:47:33 PM Account: Address: FC, Vid, TC, H, H, H, H, BOD, NO2-N, NO3-N, d-p04-p, o-p04, BOD, Phone: NH3-N, tkm, Alk, tds, tss, po4-p, toc, NH3-N, tkn, Alk, tds, tss, po4-p, toc, Gregory Wacik USACE, Philadelphia District 215-656-6561 100 Penn Square East Philadelphia PA 19107 Environmental Resources Branch 2295 7 CACIK July -Desc: WA-5 Surface Time: 330 EXT: 1540 Work Order: 004035 Work Order Description: Walter Reservoir Received by: Total Sampling Time (hours): М Laboratory Receipt Temp: Remarks: Chain of Custody J. REIDER ASSOCIATES, INC. Approved By: Received for laboratory by: Date: hll 2 5 ほうほな 너 너 с ¤ Þ 뇌비 Э Deg C. P CM3 1 X 250mlMicro P w/ Sterile/Na2S203; 1 X L Bod p w/ Cool to 6 C; 1 X 250mlMicro P w/ Sterile/Na2S2O3; 1 X L Bod p w/ Cool to 6 C; 1 X 16ozNO2NO3 p w/ Cool to 6 C; C001 Cool to 6 C/Zero Headspace; Matrix: 0 Matrix: 0 М X 8oz Alk p w/ × M × М X 2xambervoa g w/ H3PO4/zero headspace; If Temp Unacceptable, On Ice? 500ml NH3 p w/ 500ml NH3 p w/ H2SO4 (pH<2); 16ozNO2NO3 p w/ 8oz Alk p w/ 2xambervoa g w/ H3PO4/zero headspace; to 6 C/Zero Headspace; Time: Sample entered by: 000 Bottle H2SO4 (pH<2); Cool to 6 C; No: Date: <u>5/21/14</u> Time: Prep by: Time: Date: 236462 5/21 Page: 000 К COFC.PRT 0/0 z 5 ω


15783 5782 Sample No: 10 Sample No: Date: 521119 Relinquished by: sqf Samplers: Customer: 04/17/14 3:47:33 PM Account: Address: FC, VEC, TC, HC HC HC NO2-N, NO3-N, d-p04-p, 0-p04, BODy Phone: NH3-N, tkn, Alk, tds, tss, po4-p, toc, NH3-N, tkn, Alk, tds, tss, po4-p, toc, NO2-N, NO3-N, d-po4-p, 3 USACE, Philadelphia District Gregory Wacik 100 Penn Square East Philadelphia PA 19107 H 215-656-6561 Environmental Resources Branch 2295 WACik Desc: Desc: 2 , 0-po4, BOD Time: 330 WA-7 Surface WA-6 Deep Ext: Work Order: 004035 Work Order Description: Walter Reservoir 1syo Received by: Μ. Laboratory Receipt Temp: Total Sampling Time (hours): Remarks: Chain of Custody J. REIDER ASSOCIATES, INC. Approved By: 1/1 Received for laboratory by: Date: 2 12/114 শাস **G** C B b υ¤≽ Deg ы 因 CMB B 1 X 250mlMicro P w/ Sterile/Na2S203; 1 X L Bod p w/ Cool to 6 C; 1 X 16ozNO2NO3 p w/ Cool to 6 C; e. 1 X L Bod p w/ Cool to 6 C; 1 X 16ozNO2NO3 p w/ Cool to 6 C; 1 X 500ml NH3 p w/ H2SO4(pH<2); Cool to 6 C/Zero Headspace; 001 Matrix: 0 Matrix: 0 М M × × × If Temp Unacceptable, On Ice? 8oz Alk p w/ 2xambervoa g w/ H3PO4/zero headspace; 500ml NH3 p w/ H2SO4 (pH<2); 8oz Alk p w/ 2xambervoa g w/ H3PO4/zero headspace; to 6 C/Zero Headspace; Time: sample entered by: 1700 Bottle No: Date: 5/21/14 Prep Time: Time: Date: 236462 by: 3460 Page: COFC.PRT age: 5 ф 2 均

12784 5785 sample No: 13 Date: 5/21/14 Relinquished by: Sample No: 12 Samplers: jbs 04/17/14 3:47:33 PM Customer: Address: Account: Phone: NO2-N, NO3-N, d-p04-p, o-p04, BOD MH3-N, tkm, Alk, tds, tss, p04-p, toc, NO2-N, NO3-N, d-p04-p, NH3-N, tkn, Alk, tds, tss, po4-p, toc, Gregory Wacik 215-656-6561 USACE, Philadelphia District Philadelphia PA 19107 100 Penn Square East Environmental Resources Branch 2295 WACIK Desc: Desc: WA-7 Mid-Depth , or pot, BODN WA-7 Deep Time: <u>330</u> Ext: 1240 Work Order: 004035 Work Order Description: Walter Reservoir Received by: Total Sampling Time (hours): M. J. REIDER ASSOCIATES, INC. Laboratory Receipt Temp: Remarks: Chain of Custody Approved By: Received for laboratory by: Date: 6111215 5 υ¤ъ Ħ U Ħ U υup \_\_\_\_\_\_ \_\_\_\_\_\_ 1 CMB CMB r 1 X L Bod p w/ Cool to 6 C; 1 X 16ozNO2NO3 p w/ Cool to 6 C; 1 X 500ml NH3 p w/ H2SO4(pH<2); 1 X 2xambervoa g w/ H3PO4/zero h 1 X L Bod p w/ Cool to 6 C; 1 X 16ozNO2NO3 p w/ Cool to 6 C; 1 X 500ml NH3 p w/ H2SO4 (pH<2); <u>.</u> Cool to 6 C/Zero Headspace; 0001 1 X 8oz Alk p w/ Matrix: 0 Matrix: 0 X 8oz Alk p w/ ool to 6 C/Zero Headspace; X 2xambervoa g w/ H3PO4/zero headspace; If Temp Unacceptable, On Ice? 2xambervoa g w/ H3PO4/zero headspace; Time: Sample entered by: 78 Bottle Frep by: No: Date: Time: Time: Date: 236462 5/21/14 2770 1112/2 Page: 3 COFC.PRT К z





Attention: Gregory Wacik Reported To: USACE, Philadelphia District Environmental Resources Branch					Date of R Lab ID:	eport:	06/30 2295	/14 14-0019444
100 Penn Square East					Date Coll	ected.	06/18	/14 09.20
Philadelphia PA 19107					Collected	By:	Clien	rt 07.20
Sample Desc: WA-1 Surface					Date Received:		06 <u>/</u> 18/14 17:10	
PWSID: 3130843			Rep	Dilutn		Test	Test	
	Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst
BACTI					1968 Rich Andri Luck Luce Luce and many party party			
MICROBIOLOGY								
Escherichia coli	13	mpn/100ml	1	1	SM 9223B	06/19	12:00	DAD
Fecal Coliform	13	/100mL	2	1	SM 9222D	06/18	17:50	PLW
Total Coliform	>2400	mpn/100ml	1	1	SM 9223B	06/19	12:00	DAD
CHEMISTRY						•		
COLORMETRIC								
Phosphate as P, Ortho	0.04	mg/l	.01	1	SM 4500P-E	06/19	09:40	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	06/19	13:35	HRG
Phosphorus as P, Total	0.04	mg/l	.01	1	SM 4500P-E	06/19	13:50	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	. 05	1	D6919-03	06/19	14:24	JCL
Nitrogen, Nitrate	0.08	mg/l	. 05	1	EPA 353.2	06/19	18:36	JCL
Nitrogen, Nitrite	<.05	mg/l	. 05	1	EPA 353.2	06/19	16:53	JCL
Nitrogen, Total Kjeldahl	<.25	mg/L	.25	1	EPA 351.2	06/19	14:33	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	06/19	11:45	EMW
Total Organic Carbon	6.0	mg/L	1	1	SM5310 C	06/19	20:12	ALD
RESIDUES						•		
Solids, Total Dissolved	63	mg/l	5	1	SM 2540C	06/20	12:45	ТМН
Solids, Total Suspended	3	mg/l	3	1	SM 2540D	06/20	12:45	тмн
TITRATIONS		•						
Alkalinity, Total to pH 4.5	5	mg/L	1	1	SM 2320 B	06/23	10:00	HRG

Reviewed and Approved by:

Mutice 7 istle

Christina Kistler Account Executive

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Attention:	Gregory Wacik					Date of I	Report:	06/30	0/14
Reported To:	USACE, Philadelphia District					Lab ID:		2295	
	Environmental Resources Branch								
	100 Penn Square East					Date Col	lected:	06/18	3/14 09:20
	Philadelphia PA 19107	1				Collected	d By:	Clien	, it
Sample Desc:	WA-1 Surface					Date Rec	eived:	06/18	3/14 17:10
PWSID: 313084	43			Rep	Dilutn		Test	Test	
		Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst

01 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

O2 The total coliform sample was placed in the incubator on O6/18/14 at 17:45.

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Attention: Gregory Wacik Reported To: USACE, Philadelphia District Environmental Resources Branch					Date of R Lab ID:	eport:	06/30 2295	/14 14-0019445
100 Penn Square East Philadelphia PA 19107					Date Coll Collected	Date Collected: Collected By:		/14 07:15 t
Sample Desc: WA-2 Surface					Date Rece	ived:	06/18	/14 17:10
PWSID: 3130843	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI							1072-00-00 - 00 - 00 - 00 - 00 - 00 - 00	
MICROBIOLOGY								
Escherichia coli	<1	mpn/100ml	1	1	SM 9223B	06/19	12:00	DAD
Fecal Coliform	<2	/100ml	2	1	SM 9222D	06/18	17:50	PLW
Total Coliform	>2400	mpn/100ml	1	1	SM 9223B	06/19	12:00	DAD
CHEMISTRY						·		
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	06/19	09:40	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	06/19	13:35	HRG
Phosphorus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	06/19	13:50	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	06/19	14:38	JCL
Nitrogen, Nitrate	<.05	mg/l	.05	1	EPA 353.2	06/19	18:37	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	06/19	16:54	JCL
Nitrogen, Total Kjeldahl	<.25	mg/l	.25	1	EPA 351.2	06/19	14:34	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	06/19	11:45	EMW
Total Organic Carbon	4.8	mg/l	1	1	SM5310 C	06/19	21:26	ALD
RESIDUES								
Solids, Total Dissolved	62	mg/l	5	1	SM 2540C	06/20	12:45	TMĤ
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	06/20	12:45	тмн
TITRATIONS						,		
Alkalinity, Total to pH 4.5	4	mg/l	1	1	SM 2320 B	06/23	10:00	HRG

Reviewed and Approved by: Muttine M. Sistler

Christina Kistler Account Executive

Page 1 of 2

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Attention:	Gregory Wacik					Date of I	Report:	06/30	0/14
Reported To:	USACE, Philadelphia District					Lab ID:	-	2295	5–14–0019445
	Environmental Resources Branch								
	100 Penn Square East					Date Col	lected:	06/18	3/14 07:15
	Philadelphia PA 19107					Collected	d By:	, Clier	nt
Sample Desc:	WA-2 Surface					Date Rec	eived:	06/18	3/14 17:10
PWSID: 31308	43			Rep	Dilutn		Test	Test	
		Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst

01 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

O2 The total coliform sample was placed in the incubator on 06/18/14 at 17:45.

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Risting M. Listler

Christina Kistler Account Executive

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Attention: Gregory Wacik Reported To: USACE, Philadelphia District Environmental Resources Branch					Date of Report: Lab ID:		06/30/14 2295-14-0019446	
Philadelphia PA 19107					Date Coll Collected	ected:   By:	06/18/14 07:15 Client	
Sample Desc: WA-2 Mid-Depth					Date Rece	ived:	06/18/14 17:10	
PWSID: 3130843	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY						AN 20 11 12 12		
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/L	.01	1	SM 4500P-E	06/19	09:45	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	06/19	13:35	HRG
Phosphorus as P, Total	0.01	mg/l	.01	1	SM 4500P-E	06/19	13:55	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	06/19	14:53	JCL
Nitrogen, Nitrate	0.07	mg/l	.05	1	EPA 353.2	06/19	18:38	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	06/19	16:55	JCL
Nitrogen, Total Kjeldahl	<.25	mg/l	.25	1	EPA 351.2	06/19	14:35	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	06/19	11:45	EMW
Total Organic Carbon	6.0	mg/l	1	1	SM5310 C	06/19	21:58	ALD
RESIDUES								
Solids, Total Dissolved	67	mg/l	5	1	SM 2540C	06/20	13:20	ТМН
Solids, Total Suspended	3	mg/l	3	1	SM 2540D	06/20	13:20	тмн
TITRATIONS								
Alkalinity, Total to pH 4.5	5	mg/l	1	1	SM 2320 B	06/23	10:15	HRG

01 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

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Attention: Gregory Wacik Reported To: USACE, Philadelphia District Environmental Resources Branch					Date of F Lab ID:	leport:	06/30 2295	/14 -14-0019447
100 Penn Square East					Date Coll	ected:	06/18	/14 07:15
Philadelphia PA 19107					Collected	By:	Clien	t
Sample Desc: WA-2 Deep					Date Rece	ived:	06/18	/14 17:10
PWSID: 3130843			Rep	Dilutn		Test	Test	
	Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst
CHEMISTRY								FFN FFN GER HAR AND And LINA
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	06/19	09:45	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	06/19	13:35	HRG
Phosphorus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	06/19	13:55	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	06/19	15:07	JCL
Nitrogen, Nitrate	0.06	mg/l	.05	1	EPA 353.2	06/19	18:39	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	06/19	16:56	JCL
Nitrogen, Total Kjeldahl	<.25	mg/l	. 25	1	EPA 351.2	06/19	14:38	JCL
OTHER								
Biochemical Oxygen Demand	3	mg/l	2	1	SM 5210B	06/19	11:45	EMW
Total Organic Carbon	6.3	mg/l	1	1	SM5310 C	06/19	22:45	ALD
RESIDUES								
Solids, Total Dissolved	58	mg/l	5	1	SM 2540C	06/20	13:20	ТМН
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	06/20	13:20	ТМН
TITRATIONS								
Alkalinity, Total to pH 4.5	5	mg/l	1	1	SM 2320 B	06/23	10:15	HRG

01 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

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Reviewed and Approved by:

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Attention:	Gregory Wacik					Date of R	eport:	06/30	)/14
Reported To:	USACE, Philadelphia District					Lab ID:		2295	-14-0019447
	Environmental Resources Branch								
	100 Penn Square East					Date Coll	ected:	06/18	8/14 07:15
	Philadelphia PA 19107					Collected	Ву:	Clier	rt
Sample Desc:	WA-2 Deep					Date Rece	ived:	06/18	3/14 17:10
PWSID: 31308	43			Rep	Dilutn		Test	Test	
		Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst
				<b>_</b>					
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	LA ON EDIOD AND IN 1811 AND AND AND								

O2 The SM 5210B sample did not have a DO depletion of at least 2 mg/L.

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Reviewed and Approved by: fistle Wistike J

Christina Kistler Account Executive

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Attention: Gregory Wacik Reported To: USACE, Philadelphia District					Date of R Lab ID:	eport:	06/30 2295	/14 -14-0019448
Environmental Resources Branch 100 Penn Square East					Doto Coll		06 140	141 00.75
Philadelphia PA 19107					Collected	By:	Clien	/14 09:55 t
Sample Desc: WA-3 Surface					Date Received:		06/18/14 17:10	
PWSID: 3130843	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Escherichia coli	6	mpn/100mL	1	1	SM 9223B	06/19	12:00	DAD
Fecal Coliform	13	/100mL	2	1	SM 9222D	06/18	17:50	PIW
Total Coliform	2400	, mpn/100ml	1	1	SM 9223B	06/19	12:00	DÁD
CHEMISTRY		1 7				,		2112
COLORMETRIC								
Phosphate as P, Ortho	0.07	mg/l	.01	1	SM 4500P-E	06/19	09:45	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	06/19	13:35	HRG
Phosphorus as P, Total	0.07	mg/L	.01	1	SM 4500P-E	06/19	13:55	HRG
NITROGENS		-,				,		
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	06/19	15:22	JCL
Nitrogen, Nitrate	0.12	mg/l	.05	1	EPA 353.2	06/19	18:42	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	06/19	16:57	JCL
Nitrogen, Total Kjeldahl	<.25	mg/l	.25	1	EPA 351.2	06/19	14:39	JCL
OTHER						,		
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	06/19	11:45	EMW
Total Organic Carbon	8.1	mg/L	1	1	SM5310 C	06/19	23:02	ALD
RESIDUES		·				,		
Solids, Total Dissolved	73	mg/l	5	1	SM 2540C	06/20	13:20	ТМН
Solids, Total Suspended	<3	mg/L	3	1	SM 2540D	06/20	13:20	тмн
TITRATIONS		-				,		
Alkalinity, Total to pH 4.5	5	mg/l	1	1	SM 2320 B	06/23	10:15	HRG

Reviewed and Approved by:

Christina Kistler Account Executive

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Attention:	Gregory Wacik					Date of H	Report:	06/30	)/14
Reported To:	USACE, Philadelphia District					Lab ID:		2295	-14-0019448
	Environmental Resources Branch								
	100 Penn Square East					Date Col	lected:	06/18	8/14 09:35
	Philadelphia PA 19107					Collected	i By:	Clier	it
Sample Desc:	WA-3 Surface					Date Rece	eived:	06/18	3/14 17:10
PWSID: 31308	43			Rep	Dilutn		Test	Test	
		Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst

O1 The total coliform sample was placed in the incubator on 06/18/14 at 17:45.

O2 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

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Kistle Ultitae V

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Attention: Gregory Wacik Reported To: USACE, Philadelphia District					Date of R Lab ID:	eport:	06/30 2295	/14 -14-0019449
Environmental Resources Branch								
100 Penn Square East					Date Coll	ected:	06/18	/14 09:50
Philadelphia PA 19107					Collected	By:	Clien	t
Sample Desc: WA-4 Surface					Date Rece	ived:	06/18	/14 17:10
PWSID: 3130843			Rep	Dilutn		Test	Test	
	Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst
BACTI	'ny sy fat av ta an an an an an an							and the set of the set of the set
MICROBIOLOGY								
Escherichia coli	130	mpn/100ml	1	1	SM 9223B	06/19	12:00	DAD
Fecal Coliform	130	/100ml	2	1	SM 9222D	, 06/18	17:50	PLW
Total Coliform	2400	mpn/100ml	1	1	SM 9223B	06/19	12:00	DAD
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	06/19	09:45	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	06/19	13:35	HRG
Phosphorus as P, Total	<.01	mg/L	.01	1	SM 4500P-E	06/19	13:55	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	. 05	1	D6919-03	06/19	15:37	JCL
Nitrogen, Nitrate	0.10	mg/l	. 05	1	EPA 353.2	06/19	18:43	JCL
Nitrogen, Nitrite	<.05	mg/l	. 05	1	EPA 353.2	06/19	17:00	JCL
Nitrogen, Total Kjeldahl	<.25	mg/l	.25	1	EPA 351.2	06/19	14:40	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	06/19	11:45	EMW
Total Organic Carbon	5.4	mg/l	1	1	SM5310 C	06/19	23:18	ALD
RESIDUES								
Solids, Total Dissolved	66	mg/l	5	1	SM 2540C	06/20	13:20	TMH
Solids, Total Suspended	18	mg/l	3	1	SM 2540D	06/20	13:20	тмн
TITRATIONS						·		
Alkalinity, Total to pH 4.5	7	mg/l	1	1	SM 2320 B	06/23	10:30	HRG

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		Recult	llnit	limit	Factor	Procedure	Data	Time	Applyct
PWSID: 31308	43			Rep	Dilutn		Test	Test	
Sample Desc:	WA-4 Surface					Date Rec	eived:	06/18	3/14 17:10
	Philadelphia PA 19107					Collected	d By:	Clier	nt
	100 Penn Square East					Date Col	lected:	06/18	3/14 09:50
	Environmental Resources Branch								
Reported To:	USACE, Philadelphia District					Lab ID:		2295	-14-0019449
Attention:	Gregory Wacik					Date of I	Report:	06/30	)/14

01 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

O2 The total coliform sample was placed in the incubator on O6/18/14 at 17:45.

