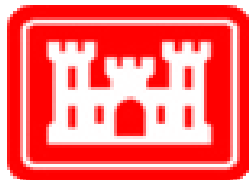


**2022 WATER QUALITY MONITORING  
BELTZVILLE RESERVOIR  
LEHIGHTON, PENNSYLVANIA**



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

**March 2023**

**2022 Water Quality Monitoring  
Beltzville Reservoir  
Lehigh, Pennsylvania**

**TABLE OF CONTENTS**

<b><u>SECTION</u></b>	<b><u>PAGE NO.</u></b>
<b>EXECUTIVE SUMMARY</b>	
<b>1.0 INTRODUCTION</b>	<b>1-1</b>
1.1 DESCRIPTION OF BELTZVILLE RESERVOIR	1-1
1.2 PURPOSE OF THE MONITORING PROGRAM	1-1
1.3 ELEMENTS OF THE STUDY	1-3
<b>2.0 METHODS</b>	<b>2-1</b>
2.1 STRATIFICATION MONITORING	2-1
2.2 WATER COLUMN CHEMISTRY MONITORING	2-1
2.3 TROPHIC STATE DETERMINATION	2-5
2.4 RESERVOIR BACTERIA MONITORING	2-5
<b>3.0 RESULTS AND DISCUSSION</b>	<b>3-1</b>
3.1 STRATIFICATION MONITORING	3-1
3.1.1 Temperature	3-1
3.1.2 Dissolved Oxygen	3-4
3.1.3 pH	3-7
3.2 WATER COLUMN CHEMISTRY MONITORING	3-10
3.2.1 Ammonia	3-10
3.2.2 Nitrite and Nitrate	3-18

**2022 Water Quality Monitoring  
Beltzville Reservoir  
Lehigh, Pennsylvania**

**TABLE OF CONTENTS**

<b><u>SECTION</u></b>	<b><u>PAGE NO.</u></b>
3.2.3 Total Kjeldahl Nitrogen	3-18
3.2.4 Total Phosphorus	3-18
3.2.5 Dissolved Phosphorus	3-19
3.2.6 Total Dissolved Solids	3-19
3.2.7 Total Suspended Solids	3-19
3.2.8 Biochemical Oxygen Demand	3-20
3.2.9 Alkalinity	3-20
3.2.10 Total Organic Carbon	3-20
3.2.11 Chlorophyll a	3-21
3.3 TROPHIC STATE DETERMINATION	3-21
3.4 RESERVOIR BACTERIA MONITORING	3-22
<b>4.0 REFERENCES</b>	
<b>APPENDIX A- YSI 6600 Data Summary Tables</b>	
<b>APPENDIX B- Laboratory Custody Sheets</b>	

**2022 Water Quality Monitoring  
Beltzville Reservoir  
Lehigh, Pennsylvania**

**TABLE OF CONTENTS**

<b><u>SECTION</u></b>	<b><u>LIST OF TABLES</u></b>	<b><u>PAGE NO.</u></b>
<b>2-1</b>	Beltzville Reservoir water quality monitoring schedule for 2022	<b>2-2</b>
<b>2-2</b>	Water quality test methods, detection limits, state regulatory criteria, and sample holding times for water quality parameters monitored at Beltzville Reservoir 2022	<b>2-4</b>
<b>2-3</b>	Water quality test methods, detection limits, PADEP water quality standards, and sample holding times for bacteria parameters monitored at Beltzville Reservoir in 2022	<b>2-5</b>
<b>3-1</b>	PADEP ammonium nitrogen criteria (Pennsylvania Code, Title 25 2013) Specific ammonia criteria dependent on temperature and pH	<b>3-10</b>
<b>3-2</b>	Summary of surface, middle, and bottom water quality monitoring data for Beltzville Reservoir in 2022	<b>3-11</b>
<b>3-3</b>	EPA trophic classification criteria and average monthly measures for Beltzville Reservoir in 2022	<b>3-22</b>
<b>3-4</b>	Bacteria counts (colonies/100ml) at Beltzville Reservoir surface stations during 2022	<b>3-24</b>

**2022 Water Quality Monitoring  
Beltzville Reservoir  
Lehighton, Pennsylvania**

**TABLE OF CONTENTS**

**SECTION** **PAGE NO.**

**LIST OF FIGURES**

<b>1-1</b>	Beltzville Reservoir water intake control tower and selective withdrawal design at Beltzville Dam and Reservoir, Carbon County, Pennsylvania	<b>1-2</b>
<b>2-1</b>	Location map of Beltzville Reservoir monitoring stations in 2022	<b>2-3</b>
<b>3-1</b>	Temperatures measured in surface waters of Beltzville Reservoir during 2022	<b>3-2</b>
<b>3-2</b>	Stratification of temperature measured in the water column of Beltzville Reservoir at station BZ-6 during 2022	<b>3-3</b>
<b>3-3</b>	Dissolved oxygen measured in surface waters of Beltzville Reservoir during 2022	<b>3-5</b>
<b>3-4</b>	Dissolved oxygen measured in the water column of Beltzville Reservoir at station BZ-6 during 2022	<b>3-6</b>
<b>3-5</b>	Measures of pH in surface waters of Beltzville Reservoir during 2022	<b>3-8</b>
<b>3-6</b>	Profile of pH measured in the water column of Beltzville Reservoir at station BZ-6 during 2022	<b>3-9</b>
<b>3-7</b>	Carlson Trophic state indices calculated from secchi disk depth, concentrations of chlorophyll a and Total Phosphorus measured in surface waters of Beltzville Reservoir at station BZ-6 during 2022	<b>3-23</b>

# Executive Summary

The United States Army Corps of Engineers, Philadelphia District, implemented a water quality monitoring program during the mid-1970s to evaluate how its dam and reservoir civil works projects may be affecting water resources. Data collected during this initial effort and annually thereafter serves as an invaluable tool for evaluating the significance of annual water quality measurements and tracking long-term trends. The District's Water Quality Program's area of responsibility includes four flood control reservoirs and is utilized to evaluate changes in operations and their potential effects on water quality, the environment, and public use and safety.

While water quality in the Philadelphia District's reservoirs is generally good overall, several water quality issues exist at each project and need to be closely monitored. The Beltzville Reservoir watershed is predominantly forested but does experience external nutrient inputs from agriculture and residential land use practices that directly affects the water quality of the lake. Changes in land use upstream can have long term implications on water quality in the basin and lake. Water quality within the lake and release waters are directly affected by changing operations historically and annually for recreation, flood risk management, water supply, and water quality related operations. The project has a selective withdrawal tower that provides operational flexibility and is used to mitigate water quality concerns downstream. As it relates to Beltzville Reservoir and tributary water quality conditions during the May through September 2022 sampling season, the following observations were made:

- Monthly water quality profile monitoring at all seven fixed stations was conducted once a month from May through September 2022. The reservoir has shown strong temperature stratification, that is directly affected by changing operations and meteorological conditions experienced throughout the sampling season. In 2022, upstream tributary water temperatures exceeded the maximum Pennsylvania state water quality criteria for maintenance of cold-water fisheries, at times, in late summer and early fall. However, throughout the summer season the downstream release water temperatures were effectively maintained below the Pennsylvania maximum temperature criteria established for the Pohopoco Creek which is classified a High-Quality Cold-Water Fishery. This was accomplished by USACE staff closely monitoring release water temperatures downstream and adjusting water quality selective withdrawal portals, as applicable, to target downstream Pennsylvania seasonal temperature criteria.
- Dissolved oxygen levels remained above the minimum 5.0 mg/L Pennsylvania state water quality criteria for the epilimnion (surface waters) of stratified lakes. There are no state criteria established for deep water dissolved oxygen levels. However, deeper water column oxygen levels do influence the water quality and health of the lake. 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 2022, these conditions were seen in both deeper bottom and mid depth waters during September at the tower station BZ-6. These conditions do not impact downstream release DO levels as release waters are re-aerated as they pass through the outlet system of the reservoir and dissolved oxygen levels remain well above Pennsylvania state surface water quality criteria in the Pohopoco Creek throughout the year.
- Dissolved Oxygen in the water column at station BZ-6 of Beltzville Reservoir from June through September, exhibited a metalimnetic oxygen minimum (negative heterograde curve) with concentrations decreasing, increasing, and decreasing rapidly as measurements were taken from the surface to the lake bottom. The most severe occurrence of these conditions was seen in September. This DO pattern has been observed at station BZ-6 in previous years and can be caused by a variety of operational and environmental factors or a combination of factors. This occurrence has the potential to limit fishery movement vertically in the water column resulting in impacts on habitat use, feeding, and other life processes. No visible or reported impacts on the in-lake fishery has occurred because of these low oxygen conditions.

# Executive Summary

- During the 2022 sampling season, the pH measures throughout the water column complied with PADEP pH criteria. The standard for pH is a range of acceptable measures between 6 and 9.
- Nutrient samples collected in 2022 (including samples from reservoir, tailwater, and tributary sites), remained consistently low and routinely within United States Environmental Protection Agency (USEPA) or Pennsylvania state water quality recommended levels during the May through September sampling season. As an oligotrophic/mesotrophic lake and being located within a relatively low nutrient producing watershed, this would be expected. Upstream tributary station BZ-5S (Pohopoco Creek) did however exceed the EPA 0.01 mg/L suggested total phosphorus concentration through much of the sampling season. Land use or other watershed factors contribute to nutrient loading in this tributary.
- In 2022, surface water bacteria samples were collected at all seven fixed stations in the watershed and reservoir as a public health and safety monitoring tool. The E. coli samples collected at Beltzville Reservoir did exceed the 235 organisms/100 ml single water sample threshold on five occasions with four of the five samples collected from upstream tributary stations. Upstream tributary stations consistently maintained the highest bacteria readings and may be associated with upstream watershed activities or land use. Water contact recreation is permitted at Beltzville Reservoir. The recreational swimming beach is monitored for bacteria and managed independently at the project by the Pennsylvania Department of Conservation and Natural Resources. No long-term elevated bacteria counts were recorded in the main reservoir body where public water recreation is permitted.

## 1.0 INTRODUCTION

### 1.1 DESCRIPTION OF BELTZVILLE RESERVOIR

The U.S. Army Corps of Engineers (USACE) operates Beltzville Reservoir located in east-central Pennsylvania within the Delaware River Basin. Beltzville Reservoir is an integral part of the Lehigh River Flood Management Program. The Reservoir is authorized to provide flood control, water supply, low flow augmentation, 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. It is in Carbon County, 3 miles northeast of Lehighton and approximately 20 miles northwest of Allentown, Pennsylvania. The reservoir dams a drainage area of 96.3 square miles and can impound up to 13.99 billion gallons of water at pool elevation 628.00 feet National Geodetic Vertical Datum of 1929 (NGVD29). 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 covers an area of 943.71 acres when operating at its base pool elevation of 628.00 feet NGVD29. The maximum depth of the lake is 140 feet near the face of the dam and the reservoirs operational control tower has in lake selective withdrawal capabilities (Figure 1.1).

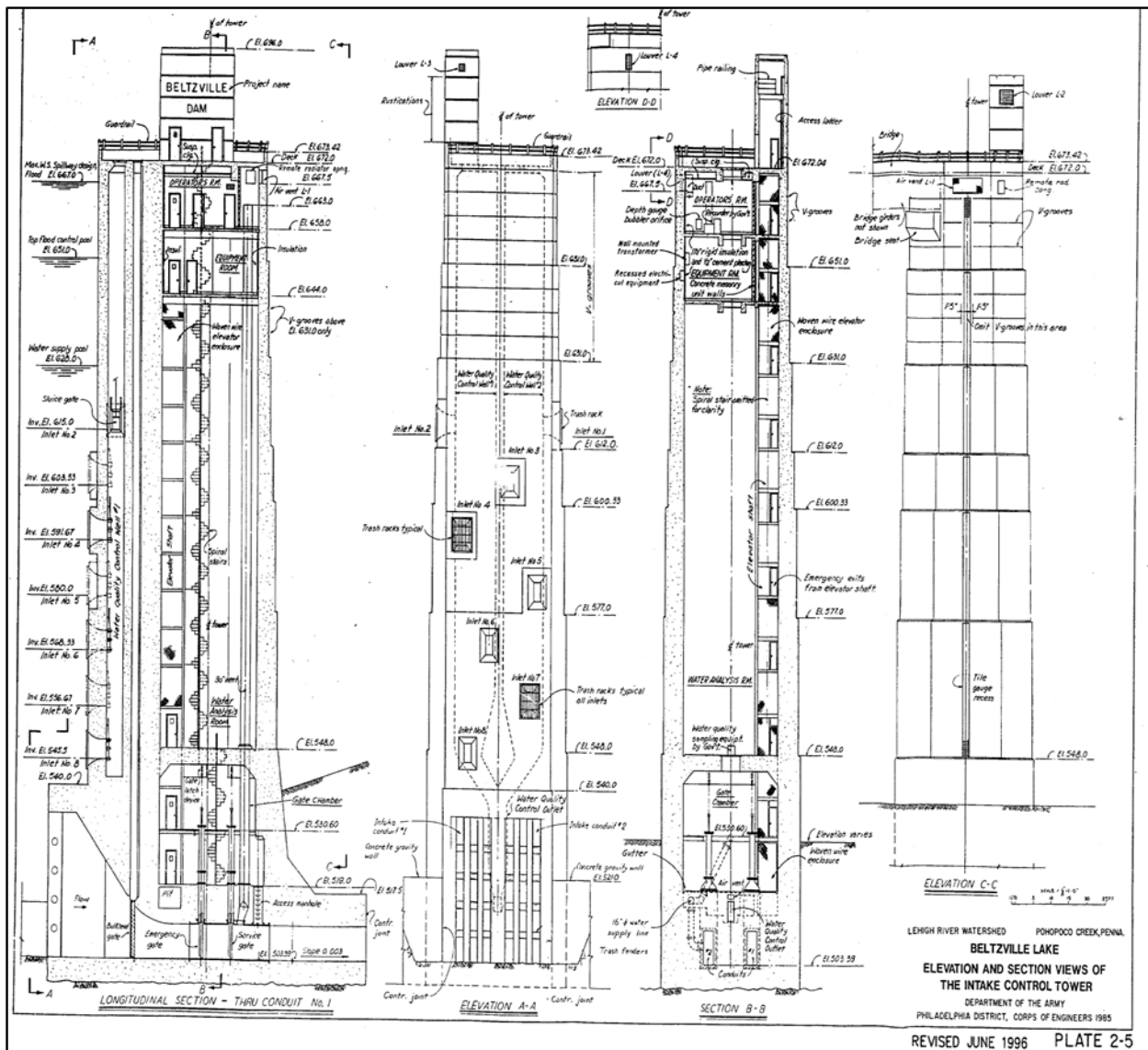
### 1.2 PURPOSE OF THE MONITORING PROGRAM

The United States Army Corps of Engineers commitment to environmental compliance and protection of estuaries, rivers, lakes, and navigable waters arises from the national policy and directives expressed in Federal Statutes, Executive Orders, and internal regulations. These regulations were designed to minimize pollution, maximize recreation, protect aesthetics, preserve natural resources, and promote the comprehensive planning and use of water bodies to enhance the public interest; therefore, USACE, in the design, construction, management, operation, and maintenance of its facilities, exerts leadership within existing authorities and appropriations in the nationwide effort to protect, enhance, and sustain the quality of the nation's resources. It is USACE's policy to comply with requirements of the Clean Water Act and not to degrade existing water quality conditions to the maximum extent that is practicable, consistent with project authorities, Federal legal and regulatory requirements, the public interest, and water control manuals. The impacts of impounding a free-flowing waterbody can be detrimental, extensive, and enduring. It is the policy of the Corps that the environment be given equal weight, not simply consideration, in all aspects of project management and the operational decision-making process.

The Corps' water quality management authority is founded on the Federal Water Pollution Control Act of 1948 and its amendments. Several Corps policies support operating Corps projects in an environmentally responsible manner. These include Engineer Regulations, Engineer Manuals, and the Environmental Operating Principles. U.S. Army Corps of Engineers policy necessitates the development and implementation of a holistic watershed monitoring plan designed to protect resources and execute an environmentally sound water quality management strategy for each project. The activities of the District's Water Quality Program are driven by the guidance and requirements set forth in ER 1110-2-8154, titled "Water Quality and Environmental Management for Corps Civil Works Projects". ER 1110-2-8154 states, "The Corps operates a water quality management program to ensure that all applicable



state and federal water quality standards are met, water quality degradation of Corps resources is avoided or minimized, and project responsibilities are attained.”



**Figure 1-1.** Beltville Reservoir water intake control tower and selective withdrawal design at Beltville Dam and Reservoir, Carbon County, Pennsylvania.

Foremost, Beltville Reservoir provides flood management to downstream communities on the 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 Beltville Reservoir serves, the USACE monitors water quality and other aspects of reservoir health to ensure user safety and protection of the environmental resources at the reservoir and downstream along the Pohopoco Creek and Lehigh River. Water quality monitoring results are compared to state and federal water quality standards and used to diagnose problems that commonly effect reservoir health such as nutrient enrichment and toxic loadings. This report

summarizes the results of water quality monitoring at Beltzville Reservoir from May through September 2022.

### **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 areas of concern such as the human health aspects of drinking water and assessments of potential sediment contaminants within the reservoir basin. The 2022 monitoring program was similar to those in recent years. The major element of the monitoring includes monthly physical and chemical water quality and bacteria monitoring from May through September to evaluate compliance with state and federal water quality standards and to monitor the overall health of the reservoir.

## 2.0 METHODS

### 2.1 STRATIFICATION MONITORING

Monitoring was conducted at seven fixed stations located throughout the reservoir watershed (Fig. 2-1). Physical stratification monitoring of the water column of Beltzville Reservoir was conducted five times between May and September 2022 at all fixed sampling stations (Table 2-1). Physical stratification parameters included temperature, dissolved oxygen (DO), pH, Oxidation Reduction Potential (ORP), Chlorophyll a, depth, turbidity, and conductivity. Surface water quality was monitored at stations downstream (release waters) of the reservoir (BZ-1S) and at upstream tributary waters (BZ-2S on Pine Run, BZ-4S on Wild Creek, and BZ-5S on Pohopoco Creek). Stratification depth monitoring was conducted within the lake near the reservoir operational control tower (BZ-6), mid-lake (BZ-3) and upper lake (BZ-7) with water quality measured from the water surface to the bottom at 5-ft intervals. The physical water quality parameters were measured with a calibrated YSI 6600 V2-4 water quality sonde.

In this report, when applicable, water quality monitoring results were compared to water quality standards established by the United States Environmental Protection Agency (USEPA) and the Pennsylvania Department of Environmental Protection (PADEP). The standard for DO is a minimum concentration of 5 mg/L in the epilimnion of a stratified lake and an acceptable range of pH from 6 to 9. PADEP temperature criteria are based on seasonal water use classification guidelines. All the water quality data collected during physical stratification monitoring is summarized in Appendix A.

