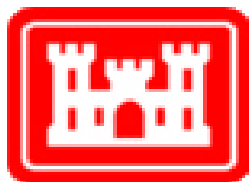


**2014 WATER QUALITY MONITORING
BELTZVILLE RESERVOIR
LEHIGHTON, PENNSYLVANIA**



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

December 2014

**2014 Water Quality Monitoring
Beltzville Reservoir
Lehigh, Pennsylvania**

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1.0 INTRODUCTION

1.1 PURPOSE OF THE MONITORING PROGRAM

The U.S. Army Corps of Engineers (USACE) manages Beltzville Reservoir located in east-central Pennsylvania within the Delaware River Basin. Beltzville Reservoir provides flood control and a dependable water supply to downstream communities along the Pohopoco Creek and Lehigh River. Additionally, the reservoir provides important habitat for fish, waterfowl, and other wildlife, and recreational opportunities through fishing, boating, and swimming. Due to the broad range of uses and demands that Beltzville Reservoir serves, the USACE monitors water quality to compare with state water quality standards and to diagnose other problems that commonly effect reservoir health such as nutrient enrichment and toxic loadings. This report summarizes the results of water quality monitoring at Beltzville Reservoir from 22 May to 11 September 2014.

1.2 DESCRIPTION OF BELTZVILLE RESERVOIR

Beltzville Reservoir was designed to provide flood control, water supply, and enhanced water quality to downstream communities along the Lehigh River. The damming of Pohopoco Creek approximately three miles upstream of its confluence with the Lehigh River formed the reservoir. The reservoir is located in Carbon County, 3 miles northeast of Lehighton and about 20 miles northwest of Allentown, Pennsylvania. The reservoir dams a drainage area of 96.3 square miles and can impound up to 13 billion gallons of water. The primary water source feeding into the lake is Pohopoco creek as it flows southwest to the Lehigh River. Secondary water sources include Pine Run and Wild Creek, both entering the reservoir from the north. The reservoir is approximately 7 miles long and, when full, covers an area of 947 acres. The maximum depth of the lake is 140 feet near the face of the dam.

1.3 ELEMENTS OF THE STUDY

The USACE, Philadelphia District, has been monitoring the water quality of Beltzville Reservoir since 1975. Over this time, the yearly monitoring designs have evolved to address new concerns such as the health of public drinking water and contamination of reservoir bottom sediments. The 2014 monitoring program included the following major elements:

- Monthly water quality and bacteria surface water monitoring of reservoir and upstream sources to evaluate compliance with Pennsylvania state water quality standards and to evaluate the health of the reservoir ecosystem starting on 22 May and ending on 11 September 2014; and
- Monthly profile samples for temperature, dissolved oxygen, chlorophyll a, pH, turbidity, and conductivity at all stations in the reservoir and watershed.

2.0 METHODS

2.1 STRATIFICATION MONITORING

Physical stratification monitoring of the water column was conducted five times at Beltzville Reservoir between 22 May and 11 September 2014 (Table 2-1). Physical stratification parameters included depth, temperature, dissolved oxygen (DO), pH, turbidity, chlorophyll a, and conductivity. Physical stratification was monitored at seven fixed stations throughout the reservoir watershed (Fig. 2-1). Three stations were located within the reservoir body (BZ-3, BZ-6, and BZ-7) for which water quality was measured from the surface to the bottom at 5-foot intervals. Surface water quality was measured at four stations, located on upstream source waters (BZ-2S on Pine Run, BZ-4S on Wild Creek, and BZ-5S on Pohopoco Creek) and BZ-1S downstream of the reservoir on Pohopoco Creek. The physical water quality parameters were measured with a calibrated YSI 6600 V2-4 water quality probe. For this report, all of the stratification monitoring results were summarized and compared to water quality standards enacted by the Pennsylvania Department of Environmental Protection (PADEP), where applicable.

2.2 WATER COLUMN CHEMISTRY MONITORING

Water column chemistry monitoring was conducted five times (once a month) at Beltzville Reservoir between 22 May and 11 September 2014 (Table 2-1). Water samples were collected at the seven fixed stations in the reservoir watershed (Fig. 2-1). Surface water samples were collected downstream of the reservoir (BZ-1S) and on upstream tributary sources Pine Run (BZ-2S), Wild Creek (BZ-4S), and Pohopoco Creek (BZ-5S). Surface, middle, and bottom water samples were collected at three reservoir stations (BZ-3, BZ-6, and BZ-7). Surface water samples were collected by opening sample containers approximately 1 foot below the water's surface. Middle and bottom water samples were collected with a Van Dorn design horizontal water bottle. MJ Reider Associates in Reading, Pennsylvania conducted the laboratory water analysis for 2014.

Water samples from all depths were analyzed for ammonia, nitrite, nitrate, total Kjeldahl nitrogen, total phosphorus, ortho-phosphate, soluble phosphorus, total dissolved solids, total suspended solids, biochemical oxygen demand, alkalinity, and total organic carbon. Table 2-2 summarizes the laboratory method detection limits, laboratory/Corps required reporting limits, state regulatory criteria, and allowable maximum hold times for each water quality parameter monitored.

Table 2-1. Beltzville Reservoir water quality monitoring schedule for 2014

Date of Sample Collection	Physical Stratification Monitoring (All Stations)	Water Column Chemistry Monitoring (All Stations)	BTEX Monitoring ⁽²⁾ (BZ-3 and -6)	Trophic State Assessment (BZ-6)	Coliform Bacteria Monitoring (All Surface Stations)	Drinking Water Monitoring ⁽¹⁾
22 May	X	X		X	X	
19 June	X	X		X	X	
17 July	X	X		X	X	
13 August	X	X		X	X	
11 September	X	X		X	X	

(1) Drinking water samples are sampled quarterly by personnel at each reservoir. This data has not been included within the reservoir water quality sampling report.

(2) BTEX sampling was not conducted in 2014 based on historically low and non-detectable levels of these parameters.

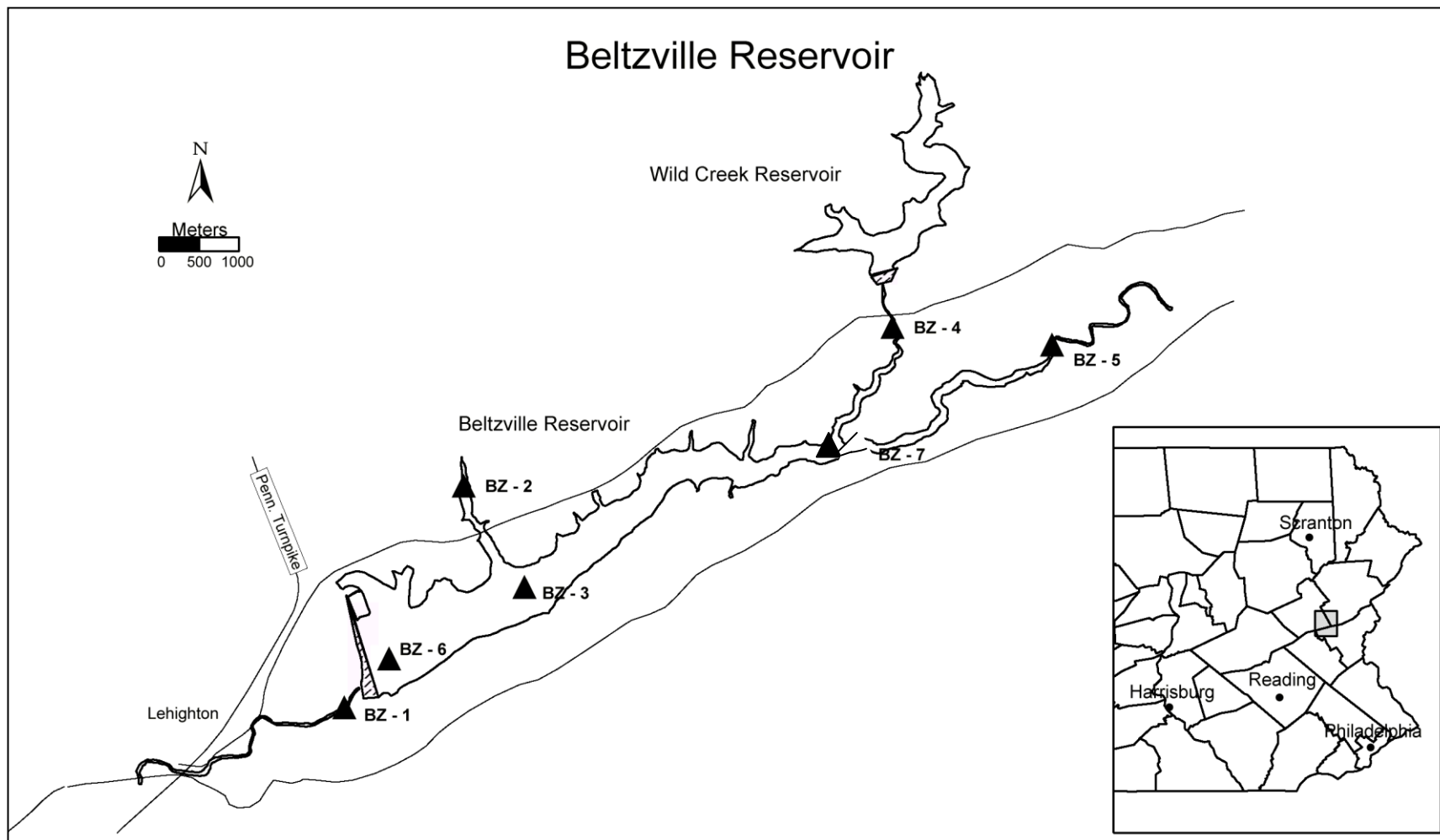


Figure 2-1. Beltzville Reservoir and the location of water quality monitoring stations in 2014.

Table 2-2. Water quality test methods, detection limits, state regulatory criteria, and sample holding times for water quality parameters monitored at Beltzville 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 ₃	14
Biochemical Oxygen Demand (BOD)	SM20 5210B	2.0 mg/L	None	2
Total Phosphorus	SM20 4500-PE	0.01 mg/L	None	28
Diss./Ortho-Phosphate	SM20 4500-PE	0.01 mg/L	None	28
Soluble Phosphorus	SM-20 4500-PE	0.05 mg/L	None	28
Total Organic Carbon (TOC)	SM-20 5310C	1.0 mg/L	None	28
Total Inorganic Carbon (TIC) *	SM-20 5310B	NA	None	28
Total Carbon (TOC + TIC) *	SM-20 5310B	NA	None	28
(1) Chlorophyll a	YSI Probe	----	None	
Total Kjeldahl Nitrogen	351.2 MCAWW	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 10 mg/L (nitrate + nitrite)	28
Nitrite	MCAWW 353.2	0.05 mg/L		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 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", 22nd Edition, 2012.

SW846- "Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods", 3rd. Edition, November 1986 and updates.

* Total Inorganic Carbon and Total Carbon were not sampled for in 2014

2.3 TROPHIC STATE DETERMINATION

The trophic state of Beltzville Reservoir was determined by methods outlined by Carlson (1977). In general, this method calculated trophic state indices (TSIs) independently for measures of total phosphorus, chlorophyll *a*, and secchi disk depth. Surface water measures of total phosphorus and chlorophyll *a* from chemistry monitoring were used independently in the determination of monthly trophic state (Table 2-1). Secchi disk depth was measured monthly at reservoir-body station BZ-6. Trophic state determinations were made using criteria defined by Carlson and EPA (1983) and calculated only for Station BZ-6 within the deepest portion of the reservoir.

2.4 RESERVOIR BACTERIA MONITORING

Monitoring for coliform bacteria contaminants was conducted five times at Beltzville Reservoir between 22 May and 11 September 2014 (Table 2-1). Surface water samples were collected at all seven stations and analyzed for total coliform and fecal coliform. The samples were collected in the same manner as the chemistry samples or approximately 1-foot below the surface of the water. Table 2-3 presents the test methods, detection limits, PADEP standards, and sample holding times for the bacteria parameters monitored at Beltzville 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.

Table 2-3. Water quality test methods, detection limits, PADEP standards, and sample holding times for bacteria parameters monitored at Beltzville Reservoir in 2014.		
Parameter	Total Coliform/E-coli	Fecal Coliform
Test method	SM 9223B	SM9222D
Detection limit	1 clns/100-mls	2 clns/100-mls
PADEP standard	None	Geometric mean < 200 clns/100-mls or a single sample reading of < 1000 clns/100-mls
Maximum allowable holding time	30 hours	30 hours
Achieved holding time	< 30 hours	< 30 hours

The PADEP monthly coliform bacteria standard is defined as a maximum geometric mean of 200 colonies/100-ml based on 5 consecutive samples collected on different days. In addition, a single sample standard of 1000 colonies/100-ml can also be used. These standards are most applicable at bathing beaches. Beltzville State Park maintains a bathing beach at Beltzville Reservoir and conducts bacteria sampling of that area. Given our logistical limitations (all monthly sampling conducted on one day) and the fact that water contact recreation is permitted within the reservoir, the coliform data collected by the Corps is compared to the single sample standard as a method of collecting and evaluating background coliform data on the main body of the reservoir. Although our sampling design does not fully meet PADEP guidelines for bathing beach monitoring, we feel that this interpretation of the coliform data meets the intent of the PADEP water quality standard for evaluating Beltzville Reservoir bacteria levels within the main reservoir body.

3.0 RESULTS AND DISCUSSION

3.1 STRATIFICATION MONITORING

The following sections summarize the water quality monitoring results of the physical and chemical parameters: temperature, dissolved oxygen, and pH. Seasonal and spatial patterns of surface water quality measured throughout the reservoir watershed, and seasonal and depth related patterns of the stratified lake water column based on measures from the deepest portion of the reservoir (station BZ-6 or the “Tower”) are described. The discussion of stratification is focused on this station as water quality problems related to depth are generally most severe in deeper water habitats. Corps personnel collected the physical and chemical water quality data discussed herein over the monitoring period from May to September 2014. All of the parameters were measured with a calibrated YSI 6600 V2-4 water quality probe and are presented in Appendix A.

3.1.1 Temperature

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

Temperatures of the tributary and downstream release surface waters generally followed a similar pattern throughout the watershed of Beltzville Reservoir during 2014 (Fig. 3-1). The maximum upstream tributary station temperature of 23.13 °C was seen at station BZ-4S on 19 June. The maximum downstream release (BZ-1S) surface water temperature was 16.35 °C on 24 July. Upstream and downstream waters have a variety of environmental and anthropogenic factors potentially influencing water temperature. Station BZ-1S is directly influenced by Beltzville Reservoir releases that come from various locations in the water column and is dictated by reservoir release operations. Downstream release temperatures are managed to meet Pennsylvania State High Quality Cold Water Fishery standards. Station BZ-2S is a small well vegetated tributary. Station BZ-4S is influenced by Wild Creek Reservoir releases upstream of Beltzville Reservoir and maintained the highest recorded tributary surface water temperatures throughout the sampling season. Station BZ-5S is located in an open water area where Pohopoco Creek enters Beltzville Reservoir. These factors, amongst others, likely result in the temperature variations in surface water temperatures at each tributary station shown in Figure 3.1.

Beltzville Reservoir was stratified with respect to temperature in 2014 (Fig. 3-2). The reservoir surface waters are warmed by the sun and would account for warmer surface water temperatures recorded at lake stations (BZ-3, BZ-7, and BZ-6). In May, the onset of stratification was apparent with surface temperatures (16.78 °C) approximately 10.6 °C warmer than the lower water column (6.18 °C). A strong stratification pattern was evident from late May into September. In September, cooling surface temperatures and erosion of the epilimnion marked the onset of fall turnover within the reservoir.

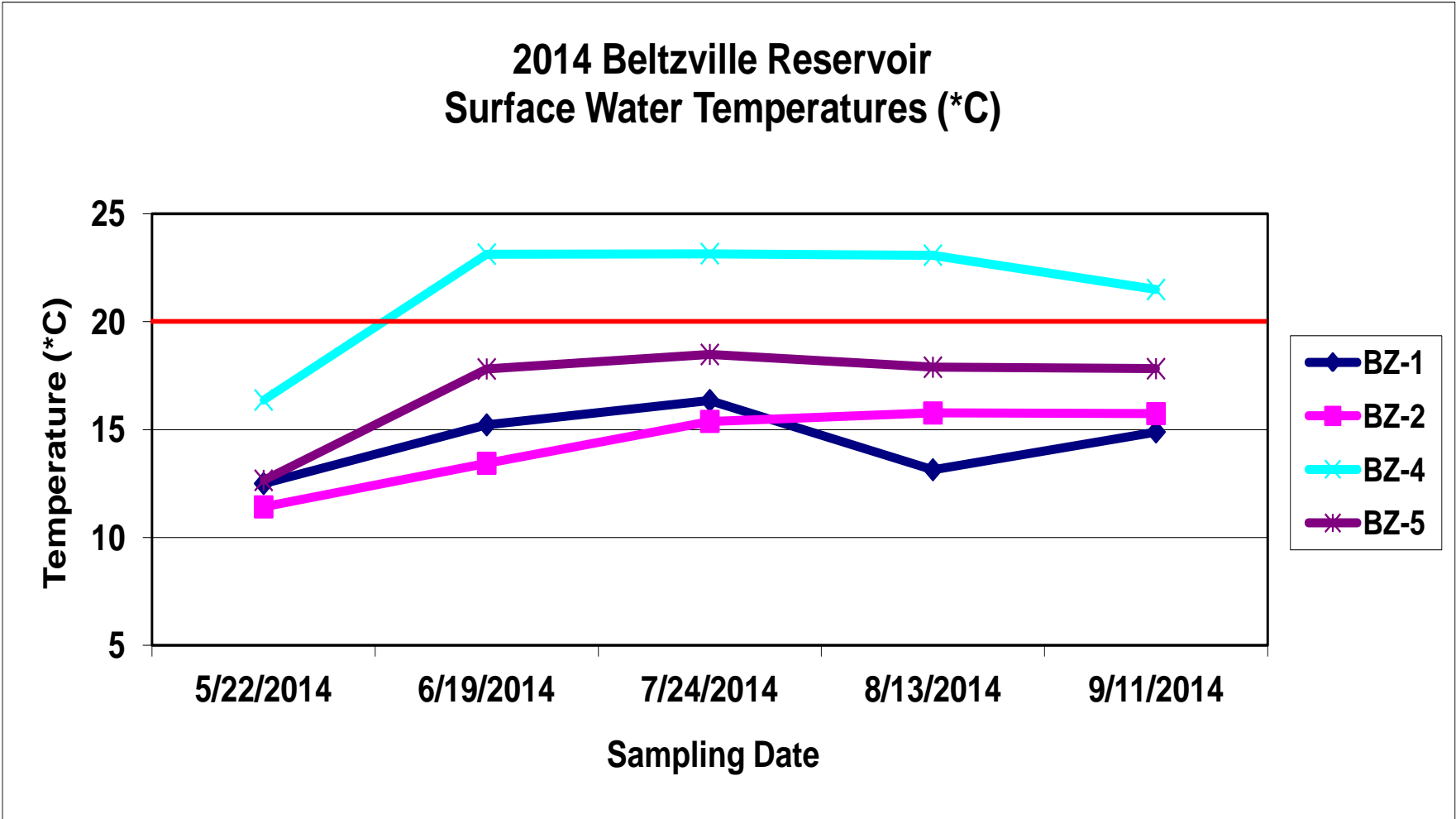


Figure 3-1. Tributary and downstream surface water temperature (°C) measured at Beltzville Reservoir in 2014. See Appendix A for Summary of plotted values. Station BZ-1 reflects releases surface water temperatures downstream of Beltzville Reservoir.

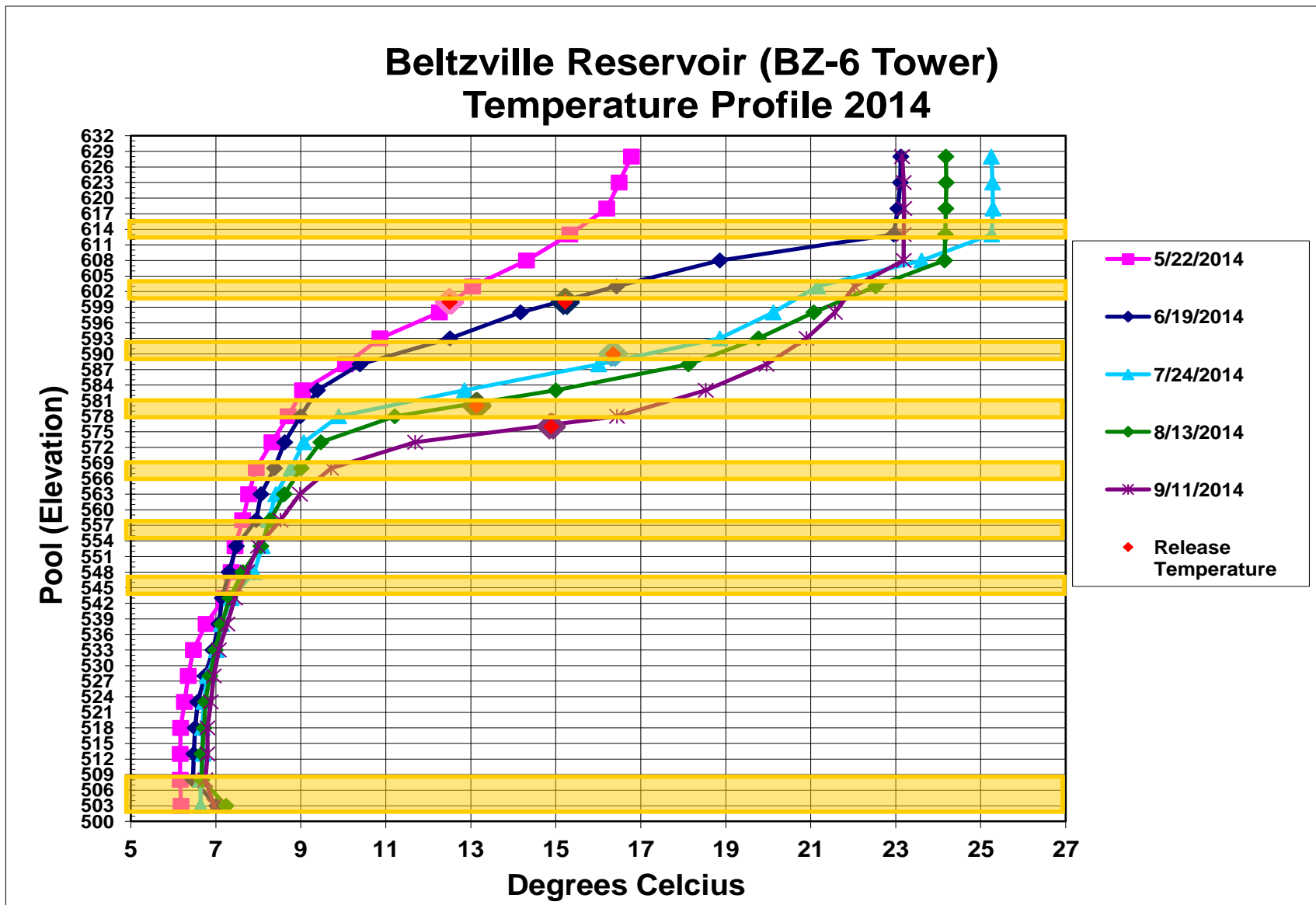


Figure 3-2. Lake temperature profile at station BZ-6 of Beltzville Reservoir in 2014. See Appendix A for summary of plotted values. The yellow bars represent the locations of water control gates in the Beltzville Reservoir control tower.

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 air and water 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 dissolved oxygen can facilitate the release of nutrients from bottom sediments.

Dissolved oxygen (DO) in the tributary and release surface waters generally followed a similar pattern throughout the watershed of Beltzville Reservoir during 2014 (Fig. 3-3). Dissolved oxygen concentrations downstream of the reservoir (BZ-1S) and at the upstream stations (BZ-2S, -4S, -5S) averaged 9.38 mg/L for the sampling season. The maximum DO reading of 10.8 mg/L occurred at BZ-2S on 22 May and a minimum reading of 7.75 mg/L occurred at BZ-4S on 24 July.

Dissolved Oxygen in the water column at station BZ-6 of Beltzville Reservoir from late May through September, exhibited a metalimnetic oxygen minimum (negative heterograde curve) with concentrations decreasing and increasing rapidly as measurements were taken from the surface to the lake bottom (Fig. 3-4). This general pattern has been observed at station BZ-6 in previous years and may be due to a lens of low oxygenated water passing through the reservoir from upstream sources, a result of portal operations at the reservoir tower, respiratory oxygen consumption or some other factor.

DO concentrations in the water column of Beltzville Reservoir were in compliance with PADEP water quality standards during 2014. The state water quality standard for DO is a minimum concentration of 5-mg/L in the epilimnion of stratified lakes. As shown in Figure 3-4, concentrations falling below the standard were encountered in July, August, and September but were located below the epilimnion. DO concentrations measured in all surface waters of the reservoir were in compliance with the standard.

The health of aquatic ecosystems is impaired by low DO concentrations in the water column. Hypoxia, or conditions of DO less than 2 mg/L, is generally accepted as the threshold at which the most severe effects on biota occur. Bottom waters that are not mixed during stratification are depleted of oxygen primarily through biological respiration. In 2014, these conditions were not seen in the lower portion of the water column at station BZ-6 but were recorded in the middle of the water column profile during the August, and September sampling events (Appendix A).

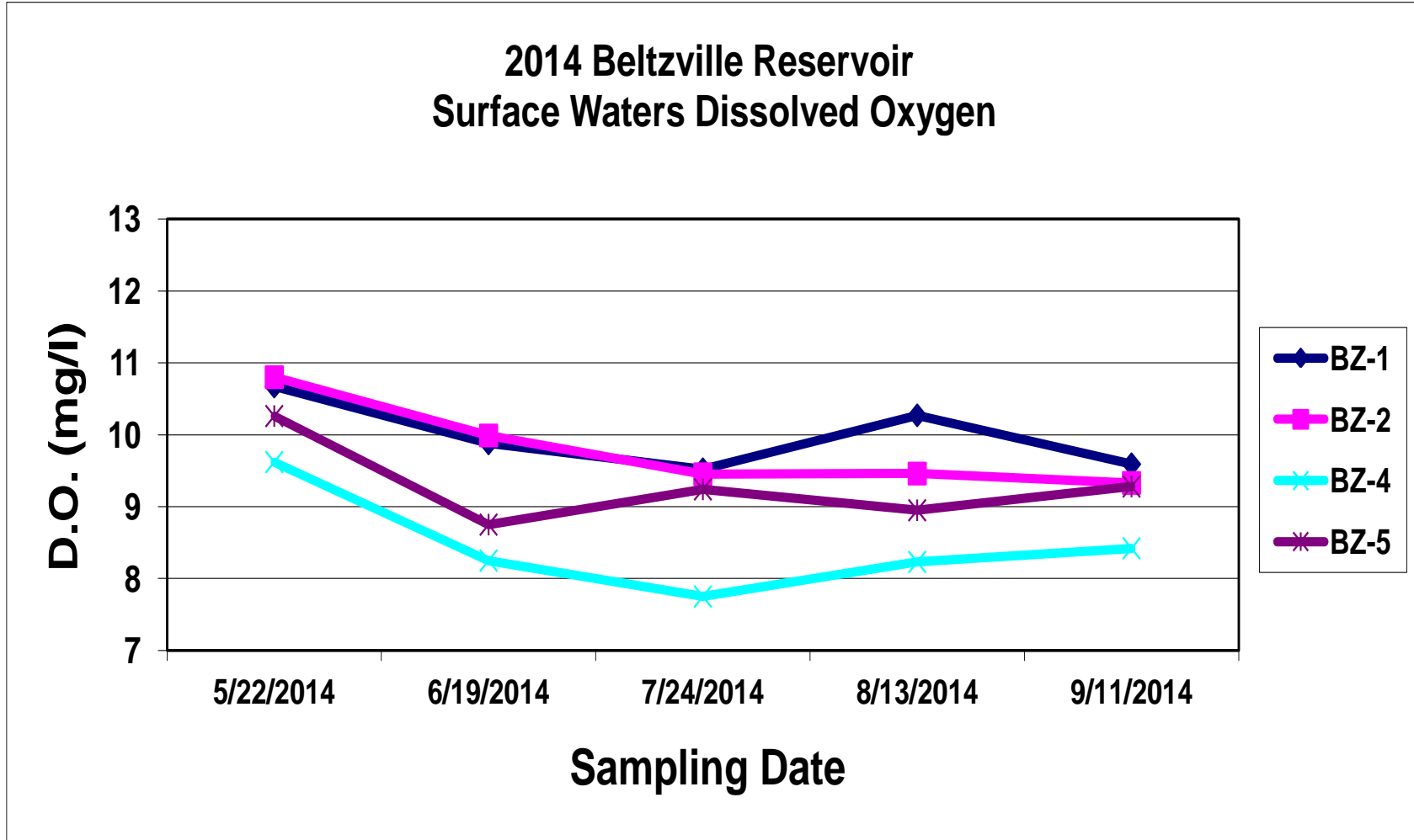


Figure 3-3. Dissolved oxygen concentrations measured in tributary and downstream surface waters at Beltzville Reservoir in 2014. (The PADEP water quality standard for dissolved oxygen is a minimum concentration of 5 mg/L.) See Appendix A for summary of plotted values. Station BZ-1 reflects reservoir release surface waters downstream of Beltzville Reservoir

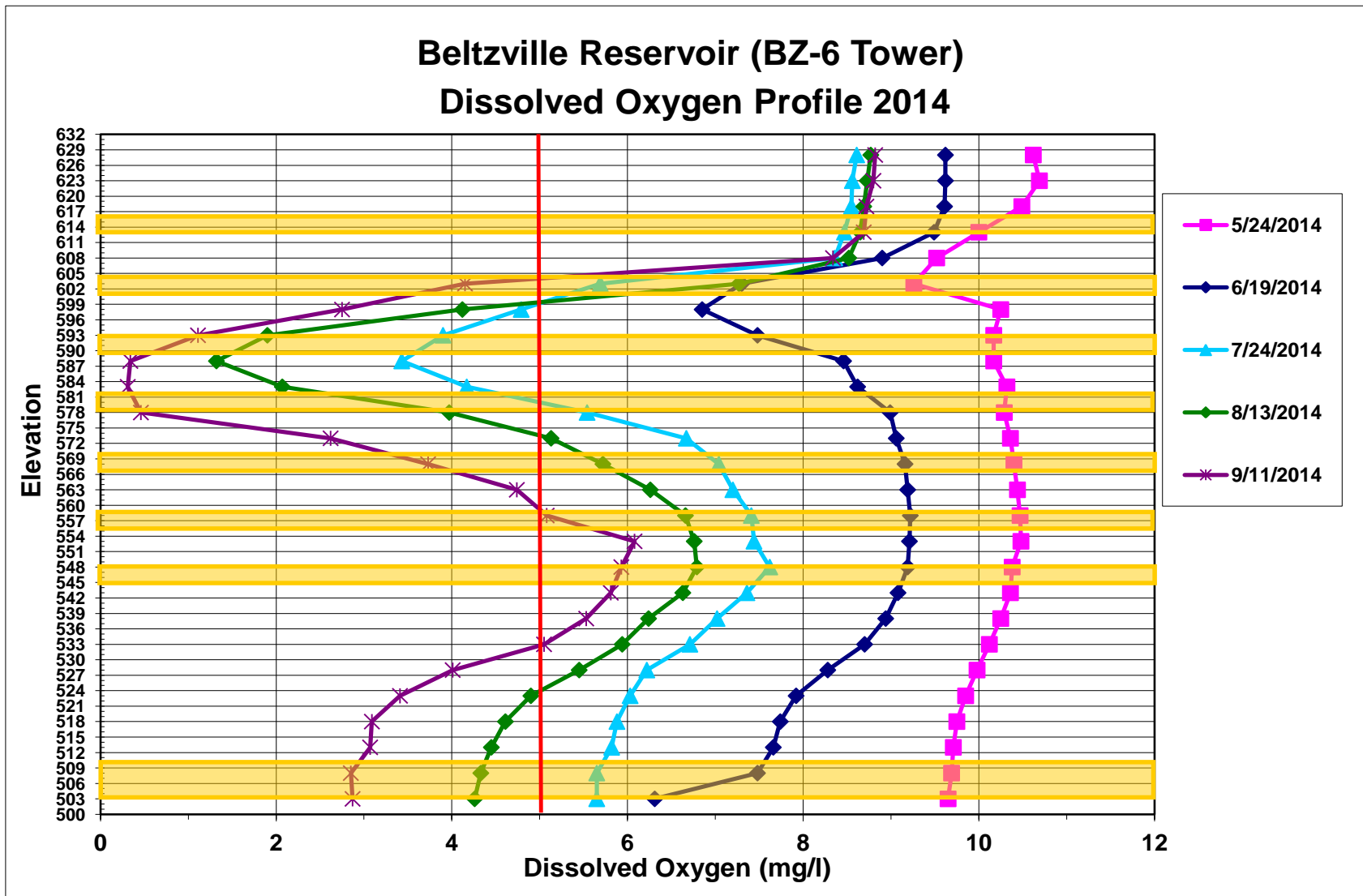


Figure 3-4. Dissolved oxygen profile at station BZ-6 of Beltzville Reservoir in 2014. (The PADEP water quality standard for DO is a minimum concentration of 5 mg/L.) See Appendix A for summary of plotted values.

3.1.3 pH

pH is the measure of the hydrogen ion concentration in the water. The pH scale is 0-14. A pH below 7 is considered acidic and a pH above 7 is 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 at upstream tributary (BZ-2S, BZ-4S and BZ-5S) and release (BZ-1S) surface water stations stayed within a tight range of values and followed a similar seasonal pattern at Beltzville Reservoir during 2014 (Fig. 3-5). The maximum pH value of 7.53 was recorded at Station BZ-4S on 24 July and at station BZ-5S on 11 September. The minimum pH value of 6.52 was recorded at station BZ-2S on 22 May.

In all months sampled in 2014, pH values in the lake water column were slightly higher near the water surface, declined rapidly, and remained relatively constant or slightly increasing throughout most of the remaining water column (Fig. 3-6). The higher pH readings near the surface can be attributed to algal productivity in the trophic zone of the lake. A slight increase in pH in bottom waters occurred in the portions of the water column experiencing anoxic or low oxygen conditions. This was most evident in July, August, and September. This increase in pH may be attributed to anaerobic oxidation processes in the bottom waters of the lake. The pH measures at lake and tributary stations of Beltzville Reservoir during 2014 were in compliance with PADEP pH criteria for all profile measures at station BZ-6. The standard for pH is a range of acceptable measures between 6 and 9.