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Attention: Gregory Wacik Reported To: USACE, Philadelphia District					Date of R Lab ID:	eport:	06/30 2295	/14 -14-0019450
100 Penn Square East					Date Coll	ected:	06/18	/14 10:00
Philadelphia PA 19107					Collected By:		Client	
Sample Desc: WA-5 Surface					Date Rece	ived:	06/18	/14 17:10
PWSID: 3130843			Rep	Dilutn		Test	Test	
	Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst
BACTI	یس ایس بسر می میز <sup>ر</sup> ف می میز می				F7 F7 F2 W W W W W W W W			
MICROBIOLOGY								
Escherichia coli	20	mpn/100ml	1	1	SM 9223B	06/19	12:00	DAD
Fecal Coliform	31	/100ml	2	1	SM 9222D	, 06/18	17:50	PLW
Total Coliform	>2400	mpn/100ml	1	1	SM 9223B	06/19	12:00	DAD
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/L	.01	1	SM 4500P-E	06/19	09:45	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	06/19	13:35	HRG
Phosphorus as P, Total	0.03	mg/l	.01	1	SM 4500P-E	06/19	13:55	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	06/19	15:51	JCL
Nitrogen, Nitrate	<.05	mg/l	.05	1	EPA 353.2	06/19	18:44	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	06/19	17:01	JCL
Nitrogen, Total Kjeldahl	0.30	mg/l	.25	1	EPA 351.2	06/19	14:41	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	06/19	11:45	EMW
Total Organic Carbon	5.0	mg/l	1	1	SM5310 C	06/19	23:34	ALD
RESIDUES								
Solids, Total Dissolved	48	mg/l	5	1	SM 2540C	06/20	13:20	тмн
Solids, Total Suspended	8	mg/l	3	1	SM 2540D	06/20	13:20	тмн
TITRATIONS								
Alkalinity, Total to pH 4.5	2	mg/l	1	1	SM 2320 B	06/23	10:30	HRG

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Attention:	Gregory Wacik					Date of F	Report:	06/30	0/14
Reported To:	USACE, Philadelphia District					Lab ID:		2295	-14-0019450
	Environmental Resources Branch								
	100 Penn Square East					Date Coll	lected:	06/18	3/14 10:00
	Philadelphia PA 19107					Collected	d By:	Clier	it
Sample Desc:	WA-5 Surface					Date Rece	eived:	06/18	3/14 17:10
PWSID: 313084	43			Rep	Dilutn		Test	Test	
		Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst

01 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

O2 The total coliform sample was placed in the incubator on O6/18/14 at 17:45.

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Attention: Gregory Wacik Reported To: USACE, Philadelphia District					Date of R Lab ID:	eport:	06/30 2295	/14 -14-0019451
100 Penn Square East Philadelphia PA 19107					Date Coll	ected:	06/18 Clien	/14 08:00 +
							ceren	
Sample Desc: WA-6 Surface					Date Rece	ived:	06/18	/14 17:10
PWSID: 3130843			Rep	Dilutn		Test	Test	
	Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst
BACTI								
MICROBIOLOGY								
Escherichia coli	2	mpn/100ml	1	1	SM 9223B	06/19	12:00	DAD
Fecal Coliform	<2	/100ml	2	1	SM 9222D	06/18	17:50	PLW
Total Coliform	2400	mpn/100ml	1	1	SM 9223B	06/19	12:00	DAD
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	06/19	10:20	HRG
Phosphorus as P, Dissolved	<.05	mg/L	.05	1	SM 4500P-E	06/19	13:35	HRG
Phosphorus as P, Total	0.01	mg/L	.01	1	SM 4500P-E	06/19	14:00	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/L	.05	1	D6919-03	06/19	16:06	JCL
Nitrogen, Nitrate	<.05	mg/l	.05	1	EPA 353.2	06/19	18:45	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	06/19	17:02	JCL
Nitrogen, Total Kjeldahl	<.25	mg/l	.25	1	EPA 351.2	06/19	14:44	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/L	2	1	SM 5210B	06/19	11:45	EMW
Total Organic Carbon	4.8	mg/l	1	1	SM5310 C	06/19	23:50	ALD
RESIDUES								
Solids, Total Dissolved	38	mg/L	5	1	SM 2540C	06/20	13:20	ТМН
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	06/20	13:20	ТМН
TITRATIONS						•		
Alkalinity, Total to pH 4.5	4	mg/l	1	1	SM 2320 B	06/23	10:30	HRG

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		Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst
PWSID: 31308	43			Rep	Dilutn		Test	Test	
Sample Desc:	WA-6 Surface					Date Rece	eived:	06/18	3/14 17:10
	Philadelphia PA 19107					Collected	By:	Clier	) it
	100 Penn Square East					Date Coll	.ected:	06/18	3/14 08:00
Reported To.	Environmental Resources Branch					Lab ID:		2295	-14-0019451
Reported To:	USACE Philadelphia District						eport.	00/30	// 14
Attention:	Gregory Wacik					Data of F	enont .	06/30	111

01 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

O2 The total coliform sample was placed in the incubator on O6/18/14 at 17:45.

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Attention: Grego	ry Wacik					Date of F	leport:	06/30	/14
Reported To: USACE	, Philadelphia District					Lab ID:		2295-14-0019452	
Enviro	onmental Resources Branch								
100 Pe	enn Square East					Date Coll	ected:	06/18	/14 08:00
Philad	delphia PA 19107					Collected	By:	Clien	t
Sample Desc: WA-6 M	Mid-Depth					Date Received:		06/18/14 17:10	
PWSID: 3130843				Rep	Dilutn		Test	Test	
		Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst
CHEMISTRY		Man and Man and And And And And and and and and							
COLORMETRIC									
Phosphate as	P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	06/19	10:20	HRG
Phosphorus a	s P, Díssolved	<.05	mg/l	.05	1	SM 4500P-E	06/19	13:35	HRG
Phosphorus a	s P, Total	<.01	mg/l	.01	1	SM 4500P-E	06/19	14:00	HRG
NITROGENS									
Nitrogen, Am	monia	<.05	mg/l	.05	1	D6919-03	06/19	16:20	JCL
Nitrogen, Ni	trate	0.06	mg/l	.05	1	EPA 353.2	06/19	18:48	JCL
Nitrogen, Nit	trite	<.05	mg/l	.05	1	EPA 353.2	06/19	17:05	JCL
Nitrogen, To	tal Kjeldahl	<.25	mg/l	.25	1	EPA 351.2	06/19	14:45	JCL
OTHER							·		
Biochemical (	Oxygen Demand	<2	mg/l	2	1	SM 5210B	06/19	11:45	EMW
Total Organi	c Carbon	5.1	mg/l	1	1	SM5310 C	06/20	00:05	ALD
RESIDUES									
Solids, Tota	l Dissolved	31	mg/l	5	1	SM 2540C	06/20	13:20	тмн
Solids, Tota	l Suspended	<3	mg/l	3	1	SM 2540D	06/20	13:20	тмн
TITRATIONS									
Alkalinity,	Total to pH 4.5	5	mg/l	1	1	SM 2320 B	06/23	10:45	HRG

01 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

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Attention: Gregory Wacik					Date of R	eport:	06/30	/14
Reported To: USACE, Philadelphia District					Lab ID:		2295	-14-0019453
Environmental Resources Branch								
100 Penn Square East					Date Coll	ected:	06/18	/14 08:00
Philadelphia PA 19107					Collected	l By:	Clier	t
Sample Desc: WA-6 Deep					Date Received:		06/18/14 17:10	
PWSID: 3130843			Rep	Dilutn		Test	Test	
	Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst
CHEMISTRY					بی ذم سر بی جا حا حا حا حا حا			یے سے سے اور اور اور
COLORMETRIC								
Phosphate as P, Ortho	0.04	mg/l	.01	1	SM 4500P-E	06/19	10:20	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	06/19	13:40	HRG
Phosphorus as P, Total	0.04	mg/l	.01	1	SM 4500P-E	06/19	14:00	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	06/19	16:35	JCL
Nitrogen, Nitrate	0.06	mg/l	. 05	1	EPA 353.2	06/19	18:49	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	06/19	17:06	JCL
Nitrogen, Total Kjeldahl	<.25	mg/l	.25	1	EPA 351.2	06/19	14:46	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	06/19	11:45	EMW
Total Organic Carbon	6.6	mg/l	1	1	SM5310 C	06/20	00:22	ALD
RESIDUES								
Solids, Total Dissolved	47	mg/l	5	1	SM 2540C	06/20	13:20	TMH
Solids, Total Suspended	3	mg/l	3	1	SM 2540D	06/20	13:20	ТМН
TITRATIONS						-		
Alkalinity, Total to pH 4.5	6	mg/l	1	1	SM 2320 B	06/23	10:45	HRG

01 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

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Attention: Gregory Wacik Reported To: USACE, Philadelphia District Environmental Resources Branch					Date of R Lab ID:	eport:	06/30 2295	)/14 140019454
100 Penn Square East Philadelphia PA 19107					Date Coll Collected	ected:   By:	06/18 Clier	/14 08:20 t
Sample Desc: WA-7 Surface					Date Rece	ived:	06/18	/14 17:10
PWSID: 3130843			Rep	Dilutn		Test	Test	
	Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst
BACTI	، میں ایک ایک ایک ایک ایک ایک ایک ایک			·				Not take taun taun taun taun taun t
MICROBIOLOGY								
Escherichia coli	1	mpn/100ml	1	1	SM 9223B	06/19	12:00	DAD
Fecal Coliform	<2	/100mL	2	1	SM 9222D	06/18	17:50	PLW
Total Coliform	>2400	mpn/100ml	1	1	SM 9223B	, 06/19	12:00	DAD
CHEMISTRY						,		
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	06/19	10:20	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	06/19	13:40	HRG
Phosphorus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	06/19	14:00	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	06/19	16:50	JCL
Nitrogen, Nitrate	<.05	mg/l	.05	1	EPA 353.2	06/19	18:50	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	06/19	17:07	JCL
Nitrogen, Total Kjeldahl	<.25	mg/l	.25	1	EPA 351.2	06/19	14:47	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	06/19	11:45	EMW
Total Organic Carbon	5.3	mg/l	1	1	SM5310 C	06/20	00:28	ALD
RESIDUES								
Solids, Total Dissolved	45	mg/l	5	1	SM 2540C	06/20	13:20	тмн
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	06/20	13:20	ТМН
TITRATIONS						-		
Alkalinity, Total to pH 4.5	5	mg/l	1	1	SM 2320 B	06/23	10:45	HRG

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		Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst
PWSID: 31308	43			Rep	Dilutn		Test	Test	
Sample Desc:	WA-7 Surface					Date Rec	eived:	06/18	3/14 17:10
	Philadelphia PA 19107					Collected	d By:	Clier	nt
	100 Penn Square East					Date Col	lected:	06/18	3/14 08:20
	Environmental Resources Branch								
Reported To:	USACE, Philadelphia District					Lab ID:		2295	5–14–0019454
Attention:	Gregory Wacik					Date of I	Report:	06/30	0/14

01 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

02 The total coliform sample was placed in the incubator on 06/18/14 at 17:45.

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Attention: Gregory Wacik Reported To: USACE, Philadelphia District Environmental Resources Branch					Date of Report: Lab ID: Date Collected: Collected By:		06/30/14 2295-14-0019455	
100 Penn Square East Philadelphia PA 19107							06/18 Clien	/14 08:20 t
Sample Desc: WA-7 Mid-Depth					Date Rece	ived:	06/18	/14 17:10
PWSID: 3130843	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY COLORMETRIC					این نوع داد: این این این برای <u>این برای می</u> برای این این این این این این این این این ا			
Phosphate as P, Ortho	0.03	mg/L	.01	1	SM 4500P-E	06/19	10:25	HRG
Phosphorus as P, Dissolved	<.05	mg/L	.05	1	SM 4500P-E	06/19	13:40	HRG
Phosphorus as P, Total	0.04	mg/l	.01	1	SM 4500P-E	, 06/19	14:00	HRG
NITROGENS		-7				,		
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	06/19	17:48	JCL
Nitrogen, Nitrate	0.08	mg/l	.05	1	EPA 353.2	06/19	18:50	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	06/19	17:08	JCL.
Nitrogen, Total Kjeldahl	<.25	mg/l	.25	1	EPA 351.2	06/19	14:48	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	06/19	11:45	EMW
Total Organic Carbon	5.9	mg/l	1	1	SM5310 C	06/20	01:53	ALD
RESIDUES								
Solids, Total Dissolved	53	mg/l	5	1	SM 2540C	06/20	13:20	тмн
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	06/20	13:50	тмн
TITRATIONS								
Alkalinity, Total to pH 4.5	5	mg/l	1	1	SM 2320 B	06/23	10:45	HRG

01 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

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Attention: Gregory Wacik Reported To: USACE, Philadelphia District					Date of R Lab ID:	eport:	06/30 2295	)/14 5-14-0019456
Environmental Resources Branch 100 Penn Square East					Dette Call		07 145	14/ 08-00
Philadelphia PA 19107					Collected	l By:	Client	
Sample Desc: WA-7 Deep					Date Received:		06/18/14 17:10	
PWSID: 3130843			Rep	Dilutn		Test	Test	
	Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst
CHEMISTRY								جر سر سر بد بد عن الله
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	06/19	10:25	HRG
Phosphorus as P, Dissolved	<.05	mg/l	. 05	1	SM 4500P-E	06/20	10:52	ALD
Phosphorus as P, Total	<.01	mg/L	.01	1	SM 4500P-E	06/20	10:30	ALD
NITROGENS		-,				,		
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	06/19	18:03	JCL
Nitrogen, Nitrate	0.06	mg/L	.05	1	EPA 353.2	06/19	18:53	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	06/19	17:11	JCL
Nitrogen, Total Kjeldahl	<.25	mg/l	.25	1	EPA 351.2	06/19	14:49	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	06/19	11:45	EMW
Total Organic Carbon	7.7	mg/l	1	1	SM5310 C	06/20	02:25	ALD
RESIDUES								
Solids, Total Dissolved	32	mg/l	5	1	SM 2540C	06/20	13:50	тмн
Solids, Total Suspended	6	mg/l	3	1	SM 2540D	06/20	13:50	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	5	mg/l	1	1	SM 2320 B	06/23	11:00	HRG

01 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

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Reviewed and Approved by:

Wistone istle

Christina Kistler Account Executive

Page 1 of 1

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19445 9494 Sample No: Date: \_ Relinquished by: Sample No: Samplers: Customer: jbs 05/12/14 1:05:49 PM Account: Address: Phone: тс, тс, тс, NO2-N, NO3-N, d-po4-p, o-po4, вор, NO2-N, NO3-N, d-po4-p, or pot, BODA DAU FC, EC, Jv NH3-N, tkn, Alk, tds, tss, po4-p, toc, NH3-N, tkn, Alk, tds, tss, po4-p, toc, 6-1874 USACE, Philadelphia District ΗĊ, 215-656-6561 Gregory Wacik Philadelphia PA 19107 100 Penn Square East Environmental Resources Branch 2295 ึง WACK G Desc: WA-2 Surface Desc: WA-1 Surface Time: <u>6/18//4</u> Ext: (1) (1) (2) Work Order: 004035 Work Order Description: Walter Reservoir Received by: Laboratory Receipt Temp: Total Sampling Time (hours): м Remarks: Chain of Custody J. REIDER ASSOCIATES, INC. **Project Leader:** Approved By: Date: 6-18-14 Received for laboratory by Sel α≱ ιι Deg দাদ Θ Ω 비지 A υB ⊅ C B B 1 X 250mlMicro P w/ Sterile/Na2S2O3 1 X L Bod p w/ Cool to 6 C; 1 X 16ozNO2NO3 p w/ Cool to 6 C; 9 1 X 250mlMicro P w/ Sterile/Na2S203; 1 X L Bod p w/ Cool to 6 C; 1 X 16oZNO2NO3 p w/ Cool to 6 C; Cool Cool to 6 C/Zero Headspace; 1 X 2xambervoa g w/ H3PO4/zero headspace; 1 X 8oz Alk p w/ Matrix: Matrix: 0 X 500ml NH3 p w/ H2SO4(pH<2); X 8oz Alk p w/ X 500ml NH3 p w/ H2SO4 (pH<2); X 2xambervoa g w/ H3PO4/zero headspace; If Temp Unacceptable, On Ice? to 6 C/Zero Headspace; 0 Time: Sample entered by: Bottle Prep 0/1 054 No: 237775 hlpers rela Time: Date: Time: Date: pÅ: 181/9 41814 0715 0920 ß Page: COFC.PRT z

Johhol Labo 19448 sample No: Date: 6-1814 Relinguished by Sample No: Sample No: jbs 05/12/14 1:05:49 PM Samplers: Customer: Address: Account: Phone: rc, EC, TC, NO2-N<sub>M</sub>NO3-N, d-po4-p, o-po4, BOD<sub>M</sub> NO2-N, NO3-N, d-po4-p, o-po4, BOD NO2-N, NO3-N, d-po4-p, orbo4, Bond M NH3-N, tkn, Alk, tds, tss, po4-p, toc, NH3-N, tkn, Alk, tds, tss, po4-p, toc, NH3-N, tkn, Alk, tds, tss, po4-p, toc, Gregory Wacik USACE, Philadelphia District ŤΩ 215-656-6561 Philadelphia PA 19107 100 Penn Square East Environmental Resources Branch 2295 4 ω WACIK Sec Desc: Desc: Desc: Time: **6/18/14** 3:38 WA-2 Mid-Depth WA-2 Deep WA-3 Surface Ext: Work Order Description: Walter Reservoir Work Order: 004035 Received by: Laboratory Receipt Temp: Total Sampling Time (hours): Remarks: M. J. REIDER ASSOCIATES, INC. Chain of Custody **Project Leader:** Approved Date: 6-1874 Received for laboratory by: I BY : с я Ъ B B P শ দা Ð ы В Р Ħ Ð Ħ A Deg Ω Q Ę, CMB 1 X L Bod p w/ Cool to 6 C; <u>.</u> 1 X 250mlMicro P w/ Sterile/Na2S203; 35 1 X L Bod n w/ / -- " 1 X 500ml NH3 p w/ H2SO4(pH<2); 1 X 2xambervoa g w/ H3PO4/zero headspace; 1 X 8oz Alk p w/ Cool to 6 C/Zero Headspace; 1 X 16ozNO2NO3 p w/ Cool to 6 C; 1 X L Bod p w/ Cool to 6 C; 1 X 16ozNO2NO3 p w/ Cool to 6 C001 0001 Matrix: Matrix: Matrix: 0 X L Bod p w/ Cool to 6 C; X 16ozNO2NO3 p w/ Cool to 6 C; X 8oz Alk p w, X 2xambervoa g w/ H3PO4/zero headspace; X 500ml NH3 p w/ H2SO4 (pH<2); X 8oz Alk p w/ X 500ml NH3 p w/ H2SO4 (pH<2); X 2xambervoa g w/ H3PO4/zero headspace; If Temp Unacceptable, On Ice? 🕥 N to 6 C/Zero Headspace; to 6 C/Zero Headspace; 0 0 Time: Sample entered by: Bottle J)e No: Date: Time: Prep by: Date: Time: Date: 237775 <u>0</u> 5120 1181/0 6/18/4 A1814 SILO Page: COFC.PRT

19449 Janzo Sample No: Date: 61814 Relinguished by Sample No: Samplers: jbs 05/12/14 1:05:49 PM Customer: Account: Address: FC, EC, TC, NO2-N, NO3-N, d-po4-p, o-po4, BOD Phone: UPOI NO2-N, NO3-N, d-po4-p, d-po4, BOD NH3-N, tkn, Alk, tds, tss, po4-p, toc, NH3-N, tkn, Alk, tds, tss, po4-p, toc, USACE, Philadelphia District Gregory Wacik ЧĊ, 215-656-6561 Philadelphia PA 19107 100 Penn Square East Environmental Resources Branch 2295 7 თ 8 310 1ACiW Desc: Desc: WA-4 Surface WA-5 Surface Time: 6/181 Ext: Ħ Work Order: 004035 Work Order Description: Walter Reservoir 50 50 0 Received by: Laboratory Receipt Temp: Total Sampling Time (hours): м Remarks: Chain of Custody J. REIDER ASSOCIATES, Project Leader: pt Temp: 8 Deg C Approved By: + 15 Date: 61574 Received for laboratory by: INC. দ্র ম А υ¤Ъ 뇌 너 ы р и в р и в р Deg C. Time: 1200 1 X 250mlMicro P w/ Sterile/Na2S203; 1 X L Bod p w/ Cool to 6 C; 1 X 16ozNO2NO3 p w/ Cool to 6 C; 1 X 500ml NH3 p w/ HPECA (COOL to 6 C; Cool Cool to 6 C/Zero Headspace; 1 X 250mlMicro P w/ Sterile/Na2S203 1 X L Bod p w/ Cool to 6 C; 1 X 16ozNO2NO3 p w/ Cool to 6 C; Matrix: 0 Matrix: X 2xambervoa g w/ H3PO4/zero headspace; X 8oz Alk p w/ X 500ml NH3 p w/ H2SO4 (pH<2); X 8oz Alk p w/ X 2xambervoa g w/ H3PO4/zero headspace; If Temp Unacceptable, On Ice? 🔗 to 6 C/Zero Headspace; 0 Time: Sample entered by: 1710 Bottle Prep No: 237775 Date: Time: Date: pA: 41/81/9 0750 Page: COFC.PRT age: 3 7 z Q

lgusi qu/ST Sample No: Sample No: 8 Desc: WA-6 Surface PC, EC, TC, NO2-N, NO3-N, d-po4-p, o-po4, BOD WMH3-N, tkm, Alk, tds, tss, po4-p, toc, Date: Relinquished by Samplers: jbs 05/12/14 1:05:49 PM Customer: Account: Address: Phone: NO2-N, NO3-N, d-po4-p, d-po4, BODAN NH3-N, tkn, Alk, tds, tss, po4-p, toc, 1111-0 Philadelphia PA 19107 215-656-6561 Ext: USACE, Philadelphia District Gregory Wacik Environmental Resources Branch 100 Penn Square East 2295 ଡ WACK 2 Desc: WA-6 Mid-Depth Time: Work Order: 004035 Work Order Description: Walter Reservoir Received by: X Laboratory Receipt Temp: Total Sampling Time (hours): Remarks: Chain of Custody J. REIDER ASSOCIATES, Approved By: ---Date: 61874 Received for laboratory by; HNC. ы Ч С И Ц С ₩ 8 ਸ਼ ਸ਼ ੶ ੶ U B ⊅ Ð Deg C. CMB B Time: OSOO 1 X 250mlMicro P w/ Sterile/Na2S203; 1 X L Bod p w/ Cool to 6 C; 1 X 16ozNO2NO3 ~ ~ ~ ~ 0001 1 X L Bod p w/ Cool to 6 C; 1 X 16ozNO2NO3 p w/ Cool to 6 C; Cool to 6 C/Zero Headspace; Matrix: Matrix: 0 X 500ml NH3 p w/ H2SO4(pH<2); X 2xambervoa g w/ H3PO4/zero headspace; X 8oz Alk p w/ X 2xambervoa g w/ H3PO4/zero headspace; X 500ml NH3 p w/ H2SO4 (pH<2); X 8oz Alk p w/ If Temp Unacceptable, On Ice? 🐼 to 6 C/Zero Headspace; 0 Time: Sample entered by: 011 Bottle Prep No: Time: Date: Date: 237775 by: 4181P 41810 0800 Page: COFC.PRT C 均

ldh23 19424 Sample No: 11 Date: 6 1874 Relinquished by: Sample No: 10 Samplers: Customer: jbs 05/12/14 1:05:49 PM Account: Address: PAD PC, EC, TC, NO2-N, NO3-N, d-po4-p, o-po4, BOD NA NH3-N, tkm, Alk, tds, tss, po4-p, toc, Phone: NO2-N, NO3-N, d-po4-p, d-po4, BOD WH3-N, tkn, Alk, tds, tss, po4-p, toc, Philadelphia PA 19107 215-656-6561 Ext: USACE, Philadelphia District Gregory Wacik 100 Penn Square East Environmental Resources Branch 2295 WACIK 22 Desc: WA-7 Surface Desc: WA,-6 Deep Work Order: 004035 Work Order Description: Walter Reservoir Received by: Laboratory Receipt Temp: Total Sampling Time (hours): м. Remarks: Chain of Custody J. REIDER ASSOCIATES, INC. Project Leader: Approved By: Th Date: 6-18 14 Received for laboratory by: ι ι ι α Β Ϸ <u>с</u>въ দা যে A 너 A CMB Time: 1 X L Bod p w/ Cool to 6 C; 1 X 16ozNO2NO3 p w/ Cool to 6 C; 1 X 500ml NH3 p w/ H2SO4(pH<2); Ģ Cool to 6 C/Zero Headspace; Coo1 1 X 8oz Alk p w/ Matrix: Matrix: X 8oz Alk p w/ X 2xambervoa g w/ H3PO4/zero headspace; X 16ozNO2NO3 p w/ Cool to 6 C X 500ml NH3 p w/ H2SO4 (pH<2); X 2xambervoa g w/ H3P04/zero headspace; If Temp Unacceptable, On Ice? to 6 C/Zero Headspace; 0 0 Ţime: Sample entered by: 011 Bottle Prep No: 237775 Date: Time: Date: by: 6/18/14 A118119 0800 Page: Ð COFC.PRT