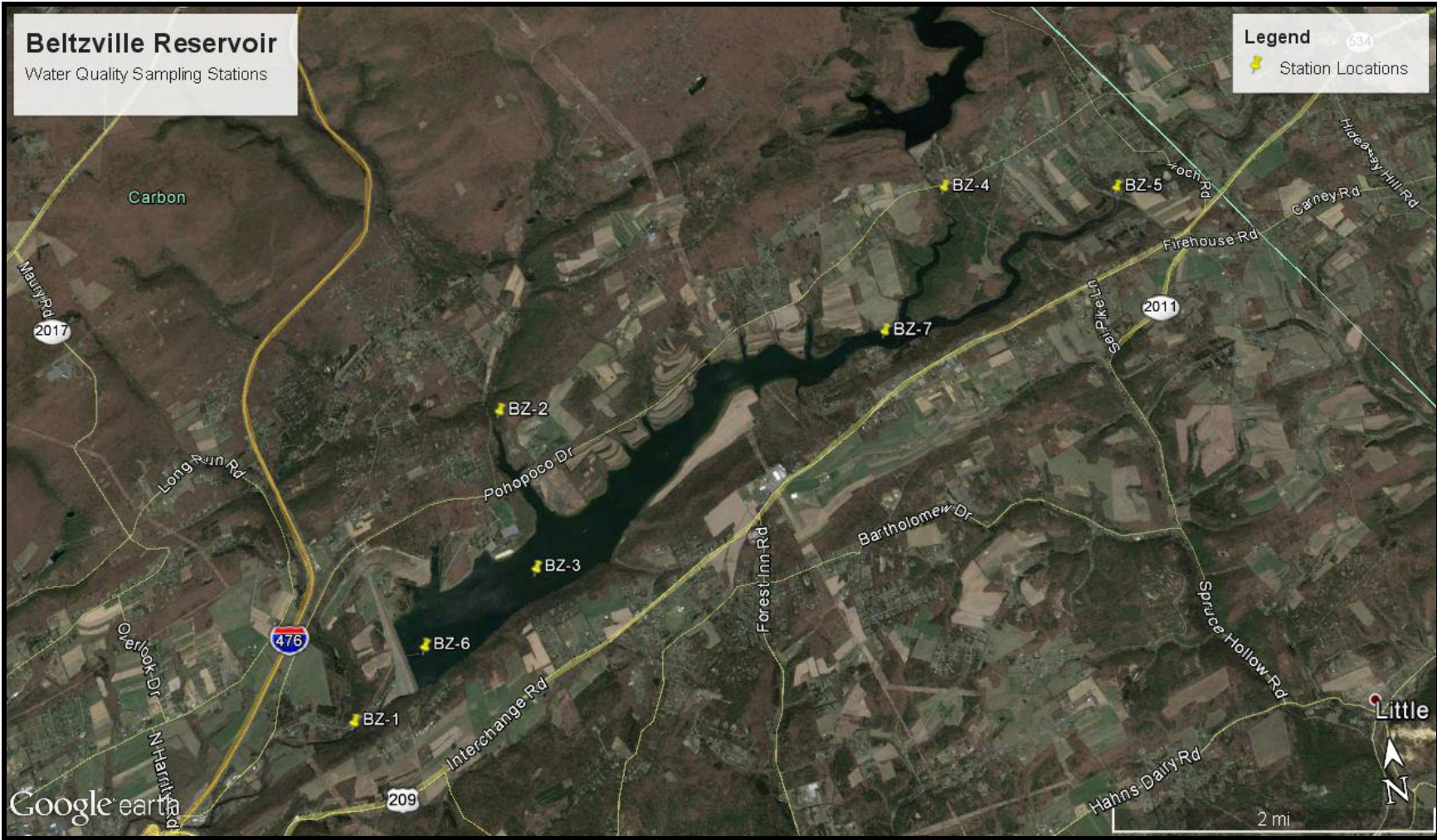
### 2.2 WATER COLUMN CHEMISTRY MONITORING

Water column chemistry monitoring was conducted five times at Beltzville Reservoir between May and September 2022 (Table 2-1). Water samples were collected at the seven fixed stations in the reservoir and its watershed (Fig. 2-1). Surface water samples were collected in release waters downstream of the reservoir (BZ-1S) and on upstream tributary source waters Pine Run (BZ-2S), Wild Creek (BZ-4S), and Pohopoco Creek (BZ-5S). Surface, middle, and bottom water samples were collected at the three in lake 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. All samples were placed on ice in a cooler and delivered to a certified laboratory for testing. Laboratory water sample analysis was conducted by M.J. Reider Associates, Inc Environmental Testing Laboratory located in Reading, Pennsylvania (U.S. EPA/PA DEP #06-00003).

Water samples from surface, middle, and bottom depths were analyzed for ammonia, nitrite, nitrate, total Kjeldahl nitrogen, total phosphorus, 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 2022

<b>Date of Sample Collection</b>	<b>Physical Stratification Monitoring (All Stations)</b>	<b>Water Column Chemistry Monitoring (All Stations)</b>	<b>Trophic State Assessment (BZ-6)</b>	<b>Bacteria Monitoring (All Surface Stations)</b>
12 May	X	X	X	X
16 June	X	X	X	X
14 July	X	X	X	X
18 August	X	X	X	X
15 September	X	X	X	X



**Figure 2-1.** Water quality monitoring stations in 2022 at the U.S. Army Corps of Engineers Beltzville Reservoir located in Lehighton, Pennsylvania.

<b>Table 2-1.</b> Water quality test methods, detection limits, state regulatory criteria, and sample holding times for water quality parameters monitored at Beltzville Reservoir in 2022				
<b>Parameter</b>	<b>(2) Method</b>	<b>Laboratory Limit of Reporting</b>	<b>PADEP Surface Water Quality Criteria</b>	<b>Allowable Hold Times (Days)</b>
Total Alkalinity	SM 2320 B	2.0 mg/L	Min. 20 mg/L CaCO <sub>3</sub>	14
Biochemical Oxygen Demand (BOD)	SM 5210 B	2.0 mg/L	None	2
Total Phosphorus	SM 4500-P F	0.01 mg/L	None	28
Diss./Ortho-Phosphate	NA	NA	None	28
Soluble Phosphorus	SM 4500-P F	0.01 mg/L	None	28
Total Organic Carbon (TOC)	SM 5310 C	0.5 mg/L	None	28
Total Inorganic Carbon (TIC) *	NA	NA	None	28
Total Carbon (TOC + TIC) *	NA	NA	None	28
(1) Chlorophyll <i>a</i>	YSI Probe	----	None	In Situ
Total Kjeldahl Nitrogen	EPA 351.2 Rev 2.0	0.50 mg/L	None	28
Ammonia	EPA 350.1	0.02 mg/L	Temp. and pH dependent	28
Nitrate	EPA 300.0 Rev 2.1	1.0 mg/L	Maximum 10 mg/L (nitrate + nitrite)	28
Nitrite	EPA 300.0 Rev 2.1	0.10 mg/L		28
Total Dissolved Solids	SM 2540 C	5.0 mg/L	Maximum 750 mg/L	7
Total Suspended Solids	SM 2540 D	1.0 mg/L	None	7

(1) Chlorophyll *a* samples were recorded using a YSI 6600 with a chlorophyll sensor.  
(2) Laboratory Methods Reference:  
**EPA-** "Methods for Chemical Analysis of Water and Wastes", EPA-600/4-79-020, March 1983 and subsequent revisions.  
**SM-** "Standard Methods for the Examination of Water and Wastewater", 22<sup>nd</sup> Edition, 2012.  
\* Total Inorganic Carbon and Total Carbon were not sampled for in 2021

### 2.3 TROPHIC STATE DETERMINATION

The trophic state of Beltzville Reservoir was determined by methods outlined by Carlson (1977) and USEPA (1983). In general, these methods calculate trophic state indices (TSIs) independently for measures of total phosphorus, chlorophyll *a*, and secchi disk depth. Surface water measures of total phosphorus and chlorophyll *a* from chemistry monitoring were used independently in the determining of monthly TSI values (Table 2-1). Secchi disk depth was measured only at reservoir-body Station BZ-6. Trophic state determinations were calculated monthly only for Station BZ-6 within the lake.

### 2.4 RESERVOIR BACTERIA MONITORING

Monitoring for coliform bacteria contaminants was conducted five times at each sampling station between May and September 2022 (Table 2-1). Surface water samples were analyzed for total coliform and escherichia coliform contamination as indicators of risk. 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, United States Environmental Protection Agency (EPA) and Pennsylvania Department of Environmental Protection (PADEP) standards, and sample holding times for the bacteria parameters monitored at Beltzville Reservoir in 2022. The bacteria analytical method was based on a membrane filtration technique. All the samples were analyzed within their maximum allowable hold times. Laboratory analysis was conducted by M.J. Reider Associates, Inc Environmental Testing Laboratory located in Reading, Pennsylvania (U.S. EPA/PA DEP #06-00003).

<b>Table 2-2. Water quality test methods, detection limits, PADEP standards, and sample holding times for bacteria parameters monitored at Beltzville Reservoir in 2022.</b>		
<b>Parameter</b>	<b>Total Coliform</b>	<b>Escherichia Coliform</b>
Test method	SM 9223 B	SM 9223 B
Limit of Quantification	1 mpn/100-mls	1 mpn/100-mls
PADEP/EPA standard	None	Geometric mean < 126 mpn/100-mls or a single sample reading of < 235 mpn/100-mls
Max. allowable holding time	30 hours	30 hours
Holding time	< 30 hours	< 30 hours

Monthly bacteria counts were compared to the USEPA primary recreation water quality single sample standard for Escherichia coli bacteria. Application of this standard applies to Beltzville Reservoir because swimming and other primary and secondary human/water contact recreation is permitted in the reservoir. Beltzville State Park maintains a bathing beach at Beltzville Reservoir and independently conducts bacteria sampling of that area. Given logistical limitations (all sampling conducted in one day) and because 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 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. USACE personnel collected the physical and chemical water quality data discussed herein over the monitoring period from May to September 2022. All the parameters were measured with a calibrated YSI 6600 V2-4 water quality sonde and are presented in Appendix A.

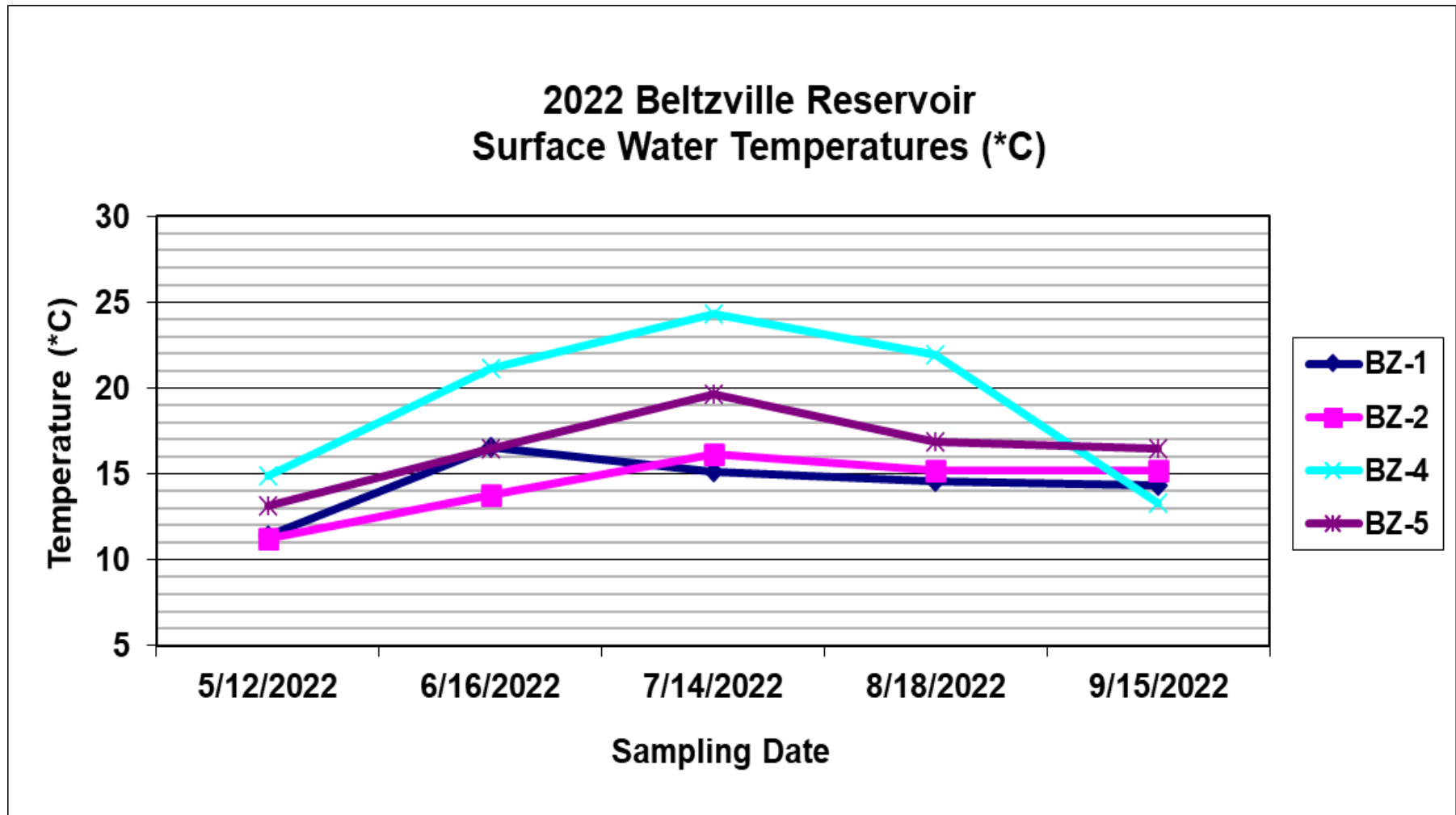
##### 3.1.1 Temperature

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

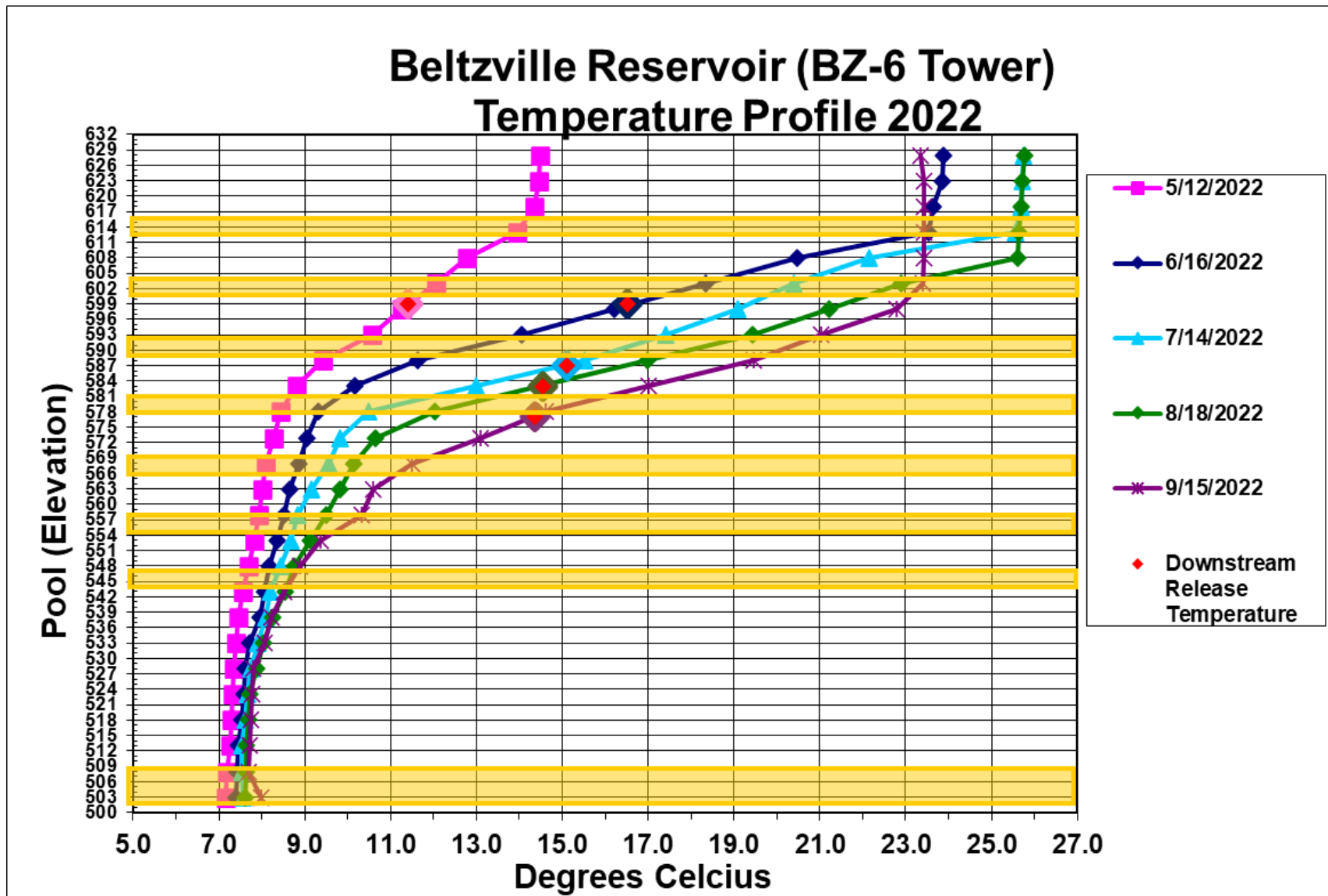
Temperatures of the tributary and downstream release surface waters generally followed a similar seasonal pattern throughout the watershed of Beltzville Reservoir during 2022 with maximum surface water temperatures seen in mid-July (Fig. 3-1). The maximum upstream tributary temperature of 24.35 °C was seen at station BZ-4S in mid-July. The maximum downstream release (BZ-1S) surface water temperature was 16.52 °C on 16 June. Upstream and downstream waters have a variety of environmental and anthropogenic factors potentially influencing surface water temperature. Station BZ-1S is directly influenced by Beltzville Reservoir releases that are pulled from various depths in the water column and is dictated by reservoir release operations. Downstream release temperatures are managed to meet Chapter 93 Pennsylvania State High-Quality Cold-Water Fishery criteria. Station BZ-2S is a small well vegetated cold-water tributary. Station BZ-4S is influenced by Wild Creek Reservoir releases upstream of Beltzville Reservoir and has consistently maintained annually the highest average tributary surface water temperatures throughout most sampling seasons. Station BZ-5S is located in an open water area where Pohopoco Creek enters Beltzville Reservoir. These factors, amongst others, 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 2022 (Fig. 3-2). The reservoir surface waters are warmed by the sun and 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 at Station BZ-6 with lake surface temperatures (14.49°C) approximately 7.34°C warmer than the lower water column (7.15°C). A strong stratification pattern was evident from May through September. As is seen in most years, cooling surface temperatures and erosion of the epilimnion developed in September marking the onset of fall turnover and destratification within the reservoir.





**Figure 3-1.** Tributary and downstream surface water temperature (°C) measured at Beltzville Reservoir in 2022. 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 2022. See Appendix A for summary of plotted values. As a reference, yellow shadowing represents the approximate location of water quality portals and bottom flood control gates for the Beltzville Reservoir control tower. See Figure 1.1 for tower design and elevations. Corresponding downstream release water temperatures at Station BZ-1S on each sampling date is also presented.