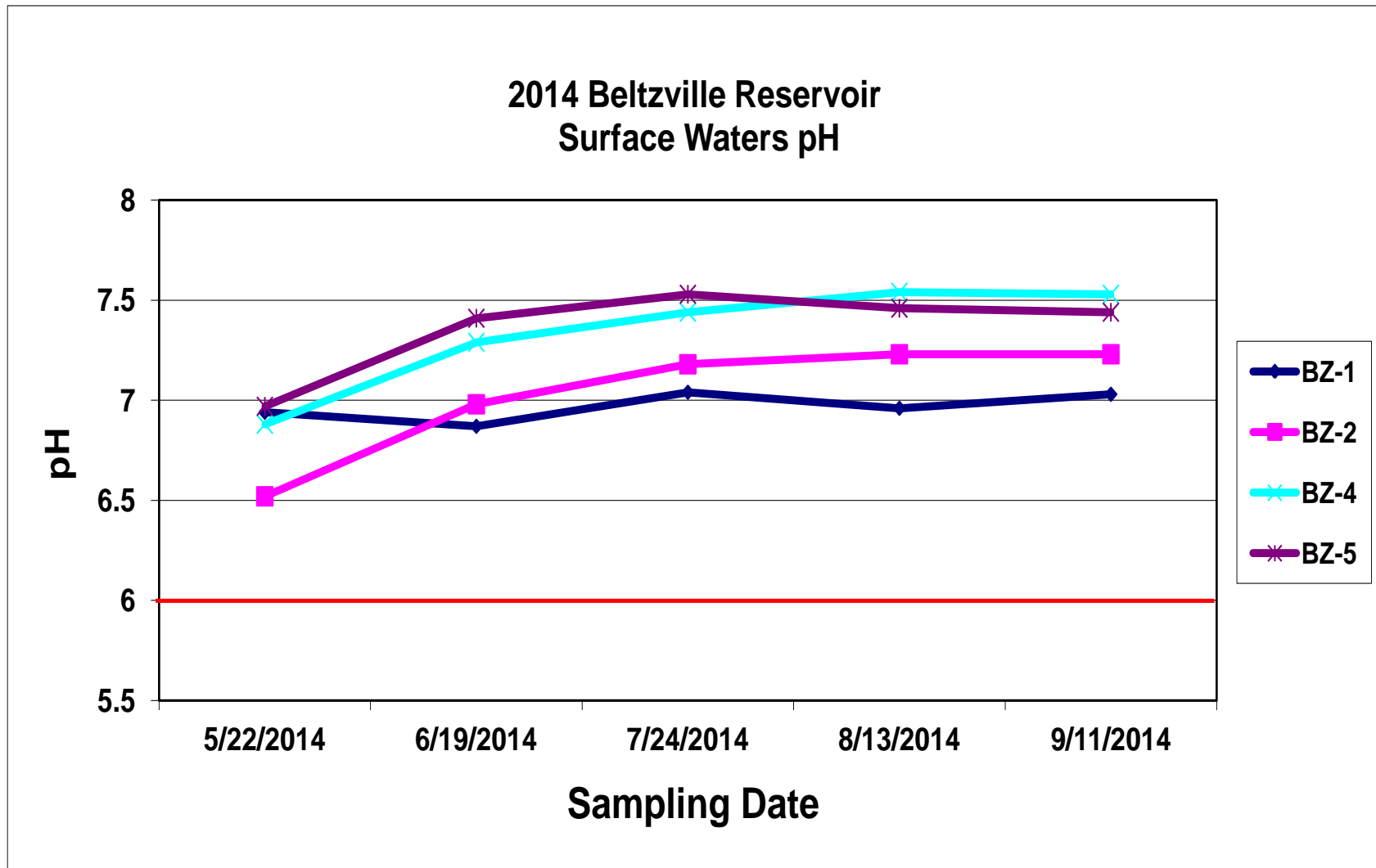


Figure 3-5. pH concentrations measured in tributary and downstream surface waters at Beltzville Reservoir in 2014. (The PADEP water quality standard for pH is between 6 and 9) See Appendix A for summary of plotted values.

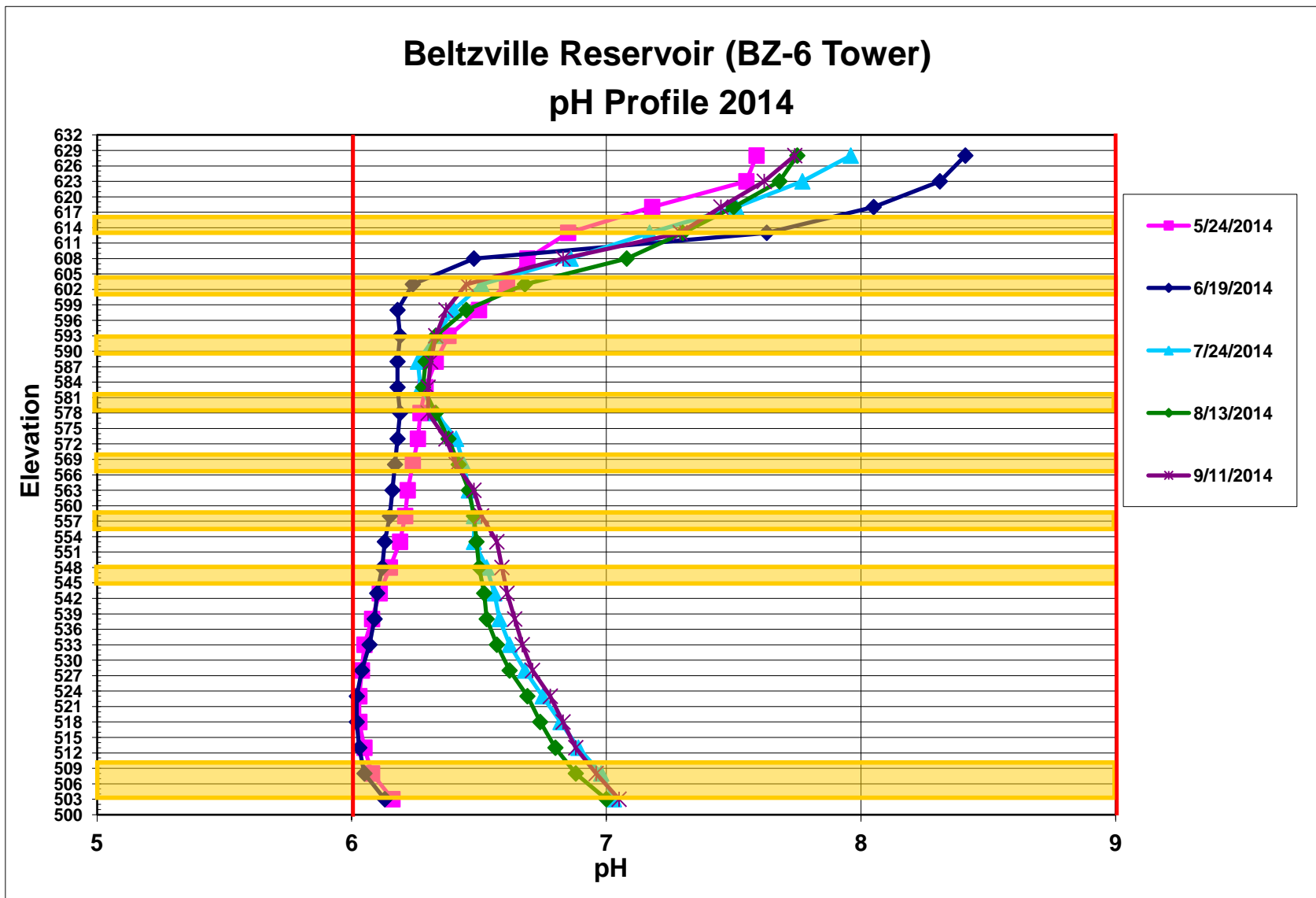


Figure 3-6. pH profile at station BZ-6 of Beltzville Reservoir in 2014. (The PADEP water quality standard for pH is between 6 and 9) See Appendix A for summary of plotted value

Results and Discussion

3.2 WATER COLUMN CHEMISTRY MONITORING

The following sections describe temporal, spatial, and patterns relating to depth for the water quality parameters measured in surface, middle, and bottom waters of Beltzville Reservoir during 2014 (Table 3-2).

3.2.1 Ammonia

Total Ammonia (NH₃) is a measure of the most reduced inorganic form of nitrogen in water and includes dissolved ammonia and the ammonium ion. Ammonia is a small component of the nitrogen cycle but as an essential plant nutrient, it contributes to the trophic status of a water body. Elevated ammonia in the lower water column of deep, stratified lakes and reservoirs usually results in those that are affected by eutrophication. 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 concentrations were low in Beltzville Reservoir during 2014. Concentrations measured at all stations and depths were less than the laboratory reporting limit of 0.05 mg/L during the entire sampling season and at all stations and depths. Concentrations of ammonia measured at Beltzville Reservoir were in compliance with the PADEP water quality standards during 2014. The state water quality standard for ammonia is dependent on temperature and pH (Table 3-1).

PH	10 °C	15 °C	20 °C	25 °C	30 °C
6.50	25.5	17.4	12.0	8.4	5.9
6.75	23.6	16.0	11.1	7.7	5.5
7.00	20.6	14.0	9.7	6.8	4.8
7.25	16.7	11.4	7.8	5.5	3.9
7.50	12.4	8.5	5.9	4.1	2.9
7.75	8.5	5.8	4.0	2.8	2.0
8.00	5.5	5.8	4.0	2.8	2.0
8.25	3.4	2.3	1.6	1.2	0.9
8.50	2.0	1.4	1.0	0.7	0.6
8.75	1.2	0.9	0.6	0.5	0.4
9.00	0.8	0.5	0.4	0.3	0.3
9.25	0.36	0.24	0.17	0.12	0.08
9.50	0.20	0.13	0.10	0.07	0.05

Station	Date	ALK	BOD5	DISS-P	NH3	NO2	NO3	PO4	TDS	TKN	TOC	TP	TSS
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
BZ-01S	5/22/2014	9	<2	<0.05	<0.05	<0.05	0.68	<0.01	20	0.27	1.8	<0.01	<3
	6/19/2014	11	<2	<0.05	<0.05	<0.05	0.68	0.04	47	<0.25	1.5	0.04	14
	7/24/2014	10	<2	<0.05	<0.05	<0.05	0.81	<0.01	87	<0.25	1.6	<0.01	<3
	8/13/2014	10	<2	<0.05	<0.05	<0.05	0.78	<0.01	128	<0.25	1.3	<0.01	11
	9/11/2014	10	<2	<0.05	<0.05	<0.05	0.77	<0.01	57	<0.25	1.4	<0.01	<3
	Mean	10	2	0.05	0.05	0.05	0.744	0.016	67.8	0.254	1.52	0.016	6.8
	Stdev	0.707	0	0	0	0	0.06	0.013	41.312	0.009	0.192	0.013	5.31
	Max	11	2	0.05	0.05	0.05	0.81	0.04	128	0.27	1.8	0.04	14
	Min	9	2	0.05	0.05	0.05	0.68	0.01	20	0.25	1.3	0.01	3
No. of Dects	5	0	0	0	0	5	1	5	1	5	1	2	
BZ-02S	5/22/2014	6	<2	<0.05	<0.05	<0.05	0.15	0.07	10	<0.25	<1	0.08	<3
	6/19/2014	6	<2	<0.05	<0.05	<0.05	0.19	0.03	45	<0.25	<1	0.04	3
	7/24/2014	8	<2	<0.05	<0.05	<0.05	0.24	<0.01	56	<0.25	<1	<0.01	3
	8/13/2014	8	<2	<0.05	<0.05	<0.05	0.26	<0.01	99	<0.25	1.8	0.02	6
	9/11/2014	9	<2	<0.05	<0.05	<0.05	0.24	<0.01	62	<0.25	<1	<0.01	<3
	Mean	7.4	2	0.05	0.05	0.05	0.216	0.026	54.4	0.25	1.16	0.032	3.6
	Stdev	1.342	0	0	0	0	0.045	0.026	32.052	0	0.358	0.029	1.342
	Max	9	2	0.05	0.05	0.05	0.26	0.07	99	0.25	1.8	0.08	6
	Min	6	2	0.05	0.05	0.05	0.15	0.01	10	0.25	1	0.01	3
	No. of Dects	5	0	0	0	0	5	2	5	0	1	3	3

Station	Date	ALK	BOD5	DISS-P	NH3	NO2	NO3	PO4	TDS	TKN	TOC	TP	TSS
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
BZ-03S	5/22/2014	9	<2	<0.05	<0.05	<0.05	0.62	0.05	22	<0.25	1.8	0.05	<3
	6/19/2014	9	<2	<0.05	<0.05	<0.05	0.43	0.05	41	<0.25	1.6	0.04	<3
	7/24/2014	10	<2	<0.05	<0.05	<0.05	0.37	<0.01	68	0.33	1.5	0.01	<3
	8/13/2014	10	<2	<0.05	<0.05	<0.05	0.33	<0.01	99	<0.25	1.4	<0.01	<3
	9/11/2014	11	2	<0.05	<0.05	<0.05	0.25	<0.01	50	<0.25	1.6	0.01	<3
	Mean	9.8	2	0.05	0.05	0.05	0.4	0.026	56	0.266	1.58	0.024	3
	Stdev	0.837	0	0	0	0	0.139	0.022	29.198	0.036	0.148	0.019	0
	Max	11	2	0.05	0.05	0.05	0.62	0.05	99	0.33	1.8	0.05	3
	Min	9	2	0.05	0.05	0.05	0.25	0.01	22	0.25	1.4	0.01	3
	No. of Dects	5	1	0	0	0	5	2	5	1	5	4	0
BZ-03M	5/22/2014	9	<2	<0.05	<0.05	<0.05	0.72	<0.01	33	<0.25	1.3	0.02	<3
	6/19/2014	9	<2	<0.05	<0.05	<0.05	0.75	0.03	65	<0.25	1.2	<0.01	<3
	7/24/2014	11	<2	<0.05	<0.05	<0.05	0.82	0.04	108	<0.25	1.2	0.04	<3
	8/13/2014	9	<2	<0.05	<0.05	<0.05	0.78	0.07	129	<0.25	1.1	0.08	<3
	9/11/2014	11	<2	<0.05	<0.05	<0.05	0.82	<0.01	88	<0.25	1.3	0.01	<3
	Mean	9.8	2	0.05	0.05	0.05	0.778	0.032	84.6	0.25	1.22	0.032	3
	Stdev	1.095	0	0	0	0	0.044	0.025	37.34	0	0.084	0.029	0
	Max	11	2	0.05	0.05	0.05	0.82	0.07	129	0.25	1.3	0.08	3
	Min	9	2	0.05	0.05	0.05	0.72	0.01	33	0.25	1.1	0.01	3
	No. of Dects	5	0	0	0	0	5	3	5	0	5	4	0

Table 3.2 Continued. Summary of surface, middle, and bottom water quality monitoring data for Beltzville Reservoir in 2014

Station	Date	ALK	BOD5	DISS-P	NH3	NO2	NO3	PO4	TDS	TKN	TOC	TP	TSS
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
BZ-03B	5/22/2014	9	<2	<0.05	<0.05	<0.05	0.77	<0.01	30	<0.25	1.2	0.03	<3
	6/19/2014	9	<2	0.07	<0.05	<0.05	0.7	0.07	58	0.39	1.4	0.12	87
	7/24/2014	10	<2	<0.05	<0.05	<0.05	0.72	<0.01	87	1.93	1.9	1.32	95
	8/13/2014	11	<2	<0.05	<0.05	<0.05	0.68	<0.01	129	<0.25	1.1	<0.01	4
	9/11/2014	11	<2	<0.05	<0.05	<0.05	0.62	<0.01	70	<0.25	1.2	<0.01	18
	Mean	10	2	0.054	0.05	0.05	0.698	0.022	74.8	0.614	1.36	0.298	41.4
	Stdev	1	0	0.009	0	0	0.055	0.027	36.738	0.738	0.321	0.573	45.753
	Max	11	2	0.07	0.05	0.05	0.77	0.07	129	1.93	1.9	1.32	95
	Min	9	2	0.05	0.05	0.05	0.62	0.01	30	0.25	1.1	0.01	3
	No. of Dects	5	0	1	0	0	5	1	5	2	5	3	4
BZ-04S	5/22/2014	5	<2	<0.05	<0.05	<0.05	0.5	<0.01	7	<0.25	1.2	0.02	<3
	6/19/2014	6	<2	<0.05	<0.05	<0.05	0.66	0.01	46	<0.25	<1	0.01	<3
	7/24/2014	6	<2	<0.05	<0.05	<0.05	0.45	0.07	55	<0.25	1.1	0.08	<3
	8/13/2014	6	<2	<0.05	<0.05	<0.05	0.38	<0.01	95	<0.25	<1	<0.01	<3
	9/11/2014	5	<2	<0.05	<0.05	<0.05	0.06	<0.01	34	<0.25	1.2	<0.01	<3
	Mean	5.6	2	0.05	0.05	0.05	0.41	0.022	47.4	0.25	1.1	0.026	3
	Stdev	0.548	0	0	0	0	0.221	0.027	32.161	0	0.1	0.03	0
	Max	6	2	0.05	0.05	0.05	0.66	0.07	95	0.25	1.2	0.08	3
	Min	5	2	0.05	0.05	0.05	0.06	0.01	7	0.25	1	0.01	3
	No. of Dects	5	0	0	0	0	5	2	5	0	3	3	0

Station	Date	ALK	BOD5	DISS-P	NH3	NO2	NO3	PO4	TDS	TKN	TOC	TP	TSS
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
BZ-05S	5/22/2014	12	<2	<0.05	<0.05	<0.05	1.11	<0.01	44	<0.25	1.4	0.04	3
	6/19/2014	12	2	<0.05	<0.05	<0.05	1.29	0.02	61	0.3	3.9	0.03	36
	7/24/2014	16	<2	<0.05	<0.05	<0.05	1.28	<0.01	77	0.28	1.7	0.05	<3
	8/13/2014	13	<2	<0.05	<0.05	<0.05	1.03	0.04	97	<0.25	2	0.04	<3
	9/11/2014	15	2	<0.05	<0.05	<0.05	1.12	0.09	80	<0.25	1.1	0.09	<3
	Mean	13.6	2	0.05	0.05	0.05	1.166	0.034	71.8	0.266	2.02	0.05	9.6
	Stdev	1.817	0	0	0	0	0.114	0.034	20.117	0.023	1.103	0.023	14.758
	Max	16	2	0.05	0.05	0.05	1.29	0.09	97	0.3	3.9	0.09	36
	Min	12	2	0.05	0.05	0.05	1.03	0.01	44	0.25	1.1	0.03	3
No. of Dects	5	2	0	0	0	5	3	5	2	5	5	2	
BZ-06S	5/22/2014	9	<2	<0.05	<0.05	<0.05	0.62	<0.01	32	0.29	1.8	0.03	<3
	6/19/2014	11	<2	<0.05	<0.05	<0.05	0.45	<0.01	36	<0.25	1.6	<0.01	4
	7/24/2014	11	<2	<0.05	<0.05	<0.05	0.37	<0.01	55	0.37	1.6	<0.01	<3
	8/13/2014	11	<2	<0.05	<0.05	<0.05	0.33	<0.01	71	<0.25	1.6	<0.01	<3
	9/11/2014	11	2	<0.05	<0.05	<0.05	0.25	<0.01	56	<0.25	1.5	<0.01	3
	Mean	10.6	2	0.05	0.05	0.05	0.404	0.01	50	0.282	1.62	0.014	3.2
	Stdev	0.894	0	0	0	0	0.141	0	15.984	0.052	0.11	0.009	0.447
	Max	11	2	0.05	0.05	0.05	0.62	0.01	71	0.37	1.8	0.03	4
	Min	9	2	0.05	0.05	0.05	0.25	0.01	32	0.25	1.5	0.01	3
No. of Dects	5	1	0	0	0	5	0	5	2	5	1	2	

Table 3.2 Continued. Summary of surface, middle, and bottom water quality monitoring data for Beltzville Reservoir in 2014

Station	Date	ALK	BOD5	DISS-P	NH3	NO2	NO3	PO4	TDS	TKN	TOC	TP	TSS
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
BZ-06M	5/22/2014	9	<2	<0.05	<0.05	<0.05	0.76	0.04	26	<0.25	1.2	0.04	<3
	6/19/2014	9	<2	<0.05	<0.05	<0.05	0.72	<0.01	62	<0.25	1.4	<0.01	<3
	7/24/2014	10	<2	<0.05	<0.05	<0.05	0.81	<0.01	68	<0.25	1.3	0.02	<3
	8/13/2014	11	<2	<0.05	<0.05	<0.05	0.77	<0.01	96	<0.25	1.1	<0.01	<3
	9/11/2014	10	<2	<0.05	<0.05	<0.05	0.74	<0.01	87	<0.25	1.2	<0.01	<3
	Mean	9.8	2	0.05	0.05	0.05	0.76	0.016	67.8	0.25	1.24	0.018	3
	Stdev	0.837	0	0	0	0	0.034	0.013	27.133	0	0.114	0.013	0
	Max	11	2	0.05	0.05	0.05	0.81	0.04	96	0.25	1.4	0.04	3
	Min	9	2	0.05	0.05	0.05	0.72	0.01	26	0.25	1.1	0.01	3
No. of Dects	5	0	0	0	0	5	1	5	0	5	2	0	
BZ-06B	5/22/2014	9	<2	<0.05	<0.05	<0.05	0.76	0.06	35	<0.25	1.2	0.06	9
	6/19/2014	10	<2	<0.05	<0.05	<0.05	0.76	<0.01	71	<0.25	1.2	<0.01	<3
	7/24/2014	10	<2	<0.05	<0.05	<0.05	0.74	<0.01	38	<0.25	1.1	0.02	<3
	8/13/2014	11	<2	<0.05	0.06	<0.05	0.63	0.01	102	0.95	1.5	0.29	77
	9/11/2014	13	2	<0.05	<0.05	<0.05	0.59	0.02	85	<0.25	1.1	0.02	5
	Mean	10.6	2	0.05	0.052	0.05	0.696	0.022	66.2	0.39	1.217	0.08	19.4
	Stdev	1.517	0	0	0.004	0	0.08	0.022	29.269	0.313	0.147	0.119	32.292
	Max	13	2	0.05	0.06	0.05	0.76	0.06	102	0.95	1.5	0.29	77
	Min	9	2	0.05	0.05	0.05	0.59	0.01	35	0.25	1.1	0.01	3
No. of Dects	5	1	0	1	0	5	3	5	1	6	4	3	

Station	Date	ALK	BOD5	DISS-P	NH3	NO2	NO3	PO4	TDS	TKN	TOC	TP	TSS
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
BZ-07S	5/22/2014	10	2	<0.05	<0.05	<0.05	0.51	0.01	17	0.41	2.6	0.08	<3
	6/19/2014	10	<2	<0.05	<0.05	<0.05	0.41	0.02	15	0.25	1.7	0.03	<3
	7/24/2014	10	<2	<0.05	<0.05	<0.05	0.33	0.02	27	<0.25	1.6	0.02	<3
	8/13/2014	10	<2	<0.05	<0.05	<0.05	0.26	<0.01	81	<0.25	1.4	<0.01	<3
	9/11/2014	12	<2	<0.05	<0.05	<0.05	0.24	0.02	79	<0.25	1.3	0.02	<3
	Mean	10.4	2	0.05	0.05	0.05	0.35	0.016	43.8	0.282	1.72	0.032	3
	Stdev	0.894	0	0	0	0	0.112	0.005	33.365	0.072	0.517	0.028	0
	Max	12	2	0.05	0.05	0.05	0.51	0.02	81	0.41	2.6	0.08	3
	Min	10	2	0.05	0.05	0.05	0.24	0.01	15	0.25	1.3	0.01	3
No. of Dects	5	1	0	0	0	5	4	5	2	5	4	0	
BZ-07M	5/22/2014	10	<2	<0.05	<0.05	<0.05	0.87	<0.01	49	<0.25	1.7	0.05	<3
	6/19/2014	11	<2	<0.05	<0.05	<0.05	0.88	<0.01	55	<0.25	1.4	<0.01	4
	7/24/2014	12	<2	<0.05	<0.05	<0.05	0.91	<0.01	61	0.3	1.4	<0.01	3
	8/13/2014	12	<2	<0.05	<0.05	<0.05	0.8	<0.01	77	<0.25	1.1	<0.01	<3
	9/11/2014	10	<2	<0.05	<0.05	<0.05	0.23	<0.01	54	<0.25	1.3	<0.01	3
	Mean	11	2	0.05	0.05	0.05	0.738	0.01	59.2	0.26	1.38	0.018	3.2
	Stdev	1	0	0	0	0	0.287	0	10.826	0.022	0.217	0.018	0.447
	Max	12	2	0.05	0.05	0.05	0.91	0.01	77	0.3	1.7	0.05	4
	Min	10	2	0.05	0.05	0.05	0.23	0.01	49	0.25	1.1	0.01	3
No. of Dects	5	0	0	0	0	5	0	5	1	5	1	3	

Table 3.2 Continued. Summary of surface, middle, and bottom water quality monitoring data for Beltzville Reservoir in 2014

Station	Date	ALK	BOD5	DISS-P	NH3	NO2	NO3	PO4	TDS	TKN	TOC	TP	TSS
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
BZ-07B	5/22/2014	8	<2	<0.05	<0.05	<0.05	0.77	<0.01	42	3.06	2.6	1	393
	6/19/2014	11	<2	<0.05	<0.05	<0.05	0.72	<0.01	54	<0.25	1.2	<0.01	<3
	7/24/2014	12	<2	<0.05	<0.05	<0.05	0.75	0.07	11	<0.25	1.4	0.09	8
	8/13/2014	14	<2	<0.05	<0.05	<0.05	0.68	0.02	80	<0.25	1.4	0.02	<3
	9/11/2014	13	<2	<0.05	<0.05	<0.05	0.67	0.02	65	0.26	1.3	0.04	9
	Mean	11.6	2	0.05	0.05	0.05	0.718	0.026	50.4	0.814	1.58	0.232	83.2
	Stdev	2.302	0	0	0	0	0.043	0.025	26.102	1.256	0.576	0.43	173.206
	Max	14	2	0.05	0.05	0.05	0.77	0.07	80	3.06	2.6	1	393
	Min	8	2	0.05	0.05	0.05	0.67	0.01	11	0.25	1.2	0.01	3
No. of Dects	5	0	0	0	0	5	3	5	2	5	4	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. Nitrite concentrations in the waters of Beltzville Reservoir measured at all stations and depths never exceeded the laboratory reporting limit of 0.05 mg/L throughout the 2014 sampling period.

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 distributed uniformly in the water column of Beltzville Reservoir during 2014 with sample results ranging from 0.15 mg/L to 1.29 mg/L (Table 3-2). The highest recorded single nitrate measure of 1.29 mg/L was measured on 19 June at station BZ-5S. Station BZ-5S also had the highest seasonal mean concentration of all stations of 1.17 mg/L.

Beltzville Reservoir was in compliance with the PADEP water quality standard for nitrite and nitrate during 2014. The standard is a summed concentration of nitrite and nitrate of less than 10 mg/L. Throughout the monitoring period, a maximum summed concentration across all stations and depths of 1.34 mg/L was measured at station BZ-5S on 19 June.

3.2.3 Total Kjeldahl Nitrogen

Total Kjeldahl nitrogen (TKN) is a measure of organic nitrogen that includes ammonia. Organic nitrogen is not immediately available for biological activity and is therefore not available for plant growth until decomposition to inorganic form occurs. Total kjeldahl nitrogen (TKN) was low in the water column of Beltzville Reservoir during 2014 with many sample concentrations measuring less than the 0.25 mg/L laboratory reporting limit (Table 3-2). The highest concentration of 3.06 mg/L was recorded at station BZ-7B on 22 May.

3.2.4 Total Phosphorus

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

EPA guidance for nutrient criteria in lakes and reservoirs suggests a maximum concentration for total phosphorus of 0.01-mg/L (EPA 2000). Lakes and reservoirs exceeding this concentration are more likely to experience algal bloom problems during the growing season. In 2014, many of the samples measured for total phosphorus were less than the 0.01 mg/L suggested concentration and laboratory reporting limits (Table 3-2). In-lake bottom water

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samples typically exceeded this concentration. The highest single sample concentration of 1.32 mg/L was measured in the reservoir bottom waters at Station BZ-3B on 24 July. The elevated TP readings in deep reservoir waters are typically associated with phosphorus release from bottom sediments during low oxygen conditions. Upstream tributary station BZ-5S (Pohopoco Creek) exceeded the EPA 0.01 mg/L suggested concentration throughout the sampling season. Land use or some other watershed factors contribute to nutrient loading in this tributary.

3.2.5 Dissolved Phosphorus

With the exception of one sample occurring in June, dissolved phosphorus (Diss. P) concentrations measured at all stations and depths in the water column of Beltzville Reservoir were less than the reporting limit of 0.05 mg/L in 2014 (Table 3-2). The highest single sample concentration of 0.07 mg/L was measured in the bottom water sample at station BZ-3B on 19 June.

3.2.6 Dissolved Phosphate

Orthophosphate (PO₄) is a measure of the inorganic oxidized form of soluble phosphorus. This form of phosphorus is the most readily available for uptake during photosynthesis. In freshwater environments, dissolved phosphate is usually a limiting nutrient and is readily taken up by freshwater plants and algae. In 2014, dissolved phosphate concentrations were low with many sample concentrations remaining below the laboratory reporting limit of 0.01 mg/L. The highest concentration of 0.09 mg/L was measured at station BZ-5S on 11 September. Upstream tributary station BZ-5S (Pohopoco Creek) also had the highest seasonal mean concentration of all stations of 0.034 mg/L.

3.2.7 Total Dissolved Solids

Total dissolved solids (TDS) is a measure of the amount of non-filterable dissolved material in the water. Dissolved salts such as sulfate, magnesium, chloride, and sodium contribute to elevated levels. Concentrations of TDS in the water column of Beltzville Reservoir were consistently low during 2014 (Table 3-2). Concentrations among all stations and depths ranged from 7 to 129 mg/L. Total dissolved solids measured at Beltzville Reservoir in 2014 were in compliance with PADEP water quality standards. The state water quality standard for TDS is a maximum concentration of 500 mg/L.

3.2.8 Total Suspended Solids

Total suspended solids (TSS) are a measure of the amount of filterable particulate matter that is suspended within the water column. High concentrations increase the turbidity of the water and can hinder photosynthetic activity, result in damage to fish gills, and cause impairment to spawning habitat (smothering). Total suspended solids concentrations in the waters of Beltzville Reservoir were low during 2014 (Table 3-2). Many concentrations measured at all stations and depths were less than or near the laboratory reporting limit of 3.0 mg/L. The maximum concentration of 393 mg/L was measured in the lake bottom waters at

station BZ-7B on 22 May. High measures of TSS can be the result of sample collection error associated with capturing disturbed fine sediments in the lake bottom sample during field sampling. This sample error may apply to the elevated BZ-7B samples collected on 22 May when compared to all other samples collected on that date and throughout the season.

3.2.9 Biochemical Oxygen Demand

Five-day biochemical oxygen demand (BOD₅) is a measure of the oxygen-depleting burden imposed by organic material present in water. It measures the rate of oxygen uptake by organisms in the water sample over a period of time. It is an indicator of the quality of a water body and the degree of pollution by biodegradable organic matter can therefore be inferred. The five-day biochemical oxygen demand and commonly accepted water quality inferences are as follows:

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

Biochemical oxygen demand concentrations in the water column of Beltzville Reservoir were consistently low in all months and stations sampled (Table 3-2). All samples were below the laboratory reporting limit of 2.0 mg/L for the entire sampling season. Based on the seasonal sampling results, it is inferred that in 2014 Beltzville 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 CaCO₃ except where natural conditions are less.

Alkalinity in the waters of Beltzville Reservoir was relatively low during 2014 (Table 3-2). On only one occasion did a sample concentration exceed the PADEP 20 mg/L minimum criteria. For all sampling stations and depths, alkalinity measures ranged from 16.0 mg/L to 5.0 mg/L and remained below the state minimum criteria for all samples. The natural alkalinity of water is largely dependent on the underlying geology and soils within the surrounding watershed. The low alkalinity measured at Beltzville Reservoir probably results from the regional geology, which is primarily sandstone and shale. Based on this, the reservoir waters and surrounding tributaries are in compliance with the PADEP alkalinity criteria, due to the regional natural conditions.

3.2.11 Total Organic Carbon

Total organic carbon (TOC) is a measurement of the amount of dissolved and particulate carbon that is bound in organic compounds. TOC can be derived from decaying vegetation, bacterial growth, and metabolic activities of living organisms. The bulk of organic carbon in water is composed of humic substances and partly degraded animal and plant materials. Other sources of TOC can include agricultural chemicals such as herbicides and insecticides and also wastewater treatment plant discharges. The amount of carbon in a freshwater stream is an indicator of the organic character of the stream or water body. High organic content can increase the growth of microorganisms which contribute to the depletion of oxygen. Total organic carbon concentrations in the water column and tributaries of Beltzville Reservoir were generally stable and remained low during 2014 (Table 3-2). Concentrations of TOC at all stations and depths in 2014 ranged from 3.90 mg/L to <1.0 mg/L (laboratory reporting limit).

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. Chlorophyll a concentrations in the surface waters (0-15 feet) of Beltzville Reservoir were low during 2014 (Appendix A) when compared to results of past sampling years. Concentrations measured in surface waters at all lake stations ranged between 0.0 and 16.8 ug/L with the majority of samples less than 6.0 ug/L. The highest concentrations during the sampling season were recorded at lake station BZ-7 in the month of June.

3.3 TROPHIC STATE DETERMINATION

Carlson's (1977) trophic state index (TSI) is a method of quantitatively expressing the magnitude of eutrophication for a lake. The trophic state analysis calculates separate indices for eutrophication based on measures of total phosphorus, chlorophyll a, and secchi disk. Index values for each parameter range on the same scale from 0 (least enriched) to 100 (most enriched). The resulting indices can also be compared to qualitative threshold values that correspond to levels of eutrophication. Classification of Beltzville Reservoir was based on a single sample each month during the sampling season taken at station BZ-6 (Figure 3-7).

TSIs calculated for measures of total phosphorus (Figure 3-7) classified Beltzville Reservoir as eutrophic in May (53.20) and oligotrophic in June (37.35), July (37.35), August (37.35) and September (37.35). TSIs calculated for measures of secchi disk depth (Figure 3-7) classified Beltzville Reservoir as mesotrophic in June (45.48), July (44.31) and September (43.24), and oligotrophic during May (31.76) and August (39.18). TSIs calculated for measures of chlorophyll a (Figure 3-7) classified Beltzville Reservoir as oligotrophic in July (21.61), and mesotrophic in May (49.41), June (44.56), August (43.82) and September (47.32).

Carlson (1977) warned against averaging TSI values estimated for different parameters, and instead suggested giving priority to chlorophyll a in the summer and to phosphorus in the

Results and Discussion

spring, fall, and winter. With this in mind, the trophic state of the reservoir, based on TSI's, was oligotrophic in fall and mid-summer, mesotrophic in early and late summer and eutrophic in spring of 2014.

The EPA (1983) also provides criteria for defining the trophic conditions of lakes of the north-temperate zone based on concentrations of total phosphorus, chlorophyll *a*, and secchi depth (Table 3-3). Taking into account the general agreement between the EPA classifications with that of the Carlson TSI's, the trophic condition of Beltzville Reservoir was predominantly mesotrophic/oligotrophic in 2014.

Water Quality Variable	Oligo-trophic	Meso-trophic	Eutrophic	22 May	19 June	24 July	13 August	11 September
Total phos. (ppb)	<10	10-20	>20	30	<10	<10	<10	<10
Chlorophyll <i>a</i> (ppb)	<4	4-10	>10	6.88	4.15	0.40	3.85	5.50
Secchi depth (meters)	>4	2-4	<2	7.10	2.74	3.3	4.24	3.20

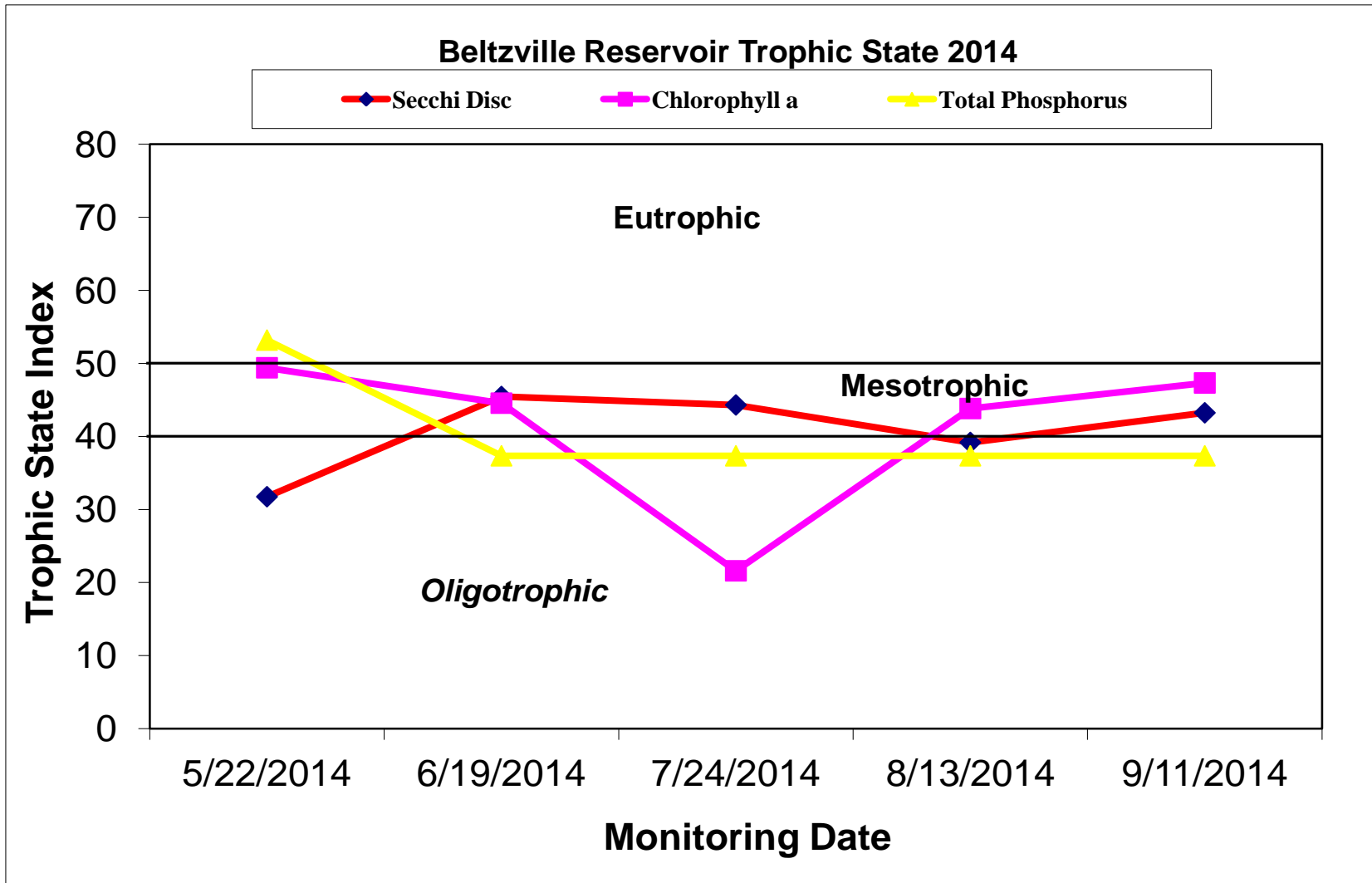


Figure 3-7. Trophic state indices calculated from secchi disk depth and concentrations of total phosphorus and chlorophyll a at Beltzville Reservoir in 2014.