19455 19456 Date: Relinquished by: U Sample No: Sample No: jbs 05/12/14 1:05:49 PM Samplers: Customer: Account: Address: Phone: NO2-N, NO3-N, d-po4-p, of po4, BOD, M NH3-N, tkn, Alk, tds, tss, po4-p, toc, NO2-N, NO3-N, d-po4-p, of po4, BOD YC NH3-N, tkn, Alk, tds, tss, po4-p, toc, 12 Gregory Wacik Ч USACE, Philadelphia District 215-656-6561 Philadelphia PA 19107 100 Penn Square East Environmental Resources Branch 2295 WACik Desc: Desc: WA,7 Deep WA-7 Mid-Depth Time: 6/ Ext: 50 Work Order: 004035 Work Order Description: Walter Reservoir Received by: М Laboratory Receipt Temp: Total Sampling Time (hours): Remarks: Chain of Custody J. REIDER ASSOCIATES, Approved by:\_\_ Date: 67074 Received for laboratory by:// INC. ) , κ α β Ω ¤ ≽ U Ω 너 Θ Deg C. CMB B 1 X L Bod p w/ Cool to 6 C; 1 X 16ozNO2NO3 p w/ Cool to 6 C; 1 X 500ml NH3 p w/ H2SO4 (pH<2); 1 X 8oz Alk p w/ 1 X L Bod p w/ Cool to 6 C; 1 X 16ozNO2NO3 p w/ Cool to 6 C; Cool to 6 C/Zero Headspace; Cool Matrix: 0 Matrix: 0 X 2xambervoa g w/ H3PO4/zero headspace; X 2xambervoa g w/ H3PO4/zero headspace; X 8oz Alk p w/ pol to 6 C/Zero Headspace; X 500ml NH3 p w/ H2SO4 (pH<2); If Temp Unacceptable, On Ice? /fime: 1710 Sample entered by: Bottle Prep No: 237775 Date: Time: Date: Time: by: 0830 1/8/14 0820 Page: COFC.PRT





Attention: Gregory Wacik					Date of F	eport:	07/31	/14
Reported To: USACE, Philadelphia District					Lab ID:		2295	-14-0023406
Environmental Resources Branch								11 0020-100
100 Penn Square East					Date Coll	ected:	07/23	/14 09.00
Philadelphia PA 19107					Collecter	By:	Clien	1 UV.00
·						,.	00101	
Sample Desc: WA-1 Surface					Date Rece	ived:	07/23	/14 18:45
PWSID: 3130843			Ren	Dilutn		Tect	Tect	
	Result	Unit	Limit	Factor	Procedure	Date	Time	Applyct
BACTI								
MICROBIOLOGY								
Escherichia coli	1	mpn/100ml	1	1	SM 9223B	07/24	13:10	PLW
Fecal Coliform	<2	/100mL	2	1	SM 9222D	07/23	19:20	PLW
Total Coliform	>2400	mpn/100ml	1	1	SM 9223B	07/24	13:10	PLW
CHEMISTRY						,		
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	07/24	09:50	HRG
Phosphorus as P, Dissolved	<.05	mg/L	.05	1	SM 4500P-E	07/24	15:15	HRG
Phosphorus as P, Total	0.03	mg/L	.01	1	SM 4500P-E	07/25	14:25	HRG
NITROGÈNS						,		
Nitrogen, Ammonia	<.05	mg/L	.05	1	D6919-03	07/24	11:42	JCL
Nitrogen, Nitrate	0.11	mg/L	.05	1	EPA 353.2	07/24	16:59	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	07/24	14:55	JCL
Nitrogen, Total Kjeldahl	0.28	mg/l	.25	1	EPA 351.2	07/26	15:00	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	07/24	13:15	EMW
Total Organic Carbon	7.4	mg/l	1	1	SM5310 C	07/24	15:53	ALD
RESIDUES						·		
Solids, Total Dissolved	87	mg/l	5	1	SM 2540C	07/28	13:00	тмн
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	07/28	13:00	тмн
TITRATIONS		·						
Alkalinity, Total to pH 4.5	7	mg/l	1	1	SM 2320 B	07/24	10:00	HRG

Reviewed and Approved by:

Mistine 7 'LeV

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		Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst
PWSID: 31308	43			Rep	Dilutn		Test	Test	
Sample Desc:	WA-1 Surface					Date Rec	eived:	07/23	5/14 18:45
	Philadelphia PA 19107					Collected	d By:	Clier	nt.
	100 Penn Square East					Date Col	lected:	07/23	5/14 09:00
	Environmental Resources Branch								
Reported To:	USACE, Philadelphia District					Lab ID:		2295	
Attention:	Gregory Wacik					Date of 1	Report:	07/31	/14

01 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

02 The total coliform sample was placed in the incubator on 07/23/14 at 19:10.

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Attention: Gregory Wacik Reported To: USACE, Philadelphia District Environmental Resources Branch					Date of F Lab ID:	eport:	07/31 2295	/14 -14-002340
100 Penn Square East Philadelphia PA 19107					Date Coll Collected	.ected:   By:	07/23 Clien	/14 07:00 It
Sample Desc: WA-2 Surface					Date Rece	eived:	07/23/14 18:45	
PWSID: 3130843			Rep	Dilutn		Test	Test	
	Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst
BACTI					ی بی بی بوجر مرحد می با		<u> </u>	
MICROBIOLOGY								
Escherichia coli	4	mpn/100ml	1	1	SM 9223B	07/24	13:10	PLW
Fecal Coliform	3	/100mL	2	1	SM 9222D	07/23	19:20	PLW
Total Coliform	>2400	mpn/100ml	1	1	SM 9223B	07/24	13:10	PLW
CHEMISTRY						,		
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	07/24	09:50	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	07/24	15:15	HRG
Phosphorus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	07/25	14:25	HRG
NITROGENS						-		
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	07/24	11:57	JCL
Nitrogen, Nitrate	0.08	mg/l	. 05	1	EPA 353.2	07/24	17:00	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	07/24	14:55	JCL
Nitrogen, Total Kjeldahl	<.25	mg/l	.25	1	EPA 351.2	07/26	15:01	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	07/24	13:15	EMW
Total Organic Carbon	5.5	mg/l	1	1	SM5310 C	07/24	16:30	ALD
RESIDUES								
Solids, Total Dissolved	65	mg/l	5	1	SM 2540C	07/28	13:00	TMH
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	07/28	13:00	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	6	mg/L	1	1	SM 2320 B	07/24	10:15	HRG

Reviewed and Approved by: Mistike M. Sistew

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ENVIRONMENTAL TESTING LABORATORY 107 ANGELICA STREET, READING, PA 19611 PHONE: 610-374-5129 • FAX: 610-374-7234 • www.mjreider.com NELAP accredited by PA. (PADEP #06-00003) (NYSDOH11630) Visit our website to view our current

NELAC accreditations for various drinking water, wastewater and solid & chemical materials analytes.

ACIL Seal of Excellence





		Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst
PWSID: 31308	43			Rep	Dilutn		Test	Test	
Sample Desc: WA-2 Surface						Date Received:		07/23/14 18:45	
	Philadelphia PA 19107					Collected	l By:	Clier	nt
	100 Penn Square East					Date Coll	ected:	07/23	3/14 07:00
	Environmental Resources Branch								
Reported To:	USACE, Philadelphia District					Lab ID:		2295	-14-0023407
Attention:	Gregory Wacik					Date of F	Report:	07/31	/14

01 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

O2 The total coliform sample was placed in the incubator on O7/23/14 at 19:10.

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Attention: Gregory Wacik				Date of Report:		07/31/14			
Reported To:	USACE, Philadelphia District	CE, Philadelphia District				Lab ID:	•	, , , , , , , , , , , , , , , , , , , ,	
	Environmental Resources Branch								
	100 Penn Square East					Date Coll	ected:	07/23	/14 07:00
Philadelphia PA 19107						Collected By:		Client	
Sample Desc:	WA-2 Mid-Depth					Date Rece	ived:	07/23/14 18:45	
PWSID: 31308	343			Rep	Dilutn		Test	Test	
		Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst
CHEMISTRY						رجم بدير الدر عن عن عن عن الد الله الله الم	···· ··· ··· ··· ··· ···		
COLORMETRI	C								
Phosph	nate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	07/24	09:50	HRG
Phosph	norus as P, Dissolved	<.05	mg/L	.05	1	SM 4500P-E	07/24	15:15	HRG
Phosph	norus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	07/25	14:25	HRG
NITROGENS							,		
Nitrog	jen, Ammonia	<.05	mg/l	.05	1	D691903	07/24	12:11	JCL
Nitrog	jen, Nitrate	0.10	mg/l	.05	1	EPA 353.2	07/24	17:01	JCL
Nitrog	jen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	07/24	14:58	JCL
Nitrog	jen, Total Kjeldahl	<.25	mg/l	.25	1	EPA 351.2	07/26	15:02	JCL
OTHER									
Bioche	mical Oxygen Demand	<2	mg/l	2	1	SM 5210B	07/24	13:15	EMW
Total	Organic Carbon	6.7	mg/l	1	1	SM5310 C	07/24	17:19	ALD
RESIDUES									
Solids	, Total Dissolved	58	mg/l	5	1	SM 2540C	07/28	13:00	ТМН
Solids	, Total Suspended	<3	mg/l	3	1	SM 2540D	07/28	13:00	тмн
TITRATIONS	1								
Alkali	nity, Total to pH 4.5	7	mg/l	1	1	SM 2320 B	07/24	10:15	HRG

01 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

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Mustine M.

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		Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst
PWSID: 31308	43			Rep	Dilutn		Test	Test	
Sample Desc:	WA-2 Mid-Depth					Date Received:		07/23	6/14 18:45
	Philadelphia PA 19107					Collected	By:	Clier	it
	100 Penn Square East					Date Coll	ected:	07/23	/14 07:00
Reported Io:	USACE, Philadelphia District					Lab ID:		2295	-14-0023408
Attention:	Gregory Wacik					Date of R	eport:	07/31	/14

02 The duplicate analysis of this sample for total dissolved solids was outside the recommended limit of 5% of their average weight.

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Attention: Gregory Wacik Reported To: USACE, Philadelphia District Environmental Resources Branch 100 Penn Square East Philadelphia PA 19107						Date of Report: Lab ID: Date Collected: Collected By:		07/31 2295 07/23 Clier	/14 14-0023409 5/14 07:00 at
Sample Desc: WA-2 De	eep					Date Rece	ived:	07/23	6/14 18:45
PWSID: 3130843		Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY		ر پریم این من من من این این بین این این این این این این این این این ا					بسر بسر النا سا الل		
COLORMETRIC									
Phosphate as F	, Ortho	<.01	mg/l	.01	1	SM 4500P-E	07/24	09:50	HRG
Phosphorus as	P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	07/24	15:15	HRG
Phosphorus as	P, Total	<.01	mg/l	.01	1	SM 4500P-E	07/25	14:25	HRG
NITROGENS							,		
Nitrogen, Ammo	mia	0.07	mg/l	.05	1	D6919-03	07/24	12:26	JCL
Nitrogen, Nitr	ate	0.10	mg/l	.05	1	EPA 353.2	07/24	17:02	JCL
Nitrogen, Nitr	ite	<.05	mg/l	.05	1	EPA 353.2	07/24	14:59	JCL
Nitrogen, Tota	al Kjeldahl	0.36	mg/l	.25	1	EPA 351.2	07/26	15:04	JCL
OTHER		-							
Biochemical Ox	kygen Demand	<2	mg/l	2	1	SM 5210B	07/24	13:15	EMW
Total Organic	Carbon	7.5	mg/l	1	1	SM5310 C	07/24	17:37	ALD
RESIDUES									
Solids, Total	Dissolved	79	mg/l	5	1	SM 2540C	07/28	13:00	тмн
Solids, Total	Suspended	9	mg/l	3	1	SM 2540D	, 07/28	13:00	тмн
TITRATIONS							,		
Alkalinity, To	otal to pH 4.5	8	mg/l	1	1	SM 2320 B	07/24	10:15	HRG

01 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

Distribution of Reports:

Reviewed and Approved by: Mustike n telee

Christina Kistler Account Executive

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Attention: Gregory Wacik					Date of R	eport:	07/31	/14
Reported To: USACE, Philadelphia District					Lab ID:		2295	-14-0023410
Environmental Resources Branch								
100 Penn Square East					Date Coli	ected:	07/23	/14 09:20
Philadelphia PA 19107					Collected	By:	Clien	t
Sample Desc: WA-3 Surface					Date Rece	ived:	07/23	/14 18:45
PWSID: 3130843			Rep	Dilutn		Test	Test	
	Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst
BACTI	، مسترحمة الماركين الماركين الماركين الماركين							
MICROBIOLOGY								
Escherichia coli	22	mpn/100ml	1	1	SM 9223B	07/24	13:10	PLW
Fecal Coliform	28	/100mL	2	1	SM 9222D	07/23	19:20	PLW
Total Coliform	>2400	mpn/100ml	1	1	SM 9223B	07/24	13:10	PLW
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	07/24	09:50	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	07/24	15:20	HRG
Phosphorus as P, Total	0.02	mg/l	.01	1	SM 4500P-E	07/25	14:25	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	. 05	1	D6919-03	07/24	12:41	JCL
Nitrogen, Nitrate	0.13	mg/l	.05	1	EPA 353.2	07/24	17:04	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	07/24	15:02	JCL
Nitrogen, Total Kjeldahl	0.37	mg/l	. 25	1	EPA 351.2	07/26	15:05	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	07/24	13:15	EMW
Total Organic Carbon	7.2	mg/L	1	1	SM5310 C	07/24	17:55	ALD
RESIDUES								
Solids, Total Dissolved	92	mg/l	5	1	SM 2540C	07/28	13:00	тмн
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	07/28	13:00	тмн
TITRATIONS								
Alkalinity, Total to pH 4.5	7	mg/l	1	1	SM 2320 B	07/24	10:15	HRG

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Attention:	Gregory Wacik					Date of R	eport:	07/31/	/14
Reported To:	USACE, Philadelphia District					Lab ID:		2295-	-14-0023410
	Environmental Resources Branch								
	100 Penn Square East					Date Coll	ected:	07/23	/14 09:20
	Philadelphia PA 19107					Collected	By:	Client	t
Sample Desc:	WA-3 Surface					Date Rece	ived:	07/23,	/14 18:45
PWSID: 313084	43			Rep	Dilutn		Test	Test	
		Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst

01 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

O2 The total coliform sample was placed in the incubator on O7/23/14 at 19:10.

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Reported To: USACE, Philadelphia District Environmental Resources Branch					Date of F Lab ID:	leport:	07/31 2295	/14 14-0023411
100 Penn Square East					Date Coll	ected.	07/27	714 09.55
Philadelphia PA 19107					Collected	By:	Clien	it
Sample Desc: WA-4 Surface					Date Rece	ived:	07/23	/14 18:45
PWSID: 3130843			Rep	Dilutn		Test	Test	
	Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst
BACTI								
MICROBIOLOGY								
Escherichia coli	73	mpn/100ml	1	1	SM 9223B	07/24	13:10	PLW
Fecal Coliform	78	/100mL	2	1	SM 9222D	07/23	19:20	PLW
Total Coliform	>2400	mpn/100ml	1	1	SM 9223B	07/24	13:10	PLW
CHEMISTRY		• •				,		
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	07/24	09:50	HRG
Phosphorus as P, Dissolved	<.05	mg/L	.05	1	SM 4500P-E	07/24	15:20	HRG
Phosphorus as P, Total	0.01	mg/l	.01	1	SM 4500P-E	07/25	14:28	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	07/24	12:55	JCL
Nitrogen, Nitrate	0.12	mg/l	.05	1	EPA 353.2	07/24	17:05	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	07/24	15:03	JCL
Nitrogen, Total Kjeldahl	0.3	mg/l	, 25	1	EPA 351.2	07/29	11:51	ALD
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	07/24	13:15	EMW
Total Organic Carbon	3.4	mg/l	1	1	SM5310 C	07/24	18:11	ALD
RESIDUES								
Solids, Total Dissolved	85	mg/L	5	1	SM 2540C	07/28	13:00	тмн
Solids, Total Suspended	3	mg/l	3	1	SM 2540D	07/28	13:00	ТМН
TITRATIONS		·						
Alkalinity, Total to pH 4.5	11	mg/l	1	1	SM 2320 B	07/24	10:30	HRG

Mustike M. Gutle

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		Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst
PWSID: 31308	43			Rep	Dilutn		Test	Test	
Sample Desc:	WA-4 Surface					Date Rece	eived:	07/23	3/14 18:45
	Philadelphia PA 19107					Collected	By:	Clier	nt
	100 Penn Square East					Date Coll	ected:	07/23	5/14 09:55
	Environmental Resources Branch								
Reported To:	USACE, Philadelphia District					Lab ID:		2295	-14-0023411
Attention:	Gregory Wacik					Date of R	eport:	07/31	/14

- 01 One of the matrix spike/matrix spike duplicate results was outside of the recommended range but the other passed the criteria for TKN.
- O2 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.
- 03 The total coliform sample was placed in the incubator on 07/23/14 at 19:10.

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Attention: Gregory Wacik Reported To: USACE, Philadelphia District Environmental Resources Branch					Date of F Lab ID:	eport:	07/31 2295	/14 -14-0023412
100 Penn Square East					Date Coll	ected:	07/27	3/14 10-10
Philadelphia PA 19107					Collected	By:	Clier	nt 10.10
Sample Desc: WA-5 Surface					Date Rece	Date Received:		5/14 18:45
PWSID: 3130843			Rep	Dilutn		Test	Test	
	Result	Unit	Limit.	Factor	Procedure	Date	Time	Analyst
BACTI		یس نین این وہ ردم بردر بعد بعد بعد اس ایسا <del>این</del> ا						
MICROBIOLOGY								
Escherichia coli	3	mpn/100ml	1	1	SM 9223B	07/24	13:10	PLW
Fecal Coliform	11	/100ml	2	1	SM 9222D	07/23	19:20	PLW
Total Coliform	>2400	mpn/100ml	1	1	SM 9223B	, 07/24	13:10	PLW
CHEMISTRY						,		
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	07/24	09:50	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	07/24	15:20	HRG
Phosphorus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	07/25	14:28	HRG
NITROGENS						·		
Nitrogen, Ammonia	< 05	mg/l	. 05	1	D6919-03	07/24	13:39	JCL
Nitrogen, Nitrate	0.11	mg/l	.05	1	EPA 353.2	07/24	17:08	JCL
Nitrogen, Nitrite	<.05	mg/l	. 05	1	EPA 353.2	07/24	15:04	JCL
Nitrogen, Total Kjeldahl	<.25	mg/l	.25	1	EPA 351.2	07/29	11:56	ALD
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	07/24	13:15	EMW
Total Organic Carbon	2.6	mg/l	1	1	SM5310 C	07/24	18:27	ALD
RESIDUES								
Solids, Total Dissolved	73	mg/l	5	1	SM 2540C	07/28	13:00	ТМН
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	07/28	13:00	тмн
TITRATIONS		·				,		
Alkalinity, Total to pH 4.5	4	mg/l	1	1	SM 2320 B	07/24	10:30	HRG

Reviewed and Approved by: Mistize n ttw

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Attention:	Gregory Wacik					Date of R	eport:	07/31	/14
Reported To:	USACE, Philadelphia District					Lab ID:		2295	-14-0023412
	Environmental Resources Branch								
	100 Penn Square East					Date Coll	ected:	07/23	/14 10:10
	Philadelphia PA 19107					Collected	Ву:	Clien	t
Sample Desc:	WA-5 Surface					Date Rece	ived:	07/23	/14 18:45
PWSID: 31308	43			Rep	Dilutn		Test	Test	
		Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst

O1 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

O2 The total coliform sample was placed in the incubator on O7/23/14 at 19:10.