### 3.1.2 Dissolved Oxygen

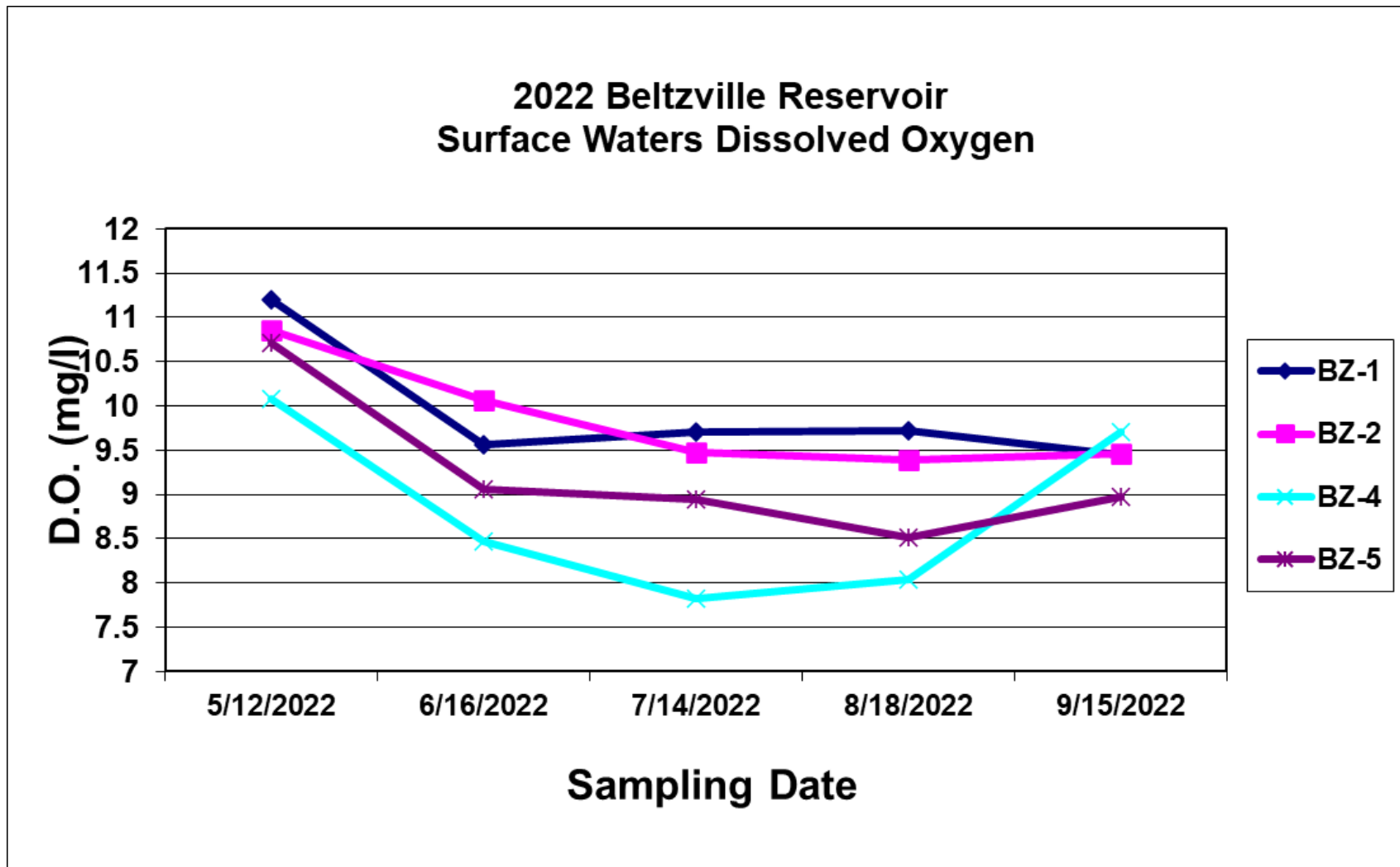
Dissolved oxygen (DO) is the measure of the amount of DO in water. Typically, DO concentrations in surface waters are less than 10 mg/L. Dissolved Oxygen concentrations are subject to diurnal and seasonal fluctuations that can be influenced, in part, by air and water temperature, river discharge, and 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 remained within a 7.82-11.20 mg/L value range and followed a similar seasonal pattern throughout the watershed during 2022 (Fig. 3-3). Dissolved oxygen concentrations downstream of the reservoir (BZ-1S) averaged 9.92 mg/L for the sampling season. The maximum DO reading of 11.20 mg/L occurred at BZ-1S on 12 May and a minimum reading of 7.82 mg/L occurred at BZ-4S on 14 July.

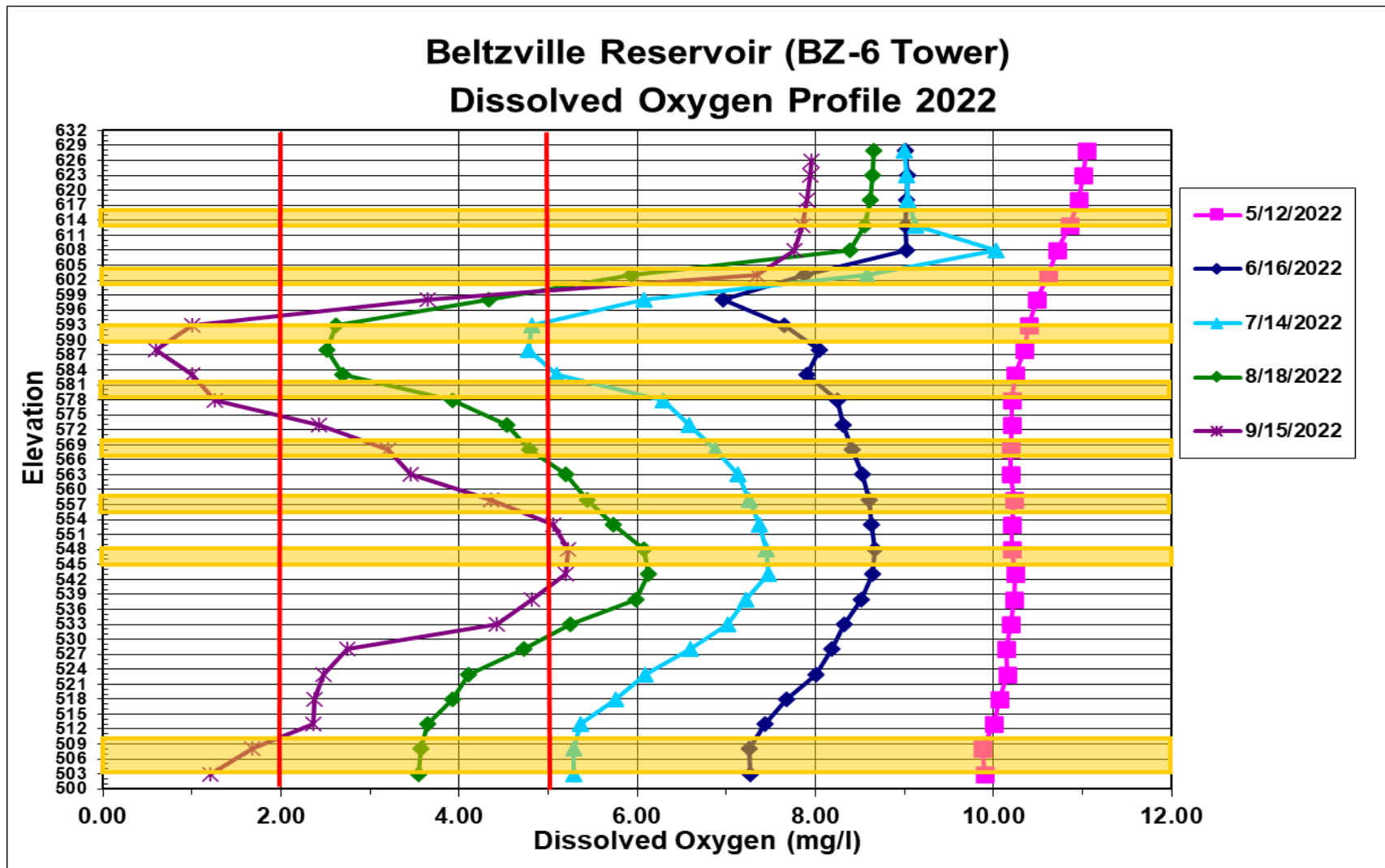
Dissolved Oxygen in the water column at station BZ-6 of Beltzville Reservoir from June through September, exhibited a metalimnetic oxygen minimum (negative heterograde curve) with concentrations decreasing, increasing, and decreasing rapidly as measurements were taken from the surface to the lake bottom (Fig. 3-4). The most severe occurrence of these conditions was seen in September. This DO 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 water quality portal operations at the reservoir tower, temperature related water density changes, respiratory oxygen consumption, lake topography or some other factor or combination of factors. This occurrence has the potential to limit fishery movement vertically in the water column resulting in impacts on habitat use, feeding, and other life processes. However, no visible or reported impacts on the in-lake fishery has occurred because of these low oxygen conditions.

The state water quality standard for DO is a minimum concentration of 5-mg/L in the epilimnion of stratified lakes. Dissolved oxygen concentrations in the epilimnion of the water column of Beltzville Reservoir remained above the PADEP water quality standards during 2022. As shown in Figure 3-4, concentrations falling below the standard were not encountered in the epilimnion in 2022 but did occur at greater depths. DO concentrations measured in all surface waters (epilimnion) of the reservoir remained above the criteria.

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 2022, these conditions were seen in both deeper bottom and mid depth waters during September at station BZ-6 (Appendix A).



**Figure 3-3.** Dissolved oxygen concentrations measured in tributary and downstream surface waters at Beltzville Reservoir in 2022. (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-1S reflects reservoir release surface waters downstream of Beltzville Reservoir.



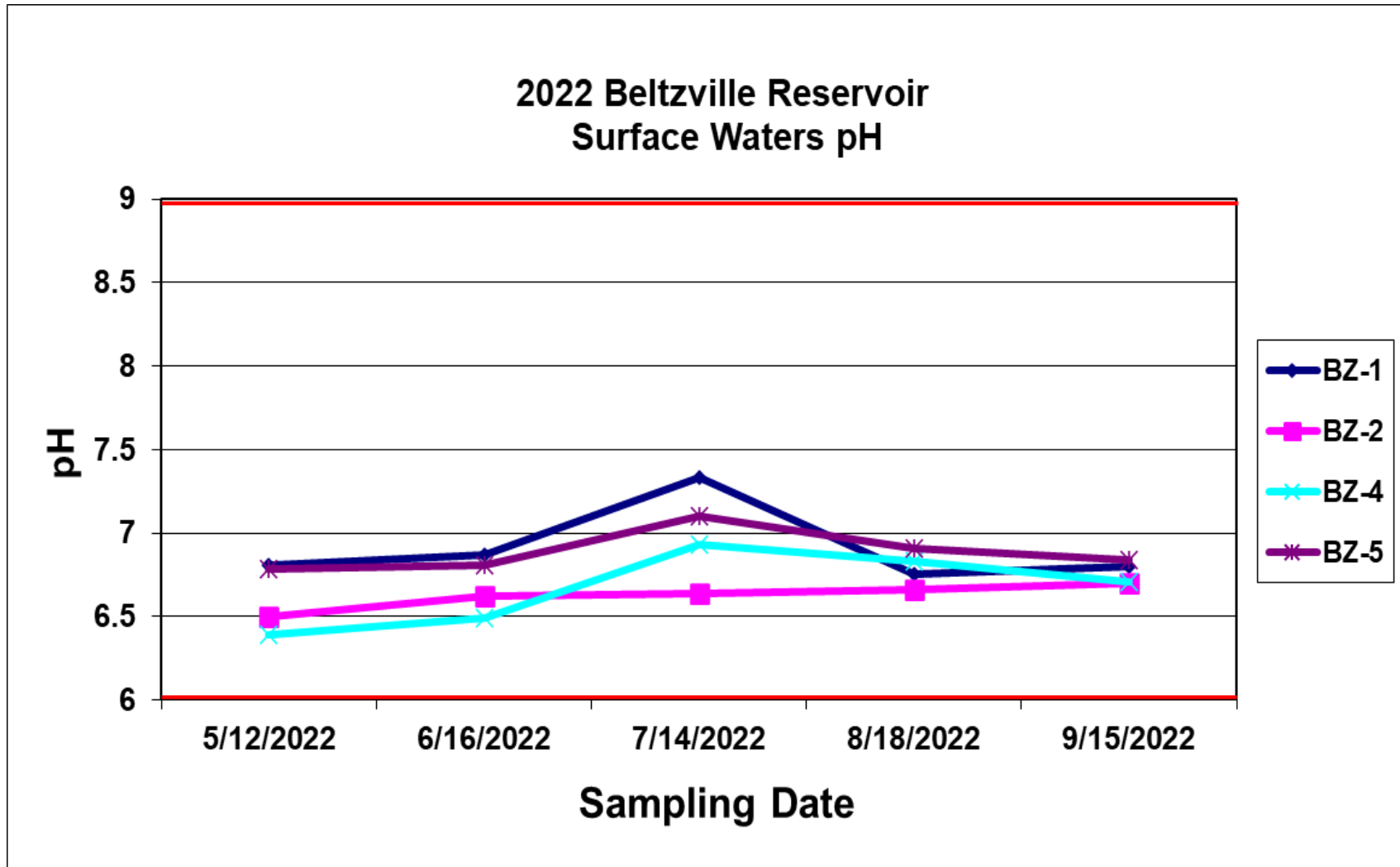
**Figure 3-4.** Dissolved oxygen profile at station BZ-6 of Beltzville Reservoir in 2022. The PADEP water quality standard for DO is a minimum concentration of 5 mg/L in epilimnion. Start of hypoxia is shown as 2 mg/L. See Appendix A for summary of plotted values. As a reference, yellow shading represents the approximate location of water quality portals and bottom flood control gates for the Beltzville Reservoir control tower. See Figure 1.1 for tower design and elevations.

### 3.1.3 pH

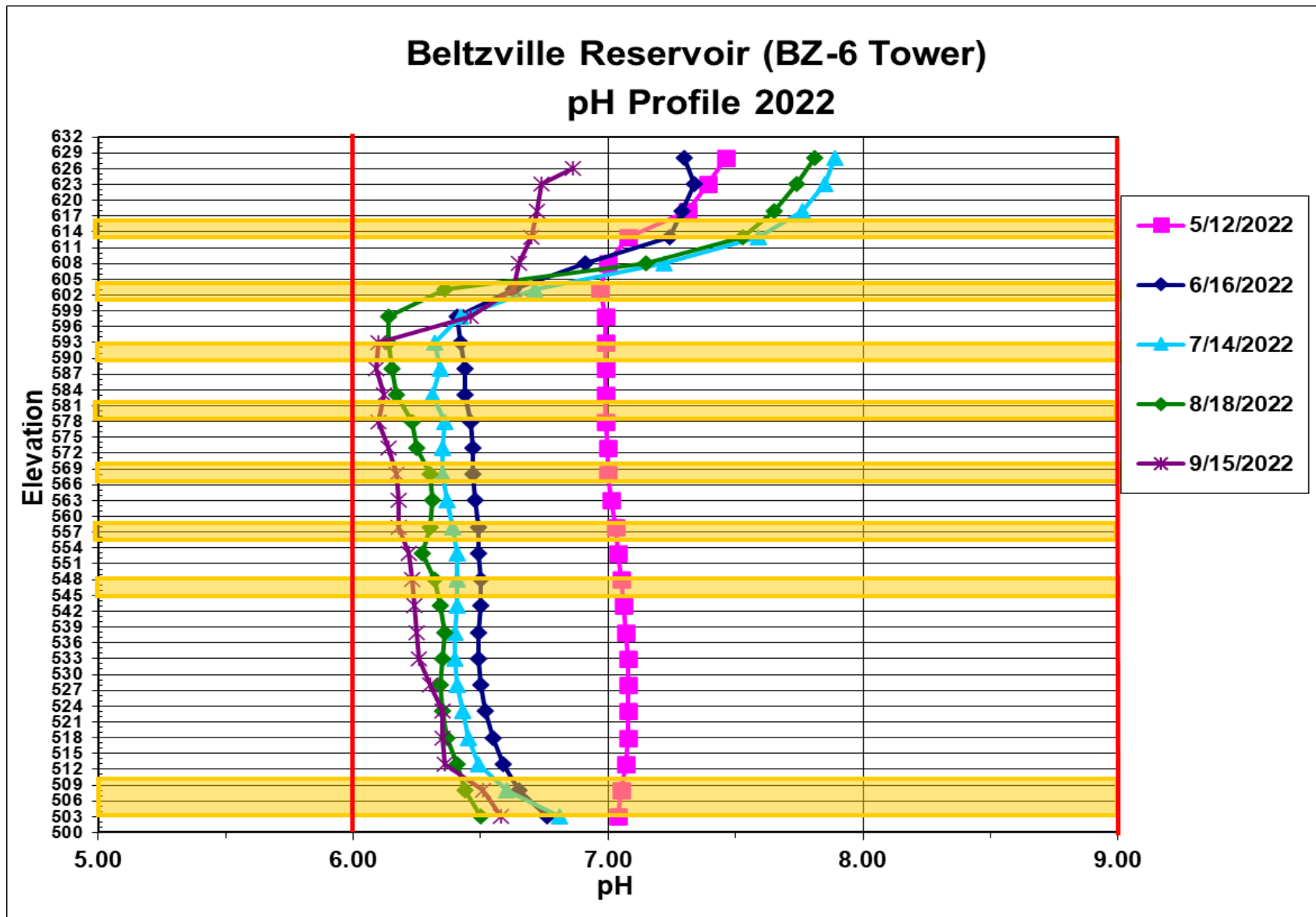
pH is the measure of the hydrogen ion concentration in the water. The pH scale is 0-14. A pH below 7 is considered acidic and a pH above 7 is basic. High pH values tend to facilitate solubilization of ammonia, salts, and heavy metals. Low pH levels tend to increase carbonic acid and carbon dioxide concentrations. 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 throughout the sampling season stayed within an acceptable range of values (6.39-7.33) and followed a similar seasonal pattern across all surface water stations at Beltzville Reservoir during 2022 (Fig. 3-5).

In all months sampled in 2022, pH values in the lake water column were slightly higher near the water surface, declined rapidly, and remained relatively constant 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. The summer season is a productive period of the year and is reflected by the increase in algal productivity and higher pH readings in July and August near the water surface. A slight variation in pH in bottom waters occurred in the portions of the water column experiencing anoxic or low oxygen conditions. This localized changes in pH may be attributed to anaerobic oxidation processes in the bottom waters of the lake near the sediment and water interphase. During the 2022 sampling season, the pH measures throughout the water column were in compliance with PADEP pH criteria. 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 2022. (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 2022. (The PADEP water quality standard for pH is between 6 and 9) See Appendix A for summary of plotted value. As a reference, yellow shadowing represents the approximate location of water quality portals and bottom flood control gates for the Beltzville Reservoir control tower. See Figure 1.1 for tower design and elevations.



### 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 2022 (Table 3-2).

#### 3.2.1 Ammonia

Total Ammonia (NH<sub>3</sub>) 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 and can result in excessive algal growths and impacts on recreation and drinking water supplies. In high concentrations, ammonia is toxic to aquatic life.

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

Ammonia concentrations were low in Beltzville Reservoir during 2022. Ammonia concentrations among 56 of 65 samples at all stations and depths remained below the laboratory minimum detection limit of 0.02 mg/L (Table 3-2). Sample results ranged from <0.02 mg/L to 0.11 mg/L (bottom waters at Station BZ-6D in September). Measurements greater than the minimum detection limit were most often recorded in deep bottom waters. Ammonia measured at Beltzville Reservoir remained below the EPA freshwater criteria during 2022.

<b>Table 3.1</b> Environmental Protection Agency Ammonia Freshwater Criteria (2013)	
2013 Final Aquatic Life Criteria for Ammonia (Magnitude, Frequency, and Duration)	
(mg TAN/L) pH 7.0, T=20°C	
Acute (1-hour average)	17
Chronic (30-day rolling average)	1.9*
*Not to exceed 2.5 times the CCC as a 4-day average within the 30-days, i.e. 4.8 mg TAN/L at pH 7 and 20°C, more than once in three years on average.	
Criteria frequency: Not to be exceeded more than once in three years on average.	