3.4 RESERVOIR BACTERIA MONITORING

Three forms of coliform bacteria contamination were monitored in the tributary and lake surface waters at Beltzville 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 values for all stations ranged from 14 colonies/100-ml to greater than the detection limit of 2400 colonies/100-ml. Bacteria in natural waters are common and their presence in the sample is not necessarily a human health concern.

With respect to PADEP water quality standards, fecal coliform bacteria contamination was low at Beltzville Reservoir during 2014. The PADEP standard for fecal coliform bacteria during the swimming season (from 1 May to 30 September) is a geometric mean not greater than 200 colonies/100-ml calculated for not less than five fecal coliform samples collected over a consecutive thirty day period. Given that our regular monitoring was completed on one day as grab samples, single sample results were then compared to the Pennsylvania Department of Health single sample standard of <1000 colonies/100-ml. The fecal coliform samples collected at Beltzville Reservoir did not exceed this standard in 2014. Fecal coliform values for all tributary and lake stations ranged from less than the detection limit of 2 colonies/100ml to 760 colonies/100ml at upstream tributary station BZ-5S on 13 August. The EPA's swimming beach single sample standard of 235 colonies/100-ml was exceeded once (650 colonies/100-ml) at station BZ-5S on 13 August. Escherica coliform values for all tributary and lake surface water stations ranged from less than the detection limit of 1 colonies/100-ml to 650 colonies/100-ml. Water contact recreation is permitted at Beltzville Reservoir. However, the recreational swimming beach is monitored and managed by the Commonwealth of Pennsylvania. No long term elevated bacteria counts were recorded in the main reservoir body where public water recreation is also permitted.

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Table 3-4 Bacteria counts (colonies/100ml) at Beltzville Reservoir and tributaries during 2014.

STATION	DATE	Total Coliform (TC)	Fecal Coliform (FC)	Escherichia coli
BZ-1S	5/22/2014	160	58	33
	6/19/2014	920	10	2
	7/24/2014	550	10	2
	8/13/2014	2400	42	17
	9/11/2014	> 2400	10	10
BZ-2S	5/22/2014	460	44	22
	6/19/2014	> 2400	82	72
	7/24/2014	2000	90	88
	8/13/2014	2400	200	140
	9/11/2014	2400	21	18
BZ-3S	5/22/2014	14	3	3
	6/19/2014	69	< 2	< 1
	7/24/2014	55	< 1	< 1
	8/13/2014	> 2400	2	2
	9/11/2014	> 2400	< 2	< 1
BZ-4S	5/22/2014	54	6	5
	6/19/2014	> 2400	11	10
	7/24/2014	2000	30	18
	8/13/2014	> 2400	170	180
	9/11/2014	> 2400	11	5
BZ-5S	5/22/2014	1400	120	120
	6/19/2014	> 2400	210	200
	7/24/2014	2400	270	120
	8/13/2014	2400	760	650
	9/11/2014	> 2400	150	110
BZ-6S	5/22/2014	25	6	5
	6/19/2014	42	< 2	< 1
	7/24/2014	310	3	1
	8/13/2014	2400	2	1
	9/11/2014	> 2400	< 2	1
BZ-7S	5/22/2014	24	5	4
	6/19/2014	250	< 2	1
	7/24/2014	460	3	2
	8/13/2014	1100	5	4
	9/11/2014	2400	< 2	< 1

- Highlighted counts exceed single sample Federal (235 e-coli colonies/100ml) or State (1000 fecal colonies/100ml) bathing beach criteria.

4.0 REFERENCES

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APPENDIX A

STRATIFICATION DATA TABLES

2014 Beltzville Reservoir Water Column Profile

Station	Date	Time	Depth	Temp	DO	DO	pH	pHmV	ORP	Turbidity	Chloro.	SpCond
	M/D/Y	hh:mm:ss	ft	C	%	mg/L		mV	mV	NTU	ug/L	mS/cm
BZ-1 Outfall Pohopoco	5/22/2014	7:33:43	1	12.5	100	10.67	6.94	-24.4	182	21.3	3.2	0.418
	6/19/2014	11:01:43	1	15.22	98.4	9.88	6.87	-20.6	187	18.7	3.5	0.199
	7/24/2014	11:24:42	1	16.35	97.2	9.52	7.04	-29.8	155	18.4	0.7	0.142
	8/13/2014	11:12:48	1	13.14	97.8	10.27	6.96	-25.3	174	17.8	2	0.127
	9/11/2014	11:22:57	1	14.89	94.9	9.59	7.03	-29.2	196.8	16.6	1	0.125
BZ-2 Pine Run Trib.	5/22/2014	11:20:37	0.5	11.42	99	10.8	6.52	-0.9	195	20.3	1.3	0.396
	6/19/2014	10:46:18	1	13.44	95.8	9.99	6.98	-26.3	184	18.4	0.4	0.193
	7/24/2014	11:13:37	1	15.38	94.5	9.45	7.18	-38.1	151	20.1	1	0.125
	8/13/2014	11:00:00	0.5	15.77	95.4	9.46	7.23	-40.6	165	23.1	2	0.111
	9/11/2014	11:09:15	1	15.74	94	9.33	7.23	-41	186	15.9	0.1	0.096
BZ-3 Bouy/Beach	5/22/2014	9:15:54	0.5	17.04	111	10.68	7.68	-66.5	178	19.5	6.8	0.376
		9:14:47	5	16.95	110	10.63	7.51	-56.8	179	19.7	9.4	0.375
		9:14:08	10	16.72	109	10.56	7.3	-45	181	19.7	10.8	0.374
		9:13:19	15	15.57	106	10.49	6.99	-26.9	185	19.8	5.8	0.381
		9:11:52	20	13.96	94.2	9.71	6.69	-10.5	189	20.3	3	0.388
		9:10:37	25	13.01	87.8	9.24	6.66	-8.4	190	20.9	2.6	0.393
		9:08:34	30	11.98	89.2	9.6	6.55	-2.6	195	20.6	2	0.395
		9:07:39	35	10.86	90.7	10.02	6.55	-2.5	196	20	1.8	0.402
		9:06:30	40	9.72	90.2	10.24	6.52	-0.8	198	19.8	1.9	0.41
		9:05:27	45	9.17	88.9	10.22	6.5	0.1	198	19.7	0.9	0.413
		9:04:25	50	8.71	87.6	10.18	6.49	0.5	198	19.7	2.2	0.416
		9:03:33	55	8.17	86.3	10.17	6.48	1.1	198	19.5	1.3	0.421
		9:02:22	60	8.07	86.4	10.2	6.47	1.8	198	19.6	1.4	0.423
		9:00:50	65	7.76	87.5	10.41	6.47	1.6	198	19.8	1.9	0.425
		8:59:49	70	7.56	87.3	10.44	6.47	1.3	197	19.6	1.8	0.427
		8:58:33	75	7.45	87	10.43	6.46	2.1	198	19.5	1.9	0.428
		8:57:08	80	7.26	85.6	10.31	6.44	3.4	198	19.8	1.3	0.43
		8:56:10	85	7.14	85.2	10.3	6.43	3.7	198	19.5	1.6	0.431
		8:55:03	90	6.94	83.8	10.18	6.43	3.6	197	19.5	1.6	0.434
8:53:22	95	6.66	82.1	10.04	6.45	2.6	196	19.4	1.3	0.438		
8:52:03	100	6.55	81.3	9.97	6.48	1.1	194	19.3	1.8	0.441		
8:49:47	104	6.59	81.2	9.94	6.53	-1.9	191	19.2	1.8	0.443		

2014 Beltzville Reservoir Water Column Profile

Station	Date	Time	Depth	Temp	DO	DO	pH	pHmV	ORP	Turbidity	Chloro.	SpCond
	M/D/Y	hh:mm:ss	ft	C	%	mg/L		mV	mV	NTU	ug/L	mS/cm
BZ-3 Bouy/Beach	6/19/2014	9:06:58	0.5	24.16	113	9.45	8.49	-114.8	132	17.5	3.5	0.183
		9:05:36	5	24.18	113	9.46	8.43	-111.3	133	17.7	4	0.183
		9:04:13	10	23.1	115	9.8	8.4	-109.1	133	17.9	6	0.183
		9:03:02	15	21.76	116	10.14	8	-85.8	135	18.2	9.1	0.18
		9:01:27	20	18.65	99.3	9.27	6.83	-17.8	150	19.6	19.2	0.19
		8:59:51	25	17.17	75.1	7.23	6.64	-7	155	18.9	8.9	0.2
		8:58:22	30	14.36	65.9	6.73	6.58	-4.2	155	18.5	4.6	0.2
		8:57:19	35	12.3	66.5	7.11	6.58	-4.4	156	18.3	4.6	0.202
		8:55:54	40	10.58	70.7	7.87	6.61	-6.2	155	18.1	4.5	0.21
		8:54:44	45	9.43	73.1	8.35	6.63	-6.9	155	18	2.3	0.215
		8:53:58	50	8.79	74.4	8.64	6.65	-8.3	154	18	1.4	0.217
		8:52:56	55	8.53	74.8	8.74	6.67	-9.6	152	18	1.4	0.218
		8:51:46	60	8.27	76.7	9.02	6.71	-11.8	150	18	1.7	0.219
		8:50:52	65	8.07	77.5	9.16	6.73	-13	149	17.9	1.3	0.22
		8:49:57	70	7.86	77.2	9.17	6.76	-14.7	148	17.9	1.3	0.221
		8:48:44	75	7.66	77.7	9.28	6.79	-16.2	146	17.9	1	0.222
		8:47:26	80	7.46	77.8	9.33	6.83	-18.5	143	17.9	1.1	0.222
		8:46:03	85	7.14	74	8.95	6.86	-19.9	142	17.9	1.7	0.224
		8:44:40	90	6.95	73.2	8.9	6.91	-22.6	139	17.8	1.7	0.225
		8:43:37	95	6.82	70.2	8.55	6.95	-25.1	136	17.8	1.4	0.227
8:42:23	100	6.7	66.1	8.08	7.02	-28.7	133	17.6	1.2	0.228		
8:41:17	105	6.62	63.6	7.79	7.12	-34.1	128	18.4	1.2	0.23		
8:39:41	107	7.05	63.7	7.71	7.31	-44.6	121	19.2	8.3	0.26		
BZ-3 Bouy/Beach	7/24/2014	9:30:59	0.5	25.72	106	8.6	7.85	-77.6	154	19.9	15.2	0.068
		9:29:53	5	25.9	105	8.56	7.82	-75.7	148	17.3	1.6	0.124
		9:29:13	10	25.88	105	8.54	7.64	-65.1	149	17.6	2.4	0.124
		9:28:28	15	25.4	107	8.74	7.37	-49.3	149	17.8	4.3	0.125
		9:27:25	20	23.33	90.4	7.7	6.87	-20.1	158	18	4.6	0.131
		9:26:24	25	21.35	74.4	6.59	6.75	-13.4	162	18.1	4.3	0.135
		9:25:00	30	20	51.6	4.69	6.62	-5.6	165	18.6	3.8	0.14
		9:24:05	35	19.03	42.8	3.97	6.58	-3.5	165	19.1	2.8	0.143
		9:23:05	40	16.13	34.9	3.44	6.53	-1.3	167	18.7	1	0.145
		9:22:00	45	12.73	38.7	4.11	6.54	-1.8	168	18.5	1.9	0.147
		9:20:01	50	10.08	44.1	4.96	6.58	-4.1	167	18.5	1.7	0.153
		9:18:13	55	9.11	49.8	5.74	6.63	-7	166	18.4	1.1	0.159
		9:17:25	60	8.78	53.6	6.22	6.67	-9.2	164	18.3	1.8	0.162
		9:15:20	65	8.47	63.1	7.39	6.76	-14.3	161	18.3	2	0.169
		9:14:23	70	8.25	62.6	7.36	6.76	-14.6	161	18.1	1.9	0.172
		9:13:02	75	7.97	62.1	7.35	6.82	-17.8	158	18	1.8	0.176
		9:12:13	80	7.73	60.9	7.25	6.84	-18.9	157	18.1	1.4	0.181
		9:11:05	85	7.44	58.6	7.03	6.88	-20.9	156	18.3	1.7	0.184
9:10:17	90	7.23	57.6	6.95	6.91	-23	154	17.9	1.6	0.186		
9:08:43	95	6.99	54.7	6.63	6.98	-26.6	152	18	1.5	0.189		
9:07:18	100	6.87	50.9	6.2	7.06	-30.8	150	18.1	1.2	0.192		

2014 Beltzville Reservoir Water Column Profile

Station	Date	Time	Depth	Temp	DO	DO	pH	pHmV	ORP	Turbidity	Chloro.	SpCond
	M/D/Y	hh:mm:ss	ft	C	%	mg/L		mV	mV	NTU	ug/L	mS/cm
BZ-3 Bouy/Beach		9:20:51	0.5	24.22	105	8.79	7.73	-70.6	181	17.1	4.4	0.11
		9:20:19	5	24.24	105	8.77	7.65	-65.9	181	17.1	4.7	0.11
		9:19:07	10	24.22	104	8.71	7.44	-53.3	182	17.3	4	0.111
		9:18:04	15	24.22	103	8.63	7.21	-40	184	17.3	3.5	0.111
		9:17:05	20	24.18	99	8.3	6.92	-23.3	185	17.6	4.2	0.111
		9:16:17	25	22.24	76.6	6.66	6.63	-6.2	196	17.4	4.1	0.12
		9:14:34	30	21.12	50.7	4.51	6.47	2.9	200	17.6	4.1	0.125
		9:12:39	35	19.91	31.9	2.9	6.37	8.4	202	17.9	1.7	0.129
	9:11:25	40	18.37	23.5	2.2	6.32	11.3	204	18.1	1.5	0.13	
	8/13/2014	9:10:38	45	15.66	18.5	1.84	6.29	12.6	206	18	1.2	0.132
	9:07:34	50	11.89	30.5	3.29	6.32	10.4	206	18.1	1.3	0.131	
	9:04:58	55	9.68	40.1	4.56	6.38	6.7	205	18	1.3	0.134	
	9:02:12	60	9.14	46.3	5.34	6.46	2.3	204	18.1	1.1	0.138	
	9:01:17	65	8.68	54.4	6.33	6.5	0	203	18	1.4	0.14	
	9:00:27	70	8.42	57.3	6.72	6.53	-1.8	202	18.1	1.1	0.156	
	8:59:13	75	8.09	59.1	6.98	6.56	-3.7	202	18.1	1.7	0.158	
	8:58:00	80	7.77	57.6	6.86	6.59	-4.9	202	18.1	1.2	0.162	
	8:57:00	85	7.48	58.4	7	6.62	-6.7	201	18.1	1.8	0.165	
	8:55:42	90	7.2	58.9	7.11	6.67	-9.6	200	17.9	1.5	0.167	
	8:53:10	95	7.08	52.1	6.31	6.77	-14.9	199	17.8	1.1	0.17	
8:51:52	100	6.86	43.6	5.31	6.84	-18.9	199	17.9	2.1	0.174		
8:50:47	105	6.88	42.6	5.18	6.94	-24.3	198	17.8	1.4	0.176		
BZ-3 Bouy/Beach	9/11/2014	9:15:52	0.5	23.21	103	8.77	7.36	-48.4	172	17.7	6.4	0.112
		9:15:23	5	23.23	102	8.73	7.26	-42.8	171	17.6	6.8	0.112
		9:14:52	10	23.22	102	8.7	7.15	-36.2	170.7	17.7	7	0.112
		9:14:19	15	23.2	100	8.58	7	-27.6	171	17.7	5.9	0.112
		9:13:51	20	23.2	99.3	8.49	6.9	-21.7	170.5	17.7	5.5	0.112
		9:12:11	25	22.46	66.1	5.72	6.55	-1.8	178.8	17.8	4.6	0.117
		9:10:30	30	21.54	42.9	3.78	6.42	6	181.6	18	2.9	0.124
		9:09:00	35	20.86	22.8	2.04	6.35	9.9	183	18.1	2.2	0.126
		9:08:02	40	20.13	20.9	1.89	6.34	10	182.3	18.1	2.8	0.129
		9:06:32	45	18.73	8.6	0.8	6.31	11.6	183.1	18.3	1.8	0.13
		9:05:19	50	15.73	5.2	0.51	6.32	10.7	182	18.2	1.2	0.133
		9:03:11	55	11.59	23.1	2.52	6.41	5.3	180.3	18.8	1	0.149
		9:01:51	60	9.72	28.2	3.21	6.47	1.9	178.9	18.7	2.3	0.158
		9:00:26	65	8.96	38.2	4.42	6.55	-2.8	175.9	18.7	1.2	0.16
		8:59:11	70	8.5	48.9	5.72	6.65	-8.1	170.7	18.6	1.3	0.161
		8:58:08	75	8.17	48.9	5.76	6.69	-10.5	168.4	18.6	1.3	0.163
		8:57:23	80	7.82	49.8	5.93	6.74	-13.4	165.2	18.6	1.8	0.165
		8:55:37	85	7.57	42.9	5.13	6.81	-17.2	161.4	18.9	1.5	0.167
		8:54:42	90	7.37	41.4	4.97	6.88	-21.2	157.4	18.4	1.3	0.169
		8:53:28	95	7.08	37.3	4.52	6.97	-26.1	151.4	18.5	2	0.172
8:51:23	100	6.92	32.5	3.96	7.16	-36.3	132.1	18.6	1.7	0.176		

2014 Beltzville Reservoir Water Column Profile

Station	Date	Time	Depth	Temp	DO	DO	pH	pHmV	ORP	Turbidity	Chloro.	SpCond
	M/D/Y	hh:mm:ss	ft	C	%	mg/L		mV	mV	NTU	ug/L	mS/cm
BZ-4 Wild Creek Upstream	5/22/2014	11:04:41	1	16.37	98.4	9.62	6.88	-21.1	168	19.7	1.5	0.378
	6/19/2014	10:33:41	1	23.13	96.5	8.25	7.29	-44.7	163	18	-0.2	0.142
	7/24/2014	11:01:58	1	23.15	90.6	7.75	7.44	-53.2	136	17.7	0.1	0.085
	8/13/2014	10:47:46	1	23.08	96.2	8.23	7.54	-59	149	16.9	-0.7	0.067
	9/11/2014	10:56:06	0.5	21.49	95.4	8.42	7.53	-58.6	167.7	16.3	0.9	0.067
BZ-5 Pohopoco Upstream	5/22/2014	10:52:40	1	12.65	96.7	10.26	6.97	-26	158	21.6	0.9	0.425
	6/19/2014	10:23:40	1	17.81	92.1	8.75	7.41	-50.9	169	23.3	-0.2	0.219
	7/24/2014	10:51:04	1	18.48	98.6	9.24	7.53	-58.1	138	19.5	-0.4	0.159
	8/13/2014	10:37:35	1	17.89	94.4	8.95	7.46	-54.2	151	19.8	0.4	0.137
	9/11/2014	10:41:52	1	17.82	97.7	9.28	7.44	-53	180.9	19.4	-0.5	0.146
BZ-6 In-Lake Tower Secchi 7.1 M	5/22/2014	8:38:06	0.5	16.78	110	10.62	7.59	-61.4	172	19.3	3.3	0.379
		8:36:54	5	16.49	110	10.69	7.55	-58.8	173	19.6	10.3	0.381
		8:35:27	10	16.2	107	10.49	7.18	-38.1	176	20.7	57.6	0.381
		8:34:31	15	15.33	100	10	6.85	-19.4	180	20.1	5.5	0.385
		8:33:01	20	14.31	93.1	9.52	6.69	-10.5	183	20.5	2.7	0.387
		8:31:54	25	13.04	88.1	9.26	6.61	-5.8	187	21.2	3	0.394
		8:30:15	30	12.26	95.8	10.25	6.5	0.1	194	20.3	2	0.396
		8:29:16	35	10.86	92	10.17	6.38	7.1	200	19.9	1.8	0.405
		8:28:20	40	10.05	90.3	10.17	6.33	9.4	202	19.9	1.3	0.409
		8:27:19	45	9.04	89.4	10.32	6.29	11.6	203	19.8	1.8	0.418
		8:26:26	50	8.7	88.5	10.29	6.27	12.8	204	19.5	1.5	0.421
		8:25:31	55	8.32	88.2	10.36	6.26	13.4	204	19.6	1.5	0.424
		8:24:25	60	7.95	87.8	10.4	6.24	14.5	205	19.6	1.5	0.428
		8:23:21	65	7.77	87.8	10.44	6.22	15.1	205	19.6	1.8	0.43
		8:22:16	70	7.63	87.7	10.47	6.21	16	205	19.6	2	0.432
		8:21:15	75	7.45	87.4	10.48	6.19	17	205	19.7	1.7	0.433
		8:19:32	80	7.36	86.4	10.38	6.15	19.4	205	19.5	1.6	0.434
		8:18:36	85	7.19	85.8	10.36	6.11	21.2	206	19.7	1.9	0.435
		8:17:38	90	6.77	84	10.25	6.08	22.9	207	19.6	1.5	0.44
		8:16:36	95	6.47	82.4	10.12	6.05	24.4	207	19.6	1.9	0.444
8:15:54	100	6.35	81	9.98	6.04	24.9	207	19.5	2.2	0.446		
8:14:59	105	6.26	79.7	9.85	6.03	25.5	206	19.5	1.7	0.447		
8:14:19	110	6.17	78.8	9.75	6.03	25.3	206	19.5	1.6	0.449		
8:13:31	115	6.16	78.4	9.71	6.05	24.5	204	19.8	1.7	0.451		
8:12:54	120	6.16	78.3	9.69	6.08	22.5	202	21.1	1.5	0.453		
8:10:24	125	6.18	78	9.65	6.16	18.3	194	23	2.4	0.456		

2014 Beltzville Reservoir Water Column Profile

Station	Date	Time	Depth	Temp	DO	DO	pH	pHmV	ORP	Turbidity	Chloro.	SpCond
	M/D/Y	hh:mm:ss	ft	C	%	mg/L		mV	mV	NTU	ug/L	mS/cm
BZ-6 In-Lake Tower	6/19/2014	8:29:52	0.5	23.12	112	9.62	8.41	-109.8	127	17.7	3.9	0.182
		8:29:09	5	23.11	113	9.62	8.31	-103.8	129	17.7	4.4	0.182
		8:28:18	10	23.05	112	9.61	8.05	-88.7	135	18	5.4	0.182
		8:27:22	15	22.95	111	9.49	7.63	-64.3	141	18.2	5	0.18
		8:25:54	20	18.86	95.7	8.9	6.48	2.3	161	20.7	33.2	0.192
		8:24:06	25	16.43	74.6	7.3	6.24	15.5	168	19.4	8.2	0.197
		8:22:42	30	14.17	66.7	6.85	6.18	18.7	169	18.6	6.2	0.2
		8:21:07	35	12.51	70.3	7.48	6.19	17.9	168	18.5	4.8	0.201
		8:20:05	40	10.39	75.6	8.46	6.18	17.7	169	18.3	3.3	0.205
		8:19:09	45	9.39	75.3	8.62	6.18	18	170	18.2	2.1	0.215
		8:17:47	50	8.99	77.8	8.99	6.19	17.4	169	18.1	2.4	0.217
		8:16:42	55	8.62	77.7	9.06	6.18	17.9	169	18.1	1.8	0.218
		8:15:50	60	8.38	78.1	9.16	6.17	18.2	168	18.1	1.8	0.219
		8:14:49	65	8.06	77.7	9.19	6.16	18.7	168	18.3	1.5	0.22
		8:13:51	70	7.95	77.8	9.22	6.15	19	167	18	1.6	0.221
		8:12:42	75	7.48	76.8	9.21	6.13	20.2	168	18.1	1.3	0.223
		8:11:36	80	7.31	76.3	9.19	6.12	20.9	167	18.1	1.5	0.224
		8:10:38	85	7.15	75.1	9.08	6.1	21.6	167	18.2	1.8	0.225
		8:09:44	90	7.07	73.8	8.94	6.09	22.3	166	18.2	0.9	0.225
		8:08:41	95	6.93	71.6	8.7	6.07	23.6	166	18.2	1.6	0.225
8:07:12	100	6.74	67.8	8.28	6.04	25.1	166	18.2	1.9	0.227		
8:06:01	105	6.57	64.6	7.92	6.02	26.1	165	18.2	1.5	0.228		
8:04:38	110	6.51	63	7.74	6.02	26.2	163	18.4	1.4	0.229		
8:03:27	115	6.48	62.3	7.66	6.03	25.7	161	19	1.5	0.23		
8:02:02	120	6.46	60.8	7.48	6.05	24.2	157	40.1	1.5	0.231		
7:59:31	125	7.02	52.1	6.31	6.13	20.4	148	-13.7	10.4	0.256		
BZ-6 In-Lake Tower	7/24/2014	8:57:00	0.5	25.25	105	8.61	7.96	-83.8	128	17.8	-0.4	0.063
		8:55:54	5	25.28	104	8.56	7.77	-73	137	17.6	0.8	0.124
		8:55:02	10	25.29	104	8.55	7.51	-57.5	141	17.7	2	0.124
		8:54:12	15	25.26	103	8.47	7.17	-37.4	144	17.9	2.7	0.124
		8:53:34	20	23.61	98.6	8.36	6.86	-19.5	153	17.8	4	0.131
		8:51:42	25	21.16	64.1	5.69	6.51	0.4	164	18.2	5.6	0.137
		8:50:26	30	20.12	52.8	4.79	6.4	6.6	168	18.4	5.1	0.141
		8:48:27	35	18.86	41.9	3.9	6.33	10.8	169	18.7	3.1	0.142
		8:46:41	40	16.01	34.8	3.43	6.26	14.2	171	18.5	2.6	0.146
		8:45:07	45	12.85	39.4	4.17	6.27	13.4	171	18.6	2.9	0.145
		8:42:20	50	9.89	49	5.54	6.33	9.7	169	18.5	1.7	0.15
		8:39:51	55	9.07	57.8	6.67	6.41	4.8	165	18.4	2.3	0.156
		8:38:50	60	8.77	60.6	7.04	6.44	3.1	164	18.6	1.2	0.161
		8:38:00	65	8.41	61.4	7.2	6.46	2.1	163	18.4	1.7	0.166
		8:37:00	70	8.24	62.9	7.41	6.48	1.3	162	18.4	1.1	0.17
		8:36:12	75	8.09	63	7.44	6.48	0.8	161	18.6	1.1	0.172
		8:34:57	80	7.9	64.2	7.62	6.53	-1.6	158	18.6	1.7	0.174
		8:32:43	85	7.36	61.2	7.36	6.56	-3.6	154	18.5	1.1	0.178
		8:31:41	90	7.13	58	7.02	6.58	-4.6	152	18.4	2	0.18
		8:30:27	95	7.01	55.3	6.71	6.62	-6.9	148	18.5	1.6	0.181
8:28:57	100	6.8	51	6.22	6.68	-10	144	18.5	1.8	0.182		
8:27:33	105	6.72	49.3	6.03	6.75	-14.1	138	18.4	1.4	0.183		
8:26:22	110	6.68	48.1	5.88	6.82	-17.7	133	18.5	1.8	0.184		
8:25:23	115	6.7	47.6	5.82	6.89	-21.7	127	19.7	1.4	0.184		
8:24:22	120	6.64	46.1	5.65	6.98	-26.4	120	26.4	2.3	0.185		
8:23:40	125	6.64	46.2	5.65	7.03	-29.2	115	24	1.7	0.186		

2014 Beltzville Reservoir Water Column Profile

Station	Date	Time	Depth	Temp	DO	DO	pH	pHmV	ORP	Turbidity	Chloro.	SpCond
	M/D/Y	hh:mm:ss	ft	C	%	mg/L		mV	mV	NTU	ug/L	mS/cm
BZ-6 In-Lake Tower	8/13/2014	8:42:33	0.5	24.18	105	8.77	7.75	-71.7	168	17	3.6	0.11
		8:41:48	5	24.19	104	8.73	7.68	-67.1	170	16.9	4.1	0.11
		8:39:57	10	24.18	104	8.69	7.5	-56.8	171	16.9	3.7	0.11
		8:38:40	15	24.17	103	8.65	7.3	-45.4	171	17	3.5	0.11
		8:37:30	20	24.15	102	8.52	7.08	-32.4	172	17.1	2.7	0.11
		8:35:58	25	22.53	84	7.27	6.68	-9	180	17.1	4.7	0.119
		8:34:05	30	21.07	46.3	4.12	6.45	3.9	184	17.3	6.5	0.124
		8:31:27	35	19.77	20.8	1.9	6.33	11.1	186	17.6	3.4	0.127
		8:29:37	40	18.12	14	1.32	6.29	12.9	187	17.9	2.1	0.128
		8:28:13	45	15	20.6	2.07	6.28	12.9	188	17.8	1.1	0.129
		8:25:33	50	11.21	36.2	3.97	6.33	9.7	187	17.7	1.4	0.13
		8:22:23	55	9.47	44.9	5.13	6.38	6.8	186	17.8	1.7	0.131
		8:20:51	60	9.01	49.5	5.72	6.42	4.7	184	17.7	1.5	0.133
		8:18:54	65	8.61	53.7	6.26	6.46	2.4	182	17.8	1	0.136
		8:17:51	70	8.28	56.7	6.66	6.48	1.2	181	17.7	1.8	0.139
		8:16:56	75	8.06	57.2	6.76	6.49	0.5	180	17.7	1.2	0.155
		8:15:31	80	7.63	56.9	6.79	6.5	-0.3	179	17.8	1	0.158
		8:14:14	85	7.33	55.1	6.63	6.52	-1.4	177	17.7	1.6	0.161
		8:12:36	90	7.13	51.6	6.24	6.53	-1.9	176	17.9	1.3	0.163
		8:11:33	95	6.99	49	5.94	6.57	-4	173	17.8	0.6	0.165
8:09:25	100	6.86	44.7	5.45	6.62	-6.7	170	17.8	1.1	0.167		
8:07:21	105	6.75	40.2	4.9	6.69	-10.4	167	18	1	0.169		
8:05:43	110	6.72	37.8	4.61	6.74	-13.7	164	17.9	1.1	0.171		
8:04:34	115	6.67	36.4	4.45	6.8	-17	161	18	1.3	0.171		
8:03:15	120	6.67	35.4	4.33	6.88	-20.9	156	18.1	1.7	0.173		
8:01:53	125	7.24	35.3	4.26	7	-27.8	162	20.6	1.4	0.174		
BZ-6 In-Lake Tower	9/11/2014	8:43:27	0.5	23.15	103	8.82	7.74	-70.8	164.3	18	5.9	0.111
		8:42:22	5	23.19	103	8.8	7.62	-63.7	162.8	18	5.1	0.111
		8:40:55	10	23.2	102	8.72	7.45	-53.8	161.1	18	6.2	0.111
		8:39:46	15	23.19	102	8.69	7.29	-44.5	159.7	18	5.9	0.111
		8:37:53	20	23.19	97.6	8.34	6.83	-17.8	159	18.1	5.6	0.112
		8:36:22	25	22.03	47.5	4.15	6.45	4.1	170.1	18	4.2	0.119
		8:34:31	30	21.57	31.2	2.75	6.37	8.5	168.3	18.1	3.6	0.122
		8:32:46	35	20.9	12.5	1.11	6.33	10.7	162.4	18.3	1.1	0.126
		8:31:27	40	19.96	3.7	0.34	6.31	11.9	155.8	18.6	3.1	0.128
		8:30:25	45	18.53	3.3	0.31	6.3	12.3	139.5	18.6	1.6	0.128
		8:29:15	50	16.44	4.7	0.46	6.3	11.9	180.1	18.6	1.8	0.13
		8:25:59	55	11.69	24.1	2.62	6.37	7.4	193.7	18.8	1	0.136
		8:24:01	60	9.71	32.8	3.73	6.41	4.9	192.9	18.9	1.3	0.153
		8:21:56	65	8.98	41	4.74	6.48	1.4	190.1	19.2	0.8	0.155
		8:20:36	70	8.52	43.4	5.08	6.51	-0.5	188.5	18.8	1.3	0.156
		8:18:35	75	7.99	51.3	6.08	6.57	-3.8	184.9	18.9	1.3	0.158
		8:16:58	80	7.74	49.8	5.93	6.59	-4.9	183.3	18.9	0.8	0.159
		8:15:44	85	7.45	48.4	5.81	6.61	-6.4	180.8	18.9	1.7	0.161
		8:14:13	90	7.27	45.9	5.53	6.64	-7.7	178.6	19	0.8	0.162
		8:12:30	95	7.07	41.7	5.05	6.67	-9.5	175.9	19.1	1.4	0.164
8:09:48	100	6.95	33	4.01	6.71	-11.7	171.7	27.1	2.7	0.166		
8:07:48	105	6.88	28	3.41	6.78	-15.4	166.8	29	3	0.168		
8:06:35	110	6.8	25.3	3.09	6.83	-18.1	163.3	21.3	2.9	0.169		
8:05:14	115	6.8	25.2	3.07	6.88	-21.3	159.9	20.9	2.2	0.17		
8:03:40	120	6.75	23.3	2.85	6.96	-25.3	154.5	27.2	5.2	0.171		
8:02:34	123	6.96	23.6	2.87	7.05	-30.2	151.5	849	28.1	0.176		