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Attention: Gregory Wacik					Date of R	Report:	07/31	/14
Reported To: USACE, Philadelphia District					Lab ID:	•	2295	, 
Environmental Resources Branch								
100 Penn Square East					Date Coll	.ected:	07/23	/14 07:35
Philadelphia PA 19107					Collected	l By:	Clien	, it
Sample Desc: WA-6 Surface					Date Rece	eived:	07/23	/14 18:45
PWSID: 3130843			Rep	Dilutn		Test	Test	
	Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst
BACTI								
MICROBIOLOGY								
Escherichia coli	<1	mpn/100ml	1	1	SM 9223B	07/24	13:10	PLW
Fecal Coliform	<2	/100mL	2	1	SM 9222D	, 07/23	19:35	PLW
Total Coliform	>2400	mpn/100ml	1	1	SM 9223B	, 07/24	13:10	PLW
CHEMISTRY						•		
COLORMETRIC								
Phosphate as P, Ortho	0.02	mg/l	.01	1	SM 4500P-E	07/24	09:53	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	07/24	15:20	HRG
Phosphorus as P, Total	0.02	mg/l	.01	1	SM 4500P-E	07/25	14:28	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/L	.05	1	D6919-03	07/24	13:54	JCL
Nitrogen, Nitrate	0.08	mg/l	.05	1	EPA 353,2	07/24	17:09	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	07/24	15:05	JCL
Nitrogen, Total Kjeldahl	<.25	mg/l	.25	1	EPA 351.2	07/29	11:57	ALD
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	07/24	13:15	EMW
Total Organic Carbon	5.2	mg/l	1	1	SM5310 C	07/24	18:44	ALD
RESIDUES								
Solids, Total Dissolved	55	mg/l	5	1	SM 2540C	07/28	13:00	тмн
Solids, Total Suspended	<3	mg/L	3	1	SM 2540D	07/28	13:00	тмн
TITRATIONS						-		
Alkalinity, Total to pH 4.5	5	mg/l	1	1	SM 2320 B	07/24	10:30	HRG

Muture M. Subtle

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		Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst
PWSID: 313084	43			Rep	Dilutn		Test	Test	
Sample Desc:	WA-6 Surface					Date Rece	ived:	07/23	6/14 18:45
	Philadelphia PA 19107					Collected	ected: By:	O7/23 Clien	0/14 07:35 it
	Environmental Resources Branch					Dotto Coll		07/07	141 07-75
Attention: Reported To:	Gregory Wacik USACE, Philadelphia District					Date of R Lab ID:	eport:	07/31 2295	/14 -14-0023413

O1 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

O2 The total coliform sample was placed in the incubator on 07/23/14 at 19:10.

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Attention: Gregory Wacik					Date of R	leport:	07/31	/14
Reported To: USACE, Philadelphia District					Lab ID:		2295	-14-0023414
Environmental Resources Branch								
100 Penn Square East					Date Coll	.ected:	07/23	/14 07:35
Philadelphia PA 19107					Collected	l By:	Clien	t
Sample Desc: WA-6 Mid-Depth					Date Rece	eived:	07/23	/14 18:45
PWSID: 3130843			Rep	Dilutn		Test	Test	
	Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	07/24	09:53	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	07/24	15:20	HRG
Phosphorus as P, Total	0.02	mg/l	.01	1	SM 4500P-E	07/25	14:28	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	. 05	1	D6919-03	07/24	14:08	JCL
Nitrogen, Nitrate	0.11	mg/L	.05	1	EPA 353.2	07/24	17:10	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	07/24	15:06	JCL
Nitrogen, Total Kjeldahl	<.25	mg/l	.25	1	EPA 351.2	07/29	11:58	ALD
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	07/24	13:15	EMW
Total Organic Carbon	6.7	mg/l	1	1	SM5310 C	07/24	20:16	ALD
RESIDUES								
Solids, Total Dissolved	70	mg/l	5	1	SM 2540C	07/28	13:00	тмн
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	07/28	13:00	ТМН
TITRATIONS								
Alkalinity, Total to pH 4.5	7	mg/l	1	1	SM 2320 B	07/24	10:30	HRG

01 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

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Attention: Gregory Wacik Reported To: USACE, Philadelphia District Environmental Resources Branch 100 Penn Square East Philadelphia PA 19107						Date of Report: Lab ID: Date Collected: Collected By:		07/31 2295 07/23 Clien	/14 14-0023415 /14 07:35 it
Sample Desc:	WA-6 Deep					Date Rece	vived:	07/23	/14 18:45
PWSID: 313084	43	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY									
COLORMETRI	c								
Phospha	ate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	07/24	09:53	HRG
Phosph	orus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	07/24	15:20	HRG
Phosph	orus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	07/25	14:28	HRG
NITROGENS									
Nitrog	en, Ammonia	<.05	mg/l	.05	1	D6919-03	07/24	14:23	JCL
Nitrog	en, Nitrate	0.10	mg/l	.05	1	EPA 353.2	07/24	17:11	JCL
Nitrog	en, Nitrite	<.05	mg/l	.05	1	EPA 353.2	07/24	15:07	JCL
Nitrog	en, Total Kjeldahl	<.25	mg/l	.25	1	EPA 351.2	07/29	11:59	ALD
OTHER									
Bioche	mical Oxygen Demand	<2	mg/l	2	1	SM 5210B	07/24	13:15	EMW
Total (	Organic Carbon	7.3	mg/l	1	1	SM5310 C	07/24	20:34	ALD
RESIDUES									
Solids	, Total Dissolved	72	mg/l	5	1	SM 2540C	07/28	13:00	ТМН
Solids	, Total Suspended	7	mg/L	3	1	SM 2540D	07/28	13:00	ТМН
TITRATIONS			- •				,		
Alkali	nity, Total to pH 4.5	7	mg/l	1	1	SM 2320 B	07/24	10:45	HRG

01 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

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Attention: Gregory Wacik					Date of R	eport:	07/31	/14
Reported To: USACE, Philadelphia District					Lab ID:		2295	-14-0023416
Environmental Resources Branch								
100 Penn Square East					Date Coll	ected:	07/23	3/14 07:55
Philadelphia PA 19107					Collected	By:	Clier	) t
Sample Desc: WA-7 Surface					Date Rece	ived:	07/23	5/14 18:45
PWSID: 3130843			Rep	Dilutn		Test	Test	
	Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst
BACTI					inna mari mur, yana para para para kasa kasa			
MICROBIOLOGY								
Escherichia coli	1	mpn/100ml	1	1	SM 9223B	07/24	13:10	PLW
Fecal Coliform	<2	/100ml	2	1	SM 9222D	07/23	19:35	PLW
Total Coliform	>2400	mpn/100ml	1	1	SM 9223B	07/24	13:10	PLW
CHEMISTRY						,		
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	07/24	09:53	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	07/24	15:20	HRG
Phosphorus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	07/25	14:32	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	. 05	1	D6919-03	07/24	14:37	JCL
Nitrogen, Nitrate	0.08	mg/l	.05	1	EPA 353.2	07/24	17:12	JCL
Nitrogen, Nitrite	<.05	mg/l	. 05	1	EPA 353.2	07/24	15:08	JCL
Nitrogen, Total Kjeldahl	<.25	mg/l	.25	1	EPA 351.2	07/29	12:00	ALD
OTHER						-		
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	07/24	13:15	EMW
Total Organic Carbon	5.7	mg/l	1	1	SM5310 C	07/24	20:51	ALD
RESIDUES								
Solids, Total Dissolved	57	mg/l	5	1	SM 2540C	07/28	13:35	тмн
Solids, Total Suspended	5	mg/l	3	1	SM 2540D	07/28	13:00	ТМН
TITRATIONS						-		
Alkalinity, Total to pH 4.5	5	mg/l	1	1	SM 2320 B	07/24	10:45	HRG

Reviewed and Approved by: Wistore M. Estle

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		Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst
PWSID: 31308	43			Rep	Dilutn		Test	Test	
Sample Desc: WA-7 Surface						Date Received:		07/23/14 18:45	
	Philadelphia PA 19107					Collected	H By:	Clier	nt.
	100 Penn Square East					Date Col	lected:	07/23	3/14 07:55
	Environmental Resources Branch								
Reported To:	USACE, Philadelphia District					Lab ID:		2295	-14-0023416
Attention:	Gregory Wacik					Date of I	Report:	07/31	/14

O1 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

O2 The total coliform sample was placed in the incubator on 07/23/14 at 19:10.

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istle Christina Kistler

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Attention: Gregory Wacik Reported To: USACE, Philadelphia District Environmental Resources Branch					Date of R Lab ID:	eport:	07/31/14 2295-14-0023417		
100 Penn Square East Philadelphia PA 19107	quare East ia PA 19107					ected: By:	07/23/14 07:55 Client		
Sample Desc: WA-7 Mid-Depth					Date Received:		07/23/14 18:45		
PWSID: 3130843	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst	
CHEMISTRY									
COLORMETRIC									
Phosphate as P, Ortho	0.03	mg/l	.01	1	SM 4500P-E	07/24	09:55	HRG	
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	07/24	15:20	HRG	
Phosphorus as P, Total	0.03	mg/l	.01	1	SM 4500P-E	07/25	14:32	HRG	
NITROGENS									
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	07/24	14:52	JCL	
Nitrogen, Nitrate	0.10	mg/l	.05	1	EPA 353.2	07/24	17:13	JCL	
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	07/24	15:09	JCL	
Nitrogen, Total Kjeldahl	<.25	mg/L	.25	1	EPA 351.2	07/29	11:01	ALD	
OTHER									
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	07/24	13:15	EMW	
Total Organic Carbon	7.6	mg/l	1	1	SM5310 C	07/24	21:08	ALD	
RESIDUES									
Solids, Total Dissolved	57	mg/l	5	1	SM 2540C	07/28	13:35	ТМН	
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	07/28	13:00	TMH	
TITRATIONS									
Alkalinity, Total to pH 4.5	6	mg/l	1	1	SM 2320 B	07/24	10:45	HRG	

01 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

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Reviewed and Approved by:

Wistore m. Extle

Christina Kistler Account Executive

Page 1 of 1

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Attention: Gregory Wacik Reported To: USACE, Philadelphia District Environmental Resources Branch 100 Penn Square East Philadelphia PA 19107					Date of F Lab ID: Date Coll Collected	eport: .ected: By:	07/31/14 2295-14-0023418 07/23/14 07:55 Client	
Sample Desc: WA-7 Deep					Date Rece	eived:	07/23/14 18:45	
PWSID: 3130843	Result	Unit .	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY		en		• •				
COLORMETRIC								
Phosphate as P, Ortho	0.02	mg/l	.01	1	SM 4500P-E	07/24	09:55	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	07/24	15:25	HRG
Phosphorus as P, Total	0.02	mg/l	.01	1	SM 4500P-E	07/25	14:27	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	07/24	15:07	JCL
Nitrogen, Nitrate	0.10	mg/l	.05	1	EPA 353.2	07/24	17:14	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	07/24	15:10	JCL
Nitrogen, Total Kjeldahl	0.35	mg/l	.25	1	EPA 351.2	07/29	12:02	ALD
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	07/24	13:15	EMW
Total Organic Carbon	7.7	mg/l	1	1	SM5310 C	07/24	21:26	ALD
RESIDUES								
Solids, Total Dissolved	51,	mg/l	5	1	SM 2540C	07/28	13:35	ТМН
Solids, Total Suspended	6	mg/L	3	1	SM 2540D	07/28	13:35	ТМН
TITRATIONS						ł		
Alkalinity, Total to pH 4.5	6	mg/l	1	1	SM 2320 B	07/24	10:45	HRG

01 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

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COFC.PRT Page: 1	No: 239131	Bottle Prep by: lacceptable, On Ice? (Y) N	Date: $7/23/14$ Time: $7/23/14$ V/ Cool to 6 C; D3 p w/ H3P04/zero headspace; D4 w/ H3P04/zero headspace;	Time: $7/23/i4$ Time: $7/23/i4$ Time: $7/23/i4$ Time: $7/23/i4$ Time: $7/23/i4$ Time: $7/23/i4$ Time: $7/23/i4$ Time: $7/23/i4$ To P w/ State (pH<2); To W/ H3P04/zero headspace; p w/ H3P04/zero headspace; p w/ To P mathematical for the time for the	Rarael Quiled me: 1845 Sample entered by:
M. J. REIDER ASSOCIATES, INC.	Chain of Custody Project Leader: CMB n: Walter Reservoir Remarks:	Total Sampling Time (hours): Laboratory Receipt Temp: <u>C</u> Deg C. If Temp Ur Approved By: <u>C</u> AC	Matrix: 0 A - 1 X 250mlMicx B - 1 X 160d p v C - 1 X 160zNO2NC D - 1 X 2xamberVO F - 1 X 2xamberVO F - 1 X 802 Alk F	Matrix: 0 A - 1 X 250mlMics B - 1 X 160zN02N0 C - 1 X 160zN02N0 E - 1 X 2xambervo F - 1 X 80z Alk H Cool to 6 C/2	L Luijade Received for laboratory by: Date: 7/2 Tir
jds 06/05/14 1:30:21 PM	Account: 2295 Work Order: 004035 Work Order Descriptic Customer: Gregory Wacik	Address: USACE, Philadelphia District Environmental Resources Branch 100 Penn Square East Philadelphia PA 19107 Phone: 215-656-6561 Ext: Samplers:	, Sample No: 1 Desc: WA-1 Surface FC, ECM TC, NO2-N, NO3-N, d-po4-p, olpo4, BOD NH3-N, thn, Alk, tds, tss, po4-p, toc,	Sample No: 2 Desc: WA-2 Surface FC, EG, TC, NO2-N, NO3-N, d-po4-p, o-p04, BOD, NH3-N, tkn, Alk, tds, tss, po4-p, toc,	Relinquished by: $23/14$ Market $3:50$ Date: $3/23/14$ Time: $3:50$
	-		source 2	10422	

	jbs 06/05/14 1:30:21 PM	M. J. REIDER ASSOCIATES, INC. Page: 2
		Chain of Custody
	Account: 2295 Work Order: 004035 Work Order Descripti	Froject Leader: CMB on: Walter Reservoir
	Customer: Gregory Wacik	Remarks:
	Address: USACE, Philadelphia District Environmental Resources Branch	
	100 Penn Square East Philadelphia PA 19107	Total Sampling Time (hours):Bottle Prep by:
	Phone: 215-656-6561 Ext: samplers: $\mathcal{UAC}^{\circ}\mathcal{K}$	Laboratory Receipt Temp: $\bigcup_{\text{Approved By:}} Deg C H Hemp Unacceptable, On Ice? O^{\dagger} N$
23408	sample No: 3 Desc: WA-2 Mid-Depth	Matrix: 0 Date: $\frac{7/23/r4}{7.00}$
Ĭ	NO2-N, NO3-N, d-po4-p, o-po4, BOD	A - 1 X L Bod p w/ Cool to 6 C; B - 1 X 160ZN02N03 p w/ Cool to 6 C;
	NH3-N, thm, Alk, tds, tss, $po4-p$ , toc,	C - 1 X 500ml NH3 P_W/ H2SO4(pH<2); D - 1 X 2xambervoa g w/ H3PO4/zero headspace; R - 1 X 802 Alk p w/
		Cool to 6 C/Zero Headspace; $-\int_{-}^{-} \int_{-}^{-} \int_{-}$
23409	Sample No: 4 Desc: WA-2 Deep	Matrix: 0 Date: // // J Time: 7700
	NO2-N, NO3-N, d-po4-p, o-po4, BOD WV NH3-N, thm, Alk, tds, tss, po4-p, toc,	<ul> <li>A - 1 X L Bod p w/ Cool to 6 C;</li> <li>B - 1 X 16ozNO2NO3 p w/ Cool to 6 C;</li> <li>C - 1 X 500ml NH3 p w/ H2SO4 (pH&lt;2);</li> <li>D - 1 X 2xambervoa g w/ H3PO4/zero headspace;</li> </ul>
		E - 1 X 802 ALK P W/ Cool to 6 C/Zero Headspace;
01422	Sample No. 5 Desc: WA-3 Surface	Matrix: 0 Date: 1/23/19 Time: 0920
1	FC, EC, TC, H, a-po4-p, o-po4, BOD, NO2-N, NO3-N, d-po4-p, o-po4, BOD, NH3-N, thm, Alk, tds, tss, po4-p, toc,	<ul> <li>A - 1 X 250mlMicro P w/ Sterile/Na2S203;</li> <li>B - 1 X L Bod p w/ Cool to 6 C;</li> <li>C - 1 X 16ozN02N03 p w/ Cool to 6 C;</li> <li>D - 1 X 500ml NH3 p w/ H2S04(pH&lt;2);</li> <li>F - 1 X 2xambervoa g w/ H3P04/zero headspace;</li> <li>F - 1 X 802 Alk p w/</li> </ul>
	(	COOL CO & C/ ZELO REAUSPACE
	a lander	which being the second for laboratory by: Rughe Leingade
	$\frac{\text{Kelinquished by}}{\text{Date: 7/23/i4}} \frac{1}{\text{Time: 3:30}}$	Date: $7/23/14$ Time: $1845$
	1222	Sample entered by: $\overbrace{\mathcal{W}}$

COFC.PRT Page: 3	No: 239131	E Temp Unacceptable, On Ice? Y N	rix: 0 Date: $7/23/17$ 250mlMicro P w/ Sterile/Na2S203; L Bod p w/ Cool to 6 C; 16ozN02N03 p w/ Cool to 6 C; 500ml NH3 p w/ H2S04 (pH<2); 2xambervoa g w/ H3P04/zero headspace; 80z Alk p w/ to 6 C/Zero Headspace;	rix: 0 Date: 7/23//4 Time: 7/23//4 250mlMicro P w/ Sterile/Na2S203; L Bod p w/ Cool to 6 C; 16ozNO2N03 p w/ Cool to 6 C; 500ml NH3 p w/ H3P04/zero headspace; 8cz Alk p w/ to 6 C/Zero Headspace;	tory by: Rafael Qui Jada Time: 1845 Sample entered by:
M. J. REIDER ASSOCIATES, INC. Chain of Custody	004035 Project Leader: CMB sscription: Walter Reservoir Remarks:	Total Sampling Time (hours): Laboratory Receipt Temp: CDeg G. I Approved By:	Mat В	Mat A - 1 X C - 1 X F - 1 X F - 1 X F - 1 X Cool	Mull Luipade ived by: Refael Without Received for labora
jbs 06/05/14 1:30:23 PM	Account: 2295 Work Order: Work Order De Customer: Gregory Wacik	Address: USACE, Philadelphia District Environmental Resources Branch 100 Penn Square East Phone: 215-656-6561 Ext: Samplers:	Sample No: 6 Desc: WA-4 Surface FC, EC, TC, NO2-N, MO3-N, d-Po4-P, olf04, BOD NH3-N, tkn, Alk, tds, tss, po4-P, toc,	Sample No: 7 Desc: WA-5 Surface FC, EC, TC, NO2-N, NO3-N, d-po4-p, o-po4, BOD, MA3-N, tkn, Alk, tds, tss, po4-p, toc,	Relinquished by $\frac{1}{173}$ CM $\frac{1}{173}$ Recei
			11422	21/22	

ER ASSOCIATES, INC. Page: 5 Custody	Project Leader: CMB No: 239131 servoir ling Time (hours): Bottle Prep by: Receipt Temp: Unacceptable, On Ice? W	Matrix: 0       Date: $\gamma/23/if$ A - 1 X L Bod p w/ Cool to 6 C; $0.73S$ B - 1 X 16ozN02N03 p w/ Cool to 6 C; $0.73S$ C - 1 X 500ml NH3 p w/ H2S04 (pH<2); $0.1 X 2xambervoa g w/ H3P04/zero headspace;         E - 1 X 802 Alk p w/       0.1 X 2xambervoa g w/ H3P04/zero headspace;   $	Matrix: 0 Date: 7/23/M Matrix: 0 Date: 7/23/M A - 1 X 250mlMicro P w/ Sterile/Na2S203; B - 1 X L Bod p w/ Cool to 6 C; C - 1 X 16ozNO2NO3 p w/ Cool to 6 C; D - 1 X 500ml NH3 p w/ H2SO4 (pH<2); E - 1 X 2xambervoa g w/ H3PO4/Zero headspace; F - 1 X 8oz Alk p w/ Cool to 6 C/Zero Headspace)	Received for laboratory by: Refael Gui Jeda Date: 713/14 Time: 1845
M. J. REIDE Chain of	ler: 004035 Jer Description: Walter Res Remarks: Ch Total Sampl Iaboratory	0C,	ž	Received by:
/14 l:30:23 PM	umt: 2295 Work Ord mer: Gregory Wacik ess: USACE, Philadelphia District Environmental Resources Branc 100 Penn Square East Philadelphia PA 19107 one: 215-656-6561 Ext: ers:	e No: 10 Desc: Wa-6 Deep 02-N, NO3-N, d-po4-p, o-bo4, Bop H3-N, tkm, Alk, tds, tss, po4-p, to	e No: 11 Desc: WA-7 Surface C, EC, TC, NV 02-N, NO3-N, d-po4-p, o-p04, BOD, H3-N, tkm, Alk, tds, tss, po4-p, to	quished by 1 All Time: 3:30
jbs 06/05/	Accou Custor Addre Phc Sample	Z 3415 Sample No	Propies 2416 Sample	Relinc Date:

, mar

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COFC.PRT Page: 6		No: 239131			Bottle Prep by:	Temp Unacceptable, On Ice? T N	ix: 0 Date: $7/23/7$ Bod p w/ Cool to 6 C; 60zN02N03 p w/ Cool to 6 C; 00ml NH3 p w/ H2SO4 (pH<2); xambervoa g w/ H3PO4/zero headspace;	ix: 0 Date: $7/23/14$ Bod p w/ Cool to 6 C; $62xSS$ 602N02N03 p w/ Cool to 6 C; 00ml NH3 p w/ H2S04 (pH<2); xambervoa g w/ H3P04/zero headspace; oz Alk p w/ to 6 C/Zero Headspace;	ory by: Rafael Quijed Time: 1845 Sample entered by:
M. J. REIDER ASSOCIATES, INC.	Chain of Custody	Project Leader: CMB : Walter Reservoir	Remarks:		Total Sampling Time (hours):	Laboratory Receipt Temp: C Deg C. If Approved By: D	мант Мант В - 1 - 2 С - 1 - 2 В - 2 В - 1 - 2 В - 2 В - 1 - 2 В -	Math Math B C C C C C C C C C C C C C C C C C C	L Luijade Ifael Quijada Received for laborat
jbs 06/05/14 1:30:24 PM		Account: 2295 Work Order: 004035 Work Order Description:		Address: USACE, Philadelphia District Environmental Resources Branch	100 Penn Square East Philadelphia PA 19107	Phone: 215-656-6561 Ext: Samplers: $WACW$	Sample No: 12 Desc: WA-7 Mid-Depth NO2-N, NO3-N, d-po4-p, o-po4, BOD NH3-N, tkn, Alk, tds, tss, po4-p, toc,	Sample No: 13 Desc: WA-7 Deep NO2-N, NO3-N, d-po4-p, o-po4, BOD M NH3-N, tkn, Alk, tds, tss, po4-p, toc,	Relinquished by: $\frac{1}{23/14}$ Time: $\frac{3:30}{125}$
							1H223411	23418	

.