**Table 3.2.** Summary of surface, middle, and bottom water quality monitoring data for Beltzville Reservoir in 2022

Station	Date	ALK	BOD5	DISS-P	NH3	NO2	NO3	NO3-NO2	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-1S	5/12/2022	10	<2.0	<0.01	<0.02	<0.01	0.88	0.89	112	0.6	1.6	<0.01	5
	6/16/2022	12	4.3	<0.01	<0.02	<0.01	0.87	0.88	35	<0.43	1.8	<0.01	2
	7/14/2022	12	<2.0	<0.01	<0.02	<0.01	0.92	0.93	58	<0.43	1.9	0.02	6
	8/18/2022	12	5.1	<0.01	<0.02	<0.01	0.9	0.91	34	<0.43	1.5	<0.01	<1
	9/15/2022	13	<2.0	0.03	<0.02	<0.01	0.83	0.84	95	<0.43	1.7	<0.01	<1
	Mean	12	3.1	0.01	0.02	0.01	0.88	0.89	67	0.46	1.7	0.01	3
	Stdev	1	1.5	0.01	0.00	0.00	0.03	0.03	35	0.08	0.2	0.00	2
	Max	13	5.1	0.03	0.02	0.01	0.92	0.93	112	0.6	1.9	0.02	6
	Min	10	2	0.01	0.02	0.01	0.83	0.84	34	0.43	1.5	0.01	1
	No. of Det.	5	2	1	0	0	5	5	5	1	5	1	3
BZ-2S	5/12/2022	7	<2.0	<0.01	<0.02	<0.01	0.41	0.42	85	<0.43	0.7	<0.01	2
	6/16/2022	10	2	<0.01	<0.02	<0.01	0.4	0.41	50	<0.43	3.4	0.04	71
	7/14/2022	9	4.1	<0.01	<0.02	<0.01	0.35	0.36	32	<0.43	0.7	<0.01	3
	8/18/2022	8	<2.0	0.01	<0.02	<0.01	0.44	0.45	5	<0.43	0.8	<0.01	<1
	9/15/2022	15	<2.0	0.03	<0.02	<0.01	0.51	<0.52	99	<0.43	1.4	0.02	1
	Mean	10	2.4	0.01	0.02	0.01	0.42	0.43	54	0.43	1.4	0.02	16
	Stdev	3	0.9	0.01	0.00	0.00	0.06	0.06	38	0.00	1.2	0.01	31
	Max	15	4.1	0.03	0.02	0.01	0.51	0.52	99	0.43	3.4	0.04	71
	Min	7	2	0.01	0.02	0.01	0.35	0.36	5	0.43	0.7	0.01	1
	No. of Det.	5	2	2	0	0	5	4	5	0	5	2	4

Results and Discussion

**Table 3.2 Continued.** Summary of surface, middle, and bottom water quality monitoring data for Beltzville Reservoir in 2022

Station	Date	ALK	BOD5	DISS-P	NH3	NO2	NO3	NO3-NO2	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-3S	5/12/2022	11	<2.0	<0.01	<0.02	<0.01	0.86	0.87	89	0.46	1.6	<0.01	4
	6/16/2022	11	<2.0	<0.01	<0.02	<0.01	0.69	0.7	58	<0.43	1.8	<0.01	<1
	7/14/2022	11	<2.0	0.01	<0.02	<0.01	0.58	0.59	60	<0.43	1.6	<0.01	1
	8/18/2022	10	<2.0	0.07	<0.02	<0.01	0.47	0.48	38	<0.43	1.9	<0.01	1
	9/15/2022	12	2.5	0.03	0.03	<0.01	0.45	0.46	118	<0.43	1.7	<0.01	2
	Mean	11	2.1	0.03	0.022	0.01	0.61	0.62	73	0.44	1.7	0.01	2
	Stdev	1	0.2	0.03	0.00	0.00	0.17	0.17	31	0.01	0.1	0.00	1
	Max	12	2.5	0.07	0.03	0.01	0.86	0.87	118	0.46	1.9	0.01	4
	Min	10	2	0.01	0.02	0.01	0.45	0.46	38	0.43	1.6	0.01	1
	No. of Det.	5	1	3	1	0	5	5	5	1	5	0	4
BZ-3M	5/12/2022	11	<2.0	<0.01	<0.02	<0.01	0.94	0.95	85	0.85	1.4	<0.01	2
	6/16/2022	12	<2.0	<0.01	0.02	<0.01	0.88	0.89	60	<0.43	1.4	<0.01	<1
	7/14/2022	13	<2.0	<0.01	<0.02	<0.01	0.9	0.91	46	<0.43	1.3	<0.01	1
	8/18/2022	13	<2.0	<0.01	<0.02	<0.01	0.9	0.91	32	<0.43	1.5	<0.01	1
	9/15/2022	13	<2.0	0.02	<0.02	<0.01	0.91	0.92	115	<0.43	1.7	<0.01	<1
	Mean	12	2.0	0.01	0.02	0.01	0.91	0.92	68	0.51	1.5	0.01	1
	Stdev	1	0.0	0.00	0.00	0.00	0.02	0.02	33	0.19	0.2	0.00	0
	Max	13	2	0.02	0.02	0.01	0.94	0.95	115	0.85	1.7	0.01	2
	Min	11	2	0.01	0.02	0.01	0.88	0.89	32	0.43	1.3	0.01	1
	No. of Det.	5	0	1	1	0	5	5	5	1	5	0	3

**Table 3.2 Continued.** Summary of surface, middle, and bottom water quality monitoring data for Beltzville Reservoir in 2022

Station	Date	ALK	BOD5	DISS-P	NH3	NO2	NO3	NO3-NO2	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-3D	5/12/2022	12	<2.0	<0.01	<0.02	<0.01	0.93	0.94	104	0.5	1.4	<0.01	12
	6/16/2022	12	2.2	<0.01	0.02	0.03	0.84	0.87	50	<0.43	1.3	0.02	<1
	7/14/2022	14	<2.0	<0.01	<0.02	<0.01	0.83	0.84	57	<0.43	1.3	0.01	5
	8/18/2022	12	<2.0	<0.01	<0.02	<0.01	0.86	0.87	52	<0.43	1.4	<0.01	12
	9/15/2022	13	<2.0	0.03	<0.02	<0.01	0.82	0.83	96	<0.43	1.4	<0.01	1
	Mean	13	2.0	0.01	0.02	0.014	0.86	0.87	72	0.44	1.4	0.01	6
	Stdev	1	0.1	0.01	0.00	0.01	0.04	0.04	26	0.03	0.1	0.00	6
	Max	14	2.2	0.03	0.02	0.03	0.93	0.94	104	0.5	1.4	0.02	12
	Min	12	2	0.01	0.02	0.01	0.82	0.83	50	0.43	1.3	0.01	1
	No. of Det.	5	1	1	1	1	5	5	5	1	5	2	4
BZ-4S	5/12/2022	6	<2.0	<0.01	<0.02	<0.01	0.2	0.21	68	<0.43	1.5	<0.01	5
	6/16/2022	7	<2.0	<0.01	<0.02	<0.01	0.21	0.22	16	<0.43	2.5	0.01	7
	7/14/2022	7	<2.0	<0.01	<0.02	<0.01	0.18	0.19	32	<0.43	1.2	<0.01	2
	8/18/2022	7	<2.0	<0.01	<0.02	<0.01	<0.18	<0.19	23	<0.43	1.8	<0.01	4
	9/15/2022	7	<2.0	0.05	<0.02	<0.01	<0.18	<0.19	61	<0.43	1.2	<0.01	1
	Mean	7	2.0	0.02	0.02	0.01	0.19	0.20	40	0.43	1.6	0.01	4
	Stdev	0	0.0	0.02	0.00	0.00	0.01	0.01	23	0.00	0.5	0.00	2
	Max	7	2	0.05	0.02	0.01	0.21	0.22	68	0.43	2.5	0.01	7
	Min	6	2	0.01	0.02	0.01	0.18	0.19	16	0.43	1.2	0.01	1
	No. of Det.	5	0	1	0	0	3	3	5	0	5	1	5

**Table 3.2 Continued.** Summary of surface, middle, and bottom water quality monitoring data for Beltzville Reservoir in 2022

Station	Date	ALK	BOD5	DISS-P	NH3	NO2	NO3	NO3-NO2	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-5S	5/12/2022	14	<2.0	<0.01	<0.02	<0.01	1.29	1.3	115	0.52	1.5	0.01	7
	6/16/2022	16	2.5	<0.01	<0.02	<0.01	1.12	1.13	62	<0.43	2.7	0.05	106
	7/14/2022	15	<2.0	<0.01	<0.02	<0.01	1.27	1.28	66	<0.43	1.5	0.03	<1
	8/18/2022	16	<2.0	0.02	<0.02	<0.01	1.27	1.28	45	<0.43	1.2	0.01	10
	9/15/2022	19	<2.0	0.06	<0.02	<0.01	1.46	1.47	115	<0.43	2.1	0.03	5
	Mean	16	2.1	0.02	0.02	0.01	1.28	1.29	81	0.45	1.8	0.03	26
	Stdev	2	0.2	0.02	0.00	0.00	0.12	0.12	32	0.04	0.6	0.02	45
	Max	19	2.5	0.06	0.02	0.01	1.46	1.47	115	0.52	2.7	0.05	106
	Min	14	2	0.01	0.02	0.01	1.12	1.13	45	0.43	1.2	0.01	1
	No. of Det.	5	1	2	0	0	5	5	5	1	5	5	4
BZ-6S	5/12/2022	11	<2.0	<0.01	<0.02	<0.01	0.86	0.87	92	0.45	1.9	<0.01	4
	6/16/2022	10	<2.0	<0.01	<0.02	<0.01	0.7	0.71	49	<0.43	1.8	0.02	<1
	7/14/2022	11	<2.0	<0.01	<0.02	<0.01	0.58	0.59	30	<0.43	1.6	<0.01	<1
	8/18/2022	11	<2.0	0.01	<0.02	<0.01	0.48	0.49	47	<0.43	1.9	<0.01	1
	9/15/2022	13	<2.0	0.04	<0.02	<0.01	0.45	0.46	96	<0.43	1.6	<0.01	1
	Mean	11	2.0	0.02	0.02	0.01	0.61	0.62	63	0.43	1.8	0.01	2
	Stdev	1	0.0	0.01	0.00	0.00	0.17	0.17	29	0.01	0.2	0.00	1
	Max	13	2	0.04	0.02	0.01	0.86	0.87	96	0.45	1.9	0.02	4
	Min	10	2	0.01	0.02	0.01	0.45	0.46	30	0.43	1.6	0.01	1
	No. of Det.	5	0	2	0	0	5	5	5	1	5	1	3

**Table 3.2 Continued.** Summary of surface, middle, and bottom water quality monitoring data for Beltzville Reservoir in 2022

Station	Date	ALK	BOD5	DISS-P	NH3	NO2	NO3	NO3-NO2	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-6M	5/12/2022	11	<2.0	<0.01	<0.02	<0.01	0.92	0.93	94	<0.43	1.5	<0.01	2
	6/16/2022	11	<2.0	<0.01	<0.02	<0.01	0.88	0.89	58	<0.43	1.3	<0.01	<1
	7/14/2022	13	<2.0	<0.01	<0.02	<0.01	0.9	0.91	40	<0.43	1.5	<0.01	1
	8/18/2022	11	<2.0	<0.01	<0.02	<0.01	0.89	0.9	72	<0.43	1.4	<0.01	1
	9/15/2022	13	<2.0	0.04	<0.02	<0.01	0.87	0.88	98	<0.43	1.4	<0.01	2
	Mean	12	2.0	0.02	0.02	0.01	0.89	0.90	72	0.43	1.4	0.01	1
	Stdev	1	0.0	0.01	0.00	0.00	0.02	0.02	24	0.00	0.1	0.00	1
	Max	13	2	0.04	0.02	0.01	0.92	0.93	98	0.43	1.5	0.01	2
	Min	11	2	0.01	0.02	0.01	0.87	0.88	40	0.43	1.3	0.01	1
	No. of Det.	5	0	1	0	0	5	5	5	0	5	0	4
BZ-6D	5/12/2022	11	<2.0	<0.01	<0.02	<0.01	0.93	0.94	68	0.47	1.8	0.03	68
	6/16/2022	12	4.1	<0.01	0.04	0.03	0.83	0.86	68	<0.43	1.2	0.02	<1
	7/14/2022	13	<2.0	<0.01	<0.02	<0.01	0.84	0.85	54	<0.43	1.5	0.01	1
	8/18/2022	15	<2.0	0.03	0.06	<0.01	0.71	0.72	50	<0.43	1.8	<0.01	20
	9/15/2022	15	2.1	0.05	0.11	<0.01	0.78	0.79	101	1.42	2	0.13	215
	Mean	13	2.4	0.02	0.05	0.014	0.82	0.83	68	0.64	1.7	0.04	61
	Stdev	2	0.9	0.02	0.04	0.01	0.08	0.08	20	0.44	0.3	0.05	90
	Max	15	4.1	0.05	0.11	0.03	0.93	0.94	101	1.42	2	0.13	215
	Min	11	2	0.01	0.02	0.01	0.71	0.72	50	0.43	1.2	0.01	1
	No. of Det.	5	2	2	3	1	5	5	5	2	5	4	4

## Results and Discussion

<b>Table 3.2 Continued.</b> Summary of surface, middle, and bottom water quality monitoring data for Beltzville Reservoir in 2022													
Station	Date	ALK	BOD5	DISS-P	NH3	NO2	NO3	NO3-NO2	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-7S	5/12/2022	11	<2.0	<0.01	<0.02	<0.01	0.93	0.94	82	0.47	1.7	0.02	2
	6/16/2022	9	<2.0	<0.01	<0.02	<0.01	0.51	0.52	37	<0.43	1.7	<0.01	3
	7/14/2022	10	<2.0	<0.01	<0.02	<0.01	0.54	0.55	52	<0.43	1.6	<0.01	3
	8/18/2022	12	4.3	0.03	<0.02	<0.01	0.47	0.48	37	<0.43	1.7	0.01	<1
	9/15/2022	12	<2.0	0.04	0.04	<0.01	0.43	0.44	72	<0.43	1.6	<0.01	4
	Mean	11	2.5	0.02	0.024	0.01	0.58	0.59	56	0.44	1.7	0.01	3
	Stdev	1	1.0	0.01	0.01	0.00	0.20	0.20	20	0.02	0.1	0.00	1
	Max	12	4.3	0.04	0.04	0.01	0.93	0.94	82	0.47	1.7	0.02	4
	Min	9	2	0.01	0.02	0.01	0.43	0.44	37	0.43	1.6	0.01	1
	No. of Det.	5	1	2	1	0	5	5	5	1	5	2	4
BZ-7M	5/12/2022	12	<2.0	<0.01	<0.02	<0.01	0.96	0.97	87	<0.43	2.1	<0.01	<1
	6/16/2022	14	<2.0	0.01	0.02	<0.01	1.13	1.14	65	<0.43	1.7	<0.01	1
	7/14/2022	13	<2.0	<0.01	<0.02	<0.01	1.02	1.03	75	<0.43	1.6	0.01	2
	8/18/2022	13	4.3	<0.01	<0.02	<0.01	0.91	0.92	55	<0.43	1.4	0.01	2
	9/15/2022	15	<2.0	0.04	<0.02	<0.01	0.8	0.81	90	<0.43	2.5	0.01	1
	Mean	13	2.5	0.02	0.02	0.01	0.96	0.97	74	0.43	1.9	0.01	1
	Stdev	1	1.0	0.01	0.00	0.00	0.12	0.12	15	0.00	0.4	0.00	1
	Max	15	4.3	0.04	0.02	0.01	1.13	1.14	90	0.43	2.5	0.01	2
	Min	12	2	0.01	0.02	0.01	0.8	0.81	55	0.43	1.4	0.01	1
	No. of Det.	5	1	2	1	0	5	5	5	0	5	3	4

**Table 3.2 Continued.** Summary of surface, middle, and bottom water quality monitoring data for Beltzville Reservoir in 2022

Station	Date	ALK	BOD5	DISS-P	NH3	NO2	NO3	NO3-NO2	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-7D	5/12/2022	13	<2.0	0.01	0.03	<0.01	0.97	0.98	92	0.44	2.6	0.02	60
	6/16/2022	11	3.9	0.01	<0.02	0.02	0.86	0.88	58	<0.43	1.5	0.03	8
	7/14/2022	14	<2.0	<0.01	0.03	<0.01	0.86	0.87	63	0.87	3.4	0.18	108
	8/18/2022	14	<2.0	0.02	0.03	<0.01	0.79	0.8	54	<0.43	1.5	0.02	6
	9/15/2022	15	<2.0	0.02	0.04	<0.01	0.79	0.8	83	<0.43	1.6	0.02	2
	Mean	13	2.4	0.01	0.03	0.012	0.85	0.87	70	0.52	2.1	0.05	37
	Stdev	2	0.8	0.01	0.01	0.00	0.07	0.07	17	0.20	0.9	0.07	46
	Max	15	3.9	0.02	0.04	0.02	0.97	0.98	92	0.87	3.4	0.18	108
	Min	11	2	0.01	0.02	0.01	0.79	0.8	54	0.43	1.5	0.02	2
	No. of Det.	5	1	4	4	1	5	5	5	2	5	5	5

< Laboratory analysis result was less than the limit of quantification or limit of detection.



### 3.2.2 Nitrite and Nitrate

Nitrite (NO<sub>2</sub>) 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. Other than three deep bottom water samples in the month of June, concentrations measured at all stations and depths remained below the laboratory reporting limit of 0.01 mg/L during the 2022 sampling season.

Nitrate (NO<sub>3</sub>) 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 and watershed of Beltzville Reservoir during 2022 with sample results ranging from <0.18 mg/L to 1.46 mg/L (Table 3-2). The highest recorded single nitrate measure of 1.46 mg/L was measured on 15 September at upstream tributary station BZ-5S. Station BZ-5S maintained the highest seasonal mean concentration of 1.28 mg/L of all stations. Elevated readings at this tributary station can be attributed to watershed inputs.

Beltzville Reservoir remained below the PADEP water quality standard for nitrite and nitrate during 2022. 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 1.47 mg/L was measured at station BZ-5S on 15 September.

### 3.2.3 Total Kjeldahl Nitrogen

Total Kjeldahl Nitrogen (TKN) is a measure of organic nitrogen that includes ammonia. Organic nitrogen is not immediately available for biological activity and is therefore not available for plant growth until decomposition to inorganic form occurs. Total kjeldahl nitrogen was low in the water column and watershed of Beltzville Reservoir during 2022 with single sample concentrations ranging from less than the 0.43 mg/L minimum laboratory reporting limit to 0.87 mg/L (Table 3-2).

### 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 2022, 17 of the 65 samples measured for total phosphorus were greater than the EPA suggested maximum concentration and minimum laboratory reporting limit of 0.01 mg/L (Table 3-2). The 17 elevated samples ranged in

concentrations from 0.02 mg/L to 0.18 mg/L with higher concentrations predominantly seen in deep bottom water samples across all stations and at upstream tributary station BZ-5S. Elevated TP readings in deep reservoir waters are typically associated with phosphorus release from bottom sediments during low oxygen conditions. Beltzville Reservoir experienced these conditions in 2022. Upstream tributary station BZ-5S (Pohopoco Creek) exceeded the EPA 0.01 mg/L suggested concentration through much of the sampling season. Land use or other watershed factors contribute to nutrient loading in this tributary.

### 3.2.5 Dissolved Phosphorus

Dissolved phosphorus (Diss P) is a measure of the fraction of total phosphorus which is in solution in the water. This form is mobile in the water column and can be readily available to aquatic plants including algae. Land use or other watershed factors contribute to nutrient loading. During the 2022 sampling season, concentrations measured at all stations and depths in the water column and tributaries of Beltzville Reservoir ranged from less than the reporting limit of 0.01 to 0.07 mg/L (Table 3-2). All stations experienced increased concentrations during September. This may be attributed to less biological demand (algae) in the surface waters along with phosphorus release from sediments in deep bottom waters during the low oxygen conditions experience in September.

### 3.2.6 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 2022 (Table 3-2). Concentrations among all stations and depths ranged from less 5.0 mg/L to 118.0 mg/L. Total dissolved solids measured at Beltzville Reservoir in 2022 remained below PADEP water quality standards. The state water quality standard for TDS is a maximum concentration of 500 mg/L.

### 3.2.7 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 2022 (Table 3-2). Concentrations measured at all stations and depths ranged from less than the minimum laboratory reporting limit of 1.0 mg/L to a maximum of 215.0 mg/L collected at Station BZ-6D in September. High measures of TSS can be the result of sample collection error associated with capturing disturbed fine sediments in the lake bottom or stream sample during field sampling. This sampling error may appear as unusually elevated, or unexplained high TSS water samples collected for those samples.

### 3.2.8 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 set laboratory method 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; and
- 10+ mg/L is associated with very polluted water and large amounts of biodegradable wastes.

Biochemical oxygen demand in the waters of Beltzville Reservoir were consistently low in all months and stations sampled (Table 3-2). Twelve of 65 samples throughout the sampling season were greater than the laboratory minimum reporting limit of 2.0 mg/L with the highest concentration of 5.1 mg/L measured in the downstream release waters of the reservoir at station BZ-01S on 18 August. Based on the seasonal sampling results, it is inferred that in 2022, Beltzville Reservoir and its associated tributaries had predominantly very clean water with little biodegradable organic wastes.

### 3.2.9 Alkalinity

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

For all sampling stations and depths, alkalinity measured during 2022 ranged from 19.0 mg/L to 6.0 mg/L (Table 3-2). All reservoir and tributary samples measured were below the state minimum criteria (20 mg/L) during the sampling season. The natural alkalinity of water is largely dependent on the underlying geology and soils within the surrounding watershed. The typically low alkalinity measured at Beltzville Reservoir results from the regional geology, which is primarily sandstone and shale. Based on this, the reservoir waters and surrounding tributaries comply with the PADEP alkalinity criteria, due to the regional natural conditions.

### 3.2.10 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 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. Measure of total organic carbon concentrations in the water column and tributaries of Beltzville Reservoir is used as a non-specific indicator of water quality. Concentrations of TOC at all stations and depths ranged from 0.6 mg/L to 3.4 mg/L and remained low throughout the 2022 sampling season (Table 3-2).