2014 Beltzville Reservoir Water Column Profile

Station	Date	Time	Depth	Temp	DO	DO	pH	pHmV	ORP	Turbidity	Chloro.	SpCond
	M/D/Y	hh:mm:ss	ft	C	%	mg/L		mV	mV	NTU	ug/L	mS/cm
BZ-7 Upper Lake No-Wake	5/22/2014	9:55:52	0.5	17.74	113	10.77	7.74	-70.2	182	19.8	9.3	0.368
		9:55:12	5	17.58	112	10.71	7.59	-61.6	180	20.4	16.8	0.367
		9:52:56	10	17.12	101	9.76	6.91	-22.3	184	19.8	4.8	0.355
		9:51:46	15	14.99	96.7	9.75	6.8	-16.2	193	20.4	3.2	0.381
		9:50:51	20	13.84	94	9.71	6.73	-12.3	195	20.4	2.1	0.396
		9:48:45	25	12.52	88.5	9.41	6.53	-1.2	202	20.7	2.1	0.397
		9:47:49	30	10.46	82.3	9.18	6.47	1.6	204	20.4	2.2	0.41
		9:46:24	35	9.21	80.3	9.23	6.44	3.2	205	20	1.2	0.417
		9:45:39	40	8.77	79.6	9.24	6.46	2.3	204	19.6	1.7	0.422
		9:43:07	45	8.57	78.9	9.2	6.46	2	204	19.6	2.3	0.425
BZ-7 Upper Lake No-Wake	6/19/2014	9:36:42	0.5	25.28	112	9.23	7.85	-77.3	156	18.3	4.2	0.177
		9:35:58	5	25.26	110	9.02	7.49	-56.3	156	18.4	5.1	0.176
		9:35:19	10	22.75	97.6	8.41	6.99	-27.1	166	18.8	6.2	0.162
		9:34:08	15	19.66	90.5	8.28	6.84	-18.7	173	19.6	7.6	0.198
		9:33:15	20	17.43	78.7	7.54	6.76	-13.8	176	19.8	10.6	0.202
		9:32:13	25	16.27	71.3	6.99	6.72	-11.9	177	19.8	4.9	0.206
		9:30:57	30	15.69	66.1	6.56	6.7	-10.5	177	19.3	3.2	0.206
		9:29:44	35	13.88	57.9	5.98	6.66	-8.4	179	18.8	2.1	0.207
		9:28:50	40	12.85	55.4	5.86	6.66	-8.6	180	18.5	2.4	0.207
		9:28:11	45	11.01	52.7	5.81	6.68	-9.8	180	18.3	2	0.211
9:27:07	50	9.84	52.5	5.94	6.74	-13.3	180	18	1.6	0.213		
9:26:17	55	9.46	52.3	5.97	6.81	-17.2	179	17.9	1.1	0.214		
BZ-7 Upper Lake No-Wake	7/24/2014	10:02:06	0.5	26.78	105	8.4	7.73	-71	97	17.4	1.6	0.12
		10:01:33	5	26.77	105	8.38	7.58	-62.1	96	17.7	1.4	0.12
		10:01:02	10	26.74	104	8.35	7.4	-51	96	17.9	2.2	0.12
		10:00:15	15	24.11	98.5	8.28	7.14	-35.9	105	18.3	2.6	0.125
		9:59:05	20	21.96	91.9	8.04	7.03	-29.2	108	18.7	3.5	0.142
		9:58:20	25	20.82	84	7.52	6.97	-25.7	108	18.7	3.2	0.145
		9:57:20	30	19.75	74.6	6.82	6.89	-21.7	108	18.8	2.4	0.146
		9:56:23	35	19.02	67	6.21	6.89	-21.5	104	18.8	2.5	0.146
		9:55:06	40	18.23	58.7	5.53	6.9	-21.8	97	18.8	1.8	0.147
		9:53:37	45	16.73	40.7	3.96	6.93	-23.5	86	19.1	0.9	0.147
9:52:32	50	12.38	30	3.2	7	-27.8	76	18.7	1.2	0.153		
9:49:55	55	10.44	3.5	0.39	7.11	-34	-31	36.3	2.6	0.159		
BZ-7 Upper Lake No-Wake	8/13/2014	9:51:09	0.5	24.46	107	8.9	7.8	-74.3	136	17.2	4.6	0.066
		9:50:26	5	24.47	106	8.84	7.67	-66.8	135	17.3	6.2	0.105
		9:49:26	10	24.44	104	8.65	7.32	-46.5	133	17.5	3.4	0.105
		9:48:31	15	23.5	84.7	7.2	7	-27.7	141	17.7	2.6	0.095
		9:47:40	20	22.49	82.7	7.16	6.93	-23.5	143	17.8	3.1	0.125
		9:46:16	25	21.4	81	7.16	6.89	-21.5	140	18	2.2	0.132
		9:44:49	30	20.81	75.6	6.76	6.83	-18.1	137	17.9	2.5	0.134
		9:43:24	35	20.41	63.7	5.74	6.77	-14.4	135	18.1	1.1	0.134
		9:41:08	40	19.41	39.4	3.63	6.68	-9.2	129	18.3	1.4	0.134
		9:39:47	45	16.52	17.6	1.72	6.64	-7.3	123	18.6	1.1	0.134
9:38:45	50	14.45	14.5	1.48	6.69	-10.3	116	25	0.9	0.138		
9:37:39	55	10.55	19	2.11	6.8	-16.8	104	30.4	1.6	0.147		

2014 Beltzville Reservoir Water Column Profile

Station	Date	Time	Depth	Temp	DO	DO	pH	pHmV	ORP	Turbidity	Chloro.	SpCond
	M/D/Y	hh:mm:ss	ft	C	%	mg/L		mV	mV	NTU	ug/L	mS/cm
BZ-7 Upper Lake No-Wake	9/11/2014	9:41:55	0.5	23.3	106	9.05	7.47	-55.1	187.3	18.1	5.7	0.106
		9:41:43	5	23.31	106	9.02	7.42	-52	186.6	18	5.1	0.109
		9:41:17	10	23.29	105	8.92	7.31	-45.6	186.1	18	4.9	0.109
		9:40:38	15	23.28	104	8.86	7.17	-37.4	185.2	18	5.6	0.109
		9:39:54	20	23.22	101	8.58	6.98	-26.8	186.9	18.1	5.8	0.108
		9:38:54	25	23.01	90.9	7.8	6.84	-18.2	189.5	18.1	5.9	0.103
		9:37:57	30	22.4	79.4	6.88	6.8	-16.3	189	18.3	3.4	0.095
		9:36:07	35	21	62.6	5.58	6.69	-9.9	193.1	18.8	3.6	0.127
		9:35:17	40	19.77	41.9	3.83	6.65	-7.9	194.9	18.8	1.8	0.131
		9:33:07	45	18.63	23.8	2.23	6.75	-13.2	195	18.3	1.8	0.132
		9:31:47	50	17.58	19.6	1.87	6.93	-23.7	195.6	18.7	1.3	0.133

APPENDIX B

LABORATORY CUSTODY SHEETS



CERTIFICATE OF ANALYSIS

M.J. Reider Associates, Inc.



Attention: Gregory Wacik
 Reported To: USACE, Philadelphia District
 Environmental Resources Branch
 100 Penn Square East
 Philadelphia PA 19107

Date of Report: 06/05/14
 Lab ID: 2295-14-0015795

Date Collected: 05/22/14 07:30
 Collected By: Client

Sample Desc: BZ-1 Surface

Date Received: 05/22/14 13:45

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Escherichia coli	33	mpn/100ml	1	1	SM 9223B	05/23	09:00	TBP
Fecal Coliform	58	/100ml	2	1	SM 9222D	05/22	14:40	PLW
Total Coliform	160	mpn/100ml	1	1	SM 9223B	05/23	09:00	TBP
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/L	.01	1	SM 4500P-E	05/22	16:30	HRG
Phosphorus as P, Dissolved	<.05	mg/L	.05	1	SM 4500P-E	06/02	15:00	HRG
Phosphorus as P, Total	<.01	mg/L	.01	1	SM 4500P-E	05/28	14:30	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/L	.05	1	D6919-03	06/05	03:28	JCL
Nitrogen, Nitrate	0.68	mg/L	.05	1	EPA 353.2	05/22	18:47	JCL
Nitrogen, Nitrite	<.05	mg/L	.05	1	EPA 353.2	05/22	17:22	JCL
Nitrogen, Total Kjeldahl	0.27	mg/L	.25	1	EPA 351.2	05/30	14:54	ALD
OTHER								
Biochemical Oxygen Demand	<2	mg/L	2	1	SM 5210B	05/22	14:55	EMW
Total Organic Carbon	1.8	mg/L	1	1	SM5310 C	05/28	18:51	ALD
RESIDUES								
Solids, Total Dissolved	20	mg/L	5	1	SM 2540C	05/28	12:35	TMH
Solids, Total Suspended	<3	mg/L	3	1	SM 2540D	05/28	12:35	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	9	mg/L	1	1	SM 2320 B	05/27	13:45	HRG

Distribution of Reports:

Reviewed and Approved by:

Christina Kistler
 Account Executive

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M.J. Reider Associates, Inc.



Attention: Gregory Wacik
 Reported To: USACE, Philadelphia District
 Environmental Resources Branch
 100 Penn Square East
 Philadelphia PA 19107

Date of Report: 06/05/14
 Lab ID: 2295-14-0015795

Date Collected: 05/22/14 07:30
 Collected By: Client

Sample Desc: BZ-1 Surface

Date Received: 05/22/14 13:45

PWSID: 3130843

Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
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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.
- 02 The total coliform sample was placed in the incubator at 05/22/14 at 14:45.

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Reviewed and Approved by:

Christina Kistler
 Account Executive

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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: 06/05/14
 Lab ID: 2295-14-0015796

Date Collected: 05/22/14 11:20
 Collected By: Client

Sample Desc: BZ-2 Surface

Date Received: 05/22/14 13:45

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Escherichia coli	22	mpn/100ml	1	1	SM 9223B	05/23	09:00	TBP
Fecal Coliform	44	/100ml	2	1	SM 9222D	05/22	14:40	PLW
Total Coliform	460	mpn/100ml	1	1	SM 9223B	05/23	09:00	TBP
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	0.07	mg/L	.01	1	SM 4500P-E	05/22	16:30	HRG
Phosphorus as P, Dissolved	<.05	mg/L	.05	1	SM 4500P-E	06/02	15:00	HRG
Phosphorus as P, Total	0.08	mg/L	.01	1	SM 4500P-E	05/28	14:30	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/L	.05	1	D6919-03	06/05	03:44	JCL
Nitrogen, Nitrate	0.15	mg/L	.05	1	EPA 353.2	05/22	18:50	JCL
Nitrogen, Nitrite	<.05	mg/L	.05	1	EPA 353.2	05/22	17:23	JCL
Nitrogen, Total Kjeldahl	<.25	mg/L	.25	1	EPA 351.2	05/30	14:55	ALD
OTHER								
Biochemical Oxygen Demand	<2	mg/L	2	1	SM 5210B	05/22	14:55	EMW
Total Organic Carbon	<1	mg/L	1	1	SM5310 C	05/28	19:25	ALD
RESIDUES								
Solids, Total Dissolved	10	mg/L	5	1	SM 2540C	05/28	12:35	TMH
Solids, Total Suspended	<3	mg/L	3	1	SM 2540D	05/28	12:35	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	6	mg/L	1	1	SM 2320 B	05/27	13:45	HRG

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 Account Executive

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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: 06/05/14
 Lab ID: 2295-14-0015796

Date Collected: 05/22/14 11:20
 Collected By: Client

Sample Desc: BZ-2 Surface

Date Received: 05/22/14 13:45

PWSID: 3130843

Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
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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.

- 02 The total coliform sample was placed in the incubator at 05/22/14 at 14:45.

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Christina Kistler
 Account Executive

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M.J. Reider Associates, Inc.



Attention: Gregory Wacik
 Reported To: USACE, Philadelphia District
 Environmental Resources Branch
 100 Penn Square East
 Philadelphia PA 19107

Date of Report: 06/05/14
 Lab ID: 2295-14-0015797

Date Collected: 05/22/14 08:50
 Collected By: Client

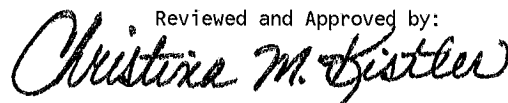
Sample Desc: BZ-3 Surface

Date Received: 05/22/14 13:45

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Escherichia coli	3	mpn/100ml	1	1	SM 9223B	05/23	09:00	TBP
Fecal Coliform	3	/100ml	2	1	SM 9222D	05/22	15:10	PLW
Total Coliform	14	mpn/100ml	1	1	SM 9223B	05/23	09:00	TBP
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	0.05	mg/L	.01	1	SM 4500P-E	05/22	16:30	HRG
Phosphorus as P, Dissolved	<.05	mg/L	.05	1	SM 4500P-E	06/02	15:00	HRG
Phosphorus as P, Total	0.05	mg/L	.01	1	SM 4500P-E	05/28	14:30	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/L	.05	1	D6919-03	06/05	04:29	JCL
Nitrogen, Nitrate	0.62	mg/L	.05	1	EPA 353.2	05/22	18:51	JCL
Nitrogen, Nitrite	<.05	mg/L	.05	1	EPA 353.2	05/22	17:24	JCL
Nitrogen, Total Kjeldahl	<.25	mg/L	.25	1	EPA 351.2	05/30	14:56	ALD
OTHER								
Biochemical Oxygen Demand	<2	mg/L	2	1	SM 5210B	05/22	14:55	EMW
Total Organic Carbon	1.8	mg/L	1	1	SM5310 C	05/28	19:37	ALD
RESIDUES								
Solids, Total Dissolved	22	mg/L	5	1	SM 2540C	05/28	12:35	TMH
Solids, Total Suspended	<3	mg/L	3	1	SM 2540D	05/28	12:35	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	9	mg/L	1	1	SM 2320 B	05/27	13:45	HRG

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Christina Kistler
 Account Executive

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M.J. Reider Associates, Inc.



Attention: Gregory Wacik
 Reported To: USACE, Philadelphia District
 Environmental Resources Branch
 100 Penn Square East
 Philadelphia PA 19107

Date of Report: 06/05/14
 Lab ID: 2295-14-0015797

Date Collected: 05/22/14 08:50
 Collected By: Client

Sample Desc: BZ-3 Surface

Date Received: 05/22/14 13:45

PWSID: 3130843

Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
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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.
- 02 The total coliform sample was placed in the incubator at 05/22/14 at 14:45.

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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: 06/05/14
 Lab ID: 2295-14-0015798

Date Collected: 05/22/14 08:50
 Collected By: Client

Sample Desc: BZ-3 Mid-Depth

Date Received: 05/22/14 13:45

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	05/22	16:30	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	06/02	15:00	HRG
Phosphorus as P, Total	0.02	mg/l	.01	1	SM 4500P-E	05/28	14:30	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	06/05	04:44	JCL
Nitrogen, Nitrate	0.72	mg/l	.05	1	EPA 353.2	05/22	18:53	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	05/22	17:25	JCL
Nitrogen, Total Kjeldahl	<.25	mg/l	.25	1	EPA 351.2	05/30	14:57	ALD
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	05/22	14:55	EMW
Total Organic Carbon	1.3	mg/l	1	1	SM5310 C	05/28	19:48	ALD
RESIDUES								
Solids, Total Dissolved	33	mg/l	5	1	SM 2540C	05/28	12:35	TMH
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	05/28	12:35	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	9	mg/l	1	1	SM 2320 B	05/27	14:00	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.

Distribution of Reports:

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Christina Kistler
 Account Executive

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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: 06/05/14
 Lab ID: 2295-14-0015799

Date Collected: 05/22/14 08:50
 Collected By: Client

Sample Desc: BZ-3 Deep

Date Received: 05/22/14 13:45

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/L	.01	1	SM 4500P-E	05/22	16:30	HRG
Phosphorus as P, Dissolved	<.05	mg/L	.05	1	SM 4500P-E	06/02	15:00	HRG
Phosphorus as P, Total	0.03	mg/L	.01	1	SM 4500P-E	05/28	14:30	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/L	.05	1	D6919-03	06/05	04:59	JCL
Nitrogen, Nitrate	0.77	mg/L	.05	1	EPA 353.2	05/22	18:53	JCL
Nitrogen, Nitrite	<.05	mg/L	.05	1	EPA 353.2	05/22	17:00	JCL
Nitrogen, Total Kjeldahl	<.25	mg/L	.25	1	EPA 351.2	05/30	15:00	ALD
OTHER								
Biochemical Oxygen Demand	<2	mg/L	2	1	SM 5210B	05/22	14:55	EMW
Total Organic Carbon	1.2	mg/L	1	1	SM5310 C	05/28	20:44	ALD
RESIDUES								
Solids, Total Dissolved	30	mg/L	5	1	SM 2540C	05/28	12:35	TMH
Solids, Total Suspended	<3	mg/L	3	1	SM 2540D	05/28	12:35	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	9	mg/L	1	1	SM 2320 B	05/27	14:00	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.

Distribution of Reports:

Reviewed and Approved by:

Christina Kistler
 Account Executive

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CERTIFICATE OF ANALYSIS

M.J. Reider Associates, Inc.

Attention: Gregory Wacik
 Reported To: USACE, Philadelphia District
 Environmental Resources Branch
 100 Penn Square East
 Philadelphia PA 19107

Date of Report: 06/05/14
 Lab ID: 2295-14-0015800
 Date Collected: 05/22/14 10:10
 Collected By: Client
 Date Received: 05/22/14 13:45

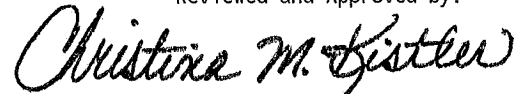
Sample Desc: BZ-4 Surface

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Escherichia coli	5	mpn/100ml	1	1	SM 9223B	05/23	09:00	TBP
Fecal Coliform	6	/100ml	2	1	SM 9222D	05/22	15:10	PLW
Total Coliform	54	mpn/100ml	1	1	SM 9223B	05/23	09:00	TBP
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/L	.01	1	SM 4500P-E	05/22	16:30	HRG
Phosphorus as P, Dissolved	<.05	mg/L	.05	1	SM 4500P-E	06/02	15:00	HRG
Phosphorus as P, Total	0.02	mg/L	.01	1	SM 4500P-E	05/28	14:30	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/L	.05	1	D6919-03	06/05	05:14	JCL
Nitrogen, Nitrate	0.50	mg/L	.05	1	EPA 353.2	05/22	18:54	JCL
Nitrogen, Nitrite	<.05	mg/L	.05	1	EPA 353.2	05/22	17:27	JCL
Nitrogen, Total Kjeldahl	<.25	mg/L	.25	1	EPA 351.2	05/30	15:01	ALD
OTHER								
Biochemical Oxygen Demand	<2	mg/L	2	1	SM 5210B	05/22	14:55	EMW
Total Organic Carbon	1.2	mg/L	1	1	SM5310 C	05/27	18:15	ALD
RESIDUES								
Solids, Total Dissolved	7	mg/L	5	1	SM 2540C	05/28	12:35	TMH
Solids, Total Suspended	<3	mg/L	3	1	SM 2540D	05/28	12:35	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	5	mg/L	1	1	SM 2320 B	05/27	14:00	HRG

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M.J. Reider Associates, Inc.



Attention: Gregory Wacik
 Reported To: USACE, Philadelphia District
 Environmental Resources Branch
 100 Penn Square East
 Philadelphia PA 19107

Date of Report: 06/05/14
 Lab ID: 2295-14-0015800
 Date Collected: 05/22/14 10:10
 Collected By: Client
 Date Received: 05/22/14 13:45

Sample Desc: BZ-4 Surface

PWSID: 3130843

Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
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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.
- 02 The total coliform sample was placed in the incubator at 05/22/14 at 14:45.

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Attention: Gregory Wacik
 Reported To: USACE, Philadelphia District
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 100 Penn Square East
 Philadelphia PA 19107

Date of Report: 06/05/14
 Lab ID: 2295-14-0015801
 Date Collected: 05/22/14 10:00
 Collected By: Client
 Date Received: 05/22/14 13:45

Sample Desc: BZ-5 Surface

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Escherichia coli	120	mpn/100mL	1	1	SM 9223B	05/23	09:00	TBP
Fecal Coliform	120	/100mL	2	1	SM 9222D	05/22	15:10	PLW
Total Coliform	1400	mpn/100mL	1	1	SM 9223B	05/23	09:00	TBP
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/L	.01	1	SM 4500P-E	05/22	16:30	HRG
Phosphorus as P, Dissolved	<.05	mg/L	.05	1	SM 4500P-E	06/02	15:00	HRG
Phosphorus as P, Total	0.04	mg/L	.01	1	SM 4500P-E	05/28	14:30	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/L	.05	1	D6919-03	06/05	05:29	JCL
Nitrogen, Nitrate	1.11	mg/L	.05	1	EPA 353.2	05/22	18:54	JCL
Nitrogen, Nitrite	<.05	mg/L	.05	1	EPA 353.2	05/22	17:28	JCL
Nitrogen, Total Kjeldahl	<.25	mg/L	.25	1	EPA 351.2	05/30	15:02	ALD
OTHER								
Biochemical Oxygen Demand	<2	mg/L	2	1	SM 5210B	05/22	14:55	EMW
Total Organic Carbon	1.4	mg/L	1	1	SM5310 C	05/27	19:27	ALD
RESIDUES								
Solids, Total Dissolved	44	mg/L	5	1	SM 2540C	05/28	12:35	TMH
Solids, Total Suspended	3	mg/L	3	1	SM 2540D	05/28	12:35	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	12	mg/L	1	1	SM 2320 B	05/27	14:00	HRG

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 Reported To: USACE, Philadelphia District
 Environmental Resources Branch
 100 Penn Square East
 Philadelphia PA 19107

Date of Report: 06/05/14
 Lab ID: 2295-14-0015801

Date Collected: 05/22/14 10:00
 Collected By: Client

Sample Desc: BZ-5 Surface

Date Received: 05/22/14 13:45

PWSID: 3130843

Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
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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.
- 02 The total coliform sample was placed in the incubator at 05/22/14 at 14:45.
- 03 One TOC CCV was 111% recovery.

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Attention: Gregory Wacik
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 100 Penn Square East
 Philadelphia PA 19107

Date of Report: 06/05/14
 Lab ID: 2295-14-0015802
 Date Collected: 05/22/14 08:00
 Collected By: Client
 Date Received: 05/22/14 13:45

Sample Desc: BZ-6 Surface

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTERIOLOGY								
MICROBIOLOGY								
Escherichia coli	5	mpn/100ml	1	1	SM 9223B	05/23	09:00	TBP
Fecal Coliform	6	/100ml	2	1	SM 9222D	05/22	15:10	PLW
Total Coliform	25	mpn/100ml	1	1	SM 9223B	05/23	09:00	TBP
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	05/22	16:30	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	06/02	15:00	HRG
Phosphorus as P, Total	0.03	mg/l	.01	1	SM 4500P-E	05/28	14:30	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	06/05	05:44	JCL
Nitrogen, Nitrate	0.62	mg/l	.05	1	EPA 353.2	05/22	18:55	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	05/22	17:29	JCL
Nitrogen, Total Kjeldahl	0.29	mg/l	.25	1	EPA 351.2	05/30	15:03	ALD
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	05/22	14:55	EMW
Total Organic Carbon	1.8	mg/l	1	1	SM5310 C	05/27	19:39	ALD
RESIDUES								
Solids, Total Dissolved	32	mg/l	5	1	SM 2540C	05/28	12:35	TMH
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	05/28	12:35	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	9	mg/l	1	1	SM 2320 B	05/27	14:15	HRG

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 Philadelphia PA 19107

Date of Report: 06/05/14
 Lab ID: 2295-14-0015802

Date Collected: 05/22/14 08:00
 Collected By: Client

Sample Desc: BZ-6 Surface

Date Received: 05/22/14 13:45

PWSID: 3130843

Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
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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.
- 02 The total coliform sample was placed in the incubator at 05/22/14 at 14:45.
- 03 One TOC CCV was 111% recovery.

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 Philadelphia PA 19107

Date of Report: 06/05/14
 Lab ID: 2295-14-0015803
 Date Collected: 05/22/14 08:00
 Collected By: Client
 Date Received: 05/22/14 13:45

Sample Desc: BZ-6 Mid-Depth

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	0.04	mg/L	.01	1	SM 4500P-E	05/22	16:30	HRG
Phosphorus as P, Dissolved	<.05	mg/L	.05	1	SM 4500P-E	06/02	15:00	HRG
Phosphorus as P, Total	0.04	mg/L	.01	1	SM 4500P-E	05/28	14:30	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/L	.05	1	D6919-03	06/05	05:59	JCL
Nitrogen, Nitrate	0.76	mg/L	.05	1	EPA 353.2	05/22	18:56	JCL
Nitrogen, Nitrite	<.05	mg/L	.05	1	EPA 353.2	05/22	17:30	JCL
Nitrogen, Total Kjeldahl	<.25	mg/L	.25	1	EPA 351.2	05/30	15:06	ALD
OTHER								
Biochemical Oxygen Demand	<2	mg/L	2	1	SM 5210B	05/22	14:55	EMW
Total Organic Carbon	1.2	mg/L	1	1	SM5310 C	05/27	19:50	ALD
RESIDUES								
Solids, Total Dissolved	26	mg/L	5	1	SM 2540C	05/28	12:35	TMH
Solids, Total Suspended	<3	mg/L	3	1	SM 2540D	05/28	12:35	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	9	mg/L	1	1	SM 2320 B	05/27	14:15	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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 Philadelphia PA 19107

Date of Report: 06/05/14
 Lab ID: 2295-14-0015803

Date Collected: 05/22/14 08:00
 Collected By: Client

Sample Desc: BZ-6 Mid-Depth

Date Received: 05/22/14 13:45

PWSID: 3130843

Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
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02 One TOC CCV was 111% recovery.

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 Reported To: USACE, Philadelphia District
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 Philadelphia PA 19107

Date of Report: 06/05/14
 Lab ID: 2295-14-0015804

Date Collected: 05/22/14 08:00
 Collected By: Client

Sample Desc: BZ-6 Deep

Date Received: 05/22/14 13:45

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	0.06	mg/L	.01	1	SM 4500P-E	05/22	16:45	HRG
Phosphorus as P, Dissolved	<.05	mg/L	.05	1	SM 4500P-E	06/02	15:00	HRG
Phosphorus as P, Total	0.06	mg/L	.01	1	SM 4500P-E	05/28	14:30	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/L	.05	1	D6919-03	06/05	06:14	JCL
Nitrogen, Nitrate	0.76	mg/L	.05	1	EPA 353.2	05/22	18:57	JCL
Nitrogen, Nitrite	<.05	mg/L	.05	1	EPA 353.2	05/22	17:31	JCL
Nitrogen, Total Kjeldahl	<.25	mg/L	.25	1	EPA 351.2	05/30	15:09	ALD
OTHER								
Biochemical Oxygen Demand	<2	mg/L	2	1	SM 5210B	05/22	14:55	EMW
Total Organic Carbon	1.2	mg/L	1	1	SM5310 C	05/27	20:02	ALD
RESIDUES								
Solids, Total Dissolved	35	mg/L	5	1	SM 2540C	05/28	12:35	TMH
Solids, Total Suspended	9	mg/L	3	1	SM 2540D	05/28	12:35	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	9	mg/L	1	1	SM 2320 B	05/27	14:15	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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Reported To: USACE, Philadelphia District
Environmental Resources Branch
100 Penn Square East
Philadelphia PA 19107

Date of Report: 06/05/14
Lab ID: 2295-14-0015804

Date Collected: 05/22/14 08:00
Collected By: Client

Sample Desc: BZ-6 Deep

Date Received: 05/22/14 13:45

PWSID: 3130843

Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
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02 One TOC CCV was 111% recovery.

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Date of Report: 06/05/14
 Lab ID: 2295-14-0015805

Date Collected: 05/22/14 09:30
 Collected By: Client

Sample Desc: BZ-7 Surface

Date Received: 05/22/14 13:45

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Escherichia coli	4	mpn/100ml	1	1	SM 9223B	05/23	09:00	TBP
Fecal Coliform	5	/100ml	2	1	SM 9222D	05/22	15:10	PLW
Total Coliform	24	mpn/100ml	1	1	SM 9223B	05/23	09:00	TBP
CHEMISTRY								
COLORIMETRIC								
Phosphate as P, Ortho	0.01	mg/L	.01	1	SM 4500P-E	05/22	16:45	HRG
Phosphorus as P, Dissolved	<.05	mg/L	.05	1	SM 4500P-E	06/02	15:00	HRG
Phosphorus as P, Total	0.08	mg/L	.01	1	SM 4500P-E	05/28	14:30	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/L	.05	1	D6919-03	06/05	06:29	JCL
Nitrogen, Nitrate	0.51	mg/L	.05	1	EPA 353.2	05/22	19:02	JCL
Nitrogen, Nitrite	<.05	mg/L	.05	1	EPA 353.2	05/22	17:34	JCL
Nitrogen, Total Kjeldahl	0.41	mg/L	.25	1	EPA 351.2	05/30	15:12	ALD
OTHER								
Biochemical Oxygen Demand	2	mg/L	2	1	SM 5210B	05/22	14:55	EMW
Total Organic Carbon	2.6	mg/L	1	1	SM5310 C	05/27	20:14	ALD
RESIDUES								
Solids, Total Dissolved	17	mg/L	5	1	SM 2540C	05/28	12:55	TMH
Solids, Total Suspended	<3	mg/L	3	1	SM 2540D	05/28	12:55	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	10	mg/L	1	1	SM 2320 B	05/27	14:30	HRG

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 100 Penn Square East
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Date of Report: 06/05/14
 Lab ID: 2295-14-0015805
 Date Collected: 05/22/14 09:30
 Collected By: Client

Sample Desc: BZ-7 Surface

Date Received: 05/22/14 13:45

PWSID: 3130843

Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
--------	------	--------------	------------------	-----------	--------------	--------------	---------

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.
- 02 The total coliform sample was placed in the incubator at 05/22/14 at 14:45.
- 03 The SM 5210B sample did not have a DO depletion of at least 2 mg/L.
- 04 One TOC CCV was 111% recovery.

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Date of Report: 06/05/14
 Lab ID: 2295-14-0015806

Date Collected: 05/22/14 09:30
 Collected By: Client

Sample Desc: BZ-7 Mid-Depth

Date Received: 05/22/14 13:45

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/L	.01	1	SM 4500P-E	05/22	16:45	HRG
Phosphorus as P, Dissolved	<.05	mg/L	.05	1	SM 4500P-E	06/02	15:00	HRG
Phosphorus as P, Total	0.05	mg/L	.01	1	SM 4500P-E	05/28	14:30	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/L	.05	1	D6919-03	06/05	06:44	JCL
Nitrogen, Nitrate	0.87	mg/L	.05	1	EPA 353.2	05/22	19:03	JCL
Nitrogen, Nitrite	<.05	mg/L	.05	1	EPA 353.2	05/22	17:35	JCL
Nitrogen, Total Kjeldahl	<.25	mg/L	.25	1	EPA 351.2	05/30	15:13	ALD
OTHER								
Biochemical Oxygen Demand	<2	mg/L	2	1	SM 5210B	05/22	14:55	EMW
Total Organic Carbon	1.7	mg/L	1	1	SM5310 C	05/27	20:27	ALD
RESIDUES								
Solids, Total Dissolved	49	mg/L	5	1	SM 2540C	05/28	12:55	TMH
Solids, Total Suspended	<3	mg/L	3	1	SM 2540D	05/28	12:55	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	10	mg/L	1	1	SM 2320 B	05/27	14:30	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.

Distribution of Reports:

Reviewed and Approved by:

Christina Kistler
 Account Executive

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CERTIFICATE OF ANALYSIS
M.J. Reider Associates, Inc.



Attention: Gregory Wacik
 Reported To: USACE, Philadelphia District
 Environmental Resources Branch
 100 Penn Square East
 Philadelphia PA 19107

Date of Report: 06/05/14
 Lab ID: 2295-14-0015806

Date Collected: 05/22/14 09:30
 Collected By: Client

Sample Desc: BZ-7 Mid-Depth

Date Received: 05/22/14 13:45

PWSID: 3130843

Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
--------	------	--------------	------------------	-----------	--------------	--------------	---------

02 One TOC CCV was 111% recovery.

Distribution of Reports:

Reviewed and Approved by:

Christina Kistler
 Account Executive

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CERTIFICATE OF ANALYSIS

M.J. Reider Associates, Inc.



Attention: Gregory Wacik
 Reported To: USACE, Philadelphia District
 Environmental Resources Branch
 100 Penn Square East
 Philadelphia PA 19107

Date of Report: 06/05/14
 Lab ID: 2295-14-0015807
 Date Collected: 05/22/14 09:30
 Collected By: Client

Sample Desc: BZ-7 Deep

Date Received: 05/22/14 13:45

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/L	.01	1	SM 4500P-E	05/22	16:45	HRG
Phosphorus as P, Dissolved	<.05	mg/L	.05	1	SM 4500P-E	06/02	15:00	HRG
Phosphorus as P, Total	1.00	mg/L	.01	1	SM 4500P-E	05/28	14:30	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/L	.05	1	D6919-03	06/05	06:59	JCL
Nitrogen, Nitrate	0.77	mg/L	.05	1	EPA 353.2	05/22	19:04	JCL
Nitrogen, Nitrite	<.05	mg/L	.05	1	EPA 353.2	05/22	17:36	JCL
Nitrogen, Total Kjeldahl	3.06	mg/L	.25	1	EPA 351.2	05/30	15:14	ALD
OTHER								
Biochemical Oxygen Demand	<2	mg/L	2	1	SM 5210B	05/22	14:55	EMW
Total Organic Carbon	2.6	mg/L	1	1	SM5310 C	05/27	20:38	ALD
RESIDUES								
Solids, Total Dissolved	42	mg/L	5	1	SM 2540C	05/28	12:55	TMH
Solids, Total Suspended	393	mg/L	3	1	SM 2540D	05/28	12:55	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	8	mg/L	1	1	SM 2320 B	05/27	14:45	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.