Attention: Gregory Wacik Reported To: USACE, Philadelphia District Environmental Resources Branch					Date of F Lab ID:	leport:	08/21/14 2295-14-0030914		
100 Penn Square East Philadelphia PA 19107					Date Coll Collected	.ected:   By:	08/12 Clier	2/14 08:30 ht	
Sample Desc: WA-1 Surface					Date Rece	ved:	08/12	2/14 16:20	
PWSID: 3130843			Rep	Dilutn		Test	Test		
	Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst	
BACTI	، عن هو رم هم هم من الله الله الله عن الله الله								
MICROBIOLOGY									
Escherichia coli	1	mpn/100ml	1	1	SM 9223B	08/13	11-15	DÍÙ	
Fecal Coliform	<2	/100mL	2	1	SM 9222D	08/12	17:15	PIW	
Total Coliform	1600	, mpn/100ml	1	1	SM 9223B	08/13	11:15	PIW	
CHEMISTRY		. ,				/		. 20	
COLORMETRIC									
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	08/13	09:05	HRG	
Phosphorus as P, Dissolved	<.05	mg/L	.05	1	SM 4500P-E	08/13	13:35	HRG	
Phosphorus as P, Total	0.02	mg/l	.01	1	SM 4500P-E	08/13	13:53	HRG	
NITROGENS						,			
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	08/13	14:03	JCL	
Nitrogen, Nitrate	0.12	mg/l	.05	1	EPA 353.2	08/13	17:57	JCL	
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	08/13	15:58	JCL	
Nitrogen, Total Kjeldahl	<.25	mg/l	.25	1	EPA 351.2	08/14	17:09	JCL	
OTHER									
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	08/13	14:15	EMW	
Total Organic Carbon	4.8	mg/l	1	1	sm5310 c	08/13	18:13	ALD	
RESIDUES									
Solids, Total Dissolved	59	mg/l	5	1	SM 2540C	08/16	12:20	тмн	
Solids, Total Suspended	16	mg/l	3	1	SM 2540D	08/16	12:20	тмн	
TITRATIONS						•			
Alkalinity, Total to pH 4.5	7	mg/l	1	1	SM 2320 B	08/18	10:30	HRG	

Reviewed and Approved by: Sistle Wistore 7

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Attention:	Gregory Wacik					Date of I	Report:	08/21	/14
Reported To:	USACE, Philadelphia District					Lab ID:		2295	- -14-0030914
	Environmental Resources Branch								
	100 Penn Square East					Date Col	ected.	08/12	2/14 08·30
	Philadelphia PA 19107					Collected	d By:	Clier	nt
Sample Desc:	WA-1 Surface					Date Rece	eived:	08/12	2/14 16:20
PWSID: 31308	43			Rep	Dilutn		Test	Test	
		Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst
									-

- 01 The total coliform sample was placed in the incubator on 08/12/14 at 17:15.
- O2 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

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Attention: Gregory Wacik Reported To: USACE, Philadelphia District Environmental Resources Branch					Date of F Lab ID:	eport:	08/21/14 2295-14-0030915		
100 Penn Square East Philadelphia PA 19107					Date Coll Collected	.ected:   By:	08/12/14 07:00 Client		
Sample Desc: WA-2 Surface					Date Rece	eived:	08/12	2/14 16:20	
PWSID: 3130843	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst	
BACTI					** W U U U U U U				
MICROBIOLOGY									
Escherichia coli	<1	mpn/100ml	1	1	SM 9223B	08/13	11:15	PLW	
Fecal Coliform	2	/100ml	2	1	SM 9222D	08/12	17:15	PLW	
Total Coliform	2400	mpn/100ml	1	1	SM 9223B	08/13	11:15	PLW	
CHEMISTRY			·						
COLORMETRIC									
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	08/13	09:05	HRG	
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	08/13	13:35	HRG	
Phosphorus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	08/13	13:58	HRG	
NITROGENS						,			
Nitrogen, Ammonia	<.05	mg/l	. 05	1	D6919-03	08/13	01:58	JCL	
Nitrogen, Nitrate	0.08	mg/l	.05	1	EPA 353.2	08/13	17:58	JCL	
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	08/13	15:59	JCL.	
Nitrogen, Total Kjeldahl	0.31	mg/l	.25	1	EPA 351.2	08/14	17:10	JCL	
OTHER									
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	08/13	14:15	EMW	
Total Organic Carbon	5.4	mg/l	1	1	SM5310 C	08/13	18:31	ALD	
RESIDUES						,			
Solids, Total Dissolved	55	mg/l	5	1	SM 2540C	08/16	12:20	тмн	
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	08/16	12:40	тмн	
TITRATIONS		•				, .			
Alkalinity, Total to pH 4.5	5	mg/l	1	1	SM 2320 B	08/18	10:45	HRG	

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Attention:	Gregory Wacik					Date of R	eport:	08/21	/14
Reported To:	USACE, Philadelphia District					Lab ID:		2295-	-14-0030915
	Environmental Resources Branch								
	100 Penn Square East					Date Coll	ected:	08/12,	/14 07:00
	Philadelphia PA 19107					Collected	By:	Clien	t
Sample Desc:	WA-2 Surface					Date Rece	ived:	08/12,	/14 16:20
PWSID: 31308	43			Rep	Dilutn		Test	Test	
		Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst

01 The total coliform sample was placed in the incubator on 08/12/14 at 17:15.

O2 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

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Attention: Gregory Wacik Reported To: USACE, Philadelphia District Environmental Resources Branch					Date of F Lab ID:	eport:	08/21/14 2295-14-0030916	
Philadelphia PA 19107					Date Coll Collected	ected: By:	08/12 Clier	14 07:00 1
Sample Desc: WA-2 Mid-Depth					Date Rece	ived:	08/12	2/14 16:20
PWSID: 3130843	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								———————
COLORMETRIC								
Phosphate as P, Ortho	0.09	mg/l	.01	1	SM 4500P-E	08/13	09:05	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	, 08/13	13:35	HRG
Phosphorus as P, Total	0.10	mg/l	.01	1	SM 4500P-E	08/13	13:58	HRG
NITROGENS						,		
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	08/13	02:13	JCL
Nitrogen, Nitrate	0.12	mg/l	.05	1	EPA 353.2	08/13	17:59	JCL
Nitrogen, Nitrite	<.05	mg/l	. 05	1	EPA 353.2	08/13	16:00	JCL
Nitrogen, Total Kjeldahl	<.25	mg/l	.25	1	EPA 351.2	08/14	17:11	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	08/13	14:15	EMW
Total Organic Carbon	5.4	mg/l	1	1	SM5310 C	08/13	18:48	ALD
RESIDUES						-		
Solids, Total Dissolved	63	mg/l	5	1	SM 2540C	08/16	12:55	ТМН
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	08/16	12:40	ТМН
TITRATIONS						-		
Alkalinity, Total to pH 4.5	5	mg/l	1	1	SM 2320 B	08/18	10:45	HRG

O1 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

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Attention:	Gregory Wacik					Date of Re	eport:	08/21/	/14
Reported To:	USACE, Philadelphia District					Lab ID:		2295-	-14-0030916
	Environmental Resources Branch								
	100 Penn Square East					Date Colle	ected:	08/12/	/14 07:00
	Philadelphia PA 19107					Collected	By:	Client	ŧ
Sample Desc:	WA-2 Mid-Depth					Date Rece	ived:	08/12/	/14 16:20
PWSID: 313084	43			Rep	Dilutn		Test	Test	
		Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst
		معادي مراجع من من حواص من من حواص من حواص							

O2 The TKN matrix spike was low indicating possible sample matrix interference.

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Attention: Gregory Wacik					Date of R	leport:	08/21	/14
Reported To: USACE, Philadelphia District					Lab ID:		2295	-14-0030917
Environmental Resources Branch							(	
Du Penn Square East					Date Coll	ected:	08/12	/14 07:00
Philadelphia PA 19107					Collected	By:	Clien	it
Sample Desc: WA-2 Deep					Date Rece	eived:	08/12	/14 16:20
PWSID: 3130843			Rep	Dilutn		Test	Test	
	Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst
CHEMISTRY					وي مز بم مر مر مر مر به زمر اس اها	******		
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	08/13	09:05	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	08/13	13:35	HRG
Phosphorus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	08/13	13:58	HRG
NITROGENS						-		
Nitrogen, Ammonia	0.07	mg/l	.05	1	D6919-03	08/13	02:28	JCL
Nitrogen, Nitrate	0.10	mg/l	.05	1	EPA 353.2	08/13	18:00	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	08/13	16:01	JCL
Nitrogen, Total Kjeldahl	<.25	mg/l	.25	1	EPA 351.2	08/14	17:14	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	08/13	14:15	EMW
Total Organic Carbon	5.0	mg/l	1	1	SM5310 C	08/13	19:07	ALD
RESIDUES								
Solids, Total Dissolved	59	mg/l	5	1	SM 2540C	08/16	12:55	тмн
Solids, Total Suspended	17	mg/l	3	1	SM 2540D	08/16	12:40	тмн
TITRATIONS						-		
Alkalinity, Total to pH 4.5	7	mg/l	1	1	SM 2320 B	08/18	10:45	HRG

01 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

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Attention: Gregory Wacik Reported To: USACE, Philadelphia District Environmental Resources Branch					Date of F Lab ID:	eport:	08/21 2295	/14 -14-0030918
100 Penn Square East Philadelphia PA 19107					Date Coll	.ected:	08/12 Clier	2/14 08:50
Sample Desc: WA-3 Surface				Date Received:		08/12	2/14 16-20	
							00/12	./14 10:20
PWSID: 3130843	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Escherichia coli	330	mpn/100ml	1	1	SM 9223B	08/13	11:15	PLW
Fecal Coliform	310	/100mL	2	1	SM 9222D	08/12	17:15	PĹW
Total Coliform	>2400	mpn/100ml	1	1	SM 9223B	08/13	11:15	PLW
CHEMISTRY		• •				1		
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	08/13	09:05	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	08/13	13:40	HRG
Phosphorus as P, Total	0.08	mg/l	.01	1	SM 4500P-E	08/13	13:58	HRG
NITROGENS		-				,		
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	08/13	02:43	JCL
Nitrogen, Nitrate	0.74	mg/L	.05	1	EPA 353.2	08/13	18:01	JCL
Nitrogen, Nitrite	<.05	mg/L	.05	1	EPA 353.2	08/13	16:02	JCL.
Nitrogen, Total Kjeldahl	<.25	mg/L	.25	1	EPA 351.2	08/14	17:15	JCL
OTHER		-,						
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	08/13	14:15	EMW
Total Organic Carbon	4.1	mg/l	1	1	SM5310 C	08/13	19:39	ALD
RESIDUES		-,				1		
Solids, Total Dissolved	83	mg/l	5	1	SM 2540C	08/16	12:55	тмн
Solids, Total Suspended	4	mg/L	3	1	SM 2540D	08/16	12:40	тмн
TITRATIONS		-,				,		
Alkalinity, Total to pH 4.5	8	mg/L	1	1	SM 2320 B	08/18	10:45	HRG

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Attention: Reported To:	Gregory Wacik USACE, Philadelphia District Environmental Resources Branch					Date of F Lab ID:	Report:	08/21 2295	/14 -14-0030918
	100 Penn Square East Philadelphia PA 19107					Date Coll Collectec	.ected:   By:	08/12 Clien	/14 08:50 t
Sample Desc:	WA-3 Surface					Date Rece	ived:	08/12	/14 16:20
PWSID: 313084	43	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst

- 01 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.
- O2 The total coliform sample was placed in the incubator on 08/12/14 at 17:15.

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Attention: Gregory Wacik Reported To: USACE, Philadelphia District					Date of R Lab ID:	eport:	08/21 2295	/14 140030919
Environmental Resources Branch 100 Penn Square East					Data Call	ootodi	00/10	144 00.45
Philadelphia PA 19107					Collected	By:	Clien	it
Sample Desc: WA-4 Surface					Date Rece	ived:	08/12	/14 16:20
PWSID: 3130843			Rep	Dilutn		Test	Test	
	Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst
BACTI	, , , , , , , , , , , , , , , , , , ,							
MICROBIOLOGY								
Escherichia coli	440	mpn/100ml	1	1	SM 9223B	08/13	11:15	PLW
Fecal Coliform	450	/100ml	2	1	SM 9222D	08/12	17:15	PLW
Total Coliform	>2400	mpn/100ml	1	1	SM 9223B	08/13	11:15	PLW
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	0.02	mg/l	.01	1	SM 4500P-E	08/13	09:05	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	08/13	13:40	HRG
Phosphorus as P, Total	0.04	mg/l	.01	1	SM 4500P-E	08/13	13:58	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	08/13	02:58	JCL
Nitrogen, Nitrate	0.21	mg/l	.05	1	EPA 353.2	08/13	18:04	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	08/13	16:04	JCL
Nitrogen, Total Kjeldahl	<.25	mg/L	.25	1	EPA 351.2	08/14	17:16	JCL
OTHER						•		
Biochemical Oxygen Demand	2	mg/l	2	1	SM 5210B	08/13	14:15	EMW
Total Organic Carbon	2.8	mg/l	1	1	SM5310 C	08/13	19:55	ALD
RESIDUES								
Solids, Total Dissolved	71	mg/l	5	1	SM 2540C	08/16	12:55	ТМН
Solids, Total Suspended	77	mg/L	3	1	SM 2540D	08/16	12:40	ТМН
TITRATIONS		- •						
Alkalinity, Total to pH 4.5	14	mg/L	1	1	SM 2320 B	08/18	10:45	HRG

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Attention:	Gregory Wacik					Date of Re	eport:	08/21/	'14
Reported To:	USACE, Philadelphia District					Lab ID:		2295-	14-0030919
	Environmental Resources Branch								
	100 Penn Square East					Date Colle	ected:	08/12/	14 09:15
	Philadelphia PA 19107					Collected	Ву:	Client	:
Sample Desc:	WA-4 Surface					Date Rece	ved:	08/12/	14 16:20
PWSID: 313084	43			Rep	Dilutn		Test	Test	
		Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst

01 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

- O2 The total coliform sample was placed in the incubator on O8/12/14 at 17:15.
- 03 The SM 5210B sample did not have a DO depletion of at least 2  $\rm mg/L.$

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Attention: Gregory Wacik Reported To: USACE, Philadelphia District Environmental Resources Branch					Date of F Lab ID:	Report:	08/21 2295	/14 5140030920
100 Penn Square East Philadelphia PA 19107					Date Coll Collected	.ected:   By:	08/12 Clier	2/14 09:25 ht
Sample Desc: WA-5 Surface					Date Rece	eived:	08/12	2/14 16:20
PWSID: 3130843	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI	ي الم الم عن من عن الله وم جد حد	یہ دین غنین نہیں ہوپر پسیز سین غنین ۔ عمر اسے سے	— — — — <u>—</u> —		به ها ما مع به به به ما ما ما ما به		1-1	
MICROBIOLOGY								
Escherichia coli	31	mpn/100ml	1	1	SM 9223B	08/13	11.15	PIW
Fecal Coliform	30	/100mL	2	1	SM 9222D	08/12	17:15	PIW
Total Coliform	>2400	mpn/100ml	1	1	SM 9223B	08/13	11:15	PLW
CHEMISTRY		·				1		
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	08/13	09:05	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	08/13	13:40	HRG
Phosphorus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	08/13	13:58	HRG
NITROGENS						•		
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	08/13	03:13	JCL
Nitrogen, Nitrate	0.13	mg/l	.05	1	EPA 353.2	08/13	18:07	JCL
Nitrogen, Nitrite	<.05	mg/L	.05	1	EPA 353.2	08/13	16:05	JCL
Nitrogen, Total Kjeldahl	<.25	mg/l	. 25	1	EPA 351.2	08/14	17:17	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/L	2	1	SM 5210B	08/13	14:15	EMW
Total Organic Carbon	2.2	mg/l	1	1	SM5310 C	08/13	20:11	ALD
RESIDUES						·		
Solids, Total Dissolved	74	mg/l	5	1	SM 2540C	08/16	12:55	ТМН
Solids, Total Suspended	<3	mg/L	3	1	SM 2540D	08/16	12:40	тмн
TITRATIONS						•		
Alkalinity, Total to pH 4.5	4	mg/l	1	1	SM 2320 B	08/18	11:00	HRG

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		Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst
PWSID: 313084	43			Rep	Dilutn		Test	Test	
Sample Desc:	WA-5 Surface					Date Rece	ived:	08/12	/14 16:20
	Philadelphia PA 19107					Collected	By:	Clien	t
	100 Penn Square East					Date Coll	ected:	08/12	/14 09:25
Reported To:	USACE, Philadelphia District					Lab ID:		2295	-14-0030920
Attention:	Gregory Wacik					Date of R	eport:	08/21	/14

O1 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

O2 The total coliform sample was placed in the incubator on O8/12/14 at 17:15.

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Attention: Gregory Wacik Reported To: USACE, Philadelphia District					Date of R Lab ID:	eport:	08/21 2295	/14 140030921
Environmental Resources Branch								
100 Penn Square East					Date Coll	ected:	08/12	2/14 07:30
Philiadecphia PA 19107				,	Collected	By:	Clien	it
Sample Desc: WA-6 Surface					Date Rece	ived:	08/12	2/14 16:20
PWSID: 3130843			Rep	Dilutn		Test	Test	
	Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst
BACTI			<b></b>	-				
MICROBIOLOGY								
Escherichia coli	<1	mpn/100ml	1	1	SM 9223B	08/13	11:15	PIW
Fecal Coliform	<2	/100mL	2	1	SM 9222D	08/12	17:15	PIW
Total Coliform	980	, mpn/100ml	1	1	SM 9223B	08/13	11:15	PIW
CHEMISTRY		. ,				/		
COLORMETRIC								
Phosphate as P, Ortho	0.05	mg/l	.01	1	SM 4500P-E	08/13	09:08	HRG
Phosphorus as P, Dissolved	<.05	mg/l	. 05	1	SM 4500P-E	08/13	13:40	HRG
Phosphorus as P, Total	0.06	mg/l	.01	1	SM 4500P-E	08/13	13:58	HRG
NITROGENS		-,				,		
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	08/13	03:28	JCL
Nitrogen, Nitrate	0.08	mg/l	.05	1	EPA 353.2	08/13	18:08	JCL
Nitrogen, Nitrite	<.05	mg/L	.05	1	EPA 353.2	08/13	16:06	JCL
Nitrogen, Total Kjeldahl	0.35	mg/L	.25	1	EPA 351.2	08/14	17:18	JCL
OTHER						,		
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	08/13	14:15	EMW
Total Organic Carbon	5.2	mg/L	1	1	SM5310 C	08/13	21:14	ALD
RESIDUES						,		
Solids, Total Dissolved	62	mg/l	5	1	SM 2540C	08/16	12:55	тмн
Solids, Total Suspended	3	mg/L	3	1	SM 2540D	08/16	12:40	ТМН
TITRATIONS		-,						
Alkalinity, Total to pH 4.5	5	mg/l	1	1	SM 2320 B	08/18	11:00	HRG

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Attention:	Gregory Wacik					Date of R	eport:	08/21	/14
Reported To:	USACE, Philadelphia District					Lab ID:		2295	-14-0030921
	Environmental Resources Branch								
	100 Penn Square East					Date Coll	ected:	08/12	/14 07:30
	Philadelphia PA 19107					Collected	By:	Clien	t
Sample Desc:	WA-6 Surface					Date Rece	ived:	08/12	2/14 16:20
PWSID: 31308	43			Rep	Dilutn		Test	Test	
		Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst

01 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

O2 The total coliform sample was placed in the incubator on O8/12/14 at 17:15.