### 3.2.11 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* concentration increases in relation to algal densities in a water body and can be affected by wind, sunlight, and other factors. Chlorophyll *a* in the surface waters (0-10 feet) of Beltzville Reservoir were low and similar at all the reservoir lake stations during 2022 (Appendix A). The highest surface water concentrations were observed in May. Concentrations measured in surface waters at all lake body stations ranged between 0.7 ug/L and 7.4 ug/L with an average seasonal concentration across all lake stations of 2.95 ug/L.

### 3.3 TROPIC 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 approximately monthly during the 2022 sampling season collected at station BZ-6 (Figure 3-7).

TSIs calculated for measures of total phosphorus classified Beltzville Reservoir as oligotrophic in May (37.35), July (37.35), August (37.35) and September (37.35) and mesotrophic in June (47.35). TSIs calculated for measures of secchi disk depth classified Beltzville Reservoir as mesotrophic in May (41.54) and August (40.39), and oligotrophic in June (37.10), July (35.97) and September (38.98). TSIs calculated for measures of chlorophyll *a* classified Beltzville Reservoir as oligotrophic in June (39.86), July (38.02) and September (37.88), and mesotrophic in May (48.76) and August (43.43).

Carlson (1977) warned against averaging TSI values estimated for different parameters, and instead suggested giving priority to chlorophyll *a* in the summer and to phosphorus in the spring, fall, and winter. Considering this and historic sampling results, the trophic state of the reservoir, based on TSI's, was oligotrophic/mesotrophic throughout the 2022 sampling season.

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). Considering the general agreement between the EPA classifications with that of the Carlson TSI's, the trophic condition of Beltzville Reservoir was predominantly oligotrophic in 2022.

**Table 3-3.** EPA trophic classification criteria and average monthly measures for Beltzville Reservoir in 2022.

Water Quality Variable	Oligo-trophic	Meso-trophic	Eutrophic	12 May	16 June	14 July	18 August	15 September
Total phosphorus (ppb)	<10	10-20	>20	<10	20	<10	<10	<10
Chlorophyll a (ppb)	<4	4-10	>10	6.37	2.57	2.13	3.7	2.1
Secchi disk depth (meters)	>4	2-4	<2	3.60	4.90	5.30	3.90	4.30

**3.4 RESERVOIR BACTERIA MONITORING**

Total coliform bacteria include *escherica coliform* (*E. coli*) and related bacteria that are associated with fecal discharges. Fecal coliform bacteria are a subgroup of the total coliform and are normally associated with waste derived from human and other warm-blooded animals and indicate the presence of fecal contamination but not the associated risk. With respect to EPA and PADEP water quality standards, fecal coliform bacteria standards have been replaced with a recommended *E. coli* criterion. Bacteria contamination was monitored in the tributary and lake surface waters at Beltzville Reservoir from May through September during 2022 (Table 3-4).

*Escherichia coli* is the most reliable indicator of fecal bacterial contamination of surface waters in the United States according to water quality standards set by the EPA (2000). The EPA recommendation for recreational water quality standards for *E. coli* is based on two criteria: a geometric mean of 126 organisms/100 ml (geometric mean of five samples collected over not more than a 30 consecutive day period) threshold and 235 organisms/100 ml (single water sample) threshold. This standard has been adopted by the State of Pennsylvania.

Total coliform values for all stations ranged from 4 colonies/100-ml to greater than the detection limit of >2420 colonies/100-ml. Bacteria in natural waters is common and their presence in the sample is not necessarily a human health concern. Given that Corps regular monitoring was completed utilizing single day grab samples, single sample results were compared to the EPA *E. coli* single sample criteria in 2022. The *E. coli* samples collected at Beltzville Reservoir did exceed the 235 organisms/100 ml single water sample threshold on five occasions with four of the five samples collected from upstream tributary stations. Upstream tributary stations consistently maintained the highest bacteria readings and may be associated with upstream watershed activities or land use. Water contact recreation is permitted at Beltzville Reservoir. The recreational swimming beach is monitored for bacteria and managed independently at the project by the Pennsylvania Department of Conservation and Natural Resources. No long-term elevated bacteria counts were recorded in the main reservoir body where public water recreation is also permitted.

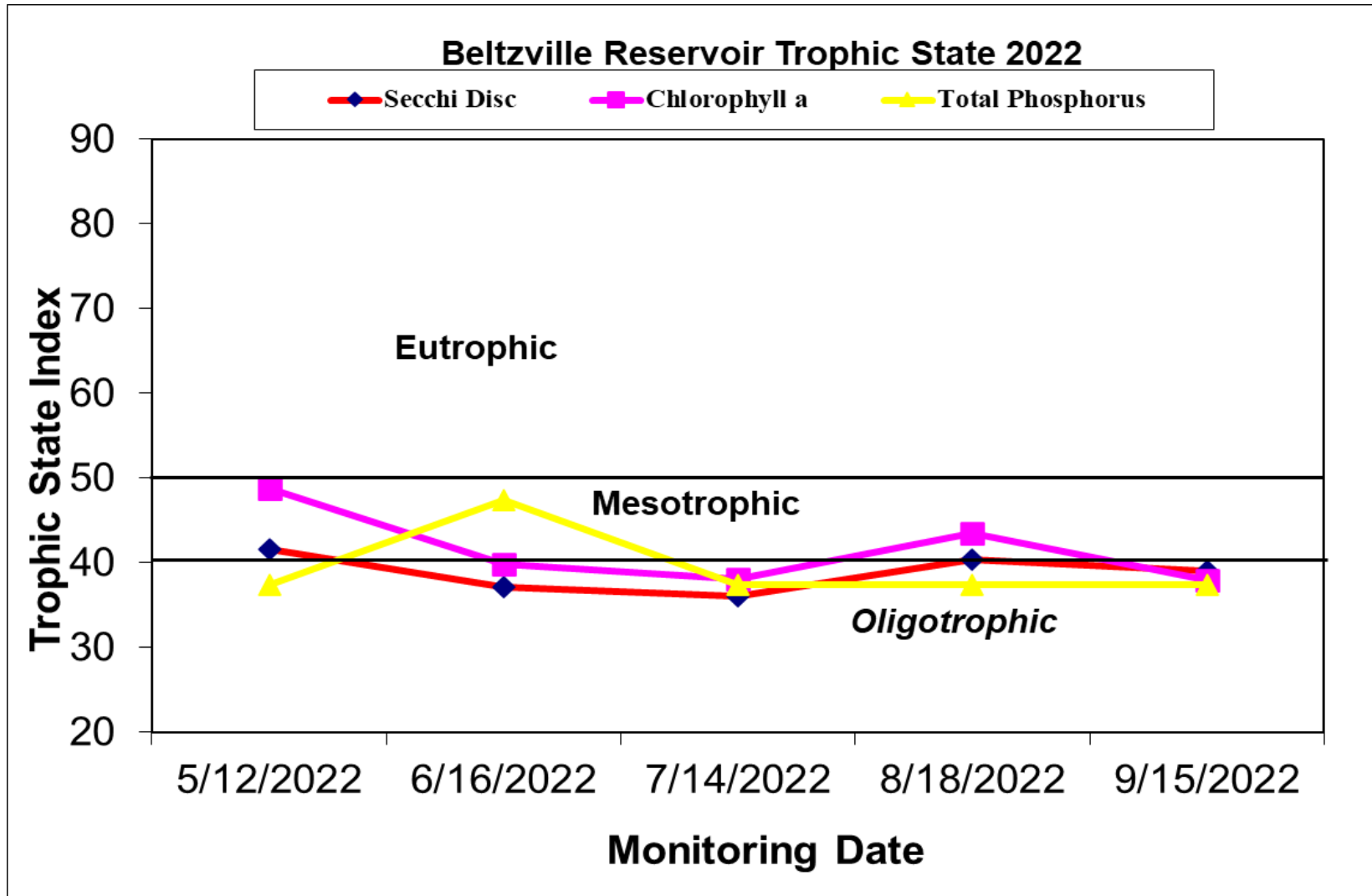


Figure 3-7. Trophic state indices calculated from secchi disk depth and concentrations of total phosphorus and chlorophyll *a* at reservoir Station BZ-6 for Beltville Reservoir in 2022.

## Results and Discussion

**Table 3-4.** Bacteria counts (colonies/100ml) at Beltzville Reservoir and tributaries during 2022.

STATION	DATE		Total Coliform (TC)		Escherichia coli
BZ-1S	5/12/2022		416		344
	6/16/2022		980		14
	7/14/2022	>	2420		2
	8/18/2022		1300		8
	9/15/2022		2420		11
BZ-2S	5/12/2022		517		13
	6/16/2022	>	2420		2420
	7/14/2022		1120		44
	8/18/2022		2420		86
	9/15/2022	>	2420		105
BZ-3S	5/12/2022		4	<	1
	6/16/2022		108	<	1
	7/14/2022		133		3
	8/18/2022		108	<	1
	9/15/2022		111	<	1
BZ-4S	5/12/2022		411	<	1
	6/16/2022	>	2420		980
	7/14/2022	>	2420		8
	8/18/2022	>	2420		24
	9/15/2022		1410		2
BZ-5S	5/12/2022		1550		36
	6/16/2022	>	2420	>	2420
	7/14/2022	>	2420		99
	8/18/2022		2420		78
	9/15/2022	>	2420		345
BZ-6S	5/12/2022		-		-
	6/16/2022		272		1
	7/14/2022		210		1
	8/18/2022		261	<	1
	9/15/2022		161		4
BZ-7S	5/12/2022		225		14
	6/16/2022		276		5
	7/14/2022		291	<	1
	8/18/2022		488	<	1
	9/15/2022		579		1

-Shaded cell counts exceed single sample EPA contact swimming beach recreation criteria (235 Escherichia Coliform colonies/100ml).

## 4.0 REFERENCES

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# **APPENDIX A**

## **BELTZVILLE RESERVOIR 2022 STRATIFICATION DATA TABLES**

## 2022 Beltzville Reservoir Summary 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
<b>BZ-1S Outfall Pohopoco</b>	5/12/2022	6:44:30	1.0	11.4	103	11.2	6.81	-28.3	53.9	0.1	2.8	0.075
	6/16/2022	7:01:32	1.0	16.52	98	9.56	6.87	-31.1	75.1	0.3	2.9	0.088
	7/14/2022	6:52:09	1.0	15.1	96.4	9.7	7.33	-55.4	86	0.0	2.3	0.086
	8/18/2022	6:46:08	1.0	14.55	95.5	9.72	6.75	-24.9	147.5	0.0	1.2	0.085
	9/15/2022	6:56:20	1.0	14.37	92.4	9.44	6.8	-27.8	145.9	5.8	1.3	0.086
<b>BZ-2S Pine Run Trib.</b>												
	5/12/2022	11:11:03	0.5	11.25	99	10.85	6.5	-12.1	62.2	1.4	1.0	0.054
	6/16/2022	8:51:59	0.5	13.78	97.2	10.06	6.62	-18	83.2	<b>43.4</b>	3.9	0.052
	7/14/2022	11:25:38	0.5	16.16	96.3	9.47	6.64	-19.3	92.5	0.4	0	0.060
	8/18/2022	8:22:06	0.5	15.19	93.5	9.39	6.66	-20.4	135	0.5	0.3	0.059
9/15/2022	8:05:47	0.5	15.24	94.3	9.46	6.7	-22.2	136.1	9.4	0.5	0.068	
<b>BZ-3 Bouy/Beach</b>	5/12/2022	9:00:15	0.5	14.54	109	11.12	7.45	-61.5	55.9	0.3	2.7	0.081
		8:59:20	5	14.18	108	11.08	7.35	-56.3	56	0.5	4.7	0.080
		8:58:34	10	13.76	107	11.03	7.28	-52.7	56.3	0.3	3.8	0.079
		8:57:32	15	13.35	104	10.91	7.16	-46.6	56.4	0.5	3.9	0.078
		8:56:30	20	12.58	101	10.76	7.09	-42.7	56.5	0.3	3.8	0.077
		8:55:29	25	12.13	98.5	10.58	7.02	-39	56.7	0.3	3	0.076
		8:54:24	30	11.3	94.7	10.37	6.96	-36	56.8	0.5	2.7	0.075
		8:53:18	35	10.54	91.5	10.2	6.94	-34.9	56.8	0.8	2.7	0.072
		8:52:28	40	9.62	87.8	10	6.92	-34	56.6	0.2	1.6	0.073
		8:51:32	45	9.07	86	9.92	6.92	-33.8	56.8	0.0	0.5	0.073
		8:50:03	50	8.43	85	9.96	6.93	-34.4	56.7	0.0	1.2	0.072
		8:47:59	55	8.28	85.8	10.09	6.94	-35.2	56.6	0.0	1.4	0.072
		8:47:07	60	8.02	85.8	10.16	6.95	-35.7	56.6	0.0	0.8	0.071
		8:46:11	65	7.96	85.6	10.15	6.95	-35.4	56.7	0.0	0.6	0.071
		8:45:30	70	7.84	85.4	10.15	6.95	-35.7	56.9	0.0	1.1	0.071
		8:43:31	75	7.64	84.9	10.14	6.98	-37.1	57	0.1	1	0.071
		8:42:45	80	7.6	84.7	10.12	6.99	-37.5	57.1	0.1	0.6	0.071
		8:41:46	85	7.55	84.1	10.07	6.99	-37.5	57.3	0.0	1	0.071
		8:40:55	90	7.45	84	10.08	7	-38	57.8	0.0	1.1	0.071
		8:39:45	95	7.35	83.7	10.07	7	-38.3	59.2	0.2	0.9	0.071
8:38:00	100	7.37	84	10.11	7.15	-45.9	58.5	0.4	0.8	0.071		

## 2022 Beltzville Reservoir Summary 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
<b>BZ-3 Bouy/Beach</b>	6/16/2022	10:49:43	0.5	23.18	108	9.24	7.31	-54.8	73.4	0.0	2.7	0.091
		10:49:10	5.0	23.19	108	9.24	7.23	-50.4	72.1	0.0	3.2	0.091
		10:48:33	10.0	23.18	108	9.22	7.03	-39.5	76.6	0.0	3.2	0.091
		10:47:45	15.0	22.71	107	9.22	6.75	-24.6	81.8	0.0	2.2	0.090
		10:47:01	20.0	19.78	99.6	9.09	6.58	-15.8	85	0.0	2.1	0.091
		10:45:27	25.0	17.91	80.3	7.61	6.35	-3.4	87.8	0.6	5.1	0.090
		10:44:45	30.0	16.54	71.2	6.94	6.32	-2	87.8	0.9	1.7	0.091
		10:43:40	35.0	14.67	68.5	6.95	6.31	-2	87.5	1.6	2	0.088
		10:42:05	40.0	12.41	71.6	7.64	6.26	0.5	87.5	1.0	1	0.078
		10:41:19	45.0	10.82	70.7	7.82	6.26	0.2	87.4	0.7	0.9	0.076
		10:39:56	50.0	9.7	70.6	8.02	6.28	-1.1	87.2	0.1	0.9	0.075
		10:39:16	55.0	9.15	72.7	8.37	6.31	-2.4	87	0.0	0.3	0.074
		10:38:13	60.0	8.88	72	8.34	6.32	-3.2	86.7	0.0	0.3	0.073
		10:37:16	65.0	8.78	72	8.36	6.33	-3.5	87	0.4	0.7	0.073
		10:36:37	70.0	8.64	72.4	8.43	6.34	-4.3	87	0.3	0.8	0.072
		10:35:18	75.0	8.49	73.5	8.6	6.38	-6.1	86.8	0.0	0.2	0.072
		10:34:13	80.0	8.27	74.1	8.72	6.41	-7.8	86.4	0.1	0.0	0.072
		10:33:16	85.0	8.2	72.3	8.52	6.42	-8.5	86.1	0.0	0.7	0.072
		10:32:28	90.0	7.97	71.4	8.46	6.44	-9.4	85.9	0.3	0.8	0.071
		10:31:09	95.0	7.78	69.5	8.28	6.47	-10.8	85.4	0.1	0	0.071
10:30:12	100.0	7.7	66.3	7.91	6.43	-9.1	88.7	0.0	0.4	0.071		
10:29:24	105.0	7.6	64	7.65	6.47	-11.1	90.7	0.3	0.3	0.072		
10:28:48	107.0	7.59	64.6	7.72	6.55	-14.9	91	0.5	0.8	0.072		
<b>BZ-3 Bouy/Beach</b>	7/14/2022	09:04:07	0.5	25.99	110	8.93	7.93	-88.6	71.2	0.0	1	0.094
		9:03:06	5	25.97	110	8.92	7.85	-84.2	67.7	0.0	2.7	0.094
		9:02:03	10	25.9	111	8.98	7.59	-70.5	72.4	0.0	2.7	0.094
		9:01:06	15	25.52	114	9.33	7.31	-54.9	76.4	0.0	3.8	0.094
		9:00:14	20	21.95	113	9.86	6.87	-31.3	80.8	0.0	3.4	0.088
		8:58:54	25	20.47	82.2	7.4	6.45	-8.6	89.5	0.9	5.1	0.098
		8:57:23	30	18.92	63.3	5.88	6.34	-2.9	89.5	0.7	3.6	0.092
		8:56:16	35	17.53	56.8	5.43	6.36	-3.9	88.6	0.6	1.1	0.092
		8:54:05	40	15.92	52.1	5.15	6.34	-3.1	87.9	1.9	1.9	0.090
		8:55:09	45	15.83	51.8	5.13	6.36	-4.6	88.2	1.2	0.9	0.090
		8:52:03	50	10.51	51.8	5.78	6.39	-6.4	86.4	0.0	1.1	0.078
		8:50:48	55	9.83	54.9	6.23	6.42	-8.3	86.3	0.2	0.5	0.077
		8:49:34	60	9.47	59.3	6.78	6.46	-10.3	86.2	0.0	0.2	0.075
		8:48:43	65	9.26	61.3	7.04	6.49	-11.8	85.9	0.3	0.0	0.074
		8:48:07	70	9.06	61.9	7.14	6.5	-12.3	86.3	0.1	0.4	0.074
		8:46:48	75	8.63	63.7	7.43	6.55	-14.9	86	0.1	0.7	0.072
		8:45:57	80	8.43	61.8	7.24	6.56	-15.5	86.5	0.6	0.8	0.072
		8:43:44	85	8.22	62.8	7.4	6.65	-20	86.4	0.0	0.6	0.072
		8:42:28	90	8.02	62.9	7.44	6.71	-23.5	86	0.6	0.8	0.072
		8:41:17	95	7.93	60.4	7.16	6.77	-26.2	86.4	0.4	0.4	0.072
8:39:28	100	7.85	55.2	6.56	6.81	-28.3	92.7	0.8	0.6	0.073		