Distribution of Reports:

Reviewed and Approved by:

Christina Kistler
 Account Executive

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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: 06/05/14
 Lab ID: 2295-14-0015807

Date Collected: 05/22/14 09:30
 Collected By: Client

Sample Desc: BZ-7 Deep

Date Received: 05/22/14 13:45

PWSID: 3130843

Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
--------	------	--------------	------------------	-----------	--------------	--------------	---------

02 One TOC CCV was 111% recovery.

Distribution of Reports:

Reviewed and Approved by:

Christina M. Kistler
 Christina Kistler
 Account Executive

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Chain of Custody

Work Order: 004036
Work Order Description: Beltzville Reservoir

Project Leader: CMB

No: 236464

Account: 2295
Customer: Gregory Wackl

Address: USACE, Philadelphia District
Environmental Resources Branch
100 Penn Square East
Philadelphia PA 19107

Phone: 215-656-6561
Ext:

Samplers: WDACIK

Remarks:
Total Sampling Time (hours):
Laboratory Receipt Temp: 2 Deg C If Temp Unacceptable, On Ice? Y N
Approved By: [Signature]

15-795

Sample No: 1 Desc: BZ-1 Surface

FC, EC, TC, old Hg
NO2-N, NO3-N, d-p04-p, o-p04, BOD
NH3-N, tkm, Alk, tds, tss, p04-p, toc,

Matrix: 0
Date: 5/22/14
Time: 0730
A - 1 X 250ml Micro P w/ Sterile/Na2S2O3;
B - 1 X 1 Bod P w/ Cool to 6 C;
C - 1 X 16oz NO2NO3 P w/ Cool to 6 C;
D - 1 X 500ml NH3 P w/ H2SO4 (pH<2);
E - 1 X 2xamberova g w/ H3PO4/zero headspace;
F - 1 X 8oz Alk P w/
Cool to 6 C/Zero Headspace;

15-796

Sample No: 2 Desc: BZ-2 Surface

FC, EC, TC, old Hg
NO2-N, NO3-N, d-p04-p, o-p04, BOD
NH3-N, tkm, Alk, tds, tss, p04-p, toc,

Matrix: 0
Date: 5/22/14
Time: 1120
A - 1 X 250ml Micro P w/ Sterile/Na2S2O3;
B - 1 X 1 Bod P w/ Cool to 6 C;
C - 1 X 16oz NO2NO3 P w/ Cool to 6 C;
D - 1 X 500ml NH3 P w/ H2SO4 (pH<2);
E - 1 X 2xamberova g w/ H3PO4/zero headspace;
F - 1 X 8oz Alk P w/
Cool to 6 C/Zero Headspace;

Relinquished by: [Signature]
Date: 5/22/14 Time: 1145

Received by: [Signature]

Received for Laboratory by: [Signature]
Date: 5-22-14 Time: 1345

Sample entered by: _____

04/17/14 3:47:34 PM

M. J. REIDER ASSOCIATES, INC.

Chain of Custody

Work Order: 004036
Work Order Description: Beltzville Reservoir

Project Leader: GMB

No: 236464

Account: 2295
Customer: Gregory Wack

Address: USACE, Philadelphia District
Environmental Resources Branch
100 Penn Square East
Philadelphia PA 19107

Phone: 215-656-6561 Ext:

Samplers: WACK

Remarks:

Total Sampling Time (hours):

Bottle Prep by:

Laboratory Receipt Temp: 2 Deg PM If Temp Unacceptable, On Ice? Y N

Approved By: PM

15797

Sample No: 3 Desc: BZ-3 Surface

FC, EC, TC, PM Hg
NO2-N, NO3-N, d-p₀₄-p, o-p₀₄, BOD
M
NH3-N, tkm, Alk, tds, tss, p₀₄-p, toc,

Matrix: 0

Date: 5/22/14
Time: 0850

- A - 1 X 1 L 250ml Micro P w/ Sterile/Na2S2O3;
- B - 1 X 1 L Bod p w/ Cool to 6 C;
- C - 1 X 1 L 16oz NO2NO3 P w/ Cool to 6 C;
- D - 1 X 1 X 500ml NH3 P w/ H2SO4 (pH<2);
- E - 1 X 2xamberova g w/ H3PO4/zero headspace;
- F - 1 X 8oz Alk p w/ Cool to 6 C/Zero Headspace;

15798

Sample No: 4 Desc: BZ-3 Mid-Depth

NO2-N, NO3-N, d-p₀₄-p, o-p₀₄, BOD
M
NH3-N, tkm, Alk, tds, tss, p₀₄-p, toc,

Matrix: 0

Date: 5/22/14
Time: 0850

- A - 1 X 1 L Bod p w/ Cool to 6 C;
- B - 1 X 1 X 16oz NO2NO3 P w/ Cool to 6 C;
- C - 1 X 1 X 500ml NH3 P w/ H2SO4 (pH<2);
- D - 1 X 2xamberova g w/ H3PO4/zero headspace;
- E - 1 X 8oz Alk p w/ Cool to 6 C/Zero Headspace;

Relinquished by: [Signature] 5/22/14

Received by: [Signature]

Received for laboratory by: [Signature]

Date: [Signature] Time: 1145

Date: 5-22-14

Time: 1345

Sample entered by: _____

lbs
04/17/14 3:47:34 PM

M. J. REIDER ASSOCIATES, INC.

COFC.PRT
Page: 3

Chain of Custody

Account: 2295

Work Order: 004036

Project Leader: CMB

No: 236464

Customer: Gregory Wack

Work Order Description: Beltzville Reservoir

Remarks:

Address: USACE, Philadelphia District
Environmental Resources Branch
100 Penn Square East
Philadelphia PA 19107

Phone: 215-656-6561 Ext:

Total Sampling Time (hours):

Bottle Prep by:

Samplers:

WACK

Laboratory Receipt Temp: 2 Deg C/If Temp Unacceptable, On Ice? Y N
Approved By: Wack

Sample No: 5 Desc: BZ-3 Deep

Matrix: 0

Date: 5/22/14
Time: 0850

NO2-N, NO3-N, d-p04-p, o-p04, BOD
NH3-N, tkm, Alk, tds, tss, po4-p, toc,

A - 1 X L Bod p w/ Cool to 6 C;
B - 1 X 16ozNO2NO3 p w/ Cool to 6 C;
C - 1 X 50ml NH3 p w/ H2SO4 (pH<2);
D - 1 X 2xamberova g w/ H3PO4/zero headspace;
E - 1 X 8oz Alk p w/
Cool to 6 C/Zero Headspace;

Matrix: 0

Date: 5/22/14
Time: 1010

15800

Sample No: 6 Desc: BZ-4 Surface

FC, EC, TC, PH
NO2-N, NO3-N, d-p04-p, o-p04, BOD
NH3-N, tkm, Alk, tds, tss, po4-p, toc,

A - 1 X 250mlMicro P w/ Sterile/Na2S2O3;
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 2xamberova g w/ H3PO4/zero headspace;
F - 1 X 8oz Alk p w/
Cool to 6 C/Zero Headspace;

15799

Relinquished by: [Signature]
Date: 5/22/14 Time: 1145

Received by: [Signature]

Received for Laboratory by: [Signature]
Date: 5.22.14 Time: 1345

Sample entered by: _____

Job
04/17/14 3:47:34 PM

M. J. REIDER ASSOCIATES, INC.

COFC.PRT
Page: 4

Chain of Custody

Work Order: 004036
Work Order Description: Beltzville Reservoir

Project Leader: GMB

No: 236464

Account: 2295
Customer: Gregory Wacik

Remarks:

Address: USACE, Philadelphia District
Environmental Resources Branch
100 Penn Square East
Philadelphia PA 19107
Phone: 215-656-6561 Ext:

Total Sampling Time (hours):

Bottle Prep by:

Laboratory Receipt Temp: ✓ Deg C If Temp Unacceptable, On Ice? Y N

Approved By: [Signature]

Samplers: Wacik

Matrix: 0

15801

Sample No: 7 Desc: BZ-5 Surface

Date: 5/22/14
Time: 4:00

FC, EC, TC, P/W Hg
NO2-N, NO3-N, d-p04-p, o-p04, BOD g
NH3-N, tkm, Alk, tds, tss, po4-p, toc,

A - 1 X 250ml Micro P w/ Sterile/Na2S2O3;
B - 1 X 1 Bod p w/ Cool to 6 C;
C - 1 X 16oz NO2NO3 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;

15802

Sample No: 8 Desc: BZ-6 Surface

Matrix: 0
Date: 5/22/14
Time: 6:00

FC, EC, TC, P/W Hg
NO2-N, NO3-N, d-p04-p, o-p04, BOD g
NH3-N, tkm, Alk, tds, tss, po4-p, toc,

A - 1 X 250ml Micro P w/ Sterile/Na2S2O3;
B - 1 X 1 Bod p w/ Cool to 6 C;
C - 1 X 16oz NO2NO3 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;

Relinquished by: [Signature]
Date: 5/22/14
Time: 1:45

Received by: [Signature]
Date: 5-22-14
Time: 1:45

Received for Laboratory by: [Signature]
Date: 5-22-14
Time: 1:45

Sample entered by: _____

Chain of Custody

Work Order: 004036
Work Order Description: Beltzville Reservoir

Project Leader: CMB

No: 236464

Account: 2295
Customer: Gregory Wacik

Address: USACE, Philadelphia District
Environmental Resources Branch
100 Penn Square East
Philadelphia PA 19107
Phone: 215-656-6561 Ext:

Samplers: WACIK

Remarks: Total Sampling Time (hours):

Bottle Prep by:

Laboratory Receipt Temp: 2 Deg ~~F~~ IF Temp Unacceptable, On Ice? Y N

Approved By: PM

=====

15803

Sample No: 9 Desc: BZ-6 Mid-Depth
NO2-N, NO3-N, d-p04-p, o-p04, BOD
NH3-N, tkm, Alk, tds, tss, p04-p, toc,

Matrix: 0 Date: 5/22/14
Time: 0800
A - 1 X 1 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;

15804

Sample No: 10 Desc: BZ-6 Deep
NO2-N, NO3-N, d-p04-p, o-p04, BOD
NH3-N, tkm, Alk, tds, tss, p04-p, toc,

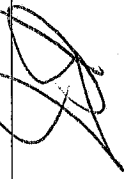
Matrix: 0 Date: 5/22/14
Time: 0800
A - 1 X 1 Bod p w/ Cool to 6 C;
B - 1 X 16ozNO2NO3 p w/ Cool to 6 C;
C - 1 X 500ml NH3 p w/ H2SO4 (pH<2);
D - 1 X 2xambervoa g w/ H3PO4/zero headspace;
E - 1 X 8oz Alk p w/
Cool to 6 C/Zero Headspace;


15805

Sample No: 11 Desc: BZ-7 Surface
FC, EC, TC, ~~pw~~ Hg
NO2-N, NO3-N, d-p04-p, o-p04, BOD
NH3-N, tkm, Alk, tds, tss, p04-p, toc,

Matrix: 0 Date: 5/22/14
Time: 0956
A - 1 X 250mlMicro P w/ Sterile/Na2S2O3;
B - 1 X 1 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;

Relinquished by: 

Received by: 

Received for laboratory by: 

Date: 5/22/14 Time: 1145

Date: 5-22-14

Time: 1345

Sample entered by: _____

Chain of Custody

Account: 2295 Work Order: 004036 Project Leader: CMB No: 236464
Customer: Gregory Wacik Work Order Description: Beltzville Reservoir

Address: USACE, Philadelphia District
Environmental Resources Branch
100 Penn Square East
Philadelphia PA 19107
Phone: 215-656-6561 Ext: _____

Samplers: WACIK

Remarks: _____
Total Sampling Time (hours): _____ Bottle Prep by: _____
Laboratory Receipt Temp: 2 Deg C If Temp Unacceptable, On Ice? Y N
Approved By: [Signature]

Sample No: 12 Desc: BZ-7 Mid-Depth Date: 5/22/14
Time: 0930

NO2-N, NO3-N, d-p04-p, o-p04, BOD
NH3-N, tkm, Alk, tds, tss, p04-p, toc,
Matrix: 0

- A - 1 X 1 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;

Sample No: 13 Desc: BZ-7 Deep Date: 5/22/14
Time: 0930

NO2-N, NO3-N, d-p04-p, o-p04, BOD
NH3-N, tkm, Alk, tds, tss, p04-p, toc,
Matrix: 0

- A - 1 X 1 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;

Relinquished by: [Signature] Received by: [Signature]
Received for Laboratory by: [Signature]

Date: 5/22/14 Time: 1145
Date: 5-22-14 Time: 1345

Sample entered by: _____

15806

15807



CERTIFICATE OF ANALYSIS

M.J. Reider Associates, Inc.



Attention: Gregory Wacik
 Reported To: USACE, Philadelphia District
 Environmental Resources Branch
 100 Penn Square East
 Philadelphia PA 19107

Date of Report: 06/30/14
 Lab ID: 2295-14-0019457
 Date Collected: 06/19/14 11:05
 Collected By: Client
 Date Received: 06/19/14 14:20

Sample Desc: BZ-1 Surface

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTERIOLOGY								
MICROBIOLOGY								
Escherichia coli	2	mpn/100ml	1	1	SM 9223B	06/20	11:30	PLW
Fecal Coliform	10	/100ml	2	1	SM 9222D	06/19	16:00	PLW
Total Coliform	920	mpn/100ml	1	1	SM 9223B	06/20	11:30	PLW
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	0.04	mg/l	.01	1	SM 4500P-E	06/20	09:15	ALD
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	06/20	11:39	ALD
Phosphorus as P, Total	0.04	mg/l	.01	1	SM 4500P-E	06/20	10:30	ALD
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	06/19	21:42	JCL
Nitrogen, Nitrate	0.68	mg/l	.05	1	EPA 353.2	06/19	18:54	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	06/23	16:31	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	06/20	13:15	EMW
Total Organic Carbon	1.5	mg/l	1	1	SM5310 C	06/20	03:14	ALD
RESIDUES								
Solids, Total Dissolved	47	mg/l	5	1	SM 2540C	06/23	13:25	TMH
Solids, Total Suspended	14	mg/l	3	1	SM 2540D	06/23	13:25	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	11	mg/l	1	1	SM 2320 B	06/23	11:00	HRG

Distribution of Reports:

Reviewed and Approved by:

Christina Kistler
 Account Executive

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M.J. Reider Associates, Inc.



Attention: Gregory Wacik
 Reported To: USACE, Philadelphia District
 Environmental Resources Branch
 100 Penn Square East
 Philadelphia PA 19107

Date of Report: 06/30/14
 Lab ID: 2295-14-0019457

Date Collected: 06/19/14 11:05
 Collected By: Client

Sample Desc: BZ-1 Surface

Date Received: 06/19/14 14:20

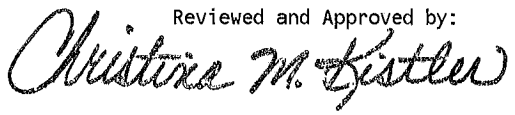
PWSID: 3130843

Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
--------	------	-----------	---------------	-----------	-----------	-----------	---------

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.
- 02 The duplicate analysis of this sample for total dissolved solids was outside the recommended limit of 5% of their average weight.
- 03 The total coliform sample was placed in the incubator on 06/19/14 at 17:15.

Distribution of Reports:

Reviewed and Approved by:


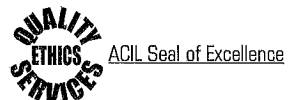
Christina Kistler
 Account Executive

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CERTIFICATE OF ANALYSIS

M.J. Reider Associates, Inc.



Attention: Gregory Wacik
 Reported To: USACE, Philadelphia District
 Environmental Resources Branch
 100 Penn Square East
 Philadelphia PA 19107

Date of Report: 06/30/14
 Lab ID: 2295-14-0019458

Date Collected: 06/19/14 10:50
 Collected By: Client

Sample Desc: BZ-2 Surface

Date Received: 06/19/14 14:20

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Escherichia coli	72	mpn/100mL	1	1	SM 9223B	06/20	11:30	PLW
Fecal Coliform	82	/100mL	2	1	SM 9222D	06/19	16:00	PLW
Total Coliform	>2400	mpn/100mL	1	1	SM 9223B	06/20	11:30	PLW
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	0.03	mg/L	.01	1	SM 4500P-E	06/20	09:15	ALD
Phosphorus as P, Dissolved	<.05	mg/L	.05	1	SM 4500P-E	06/20	11:39	ALD
Phosphorus as P, Total	0.04	mg/L	.01	1	SM 4500P-E	06/20	10:30	ALD
NITROGENS								
Nitrogen, Ammonia	<.05	mg/L	.05	1	D6919-03	06/19	21:56	JCL
Nitrogen, Nitrate	0.19	mg/L	.05	1	EPA 353.2	06/19	18:55	JCL
Nitrogen, Nitrite	<.05	mg/L	.05	1	EPA 353.2	06/19	17:12	JCL
Nitrogen, Total Kjeldahl	<.25	mg/L	.25	1	EPA 351.2	06/23	16:32	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/L	2	1	SM 5210B	06/20	13:15	EMW
Total Organic Carbon	<1	mg/L	1	1	SM5310 C	06/20	03:28	ALD
RESIDUES								
Solids, Total Dissolved	45	mg/L	5	1	SM 2540C	06/23	13:25	TMH
Solids, Total Suspended	3	mg/L	3	1	SM 2540D	06/23	13:25	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	6	mg/L	1	1	SM 2320 B	06/23	11:00	HRG

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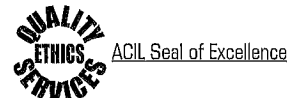
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 Account Executive

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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: 06/30/14
 Lab ID: 2295-14-0019458
 Date Collected: 06/19/14 10:50
 Collected By: Client
 Date Received: 06/19/14 14:20

Sample Desc: BZ-2 Surface

PWSID: 3130843

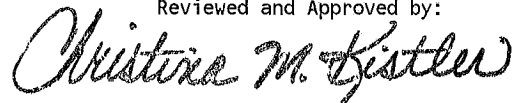
Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
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COMMENTS

- 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.
- 02 The total coliform sample was placed in the incubator on 06/19/14 at 17:15.

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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: 06/30/14
 Lab ID: 2295-14-0019459

Date Collected: 06/19/14 08:40
 Collected By: Client

Sample Desc: BZ-3 Surface

Date Received: 06/19/14 14:20

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Escherichia coli	<1	mpn/100mL	1	1	SM 9223B	06/20	11:30	PLW
Fecal Coliform	<2	/100mL	2	1	SM 9222D	06/19	16:25	PLW
Total Coliform	69	mpn/100mL	1	1	SM 9223B	06/20	11:30	PLW
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	0.05	mg/L	.01	1	SM 4500P-E	06/20	09:15	ALD
Phosphorus as P, Dissolved	<.05	mg/L	.05	1	SM 4500P-E	06/20	11:39	ALD
Phosphorus as P, Total	0.04	mg/L	.01	1	SM 4500P-E	06/20	10:30	ALD
NITROGENS								
Nitrogen, Ammonia	<.05	mg/L	.05	1	D6919-03	06/19	22:11	JCL
Nitrogen, Nitrate	0.43	mg/L	.05	1	EPA 353.2	06/19	18:56	JCL
Nitrogen, Nitrite	<.05	mg/L	.05	1	EPA 353.2	06/19	17:13	JCL
Nitrogen, Total Kjeldahl	<.25	mg/L	.25	1	EPA 351.2	06/23	16:33	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/L	2	1	SM 5210B	06/20	13:15	EMW
Total Organic Carbon	1.6	mg/L	1	1	SM5310 C	06/20	03:43	ALD
RESIDUES								
Solids, Total Dissolved	41	mg/L	5	1	SM 2540C	06/23	13:25	TMH
Solids, Total Suspended	<3	mg/L	3	1	SM 2540D	06/23	13:25	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	9	mg/L	1	1	SM 2320 B	06/23	11:00	HRG

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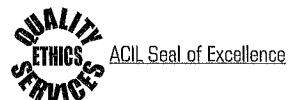
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 Account Executive

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 100 Penn Square East
 Philadelphia PA 19107

Date of Report: 06/30/14
 Lab ID: 2295-14-0019459

Date Collected: 06/19/14 08:40
 Collected By: Client

Sample Desc: BZ-3 Surface

Date Received: 06/19/14 14:20

PWSID: 3130843

Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
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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.

- 02 The total coliform sample was placed in the incubator on 06/19/14 at 17:15.

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Date of Report: 06/30/14
 Lab ID: 2295-14-0019460

Date Collected: 06/19/14 08:40
 Collected By: Client

Sample Desc: BZ-3 Mid-Depth

Date Received: 06/19/14 14:20

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	06/20	09:15	ALD
Phosphorus as P, Dissolved	<.05	mg/L	.05	1	SM 4500P-E	06/20	11:39	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	22:25	JCL
Nitrogen, Nitrate	0.75	mg/L	.05	1	EPA 353.2	06/19	19:01	JCL
Nitrogen, Nitrite	<.05	mg/L	.05	1	EPA 353.2	06/19	17:18	JCL
Nitrogen, Total Kjeldahl	<.25	mg/L	.25	1	EPA 351.2	06/23	16:36	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/L	2	1	SM 5210B	06/20	13:15	EMW
Total Organic Carbon	1.2	mg/L	1	1	SM5310 C	06/20	03:57	ALD
RESIDUES								
Solids, Total Dissolved	65	mg/L	5	1	SM 2540C	06/23	13:25	TMH
Solids, Total Suspended	<3	mg/L	3	1	SM 2540D	06/23	13:25	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	9	mg/L	1	1	SM 2320 B	06/23	11:30	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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Date of Report: 06/30/14
 Lab ID: 2295-14-0019461

Date Collected: 06/19/14 08:40
 Collected By: Client

Sample Desc: BZ-3 Deep

Date Received: 06/19/14 14:20

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	06/20	09:22	ALD
Phosphorus as P, Dissolved	0.07	mg/L	.05	1	SM 4500P-E	06/20	11:39	ALD
Phosphorus as P, Total	0.12	mg/L	.01	1	SM 4500P-E	06/20	10:30	ALD
NITROGENS								
Nitrogen, Ammonia	<.05	mg/L	.05	1	D6919-03	06/19	22:40	JCL
Nitrogen, Nitrate	0.70	mg/L	.05	1	EPA 353.2	06/19	19:02	JCL
Nitrogen, Nitrite	<.05	mg/L	.05	1	EPA 353.2	06/19	17:19	JCL
Nitrogen, Total Kjeldahl	0.39	mg/L	.25	1	EPA 351.2	06/23	16:37	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/L	2	1	SM 5210B	06/20	13:15	EMW
Total Organic Carbon	1.4	mg/L	1	1	SM5310 C	06/20	04:12	ALD
RESIDUES								
Solids, Total Dissolved	58	mg/L	5	1	SM 2540C	06/23	13:25	TMH
Solids, Total Suspended	87	mg/L	3	1	SM 2540D	06/23	13:25	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	9	mg/L	1	1	SM 2320 B	06/23	11:30	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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Date of Report: 06/30/14
 Lab ID: 2295-14-0019462
 Date Collected: 06/19/14 10:40
 Collected By: Client
 Date Received: 06/19/14 14:20

Sample Desc: BZ-4 Surface

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Escherichia coli	10	mpn/100mL	1	1	SM 9223B	06/20	11:30	PLW
Fecal Coliform	11	/100mL	2	1	SM 9222D	06/19	16:25	PLW
Total Coliform	>2400	mpn/100mL	1	1	SM 9223B	06/20	11:30	PLW
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	0.01	mg/L	.01	1	SM 4500P-E	06/20	09:22	ALD
Phosphorus as P, Dissolved	<.05	mg/L	.05	1	SM 4500P-E	06/20	11:39	ALD
Phosphorus as P, Total	0.01	mg/L	.01	1	SM 4500P-E	06/20	10:39	ALD
NITROGENS								
Nitrogen, Ammonia	<.05	mg/L	.05	1	D6919-03	06/19	22:55	JCL
Nitrogen, Nitrate	0.66	mg/L	.05	1	EPA 353.2	06/19	19:03	JCL
Nitrogen, Nitrite	<.05	mg/L	.05	1	EPA 353.2	06/19	17:20	JCL
Nitrogen, Total Kjeldahl	<.25	mg/L	.25	1	EPA 351.2	06/23	16:38	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/L	2	1	SM 5210B	06/20	13:15	EMW
Total Organic Carbon	<1	mg/L	1	1	SM5310 C	06/20	04:26	ALD
RESIDUES								
Solids, Total Dissolved	46	mg/L	5	1	SM 2540C	06/23	13:25	TMH
Solids, Total Suspended	<3	mg/L	3	1	SM 2540D	06/23	13:25	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	6	mg/L	1	1	SM 2320 B	06/23	11:30	HRG

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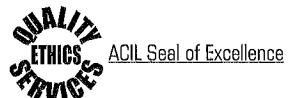
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 100 Penn Square East
 Philadelphia PA 19107

Date of Report: 06/30/14
 Lab ID: 2295-14-0019462
 Date Collected: 06/19/14 10:40
 Collected By: Client
 Date Received: 06/19/14 14:20

Sample Desc: BZ-4 Surface

PWSID: 3130843

Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
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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.
- 02 The total coliform sample was placed in the incubator on 06/19/14 at 17:15.

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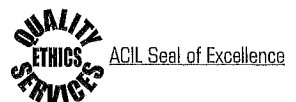
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 Environmental Resources Branch
 100 Penn Square East
 Philadelphia PA 19107

Date of Report: 07/01/14
 Lab ID: 2295-14-0019463
 Date Collected: 06/19/14 10:30
 Collected By: CLIENT
 Date Received: 06/19/14 14:20

Sample Desc: BZ-5 Surface

PWSID: 3130843

	Result	Unit	Rep. Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Escherichia coli	200	mpn/100ml	1	1	SM 9223B	06/20	11:30	PLW
Fecal Coliform	210	/100mL	2	1	SM 9222D	06/19	16:25	PLW
Total Coliform	>2400	mpn/100ml	1	1	SM 9223B	06/20	11:30	PLW
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	0.02	mg/l	.01	1	SM 4500P-E	06/20	09:22	ALD
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	06/20	11:39	ALD
Phosphorus as P, Total	0.03	mg/l	.01	1	SM 4500P-E	06/20	10:39	ALD
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	06/19	23:53	JCL
Nitrogen, Nitrate	1.29	mg/l	.05	1	EPA 353.2	06/19	19:04	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	06/19	17:21	JCL
Nitrogen, Total Kjeldahl	0.30	mg/l	.25	1	EPA 351.2	06/23	16:41	JCL
OTHER								
Biochemical Oxygen Demand	2	mg/l	2	1	SM 5210B	06/20	13:15	EMW
Total Organic Carbon	3.9	mg/l	1	1	SM5310 C	06/20	04:42	ALD
RESIDUES								
Solids, Total Dissolved	61	mg/l	5	1	SM 2540C	06/23	13:25	TMH
Solids, Total Suspended	36	mg/l	3	1	SM 2540D	06/23	13:25	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	12	mg/l	1	1	SM 2320 B	06/23	11:30	HRG

COMMENTS

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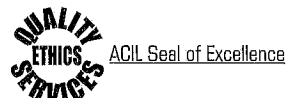
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 Christina Kistler
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 Environmental Resources Branch
 100 Penn Square East
 Philadelphia PA 19107

Date of Report: 07/01/14
 Lab ID: 2295-14-0019463
 Date Collected: 06/19/14 10:30
 Collected By: CLIENT
 Date Received: 06/19/14 14:20

Sample Desc: BZ-5 Surface

PWSID: 3130843

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.

02 The total coliform sample was placed in the incubator on 06/19/14 at 17:15.

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Date of Report: 06/30/14
 Lab ID: 2295-14-0019464
 Date Collected: 06/19/14 07:50
 Collected By: Client
 Date Received: 06/19/14 14:20

Sample Desc: BZ-6 Surface

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Escherichia coli	<1	mpn/100mL	1	1	SM 9223B	06/20	11:30	PLW
Fecal Coliform	<2	/100mL	2	1	SM 9222D	06/19	16:25	PLW
Total Coliform	42	mpn/100mL	1	1	SM 9223B	06/20	11:30	PLW
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/L	.01	1	SM 4500P-E	06/20	09:22	ALD
Phosphorus as P, Dissolved	<.05	mg/L	.05	1	SM 4500P-E	06/20	11:39	ALD
Phosphorus as P, Total	<.01	mg/L	.01	1	SM 4500P-E	06/20	10:39	ALD
NITROGENS								
Nitrogen, Ammonia	<.05	mg/L	.05	1	D6919-03	06/20	00:38	JCL
Nitrogen, Nitrate	0.45	mg/L	.05	1	EPA 353.2	06/19	19:05	JCL
Nitrogen, Nitrite	<.05	mg/L	.05	1	EPA 353.2	06/19	17:22	JCL
Nitrogen, Total Kjeldahl	<.25	mg/L	.25	1	EPA 351.2	06/23	16:42	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/L	2	1	SM 5210B	06/20	13:15	EMW
Total Organic Carbon	1.6	mg/L	1	1	SM5310 C	06/20	04:57	ALD
RESIDUES								
Solids, Total Dissolved	36	mg/L	5	1	SM 2540C	06/23	13:25	TMH
Solids, Total Suspended	4	mg/L	3	1	SM 2540D	06/23	13:25	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	11	mg/L	1	1	SM 2320 B	06/23	11:45	HRG

Distribution of Reports:

Reviewed and Approved by:

Christina Kistler
 Account Executive

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M.J. Reider Associates, Inc.



Attention: Gregory Wacik
 Reported To: USACE, Philadelphia District
 Environmental Resources Branch
 100 Penn Square East
 Philadelphia PA 19107

Date of Report: 06/30/14
 Lab ID: 2295-14-0019464

Date Collected: 06/19/14 07:50
 Collected By: Client

Sample Desc: BZ-6 Surface

Date Received: 06/19/14 14:20

PWSID: 3130843

Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
-----	-----	-----	-----	-----	-----	-----	-----

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.

- 02 The total coliform sample was placed in the incubator on 06/19/14 at 17:15.

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Christina Kistler
 Account Executive

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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: 06/30/14
 Lab ID: 2295-14-0019465
 Date Collected: 06/19/14 07:50
 Collected By: Client
 Date Received: 06/19/14 14:20

Sample Desc: BZ-6 Mid-Depth

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/L	.01	1	SM 4500P-E	06/20	09:22	ALD
Phosphorus as P, Dissolved	<.05	mg/L	.05	1	SM 4500P-E	06/20	11:39	ALD
Phosphorus as P, Total	<.01	mg/L	.01	1	SM 4500P-E	06/20	10:39	ALD
NITROGENS								
Nitrogen, Ammonia	<.05	mg/L	.05	1	D6919-03	06/20	00:53	JCL
Nitrogen, Nitrate	0.72	mg/L	.05	1	EPA 353.2	06/19	19:06	JCL
Nitrogen, Nitrite	<.05	mg/L	.05	1	EPA 353.2	06/19	17:23	JCL
Nitrogen, Total Kjeldahl	<.25	mg/L	.25	1	EPA 351.2	06/23	16:43	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/L	2	1	SM 5210B	06/20	13:15	EMW
Total Organic Carbon	1.4	mg/L	1	1	SM5310 C	06/24	13:34	ALD
RESIDUES								
Solids, Total Dissolved	62	mg/L	5	1	SM 2540C	06/23	13:25	TMH
Solids, Total Suspended	<3	mg/L	3	1	SM 2540D	06/23	13:25	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	9	mg/L	1	1	SM 2320 B	06/23	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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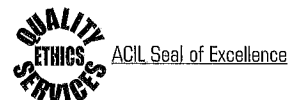
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 Account Executive

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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: 06/30/14
 Lab ID: 2295-14-0019466
 Date Collected: 06/19/14 07:50
 Collected By: Client
 Date Received: 06/19/14 14:20

Sample Desc: BZ-6 Deep

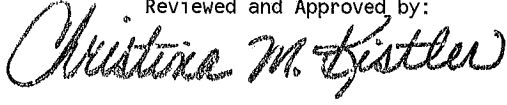
PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	06/20	09:30	ALD
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	06/20	11:39	ALD
Phosphorus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	06/20	10:44	ALD
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	06/20	01:08	JCL
Nitrogen, Nitrate	0.76	mg/l	.05	1	EPA 353.2	06/19	19:07	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	06/19	17:24	JCL
Nitrogen, Total Kjeldahl	<.25	mg/l	.25	1	EPA 351.2	06/23	16:43	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	06/20	13:15	EMW
Total Organic Carbon	1.2	mg/l	1	1	SM5310 C	06/24	14:02	ALD
RESIDUES								
Solids, Total Dissolved	71	mg/l	5	1	SM 2540C	06/23	13:25	TMH
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	06/23	13:25	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	10	mg/l	1	1	SM 2320 B	06/23	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.

Distribution of Reports:

Reviewed and Approved by:


Christina Kistler
 Account Executive

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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: 06/30/14
 Lab ID: 2295-14-0019467

Date Collected: 06/19/14 09:15
 Collected By: Client

Sample Desc: BZ-7 Surface

Date Received: 06/19/14 14:20

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Escherichia coli	1	mpn/100mL	1	1	SM 9223B	06/20	11:30	PLW
Fecal Coliform	<2	/100mL	2	1	SM 9222D	06/19	16:25	PLW
Total Coliform	250	mpn/100mL	1	1	SM 9223B	06/20	11:30	PLW
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	0.02	mg/L	.01	1	SM 4500P-E	06/20	09:30	ALD
Phosphorus as P, Dissolved	<.05	mg/L	.05	1	SM 4500P-E	06/20	11:50	ALD
Phosphorus as P, Total	0.03	mg/L	.01	1	SM 4500P-E	06/20	10:44	ALD
NITROGENS								
Nitrogen, Ammonia	<.05	mg/L	.05	1	D6919-03	06/20	01:23	JCL
Nitrogen, Nitrate	0.41	mg/L	.05	1	EPA 353.2	06/19	19:08	JCL
Nitrogen, Nitrite	<.05	mg/L	.05	1	EPA 353.2	06/19	17:25	JCL
Nitrogen, Total Kjeldahl	0.25	mg/L	.25	1	EPA 351.2	06/23	16:44	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/L	2	1	SM 5210B	06/20	13:15	EMW
Total Organic Carbon	1.7	mg/L	1	1	SM5310 C	06/24	14:45	ALD
RESIDUES								
Solids, Total Dissolved	15	mg/L	5	1	SM 2540C	06/23	13:55	TMH
Solids, Total Suspended	<3	mg/L	3	1	SM 2540D	06/23	13:25	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	10	mg/L	1	1	SM 2320 B	06/23	11:45	HRG

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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: 06/30/14
 Lab ID: 2295-14-0019467

Date Collected: 06/19/14 09:15
 Collected By: Client

Sample Desc: BZ-7 Surface

Date Received: 06/19/14 14:20

PWSID: 3130843

Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
-----	-----	-----	-----	-----	-----	-----	-----

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.

- 02 The total coliform sample was placed in the incubator on 06/19/14 at 17:15.

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 Environmental Resources Branch
 100 Penn Square East
 Philadelphia PA 19107

Date of Report: 06/30/14
 Lab ID: 2295-14-0019468
 Date Collected: 06/19/14 09:15
 Collected By: Client
 Date Received: 06/19/14 14:20

Sample Desc: BZ-7 Mid-Depth

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/L	.01	1	SM 4500P-E	06/20	09:30	ALD
Phosphorus as P, Dissolved	<.05	mg/L	.05	1	SM 4500P-E	06/20	11:50	ALD
Phosphorus as P, Total	<.01	mg/L	.01	1	SM 4500P-E	06/20	10:44	ALD
NITROGENS								
Nitrogen, Ammonia	<.05	mg/L	.05	1	D6919-03	06/20	01:38	JCL
Nitrogen, Nitrate	0.88	mg/L	.05	1	EPA 353.2	06/19	19:11	JCL
Nitrogen, Nitrite	<.05	mg/L	.05	1	EPA 353.2	06/19	17:28	JCL
Nitrogen, Total Kjeldahl	<.25	mg/L	.25	1	EPA 351.2	06/23	16:47	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/L	2	1	SM 5210B	06/20	13:15	EMW
Total Organic Carbon	1.4	mg/L	1	1	SM5310 C	06/24	15:13	ALD
RESIDUES								
Solids, Total Dissolved	55	mg/L	5	1	SM 2540C	06/23	13:55	TMH
Solids, Total Suspended	4	mg/L	3	1	SM 2540D	06/23	13:25	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	11	mg/L	1	1	SM 2320 B	06/23	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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Christina Kistler
 Account Executive

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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: 06/30/14
 Lab ID: 2295-14-0019469

Date Collected: 06/19/14 09:15
 Collected By: Client

Sample Desc: BZ-7 Deep

Date Received: 06/19/14 14:20

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/L	.01	1	SM 4500P-E	06/20	09:30	ALD
Phosphorus as P, Dissolved	<.05	mg/L	.05	1	SM 4500P-E	06/20	11:50	ALD
Phosphorus as P, Total	<.01	mg/L	.01	1	SM 4500P-E	06/20	10:44	ALD
NITROGENS								
Nitrogen, Ammonia	<.05	mg/L	.05	1	D6919-03	06/20	01:53	JCL
Nitrogen, Nitrate	0.72	mg/L	.05	1	EPA 353.2	06/19	19:14	JCL
Nitrogen, Nitrite	<.05	mg/L	.05	1	EPA 353.2	06/19	17:31	JCL
Nitrogen, Total Kjeldahl	<.25	mg/L	.25	1	EPA 351.2	06/23	16:48	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/L	2	1	SM 5210B	06/20	13:15	EMW
Total Organic Carbon	1.2	mg/L	1	1	SM5310 C	06/24	15:40	ALD
RESIDUES								
Solids, Total Dissolved	54	mg/L	5	1	SM 2540C	06/23	13:55	TMH
Solids, Total Suspended	<3	mg/L	3	1	SM 2540D	06/23	13:25	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	11	mg/L	1	1	SM 2320 B	06/23	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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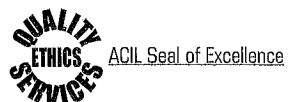
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Chain of Custody

No: 237776

Project Leader: CMB

Work Order: 004036

Work Order Description: Beltzville Reservoir

Customer: Gregory Wacik

Address: USACE, Philadelphia District
Environmental Resources Branch
100 Penn Square East
Philadelphia PA 19107
Phone: 215-656-6561
Ext: WACIK

Remarks:

Total Sampling Time (hours): _____ Bottle Prep by: _____

Laboratory Receipt Temp: 6 Deg C. If Temp Unacceptable, On Ice? Y N
Approved By: [Signature]

Samplers: _____

19457

Sample No: 1 Desc: BZ-1 Surface
FC, EC, TC, PHG
NO2-N, NO3-N, d-p04-p, o-p04, BOD₅
NH3-N, tkm, Alk, tds, tss, po4-p, toc,

Matrix: 0 Date: 6/19/14
Time: 1105
A - 1 X 250ml Micro P w/ Sterile/Na2S2O3;
B - 1 X L Bod p w/ Cool to 6 C;
C - 1 X 16oz NO2NO3 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;

19458

Sample No: 2 Desc: BZ-2 Surface
FC, EC, TC, PHG
NO2-N, NO3-N, d-p04-p, o-p04, BOD₅
NH3-N, tkm, Alk, tds, tss, po4-p, toc,

Matrix: 0 Date: 6/19/14
Time: 1050
A - 1 X 250ml Micro P w/ Sterile/Na2S2O3;
B - 1 X L Bod p w/ Cool to 6 C;
C - 1 X 16oz NO2NO3 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;

[Signature]

[Signature]

Relinquished by: _____ Received by: _____

Received for laboratory by: _____

Date: 6/19/14 Time: 12:00

Date: 6/19/14 Time: 1420

Sample entered by: [Signature]

Account: 2295
Customer: Gregory Wacik

Work Order: 004036
Work Order Description: Baltzville Reservoir

Project Leader: CMB
No: 237776

Address: USACE, Philadelphia District
Environmental Resources Branch
100 Penn Square East
Philadelphia PA 19107

Phone: 215-656-6561 Ext: WACIK

Samplers: WACIK

Remarks: WACIK

Total Sampling Time (hours): 6 Bottle Prep by: _____

Laboratory Receipt Temp: 6 Deg C. If Temp Unacceptable, On Ice? Y N

Approved By: [Signature]

Matrix: 0 Date: 6/19/14
Time: 0840

- A - 1 X 250ml Micro P w/ Sterile/Na2S2O3;
- B - 1 X L Bod p w/ Cool to 6 C;
- C - 1 X 16oz NO2NO3 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: 6/19/14
Time: 0840

- A - 1 X L Bod p w/ Cool to 6 C;
- B - 1 X 16oz NO2NO3 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;

Relinquished by: [Signature] Received by: [Signature]

Date: 6/19/14 Time: 12:00

Date: 6-18-14 Time: 1420

Sample entered by: [Signature]

Account: 2295

Work Order: 004036

Project Leader: CMB

No: 237776

Customer: Gregory Wacik

Work Order Description: Baltzville Reservoir

Chain of Custody

Address: USACE, Philadelphia District
Environmental Resources Branch
100 Penn Square East
Philadelphia PA 19107

Phone: 215-656-6561

Ext: WACIK

Remarks:

Total Sampling Time (hours): _____

Bottle Prep by: _____

Laboratory Receipt Temp: _____ Deg. C. If Temp Unacceptable, On Ice? Y N

Approved By: [Signature]

19461

Sample No: 5 Desc: BZ-3 Deep
NO2-N, NO3-N, d-po4-p, o-po4, BOD HC
NH3-N, tkn, Alk, tds, tss, po4-p, toc, HC

Matrix: 0 Date: 6/19/14
Time: 0840
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;

19462

Sample No: 6 Desc: BZ-4 Surface
FC, EC, TC, HC
NO2-N, NO3-N, d-po4-p, o-po4, BOD HC
NH3-N, tkn, Alk, tds, tss, po4-p, toc, HC

Matrix: 0 Date: 6/19/14
Time: 1040
A - 1 X 250mlMicro P w/ Sterile/Na2S2O3;
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;

Relinquished by: [Signature]
Date: 6/19/14 Time: 1200

Received by: [Signature]
Date: 6-19-14 Time: 1420

Sample entered by: DSM

Chain of Custody

Account: 2295

Work Order: 004036

Project Leader: CMB

No: 237776

Customer: Gregory Wacik

Work Order Description: Beltzville Reservoir

Remarks:

Address: USACE, Philadelphia District
Environmental Resources Branch
100 Penn Square East
Philadelphia PA 19107

Phone: 215-656-6561 Ext:

Total Sampling Time (hours): _____ Bottle Prep by: _____

Laboratory Receipt Temp: 6 Deg/C. If Temp Unacceptable, On Ice? Y N

Approved By: WACIK

Samplers: WACIK

19465

Sample No: 9 Desc: BZ-6 Mid-Depth
NO2-N, NO3-N, d-po4-p, o-po4, BOD
NH3-N, tkn, Alk, tds, tss, po4-p, toc,

Matrix: 0 Date: 6/19/14
Time: 0750
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;

19466

Sample No: 10 Desc: BZ-6 Deep
NO2-N, NO3-N, d-po4-p, o-po4, BOD
NH3-N, tkn, Alk, tds, tss, po4-p, toc,

Matrix: 0 Date: 6/19/14
Time: 0750
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;

19467

Sample No: 11 Desc: BZ-7 Surface
FC, EC, TC, TKN
NO2-N, NO3-N, d-po4-p, o-po4, BOD
NH3-N, tkn, Alk, tds, tss, po4-p, toc,

Matrix: 0 Date: 6/19/14
Time: 0915
A - 1 X 250mlMicro P w/ Sterile/Na2S2O5;
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;

Relinquished by: [Signature]
Date: 6/19/14 Time: 1200

Received by: [Signature]
Date: 6/19/14 Time: _____

Received for Laboratory by: [Signature]
Date: 6/19/14 Time: 0920

Sample entered by: JSR



CERTIFICATE OF ANALYSIS

M.J. Reider Associates, Inc.