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Attention: Gregory Wacik Reported To: USACE, Philadelphia District Environmental Resources Branch					Date of Report: Lab ID: Date Collected: Collected By:		08/21/14 2295-14-0030922	
100 Penn Square East Philadelphia PA 19107							08/12 Clier	2/14 07:30 nt
Sample Desc: WA-6 Mid-Depth					Date Rece	eived:	08/12	2/14 16:20
PWSID: 3130843	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	0.07	mg/l	.01	1	SM 4500P-E	08/13	09:08	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	08/13	13:40	HRG
Phosphorus as P, Total	0.07	mg/l	.01	1	SM 4500P-E	08/13	14:00	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	08/13	03:43	JCL
Nitrogen, Nitrate	0.09	mg/l	.05	1	EPA 353.2	08/13	18:09	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	08/13	16:09	JCL
Nitrogen, Total Kjeldahl	<.25	mg/l	.25	1	EPA 351.2	08/14	17:21	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	08/13	14:15	EMW
Total Organic Carbon	5.3	mg/l	1	1	SM5310 C	08/13	21:48	ALD
RESIDUES								
Solids, Total Dissolved	59	mg/L	5	1	SM 2540C	08/16	12:55	тмн
Solids, Total Suspended	3	mg/l	3	1	SM 2540D	08/16	12:40	ТМН
TITRATIONS						1		
Alkalinity, Total to pH 4.5	6	mg/l	1	1	SM 2320 B	08/18	11:00	HRG

01 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

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Attention: Gregory Wacik Reported To: USACE, Philadelphia District Environmental Resources Branch					Date of Report: Lab ID: Date Collected: Collected By:		08/21/14 2295-14-0030923	
100 Penn Square East Philadelphia PA 19107							08/12 Clier	2/14 07:30 It
Sample Desc: WA-6 Deep					Date Rece	eived:	08/12	2/14 16:20
PWSID: 3130843	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY	<u>سے سے سے س</u> ر ہو ہو ہو ہے اسا نظ							
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/L	.01	1	SM 4500P-F	08/13	09-08	HPG
Phosphorus as P, Dissolved	<.05	mg/L	.05	1	SM 4500P-E	08/13	13.43	HRG
Phosphorus as P, Total	<.01	mg/L	.01	1	SM 4500P-E	08/13	14:00	HRG
NITROGENS		-,				00710	14100	Into
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	08/13	03:58	.101
Nitrogen, Nitrate	0.10	mg/L	.05	1	EPA 353.2	08/13	18:10	
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	08/13	16:10	JCL
Nitrogen, Total Kjeldahl	0.25	mg/l	.25	1	EPA 351.2	08/14	17:22	JCL
OTHER						,		
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	08/13	14:15	EMW
Total Organic Carbon	5.3	mg/l	1	1	SM5310 C	08/13	22:05	ALD
RESIDUES								
Solids, Total Dissolved	57	mg/l	5	1	SM 2540c	08/16	12:55	тмн
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	08/16	12:40	тмн
TITRATIONS		•				1 -		
Alkalinity, Total to pH 4.5	5	mg/l	1	1	SM 2320 B	08/18	11:30	HRG

01 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

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Attention: Gregory Wacik Reported To: USACE, Philadelphia District Environmental Resources Branch					Date of R Lab ID:	eport:	08/21 2295	/14 -14-0030924
100 Penn Square East					Date Coll	ected:	08/12	/14 07:50
Philadelphia PA 19107					Collected	By:	Clien	t
Sample Desc: WA-7 Surface					Date Received:		08/12/14 16:20	
PWSID: 3130843			Rep	Dilutn		Test	Test	
	Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst
BACTI				n Pris List har het ant an an			Nana Yanay Anna	
MICROBIOLOGY								
Escherichia coli	<1	mpn/100ml	1	1	SM 9223B	08/13	11:15	PLW
Fecal Coliform	<2	/100ml	2	1	SM 9222D	08/12	17:15	PLW
Total Coliform	1100	mpn/100ml	1	1	SM 9223B	08/13	11:15	PLW
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	08/13	09:08	HRG
Phosphorus as P, Dissolved	<.05	mg/l	. 05	1	SM 4500P-E	08/13	13:43	HRG
Phosphorus as P, Total	0.02	mg/l	.01	1	SM 4500P-E	08/13	14:00	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	08/13	04:13	JCL
Nitrogen, Nitrate	0.10	mg/l	.05	1	EPA 353.2	08/13	18:11	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	08/13	16:11	JCL
Nitrogen, Total Kjeldahl	<.25	mg/l	.25	1	EPA 351.2	08/14	17:23	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	08/13	14:15	EMW
Total Organic Carbon	5.3	mg/l	1	1	SM5310 C	08/13	22:22	ALD
RESIDUES								
Solids, Total Dissolved	59 <sup>.</sup>	mg/l	5	1	SM 2540C	08/16	12:55	тмн
Solids, Total Suspended	4	mg/l	3	1	SM 2540D	08/16	12:40	тмн
TITRATIONS						-		
Alkalinity, Total to pH 4.5	6	mg/l	1	1	SM 2320 B	08/18	11:30	HRG

Reviewed and Approved by:

Wistike M stle

Christina Kistler Account Executive

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Reported To:	USACE Philadelphia District					Date of H	eport:	08/21	/14
Reported To.	Environmental Resources Branch					Lab ID:		2295	-14-0030924
	100 Penn Square East					Date Coll	ected:	08/12	/14 07:50
	Philadelphia PA 19107					Collected	l By:	Clien	t
Sample Desc:	WA-7 Surface					Date Rece	ved:	08/12	/14 16:20
PWSID: 31308	43			Rep	Dilutn		Test	Test	
		Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst

- 01 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.
- O2 The total coliform sample was placed in the incubator on 08/12/14 at 17:15.

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Christina Kistler Account Executive

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Attention: Gregory Wacik Reported To: USACE, Philadelphia District					Date of Report: Lab ID:		08/21/14 2295-14-0030925	
100 Penn Square East					Date Coll	ected:	08/12	/14 07:50
Philadelphia PA 19107					Collected	By:	Clien	t
Sample Desc: WA-7 Mid-Depth					Date Rece	ived:	08/12	/14 16:20
PWSID: 3130843	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY					یوں ہے جب ہے جہ بھر سے اس کے اس	ana ila sin kanan		
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	08/13	09:08	HRG
Phosphorus as P, Dissolved	<.05	mg/l	. 05	1	SM 4500P-E	08/13	13:43	HRG
Phosphorus as P, Total	<.01	mg/l	. 01	1	SM 4500P-E	08/13	14:00	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	08/13	04:28	JCL
Nitrogen, Nitrate	0.08	mg/l	. 05	1	EPA 353.2	08/13	18:12	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	08/13	16:12	JCL
Nitrogen, Total Kjeldahl	<.25	mg/l	.25	1	EPA 351.2	08/14	17:24	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	08/13	14:15	EMW
Total Organic Carbon	5.5	mg/l	1	1	SM5310 C	08/13	22:40	ALD
RESIDUES								
Solids, Total Dissolved	62	mg/l	5	1	SM 2540C	08/16	12:55	ТМН
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	08/16	13:10	тмн
TITRATIONS								
Alkalinity, Total to pH 4.5	5	mg/l	1	1	SM 2320 B	08/18	11:30	HRG

01 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

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Attention:	Gregory Wacik					Date of F	leport:	08/21	/14
Reported To:	USACE, Philadelphia District					Lab ID:		2295	-14-0030926
	Environmental Resources Branch								
	100 Penn Square East					Date Coll	ected:	08/12	/14 07:50
	Philadelphia PA 19107					Collected	By:	Clier	t
Sample Desc:	WA-7 Deep					Date Rece	ived:	08/12	/14 16:20
PWSID: 31308	343			Rep	Dilutn		Test	Test	
		Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst
CHEMISTRY		مریح ویس بیس است است است کرد. مریح ویس است است است است است است است است است اس					m		
COLORMETRI	C								
Phosph	ate as P, Ortho	<.01	mg/l	. 01	1	SM 4500P-E	08/13	09:10	HRG
Phosph	norus as P, Dissolved	<.05	mg/L	.05	1	SM 4500P-E	08/14	15:00	HRG
Phosph	orus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	08/19	13:30	HRG
NITROGENS							,		
Nitrog	en, Ammonia	<.05	mg/l	.05	1	D6919-03	08/13	04:43	JCL
Nitrog	en, Nitrate	0.10	mg/l	.05	1	EPA 353.2	08/13	18:15	JCL
Nitrog	en, Nitrite	<.05	mg/l	. 05	1	EPA 353.2	08/13	16:15	JCL
Nitrog	en, Total Kjeldahl	<.25	mg/l	.25	1	EPA 351.2	08/14	17:27	JCL
OTHER							•		
Bioche	mical Oxygen Demand	<2	mg/l	2	1	SM 5210B	08/13	14:15	EMW
Total	Organic Carbon	4.5	mg/L	· 1	1	SM5310 C	08/13	22:57	ALD
RESIDUES							•		
Solids	, Total Dissolved	63	mg/l	5	1	SM 2540C	08/16	13:20	тмн
Solids	, Total Suspended	8	mg/l	3	1	SM 2540D	08/16	13:10	тмн
TITRATIONS	1						•		
Alkali	nity, Total to pH 4.5	7	mg/l	1	1	SM 2320 B	08/18	11:30	HRG

.01 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

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		Result	Unit	Limit 	Factor	Procedure	Date	Time	Analyst
PWSID: 31308	43			Rep	Dilutn		Test	Test	
Sample Desc:	WA-7 Deep					Date Rece	vived:	08/12	2/14 16:20
	Philadelphia PA 19107					Collected	By:	Clier	nt
	100 Penn Square East					Date Coll	ected:	08/12	2/14 07:50
•	Environmental Resources Branch								
Reported To:	USACE, Philadelphia District					Lab ID:	•	2295	, -14-0030926
Attention:	Gregory Wacik					Date of R	eport:	08/21	/14

02 One of the matrix spike/matrix spike duplicate results was outside of the recommended range but the other passed the criteria for TKN.

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Relinquished by Time: 3:00 Date: 8/12/14 Time: 3:00	30915 Sample No: 2 Desc: WA-2 Surface FC, EC, TC, U NO2-N, NO3-N, d-po4-p, o-po4, BOD, NH3-N, tkn, Alk, tds, tss, po4-p, toc,	30914 Sample No: 1 Desc: WA-1 Surface FC, EC, TC, IV NO2-N, NO3-N, d-po4-p, o-po4, BOD, NH3-N, thm, Alk, tds, tss, po4-p, toc,	Address: USACE, Philadelphia District Environmental Resources Branch 100 Penn Square East Philadelphia PA 19107 Phone: 215-656-6561 Ext: Samplers: UNR CIV	Account: 2295 Work Order: 004035 Work Order Description: Customer: Gregory Wacik	raq 07/16/14 4:26:53 PM
Received for laboratory by: $M$ Date: $\frac{g}{12}$ $M$ $M$ Sample entered by: $M$	Cool to 6 C/Zero Headspace; Matrix: O Date: $\frac{g/z}{/\gamma}$ A - 1 X 250mlMicro P w/ Sterile/Na2S203; B - 1 X L Bod p w/ Cool to 6 C; C - 1 X 16ozNO2NO3 p w/ Cool to 6 C; D - 1 X 500ml NH3 p w/ H2SO4 (pH<2); E - 1 X 2xambervoa g w/ H2SO4(pH<2); F - 1 X 8oz Alk p w/ Cool to 6 C/Zero Headspace;	$\begin{array}{llllllllllllllllllllllllllllllllllll$	Total Sampling Time (hours): Bottle Prep by: Laboratory Receipt Temp: Deg C. If Temp Unacceptable, On Ice? 🕅 N	Project Leader: CMB No: 241685 Walter Reservoir Remarks:	M. J. REIDER ASSOCIATES, INC. Page: 1 Chain of Custody

Relinquished by Apple Receive Date: 8/12/14 Time: 3:00	30918 Sample No: 5 Desc: WA-3 Surface FC, EC, TC, M NO2-N, NO3-N, d-po4-p, o-po4, BOD, NH3-N, tkm, Alk, tds, tss, po4-p, toc,	30917 sample No: 4 Desc: WA-2 Deep NO2-N, NO3-N, d-po4-p, o-po4, BOD, NH3-N, tkn, Alk, tds, tss, po4-p, toc,	30916 sample No: 3 Desc: WA-2 Mid-Depth NO2-N, NO3-N, d-po4-p, o-po4, BOD, NH3-N, tkn, Alk, tds, tss, po4-p, toc,	Address: USACE, Philadelphia District Environmental Resources Branch 100 Penn Square East Philadelphia PA 19107 Phone: 215-656-6561 Ext: Samplers: WACAK	raq 07/16/14 4:26:53 PM Account: 2295 Customer: Gregory Wacik
by: M Received for laboratory by: Date: $\frac{8 - 12.14}{12.0}$ Date: $\frac{162.0}{162.0}$ Sample entered by: $M$	Matrix:       O       Date:       3/12/14/         Matrix:       O       Time:       Original         Matrix:       O       Time:       Original         Matrix:       D       Time:       Original         Matrix:       O       Time:       Original         Matrix:       D       Time:       Original         Matrix:       D       Matrix:       D         Matrix:       D       Matrix:       D         Matrix:       D       T       Matrix:       D         Matrix:       D       T       T       Matrix:       D         Matrix:       D       T       T       Matrix:       D       Cool to 6       C         Matrix:       D       T       T       South NH3:       D       Matrix:       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D       D	$\begin{array}{llllllllllllllllllllllllllllllllllll$	$\begin{array}{llllllllllllllllllllllllllllllllllll$	Total Sampling Time (hours): Bottle Prep by: Laboratory Receipt Temp: Deg C. If Temp Unacceptable, On Ice? V N Approved By: V	M. J. REIDER ASSOCIATES, INC. COFC.PRT Chain of Custody 035 Project Leader: CMB No: 241685 1ption: Walter Reservoir Remarks:

30920 Sample No: 30919 Sample No: Date: Relinquished by; Samplers: Customer: raq 07/16/14 4:26:53 PM Address: Account: Phone: NH3-N, tkn, Alk, tds, tss, po4-p, toc, FC, EC, TC, V NO2-N, NO3-N, d-po4-p, o-po4, BOD FC, EC, TC, NO2-N, NO3-N; NH3-N, tkn, Alk, tds, tss, po4-p, toc, 6/12/14 3 Philadelphia PA 19107 215-656-6561 Ext: USACE, Philadelphia District Gregory Wacik 100 Penn Square East Environmental Resources Branch 2295 თ 7 d-po4-p, o-po4, BOD, Desc: WA-5 Surface Desc: E WA-4 Surface Time: <u>3</u>:00 Work Order: 004035 Work Order Description: Walter Reservoir Received by: Μ Laboratory Receipt Temp: Total Sampling Time (hours) : Remarks: Chain of Custody J. REIDER ASSOCIATES, INC. Project Leader: Approved Date: 8-12 Received for laboratory by: 8 Þ الي ال U দ্দ দে U Time: 0925 Time: CMB ý 1 X L Bod p w/ Cool to 6 C; 1 X 16ozNO2NO3 p w/ Cool to 6 C; 1 X 500ml NH3 p w/ H2SO4 (pH<2); 1 X 250mlMicro P w/ Sterile/Na2S2O3; Cool to 6 C/Zero Headspace; 0001 Matrix: Matrix: X 8oz Alk p w/ X 2xambervoa g w/ H3P04/zero headspace; If Temp Unacceptable, On Ice? to 6 C/Zero Headspace; 0 0 Ţ**ī**me: Sample entered by: 0201 Bottle Prep by: No: Date: Time: Date: 241685 41/21/18 41/21/8 2160 Page: 12/2/ Ц COFC.PRT z ω

Relinquished by $\frac{1}{12/14}$ Received by: Date: $\frac{5/12/14}{11}$ Time: $\frac{3}{10}$	$30$ $\beta$ 2 $\nu$ sample No: 9 Desc: WA-6 Mid-Depth NO2-N, NO3-N, d-po4-p, o-po4, BOD, NH3-N, tkn, Alk, tds, tss, po4-p, toc,		Address: USACE, Philadelphia District Environmental Resources Branch 100 Penn Square East Philadelphia PA 19107 Phone: 215-656-6561 Ext: Samplers:	0//16/14 4:20:55 FM Account: 2295 Work Order: 004035 Work Order Descriptio Customer: Gregory Wacik	Hag
MM Received for laboratory by: MM Date: $5-1217$ Phine: 1620 Sample entered by: MM	<pre>D - 1 X SUMMINHS p W/ HJSO4(pH&lt;2); E - 1 X Sozambervoa g W/ HJSO4/zero headspace; F - 1 X 8oz Alk p W/ Cool to 6 C/Zero Headspace; A - 1 X L Bod p W/ Cool to 6 C; B - 1 X 16ozNO2NO3 p W/ Cool to 6 C; C - 1 X 500ml NH3 p W/ H2SO4(pH&lt;2); D - 1 X 2xambervoa g W/ H3PO4/zero headspace; E - 1 X 8oz Alk p W/ Cool to 6 C/Zero Headspace;</pre>	Matrix: O Date: $\frac{g}{z}/z$ A - 1 X 250mlMicro P w/ Sterile/Na2S2O3; B - 1 X 1 Bod p w/ Cool to 6 C; C - 1 X 16zNO2NO3 p w/ Cool to 6 C;	Total Sampling Time (hours):Bottle Prep by: Laboratory Receipt Temp:Deg C. If Temp Unacceptable, On Ice? Y N Approved By:N	Chain of Custody Project Leader: CMB No: 241685 : Walter Reservoir Remarks:	M. J. REIDER ASSOCIATES, INC. Page: 4

Relinquished by $\mathcal{K}$ Received by Date: $\frac{g/l/l'}{2/l'}$ Time: $\frac{2.20}{2.00}$	30924 Sample No: 11 Desc: WA-7 Surface FC, EC, TC, NM NO2-N, NO3-N, d-po4-p, o-po4, BOD, MH3-N, tkn, Alk, tds, tss, po4-p, toc,	309233333333333333333333333333333333333	Address: USACE, Philadelphia District Environmental Resources Branch 100 Penn Square East Philadelphia PA 19107 215-656-6561 Ext: Samplers:	Account: 2295 Work Order: 004035 Work Order Descript: Customer: Gregory Wacik	rag 07/16/14 4:26:53 PM
$\frac{1}{10000000000000000000000000000000000$	$\begin{array}{llllllllllllllllllllllllllllllllllll$	$\begin{array}{ccccc} \text{Matrix: 0} & \text{Date: } \frac{\delta/(2))\psi}{\text{Time: }} \\ \text{A - 1 X L Bod p w/ Cool to 6 C;} \\ \text{B - 1 X 16ozNO2NO3 p w/ Cool to 6 C;} \\ \text{C - 1 X 500ml NH3 p w/ H2SO4(pH<2);} \\ \text{D - 1 X 2xambervoa g w/ H3PO4/zero headspace;} \\ \text{E - 1 X 8oz Alk p w/} \\ \text{Cool to 6 C/Zero Headspace;} \end{array}$	Total Sampling Time (hours): Bottle Prep by: Laboratory Receipt Temp: $\int Deg C$ . If Temp Unacceptable, On Ice? Y N Approved By: $\int V$	project Leader: CMB No: 241685 Demarke.	M. J. REIDER ASSOCIATES, INC. Page: 5 Chain of Custody

. . . . .