## 2022 Beltzville Reservoir Summary 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	8/18/2022	10:30:38	0.5	25.75	107	8.74	7.76	-79.3	110	0.0	2.3	0.097
		10:29:52	5	25.73	107	8.73	7.65	-73.7	111.1	0.1	2.6	0.097
		10:29:11	10	25.62	106	8.65	7.51	-66.1	112.4	0.3	3.5	0.096
		10:28:17	15	25.59	105	8.56	7.24	-51.1	120.8	0.2	4.3	0.096
		10:27:22	20	25.55	102	8.36	6.84	-29.5	133.8	0.0	4.1	0.096
		10:25:36	25	23.72	56.5	4.78	5.89	21.7	162.2	0.2	3.5	0.106
		10:24:41	30	21.35	42.3	3.75	5.88	22.2	164.2	0.3	2.3	0.1
		10:23:13	35	18.99	29	2.69	5.86	22.4	166	0.4	0.9	0.096
		10:22:19	40	17.74	28.5	2.71	5.87	21.7	167.8	1.2	1.2	0.094
		10:21:00	45	14.16	30.5	3.13	5.92	18.5	171.5	0.9	0.7	0.085
		10:19:44	50	12.27	34.2	3.66	5.93	17.4	174.2	0.5	0.8	0.082
		10:18:42	55	10.74	36.9	4.09	5.97	15.2	176.3	0.3	0.7	0.079
		10:17:37	60	10.23	40.1	4.5	6	13.8	179	0.6	0.9	0.078
		10:16:22	65	9.85	45.8	5.19	6.04	11.6	181.5	0.4	0.8	0.076
		10:15:37	70	9.5	47.2	5.39	6.07	10.1	182.5	0.4	0.2	0.075
		10:14:25	75	9.16	48.4	5.57	6.11	7.9	185.2	0.0	0.8	0.074
		10:13:29	80	8.64	48.6	5.67	6.15	5.7	187.4	0.7	0.7	0.073
		10:12:30	85	8.54	48.1	5.62	6.18	4	189.8	0.6	0.0	0.073
		10:11:36	90	8.26	46.2	5.44	6.24	1	189.8	0.0	0.4	0.073
10:10:52	95	8.06	42.9	5.07	6.36	-5.5	181.9	0.7	0.8	0.073		
10:09:36	100	8	42.5	5.03	6.6	-17.7	169.3	2.3	0.6	0.073		
BZ-3 Bouy/Beach	9/15/2022	10:08:47	0.5	23.53	95	8.07	6.77	-25.5	130.9	0.5	1.4	0.094
		10:08:10	5	23.53	94.8	8.05	6.84	-29.4	123.2	0.6	2.3	0.094
		10:07:20	10	23.53	94.6	8.03	6.74	-24.1	126.8	0.2	2.4	0.094
		10:06:18	15	23.53	93.9	7.98	6.72	-22.8	123.9	0.3	2.3	0.094
		10:05:46	20	23.52	93.3	7.92	6.63	-18.3	126.2	0.5	2.5	0.094
		10:04:37	25	23.51	91.3	7.76	6.54	-13.2	126.9	0.6	2.2	0.094
		10:02:35	30	22.73	42	3.62	6.1	10.3	144.4	0.5	2.0	0.1
		10:01:10	35	21.29	36.7	3.26	6.06	12.4	144.8	1.0	1.6	0.102
		9:58:28	40	18.39	8	0.75	5.94	18.5	151.1	0.4	0.7	0.096
		9:56:09	45	17.07	9.7	0.93	5.9	20.3	154.4	1.1	1.0	0.093
		9:54:22	50	15.26	16.4	1.65	5.89	20.4	155.2	1.6	0.9	0.088
		9:52:36	55	13.33	21.2	2.22	5.92	18.4	154.2	1.7	0.4	0.085
		9:51:41	60	11.7	25.2	2.73	5.92	17.9	155.3	0.8	0.8	0.081
		9:50:37	65	10.4	27.6	3.08	5.94	16.7	155.5	0.5	1.1	0.078
		9:48:58	70	9.87	33.9	3.83	5.93	17.3	159.2	0.8	0.3	0.077
		9:47:53	75	9.54	36.4	4.15	5.92	17.5	161.6	0.9	0.2	0.076
		9:46:50	80	8.98	36.4	4.21	5.93	16.7	162.2	0.8	0.4	0.074
		9:45:50	85	8.59	33.6	3.93	5.95	15.8	162.2	1.1	0.7	0.074
		9:44:00	90	8.33	34.4	4.04	6.03	11.8	159	1.0	0.4	0.074
9:42:26	95	8.05	32.4	3.83	6.08	9.2	159.7	2.2	0.8	0.075		

## 2022 Beltzville Reservoir Summary 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
<b>BZ-4S Wild Creek Upstream</b>	5/12/2022	10:56:25	1.0	14.87	99.7	10.08	6.39	-6.3	62	0.2	0.5	0.033
	6/16/2022	8:31:20	1.0	21.17	95.3	8.47	6.49	-10.9	85.9	8.1	2.3	0.038
	7/14/2022	11:05:04	1.0	24.35	93.5	7.82	6.93	-34.2	90.7	1.0	0.8	0.043
	8/18/2022	8:01:01	1.0	21.91	91.7	8.04	6.83	-29.1	133.6	0.1	11.6	0.039
	9/15/2022	7:45:52	1.0	13.28	92.7	9.71	6.71	-23	143.3	4.5	0.2	0.035
<b>BZ-5S Pohopoco Upstream</b>	5/12/2022	10:44:50	1.0	13.12	102	10.71	6.78	-26.4	59.3	1.9	0.6	0.1
	6/16/2022	8:09:05	1.0	16.45	92.7	9.06	6.81	-28.2	76.1	88.2	4.8	0.095
	7/14/2022	10:46:26	1.0	19.62	97.6	8.94	7.1	-43.2	87.4	1.8	1.0	0.124
	8/18/2022	7:43:54	1.0	16.84	87.8	8.51	6.91	-33.1	125.8	1.2	0.9	0.121
	9/15/2022	7:27:25	1.0	16.47	91.8	8.97	6.84	-29.5	129.7	9.1	0.5	0.126
<b>BZ-6 In-Lake Tower  Secchi 3.60 M</b>	5/12/2022	8:21:29	0.5	14.49	108	11.05	7.46	-62	53.3	0.4	4.6	0.08
		8:20:26	5	14.46	108	11.01	7.39	-58.7	53.1	0.4	7.1	0.08
		8:19:37	10	14.34	107	10.95	7.31	-54.2	53.3	0.4	7.4	0.08
		8:18:27	15	13.94	105	10.85	7.08	-42.2	53.3	0.3	3.9	0.079
		8:17:33	20	12.78	101	10.72	7	-38	53.4	0.4	3.4	0.077
		8:15:58	25	12.05	98.6	10.61	6.97	-36.5	53.4	0.2	2.3	0.076
		8:14:33	30	11.27	95.7	10.49	6.99	-37.5	53.3	0.2	2.2	0.075
		8:13:12	35	10.57	93.4	10.4	6.99	-37.3	53.1	0.3	1.6	0.073
		8:11:47	40	9.43	90.4	10.34	6.99	-37.6	52.8	0.1	1.5	0.072
		8:10:26	45	8.81	88.2	10.24	6.99	-37.7	52.7	0.2	0.9	0.071
		8:08:45	50	8.44	87.1	10.2	6.99	-37.8	52.6	0.2	1.7	0.071
		8:07:31	55	8.29	86.8	10.2	7	-38.1	52.5	0.1	1	0.071
		8:06:21	60	8.09	86.3	10.19	7	-38.3	52.4	0.0	1.5	0.071
		8:05:09	65	8.02	86.1	10.19	7.01	-38.6	52.3	0.0	0.8	0.071
		8:03:40	70	7.92	86.2	10.23	7.03	-39.4	52.2	0.0	1.1	0.071
		8:02:24	75	7.82	85.8	10.2	7.04	-39.9	52.2	0.1	1.3	0.071
		8:00:51	80	7.69	85.6	10.21	7.05	-40.5	52.2	0.0	0.7	0.071
		7:59:14	85	7.55	85.6	10.24	7.06	-41.1	52	0.2	0.3	0.071
		7:57:19	90	7.45	85.2	10.23	7.07	-41.7	51.9	0.1	0.3	0.071
		7:55:32	95	7.39	84.7	10.19	7.08	-42.1	51.8	0.2	1	0.071
		7:54:20	100	7.35	84.3	10.14	7.08	-42.2	51.9	0.0	0.5	0.071
7:52:58	105	7.32	84.3	10.15	7.08	-42.2	51.9	0.0	0.9	0.071		
7:50:20	110	7.3	83.6	10.06	7.08	-42.2	52	0.1	1	0.071		
7:48:10	115	7.26	83	10	7.07	-41.8	52.1	0.3	1.5	0.071		
7:46:04	120	7.18	81.7	9.88	7.05	-40.6	52.4	0.1	0.9	0.071		
7:44:32	125	7.15	81.9	9.9	7.04	-40	52.8	0.6	2	0.071		

## 2022 Beltzville Reservoir Summary 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
<b>BZ-6 In-Lake Tower</b>	6/16/2022	10:10:58	0.5	23.87	107	9.01	7.3	-54.5	79.1	0.0	2.8	0.094
		10:10:20	5	23.85	107	9.03	7.34	-56.7	76.4	0.0	2.6	0.093
		10:09:10	10	23.63	107	9.02	7.29	-53.6	74.9	0.0	2.3	0.093
		10:08:30	15	23.54	106	9.01	7.24	-51.1	73.2	0.0	3	0.093
		10:06:39	20	20.46	100	9.02	6.91	-33.2	74.4	0.2	3.5	0.087
		10:05:06	25	18.34	83.8	7.88	6.63	-18.7	78.1	0.3	5.8	0.092
		10:03:13	30	16.21	70.8	6.96	6.41	-7.1	82.7	0.4	1.6	0.091
		10:01:33	35	14.06	74.3	7.65	6.42	-7.7	83.2	0.3	0.8	0.082
		10:00:42	40	11.63	74.1	8.05	6.44	-8.9	82.7	0.4	1.5	0.076
		9:58:55	45	10.18	70.4	7.91	6.44	-9.1	82.3	0.1	1.5	0.075
		9:56:29	50	9.31	72	8.25	6.46	-10.3	82.1	0.1	0.6	0.074
		9:55:04	55	9.05	72	8.31	6.47	-10.6	82	0.0	1.3	0.073
		9:53:49	60	8.87	72.5	8.41	6.47	-11	82.1	0.0	1.1	0.073
		9:52:32	65	8.66	73.2	8.53	6.48	-11.3	82.1	0.0	0.2	0.072
		9:50:57	70	8.52	73.7	8.61	6.49	-11.8	82.1	0.0	0.5	0.072
		9:50:17	75	8.35	73.5	8.63	6.49	-11.9	82.2	0.0	0.4	0.072
		9:49:23	80	8.16	73.5	8.67	6.5	-12.5	82	0.0	0.3	0.071
		9:47:52	85	8.06	73	8.64	6.5	-12.4	82.1	0.2	0.7	0.071
		9:46:05	90	7.96	71.9	8.52	6.49	-12.2	82.4	0.0	0.2	0.071
		9:44:29	95	7.71	69.8	8.32	6.49	-12.1	82.6	0.0	0.5	0.071
9:42:47	100	7.62	68.4	8.18	6.5	-12.6	82.8	0.0	0.1	0.071		
9:41:00	105	7.58	67	8.01	6.52	-13.6	82.8	0.0	0.9	0.071		
9:39:21	110	7.52	64.1	7.68	6.55	-15.3	82.5	0.1	0.3	0.071		
9:37:44	115	7.46	61.9	7.43	6.59	-17.3	82.5	0.4	0.3	0.072		
9:36:21	120	7.43	60.5	7.26	6.65	-20.1	82.6	0.2	0.4	0.072		
9:35:20	125	7.41	60.5	7.27	6.76	-25.6	79.7	0.3	0.3	0.072		
<b>BZ-6 In-Lake Tower</b>	7/14/2022	8:28:17	0.5	25.74	110	9	7.89	-86.8	74.6	0.0	1.3	0.094
		8:27:23	5.0	25.73	111	9.02	7.85	-84.6	71.4	0.0	2.4	0.094
		8:26:58	10	25.7	111	9.03	7.76	-79.4	72.7	0.0	2.7	0.094
		8:25:52	15	25.57	112	9.12	7.59	-70.1	68.8	0.0	2.7	0.093
		8:24:43	20	22.15	115	10.03	7.22	-50	68	0.1	3.5	0.087
		8:23:09	25	20.38	95.1	8.58	6.71	-22.6	79.6	0.3	5.0	0.088
		8:21:12	30	19.09	65.6	6.07	6.42	-7.2	86.1	0.3	6.8	0.090
		8:19:03	35	17.41	50.2	4.81	6.32	-1.9	86.6	0.1	2.5	0.091
		8:17:35	40	15.53	47.9	4.78	6.34	-3.3	85.8	0.0	0.6	0.090
		8:16:06	45	12.99	48.5	5.1	6.31	-2.1	85.7	0.1	1.5	0.082
		8:13:54	50	10.48	56.4	6.29	6.36	-4.9	85.3	0.0	1.5	0.077
		8:11:55	55	9.82	58.1	6.58	6.35	-4.6	85.2	0.0	1.0	0.076
		8:10:29	60	9.55	60.3	6.88	6.35	-4.8	85.2	0.0	0.1	0.075
		8:08:08	65	9.15	62	7.13	6.37	-5.6	85.1	0.2	1.6	0.074
		8:06:24	70	8.84	62.6	7.26	6.39	-6.7	84.9	0.0	0.7	0.073
		8:04:12	75	8.67	63.3	7.37	6.41	-7.7	84.9	0.0	0.5	0.072
		8:02:28	80	8.43	63.6	7.45	6.41	-8	84.8	0.0	0.6	0.072
		8:01:32	85	8.19	63.4	7.47	6.41	-8	84.6	0.0	0.6	0.072
		7:59:27	90	8.09	61.1	7.22	6.4	-7.1	84.3	0.0	0.0	0.072
		7:58:20	95	7.9	59.1	7.01	6.4	-7.4	84.1	0.0	0.0	0.072
7:56:02	100	7.75	55.3	6.59	6.41	-7.8	83.8	0.2	0.4	0.072		
7:53:31	105	7.67	51	6.09	6.43	-8.7	83.4	0.1	0.0	0.072		
7:51:44	110	7.61	48.2	5.76	6.45	-9.7	83.3	0.4	0.7	0.072		
7:49:30	115	7.54	44.8	5.36	6.49	-12.1	83.4	0.1	0.3	0.073		
7:46:44	120	7.52	44.2	5.29	6.6	-17.5	83.6	0.4	0.5	0.073		
7:44:16	125	7.56	44.2	5.29	6.81	-28.4	83.6	0.6	0.0	0.073		

## 2022 Beltzville Reservoir Summary 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
<b>BZ-6 In-Lake Tower</b>	8/18/2022	9:50:55	0.5	25.77	106	8.66	7.81	-82.4	109.3	0.4	3.9	0.097
		9:50:23	5	25.71	106	8.64	7.74	-78.4	110.4	0.6	3.0	0.096
		9:49:43	10	25.69	106	8.62	7.65	-73.3	109.9	0.0	4.2	0.096
		9:48:45	15	25.65	105	8.55	7.53	-66.8	104.8	0.3	4.2	0.096
		9:47:41	20	25.62	103	8.39	7.15	-46.5	106.2	0.4	3.8	0.096
		9:45:50	25	22.89	69	5.93	6.36	-3.4	135	0.3	3.6	0.101
		9:43:51	30	21.23	48.8	4.33	6.14	8.1	148.9	0.5	2.3	0.097
		9:41:34	35	19.44	28.4	2.61	6.14	8	147.8	0.4	1.6	0.095
		9:40:38	40	16.98	26	2.51	6.15	7	147.8	0.0	1.2	0.091
		9:39:36	45	14.48	26.4	2.69	6.17	5.5	148	0.2	0.9	0.087
		9:36:34	50	12.04	36.4	3.92	6.23	2	147.2	0.0	1.0	0.081
		9:34:35	55	10.64	40.8	4.53	6.25	0.9	147.8	0.2	0.7	0.078
		9:33:41	60	10.15	42.6	4.79	6.3	-1.7	143.9	0.0	0.9	0.077
		9:32:14	65	9.81	45.9	5.2	6.31	-2.7	143	0.3	0.5	0.076
		9:31:09	70	9.51	47.7	5.44	6.3	-1.8	146.8	0.1	0.3	0.075
		9:30:00	75	9.12	49.8	5.73	6.27	-0.5	150.7	0.1	0.7	0.074
		9:28:40	80	8.77	52.3	6.08	6.32	-3.2	146.1	0.0	1.0	0.073
		9:27:14	85	8.54	52.4	6.12	6.34	-4	146	0.1	1.1	0.073
		9:26:12	90	8.25	50.8	5.98	6.36	-5.2	145.3	0.0	0.1	0.072
		9:23:27	95	8.04	44.4	5.25	6.35	-4.5	149.2	0.1	1.3	0.072
9:22:19	100	7.89	39.8	4.73	6.34	-4.4	150.1	0.8	0.3	0.073		
9:20:47	105	7.73	34.4	4.1	6.35	-4.8	151.7	1.0	0.6	0.073		
9:19:43	110	7.7	32.9	3.92	6.37	-5.8	152	1.4	0.6	0.074		
9:17:47	115	7.64	30.6	3.65	6.41	-8.1	153.6	2.1	0.4	0.074		
9:16:56	120	7.64	29.9	3.57	6.44	-9.2	153.2	3.7	0.7	0.074		
9:15:50	125	7.62	29.6	3.54	6.5	-12.6	150.3	2.5	0.7	0.074		
<b>BZ-6 In-Lake Tower</b>	9/15/2022	9:26:31	0.5	23.36	93.4	7.96	6.86	-30.4	127.7	2.0	1.8	0.093
		9:25:38	5	23.43	93.3	7.94	6.74	-23.8	135.6	0.9	2.6	0.094
		9:24:33	10	23.42	92.8	7.9	6.72	-23	134	2.0	1.9	0.094
		9:23:33	15	23.42	92.4	7.86	6.7	-22	133.4	2.7	2.3	0.094
		9:21:55	20	23.42	91.3	7.77	6.65	-19.1	131.4	2.1	2.8	0.094
		9:20:21	25	23.39	86.2	7.34	6.63	-18	124.6	1.6	2.6	0.094
		9:19:02	30	22.79	42.3	3.65	6.46	-8.8	129.2	4.2	2.8	0.101
		9:14:45	35	21.04	11.2	1	6.1	10.2	146.9	4.3	2.2	0.103
		9:13:25	40	19.47	6.4	0.59	6.09	10.5	147.9	7.0	1.2	0.096
		9:11:59	45	17.01	10.3	1	6.12	8.2	147.9	6.3	1.7	0.091
		9:10:15	50	14.61	12.4	1.26	6.1	9.2	150.2	7.4	1.7	0.088
		9:08:30	55	13.11	23.1	2.43	6.14	7	148.6	7.8	1.6	0.083
		9:07:05	60	11.51	29.4	3.2	6.17	4.8	147.8	11.8	1.0	0.08
		9:06:12	65	10.6	31.1	3.46	6.18	4.6	148.1	10.3	0.8	0.079
		9:05:03	70	10.32	38.9	4.36	6.18	4.1	148.6	9.2	1.5	0.078
		9:03:36	75	9.38	44.2	5.06	6.22	2.3	147.5	9.5	0.0	0.075
		9:02:55	80	8.88	45	5.22	6.23	1.3	146.7	7.9	0.3	0.074
		9:02:16	85	8.53	44.5	5.2	6.24	1.2	147	6.1	0.5	0.073
		9:01:05	90	8.23	40.8	4.81	6.25	0.5	146.7	7.0	0.0	0.073
		9:00:06	95	8.06	37.4	4.42	6.26	0	146.2	8.2	1.0	0.073
8:57:02	100	7.79	23	2.74	6.3	-2.2	144.1	8.1	0.6	0.074		
8:55:39	105	7.78	20.8	2.48	6.35	-4.9	141.5	7.5	0.8	0.074		
8:54:58	110	7.75	19.9	2.37	6.35	-4.7	142	8.5	0.6	0.074		
8:54:14	115	7.71	19.8	2.36	6.36	-5.3	142	7.1	0.7	0.075		
8:47:16	120	7.68	14.1	1.68	6.51	-12.8	139.7	12.5	1.4	0.076		
8:44:19	125	7.99	10.3	1.21	6.58	-16.5	138.9	42.6	1.9	0.077		