Attention: Gregory Wacik
 Reported To: USACE, Philadelphia District
 Environmental Resources Branch
 100 Penn Square East
 Philadelphia PA 19107

Date of Report: 07/31/14
 Lab ID: 2295-14-0023428
 Date Collected: 07/24/14 11:30
 Collected By: Client

Sample Desc: BZ-1 Surface

Date Received: 07/24/14 13:30

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Escherichia coli	2	mpn/100mL	1	1	SM 9223B	07/25	09:35	DAD
Fecal Coliform	10	/100mL	2	1	SM 9222D	07/24	14:35	PLW
Total Coliform	550	mpn/100mL	1	1	SM 9223B	07/25	09:35	DAD
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/L	.01	1	SM 4500P-E	07/25	10:10	HRG
Phosphorus as P, Dissolved	<.05	mg/L	.05	1	SM 4500P-E	07/25	14:10	HRG
Phosphorus as P, Total	<.01	mg/L	.01	1	SM 4500P-E	07/25	14:40	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/L	.05	1	D6919-03	07/24	19:29	JCL
Nitrogen, Nitrate	0.81	mg/L	.05	1	EPA 353.2	07/24	17:28	JCL
Nitrogen, Nitrite	<.05	mg/L	.05	1	EPA 353.2	07/24	15:26	JCL
Nitrogen, Total Kjeldahl	<.25	mg/L	.25	1	EPA 351.2	07/29	15:10	ALD
OTHER								
Biochemical Oxygen Demand	<2	mg/L	2	1	SM 5210B	07/25	13:35	EMW
Total Organic Carbon	1.6	mg/L	1	1	SM5310 C	07/25	01:51	ALD
RESIDUES								
Solids, Total Dissolved	87	mg/L	5	1	SM 2540C	07/29	13:40	TMH
Solids, Total Suspended	<3	mg/L	3	1	SM 2540D	07/29	13:40	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	10	mg/L	1	1	SM 2320 B	07/28	09:45	HRG

Distribution of Reports:

Reviewed and Approved by:

Christina Kistler
 Account Executive

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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: 07/31/14
Lab ID: 2295-14-0023428

Date Collected: 07/24/14 11:30
Collected By: Client

Sample Desc: BZ-1 Surface

Date Received: 07/24/14 13:30

PWSID: 3130843

Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
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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.
- 02 The total coliform sample was placed in the incubator on 07/24/14 at 14:35.

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Christina Kistler
Account Executive

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 Environmental Resources Branch
 100 Penn Square East
 Philadelphia PA 19107

Date of Report: 07/31/14
 Lab ID: 2295-14-0023429
 Date Collected: 07/24/14 11:20
 Collected By: Client
 Date Received: 07/24/14 13:30

Sample Desc: BZ-2 Surface

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Escherichia coli	88	mpn/100mL	1	1	SM 9223B	07/25	09:35	DAD
Fecal Coliform	90	/100mL	2	1	SM 9222D	07/24	14:35	PLW
Total Coliform	2000	mpn/100mL	1	1	SM 9223B	07/25	09:35	DAD
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/L	.01	1	SM 4500P-E	07/25	10:10	HRG
Phosphorus as P, Dissolved	<.05	mg/L	.05	1	SM 4500P-E	07/25	14:10	HRG
Phosphorus as P, Total	<.01	mg/L	.01	1	SM 4500P-E	07/25	14:40	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/L	.05	1	D6919-03	07/24	19:44	JCL
Nitrogen, Nitrate	0.24	mg/L	.05	1	EPA 353.2	07/24	17:31	JCL
Nitrogen, Nitrite	<.05	mg/L	.05	1	EPA 353.2	07/24	15:27	JCL
Nitrogen, Total Kjeldahl	<.25	mg/L	.25	1	EPA 351.2	07/29	15:11	ALD
OTHER								
Biochemical Oxygen Demand	<2	mg/L	2	1	SM 5210B	07/25	13:35	EMW
Total Organic Carbon	<1	mg/L	1	1	SM5310 C	07/25	02:05	ALD
RESIDUES								
Solids, Total Dissolved	56	mg/L	5	1	SM 2540C	07/29	13:40	TMH
Solids, Total Suspended	3	mg/L	3	1	SM 2540D	07/29	13:40	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	8	mg/L	1	1	SM 2320 B	07/28	09:45	HRG

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Environmental Resources Branch
100 Penn Square East
Philadelphia PA 19107

Date of Report: 07/31/14
Lab ID: 2295-14-0023429
Date Collected: 07/24/14 11:20
Collected By: Client
Date Received: 07/24/14 13:30

Sample Desc: BZ-2 Surface

PWSID: 3130843

Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
--------	------	-----------	---------------	-----------	-----------	-----------	---------

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.
- 02 The total coliform sample was placed in the incubator on 07/24/14 at 14:35.

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Christina M. Kistler

Christina Kistler
Account Executive

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Date of Report: 07/31/14
 Lab ID: 2295-14-0023430
 Date Collected: 07/24/14 09:05
 Collected By: Client

Sample Desc: BZ-3 Surface

Date Received: 07/24/14 13:30

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Escherichia coli	<1	mpn/100mL	1	1	SM 9223B	07/25	09:35	DAD
Fecal Coliform	<2	/100mL	2	1	SM 9222D	07/24	14:35	PLW
Total Coliform	55	mpn/100mL	1	1	SM 9223B	07/25	09:35	DAD
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/L	.01	1	SM 4500P-E	07/25	10:10	HRG
Phosphorus as P, Dissolved	<.05	mg/L	.05	1	SM 4500P-E	07/25	14:13	HRG
Phosphorus as P, Total	0.01	mg/L	.01	1	SM 4500P-E	07/25	14:40	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/L	.05	1	D6919-03	07/24	19:59	JCL
Nitrogen, Nitrate	0.37	mg/L	.05	1	EPA 353.2	07/24	17:32	JCL
Nitrogen, Nitrite	<.05	mg/L	.05	1	EPA 353.2	07/24	15:28	JCL
Nitrogen, Total Kjeldahl	0.33	mg/L	.25	1	EPA 351.2	07/29	15:12	ALD
OTHER								
Biochemical Oxygen Demand	<2	mg/L	2	1	SM 5210B	07/25	13:35	EMW
Total Organic Carbon	1.5	mg/L	1	1	SM5310 C	07/25	02:50	ALD
RESIDUES								
Solids, Total Dissolved	68	mg/L	5	1	SM 2540C	07/29	13:40	TMH
Solids, Total Suspended	<3	mg/L	3	1	SM 2540D	07/29	13:40	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	10	mg/L	1	1	SM 2320 B	07/28	09:45	HRG

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Date of Report: 07/31/14
 Lab ID: 2295-14-0023430

Date Collected: 07/24/14 09:05
 Collected By: Client

Sample Desc: BZ-3 Surface

Date Received: 07/24/14 13:30

PWSID: 3130843

Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
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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.

- 02 The total coliform sample was placed in the incubator on 07/24/14 at 14:35.

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 Environmental Resources Branch
 100 Penn Square East
 Philadelphia PA 19107

Date of Report: 07/31/14
 Lab ID: 2295-14-0023431
 Date Collected: 07/24/14 09:15
 Collected By: Client
 Date Received: 07/24/14 13:30

Sample Desc: BZ-3 Mid-Depth

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	0.04	mg/L	.01	1	SM 4500P-E	07/25	10:10	HRG
Phosphorus as P, Dissolved	<.05	mg/L	.05	1	SM 4500P-E	07/25	14:13	HRG
Phosphorus as P, Total	0.04	mg/L	.01	1	SM 4500P-E	07/25	14:44	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/L	.05	1	D6919-03	07/24	20:14	JCL
Nitrogen, Nitrate	0.82	mg/L	.05	1	EPA 353.2	07/24	17:33	JCL
Nitrogen, Nitrite	<.05	mg/L	.05	1	EPA 353.2	07/24	15:31	JCL
Nitrogen, Total Kjeldahl	<.25	mg/L	.25	1	EPA 351.2	07/29	15:15	ALD
OTHER								
Biochemical Oxygen Demand	<2	mg/L	2	1	SM 5210B	07/25	13:35	EMW
Total Organic Carbon	1.2	mg/L	1	1	SM5310 C	07/25	03:05	ALD
RESIDUES								
Solids, Total Dissolved	108	mg/L	5	1	SM 2540C	07/29	13:40	TMH
Solids, Total Suspended	<3	mg/L	3	1	SM 2540D	07/29	13:40	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	11	mg/L	1	1	SM 2320 B	07/28	10:00	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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Date of Report: 07/31/14
 Lab ID: 2295-14-0023432
 Date Collected: 07/24/14 09:05
 Collected By: Client
 Date Received: 07/24/14 13:30

Sample Desc: BZ-3 Deep

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/L	.01	1	SM 4500P-E	07/25	10:10	HRG
Phosphorus as P, Dissolved	<.05	mg/L	.05	1	SM 4500P-E	07/25	14:13	HRG
Phosphorus as P, Total	1.32	mg/L	.01	1	SM 4500P-E	07/25	14:44	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/L	.05	1	D6919-03	07/24	20:29	JCL
Nitrogen, Nitrate	0.72	mg/L	.05	1	EPA 353.2	07/24	17:36	JCL
Nitrogen, Nitrite	<.05	mg/L	.05	1	EPA 353.2	07/24	15:32	JCL
Nitrogen, Total Kjeldahl	1.93	mg/L	.25	1	EPA 351.2	07/29	15:16	ALD
OTHER								
Biochemical Oxygen Demand	<2	mg/L	2	1	SM 5210B	07/25	13:35	EMW
Total Organic Carbon	1.9	mg/L	1	1	SM5310 C	07/25	03:20	ALD
RESIDUES								
Solids, Total Dissolved	87	mg/L	5	1	SM 2540C	07/29	13:40	TMH
Solids, Total Suspended	95	mg/L	3	1	SM 2540D	07/29	13:40	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	10	mg/L	1	1	SM 2320 B	07/28	10:00	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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Christina Kistler
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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: 07/31/14
 Lab ID: 2295-14-0023433

Date Collected: 07/24/14 11:10
 Collected By: Client

Sample Desc: BZ-4 Surface

Date Received: 07/24/14 13:30

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Escherichia coli	18	mpn/100ml	1	1	SM 9223B	07/25	09:35	DAD
Fecal Coliform	30	/100ml	2	1	SM 9222D	07/24	14:35	PLW
Total Coliform	2000	mpn/100ml	1	1	SM 9223B	07/25	09:35	DAD
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	0.07	mg/L	.01	1	SM 4500P-E	07/25	10:10	HRG
Phosphorus as P, Dissolved	<.05	mg/L	.05	1	SM 4500P-E	07/25	14:13	HRG
Phosphorus as P, Total	0.08	mg/L	.01	1	SM 4500P-E	07/25	14:44	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/L	.05	1	D6919-03	07/24	20:43	JCL
Nitrogen, Nitrate	0.45	mg/L	.05	1	EPA 353.2	07/24	17:37	JCL
Nitrogen, Nitrite	<.05	mg/L	.05	1	EPA 353.2	07/24	15:33	JCL
Nitrogen, Total Kjeldahl	<.25	mg/L	.25	1	EPA 351.2	07/29	15:17	ALD
OTHER								
Biochemical Oxygen Demand	<2	mg/L	2	1	SM 5210B	07/25	13:35	EMW
Total Organic Carbon	1.1	mg/L	1	1	SM5310 C	07/25	03:35	ALD
RESIDUES								
Solids, Total Dissolved	55	mg/L	5	1	SM 2540C	07/29	13:40	TMH
Solids, Total Suspended	<3	mg/L	3	1	SM 2540D	07/29	13:40	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	6	mg/L	1	1	SM 2320 B	07/28	10:00	HRG

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Reported To: USACE, Philadelphia District
Environmental Resources Branch
100 Penn Square East
Philadelphia PA 19107

Date of Report: 07/31/14
Lab ID: 2295-14-0023433
Date Collected: 07/24/14 11:10
Collected By: Client
Date Received: 07/24/14 13:30

Sample Desc: BZ-4 Surface

PWSID: 3130843

Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
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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.
- 02 The total coliform sample was placed in the incubator on 07/24/14 at 14:35.

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Christina Kistler
Account Executive

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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: 07/31/14
 Lab ID: 2295-14-0023434

Date Collected: 07/24/14 10:55
 Collected By: Client

Sample Desc: BZ-5 Surface

Date Received: 07/24/14 13:30

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Escherichia coli	120	mpn/100ml	1	1	SM 9223B	07/25	09:35	DAD
Fecal Coliform	270	/100ml	2	1	SM 9222D	07/24	14:35	PLW
Total Coliform	2400	mpn/100ml	1	1	SM 9223B	07/25	09:35	DAD
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/L	.01	1	SM 4500P-E	07/25	10:10	HRG
Phosphorus as P, Dissolved	<.05	mg/L	.05	1	SM 4500P-E	07/25	14:13	HRG
Phosphorus as P, Total	0.05	mg/L	.01	1	SM 4500P-E	07/25	14:44	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/L	.05	1	D6919-03	07/24	20:58	JCL
Nitrogen, Nitrate	1.28	mg/L	.05	1	EPA 353.2	07/24	17:38	JCL
Nitrogen, Nitrite	<.05	mg/L	.05	1	EPA 353.2	07/24	15:34	JCL
Nitrogen, Total Kjeldahl	0.28	mg/L	.25	1	EPA 351.2	07/29	15:18	ALD
OTHER								
Biochemical Oxygen Demand	<2	mg/L	2	1	SM 5210B	07/25	13:35	EMW
Total Organic Carbon	1.7	mg/L	1	1	SM5310 C	07/28	16:43	ALD
RESIDUES								
Solids, Total Dissolved	77	mg/L	5	1	SM 2540C	07/29	13:40	TMH
Solids, Total Suspended	<3	mg/L	3	1	SM 2540D	07/29	13:40	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	16	mg/L	1	1	SM 2320 B	07/28	10:00	HRG

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Reviewed and Approved by:

Christina Kistler
 Account Executive

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CERTIFICATE OF ANALYSIS

M.J. Reider Associates, Inc.



Attention: Gregory Wacik
 Reported To: USACE, Philadelphia District
 Environmental Resources Branch
 100 Penn Square East
 Philadelphia PA 19107

Date of Report: 07/31/14
 Lab ID: 2295-14-0023434

Date Collected: 07/24/14 10:55
 Collected By: Client

Sample Desc: BZ-5 Surface

Date Received: 07/24/14 13:30

PWSID: 3130843

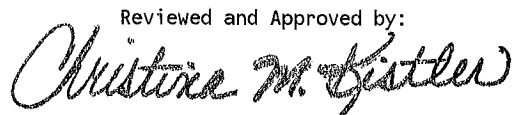
Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
-----	-----	-----	-----	-----	-----	-----	-----

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.

- 02 The total coliform sample was placed in the incubator on 07/24/14 at 14:35.

Distribution of Reports:

Reviewed and Approved by:

 Christina Kistler
 Account Executive

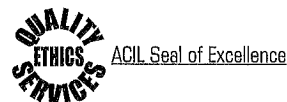
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CERTIFICATE OF ANALYSIS

M.J. Reider Associates, Inc.



Attention: Gregory Wacik
 Reported To: USACE, Philadelphia District
 Environmental Resources Branch
 100 Penn Square East
 Philadelphia PA 19107

Date of Report: 07/31/14
 Lab ID: 2295-14-0023435

Date Collected: 07/24/14 08:15
 Collected By: Client

Sample Desc: BZ-6 Surface

Date Received: 07/24/14 13:30

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTERIOLOGY								
MICROBIOLOGY								
Escherichia coli	<1	mpn/100ml	1	1	SM 9223B	07/25	09:35	DAD
Fecal Coliform	3	/100ml	2	1	SM 9222D	07/24	14:53	PLW
Total Coliform	310	mpn/100ml	1	1	SM 9223B	07/25	09:35	DAD
CHEMISTRY								
COLORIMETRIC								
Phosphate as P, Ortho	<.01	mg/L	.01	1	SM 4500P-E	07/25	10:10	HRG
Phosphorus as P, Dissolved	<.05	mg/L	.05	1	SM 4500P-E	07/25	14:15	HRG
Phosphorus as P, Total	<.01	mg/L	.01	1	SM 4500P-E	07/25	14:44	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/L	.05	1	D6919-03	07/24	21:13	JCL
Nitrogen, Nitrate	0.37	mg/L	.05	1	EPA 353.2	07/24	17:39	JCL
Nitrogen, Nitrite	<.05	mg/L	.05	1	EPA 353.2	07/24	15:37	JCL
Nitrogen, Total Kjeldahl	0.37	mg/L	.25	1	EPA 351.2	07/29	15:19	ALD
OTHER								
Biochemical Oxygen Demand	<2	mg/L	2	1	SM 5210B	07/25	13:35	EMW
Total Organic Carbon	1.6	mg/L	1	1	SM5310 C	07/28	17:13	ALD
RESIDUES								
Solids, Total Dissolved	55	mg/L	5	1	SM 2540C	07/30	12:50	TMH
Solids, Total Suspended	<3	mg/L	3	1	SM 2540D	07/30	12:50	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	11	mg/L	1	1	SM 2320 B	07/28	10:00	HRG

Distribution of Reports:

Reviewed and Approved by:

Christina Kistler
 Account Executive

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M.J. Reider Associates, Inc.



Attention: Gregory Wacik
 Reported To: USACE, Philadelphia District
 Environmental Resources Branch
 100 Penn Square East
 Philadelphia PA 19107

Date of Report: 07/31/14
 Lab ID: 2295-14-0023435

Date Collected: 07/24/14 08:15
 Collected By: Client

Sample Desc: BZ-6 Surface

Date Received: 07/24/14 13:30

PWSID: 3130843

Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
-----	-----	-----	-----	-----	-----	-----	-----

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.

- 02 The total coliform sample was placed in the incubator on 07/24/14 at 14:35.

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Reviewed and Approved by:

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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: 07/31/14
 Lab ID: 2295-14-0023436
 Date Collected: 07/24/14 08:15
 Collected By: Client
 Date Received: 07/24/14 13:30

Sample Desc: BZ-6 Mid-Depth

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/L	.01	1	SM 4500P-E	07/25	10:13	HRG
Phosphorus as P, Dissolved	<.05	mg/L	.05	1	SM 4500P-E	07/25	14:15	HRG
Phosphorus as P, Total	0.02	mg/L	.01	1	SM 4500P-E	07/25	14:44	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/L	.05	1	D6919-03	07/24	21:27	JCL
Nitrogen, Nitrate	0.81	mg/L	.05	1	EPA 353.2	07/24	17:40	JCL
Nitrogen, Nitrite	<.05	mg/L	.05	1	EPA 353.2	07/24	15:38	JCL
Nitrogen, Total Kjeldahl	<.25	mg/L	.25	1	EPA 351.2	07/29	15:22	ALD
OTHER								
Biochemical Oxygen Demand	<2	mg/L	2	1	SM 5210B	07/25	13:35	EMW
Total Organic Carbon	1.3	mg/L	1	1	SM5310 C	07/28	17:57	ALD
RESIDUES								
Solids, Total Dissolved	68	mg/L	5	1	SM 2540C	07/30	12:50	TMH
Solids, Total Suspended	<3	mg/L	3	1	SM 2540D	07/30	12:50	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	10	mg/L	1	1	SM 2320 B	07/28	10:15	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.

Distribution of Reports:

Reviewed and Approved by:

Christina Kistler
 Account Executive

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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: 07/31/14
 Lab ID: 2295-14-0023437

Date Collected: 07/24/14 08:15
 Collected By: Client

Sample Desc: BZ-6 Deep

Date Received: 07/24/14 13:30

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/L	.01	1	SM 4500P-E	07/25	10:13	HRG
Phosphorus as P, Dissolved	<.05	mg/L	.05	1	SM 4500P-E	07/25	14:15	HRG
Phosphorus as P, Total	0.02	mg/L	.01	1	SM 4500P-E	07/25	14:44	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/L	.05	1	D6919-03	07/24	21:42	JCL
Nitrogen, Nitrate	0.74	mg/L	.05	1	EPA 353.2	07/24	17:43	JCL
Nitrogen, Nitrite	<.05	mg/L	.05	1	EPA 353.2	07/24	15:39	JCL
Nitrogen, Total Kjeldahl	<.25	mg/L	.25	1	EPA 351.2	07/29	15:23	ALD
OTHER								
Biochemical Oxygen Demand	<2	mg/L	2	1	SM 5210B	07/25	13:35	EMW
Total Organic Carbon	1.1	mg/L	1	1	SM5310 C	07/28	18:12	ALD
RESIDUES								
Solids, Total Dissolved	38	mg/L	5	1	SM 2540C	07/30	12:50	TMH
Solids, Total Suspended	<3	mg/L	3	1	SM 2540D	07/30	12:50	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	10	mg/L	1	1	SM 2320 B	07/28	10:15	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
 Environmental Resources Branch
 100 Penn Square East
 Philadelphia PA 19107

Date of Report: 07/31/14
 Lab ID: 2295-14-0023438

Date Collected: 07/24/14 09:45
 Collected By: Client

Sample Desc: BZ-7 Surface

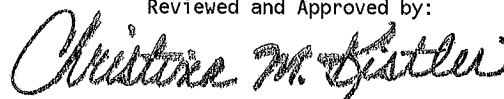
Date Received: 07/24/14 13:30

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Escherichia coli	2	mpn/100ml	1	1	SM 9223B	07/25	09:30	DAD
Fecal Coliform	3	/100ml	2	1	SM 9222D	07/24	14:53	PLW
Total Coliform	460	mpn/100ml	1	1	SM 9223B	07/25	09:35	DAD
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	0.02	mg/l	.01	1	SM 4500P-E	07/25	10:13	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	07/25	14:15	HRG
Phosphorus as P, Total	0.02	mg/l	.01	1	SM 4500P-E	07/25	14:48	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	07/24	21:56	JCL
Nitrogen, Nitrate	0.33	mg/l	.05	1	EPA 353.2	07/24	17:44	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	07/24	15:40	JCL
Nitrogen, Total Kjeldahl	<.25	mg/l	.25	1	EPA 351.2	07/29	15:24	ALD
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	07/25	13:35	EMW
Total Organic Carbon	1.6	mg/l	1	1	SM5310 C	07/28	19:10	ALD
RESIDUES								
Solids, Total Dissolved	27	mg/l	5	1	SM 2540C	07/30	12:50	TMH
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	07/30	12:50	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	10	mg/l	1	1	SM 2320 B	07/28	10:15	HRG

Distribution of Reports:

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Christina Kistler
 Account Executive

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CERTIFICATE OF ANALYSIS
M.J. Reider Associates, Inc.



Attention: Gregory Wacik
Reported To: USACE, Philadelphia District
Environmental Resources Branch
100 Penn Square East
Philadelphia PA 19107

Date of Report: 07/31/14
Lab ID: 2295-14-0023438

Date Collected: 07/24/14 09:45
Collected By: Client

Sample Desc: BZ-7 Surface

Date Received: 07/24/14 13:30

PWSID: 3130843

Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
-----	-----	-----	-----	-----	-----	-----	-----

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.
- 02 The total coliform sample was placed in the incubator on 07/24/14 at 14:35.

Distribution of Reports:

Reviewed and Approved by:

Christina Kistler
Account Executive

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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: 07/31/14
 Lab ID: 2295-14-0023439

Date Collected: 07/24/14 09:45
 Collected By: Client

Sample Desc: BZ-7 Mid-Depth

Date Received: 07/24/14 13:30

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/L	.01	1	SM 4500P-E	07/25	10:13	HRG
Phosphorus as P, Dissolved	<.05	mg/L	.05	1	SM 4500P-E	07/25	14:15	HRG
Phosphorus as P, Total	<.01	mg/L	.01	1	SM 4500P-E	07/25	14:48	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/L	.05	1	D6919-03	07/24	22:56	JCL
Nitrogen, Nitrate	0.91	mg/L	.05	1	EPA 353.2	07/24	17:45	JCL
Nitrogen, Nitrite	<.05	mg/L	.05	1	EPA 353.2	07/24	15:41	JCL
Nitrogen, Total Kjeldahl	0.30	mg/L	.25	1	EPA 351.2	07/29	15:25	ALD
OTHER								
Biochemical Oxygen Demand	<2	mg/L	2	1	SM 5210B	07/25	13:35	EMW
Total Organic Carbon	1.4	mg/L	1	1	SM5310 C	07/28	19:25	ALD
RESIDUES								
Solids, Total Dissolved	61	mg/L	5	1	SM 2540C	07/30	12:50	TMH
Solids, Total Suspended	3	mg/L	3	1	SM 2540D	07/30	12:50	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	12	mg/L	1	1	SM 2320 B	07/28	10:15	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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Christina Kistler
 Account Executive

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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: 07/31/14
 Lab ID: 2295-14-0023440
 Date Collected: 07/24/14 09:45
 Collected By: Client
 Date Received: 07/24/14 13:30

Sample Desc: BZ-7 Deep

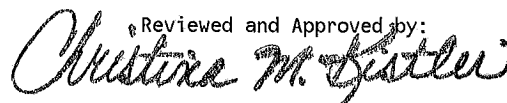
PWSID: 3130843

	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	07/25	10:13	HRG
Phosphorus as P, Dissolved	<.05	mg/L	.05	1	SM 4500P-E	07/25	14:15	HRG
Phosphorus as P, Total	0.09	mg/L	.01	1	SM 4500P-E	07/25	14:48	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/L	.05	1	D6919-03	07/24	23:11	JCL
Nitrogen, Nitrate	0.75	mg/L	.05	1	EPA 353.2	07/24	17:48	JCL
Nitrogen, Nitrite	<.05	mg/L	.05	1	EPA 353.2	07/24	15:44	JCL
Nitrogen, Total Kjeldahl	<.25	mg/L	.25	1	EPA 351.2	07/29	15:27	ALD
OTHER								
Biochemical Oxygen Demand	<2	mg/L	2	1	SM 5210B	07/25	13:35	EMW
Total Organic Carbon	1.4	mg/L	1	1	SM5310 C	07/28	19:39	ALD
RESIDUES								
Solids, Total Dissolved	11	mg/L	5	1	SM 2540C	07/30	12:50	TMH
Solids, Total Suspended	8	mg/L	3	1	SM 2540D	07/30	12:50	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	12	mg/L	1	1	SM 2320 B	07/28	10:15	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.

Distribution of Reports:

Reviewed and Approved by:


Christina Kistler
 Account Executive

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06/05/14 1:30:25 PM

Account: 2295
Customer: Gregory Wacik

Work Order: 004036
Project Leader: CMB

Work Order Description: Beltzville Reservoir

No: 239133

Address: USACE, Philadelphia District
Environmental Resources Branch
100 Penn Square East
Philadelphia PA 19107

Phone: 215-656-6561 Ext: WACIK

Chain of Custody
Remarks:
Total Sampling Time (hours): _____ Bottle Prep by: _____

Laboratory Receipt Temp: 5 Deg C. If Temp Unacceptable, On Ice? Y N
Approved By: PSW

Sample No: 23428 1 Desc: BZ-1 Surface
FC, EC, TC, RD
NO2-N, NO3-N, d-po4-p, o-po4, BOD₅
NH3-N, tkn, Alk, tds, tss, po4-p, toc,
Matrix: O Date: 7/24/14
Time: 1130
A - 1 X 250ml Micro P w/ Sterile/Na2S2O3;
B - 1 X 1 Bod p w/ Cool to 6 C;
C - 1 X 16oz NO2NO3 p w/ Cool to 6 C;
D - 1 X 500ml NH3 p w/ H2SO4 (pH<2);
E - 1 X 2xamber vov g w/ H3PO4/zero headspace;
F - 1 X 8oz Alk p w/
Cool to 6 C/Zero Headspace;

Sample No: 23429 2 Desc: BZ-2 Surface
FC, EC, TC, X
NO2-N, NO3-N, d-po4-p, o-po4, BOD₅
NH3-N, tkn, Alk, tds, tss, po4-p, toc,
Matrix: O Date: 7/24/14
Time: 1120
A - 1 X 250ml Micro P w/ Sterile/Na2S2O3;
B - 1 X 1 Bod p w/ Cool to 6 C;
C - 1 X 16oz NO2NO3 p w/ Cool to 6 C;
D - 1 X 500ml NH3 p w/ H2SO4 (pH<2);
E - 1 X 2xamber vov g w/ H3PO4/zero headspace;
F - 1 X 8oz Alk p w/
Cool to 6 C/Zero Headspace;

Relinquished by: [Signature] Received by: [Signature]
Date: 7/24/14 Time: 1145
Received for laboratory by: [Signature]
Date: 7-24-14 Time: 1330

Sample entered by: [Signature]

M. J. REIDER ASSOCIATES, INC.

jbs
06/05/14 1:30:26 PM

Chain of Custody

Account: 2295 Work Order: 004036 Project Leader: CMB No: 239133

Customer: Gregory Wacik Work Order Description: Beltzville Reservoir

Address: USACE, Philadelphia District
 Environmental Resources Branch
 100 Penn Square East
 Philadelphia PA 19107

Phone: 215-656-6561 Ext: _____

Samplers: WACIK

Remarks: _____

Total Sampling Time (hours): _____ Bottle Prep by: _____

Laboratory Receipt Temp: 5 Deg C. If Temp Unacceptable, On Ice? Y N

Approved By: BSW

=====

Sample No: 23430 3 Desc: BZ-3 Surface

FC, EC, TC, NO

NO2-N, NO3-N, d-po4-P, o-po4, BOD A

NH3-N, tkn, Alk, tds, tss, po4-P, toc, B

Matrix: 0 Date: 7/24/14
 Time: 0905

A - 1 X 250ml Micro P w/ Sterile/Na2S2O3;
 B - 1 X L Bod p w/ Cool to 6 C;
 C - 1 X 16oz NO2NO3 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;

Sample No: 23431 4 Desc: BZ-3 Mid-Depth

NO2-N, NO3-N, d-po4-P, o-po4, BOD M

NH3-N, tkn, Alk, tds, tss, po4-P, toc, SW

Matrix: 0 Date: 7/24/14
 Time: 0915

A - 1 X L Bod p w/ Cool to 6 C;
 B - 1 X 16oz NO2NO3 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;

Relinquished by: [Signature] Received by: [Signature]

Date: 7/24/14 Time: 1145

Received for laboratory by: [Signature]

Date: 7-24-14 Time: 1330

Sample entered by: [Signature]

M. J. REIDER ASSOCIATES, INC.

jbs
06/05/14 1:30:26 PM

Chain of Custody

No: 239133

Work Order: 004036 Project Leader: CMB
Work Order Description: Beltzville Reservoir

Account: 2295

Customer: Gregory Wacik

Address: USACE, Philadelphia District
Environmental Resources Branch
100 Penn Square East
Philadelphia PA 19107
Phone: 215-656-6561 Ext: WACIK

Remarks: _____
Total Sampling Time (hours): _____ Bottle Prep by: _____

Laboratory Receipt Temp: 5 Deg C. If Temp Unacceptable, On Ice? Y N
Approved By: ASW

Samplers: WACIK

Sample No: 5 Desc: BZ-3 Deep
NO2-N, NO3-N, d-po4-p, o-po4, BOD
NH3-N, tkm, Alk, tds, tss, po4-p, toc,

Matrix: 0 Date: 7/24/14
Time: 0805
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;

Sample No: 6 Desc: BZ-4 Surface
FC, EC, TC, RM
NO2-N, NO3-N, d-po4-p, o-po4, BOD RM
NH3-N, tkm, Alk, tds, tss, po4-p, toc,

Matrix: 0 Date: 7/24/14
Time: 1110
A - 1 X 250mlMicro P w/ Sterile/Na2S2O3;
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;

Relinquished by: [Signature] Received by: [Signature]

Received for laboratory by: [Signature]

Date: 7/24/14 Time: 1145

Date: 7-24-14 Time: 1330

Sample entered by: [Signature]

M. J. REIDER ASSOCIATES, INC.

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06/05/14 1:30:26 PM

Chain of Custody

Account: 2295 Work Order: 004036 Project Leader: CMB No: 239133
Customer: Gregory Wacik Work Order Description: Beltzville Reservoir

Address: USACE, Philadelphia District
Environmental Resources Branch
100 Penn Square East
Philadelphia PA 19107

Phone: 215-656-6561 Ext: WACIK

Sample No: 7 Desc: BZ-5 Surface

FC, EC, TC, BN
NO2-N, NO3-N, d-po4-P, o-po4, BOD, SN
NH3-N, tkm, Alk, tds, tss, po4-P, toc,

Sample No: 8 Desc: BZ-6 Surface
FC, EC, TC, BN
NO2-N, NO3-N, d-po4-P, o-po4, BOD, SN
NH3-N, tkm, Alk, tds, tss, po4-P, toc,

Matrix: 0 Date: 7/24/14
Time: 1055
A - 1 X 250ml Micro P w/ Sterile/Na2S2O3;
B - 1 X 1 Bod P w/ Cool to 6 C;
C - 1 X 16oz NO2NO3 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: 7/24/14
Time: 0813
A - 1 X 250ml Micro P w/ Sterile/Na2S2O3;
B - 1 X 1 Bod P w/ Cool to 6 C;
C - 1 X 16oz NO2NO3 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;

Total Sampling Time (hours): _____ Bottle Prep by: _____

Laboratory Receipt Temp: S Deg C. If Temp Unacceptable, On Ice? Y N
Approved By: BSW

Remarks: _____

Relinquished by: [Signature] Received by: [Signature]

Date: 7/24/14 Time: 1145

Date: 7/24/14 Time: 1330

Sample entered by: [Signature]

M. J. REIDER ASSOCIATES, INC.

jbs
06/05/14 1:30:26 PM

Chain of Custody

No: 239133

Project Leader: CMB
Beltzville Reservoir

Work Order: 004036
Work Order Description: Beltzville Reservoir

Account: 2295
Customer: Gregory Wacik

Address: USACE, Philadelphia District
Environmental Resources Branch
100 Penn Square East
Philadelphia PA 19107
Phone: 215-656-6561 Ext: WACIK

Remarks:

Total Sampling Time (hours): _____ Bottle Prep by: _____
Laboratory Receipt Temp: 5 Deg C. If Temp Unacceptable, On Ice? Y N
Approved By: BSW

23436

Sample No: 9 Desc: BZ-6 Mid-Depth
NO2-N, NO3-N, d-po4-p, o-po4, BOD SW
NH3-N, tkn, Alk, tds, tss, po4-p, toc,

Matrix: 0 Date: 7/24/14
Time: 0815
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;

23437

Sample No: 10 Desc: BZ-6 Deep
NO2-N, NO3-N, d-po4-p, o-po4, BOD SW
NH3-N, tkn, Alk, tds, tss, po4-p, toc,

Matrix: 0 Date: 7/24/14
Time: 0815
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;

23438

Sample No: 11 Desc: BZ-7 Surface
FC, EC, TC, BA
NO2-N, NO3-N, d-po4-p, o-po4, BOD SW
NH3-N, tkn, Alk, tds, tss, po4-p, toc,

Matrix: 0 Date: 7/24/14
Time: 0945
A - 1 X 250mlMicro P w/ Sterile/Na2E2O3;
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;

Relinquished by: [Signature]
Date: 7/24/14 Time: 1145

Received by: [Signature]
Date: 7-24-14 Time: 1330

Received for laboratory by: [Signature]

Sample entered by: [Signature]

M. J. REIDER ASSOCIATES, INC.

jbs
06/05/14 1:30:27 PM

Chain of Custody

No: 239133

Project Leader: CMB
Work Order Description: Beltzville Reservoir

Work Order: 004036
Work Order Description: Beltzville Reservoir

Account: 2295

Customer: Gregory Wacik

Address: USACE, Philadelphia District
Environmental Resources Branch
100 Penn Square East
Philadelphia PA 19107

Phone: 215-656-6561 Ext: WACIK

Samplers: _____

Remarks: _____

Total Sampling Time (hours): _____ Bottle Prep by: _____

Laboratory Receipt Temp: 5 Deg C. If Temp Unacceptable, On Ice? Y N
Approved By: ASW

23439

Sample No: 12 Desc: BZ-7 Mid-Depth
NO2-N, NO3-N, d-po4-P, o-po4, BOD
NH3-N, tkm, Alk, tds, tss, po4-P, toc,

Matrix: 0 Date: 7/24/14
Time: 0945
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;

23440

Sample No: 13 Desc: BZ-7 Deep
NO2-N, NO3-N, d-po4-P, o-po4, BOD
NH3-N, tkm, Alk, tds, tss, po4-P, toc,

Matrix: 0 Date: 7/24/14
Time: 0945
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;

Relinquished by: [Signature] Received by: [Signature]
Date: 7/24/14 Time: 1145

Received for laboratory by: [Signature]
Date: 7-24-14 Time: 1330

Sample entered by: [Signature]



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M.J. Reider Associates, Inc.