Relinquished by: Received by: Date: $\frac{1}{2}\frac{1}{2}\frac{1}{2}$	30926 sample No: 13 Desc: WA-7 Deep NO2-N, NO3-N, d-po4-p, o-po4, BOD, NH3-N, tkn, Alk, tds, tss, po4-p, toc,	30925 <sub>samp</sub> le No: 12 Desc: WA-7 Mid-Depth NO2-N <sub>N</sub> NO3-N, d-po4-p, o-po4, BOD, NH3-N, tkn, Alk, tds, tss, po4-p, toc,	Work Order Descriptio Customer: Gregory Wacik Address: USACE, Philadelphia District Environmental Resources Branch 100 Penn Square East Philadelphia PA 19107 Phone: 215-656-6561 Ext: Samplers: WACW	rag 07/16/14 4:26:53 PM Account: 2295 Work Order: 004035
Received for laboratory by: JA Date: 1/274 prime: 1620 Sample entered by: 154	Matrix:       O       Date:       \$\begin{aligned} 1/1/1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 &	$\begin{array}{llllllllllllllllllllllllllllllllllll$	1: Walter Reservoir Remarks: Total Sampling Time (hours): Laboratory Receipt Temp: Deg C. If Temp Unacceptable, On Ice? Y N Approved By:	M. J. REIDER ASSOCIATES, INC. COFC.PRT Page: 6 Chain of Custody Project Leader: CMB No: 241685





Attention: Gregory Wacik Reported To: USACE, Philadelphia District					Date of Report: Lab ID:		09/18/14 2295-14-0034278	
Environmental Resources Branch								
100 Penn Square East					Date Coll	ected:	09/10	/14 09:40
Philadelphia PA 19107					Collected	By:	Clien	t
Sample Desc: WA-1 Surface					Date Rece	ived:	09 <u>/</u> 10	/14 17:15
PWSID: 3130843			Rep	Dilutn		Test	Test	
	Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst
BACTI	PPPE Mill Mill fait fait fait and and and and							
MICROBIOLOGY								
Escherichia coli	6	mpn/100ml	1	1	SM 9223B	09/11	11:50	PLW
Fecal Coliform	8	/100mL	2	1	SM 9222D	09/10	17:55	PLW
Total Coliform	1000	mpn/100ml	1	1	SM 9223B	09/11	11:50	PLW
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	0.04	mg/l	.01	1	SM 4500P-E	09/11	09:47	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	09/11	12:45	HRG
Phosphorus as P, Total	0.04	mg/l	.01	1	SM 4500P-E	09/11	12:25	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	09/11	03:25	JCL
Nitrogen, Nitrate	0.11	mg/l	.05	1	EPA 353.2	09/11	16:19	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	09/11	14:54	JCL
Nitrogen, Total Kjeldahl	0.27	mg/l	.25	1	EPA 351.2	09/11	18:23	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	09/11	11:30	ALD
Total Organic Carbon	4.0	mg/l	1	1	SM5310 C	09/12	17:09	ALD
RESIDUES								
Solids, Total Dissolved	58	mg/L	5	1	SM 2540C	09/12	12:30	тмн
Solids, Total Suspended	8	mg/l	3	1	SM 2540D	09/12	12:30	тмн
TITRATIONS								
Alkalinity, Total to pH 4.5	8	mg/l .	1	1	SM 2320 B	09/15	09:45	HRG

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Attention:	Gregory Wacik					Date of	Report:	09/18	3/14
Reported To:	USACE, Philadelphia District					Lab ID:	•	2295	-14-0034278
	Environmental Resources Branch								
	100 Penn Square East					Date Col	lected:	09/10	)/14 09:40
	Philadelphia PA 19107					Collecte	d By:	Clier	nt
Sample Desc:	WA-1 Surface					Date Rec	eived:	09/10	)/14 17:15
PWSID: 313084	43			Rep	Dilutn		Test	Test	
		Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst

01 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

O2 The total coliform sample was placed in the incubator on 09/10/14 at 17:40.

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Attention: Gregory Wacik Reported To: USACE, Philadelphia District Environmental Resources Branch					Date of R Lab ID:	eport:	09/18 2295	-14-0034279
100 Penn Square East					Date Coll	ected:	09/10	/14 07:40
Philadelphia PA 19107					Collected	By:	Clien	t
Sample Desc: WA-2 Surface					Date Rece	ved:	09/10	/14 17:15
PWSID: 3130843			Rep	Dilutn		Test	Test	
	Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst
BACTI		ndu essansuus						
MICROBIOLOGY								
Escherichia coli	<1	mpn/100ml	1	1	SM 9223B	09/11	11:50	PLW
Fecal Coliform	6	/100mL	2	1	SM 9222D	, 09/10	17:55	PLW
Total Coliform	260	mpn/100ml	1	1	SM 9223B	09/11	11:50	PLW
CHEMISTRY						,		
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	09/11	09:47	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	09/11	12:50	HRG
Phosphorus as P, Total	<.01	mg/L	.01	1	SM 4500P-E	09/11	12:30	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	. 05	1	D6919-03	09/11	03:40	JCL
Nitrogen, Nitrate	0.10	mg/l	.05	1.	EPA 353.2	09/11	16:20	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	09/11	14:55	JCL
Nitrogen, Total Kjeldahl	0.28	mg/l	.25	1	EPA 351.2	09/11	18:24	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/L	2	1	SM 5210B	09/11	11:30	ALD
Total Organic Carbon	4.7	mg/l	1	1	sm5310 c	09/12	17:25	ALD
RESIDUES								
Solids, Total Dissolved	57	mg/l	5	1	SM 2540C	09/12	12:30	тмн
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	09/12	12:30	ТМН
TITRATIONS						•		
Alkalinity, Total to pH 4.5	6	mg/l	1	1	SM 2320 B	09/15	10:00	HRG

Reviewed and Approved by:

Wistone n Ler)

Christina Kistler Account Executive

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Attention:	Gregory Wacik					Date of	Report:	09/18	3/14
Reported To:	USACE, Philadelphia District					Lab ID:	•	2295	, -14-0034279
	Environmental Resources Branch								
	100 Penn Square East					Date Col	lected:	09/10	)/14 07:40
	Philadelphia PA 19107					Collecte	d By:	Clier	nt
Sample Desc:	WA-2 Surface					Date Rec	eived:	09/10	)/14 17:15
PWSID: 313084	43			Rep	Dilutn		Test	Test	
		Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst

01 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

O2 The total coliform sample was placed in the incubator on O9/10/14 at 17:40.

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Attention: Gregory Wacik Reported To: USACE, Philadelphia District Environmental Resources Branch					Date of Report: Lab ID:		09/18/14 2295-14-0034280	
100 Penn Square East Philadelphia PA 19107					Date Coll Collected	.ected:   By:	09/10 Clien	/14 07:40 t
Sample Desc: WA-2 Mid-Depth					Date Rece	eived:	09/10	/14 17:15
PWSID: 3130843	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY		en en pen						سن د غن د عن د بر سن م
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	09/11	09:50	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	09/11	12:50	HRG
Phosphorus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	09/11	12:30	HRG
NITROGENS						-		
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	09/11	03:55	JCL
Nitrogen, Nitrate	0.09	mg/l	.05	1	EPA 353.2	09/11	16:21	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	09/11	14:56	JCL
Nitrogen, Total Kjeldahl	0.27	mg/l	.25	1	EPA 351.2	09/16	16:38	JCL
OTHER						•		
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	09/11	11:30	ALD
Total Organic Carbon	4.7	mg/l	1	1	SM5310 C	09/12	17:43	ALD
RESIDUES						•		
Solids, Total Dissolved	53	mg/l	5	1	SM 2540C	09/12	13:00	тмн
Solids, Total Suspended	3	mg/L	3	1	SM 2540D	09/12	13:00	тмн
TITRATIONS						•		
Alkalinity, Total to pH 4.5	5	mg/l	1	1	SM 2320 B	09/15	10:00	HRG

01 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

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Attention:	Gregory Wacik					Date of F	Report:	09/18	8/14
Reported To:	USACE, Philadelphia District					Lab ID:		2295	-14-0034280
	Environmental Resources Branch								
	100 Penn Square East					Date Coll	.ected:	09/10	/14 07:40
	Philadelphia PA 19107					Collected	By:	Clier	nt.
Sample Desc:	WA-2 Mid-Depth					Date Rece	eived:	09/10	)/14 17:15
PWSID: 31308	43			Rep	Dilutn		Test	Test	
		Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst

O2 The duplicate analysis of this sample for total dissolved solids was outside the recommended limit of 5% of their average weight.

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Attention: Gregory Wacik					Date of R	leport:	09/18	/14
Reported To: USACE, Philadelphia Distr	ict				Lab ID:		2295	-14-0034281
Environmental Resources B	ranch							
100 Penn Square East					Date Coll	ected:	09/10/14 07:40	
Philadelphia PA 19107					Collected	By:	Clien	t
Sample Desc: WA-2 Deep					Date Received:		09/10/14 17:15	
PWSID: 3130843			Rep	Dilutn		Test	Test	
	Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst
CHEMISTRY	Band band band band bang bang peng peng peng peng peng peng							
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg∕L	.01	1	SM 4500P-E	09/11	09:50	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	09/11	12:50	HRG
Phosphorus as P, Total	0.06	mg/l	.01	1	SM 4500P-E	09/11	12:30	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	09/11	04:10	JCL
Nitrogen, Nitrate	0.10	mg/l	.05	1	EPA 353.2	09/11	16:22	JCL
Nitrogen, Nitrite	<.05	mg/l	. 05	1	EPA 353.2	09/11	14:57	JCL
Nitrogen, Total Kjeldahl	0.37	mg/l	.25	1	EPA 351.2	09/16	16:41	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	09/11	11:30	ALD
Total Organic Carbon	4.0	mg/l	.1	1	SM5310 C	09/12	17:59	ALD
RESIDUES						•		
Solids, Total Dissolved	55	mg/l	5	1	SM 2540C	09/12	13:00	тмн
Solids, Total Suspended	16	mg/l	3	1	SM 2540D	09/12	13:00	тмн
TITRATIONS		-,				,	_	
Alkalinity, Total to pH 4.5	8	mg/l	1	1	SM 2320 B	09/15	10:00	HRG

01 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

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Attention: Gregory Wacik Reported To: USACE, Philadelphia District Environmental Resources Branch					Date of R Lab ID:	leport:	09/18 2295	/14 -14-0034282
100 Penn Square East					Date Coll	ected:	09/10	/14 10:10
Philadelphia PA 19107					Collected	By:	Clien	t
Sample Desc: WA-3 Surface					Date Rece	eived:	09/10	/14 17:15
PWSID: 3130843			Rep	Dilutn	ı	Test	Test	
	Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst
BACTI	ر پیچ ایسا سے جاتی ہیں ہیں جات ہیں ایسا ایسا ایسا							
MICROBIOLOGY								
Escherichia coli	20	mpn/100ml	1	1	SM 9223B	09/11	11:50	PLW
Fecal Coliform	30	/100ml	2	1	SM 9222D	09/10	17:55	PLW
Total Coliform	>2400	mpn/100ml	1	1	SM 9223B	09/11	11:50	PLW
CHEMISTRY						,		
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	09/11	09:50	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	09/11	12:50	HRG
Phosphorus as P, Total	0.06	mg/l	.01	1	SM 4500P-E	09/11	12:30	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	09/11	04:25	JCL
Nitrogen, Nitrate	0.21	mg/l	. 05	1 ·	EPA 353.2	09/11	16:23	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	09/11	14:58	JCL
Nitrogen, Total Kjeldahl	<.25	mg/l	.25	1	EPA 351.2	09/16	16:42	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	09/11	11:30	ALD
Total Organic Carbon	4.0	mg/L	1	1	SM5310 C	09/12	18:31	ALD
RESIDUES								
Solids, Total Dissolved	61	mg/l	5	1	SM 2540C	09/12	13:00	тмн
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	09/12	13:00	тмн
TITRATIONS								
Alkalinity, Total to pH 4.5	8	mg/l	1	1	SM 2320 B	09/15	10:15	HRG

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		Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst
PWSID: 31308	43			Rep	Dilutn		Test	Test	
Sample Desc:	WA-3 Surface					Date Rece	ived:	09/10	)/14 17:15
	Philadelphia PA 19107					Collected	By:	Clier	nt
	100 Penn Square East					Date Coll	ected:	09/10	0/14 10:10
	Environmental Resources Branch								
Reported To:	USACE, Philadelphia District					Lab ID:		2295	, 
Attention:	Gregory Wacik					Date of R	eport:	09/18	3/14

01 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

O2 The total coliform sample was placed in the incubator on O9/10/14 at 17:40.

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Attention: Gregory Wacik Reported To: USACE, Philadelphia District					Date of R Lab ID:	eport:	09/18/14 2295-14-0034283	
Environmental Resources Branch 100 Penn Square East Philadelphia PA 19107					Date Coll Collected	ected:   By:	09/10 Clien	/14 10:30 t
Sample Desc: WA-4 Surface					Date Rece	eived:	09/10	/14 17:15
PWSID: 3130843			Rep	Dilutn		Test	Test	
	Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst
BACTI	س <u>بہ مر</u> بے اور سے میں اور		مر بعد اعدا اعدا اعدا اعدا					
MICROBIOLOGY								
Escherichia coli	19	mpn/100ml	1	1	SM 9223B	09/11	11:50	PLW
Fecal Coliform	21	/100mL	2	1	SM 9222D	, 09/10	17:55	PLW
Total Coliform	>2400	mpn/100ml	1	1	SM 9223B	09/11	11:50	PLW
CHEMISTRY		·						
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	09/11	09:53	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	09/11	12:50	HRG
Phosphorus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	09/11	12:30	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/t	.05	1	d6919-03	09/11	04:40	JCL
Nitrogen, Nitrate	<.05	mg/l	. 05	1	EPA 353.2	09/11	16:26	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	09/11	15:01	JCL
Nitrogen, Total Kjeldahl	<.25	mg/l	.25	1	EPA 351.2	09/16	16:43	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	09/11	11:30	ALD
Total Organic Carbon	2.6	mg/l	1	1	SM5310 C	09/12	18:15	ALD
RESIDUES-								
Solids, Total Dissolved	57	mg/l	5	1	SM 2540C	09/12	13:00	ТМН
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	09/12	13:00	тмн
TITRATIONS								
Alkalinity, Total to pH 4.5	12	mg/l	1	1	SM 2320 B	09/15	10:15	HRG

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. . . .....





Attention:	Gregory Wacik					Date of R	eport:	09/18	/14
Reported To:	USACE, Philadelphia District					Lab ID:		2295	-14-0034283
	Environmental Resources Branch								
	100 Penn Square East					Date Coll	ected:	09/10	/14 10:30
	Philadelphia PA 19107					Collected	By:	Clien	t
Sample Desc:	WA-4 Surface					Date Rece	ived:	09/10	/14 17:15
PWSID: 313084	43			Rep	Dilutn		Test	Test	
		Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst

01 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

O2 The total coliform sample was placed in the incubator on O9/10/14 at 17:40.

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Attention: Gregory Wacik Reported To: USACE, Philadelphia District Environmental Resources Branch					Date of R Lab ID:	eport:	09/18 2295	/14 -14-0034284
100 Penn Square East	•				Date Coll	ected:	09/10	/14 10:50
Philadelphia PA 19107					Collected	By:	Clien	t
Sample Desc: WA-5 Surface					Date Rece	ived:	09/10	/14 17:15
PWSID: 3130843			Rep	Dilutn		Test	Test	
	Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst
BACTI							~~~~	
MICROBIOLOGY								
Escherichia coli	5	mpn/100ml	1	1	SM 9223B	09/11	11:50	PLW
Fecal Coliform	10	/100mL	2	1	SM 9222D	09/10	17:55	PLW
Total Coliform	2400	mpn/100ml	1	1	SM 9223B	09/11	11:50	PLW
CHEMISTRY						,		
COLORMETRIC								
Phosphate as P, Ortho	0.02	mg/l	.01	1	SM 4500P-E	09/11	09:53	HRG
Phosphorus as P, Dissolved	<.05	mg/L	.05	1	SM 4500P-E	09/11	12:50	HRG
Phosphorus as P, Total	0.02	mg/l	.01	1	SM 4500P-E	09/11	12:30	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	09/11	04:55	JCL
Nitrogen, Nitrate	0.09	mg/l	.05	1	EPA 353.2	09/11	16:28	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	09/11	15:02	JCL
Nitrogen, Total Kjeldahl	<.25	mg/l	.25	1	EPA 351.2	09/16	16:44	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	09/11	11:30	ALD
Total Organic Carbon	2.2	mg/L	1	1	SM5310 C	09/12	18:47	ALD
RESIDUES								
Solids, Total Dissolved	78	mg/l	5	1	SM 2540C	09/12	13:00	тмн
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	09/12	13:00	тмн
TITRATIONS						•		
Alkalinity, Total to pH 4.5	4	mg/l	1	1	SM 2320 B	09/15	10:15	HRG

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Attention:	Gregory Wacik					Date of R	eport:	09/18/	/14
Reported To:	USACE, Philadelphia District					Lab ID:		2295-	-14-0034284
	Environmental Resources Branch								
	100 Penn Square East					Date Coll	ected:	09/10/	/14 10:50
	Philadelphia PA 19107					Collected	By:	Client	t
Sample Desc:	WA-5 Surface					Date Received:		09/10/14 17:15	
PWSID: 313084	43			Rep	Dilutn		Test	Test	
		Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst

01 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

02 The total coliform sample was placed in the incubator on 09/10/14 at 17:40.

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Attention: Gregory Wacik Reported To: USACE, Philadelphia District Environmental Resources Branch					Date of R Lab ID:	eport:	09/18 2295	/14 -14-0034285
100 Penn Square East					Date Coll	ected:	09/10	/14 08:10
Philadelphia PA 19107					Collected	By:	Clien	t
Sample Desc: WA-6 Surface					Date Rece	ived:	09/10	/14 17:15
PWSID: 3130843			Rep	Dilutn		Test	Test	
	Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst
BACTI								
MICROBIOLOGY								
Escherichia coli	<1	mpn/100ml	1	1	SM 9223B	09/11	11:50	PLW
Fecal Coliform	<2	/100mL	2	1	SM 9222D	09/10	17:55	PL.W
Total Coliform	1100	mpn/100ml	1	1	SM 9223B	09/11	11:50	PLW
CHEMISTRY						•		
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	09/11	09:53	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 45'00P-E	09/11	12:50	HRG
Phosphorus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	09/11	12:30	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	09/11	05:10	JCL
Nitrogen, Nitrate	0.10	mg/l	.05	1	EPA 353.2	09/11	16:29	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	09/11	15:02	JCL
Nitrogen, Total Kjeldahl	<.25	mg/l	.25	1	EPA 351.2	09/16	16:45	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	09/11	11:30	ALD
Total Organic Carbon	4.8	mg/l	1	1	SM5310 C	09/12	19:04	ALD
RESIDUES		· · · · · · · · · · · · · · · · · · ·						
Solids, Total Dissolved	51	mg/l	5	1	SM 2540C	09/12	13:00	тмн
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	09/12	13:00	тмн
TITRATIONS								
Alkalinity, Total to pH 4.5	5	mg/l	1	1	SM 2320 B	09/15	10:15	HRG

Mustoka M. Sister

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Attention:	Gregory Wacik					Date of I	Report:	09/18	3/14
Reported To:	USACE, Philadelphia District					Lab ID:	·	2295	, -14-0034285
	Environmental Resources Branch								
	100 Penn Square East					Date Col	lected:	09/10	)/14 08:10
	Philadelphia PA 19107					Collected	d By:	Clier	nt
Sample Desc:	WA-6 Surface					Date Rec	eived:	09/10	)/14 17:15
PWSID: 31308	43			Rep	Dilutn		Test	Test	
		Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst

01 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

O2 The total coliform sample was placed in the incubator on O9/10/14 at 17:40.