## 2022 Beltzville Reservoir Summary 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	5/12/2022	9:37:04	0.5	13.95	103	10.58	7.07	-41.9	62	0.5	1	0.081
		9:36:08	5	13.63	102	10.62	7.06	-41.3	61.9	0.5	1.8	0.083
		9:35:16	10	13.39	102	10.66	7.01	-38.6	62.5	0.9	3.5	0.08
		9:34:03	15	12.94	101	10.69	6.99	-37.5	62.1	0.6	3	0.078
		9:33:03	20	12.59	99.2	10.55	6.92	-34	62.3	0.8	3.5	0.077
		9:32:21	25	12.2	97.5	10.45	6.91	-33.4	62.7	0.6	2.3	0.077
		9:31:03	30	11.9	95.4	10.3	6.89	-32.6	62.9	0.5	2.1	0.076
		9:30:15	35	11.52	93.4	10.18	6.88	-31.8	63.5	0.8	2.4	0.075
		9:29:04	40	11.23	90.5	9.93	6.88	-31.7	64.5	0.8	2.1	0.075
		9:27:37	45	10.55	86	9.58	6.9	-32.9	64.7	1.8	1.5	0.079
		9:26:17	50	9.61	82.1	9.35	6.94	-34.8	65.5	1.4	1.9	0.077
9:24:55	55	9.46	82.7	9.45	7.11	-43.5	66.8	3.7	2	0.077		
BZ-7 Upper Lake No-Wake	6/16/2022	11:21:29	0.5	23.92	108	9.06	6.77	-25.7	83.8	0.3	4.6	0.077
		11:20:52	5	23.89	108	9.12	6.61	-17.2	89.2	0.2	3.9	0.076
		11:20:09	10	21.74	106	9.33	6.58	-15.7	89.4	0.7	6	0.068
		11:19:21	15	19.63	101	9.22	6.55	-14.3	88.2	1.7	2.3	0.102
		11:18:31	20	18.19	90.5	8.53	6.48	-10.5	88	2.5	1.8	0.105
		11:17:25	25	16.83	80.2	7.78	6.39	-5.6	88.6	2.9	1.2	0.098
		11:16:42	30	15.8	75.7	7.5	6.36	-4.5	88.6	2.7	1	0.095
		11:15:34	35	14.49	68.2	6.95	6.29	-1	88.2	1.5	1	0.09
		11:14:49	40	12.39	62.2	6.64	6.24	1.5	88.9	1.2	0.8	0.084
		11:13:54	45	10.54	59.8	6.66	6.24	1.2	89.4	0.6	0.6	0.079
		11:12:57	50	9.75	59.9	6.8	6.28	-1	90.9	0.8	1	0.077
11:11:34	55	9.44	60.8	6.96	6.45	-9.6	92.7	0.8	0.7	0.076		
BZ-7 Upper Lake No-Wake	7/14/2022	9:41:00	0.5	27	111	8.8	7.66	-74.2	72.7	0.0	0.9	0.093
		9:40:26	5	26.95	110	8.78	7.56	-68.8	72.4	0.0	1.3	0.093
		9:38:50	10	26.87	109	8.66	6.92	-33.7	82.8	0.2	2.3	0.093
		9:37:32	15	23.73	94.6	8.01	6.46	-9	93.9	0.4	2.7	0.092
		9:35:53	20	21.52	86	7.59	6.47	-9.7	90.5	1.4	2.9	0.113
		9:34:36	25	20.14	72.3	6.55	6.39	-5.6	91.8	1.7	1.8	0.110
		9:33:03	30	18.52	59.9	5.61	6.34	-2.8	92.1	1.5	1.8	0.101
		9:31:42	35	17.4	56.4	5.41	6.38	-5	91.5	0.7	1.6	0.096
		9:30:42	40	16.22	53	5.21	6.4	-6.6	91.6	0.4	1.0	0.092
		9:29:05	45	14.29	45.4	4.65	6.45	-9.4	92	0.2	0.9	0.088
		9:27:32	50	11.29	41.9	4.59	6.59	-16.8	90.4	5.4	0.7	0.080



## 2022 Beltzville Reservoir Summary 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
<b>BZ-7 Upper Lake No-Wake</b>	8/18/2022	11:04:01	0.5	25.68	105	8.53	7.31	-55	118.7	0.4	1.8	0.096
		11:03:08	5	25.59	104	8.53	7.17	-47.4	123.2	0.4	2.7	0.096
		11:01:44	10	25.46	103	8.43	6.95	-35.5	124.7	0.2	4.3	0.095
		11:00:52	15	25.43	102	8.32	6.74	-23.9	134.4	0.0	4.3	0.094
		11:00:05	20	25.33	99.6	8.18	6.59	-15.6	140	0.3	4.1	0.094
		10:58:48	25	24.98	79.7	6.59	6.35	-2.8	150.9	1.0	3.9	0.082
		10:57:57	30	22.88	71.8	6.17	6.32	-1.2	153.9	1.4	1.6	0.113
		10:55:54	35	20.39	14.5	1.31	6.23	3.1	164.6	2.3	0.4	0.105
		10:54:32	40	17.82	18.1	1.72	6.31	-1.7	168.9	0.9	0.5	0.098
		10:53:51	45	14.56	17.9	1.82	6.41	-7.4	167.9	1.2	0.6	0.09
		10:52:36	50	11.39	22	2.41	6.55	-14.7	169.4	0.8	1.0	0.081
		10:51:42	55	11.04	24.2	2.66	6.67	-21	164.3	0.6	0.8	0.08
<b>BZ-7 Upper Lake No-Wake</b>	9/15/2022	10:48:05	0.5	23.82	101	8.5	6.96	-35.9	130.2	0.4	2.2	0.093
		10:47:23	5	23.84	100	8.47	7	-38.2	124.4	0.5	2.2	0.093
		10:45:34	10	23.83	99.8	8.42	6.92	-33.7	122.3	0.5	2.4	0.093
		10:44:24	15	23.81	99	8.36	6.7	-21.7	132.7	0.1	2.4	0.093
		10:43:13	20	23.76	97.5	8.24	6.65	-19.2	129.7	0.5	2.1	0.093
		10:42:16	25	23.61	94.5	8.01	6.5	-10.9	137.3	0.6	2.0	0.092
		10:41:06	30	22.08	93.1	8.12	6.34	-2.7	143.8	1.6	1.9	0.104
		10:39:52	35	20.88	87.9	7.85	6.27	0.9	143.7	2.7	1.8	0.114
		10:37:58	40	19.95	49.8	4.53	6.09	10.5	148.9	3.9	1.4	0.106
		10:36:40	45	17.65	6.9	0.66	6.04	13	148.8	1.9	1.2	0.098
		10:35:25	50	16.32	4.6	0.45	5.99	15.1	151.8	2.0	0.4	0.097
		10:33:22	52	14.6	5.9	0.6	6.07	10.9	140.9	4.1	0.9	0.094

# **APPENDIX B**

**BELTZVILLE RESERVOIR 2022  
LABORATORY CUSTODY SHEETS**



# Certificate of Analysis

**M.J. Reider Associates, Inc.**

ENVIRONMENTAL TESTING LABORATORY  
U.S. EPA/PA DEP #06-00003

**Laboratory No.:** 2216593

**Report:** 05/23/22

**Lab Contact:** Richard A Wheeler

**Attention:** David Wertz

**Project:** 2022 - Beltzville Reservoir

**Reported To:** Tetra Tech

USACE, Phila Dist. Env.Resources Branch 100 Penn Square E.  
Arlington, VA 22201

**Lab ID:** 2216593-01

**Collected By:** Client

**Sampled:** 05/12/22 06:30

**Received:** 05/12/22 13:15

**Sample Desc:** BZ-1S

**Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
<b>Dissolved General Chemistry</b>								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	05/19/22	G-23, G-24	SNF
<b>General Chemistry</b>								
Alkalinity, Total to pH 4.5	10	mg CaCO <sub>3</sub> /L		2	SM 2320 B	05/16/22	C-51	APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1	05/13/22	U	MRW
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	05/12/22 15:10		GNG
Nitrate as N	0.88	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	05/12/22 15:31	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	05/12/22 15:31	U	JAF
Nitrate+Nitrite as N	<0.89	mg/l	0.122	1.10	CALCULATED	05/12/22 15:31		JAF
Nitrogen, Total Kjeldahl (TKN)	0.60	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	05/19/22		SNF
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	05/13/22		MRW
Solids, Total Dissolved	112	mg/l	4	5	SM 2540 C	05/13/22		TMH
Total Organic Carbon	1.6	mg/l	0.3	0.5	SM 5310 C	05/16/22		ALD
Solids, Total Suspended	5	mg/l	1	1	SM 2540 D	05/13/22		ALD
<b>Microbiology</b>								
Escherichia coli	344	mpn/100ml	1		SM 9223 B/Quantitray	5/12/22 14:12	5/13/22 8:44	JMW
Total Coliform	416	mpn/100ml	1		SM 9223 B/Quantitray	5/12/22 14:12	5/13/22 8:44	JMW



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Additional accreditations by MD (261), NY(12094)

**M.J. Reider Associates, Inc.**

**Lab ID:** 2216593-02      **Collected By:** Client      **Sampled:** 05/12/22 11:15      **Received:** 05/12/22 13:15  
**Sample Desc:** BZ-2S      **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
<b>Dissolved General Chemistry</b>								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	05/19/22	G-23, G-24	SNF
<b>General Chemistry</b>								
Alkalinity, Total to pH 4.5	7	mg CaCO <sub>3</sub> /L		2	SM 2320 B	05/16/22	C-51k	APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1	05/13/22	U	MRW
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	05/12/22 15:10		GNG
Nitrate as N	0.41	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	05/12/22 15:48	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	05/12/22 15:48	U	JAF
Nitrate+Nitrite as N	<0.42	mg/l	0.122	1.10	CALCULATED	05/12/22 15:48		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	05/19/22	U	SNF
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	05/13/22		MRW
Solids, Total Dissolved	85	mg/l	4	5	SM 2540 C	05/13/22		TMH
Total Organic Carbon	0.7	mg/l	0.3	0.5	SM 5310 C	05/16/22		ALD
Solids, Total Suspended	2	mg/l	1	1	SM 2540 D	05/13/22		ALD
<b>Microbiology</b>								
Escherichia coli	13	mpn/100ml	1		SM 9223 B/Quantitray	5/12/22 14:12	5/13/22 8:44	JMW
Total Coliform	517	mpn/100ml	1		SM 9223 B/Quantitray	5/12/22 14:12	5/13/22 8:44	JMW



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 Additional accreditations by MD (261), NY(12094)

**M.J. Reider Associates, Inc.**

**Lab ID:** 2216593-03      **Collected By:** Client      **Sampled:** 05/12/22 08:35      **Received:** 05/12/22 13:15  
**Sample Desc:** BZ-3S      **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
<b>Dissolved General Chemistry</b>								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	05/19/22	G-23, G-24	SNF
<b>General Chemistry</b>								
Alkalinity, Total to pH 4.5	11	mg CaCO <sub>3</sub> /L		2	SM 2320 B	05/16/22	C-51a	APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1	05/13/22	U	MRW
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	05/12/22 15:10		GNG
Nitrate as N	0.86	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	05/12/22 16:05	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	05/12/22 16:05	U	JAF
Nitrate+Nitrite as N	<0.87	mg/l	0.122	1.10	CALCULATED	05/12/22 16:05		JAF
Nitrogen, Total Kjeldahl (TKN)	0.46	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	05/19/22	J	SNF
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	05/13/22		MRW
Solids, Total Dissolved	89	mg/l	4	5	SM 2540 C	05/13/22		TMH
Total Organic Carbon	1.6	mg/l	0.3	0.5	SM 5310 C	05/16/22		ALD
Solids, Total Suspended	4	mg/l	1	1	SM 2540 D	05/13/22		ALD
<b>Microbiology</b>								
Escherichia coli	<1	mpn/100ml	1		SM 9223 B/Quantitray	5/12/22 14:12	5/13/22 8:44	JMW
Total Coliform	4	mpn/100ml	1		SM 9223 B/Quantitray	5/12/22 14:12	5/13/22 8:44	JMW



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**M.J. Reider Associates, Inc.**

**Lab ID:** 2216593-04    **Collected By:** Client    **Sampled:** 05/12/22 08:35    **Received:** 05/12/22 13:15  
**Sample Desc:** BZ-3M    **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
<b>Dissolved General Chemistry</b>								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	05/19/22	G-23, G-24	SNF
<b>General Chemistry</b>								
Alkalinity, Total to pH 4.5	11	mg CaCO <sub>3</sub> /L		2	SM 2320 B	05/16/22	C-51b	APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1	05/13/22	U	MRW
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	05/12/22 15:09		ASD
Nitrate as N	0.94	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	05/12/22 16:21	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	05/12/22 16:21	U	JAF
Nitrate+Nitrite as N	<0.95	mg/l	0.122	1.10	CALCULATED	05/12/22 16:21		JAF
Nitrogen, Total Kjeldahl (TKN)	0.85	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	05/19/22		SNF
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	05/13/22		MRW
Solids, Total Dissolved	85	mg/l	4	5	SM 2540 C	05/13/22		TMH
Total Organic Carbon	1.4	mg/l	0.3	0.5	SM 5310 C	05/16/22		ALD
Solids, Total Suspended	2	mg/l	1	1	SM 2540 D	05/13/22		ALD

**Lab ID:** 2216593-05    **Collected By:** Client    **Sampled:** 05/12/22 08:35    **Received:** 05/12/22 13:15  
**Sample Desc:** BZ-3D    **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
<b>Dissolved General Chemistry</b>								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	05/19/22	G-23, G-24	SNF
<b>General Chemistry</b>								
Alkalinity, Total to pH 4.5	12	mg CaCO <sub>3</sub> /L		2	SM 2320 B	05/16/22	C-51f	APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1	05/13/22	U	MRW
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	05/12/22 15:09		ASD
Nitrate as N	0.93	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	05/12/22 16:38	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	05/12/22 16:38	U	JAF
Nitrate+Nitrite as N	<0.94	mg/l	0.122	1.10	CALCULATED	05/12/22 16:38		JAF
Nitrogen, Total Kjeldahl (TKN)	0.50	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	05/19/22	J	SNF
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	05/13/22		MRW
Solids, Total Dissolved	104	mg/l	4	5	SM 2540 C	05/13/22		TMH
Total Organic Carbon	1.4	mg/l	0.3	0.5	SM 5310 C	05/16/22		ALD
Solids, Total Suspended	12	mg/l	1	1	SM 2540 D	05/13/22		ALD



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**M.J. Reider Associates, Inc.**

**Lab ID:** 2216593-06      **Collected By:** Client      **Sampled:** 05/12/22 11:00      **Received:** 05/12/22 13:15  
**Sample Desc:** BZ-4S      **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
<b>Dissolved General Chemistry</b>								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	05/19/22	G-23, G-24	SNF
<b>General Chemistry</b>								
Alkalinity, Total to pH 4.5	6	mg CaCO <sub>3</sub> /L		2	SM 2320 B	05/16/22	C-51j	APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1	05/13/22	U	MRW
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	05/12/22 15:09		ASD
Nitrate as N	0.20	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	05/12/22 16:55	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	05/12/22 16:55	U	JAF
Nitrate+Nitrite as N	<0.21	mg/l	0.122	1.10	CALCULATED	05/12/22 16:55		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	05/19/22	U	SNF
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	05/13/22		MRW
Solids, Total Dissolved	68	mg/l	4	5	SM 2540 C	05/13/22		TMH
Total Organic Carbon	1.5	mg/l	0.3	0.5	SM 5310 C	05/16/22		ALD
Solids, Total Suspended	5	mg/l	1	1	SM 2540 D	05/13/22		ALD
<b>Microbiology</b>								
Escherichia coli	<1	mpn/100ml	1		SM 9223 B/Quantitray	5/12/22 14:12	5/13/22 8:44	JMW
Total Coliform	411	mpn/100ml	1		SM 9223 B/Quantitray	5/12/22 14:12	5/13/22 8:44	JMW



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**M.J. Reider Associates, Inc.**

**Lab ID:** 2216593-07      **Collected By:** Client      **Sampled:** 05/12/22 10:40      **Received:** 05/12/22 13:15  
**Sample Desc:** BZ-5S      **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
<b>Dissolved General Chemistry</b>								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	05/19/22	G-23, G-24	SNF
<b>General Chemistry</b>								
Alkalinity, Total to pH 4.5	14	mg CaCO <sub>3</sub> /L		2	SM 2320 B	05/16/22	C-51i	APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1	05/13/22	U	MRW
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	05/12/22 15:10		GNG
Nitrate as N	1.29	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	05/12/22 17:12		JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	05/12/22 17:12	U	JAF
Nitrate+Nitrite as N	<1.30	mg/l	0.122	1.10	CALCULATED	05/12/22 17:12		JAF
Nitrogen, Total Kjeldahl (TKN)	0.52	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	05/19/22		SNF
Phosphorus as P, Total	0.01	mg/l	0.01	0.01	SM 4500-P F	05/13/22		MRW
Solids, Total Dissolved	115	mg/l	4	5	SM 2540 C	05/13/22		TMH
Total Organic Carbon	1.5	mg/l	0.3	0.5	SM 5310 C	05/16/22		ALD
Solids, Total Suspended	7	mg/l	1	1	SM 2540 D	05/13/22		ALD
<b>Microbiology</b>								
Escherichia coli	36	mpn/100ml	1		SM 9223 B/Quantitray	5/12/22 14:12	5/13/22 8:44	JMW
Total Coliform	1550	mpn/100ml	1		SM 9223 B/Quantitray	5/12/22 14:12	5/13/22 8:44	JMW



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M.J. Reider Associates, Inc.

**Lab ID:** 2216593-08      **Collected By:** Client      **Sampled:** 05/12/22 07:30      **Received:** 05/12/22 13:15  
**Sample Desc:** BZ-6S      **Sample Type:** Grab  
**Comments:** Bacteria bottle was not filled at time of sampling.

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	05/19/22	G-23, G-24	SNF
General Chemistry								
Alkalinity, Total to pH 4.5	11	mg CaCO <sub>3</sub> /L		2	SM 2320 B	05/16/22	C-51c	APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1	05/13/22	U	MRW
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	05/12/22 15:09		ASD
Nitrate as N	0.86	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	05/12/22 17:29	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	05/12/22 17:29	U	JAF
Nitrate+Nitrite as N	<0.87	mg/l	0.122	1.10	CALCULATED	05/12/22 17:29		JAF
Nitrogen, Total Kjeldahl (TKN)	0.45	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	05/19/22	J	SNF
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	05/13/22		MRW
Solids, Total Dissolved	92	mg/l	4	5	SM 2540 C	05/13/22		TMH
Total Organic Carbon	1.9	mg/l	0.3	0.5	SM 5310 C	05/16/22		ALD
Solids, Total Suspended	4	mg/l	1	1	SM 2540 D	05/13/22		ALD

**Lab ID:** 2216593-09      **Collected By:** Client      **Sampled:** 05/12/22 07:30      **Received:** 05/12/22 13:15  
**Sample Desc:** BZ-6M      **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	05/19/22	G-23, G-24	SNF
General Chemistry								
Alkalinity, Total to pH 4.5	11	mg CaCO <sub>3</sub> /L		2	SM 2320 B	05/16/22	C-51c	APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1	05/13/22	U	MRW
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	05/12/22 15:09		ASD
Nitrate as N	0.92	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	05/12/22 17:45	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	05/12/22 17:45	U	JAF
Nitrate+Nitrite as N	<0.93	mg/l	0.122	1.10	CALCULATED	05/12/22 17:45		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	05/19/22	U	SNF
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	05/13/22		MRW
Solids, Total Dissolved	94	mg/l	4	5	SM 2540 C	05/13/22		TMH
Total Organic Carbon	1.5	mg/l	0.3	0.5	SM 5310 C	05/16/22		ALD
Solids, Total Suspended	2	mg/l	1	1	SM 2540 D	05/13/22		ALD



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**M.J. Reider Associates, Inc.**

**Lab ID:** 2216593-10      **Collected By:** Client      **Sampled:** 05/12/22 07:30      **Received:** 05/12/22 13:15  
**Sample Desc:** BZ-6D      **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
<b>Dissolved General Chemistry</b>								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	05/19/22	G-23, G-24	SNF
<b>General Chemistry</b>								
Alkalinity, Total to pH 4.5	11	mg CaCO <sub>3</sub> /L		2	SM 2320 B	05/16/22	C-51e	APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1	05/13/22	U	MRW
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	05/12/22 15:09		ASD
Nitrate as N	0.93	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	05/12/22 18:53	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	05/12/22 18:53	U	JAF
Nitrate+Nitrite as N	<0.94	mg/l	0.122	1.10	CALCULATED	05/12/22 18:53		JAF
Nitrogen, Total Kjeldahl (TKN)	0.47	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	05/19/22	Q-10, J	SNF
Phosphorus as P, Total	0.03	mg/l	0.01	0.01	SM 4500-P F	05/13/22		MRW
Solids, Total Dissolved	68	mg/l	4	5	SM 2540 C	05/13/22		TMH
Total Organic Carbon	1.8	mg/l	0.3	0.5	SM 5310 C	05/16/22		ALD
Solids, Total Suspended	68	mg/l	1	1	SM 2540 D	05/13/22		ALD