Attention: Gregory Wacik
 Reported To: USACE, Philadelphia District
 Environmental Resources Branch
 100 Penn Square East
 Philadelphia PA 19107

Date of Report: 08/21/14
 Lab ID: 2295-14-0030937

Date Collected: 08/13/14 11:25
 Collected By: Client

Sample Desc: BZ-1 Surface

Date Received: 08/13/14 14:30

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Escherichia coli	17	mpn/100mL	1	1	SM 9223B	08/14	10:45	DAD
Fecal Coliform	42	/100mL	2	1	SM 9222D	08/13	15:00	PLW
Total Coliform	2400	mpn/100mL	1	1	SM 9223B	08/14	10:45	DAD
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/L	.01	1	SM 4500P-E	08/14	09:15	HRG
Phosphorus as P, Dissolved	<.05	mg/L	.05	1	SM 4500P-E	08/14	15:00	HRG
Phosphorus as P, Total	<.01	mg/L	.01	1	SM 4500P-E	08/19	13:30	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/L	.05	1	D6919-03	08/13	20:59	JCL
Nitrogen, Nitrate	0.78	mg/L	.05	1	EPA 353.2	08/13	18:16	JCL
Nitrogen, Nitrite	<.05	mg/L	.05	1	EPA 353.2	08/13	16:16	JCL
Nitrogen, Total Kjeldahl	<.25	mg/L	.25	1	EPA 351.2	08/15	16:51	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/L	2	1	SM 5210B	08/14	14:25	EMW
Total Organic Carbon	1.3	mg/L	1	1	SM5310 C	08/18	12:11	ALD
RESIDUES								
Solids, Total Dissolved	128	mg/L	5	1	SM 2540C	08/17	09:20	TMH
Solids, Total Suspended	11	mg/L	3	1	SM 2540D	08/17	09:20	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	10	mg/L	1	1	SM 2320 B	08/18	13:45	HRG

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Reviewed and Approved by:

Christina Kistler
 Account Executive

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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: 08/21/14
 Lab ID: 2295-14-0030937

Date Collected: 08/13/14 11:25
 Collected By: Client

Sample Desc: BZ-1 Surface

Date Received: 08/13/14 14:30

PWSID: 3130843

Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
-----	-----	-----	-----	-----	-----	-----	-----

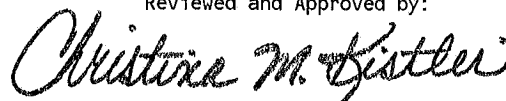
COMMENTS

- 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.

- 02 The total coliform sample was placed in the incubator on 08/13/14 at 14:55.

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Christina Kistler
 Account Executive

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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: 08/21/14
 Lab ID: 2295-14-0030938
 Date Collected: 08/13/14 11:15
 Collected By: Client
 Date Received: 08/13/14 14:30

Sample Desc: BZ-2 Surface

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTERIOLOGY								
MICROBIOLOGY								
Escherichia coli	140	mpn/100mL	1	1	SM 9223B	08/14	10:45	DAD
Fecal Coliform	200	/100mL	2	1	SM 9222D	08/13	15:00	PLW
Total Coliform	2400	mpn/100mL	1	1	SM 9223B	08/14	10:45	DAD
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/L	.01	1	SM 4500P-E	08/14	09:15	HRG
Phosphorus as P, Dissolved	<.05	mg/L	.05	1	SM 4500P-E	08/14	15:00	HRG
Phosphorus as P, Total	0.02	mg/L	.01	1	SM 4500P-E	08/19	13:30	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/L	.05	1	D6919-03	08/13	21:14	JCL
Nitrogen, Nitrate	0.26	mg/L	.05	1	EPA 353.2	08/13	18:19	JCL
Nitrogen, Nitrite	<.05	mg/L	.05	1	EPA 353.2	08/13	16:17	JCL
Nitrogen, Total Kjeldahl	<.25	mg/L	.25	1	EPA 351.2	08/15	15:53	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/L	2	1	SM 5210B	08/14	14:25	EMW
Total Organic Carbon	1.8	mg/L	1	1	SM5310 C	08/18	12:41	ALD
RESIDUES								
Solids, Total Dissolved	99	mg/L	5	1	SM 2540C	08/17	09:20	TMH
Solids, Total Suspended	6	mg/L	3	1	SM 2540D	08/17	09:20	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	8	mg/L	1	1	SM 2320 B	08/18	13:45	HRG

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Reviewed and Approved by:

Christina M. Kistler

Christina Kistler
 Account Executive

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 Reported To: USACE, Philadelphia District
 Environmental Resources Branch
 100 Penn Square East
 Philadelphia PA 19107

Date of Report: 08/21/14
 Lab ID: 2295-14-0030938
 Date Collected: 08/13/14 11:15
 Collected By: Client
 Date Received: 08/13/14 14:30

Sample Desc: BZ-2 Surface

PWSID: 3130843

Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
--------	------	-----------	---------------	-----------	-----------	-----------	---------

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.
- 02 The total coliform sample was placed in the incubator on 08/13/14 at 14:55.

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 Account Executive

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 Environmental Resources Branch
 100 Penn Square East
 Philadelphia PA 19107

Date of Report: 08/21/14
 Lab ID: 2295-14-0030939

Date Collected: 08/13/14 09:00
 Collected By: Client

Sample Desc: BZ-3 Surface

Date Received: 08/13/14 14:30

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Escherichia coli	2	mpn/100ml	1	1	SM 9223B	08/14	10:45	DAD
Fecal Coliform	2	/100ml	2	1	SM 9222D	08/13	15:30	PLW
Total Coliform	>2400	mpn/100ml	1	1	SM 9223B	08/14	10:45	DAD
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/L	.01	1	SM 4500P-E	08/14	09:15	HRG
Phosphorus as P, Dissolved	<.05	mg/L	.05	1	SM 4500P-E	08/14	15:00	HRG
Phosphorus as P, Total	<.01	mg/L	.01	1	SM 4500P-E	08/19	13:30	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/L	.05	1	D6919-03	08/13	21:29	JCL
Nitrogen, Nitrate	0.33	mg/L	.05	1	EPA 353.2	08/13	18:20	JCL
Nitrogen, Nitrite	<.05	mg/L	.05	1	EPA 353.2	08/13	16:18	JCL
Nitrogen, Total Kjeldahl	<.25	mg/L	.25	1	EPA 351.2	08/15	16:54	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/L	2	1	SM 5210B	08/14	14:25	EMW
Total Organic Carbon	1.4	mg/L	1	1	SM5310 C	08/18	13:27	ALD
RESIDUES								
Solids, Total Dissolved	99	mg/L	5	1	SM 2540C	08/17	09:20	TMH
Solids, Total Suspended	<3	mg/L	3	1	SM 2540D	08/17	09:20	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	10	mg/L	1	1	SM 2320 B	08/18	14:00	HRG

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Reviewed and Approved by:

Christina M. Kistler

Christina Kistler
 Account Executive

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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: 08/21/14
 Lab ID: 2295-14-0030939

Date Collected: 08/13/14 09:00
 Collected By: Client

Sample Desc: BZ-3 Surface

Date Received: 08/13/14 14:30

PWSID: 3130843

Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
-----	-----	-----	-----	-----	-----	-----	-----

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.

- 02 The total coliform sample was placed in the incubator on 08/13/14 at 14:55.

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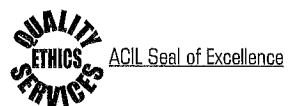
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M.J. Reider Associates, Inc.



Attention: Gregory Wacik
 Reported To: USACE, Philadelphia District
 Environmental Resources Branch
 100 Penn Square East
 Philadelphia PA 19107

Date of Report: 08/21/14
 Lab ID: 2295-14-0030940

Date Collected: 08/13/14 09:00
 Collected By: Client

Sample Desc: BZ-3 Mid-Depth

Date Received: 08/13/14 14:30

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	08/14	09:20	HRG
Phosphorus as P, Dissolved	<.05	mg/L	.05	1	SM 4500P-E	08/14	15:03	HRG
Phosphorus as P, Total	0.08	mg/L	.01	1	SM 4500P-E	08/19	13:30	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/L	.05	1	D6919-03	08/13	21:43	JCL
Nitrogen, Nitrate	0.78	mg/L	.05	1	EPA 353.2	08/13	18:21	JCL
Nitrogen, Nitrite	<.05	mg/L	.05	1	EPA 353.2	08/13	16:21	JCL
Nitrogen, Total Kjeldahl	<.25	mg/L	.25	1	EPA 351.2	08/15	16:55	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/L	2	1	SM 5210B	08/14	14:25	EMW
Total Organic Carbon	1.1	mg/L	1	1	SM5310 C	08/18	13:41	ALD
RESIDUES								
Solids, Total Dissolved	129	mg/L	5	1	SM 2540C	08/17	09:20	TMH
Solids, Total Suspended	<3	mg/L	3	1	SM 2540D	08/17	09:20	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	9	mg/L	1	1	SM 2320 B	08/18	14:00	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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Christina Kistler
 Account Executive

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CERTIFICATE OF ANALYSIS

M.J. Reider Associates, Inc.



Attention: Gregory Wacik
 Reported To: USACE, Philadelphia District
 Environmental Resources Branch
 100 Penn Square East
 Philadelphia PA 19107

Date of Report: 08/21/14
 Lab ID: 2295-14-0030941
 Date Collected: 08/13/14 09:00
 Collected By: Client
 Date Received: 08/13/14 14:30

Sample Desc: BZ-3 Deep

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/L	.01	1	SM 4500P-E	08/14	09:20	HRG
Phosphorus as P, Dissolved	<.05	mg/L	.05	1	SM 4500P-E	08/14	15:03	HRG
Phosphorus as P, Total	<.01	mg/L	.01	1	SM 4500P-E	08/19	13:35	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/L	.05	1	D6919-03	08/13	21:58	JCL
Nitrogen, Nitrate	0.68	mg/L	.05	1	EPA 353.2	08/13	18:23	JCL
Nitrogen, Nitrite	<.05	mg/L	.05	1	EPA 353.2	08/13	16:24	JCL
Nitrogen, Total Kjeldahl	<.25	mg/L	.25	1	EPA 351.2	08/15	16:56	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/L	2	1	SM 5210B	08/14	14:25	EMW
Total Organic Carbon	1.1	mg/L	1	1	SM5310 C	08/18	13:56	ALD
RESIDUES								
Solids, Total Dissolved	129	mg/L	5	1	SM 2540C	08/17	09:20	TMH
Solids, Total Suspended	4	mg/L	3	1	SM 2540D	08/17	09:20	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	11	mg/L	1	1	SM 2320 B	08/18	14:15	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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Reviewed and Approved by:

Christina Kistler
 Account Executive

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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: 08/21/14
 Lab ID: 2295-14-0030942

Date Collected: 08/13/14 11:05
 Collected By: Client

Sample Desc: BZ-4 Surface

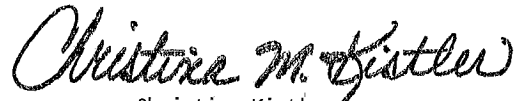
Date Received: 08/13/14 14:30

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Escherichia coli	180	mpn/100ml	1	1	SM 9223B	08/14	10:45	DAD
Fecal Coliform	170	/100ml	2	1	SM 9222D	08/13	15:30	PLW
Total Coliform	>2400	mpn/100ml	1	1	SM 9223B	08/14	10:45	DAD
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/L	.01	1	SM 4500P-E	08/14	09:20	HRG
Phosphorus as P, Dissolved	<.05	mg/L	.05	1	SM 4500P-E	08/14	15:03	HRG
Phosphorus as P, Total	<.01	mg/L	.01	1	SM 4500P-E	08/19	13:35	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/L	.05	1	D6919-03	08/13	22:12	JCL
Nitrogen, Nitrate	0.38	mg/L	.05	1	EPA 353.2	08/13	18:24	JCL
Nitrogen, Nitrite	<.05	mg/L	.05	1	EPA 353.2	08/13	16:25	JCL
Nitrogen, Total Kjeldahl	<.25	mg/L	.25	1	EPA 351.2	08/15	15:57	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/L	2	1	SM 5210B	08/14	14:25	EMW
Total Organic Carbon	<1	mg/L	1	1	SM5310 C	08/18	14:11	ALD
RESIDUES								
Solids, Total Dissolved	95	mg/L	5	1	SM 2540C	08/17	09:20	TMH
Solids, Total Suspended	<3	mg/L	3	1	SM 2540D	08/17	09:20	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	6	mg/L	1	1	SM 2320 B	08/18	14:15	HRG

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 Account Executive

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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: 08/21/14
 Lab ID: 2295-14-0030942

Date Collected: 08/13/14 11:05
 Collected By: Client

Sample Desc: BZ-4 Surface

Date Received: 08/13/14 14:30

PWSID: 3130843

Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
-----	-----	-----	-----	-----	-----	-----	-----

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.

- 02 The total coliform sample was placed in the incubator on 08/13/14 at 14:55.

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 100 Penn Square East
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Date of Report: 08/21/14
 Lab ID: 2295-14-0030943
 Date Collected: 08/13/14 10:50
 Collected By: Client
 Date Received: 08/13/14 14:30

Sample Desc: BZ-5 Surface

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Escherichia coli	650	mpn/100mL	1	1	SM 9223B	08/14	10:45	DAD
Fecal Coliform	760	/100mL	2	1	SM 9222D	08/13	15:30	PLW
Total Coliform	2400	mpn/100mL	1	1	SM 9223B	08/14	10:45	DAD
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	0.04	mg/L	.01	1	SM 4500P-E	08/14	09:20	HRG
Phosphorus as P, Dissolved	<.05	mg/L	.05	1	SM 4500P-E	08/14	15:03	HRG
Phosphorus as P, Total	0.04	mg/L	.01	1	SM 4500P-E	08/19	13:35	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/L	.05	1	D6919-03	08/13	22:27	JCL
Nitrogen, Nitrate	1.03	mg/L	.05	1	EPA 353.2	08/13	18:25	JCL
Nitrogen, Nitrite	<.05	mg/L	.05	1	EPA 353.2	08/13	16:26	JCL
Nitrogen, Total Kjeldahl	<.25	mg/L	.25	1	EPA 351.2	08/15	16:58	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/L	2	1	SM 5210B	08/14	14:25	EMW
Total Organic Carbon	2.0	mg/L	1	1	SM5310 c	08/18	14:26	ALD
RESIDUES								
Solids, Total Dissolved	97	mg/L	5	1	SM 2540C	08/17	09:20	TMH
Solids, Total Suspended	<3	mg/L	3	1	SM 2540D	08/17	09:20	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	13	mg/L	1	1	SM 2320 B	08/18	14:15	HRG

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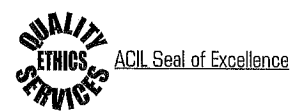
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 Account Executive

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 100 Penn Square East
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Date of Report: 08/21/14
 Lab ID: 2295-14-0030943
 Date Collected: 08/13/14 10:50
 Collected By: Client
 Date Received: 08/13/14 14:30

Sample Desc: BZ-5 Surface

PWSID: 3130843

Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
-----	-----	-----	-----	-----	-----	-----	-----

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.

- 02 The total coliform sample was placed in the incubator on 08/13/14 at 14:55.

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Christina M. Kistler
 Christina Kistler
 Account Executive

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Date of Report: 08/21/14
 Lab ID: 2295-14-0030944

Date Collected: 08/13/14 08:10
 Collected By: Client

Sample Desc: BZ-6 Surface

Date Received: 08/13/14 14:30

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Escherichia coli	<1	mpn/100ml	1	1	SM 9223B	08/14	10:45	DAD
Fecal Coliform	2	/100ml	2	1	SM 9222D	08/13	15:30	PLW
Total Coliform	2400	mpn/100ml	1	1	SM 9223B	08/14	10:45	DAD
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/L	.01	1	SM 4500P-E	08/14	09:20	HRG
Phosphorus as P, Dissolved	<.05	mg/L	.05	1	SM 4500P-E	08/14	15:03	HRG
Phosphorus as P, Total	<.01	mg/L	.01	1	SM 4500P-E	08/19	13:35	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/L	.05	1	D6919-03	08/13	22:42	JCL
Nitrogen, Nitrate	0.33	mg/L	.05	1	EPA 353.2	08/13	18:26	JCL
Nitrogen, Nitrite	<.05	mg/L	.05	1	EPA 353.2	08/13	16:26	JCL
Nitrogen, Total Kjeldahl	<.25	mg/L	.25	1	EPA 351.2	08/15	16:59	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/L	2	1	SM 5210B	08/14	14:25	EMW
Total Organic Carbon	1.6	mg/L	1	1	SM5310 C	08/18	14:42	ALD
RESIDUES								
Solids, Total Dissolved	71	mg/L	5	1	SM 2540C	08/17	09:20	TMH
Solids, Total Suspended	<3	mg/L	3	1	SM 2540D	08/17	09:20	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	11	mg/L	1	1	SM 2320 B	08/18	14:30	HRG

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 100 Penn Square East
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Date of Report: 08/21/14
 Lab ID: 2295-14-0030944

Date Collected: 08/13/14 08:10
 Collected By: Client

Sample Desc: BZ-6 Surface

Date Received: 08/13/14 14:30

PWSID: 3130843

Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
-----	-----	-----	-----	-----	-----	-----	-----

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.

- 02 The total coliform sample was placed in the incubator on 08/13/14 at 14:55.

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Date of Report: 08/21/14
 Lab ID: 2295-14-0030945

Date Collected: 08/13/14 08:10
 Collected By: Client

Sample Desc: BZ-6 Mid-Depth

Date Received: 08/13/14 14:30

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/L	.01	1	SM 4500P-E	08/14	09:20	HRG
Phosphorus as P, Dissolved	<.05	mg/L	.05	1	SM 4500P-E	08/14	15:03	HRG
Phosphorus as P, Total	<.01	mg/L	.01	1	SM 4500P-E	08/19	13:35	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/L	.05	1	D6919-03	08/13	22:57	JCL
Nitrogen, Nitrate	0.77	mg/L	.05	1	EPA 353.2	08/13	18:27	JCL
Nitrogen, Nitrite	<.05	mg/L	.05	1	EPA 353.2	08/13	16:27	JCL
Nitrogen, Total Kjeldahl	<.25	mg/L	.25	1	EPA 351.2	08/15	17:02	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/L	2	1	SM 5210B	08/14	14:25	EMW
Total Organic Carbon	1.1	mg/L	1	1	SM5310 C	08/18	14:56	ALD
RESIDUES								
Solids, Total Dissolved	96	mg/L	5	1	SM 2540C	08/17	09:20	TMH
Solids, Total Suspended	<3	mg/L	3	1	SM 2540D	08/17	09:20	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	11	mg/L	1	1	SM 2320 B	08/18	14:30	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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 Environmental Resources Branch
 100 Penn Square East
 Philadelphia PA 19107

Date of Report: 08/21/14
 Lab ID: 2295-14-0030946

Date Collected: 08/13/14 08:10
 Collected By: Client

Sample Desc: BZ-6 Deep

Date Received: 08/13/14 14:30

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	0.01	mg/L	.01	1	SM 4500P-E	08/14	09:20	HRG
Phosphorus as P, Dissolved	<.05	mg/L	.05	1	SM 4500P-E	08/14	15:03	HRG
Phosphorus as P, Total	0.29	mg/L	.01	1	SM 4500P-E	08/19	13:40	HRG
NITROGENS								
Nitrogen, Ammonia	0.06	mg/L	.05	1	D6919-03	08/13	23:57	JCL
Nitrogen, Nitrate	0.63	mg/L	.05	1	EPA 353.2	08/13	18:30	JCL
Nitrogen, Nitrite	<.05	mg/L	.05	1	EPA 353.2	08/13	16:28	JCL
Nitrogen, Total Kjeldahl	0.95	mg/L	.25	1	EPA 351.2	08/15	17:03	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/L	2	1	SM 5210B	08/14	14:25	EMW
Total Organic Carbon	1.5	mg/L	1	1	SM5310 C	08/18	15:11	ALD
RESIDUES								
Solids, Total Dissolved	102	mg/L	5	1	SM 2540C	08/17	09:20	TMH
Solids, Total Suspended	77	mg/L	3	1	SM 2540D	08/17	09:20	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	11	mg/L	1	1	SM 2320 B	08/18	14:30	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
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 100 Penn Square East
 Philadelphia PA 19107

Date of Report: 08/21/14
 Lab ID: 2295-14-0030947
 Date Collected: 08/13/14 09:30
 Collected By: Client
 Date Received: 08/13/14 14:30

Sample Desc: BZ-7 Surface

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Escherichia coli	4	mpn/100ml	1	1	SM 9223B	08/14	10:45	DAD
Fecal Coliform	5	/100ml	2	1	SM 9222D	08/13	15:30	PLW
Total Coliform	1100	mpn/100ml	1	1	SM 9223B	08/14	10:45	DAD
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/L	.01	1	SM 4500P-E	08/14	09:20	HRG
Phosphorus as P, Dissolved	<.05	mg/L	.05	1	SM 4500P-E	08/14	15:03	HRG
Phosphorus as P, Total	<.01	mg/L	.01	1	SM 4500P-E	08/19	13:40	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/L	.05	1	D6919-03	08/14	00:12	JCL
Nitrogen, Nitrate	0.26	mg/L	.05	1	EPA 353.2	08/13	18:31	JCL
Nitrogen, Nitrite	<.05	mg/L	.05	1	EPA 353.2	08/13	16:29	JCL
Nitrogen, Total Kjeldahl	<.25	mg/L	.25	1	EPA 351.2	08/15	17:04	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/L	2	1	SM 5210B	08/14	14:25	EMW
Total Organic Carbon	1.4	mg/L	1	1	SM5310 C	08/18	21:31	ALD
RESIDUES								
Solids, Total Dissolved	81	mg/L	5	1	SM 2540C	08/17	09:45	TMH
Solids, Total Suspended	<3	mg/L	3	1	SM 2540D	08/17	09:45	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	10	mg/L	1	1	SM 2320 B	08/18	14:30	HRG

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Christina Kistler
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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: 08/21/14
 Lab ID: 2295-14-0030947

Date Collected: 08/13/14 09:30
 Collected By: Client

Sample Desc: BZ-7 Surface

Date Received: 08/13/14 14:30

PWSID: 3130843

Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
-----	-----	-----	-----	-----	-----	-----	-----

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.

02 The total coliform sample was placed in the incubator on 08/13/14 at 14:55.

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ENVIRONMENTAL TESTING LABORATORY 107 ANGELICA STREET, READING, PA 19611
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CERTIFICATE OF ANALYSIS

M.J. Reider Associates, Inc.



Attention: Gregory Wacik
 Reported To: USACE, Philadelphia District
 Environmental Resources Branch
 100 Penn Square East
 Philadelphia PA 19107

Date of Report: 08/21/14
 Lab ID: 2295-14-0030948

Date Collected: 08/13/14 09:30
 Collected By: Client

Sample Desc: BZ-7 Mid-Depth

Date Received: 08/13/14 14:30

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/L	.01	1	SM 4500P-E	08/14	09:25	HRG
Phosphorus as P, Dissolved	<.05	mg/L	.05	1	SM 4500P-E	08/14	15:06	HRG
Phosphorus as P, Total	<.01	mg/L	.01	1	SM 4500P-E	08/19	13:40	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/L	.05	1	D6919-03	08/14	00:27	JCL
Nitrogen, Nitrate	0.80	mg/L	.05	1	EPA 353.2	08/13	18:34	JCL
Nitrogen, Nitrite	<.05	mg/L	.05	1	EPA 353.2	08/13	16:32	JCL
Nitrogen, Total Kjeldahl	<.25	mg/L	.25	1	EPA 351.2	08/15	17:06	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/L	2	1	SM 5210B	08/14	14:25	EMW
Total Organic Carbon	1.1	mg/L	1	1	SM5310 C	08/18	21:45	ALD
RESIDUES								
Solids, Total Dissolved	77	mg/L	5	1	SM 2540C	08/17	09:45	TMH
Solids, Total Suspended	<3	mg/L	3	1	SM 2540D	08/17	09:45	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	12	mg/L	1	1	SM 2320 B	08/18	14:45	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.

Distribution of Reports:

Reviewed and Approved by:

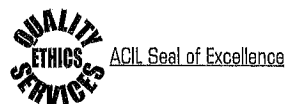
Christina Kistler
 Account Executive

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CERTIFICATE OF ANALYSIS

M.J. Reider Associates, Inc.



Attention: Gregory Wacik
 Reported To: USACE, Philadelphia District
 Environmental Resources Branch
 100 Penn Square East
 Philadelphia PA 19107

Date of Report: 08/21/14
 Lab ID: 2295-14-0030949
 Date Collected: 08/13/14 09:30
 Collected By: Client
 Date Received: 08/13/14 14:30

Sample Desc: BZ-7 Deep

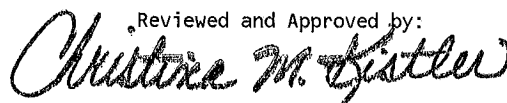
PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	0.02	mg/l	.01	1	SM 4500P-E	08/14	09:25	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	08/14	15:06	HRG
Phosphorus as P, Total	0.02	mg/l	.01	1	SM 4500P-E	08/19	13:40	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	08/14	01:12	JCL
Nitrogen, Nitrate	0.68	mg/l	.05	1	EPA 353.2	08/13	18:35	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	08/13	16:35	JCL
Nitrogen, Total Kjeldahl	<.25	mg/l	.25	1	EPA 351.2	08/15	17:07	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	08/14	14:25	EMW
Total Organic Carbon	1.4	mg/l	1	1	SM5310 C	08/18	22:00	ALD
RESIDUES								
Solids, Total Dissolved	80	mg/l	5	1	SM 2540C	08/17	09:45	TMH
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	08/17	09:45	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	14	mg/l	1	1	SM 2320 B	08/18	15:00	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.

Distribution of Reports:

Reviewed and Approved by:


Christina Kistler
 Account Executive

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M. J. REIDER ASSOCIATES, INC.

07/16/14 4:26:53 PM

Chain of Custody

No: 241686

Work Order: 004036 Project Leader: CMB
Work Order Description: Beltzville Reservoir

Account: 2295

Customer: Gregory Wacik

Address: USACE, Philadelphia District
Environmental Resources Branch
100 Penn Square East
Philadelphia PA 19107

Phone: 215-656-6561 Ext:

WACIK

Remarks:

Total Sampling Time (hours):

Bottle Prep by:

Laboratory Receipt Temp: 5 Deg C. If Temp Unacceptable, On Ice? Y N

Approved By: BSW

30937

Sample No: 1 Desc: BZ-1 Surface
FC, EC, TC, ^{H6}
NO2-N, NO3-N, d-po4-p, o-po4, BOD ^{SW}
NH3-N, tkn, Alk, tds, tss, po4-p, toc,

Matrix: 0 Date: 8/13/14
Time: 1125
A - 1 X 250ml Micro P w/ Sterile/Na2S2O3;
B - 1 X L Bod p w/ Cool to 6 C;
C - 1 X 16oz NO2NO3 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;

30938

Sample No: 2 Desc: BZ-2 Surface
FC, EC, TC, ^{H6}
NO2-N, NO3-N, d-po4-p, o-po4, BOD ^{SW}
NH3-N, tkn, Alk, tds, tss, po4-p, toc,

Matrix: 0 Date: 8/13/14
Time: 1115
A - 1 X 250ml Micro P w/ Sterile/Na2S2O3;
B - 1 X L Bod p w/ Cool to 6 C;
C - 1 X 16oz NO2NO3 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;

Greg Wacik

Greg Wacik

Greg Wacik

Relinquished by:

Received by:

Received for laboratory by:

Date: 8/13/14 Time: 1200

Date: 8-13-14 Time: 1430

Sample entered by: *R*

M. J. REIDER ASSOCIATES, INC.

raq
07/16/14 4:26:53 PM

Chain of Custody

No: 241686

Project Leader: CMB
Work Order Description: Beltzville Reservoir

Work Order: 004036
Work Order Description: Beltzville Reservoir

Customer: Gregory Wacik

Address: USACE, Philadelphia District
Environmental Resources Branch
100 Penn Square East
Philadelphia PA 19107
Phone: 215-656-6561 Ext:

Total Sampling Time (hours): _____ Bottle Prep by: _____

Laboratory Receipt Temp: 5 Deg C. If Temp Unacceptable, On Ice? Y N
Approved By: BSW

Samplers: WACIK

=====

309339 Sample No: 3 Desc: BZ-3 Surface
FC, EC, TC, pm
NO2-N, NO3-N, d-po4-p, o-po4, BOD H6
NH3-N, tkm, Alk, tds, tss, po4-p, toc, gw

Matrix: 0 Date: 8/13/14
Time: 0900
A - 1 X 250ml Micro P w/ Sterile/Na2S2O3;
B - 1 X L Bod p w/ Cool to 6 C;
C - 1 X 16oz NO2NO3 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;

30940 Sample No: 4 Desc: BZ-3 Mid-Depth
H6
NO2-N, NO3-N, d-po4-p, o-po4, BOD gw
NH3-N, tkm, Alk, tds, tss, po4-p, toc, gw

Matrix: 0 Date: 8/13/14
Time: 0900
A - 1 X L Bod p w/ Cool to 6 C;
B - 1 X 16oz NO2NO3 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;

Relinquished by: [Signature]
Date: 8/13/14 Time: 1200

Received by: [Signature]

Received for laboratory by: [Signature]
Date: 8-13-14 Time: 1430

Sample entered by: [Signature]

Chain of Custody

Account: 2295

Work Order: 004036

Project Leader: CMB

No: 241686

Work Order Description: Beltzville Reservoir

Customer: Gregory Wacik

Address: USACE, Philadelphia District
Environmental Resources Branch
100 Penn Square East
Philadelphia PA 19107

Phone: 215-656-6561

Ext: WACIK

Total Sampling Time (hours): _____ Bottle Prep by: _____

Laboratory Receipt Temp: 5 Deg C. If Temp Unacceptable, On Ice? Y N
Approved By: BSV

Remarks:

30941 Sample No: 5 Desc: BZ-3 Deep
NO2-N, NO3-N, d-po4-p, o-po4, BOD ^{He}
NH3-N, tkm, Alk, tds, tss, po4-p, toc, ^g

Matrix: 0 Date: 8/13/14
Time: 0900
A - 1 X 1 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;

30942 Sample No: 6 Desc: BZ-4 Surface
FC, EC, TC, ^g
NO2-N, NO3-N, d-po4-p, o-po4, BOD ^{He}
NH3-N, tkm, Alk, tds, tss, po4-p, toc, ^g

Matrix: 0 Date: 8/13/14
Time: 1105
A - 1 X 250mlMicro P w/ Sterile/Na2S2O3;
B - 1 X 1 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;

Relinquished by: [Signature] Received by: [Signature]

Received for laboratory by: [Signature]

Date: 8/13/14 Time: 1200

Date: 8-13-14 Time: 1430

Sample entered by: [Signature]

Chain of Custody

Account: 2295 Work Order: 004036 Project Leader: CMB No: 241686
 Customer: Gregory Wacik Work Order Description: Beltzville Reservoir
 Address: USACE, Philadelphia District Environmental Resources Branch
 100 Penn Square East Philadelphia PA 19107
 Phone: 215-656-6561 Ext: Wacik
 Samplers: Wacik

Total Sampling Time (hours): _____ Bottle Prep by: _____

Laboratory Receipt Temp: 5 Deg C. If Temp Unacceptable, On Ice? Y N
Approved By: BSW

30943 Sample No: 7 Desc: BZ-5 Surface
 FC, EC, TC, pld
 NO2-N, NO3-N, d-po4-p, o-po4, BOD₅ gn
 NH3-N, tkn, Alk, tds, tss, po4-p, toc,

Matrix: 0 Date: 8/13/14
 Time: 1830
 A - 1 X 250ml Micro P w/ Sterile/Na2S2O3;
 B - 1 X L Bod p w/ Cool to 6 C;
 C - 1 X 16oz NO2NO3 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;

30944 Sample No: 8 Desc: BZ-6 Surface
 FC, EC, TC, pld
 NO2-N, NO3-N, d-po4-p, o-po4, BOD₅ gn
 NH3-N, tkn, Alk, tds, tss, po4-p, toc,

Matrix: 0 Date: 8/13/14
 Time: 0816
 A - 1 X 250ml Micro P w/ Sterile/Na2S2O3;
 B - 1 X L Bod p w/ Cool to 6 C;
 C - 1 X 16oz NO2NO3 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;

Relinquished by: [Signature]
 Date: 8/13/14 Time: 1200

Received by: [Signature]

Received for laboratory by: [Signature]
 Date: 8-14 Time: 1430

BSW 8-13-14

Sample entered by: [Signature]

Account: 2295
Customer: Gregory Wacik

Work Order: 004036
Project Leader: CMB

Work Order Description: Beltzville Reservoir

No: 241686

Address: USACE, Philadelphia District
Environmental Resources Branch
100 Penn Square East
Philadelphia PA 19107

Phone: 215-656-6561 Ext: WACIK

Samplers: WACIK

30945 Sample No: 9 Desc: BZ-6 Mid-Depth
N02-N, N03-N, d-po4-p, o-po4, BOD^{HC}
N03-N, tkn, Alk, tds, tss, po4-p, toc, ^{HC}

30946 Sample No: 10 Desc: BZ-6 Deep
N02-N, N03-N, d-po4-p, o-po4, BOD^{HC}
N03-N, tkn, Alk, tds, tss, po4-p, toc, ^{HC}

30947 Sample No: 11 Desc: BZ-7 Surface
FC, EC, TC, ^{HC}
N02-N, N03-N, d-po4-p, o-po4, BOD^{HC}
N03-N, tkn, Alk, tds, tss, po4-p, toc, ^{HC}

Chain of Custody

Remarks:

Total Sampling Time (hours): _____ Bottle Prep by: _____

Laboratory Receipt Temp: 5 Deg C. If Temp Unacceptable, On Ice? Y N
Approved By: B.S.F.