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Attention: Gregory Wacik Reported To: USACE, Philadelphia District Environmental Resources Branch					Date of R Lab ID:	eport:	09/18 2295	5/14 
100 Penn Square East					Date Coll	ected:	09/10	/14 08:10
Philadelphia PA 19107					Collected	By:	Clien	it
Sample Desc: WA-6 Mid-Depth					Date Rece	ived:	09/10	)/14 17:10
PWSID: 3130843			Rep	Dilutn		Test	Test	
	Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	09/11	09:53	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	09/11	12:53	HRG
Phosphorus as P, Total	<.01	mg/L	.01	1	SM 4500P-E	09/11	12:30	HRG
NITROGENS						·		
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	09/11	05:25	JCL
Nitrogen, Nitrate	0.10	mg/l	.05	1	EPA 353.2	09/11	16:30	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	09/11	15:05	JCL
Nitrogen, Total Kjeldahl	<.25	mg/l	.25	1	EPA 351.2	09/16	16:46	JCL
OTHER						·		
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	09/11	11:30	ALD
Total Organic Carbon	4.6	mg/l	1	1	SM5310 C	09/12	19:21	ALD
RESIDUES						•		
Solids, Total Dissolved	50	mg/l	5	1	SM 2540C	09/12	13:00	тмн
Solids, Total Suspended	3	mg/l	3	1	SM 2540D	09/12	13:00	тмн
TITRATIONS						,		
Alkalinity, Total to pH 4.5	6	mg/l	1	1	SM 2320 B	09/15	10:30	HRG

01 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

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Attention: Gregory Wacik					Date of R	leport:	09/18	3/14
Reported To: USACE, Philadelphia District					Lab ID:		2295	-14-0034287
100 Penn Square Fast					Doto Coll	ممضمطه	00/40	141 00-40
Philadelphia PA 19107						lected:	09/10	714 08:10
					corrected	ву:	utien	ιτ
Sample Desc: WA-6 Deep					Date Rece	ived:	09/10	)/14 17:15
PWSID: 3130843			Rep	Dilutn		Test	Test	
	Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst
CHEMISTRY	المتناف المرابع بيرابي مراجع بمر	، سین است است بینی بردی بردی است است است ا			روز بر بر بر این این این این ور بر روز بر روز این بر این این این این ور بر روز این ور این ور این ور این ور این			
COLORMETRIC								
Phosphate as P, Ortho	0.01	mg/l	.01	1	SM 4500P-E	09/11	09:53	HRG
Phosphorus as P, Dissolved	<.05	mg/L	.05	1	SM 4500P-E	09/11	12:55	HRG
Phosphorus as P, Total	0.01	mg/l	.01	1	SM 4500P-E	09/11	12:35	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg∕L	.05	1	D6919-03	09/11	05:40	JCL
Nitrogen, Nitrate	0.11	mg/l	.05	1	EPA 353.2	09/11	16:31	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	09/11	15:06	JCL
Nitrogen, Total Kjeldahl	<.25	mg/l	.25	1	EPA 351.2	09/16	16:46	JCL
OTHER						•		
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	09/11	11:30	ALD
Total Organic Carbon	4.1	mg/l	1	1	SM5310 C	09/15	11:40	ALD
RESIDUES								
Solids, Total Dissolved	44	mg/l	5	1	SM 2540C	09/12	13:00	ТМН
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	09/12	13:00	тмн
TITRATIONS						•		
Alkalinity, Total to pH 4.5	7	mg/l	1	1	SM 2320 B	09/15	10:30	HRG

01 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

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Reviewed and Approved by:

stle Wistoxe 7

Christina Kistler Account Executive

Page 1 of 1

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ENVIRONMENTAL TESTING LABORATORY 107 ANGELICA STREET, READING, PA 19611 PHONE: 610-374-5129 · FAX: 610-374-7234 · www.mjreider.com







Attention: Gregory Wacik Reported To: USACE, Philadelphia District Environmental Resources Branch					Date of R Lab ID:	eport:	09/18 2295	/14 -14-0034288
100 Penn Square East					Date Coll	ected:	09/10	/14 08:40
Philadelphia PA 19107					Collected	By:	Clien	t
Sample Desc: WA-7 Surface					Date Rece	ived:	09/10	/14 17:15
PWSID: 3130843			Rep	Dilutn		Test	Test	
	Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst
BACTI					ہو ہے ہے جر حر نے نے نے <del>نے نے نے تھ</del>			
MICROBIOLOGY								
Escherichia coli	<1	mpn/100ml	1	1	SM 9223B	09/11	11:50	PLW
Fecal Coliform	<2	/100mL	2	1	SM 9222D	, 09/10	17:55	PLW
Total Coliform	920	mpn/100ml	1	1	SM 9223B	, 09/11	11:50	PLW
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	09/11	09:53	HRG
Phosphorus as P, Dissolved	<.05	mg/L	. 05	1	SM 4500P-E	09/11	12:55	HRG
Phosphorus as P, Total	<.01	mg/L	. 01	1	SM 4500P-E	09/11	12:35	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	09/11	12:36	JCL
Nitrogen, Nitrate	0.10	mg/l	. 05	1	EPA 353.2	09/11	16:32	JCL
Nitrogen, Nitrite	<.05	ˈmg/l	.05	1	EPA 353.2	09/11	15:07	JCL
Nitrogen, Total Kjeldahl	<.25	mg/l	. 25	1	EPA 351.2	09/16	16:49	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	09/11	11:30	ALD
Total Organic Carbon	4.3	mg/l	1	1	SM5310 C	09/15	12:30	ALD
RESIDUES								
Solids, Total Dissolved	50	mg/l	5	1	SM 2540C	09/12	13:00	ТМН
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	09/12	13:00	ТМН
TITRATIONS								
Alkalinity, Total to pH 4.5	6	mg/l	1	1	SM 2320 B	09/15	10:30	HRG

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Christina Kistler Account Executive

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Attention:	Gregory Wacik					Date of I	Report:	09/18	3/14
Reported To:	USACE, Philadelphia District					Lab ID:	·	2295	, 
	Environmental Resources Branch								
	100 Penn Square East					Date Col	lected:	09/10	0/14 08:40
	Philadelphia PA 19107					Collected	d By:	Clier	nt
Sample Desc:	WA-7 Surface					Date Rece	eived:	09/10	)/14 17:15
PWSID: 31308	43			Rep	Dilutn		Test	Test	
		Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst

01 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

O2 The total coliform sample was placed in the incubator on O9/10/14 at 17:40.

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Christina Kistler Account Executive

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Attention: Gregory Wacik					Date of R	eport:	09/18	/14
Reported To: USACE, Philadelphia District					Lab ID:		2295	-14-0034289
100 Penn Square East					Date Coll	ected.	09/10	1/16 08-60
Philadelphia PA 19107					Collected	By:	Clien	14 03,40
						•		
Sample Desc: WA-7 Mid-Depth					Date Rece	ived:	09/10	/14 17:15
PWSID: 3130843			Rep	Dilutn		Test	Test	
	Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst
CHEMISTRY					<b></b>			
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	09/11	09:55	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	09/11	12:55	HRG
Phosphorus as P, Total	0.01	mg/l	.01	1	SM 4500P-E	09/11	12:35	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	09/11	12:51	JCL
Nitrogen, Nitrate	0.10	mg/l	.05	1	EPA 353.2	09/11	16:33	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	09/11	15:08	JCL
Nitrogen, Total Kjeldahl	0.27	mg/L	.25	1	EPA 351.2	09/16	16:50	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	09/11	11:30	ALD
Total Organic Carbon	4.3	mg/l	1	1	SM5310 C	09/15	13:21	ALD
RESIDUES						•		
Solids, Total Dissolved	45	mg/l	5	1	SM 2540C	09/12	13:00	тмн
Solids, Total Suspended	3	mg/l	3	1	SM 2540D	09/12	13:00	тмн
TITRÁTIONS						,		
Alkalinity, Total to pH 4.5	6	mg/l	1	1	SM 2320 B	09/15	10:30	HRG

01 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

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Attention: Gregory Wacik Reported To: USACE, Philadelphia District Environmental Resources Branch					Date of R Lab ID:	eport:	09/18 2295	5/14 140034290
100 Penn Square East Philadelphia PA 19107					Date Coll Collected	ected: By:	09/10 Clien	/14 08:40 t
Sample Desc: WA-7 Deep					Date Rece	ived:	09/10	)/14 17:15
PWSID: 3130843	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY						, <u></u>		
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	09/11	09:57	HRG
Phosphorus as P, Dissolved	<.05	mg/L	.05	1	SM 4500P-E	09/12	12:50	HRG
Phosphorus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	09/12	12:30	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg∕l	.05	1	D6919-03	09/11	13:05	JCL
Nitrogen, Nitrate	0.09	mg/l	.05	1	EPA 353.2	09/11	16:36	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPÁ 353.2	09/11	15:11	JCL
Nitrogen, Total Kjeldahl	0.25	mg/l	.25	1	EPA 351.2	09/16	16:51	JCL
OTHER						·		
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	09/11	11:30	ALD
Total Organic Carbon	3.6	mg/l	1	1	SM5310 C	09/15	13:37	ALD
RESIDUES								
Solids, Total Dissolved	50	mg/l	5	1	SM 2540C	09/12	13:25	ТМН
Solids, Total Suspended	18	mg/l	3	1	SM 2540D	09/12	13:25	ТМН
TITRATIONS						•		
Alkalinity, Total to pH 4.5	8	mg/l	1	1	SM 2320 B	09/15	10:30	HRG

01 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

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	jbs 08/06/14 12:25:16 PM	M. J. REIDER ASSOCIATES, INC. Page: 1
		Chain of Custody
	Account: 2295 Work Order: 004035 Work Order Description	Project Leader: CMB : Walter Reservoir
	Customer: Gregory Wacik	Remarks:
	Address: USACE, Philadelphia District Environmental Resources Branch	GNICE
	100 Penn Square East Philadelphia PA 19107 715 65661	Total Sampling Time (hours): Bottle Prep by:
	Samplers: $WACIK$	Laboratory Receipt Temp: $\frac{1}{2}$ Deg C If Temp Unacceptable, On Ice? (Y) N Approved By: $0.000$
stane	Sample No: 1 Desc: WA-1 Surface FC, EC, TC, NO3-N, d-p64-p, dp04, BOD, NO NH3-N, tkm, Alk, tds, tss, p04-p, toc,	Matrix: 0 Date: 9/0/14 A - 1 X 250mlMicro P w/ Sterile/Na2S203;40 B - 1 X 160ZN02 P w/ Cool to 6 C; C - 1 X 160ZN03 P w/ Cool to 6 C; D - 1 X 500ml NH3 P w/ H3P04/Zero headspace; E - 1 X 250mh VH2 O w/ H3P04/Zero headspace;
		Cool to 6 C/Zero Headspace;
61222	Sample No: 2 Desc: WA-2 Surface FC, EC, TC, NW NO2-NN NO3-N, d-p64-p, 0-p04, BOD, NH3-N, thu, Alk, tds, tss, p04-p, toc,	<pre>Matrix: 0 Date: //0/1/ A - 1 X 250mlMicro P w/ Sterile/Na2S203; B - 1 X L Bod p w/ Cool to 6 C; C - 1 X 16ozN02N03 p w/ Cool to 6 C; D - 1 X 500ml NH3 p w/ H2S04 (pH&lt;2); E - 1 X 2xambervoa g w/ H3P04/zero headspace; F - 1 X 8oz Alk p w/ Cool to 6 C/Zero Headspace;</pre>
		·
	Relinquished by: Received by	Received for laboratory by: Rafael quificial
	Date: $\frac{9/10}{14}$ $\frac{1545}{1545}$	Date: $\frac{q/10/114}{Sample entered by:}$

	jbs 08/06/14 12:25:16 PM	M. J. REIDER ASSOCIATES, INC. Page: 2												
		Chain of Custody												
	Account: 2295 Work Order: 004035 Work Order Descriptic Customer: Gregory Wacik	Project Leader: CMB n: Walter Reservoir 												
	Address: USACE, Philadelphia District													
	Environmental Resources Branch 100 Penn Square East Philadelphia PA 19107	Total Sampling Time (hours): Bottle Prep by:												
	Fhone: 215-656-6561 Ext: Samplers: $\dot{WA}_{CiK}$	Laboratory Receipt Temp: <u>12 Deg</u> C.If Temp Unacceptable, On Ice. N Approved By: 13												
03222	Sample No: 3 Desc: WA-2 Mid-Depth NO2-N, NO3-N, d-po4-p, o-po4, BOD, N NH3-N, tkn, Alk, tds, tss, po4-p, toc,	Matrix:       0       Date:       0//0//4         A - 1 X L Bod p w/ Cool to 6 C;       B - 1 X 1602N033 p w/ Cool to 6 C;       C - 1 X 500ml NH3 p w/ H2S04 (pH<2);												
		E - 1 X 802 Alk p w/ Cool to 6 C/Zero Headspace; Co/A ni												
34281	Sample No: 4 Desc: WA-2 Deep NO2-N, NO3-N, d-p04-p, o-p04, BOD, NH3-N, tkn, Alk, tds, tss, p04-p, toc,	Matrix: 0 Date: 7/0/17 A - 1 X L Bod p w/ Cool to 6 C; B - 1 X 1602N02N03 p w/ Cool to 6 C; C - 1 X 500ml NH3 p w/ H2SO4 (pH<2);												
		<pre>D - 1 X 2xambervoa g w/ H3P04/zero headspace; E - 1 X 8oz Alk p w/ Cool to 6 C/zero Headspace;</pre>												
282h 2	Sample No: 5 Desc: WA-3 Surface FC, EC, TC, NU NO2-N, NO3-N, d-p01-p, o-p04, BOD, P NH3-N, tkn, Alk, tds, tss, p04-p, toc,	<pre>Matrix: 0 Date: Time: A - 1 X 250mlMicro P w/ Sterile/Na25203; B - 1 X 1602N02N03 P w/ Cool to 6 C; C - 1 X 1602N02N03 P w/ Cool to 6 C; D - 1 X 500ml NH3 P w/ H2S04 (pH&lt;2); F - 1 X 802 Alk P w/ Cool to 6 C/Zero Headspace;</pre>												
		Pareived for Taboratory by:												
	pate: $9/p/y$ Time: 330	Date: $\frac{q/(0/(\gamma - Time: 17/5))}{Sample entered by: M$												
SOCIATES, INC. COFC.PRT Page: 3 Page: 3	ddy	roject Leader: CMB No: 242819 .r	CP ICP	Time (hours): Bottle Prep by: pt Temp: Ul Deg 200 Information Unacceptable, On Ice? IN		Matrix:       0       Date:       7// OW 1         A - 1 X 250mlMicro P w/ Sterile/Na2S203;       B - 1 X L Bod P w/ Cool to 6 C;       Cool to 6 C;	C - 1 X 16ozMO2NO3 p w/ Cool to 6 C; D - 1 X 500ml NH3 p w/ H2SO4(pH<2); E - 1 X 2xambervoa g w/ H3PO4/zero headspace; F - 1 X 8oz Alk p w/ Cool to 6 C/Zero Headspace;	Matrix: 0 Date: $\frac{\sqrt{0}}{1}$	<ul> <li>A - 1 X 250mlMicro P w/ Sterile/Na2S203;</li> <li>B - 1 X L Bod P w/ Cool to 6 C;</li> <li>C - 1 X 16ozN02N03 P w/ Cool to 6 C;</li> <li>D - 1 X 500ml NH3 P w/ H2S04(PH&lt;2);</li> <li>E - 1 X 2xambervoa g w/ H3P04/zero headspace;</li> <li>F - 1 X 8oz Alk P w/</li> <li>Cool to 6 C/Zero Headspace;</li> </ul>				Received for laboratory by: Rufuel Quijeda	Date: $\frac{q  o  (\gamma)}{\beta n}$ Time: $\frac{(715)}{\beta n}$
-----------------------------------------	----------------	-------------------------------------------------------	----------------------------------------------------------------	-------------------------------------------------------------------------------------------	-----------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----------	---	---	--------------------------------------------	----------------------------------------------------------------------
M. J. REIDER ASS	Chain of Custc	104035 scription: Walter Reservoi Remarks:		Total Sampling I Laboratory Recei	2000 200 200 200 200 200 200 200 200 20	<b></b> .			<b></b>	<u>-</u>	-		ed by:	
12:25:16 PM		2295 Work Order: 0 Work Order Des Gregory Wacik	USACE, Philadelphia District Environmental Resources Branch	100 Penn Square East Philadelphia PA 19107 215-656-6561 Ext: WACIK		: 6 Desc: WA-4 Surface c, TC, NU , N03-N, d-po4-P, 0-Po4, BOD, KU	√√ , tkm, Alk, tds, tss, po4-p, toc,	: 7 Desc: WA-5 Surface	c, Tc, Nud , No3-N, d-p64-p, o-p04, BOD, N , tkm, Alk, tds, tss, p04-p, toc,			(	hed by: Receiv	10/14 Time: 330
jbs 08/06/14 1		Account: Customer:	Address:	Phone: Samplers:		74283 Sample No. FC, EC	NH3-N,	74284 sample No:	FC, EC NO2-N, NH3-N,				Relinquist	Date: 0

COFC.PRT Page: 4		No: 242819	6	Bottle Prep by:	emp Unacceptable, On Ice? 👻 N	: 0 $\frac{\text{Date:}}{\text{Time:}} \frac{9//3/\sqrt{2}}{\sqrt{3/2}}$	mlmicro P w/ Sterile/Na2S203; od p w/ Cool to 6 C; zNO2NO3 p w/ Cool to 6 C;	ml NH3 P W/ HZSO4(PH<2); mbervoa g w/ H3PO4/zero headspace; Alk p w/ 6 C/Zero Headspace;	: 0 Date: $\frac{9/\omega}{\sqrt{\chi}}$	od p w/ Cool to 6 C; zNO2NO3 p w/ Cool to 6 C; ml NH3 p w/ H2SO4(pH<2); mbervoa g w/ H3PO4/zero headspace;	6 C/Zero Headspace;		n I P C inde	y by:   kafael Qui kida	Time: 1715 Sample entered by:
M. J. REIDER ASSOCIATES, INC.	Chain of Custody	Froject Leader: CMB n: Walter Reservoir Remarks:	2 40	Total Sampling Time (hours):	Laboratory Receipt Temp: 13 Deg C.If T Approved By: 240	Matrix	A - 1 X 250 B - 1 X L B C - 1 X 160 C - 1 X 160	D - 1 X 500 E - 1 X 2xa F - 1 X 802 Cool to	Matrix	A - 1 X L B B - 1 X 160 C - 1 X 520 D - 1 X 220 H - 1 X 220	P			Received for laborator	Date: 9/10/14
jbs 08/06/14 12:25:16 PM		Account: 2295 Work Order: 004035 Work Order Description Customer: Gregory Wacik	Address: USACE, Philadelphia District Environmental Resources Branch	100 Penn Square East Philadelphia PA 19107	Phone: 215-656-6561 Ext: Samplers: WACK	g Sample No: 8 Desc: WA-6 Surface	FC, EC, TC, NU H, Hood, BOD, NO2-N, NO3-N, d-pof-p, Hood, BOD, NO	NH3-N, tkn, Alk, tds, tss, po4-p, toc,	🕅 Sample No: 9 Desc: WA-6 Mid-Depth	NO2-N, NO3-N, affo4-p, 0-po4, BOD, N <sup>F,</sup> NH3-N, tha, Alk, tds, tss, po4-p, toc,				Relinquished by AAAA Received by (	Date: $\frac{3/0/4}{1545}$ / Time: $\frac{330}{1545}$
						242			2n0	, r					

	jbs 08/06/14 12:25:17 PM	M. J. REIDER ASSOCIATES, INC. Page: 5
		Chain of Custody
	Account: 2295 Work Order: 004035 Work Order Descriptio	Project Leader: CMB n: Walter Reservoir
	Customer: Gregory Wacik	Remarks:
	Address: USACE, Philadelphia District Environmental Resources Branch	en icl
	100 Penn Square East Philadelphia PA 19107 Phone: 215-656-6561 Ext: Samblers: NACIK	Total Sampling Time (hours): Bottle Prep by: Laboratory Receipt Temp: 2 13 14 91(6/14 Approved By: C. If Temp Unacceptable, On Ice? Y N
18242	Sample No: 10 Desc: WA-6 Deep NO2-N, NO3-N, d-po4-p, of po4, BOD	Matrix:0Date:MetrixA - 1 X L Bod p w/ Cool to 6 C;ACB - 1 X 160zN02N03 p w/ Cool to 6 C;C - 1 X 500ml NH3 p w/ H3P04/zero headspace;AD - 1 X 2xambervoa g w/ H3P04/zero headspace;E - 1 X 80z Alk p w/Cool to 6 C/Zero Headspace;
J\$2h2	Sample No: 11 Desc: WA-7 Surface	Matrix: 0 Date: $\frac{1}{\sqrt{240}}$
	FC, EC, TC, V d-pod-p, of BOD V NO2-N <sub>M</sub> NO3-N, d-pod-p, o-pod, BOD V NH3-N, tkm, Alk, tds, tss, pod-p, toc,	A - 1 X 250mlMicro P w/ Sterile/Na2S203; B - 1 X L Bod P w/ Cool to 6 C; C - 1 X 16ozN02N03 P w/ Cool to 6 C; D - 1 X 500ml NH3 P w/ H2S04 ( $\text{PH<2}$ ); F - 1 X 2xambervoa 9 w/ H3P04/zero headspace; F - 1 X 8oz Alk P w/ Cool to 6 C/Zero Headspace;
	Relinquished by: $\frac{1}{10000000000000000000000000000000000$	$\sum_{\text{Date: } \frac{q}{ 0 /4}} \frac{1}{\text{Time: } \frac{1}{1/5}} \frac{1}{1000} \frac$
	2	

	jbs 08/06/14 12:25:17 PM	M. J. REIDER ASSOCIATES, INC. Page: 6 Chain of Custody
	Account: 2295 Work Order: 004035 Work Order Descript Customer: Gregory Wacik	Project Leader: CMB ion: Walter Reservoir Remarks:
	Address: USACE, Philadelphia District Environmental Resources Branch 100 Penn Square East Philadelphia PA 19107	ON     ICC       Total Sampling Time (hours):     OACL, Bottle Prep by:
	Phone: 215-656-6561 Ext: Samplers: $\mathcal{OOPC}K$	Laboratory Receipt Temp: K   Beg C If Temp Unacceptable, On Ice? Y N Approved By:
682h2	Sample No: 12 Desc: WA-7 Mid-Depth NO2-N, NO3-N, d-po4-p, 0-po4, BOD, K NH3-N, tkn, Alk, tds, tss, po4-p, toc,	Matrix: 0 Date: Matrix: 0 Time: A - 1 X L Bod p w/ Cool to 6 C; B - 1 X 16ozNO2NO3 p w/ Cool to 6 C; C - 1 X 500ml NH3 p w/ H2SO4(pH<2); D - 1 X 2xambervoa g w/ H3PO4/zero headspace; E - 1 X 8oz Alk p w/ Cool to 6 C/Zero Headspace;
06252	Sample No: 13 Desc: WA-7 Deep NO2-N, NO3-N, d-p04-p, o-p04, BOD, k NH3-N, tkm, Alk, tds, tss, p04-p, toc,	Matrix:0Date:A - 1 X L Bod p w/ Cool to 6 C;Time:B - 1 X 1602N03 p w/ Cool to 6 C;C - 1 X 500ml NH3 p w/ H3204 (pH<2);
	Relinquished by: Received by Received by Date: $\frac{9/c/i4}{i545}$	$\frac{1}{10000000000000000000000000000000000$