Matrix: 0 Date: 8/13/14
Time: 0810
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;

Matrix: 0 Date: 8/13/14
Time: 0810
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;

Matrix: 0 Date: 8/13/14
Time: 0830
A - 1 X 250mlMicro P w/ Sterile/Na2S2O3;
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;

Relinquished by: [Signature] Received by: [Signature]

Received for laboratory by: [Signature]

Date: 8/13/14 Time: 1200

Date: 8-13-14 Time: 1430

Sample entered by: [Signature]

M. J. REIDER ASSOCIATES, INC.

07/16/14 4:26:54 PM

Chain of Custody

Account: 2295 Work Order: 004036 Project Leader: CMB No: 241686

Customer: Gregory Wacik Work Order Description: Beltzville Reservoir

Address: USACE, Philadelphia District
Environmental Resources Branch
100 Penn Square East
Philadelphia PA 19107

Phone: 215-656-6561 Ext: _____

Samplers: WACIK

Remarks: _____

Total Sampling Time (hours): _____ Bottle Prep by: _____

Laboratory Receipt Temp: 5 Deg C. If Temp Unacceptable, On Ice? Y N

Approved By: GSW

Matrix: 0 Date: 8/13/14
Time: 0930

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;

Matrix: 0 Date: 8/13/14
Time: 0930

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;

30948 Sample No: 12 Desc: BZ-7 Mid-Depth
NO2-N, NO3-N, d-po4-p, o-po4, BOD HC
NH3-N, tkm, Alk, tds, tss, po4-p, toc, GSW

30949 Sample No: 13 Desc: BZ-7 Deep
NO2-N, NO3-N, d-po4-p, o-po4, BOD HC
NH3-N, tkm, Alk, tds, tss, po4-p, toc, GSW

Relinquished by: [Signature] Received by: [Signature]

Date: 8/13/14 Time: 1200

Received for laboratory by: [Signature]

Date: 8-13-14 Time: 1430

Sample entered by: [Signature]

CERTIFICATE OF ANALYSIS

M.J. Reider Associates, Inc.



Attention: Gregory Wacik
 Reported To: USACE, Philadelphia District
 Environmental Resources Branch
 100 Penn Square East
 Philadelphia PA 19107

Date of Report: 09/18/14
 Lab ID: 2295-14-0034291

Date Collected: 09/11/14 11:30
 Collected By: Client

Sample Desc: BZ-1 Surface

Date Received: 09/11/14 13:05

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Escherichia coli	10	mpn/100mL	1	1	SM 9223B	09/12	09:00	DAD
Fecal Coliform	10	/100mL	2	1	SM 9222D	09/11	14:30	PLW
Total Coliform	>2400	mpn/100mL	1	1	SM 9223B	09/12	09:00	DAD
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/L	.01	1	SM 4500P-E	09/11	14:15	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	16:30	JCL
Nitrogen, Nitrate	0.77	mg/L	.05	1	EPA 353.2	09/11	16:37	JCL
Nitrogen, Nitrite	<.05	mg/L	.05	1	EPA 353.2	09/11	15:12	JCL
Nitrogen, Total Kjeldahl	<.25	mg/L	.25	1	EPA 351.2	09/16	16:52	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/L	2	1	SM 5210B	09/11	14:10	ALD
Total Organic Carbon	1.4	mg/L	1	1	SM5310 C	09/15	13:53	ALD
RESIDUES								
Solids, Total Dissolved	57	mg/L	5	1	SM 2540C	09/15	13:25	TMH
Solids, Total Suspended	<3	mg/L	3	1	SM 2540D	09/15	13:25	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	10	mg/L	1	1	SM 2320 B	09/15	10:45	HRG

Distribution of Reports:

Reviewed and Approved by:

Christina Kistler
 Account Executive

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ACIL Seal of Excellence



CERTIFICATE OF ANALYSIS
M.J. Reider Associates, Inc.



Attention: Gregory Wacik
Reported To: USACE, Philadelphia District
Environmental Resources Branch
100 Penn Square East
Philadelphia PA 19107

Date of Report: 09/18/14
Lab ID: 2295-14-0034291

Date Collected: 09/11/14 11:30
Collected By: Client

Date Received: 09/11/14 13:05

Sample Desc: BZ-1 Surface

PWSID: 3130843

Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
-----	-----	-----	-----	-----	-----	-----	-----

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.

- 02 The total coliform sample was placed in the incubator on 09/11/14 at 15:00.

Distribution of Reports:

Reviewed and Approved by:

Christina Kistler
Account Executive

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CERTIFICATE OF ANALYSIS

M.J. Reider Associates, Inc.



Attention: Gregory Wacik
Reported To: USACE, Philadelphia District
Environmental Resources Branch
100 Penn Square East
Philadelphia PA 19107

Date of Report: 09/18/14
Lab ID: 2295-14-0034292

Date Collected: 09/11/14 11:00
Collected By: Client

Sample Desc: BZ-2 Surface

Date Received: 09/11/14 13:05

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTERIOLOGY								
BACTI								
MICROBIOLOGY								
Escherichia coli	18	mpn/100ml	1	1	SM 9223B	09/12	09:00	DAD
Fecal Coliform	21	/100ml	2	1	SM 9222D	09/11	14:30	PLW
Total Coliform	2400	mpn/100ml	1	1	SM 9223B	09/12	09:00	DAD
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/L	.01	1	SM 4500P-E	09/11	14:18	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	12:35	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/L	.05	1	D6919-03	09/11	16:44	JCL
Nitrogen, Nitrate	0.24	mg/L	.05	1	EPA 353.2	09/11	16:40	JCL
Nitrogen, Nitrite	<.05	mg/L	.05	1	EPA 353.2	09/11	15:13	JCL
Nitrogen, Total Kjeldahl	<.25	mg/L	.25	1	EPA 351.2	09/16	16:55	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/L	2	1	SM 5210B	09/11	14:10	ALD
Total Organic Carbon	<1	mg/L	1	1	SM5310 C	09/15	14:08	ALD
RESIDUES								
Solids, Total Dissolved	62	mg/L	5	1	SM 2540C	09/15	13:25	TMH
Solids, Total Suspended	<3	mg/L	3	1	SM 2540D	09/15	13:25	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	9	mg/L	1	1	SM 2320 B	09/15	10:45	HRG

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Christina M. Kistler

Christina Kistler
Account Executive

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M.J. Reider Associates, Inc.



Attention: Gregory Wacik
Reported To: USACE, Philadelphia District
Environmental Resources Branch
100 Penn Square East
Philadelphia PA 19107

Date of Report: 09/18/14
Lab ID: 2295-14-0034292

Date Collected: 09/11/14 11:00
Collected By: Client

Sample Desc: BZ-2 Surface

Date Received: 09/11/14 13:05

PWSID: 3130843

Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
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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.
- 02 The total coliform sample was placed in the incubator on 09/11/14 at 15:00.

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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: 09/18/14
Lab ID: 2295-14-0034293

Date Collected: 09/11/14 08:50
Collected By: Client

Sample Desc: BZ-3 Surface

Date Received: 09/11/14 13:05

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Escherichia coli	<1	mpn/100ml	1	1	SM 9223B	09/12	09:00	DAD
Fecal Coliform	<2	/100ml	2	1	SM 9222D	09/11	14:30	PLW
Total Coliform	>2400	mpn/100ml	1	1	SM 9223B	09/12	09:00	DAD
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/L	.01	1	SM 4500P-E	09/11	14:18	HRG
Phosphorus as P, Dissolved	<.05	mg/L	.05	1	SM 4500P-E	09/12	12:50	HRG
Phosphorus as P, Total	0.01	mg/L	.01	1	SM 4500P-E	09/12	12:35	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/L	.05	1	D6919-03	09/11	16:59	JCL
Nitrogen, Nitrate	0.25	mg/L	.05	1	EPA 353.2	09/11	16:41	JCL
Nitrogen, Nitrite	<.05	mg/L	.05	1	EPA 353.2	09/11	15:14	JCL
Nitrogen, Total Kjeldahl	<.25	mg/L	.25	1	EPA 351.2	09/16	16:56	JCL
OTHER								
Biochemical Oxygen Demand	2	mg/L	2	1	SM 5210B	09/11	14:10	ALD
Total Organic Carbon	1.6	mg/L	1	1	SM5310 C	09/15	14:39	ALD
RESIDUES								
Solids, Total Dissolved	50	mg/L	5	1	SM 2540C	09/15	13:25	TMH
Solids, Total Suspended	<3	mg/L	3	1	SM 2540D	09/15	13:25	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	11	mg/L	1	1	SM 2320 B	09/15	10:45	HRG

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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: 09/18/14
Lab ID: 2295-14-0034293

Date Collected: 09/11/14 08:50
Collected By: Client

Sample Desc: BZ-3 Surface

Date Received: 09/11/14 13:05

PWSID: 3130843

Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
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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.
- 02 The SM 5210B sample did not have a DO depletion of at least 2 mg/L.
- 03 The total coliform sample was placed in the incubator on 09/11/14 at 15:00.

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 100 Penn Square East
 Philadelphia PA 19107

Date of Report: 09/18/14
 Lab ID: 2295-14-0034294

Date Collected: 09/11/14 08:50
 Collected By: Client

Sample Desc: BZ-3 Mid-Depth

Date Received: 09/11/14 13:05

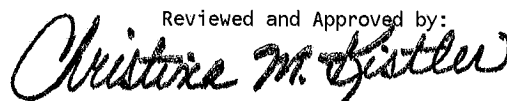
PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/L	.01	1	SM 4500P-E	09/11	14:18	HRG
Phosphorus as P, Dissolved	<.05	mg/L	.05	1	SM 4500P-E	09/12	12:50	HRG
Phosphorus as P, Total	0.01	mg/L	.01	1	SM 4500P-E	09/12	12:35	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/L	.05	1	D6919-03	09/11	17:14	JCL
Nitrogen, Nitrate	0.82	mg/L	.05	1	EPA 353.2	09/11	16:42	JCL
Nitrogen, Nitrite	<.05	mg/L	.05	1	EPA 353.2	09/11	15:17	JCL
Nitrogen, Total Kjeldahl	<.25	mg/L	.25	1	EPA 351.2	09/16	16:57	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/L	2	1	SM 5210B	09/11	14:10	ALD
Total Organic Carbon	1.3	mg/L	1	1	SM5310 C	09/15	14:54	ALD
RESIDUES								
Solids, Total Dissolved	88	mg/L	5	1	SM 2540C	09/15	13:25	TMH
Solids, Total Suspended	<3	mg/L	3	1	SM 2540D	09/15	13:25	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	11	mg/L	1	1	SM 2320 B	09/15	10:45	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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Date of Report: 09/18/14
 Lab ID: 2295-14-0034295

Date Collected: 09/11/14 08:50
 Collected By: Client

Sample Desc: BZ-3 Deep

Date Received: 09/11/14 13:05

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/L	.01	1	SM 4500P-E	09/11	14:18	HRG
Phosphorus as P, Dissolved	<.05	mg/L	.05	1	SM 4500P-E	09/12	12:55	HRG
Phosphorus as P, Total	<.01	mg/L	.01	1	SM 4500P-E	09/12	12:35	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/L	.05	1	D6919-03	09/11	17:28	JCL
Nitrogen, Nitrate	0.62	mg/L	.05	1	EPA 353.2	09/11	16:45	JCL
Nitrogen, Nitrite	<.05	mg/L	.05	1	EPA 353.2	09/11	15:20	JCL
Nitrogen, Total Kjeldahl	<.25	mg/L	.25	1	EPA 351.2	09/16	16:58	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/L	2	1	SM 5210B	09/11	14:10	ALD
Total Organic Carbon	1.2	mg/L	1	1	SM5310 C	09/15	15:10	ALD
RESIDUES								
Solids, Total Dissolved	70	mg/L	5	1	SM 2540C	09/15	13:25	TMH
Solids, Total Suspended	18	mg/L	3	1	SM 2540D	09/15	13:25	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	11	mg/L	1	1	SM 2320 B	09/15	11:00	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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Date of Report: 09/18/14
 Lab ID: 2295-14-0034296

Date Collected: 09/11/14 11:00
 Collected By: Client

Sample Desc: BZ-4 Surface

Date Received: 09/11/14 13:05

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Escherichia coli	5	mpn/100ml	1	1	SM 9223B	09/12	09:00	DAD
Fecal Coliform	11	/100ml	2	1	SM 9222D	09/11	14:30	PLW
Total Coliform	>2400	mpn/100ml	1	1	SM 9223B	09/12	09:00	DAD
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	09/11	14:18	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	09/12	12:55	HRG
Phosphorus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	09/12	12:35	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	09/11	17:43	JCL
Nitrogen, Nitrate	0.06	mg/l	.05	1	EPA 353.2	09/11	16:46	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	09/11	15:21	JCL
Nitrogen, Total Kjeldahl	<.25	mg/l	.25	1	EPA 351.2	09/16	17:01	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	09/11	14:10	ALD
Total Organic Carbon	1.2	mg/l	1	1	SM5310 C	09/15	15:25	ALD
RESIDUES								
Solids, Total Dissolved	34	mg/l	5	1	SM 2540C	09/15	13:25	TMH
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	09/15	13:25	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	5	mg/l	1	1	SM 2320 B	09/15	11:00	HRG

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 Reported To: USACE, Philadelphia District
 Environmental Resources Branch
 100 Penn Square East
 Philadelphia PA 19107

Date of Report: 09/18/14
 Lab ID: 2295-14-0034296
 Date Collected: 09/11/14 11:00
 Collected By: Client
 Date Received: 09/11/14 13:05

Sample Desc: BZ-4 Surface

PWSID: 3130843

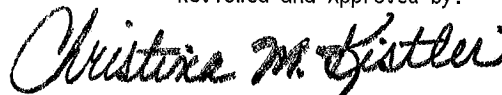
Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
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COMMENTS

- 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.
- 02 The total coliform sample was placed in the incubator on 09/11/14 at 15:00.

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 Reported To: USACE, Philadelphia District
 Environmental Resources Branch
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 Philadelphia PA 19107

Date of Report: 09/18/14
 Lab ID: 2295-14-0034297

Date Collected: 09/11/14 10:50
 Collected By: Client

Sample Desc: BZ-5 Surface

Date Received: 09/11/14 13:05

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Escherichia coli	110	mpn/100mL	1	1	SM 9223B	09/12	09:00	DAD
Fecal Coliform	150	/100mL	2	1	SM 9222D	09/11	14:30	PLW
Total Coliform	>2400	mpn/100mL	1	1	SM 9223B	09/12	09:00	DAD
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	0.09	mg/L	.01	1	SM 4500P-E	09/11	14:18	HRG
Phosphorus as P, Dissolved	<.05	mg/L	.05	1	SM 4500P-E	09/12	12:55	HRG
Phosphorus as P, Total	0.09	mg/L	.01	1	SM 4500P-E	09/12	12:35	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/L	.05	1	D6919-03	09/11	18:41	JCL
Nitrogen, Nitrate	1.12	mg/L	.05	1	EPA 353.2	09/11	16:46	JCL
Nitrogen, Nitrite	<.05	mg/L	.05	1	EPA 353.2	09/11	15:22	JCL
Nitrogen, Total Kjeldahl	<.25	mg/L	.25	1	EPA 351.2	09/16	17:02	JCL
OTHER								
Biochemical Oxygen Demand	2	mg/L	2	1	SM 5210B	09/11	14:10	ALD
Total Organic Carbon	1.1	mg/L	1	1	SM5310 C	09/15	20:55	ALD
RESIDUES								
Solids, Total Dissolved	80	mg/L	5	1	SM 2540C	09/15	13:25	TMH
Solids, Total Suspended	<3	mg/L	3	1	SM 2540D	09/15	13:25	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	15	mg/L	1	1	SM 2320 B	09/15	11:15	HRG

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 100 Penn Square East
 Philadelphia PA 19107

Date of Report: 09/18/14
 Lab ID: 2295-14-0034297

Date Collected: 09/11/14 10:50
 Collected By: Client

Sample Desc: BZ-5 Surface

Date Received: 09/11/14 13:05

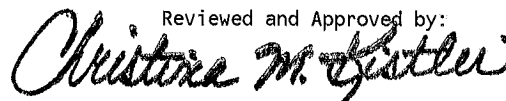
PWSID: 3130843

Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
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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.
- 02 The SM 5210B sample did not have a DO depletion of at least 2 mg/L.
- 03 The total coliform sample was placed in the incubator on 09/11/14 at 15:00.

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Date of Report: 09/18/14
 Lab ID: 2295-14-0034298

Date Collected: 09/11/14 08:00
 Collected By: Client

Sample Desc: BZ-6 Surface

Date Received: 09/11/14 13:05

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Escherichia coli	1	mpn/100ml	1	1	SM 9223B	09/12	09:00	DAD
Fecal Coliform	<2	/100ml	2	1	SM 9222D	09/11	14:30	PLW
Total Coliform	>2400	mpn/100ml	1	1	SM 9223B	09/12	09:00	DAD
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/L	.01	1	SM 4500P-E	09/11	14:18	HRG
Phosphorus as P, Dissolved	<.05	mg/L	.05	1	SM 4500P-E	09/12	12:55	HRG
Phosphorus as P, Total	<.01	mg/L	.01	1	SM 4500P-E	09/12	12:35	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/L	.05	1	D6919-03	09/11	18:56	JCL
Nitrogen, Nitrate	0.25	mg/L	.05	1	EPA 353.2	09/11	16:47	JCL
Nitrogen, Nitrite	<.05	mg/L	.05	1	EPA 353.2	09/11	15:23	JCL
Nitrogen, Total Kjeldahl	<.25	mg/L	.25	1	EPA 351.2	09/16	17:03	JCL
OTHER								
Biochemical Oxygen Demand	2	mg/L	2	1	SM 5210B	09/11	14:10	ALD
Total Organic Carbon	1.5	mg/L	1	1	SM5310 C	09/15	21:10	ALD
RESIDUES								
Solids, Total Dissolved	56	mg/L	5	1	SM 2540C	09/15	13:25	TMH
Solids, Total Suspended	3	mg/L	3	1	SM 2540D	09/15	13:25	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	11	mg/L	1	1	SM 2320 B	09/15	11:15	HRG

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 100 Penn Square East
 Philadelphia PA 19107

Date of Report: 09/18/14
 Lab ID: 2295-14-0034298

Date Collected: 09/11/14 08:00
 Collected By: Client

Sample Desc: BZ-6 Surface

Date Received: 09/11/14 13:05

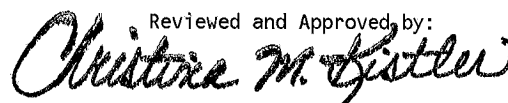
PWSID: 3130843

Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
-----	-----	-----	-----	-----	-----	-----	-----

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.
- 02 The SM 5210B sample did not have a DO depletion of at least 2 mg/L.
- 03 The total coliform sample was placed in the incubator on 09/11/14 at 15:00.

Distribution of Reports:

Reviewed and Approved by:


Christina Kistler
 Account Executive

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CERTIFICATE OF ANALYSIS

M.J. Reider Associates, Inc.



Attention: Gregory Wacik
Reported To: USACE, Philadelphia District
Environmental Resources Branch
100 Penn Square East
Philadelphia PA 19107

Date of Report: 09/18/14
Lab ID: 2295-14-0034299

Date Collected: 09/11/14 08:00
Collected By: Client

Sample Desc: BZ-6 Mid-Depth

Date Received: 09/11/14 13:05

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/L	.01	1	SM 4500P-E	09/11	14:20	HRG
Phosphorus as P, Dissolved	<.05	mg/L	.05	1	SM 4500P-E	09/12	12:55	HRG
Phosphorus as P, Total	<.01	mg/L	.01	1	SM 4500P-E	09/12	12:35	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/L	.05	1	D6919-03	09/11	19:10	JCL
Nitrogen, Nitrate	0.74	mg/L	.05	1	EPA 353.2	09/11	16:48	JCL
Nitrogen, Nitrite	<.05	mg/L	.05	1	EPA 353.2	09/11	15:23	JCL
Nitrogen, Total Kjeldahl	<.25	mg/L	.25	1	EPA 351.2	09/16	17:04	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/L	2	1	SM 5210B	09/11	14:10	ALD
Total Organic Carbon	1.2	mg/L	1	1	SM5310 C	09/15	22:43	ALD
RESIDUES								
Solids, Total Dissolved	87	mg/L	5	1	SM 2540C	09/15	13:25	TMH
Solids, Total Suspended	<3	mg/L	3	1	SM 2540D	09/15	13:25	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	10	mg/L	1	1	SM 2320 B	09/15	11:15	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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Reviewed and Approved by:
Christina M. Kistler

Christina Kistler
Account Executive

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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: 09/18/14
Lab ID: 2295-14-0034300

Date Collected: 09/11/14 08:00
Collected By: Client

Sample Desc: BZ-6 Deep

Date Received: 09/11/14 13:05

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	0.02	mg/L	.01	1	SM 4500P-E	09/11	14:20	HRG
Phosphorus as P, Dissolved	<.05	mg/L	.05	1	SM 4500P-E	09/12	12:55	HRG
Phosphorus as P, Total	0.02	mg/L	.01	1	SM 4500P-E	09/12	12:35	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/L	.05	1	D6919-03	09/11	19:25	JCL
Nitrogen, Nitrate	0.59	mg/L	.05	1	EPA 353.2	09/11	16:51	JCL
Nitrogen, Nitrite	<.05	mg/L	.05	1	EPA 353.2	09/11	15:24	JCL
Nitrogen, Total Kjeldahl	<.25	mg/L	.25	1	EPA 351.2	09/16	17:06	JCL
OTHER								
Biochemical Oxygen Demand	2	mg/L	2	1	SM 5210B	09/11	14:10	ALD
Total Organic Carbon	1.1	mg/L	1	1	SM5310 C	09/15	23:13	ALD
RESIDUES								
Solids, Total Dissolved	85	mg/L	5	1	SM 2540C	09/15	13:25	TMH
Solids, Total Suspended	5	mg/L	3	1	SM 2540D	09/15	13:25	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	13	mg/L	1	1	SM 2320 B	09/15	11:45	HRG

COMMENTS

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

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Account Executive

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M.J. Reider Associates, Inc.



Attention: Gregory Wacik
Reported To: USACE, Philadelphia District
Environmental Resources Branch
100 Penn Square East
Philadelphia PA 19107

Date of Report: 09/18/14
Lab ID: 2295-14-0034300

Date Collected: 09/11/14 08:00
Collected By: Client

Sample Desc: BZ-6 Deep

Date Received: 09/11/14 13:05

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
02	The SM 5210B sample did not have a DO depletion of at least 2 mg/L.							

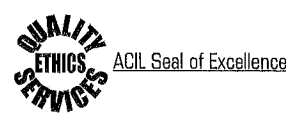
Distribution of Reports:

Reviewed and Approved by:
Christina M. Kistler
Christina Kistler
Account Executive

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M.J. Reider Associates, Inc.



Attention: Gregory Wacik
 Reported To: USACE, Philadelphia District
 Environmental Resources Branch
 100 Penn Square East
 Philadelphia PA 19107

Date of Report: 09/18/14
 Lab ID: 2295-14-0034301

Date Collected: 09/11/14 09:30
 Collected By: Client

Sample Desc: BZ-7 Surface

Date Received: 09/11/14 13:05

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Escherichia coli	<1	mpn/100ml	1	1	SM 9223B	09/12	09:00	DAD
Fecal Coliform	<2	/100ml	2	1	SM 9222D	09/11	14:30	PLW
Total Coliform	2400	mpn/100ml	1	1	SM 9223B	09/12	09:00	DAD
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	0.02	mg/L	.01	1	SM 4500P-E	09/11	14:20	HRG
Phosphorus as P, Dissolved	<.05	mg/L	.05	1	SM 4500P-E	09/12	13:00	HRG
Phosphorus as P, Total	0.02	mg/L	.01	1	SM 4500P-E	09/12	12:40	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/L	.05	1	D6919-03	09/11	19:40	JCL
Nitrogen, Nitrate	0.24	mg/L	.05	1	EPA 353.2	09/11	16:52	JCL
Nitrogen, Nitrite	<.05	mg/L	.05	1	EPA 353.2	09/11	15:25	JCL
Nitrogen, Total Kjeldahl	<.25	mg/L	.25	1	EPA 351.2	09/16	17:07	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/L	2	1	SM 5210B	09/11	14:10	ALD
Total Organic Carbon	1.3	mg/L	1	1	SM5310 C	09/15	23:43	ALD
RESIDUES								
Solids, Total Dissolved	79	mg/L	5	1	SM 2540C	09/15	13:50	TMH
Solids, Total Suspended	<3	mg/L	3	1	SM 2540D	09/15	13:50	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	12	mg/L	1	1	SM 2320 B	09/15	11:45	HRG

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 Account Executive

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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: 09/18/14
Lab ID: 2295-14-0034301

Date Collected: 09/11/14 09:30
Collected By: Client

Sample Desc: BZ-7 Surface

Date Received: 09/11/14 13:05

PWSID: 3130843

Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
-----	-----	-----	-----	-----	-----	-----	-----

COMMENTS

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

- 02 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 09/11/14 at 15:00.

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Account Executive

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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: 09/18/14
Lab ID: 2295-14-0034302

Date Collected: 09/11/14 09:30
Collected By: Client

Sample Desc: BZ-7 Mid-Depth

Date Received: 09/11/14 13:05

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/L	.01	1	SM 4500P-E	09/11	14:23	HRG
Phosphorus as P, Dissolved	<.05	mg/L	.05	1	SM 4500P-E	09/12	13:00	HRG
Phosphorus as P, Total	<.01	mg/L	.01	1	SM 4500P-E	09/12	12:40	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/L	.05	1	D6919-03	09/11	19:54	JCL
Nitrogen, Nitrate	0.23	mg/L	.05	1	EPA 353.2	09/11	16:55	JCL
Nitrogen, Nitrite	<.05	mg/L	.05	1	EPA 353.2	09/11	15:28	JCL
Nitrogen, Total Kjeldahl	<.25	mg/L	.25	1	EPA 351.2	09/16	17:08	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/L	2	1	SM 5210B	09/11	14:10	ALD
Total Organic Carbon	1.3	mg/L	1	1	SM5310 C	09/16	00:29	ALD
RESIDUES								
Solids, Total Dissolved	54	mg/L	5	1	SM 2540C	09/15	13:50	TMH
Solids, Total Suspended	3	mg/L	3	1	SM 2540D	09/15	13:50	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	10	mg/L	1	1	SM 2320 B	09/15	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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Reviewed and Approved by:
Christina M. Kistler

Christina Kistler
Account Executive

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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: 09/18/14
 Lab ID: 2295-14-0034303

Date Collected: 09/11/14 09:30
 Collected By: Client

Sample Desc: BZ-7 Deep

Date Received: 09/11/14 13:05

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	0.02	mg/L	.01	1	SM 4500P-E	09/11	14:23	HRG
Phosphorus as P, Dissolved	<.05	mg/L	.05	1	SM 4500P-E	09/12	13:00	HRG
Phosphorus as P, Total	0.04	mg/L	.01	1	SM 4500P-E	09/12	12:40	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/L	.05	1	D6919-03	09/11	20:38	JCL
Nitrogen, Nitrate	0.67	mg/L	.05	1	EPA 353.2	09/11	16:56	JCL
Nitrogen, Nitrite	<.05	mg/L	.05	1	EPA 353.2	09/11	15:31	JCL
Nitrogen, Total Kjeldahl	0.26	mg/L	.25	1	EPA 351.2	09/16	17:09	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/L	2	1	SM 5210B	09/11	14:10	ALD
Total Organic Carbon	1.3	mg/L	1	1	SM5310 C	09/16	00:44	ALD
RESIDUES								
Solids, Total Dissolved	65	mg/L	5	1	SM 2540C	09/15	13:50	TMH
Solids, Total Suspended	9	mg/L	3	1	SM 2540D	09/15	13:50	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	13	mg/L	1	1	SM 2320 B	09/15	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.

Distribution of Reports:

Reviewed and Approved by:

Christina Kistler
 Account Executive

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jbs
08/06/14 12:22:12 PM

Account: 2295 Work Order: 004036
Customer: Gregory Wacik Work Order Description: Beltzville Reservoir

Chain of Custody

Project Leader: CMB No: 242816

Remarks:

Address: USACE, Philadelphia District
Environmental Resources Branch
100 Penn Square East
Philadelphia PA 19107
Phone: 215-656-6561 Ext: WACIK

Total Sampling Time (hours): _____ Bottle Prep by: _____

Laboratory Receipt Temp: 9 Deg C If Temp Unacceptable, On Ice? Y N
Approved By: RKE

Sample No: 1 Desc: BZ-1 Surface
FC, EC, TC, TK
NO2-N, NO3-N, d-po4-p, o-po4, BOD, NO
NH3-N, tkn, Alk, tds, tss, po4-p, toc,

Sample No: 2 Desc: BZ-2 Surface
FC, EC, TC, TK
NO2-N, NO3-N, d-po4-p, o-po4, BOD, NO
NH3-N, tkn, Alk, tds, tss, po4-p, toc,

Matrix: 0
A - 1 X 250ml Micro P w/ Sterile/Na2S2O3;
B - 1 X L Bod p w/ Cool to 6 C;
C - 1 X 16oz NO2NO3 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
A - 1 X 250ml Micro P w/ Sterile/Na2S2O3;
B - 1 X L Bod p w/ Cool to 6 C;
C - 1 X 16oz NO2NO3 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;

Date: 9/11/14
Time: 1130

Date: 9/11/14
Time: 1100

Relinquished by: [Signature]
Date: 9/11/14 Time: 1130

Received for laboratory by: [Signature]
Date: 9/11/14 Time: 1305

Sample entered by: RJL

jbs
08/06/14 12:22:12 PM

Account: 2295 Work Order: 004036
Customer: Gregory Wacik Work Order Description: Beltzville Reservoir

Address: USACE, Philadelphia District
Environmental Resources Branch
100 Penn Square East
Philadelphia PA 19107
Phone: 215-656-6561 Ext: WACIK

Samplers: WACIK

Chain of Custody

Project Leader: CMB No: 242816

Remarks:

Total Sampling Time (hours): _____ Bottle Prep by: _____

Laboratory Receipt Temp: 9 Deg C. If Temp Unacceptable, On Ice? Y N
Approved By: RKN

3-2295
Sample No: 5 Desc: BZ-3 Deep
NO2-N, NO3-N, d-po4-p, o-po4, BOD, TK
NH3-N, tkn, Alk, tds, tss, po4-p, toc, AM

3-2296
Sample No: 6 Desc: BZ-4 Surface
FC, EC, TC, TK
NO2-N, NO3-N, d-po4-p, o-po4, BOD, TK
NH3-N, tkn, Alk, tds, tss, po4-p, toc, TK

Matrix: 0 Date: 9/11/14
Time: 0850
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;

Matrix: 0 Date: 9/11/14
Time: 1600
A - 1 X 250mlMicro P w/ Sterile/Na2S2O3;
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;

Relinquished by: [Signature] Received by: [Signature]

Received for laboratory by: [Signature]

Date: 9/11/14 Time: 1130

Date: 9/11/14 Time: 1305

Sample entered by: RJC

Account: 2295 Work Order: 004036
Customer: Gregory Wacik Work Order Description: Beltzville Reservoir

Project Leader: CMB No: 242816

Address: USACE, Philadelphia District
Environmental Resources Branch
100 Penn Square East
Philadelphia PA 19107
Phone: 215-656-6561 Ext: WACIK

Chain of Custody

Remarks: _____

Total Sampling Time (hours): _____ Bottle Prep by: _____
Laboratory Receipt Temp: 9 Deg C. If Temp Unacceptable, On Ice? (Y) N
Approved By: RK

Sample No: 9 Desc: BZ-6 Mid-Depth
NO2-N, NO3-N, d-pO4-P, o-Po4, BOD, TK
NH3-N, tkn, Alk, tds, tss, po4-P, toc, TK

Sample No: 10 Desc: BZ-6 Deep
NO2-N, NO3-N, d-pO4-P, o-Po4, BOD, TK
NH3-N, tkn, Alk, tds, tss, po4-P, toc, TK

Sample No: 11 Desc: BZ-7 Surface
FC, EC, TC, TK
NO2-N, NO3-N, d-pO4-P, o-Po4, BOD, TK
NH3-N, tkn, Alk, tds, tss, po4-P, toc, TK

Matrix: 0 Date: 9/11/14
Time: 0800
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;

Matrix: 0 Date: 9/11/14
Time: 0800
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;

Matrix: 0 Date: 9/11/14
Time: 0930
A - 1 X 250mlMicro p w/ Sterile/Na2S2O3;
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;

Relinquished by: [Signature] Received by: [Signature]

Received for laboratory by: [Signature]

Date: 9/11/14 Time: 1130

Date: 9/11/14 Time: 1205

Sample entered by: RK

M. J. REIDER ASSOCIATES, INC.

jbs
08/06/14 12:22:12 PM

Chain of Custody

Project Leader: CMB No: 242816

Work Order: 004036
Work Order Description: Beltzville Reservoir

Customer: Gregory Wacik

Address: USACE, Philadelphia District
Environmental Resources Branch
100 Penn Square East
Philadelphia PA 19107
Phone: 215-656-6561 Ext: WACIK

Remarks:

Total Sampling Time (hours): _____ Bottle Prep by: _____

Laboratory Receipt Temp: 9 Deg C. If Temp Unacceptable, On Ice? Y N
Approved By: RW

Sample No: 12 Desc: BZ-7 Mid-Depth
NO2-N, NO3-N, d-p04-p, o-p04, BOD, W
NH3-N, tkn, Alk, tds, tss, po4-p, toc,

Matrix: O Date: 9/11/14
Time: 0930
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;

Sample No: 13 Desc: BZ-7 Deep
NO2-N, NO3-N, d-p04-p, o-p04, BOD, W
NH3-N, tkn, Alk, tds, tss, po4-p, toc,

Matrix: O Date: 9/11/14
Time: 0930
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;

Relinquished by: [Signature] Received by: [Signature]

Received for laboratory by: [Signature]

Date: 9/11/14 Time: 1130

Date: 9/11/14 Time: 1305

Sample entered by: RJC