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**M.J. Reider Associates, Inc.**

**Lab ID:** 2216593-11      **Collected By:** Client      **Sampled:** 05/12/22 09:20      **Received:** 05/12/22 13:15  
**Sample Desc:** BZ-7S      **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
<b>Dissolved General Chemistry</b>								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	05/19/22	G-23, G-24	SNF
<b>General Chemistry</b>								
Alkalinity, Total to pH 4.5	11	mg CaCO <sub>3</sub> /L		2	SM 2320 B	05/16/22	C-51d	APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1	05/13/22	U	MRW
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	05/12/22 15:10		GNG
Nitrate as N	0.93	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	05/12/22 19:43	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	05/12/22 19:43	U	JAF
Nitrate+Nitrite as N	<0.94	mg/l	0.122	1.10	CALCULATED	05/12/22 19:43		JAF
Nitrogen, Total Kjeldahl (TKN)	0.47	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	05/19/22	J	SNF
Phosphorus as P, Total	0.02	mg/l	0.01	0.01	SM 4500-P F	05/13/22		MRW
Solids, Total Dissolved	82	mg/l	4	5	SM 2540 C	05/13/22		TMH
Total Organic Carbon	1.7	mg/l	0.3	0.5	SM 5310 C	05/16/22		ALD
Solids, Total Suspended	2	mg/l	1	1	SM 2540 D	05/13/22		ALD
<b>Microbiology</b>								
Escherichia coli	14	mpn/100ml	1		SM 9223 B/Quantitray	5/12/22 14:12	5/13/22 8:44	JMW
Total Coliform	225	mpn/100ml	1		SM 9223 B/Quantitray	5/12/22 14:12	5/13/22 8:44	JMW



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**M.J. Reider Associates, Inc.**

**Lab ID:** 2216593-12      **Collected By:** Client      **Sampled:** 05/12/22 09:20      **Received:** 05/12/22 13:15  
**Sample Desc:** BZ-7M      **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
<b>Dissolved General Chemistry</b>								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	05/19/22	G-23, G-24	SNF
<b>General Chemistry</b>								
Alkalinity, Total to pH 4.5	12	mg CaCO <sub>3</sub> /L		2	SM 2320 B	05/16/22	C-51g	APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1	05/13/22	U	MRW
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	05/12/22 15:10		GNG
Nitrate as N	0.96	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	05/12/22 20:00	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	05/12/22 20:00	U	JAF
Nitrate+Nitrite as N	<0.97	mg/l	0.122	1.10	CALCULATED	05/12/22 20:00		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	05/19/22	U	SNF
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	05/13/22		MRW
Solids, Total Dissolved	87	mg/l	4	5	SM 2540 C	05/13/22		TMH
Total Organic Carbon	2.1	mg/l	0.3	0.5	SM 5310 C	05/16/22		ALD
Solids, Total Suspended	<1	mg/l	1	1	SM 2540 D	05/13/22		ALD

**Lab ID:** 2216593-13      **Collected By:** Client      **Sampled:** 05/12/22 09:20      **Received:** 05/12/22 13:15  
**Sample Desc:** BZ-7D      **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
<b>Dissolved General Chemistry</b>								
Phosphorus as P, Dissolved	0.01	mg/l		0.01	SM 4500-P F	05/19/22	G-23, G-24	SNF
<b>General Chemistry</b>								
Alkalinity, Total to pH 4.5	13	mg CaCO <sub>3</sub> /L		2	SM 2320 B	05/16/22	C-51h	APR
Ammonia as N	0.03	mg/l	0.02	0.02	EPA 350.1	05/13/22		MRW
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	05/12/22 15:10		GNG
Nitrate as N	0.97	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	05/12/22 20:17	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	05/12/22 20:17	U	JAF
Nitrate+Nitrite as N	<0.98	mg/l	0.122	1.10	CALCULATED	05/12/22 20:17		JAF
Nitrogen, Total Kjeldahl (TKN)	0.44	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	05/19/22	J	SNF
Phosphorus as P, Total	0.02	mg/l	0.01	0.01	SM 4500-P F	05/13/22		MRW
Solids, Total Dissolved	92	mg/l	4	5	SM 2540 C	05/13/22		TMH
Total Organic Carbon	2.6	mg/l	0.3	0.5	SM 5310 C	05/16/22		ALD
Solids, Total Suspended	60	mg/l	1	1	SM 2540 D	05/13/22		ALD



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Preparation Methods

Specific Method	Preparation Method	Prep Batch	Prepared Date	Prepared By
<b>2216593-01</b>				
<b>Dissolved General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B2E1020	05/18/2022	SNF
<b>General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B2E0770	05/13/2022	MRW
<b>2216593-02</b>				
<b>Dissolved General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B2E1020	05/18/2022	SNF
<b>General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B2E0770	05/13/2022	MRW
<b>2216593-03</b>				
<b>Dissolved General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B2E1020	05/18/2022	SNF
<b>General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B2E0770	05/13/2022	MRW
<b>2216593-04</b>				
<b>Dissolved General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B2E1020	05/18/2022	SNF
<b>General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B2E0770	05/13/2022	MRW
<b>2216593-05</b>				
<b>Dissolved General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B2E1020	05/18/2022	SNF
<b>General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B2E0770	05/13/2022	MRW
<b>2216593-06</b>				
<b>Dissolved General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B2E1020	05/18/2022	SNF
<b>General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B2E0770	05/13/2022	MRW
<b>2216593-07</b>				
<b>Dissolved General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B2E1020	05/18/2022	SNF
<b>General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B2E0770	05/13/2022	MRW
<b>2216593-08</b>				
<b>Dissolved General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B2E1020	05/18/2022	SNF
<b>General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B2E0770	05/13/2022	MRW
<b>2216593-09</b>				



107 Angelica Street ○ Reading, PA 19611 ○ www.mjreider.com ○ (610) 374-5129 ○ fax (610) 374-7234

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Additional accreditations by MD (261), NY(12094)

M.J. Reider Associates, Inc.

**Dissolved General Chemistry**

SM 4500-P F	SM 4500-P B	B2E1020	05/18/2022	SNF
-------------	-------------	---------	------------	-----

**General Chemistry**

SM 4500-P F	SM 4500-P B	B2E0770	05/13/2022	MRW
-------------	-------------	---------	------------	-----

**2216593-10**

**Dissolved General Chemistry**

SM 4500-P F	SM 4500-P B	B2E1020	05/18/2022	SNF
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**General Chemistry**

SM 4500-P F	SM 4500-P B	B2E0770	05/13/2022	MRW
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**2216593-11**

**Dissolved General Chemistry**

SM 4500-P F	SM 4500-P B	B2E1020	05/18/2022	SNF
-------------	-------------	---------	------------	-----

**General Chemistry**

SM 4500-P F	SM 4500-P B	B2E0770	05/13/2022	MRW
-------------	-------------	---------	------------	-----

**2216593-12**

**Dissolved General Chemistry**

SM 4500-P F	SM 4500-P B	B2E1020	05/18/2022	SNF
-------------	-------------	---------	------------	-----

**General Chemistry**

SM 4500-P F	SM 4500-P B	B2E0770	05/13/2022	MRW
-------------	-------------	---------	------------	-----

**2216593-13**

**Dissolved General Chemistry**

SM 4500-P F	SM 4500-P B	B2E1020	05/18/2022	SNF
-------------	-------------	---------	------------	-----

**General Chemistry**

SM 4500-P F	SM 4500-P B	B2E0770	05/13/2022	MRW
-------------	-------------	---------	------------	-----

**Notes and Definitions**

- C-51 The alkalinity to pH 4.2 = 10.4 mg CaCO<sub>3</sub>/L.
- C-51a The alkalinity to pH 4.2 = 10.6 mg CaCO<sub>3</sub>/L.
- C-51b The alkalinity to pH 4.2 = 10.8 mg CaCO<sub>3</sub>/L.
- C-51c The alkalinity to pH 4.2 = 11.0 mg CaCO<sub>3</sub>/L.
- C-51d The alkalinity to pH 4.2 = 11.3 mg CaCO<sub>3</sub>/L.
- C-51e The alkalinity to pH 4.2 = 11.4 mg CaCO<sub>3</sub>/L.
- C-51f The alkalinity to pH 4.2 = 11.8 mg CaCO<sub>3</sub>/L.
- C-51g The alkalinity to pH 4.2 = 12.0 mg CaCO<sub>3</sub>/L.
- C-51h The alkalinity to pH 4.2 = 13.2 mg CaCO<sub>3</sub>/L.
- C-51i The alkalinity to pH 4.2 = 13.5 mg CaCO<sub>3</sub>/L.
- C-51j The alkalinity to pH 4.2 = 6.0 mg CaCO<sub>3</sub>/L.
- C-51k The alkalinity to pH 4.2 = 7.4 mg CaCO<sub>3</sub>/L.
- G-23 The sample was filtered after it was received at the laboratory and outside of the 15-minute hold time.
- G-24 The sample was preserved in the laboratory and outside of the 15-minute hold time.
- J Estimated value
- Q-10 The matrix spike(s) were outside acceptable limits of 90-110% recovery at 113%.
- U Analyte was not detected above the indicated value.



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NELAC accreditations for various drinking water, wastewater and solid & chemical materials analytes.  
Additional accreditations by MD (261), NY(12094)



**M.J. Reider Associates, Inc.**

107 Angelica St, Reading PA, 19611  
610-374-5129 www.mjreider.com

**WORK ORDER  
Chain of Custody**

2216593



Client Code: 3157

Project Manager: Richard A Wheeler

Report To: Tetra Tech - David Wertz - USACE, Phila Dist. Env.Resources Branch 100 Penn Square E., Arlington, VA 22201

Invoice To: Tetra Tech - David Wertz - USACE, Phila Dist. Env.Resources Branch 100 Penn Square E., Arlington, VA 22201

Client: Tetra Tech

Project: 2022 - Beltzville Reservoir

Comments: \_\_\_\_\_

Collected By :  
(Full Name)

*Gregory Wacik*

**2216593-01 BZ-1S**

*KMS*  
BOD SM 5210B, EC (#) SM 9223B Confirmation, NO2-N EPA 300.0, NO3-N EPA 300.0, NO2-N, NO3-N, Combined NO3+NO2, PO4-D SM 4500P-F, TC (#) SM 9223B  
Alk SM 2320B, NH3-N EPA 350.1, PO4 SM 4500P-F, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D

Matrix: Non-Potable Water  
Type: Grab

Date: 5/12/22  
Time: 0630

- A - PI 500ml NP, minimal hdspc
- B - PI Liter NP
- C - Sterile PI 125ml NaThio
- D - PI 500ml H2SO4
- E - PI 250ml NP
- F - PI 500ml Lab Filtered
- G - Vial Amber 40ml H3PO4, minimal hdspc
- H - Vial Amber 40ml H3PO4, minimal hdspc
- I - Vial Amber 40ml H3PO4, minimal hdspc

**2216593-02 BZ-2S**

*KMS*  
PO4-D SM 4500P-F, TC (#) SM 9223B, BOD SM 5210B, EC (#) SM 9223B Confirmation, NO2-N EPA 300.0, NO3-N EPA 300.0, NO2-N, NO3-N, Combined NO3+NO2  
TDS SM 2540C, TOC SM 5310C, Alk SM 2320B, NH3-N EPA 350.1, PO4 SM 4500P-F, TKN EPA 351.2, TSS SM 2540D

Matrix: Non-Potable Water  
Type: Grab

Date: 5/12/22  
Time: 1115

- A - PI 500ml NP, minimal hdspc
- B - PI Liter NP
- C - Sterile PI 125ml NaThio
- D - PI 500ml H2SO4
- E - PI 250ml NP
- F - PI 500ml Lab Filtered
- G - Vial Amber 40ml H3PO4, minimal hdspc
- H - Vial Amber 40ml H3PO4, minimal hdspc
- I - Vial Amber 40ml H3PO4, minimal hdspc

*[Signature]* 5/12/22 1130  
Relinquished By \_\_\_\_\_ Date/Time \_\_\_\_\_  
Relinquished By \_\_\_\_\_ Date/Time \_\_\_\_\_  
Relinquished By \_\_\_\_\_ Date/Time \_\_\_\_\_

*Benny Wertz* 5-12-22 1135  
Received By \_\_\_\_\_ Date/Time \_\_\_\_\_  
*Benny Wertz* 5-12-22 1315  
Received at Laboratory By \_\_\_\_\_ Date/Time \_\_\_\_\_

Sample Kit Prepared By: <i>TBS</i>	Date/Time
Sample Temp (°C): <u>5.7</u>	
Samples on Ice? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA	
Approved By: <i>[Signature]</i>	
Entered By: <i>[Signature]</i>	

The Client, by signing (or having the client's agent sign), agrees to MJRA's Terms and Conditions and to pay for the above requested services including any additional associated fees incurred.



Client Code: 3157
Project Manager: Richard A Wheeler

Client: Tetra Tech
Project: 2022 - Beltzville Reservoir

Collected By: Gregory Wacik

Comments:

2216593-03 BZ-3S

BOD SM 5210B, EC (#) SM 9223B Confirmation, NO2-N EPA 300.0, NO3-N EPA 300.0, NO2-N, NO3-N, Combined NO3+NO2, PO4-D SM 4500P-F, TC (#) SM 9223B
Alk SM 2320B, NH3-N EPA 350.1, PO4 SM 4500P-F, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D, TDS SM 2540C

Matrix: Non-Potable Water
Type: Grab

Date: 5/12/22
Time: 0835

- A - PI 500ml NP, minimal hdspc
B - PI Liter NP
C - Sterile PI 125ml NaThio
D - PI 500ml H2SO4
E - PI 250ml NP
F - PI 500ml Lab Filtered
G - Vial Amber 40ml H3PO4, minimal hdspc
H - Vial Amber 40ml H3PO4, minimal hdspc
I - Vial Amber 40ml H3PO4, minimal hdspc

2216593-04 BZ-3M

NO2-N EPA 300.0, NO3-N EPA 300.0, BOD SM 5210B, NO2-N, NO3-N, Combined NO3+NO2, PO4-D SM 4500P-F
TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, Alk SM 2320B, NH3-N EPA 350.1, PO4 SM 4500P-F, TSS SM 2540D

Matrix: Non-Potable Water
Type: Grab

Date: 5/12/22
Time: 0835

- A - PI 500ml NP, minimal hdspc
B - PI Liter NP
C - PI 500ml H2SO4
D - PI 250ml NP
E - PI 500ml Lab Filtered
F - Vial Amber 40ml H3PO4, minimal hdspc
G - Vial Amber 40ml H3PO4, minimal hdspc
H - Vial Amber 40ml H3PO4, minimal hdspc

2216593-05 BZ-3D

NO2-N EPA 300.0, NO3-N EPA 300.0, PO4-D SM 4500P-F, BOD SM 5210B, NO2-N, NO3-N, Combined NO3+NO2
NH3-N EPA 350.1, PO4 SM 4500P-F, Alk SM 2320B, TDS SM 2540C, TOC SM 5310C, TSS SM 2540D, TKN EPA 351.2

Matrix: Non-Potable Water
Type: Grab

Date: 5/12/22
Time: 0835

- A - PI 500ml NP, minimal hdspc
B - PI Liter NP
C - PI 500ml H2SO4
D - PI 250ml NP
E - PI 500ml Lab Filtered
F - Vial Amber 40ml H3PO4, minimal hdspc
G - Vial Amber 40ml H3PO4, minimal hdspc
H - Vial Amber 40ml H3PO4, minimal hdspc

Relinquished By: [Signature] Date/Time: 5/12/22 1130
Received By: Benny Math Date/Time: 5-12-22 1135
Relinquished By: [Signature] Date/Time:
Received By: Benny Math Date/Time:
Relinquished By: [Signature] Date/Time:
Received at Laboratory By: Benny Math Date/Time: 5-12-22 1315

Sample Kit Prepared By: Date/Time
Sample Temp (°C): 5.7
Samples on Ice? Yes No NA
Approved By: BSW
Entered By: [Signature]





Client Code: 3157

Client: Tetra Tech

Project Manager: Richard A Wheeler

Project: 2022 - Beltzville Reservoir

Comments: \_\_\_\_\_

Collected By : Gregory Wacik  
(Full Name)

2216593-06 BZ-4S

*kms*  
BOD SM 5210B, EC (#) SM 9223B Confirmation, NO2-N, NO3-N, Combined NO3+NO2, PO4-D SM 4500P-F, NO2-N EPA 300.0, NO3-N EPA 300.0, TC (#) SM 9223B  
Alk SM 2320B, PO4 SM 4500P-F, NH3-N EPA 350.1, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D

Matrix: Non-Potable Water

Date: 5/12/22  
Time: 1100

Type: Grab

- A - Pl 500ml NP, minimal hdspc
- B - Pl Liter NP
- C - Sterile Pl 125ml NaThio
- D - Pl 500ml H2SO4
- E - Pl 250ml NP
- F - Pl 500ml Lab Filtered
- G - Vial Amber 40ml H3PO4, minimal hdspc
- H - Vial Amber 40ml H3PO4, minimal hdspc
- I - Vial Amber 40ml H3PO4, minimal hdspc

2216593-07 BZ-5S

*kms*  
NO2-N EPA 300.0, NO3-N EPA 300.0, TC (#) SM 9223B, BOD SM 5210B, EC (#) SM 9223B Confirmation, NO2-N, NO3-N, Combined NO3+NO2, PO4-D SM 4500P-F  
NH3-N EPA 350.1, Alk SM 2320B, TDS SM 2540C, TKN EPA 351.2, PO4 SM 4500P-F, TOC SM 5310C, TSS SM 2540D

Matrix: Non-Potable Water

Date: 5/12/22  
Time: 10:40

Type: Grab

- A - Pl 500ml NP, minimal hdspc
- B - Pl Liter NP
- C - Sterile Pl 125ml NaThio
- D - Pl 500ml H2SO4
- E - Pl 250ml NP
- F - Pl 500ml Lab Filtered
- G - Vial Amber 40ml H3PO4, minimal hdspc
- H - Vial Amber 40ml H3PO4, minimal hdspc
- I - Vial Amber 40ml H3PO4, minimal hdspc

2216593-08 BZ-6S

*kms*  
BOD SM 5210B, EC (#) SM 9223B Confirmation, PO4-D SM 4500P-F, TC (#) SM 9223B, NO2-N EPA 300.0, NO3-N EPA 300.0, NO2-N, NO3-N, Combined NO3+NO2  
TSS SM 2540D, TOC SM 5310C, NH3-N EPA 350.1, TDS SM 2540C, Alk SM 2320B, PO4 SM 4500P-F, TKN EPA 351.2

Matrix: Non-Potable Water

Date: 5/12/22  
Time: 0730

Type: Grab

- A - Pl 500ml NP, minimal hdspc
- B - Pl Liter NP
- ~~C - Sterile Pl 125ml NaThio~~
- D - Pl 500ml H2SO4
- E - Pl 250ml NP
- F - Pl 500ml Lab Filtered
- G - Vial Amber 40ml H3PO4, minimal hdspc
- H - Vial Amber 40ml H3PO4, minimal hdspc
- I - Vial Amber 40ml H3PO4, minimal hdspc

*C - No Sample collected  
BSW 5-12-22*

*[Signature]*  
Relinquished By \_\_\_\_\_ Date/Time 5/12/22 1130

*Benny Wacik*  
Received By \_\_\_\_\_ Date/Time 5-12-22 1135

Relinquished By \_\_\_\_\_ Date/Time \_\_\_\_\_

Received By \_\_\_\_\_ Date/Time \_\_\_\_\_

Relinquished By \_\_\_\_\_ Date/Time \_\_\_\_\_

*Benny Wacik*  
Received at Laboratory By \_\_\_\_\_ Date/Time 5-12-22 1313

Sample Kit Prepared By:	Date/Time
Sample Temp (°C):	<u>5.7</u>
Samples on Ice?	<input checked="" type="radio"/> Yes <input type="radio"/> No <input type="radio"/> NA
Approved By:	<u>BSW</u>
Entered By:	<u>(Signature)</u>



M.J. Reider Associates, Inc.

2216593

Client Code: 3157

Client: Tetra Tech

Project Manager: Richard A Wheeler

Project: 2022 - Beltzville Reservoir

Comments: \_\_\_\_\_

Collected By : Gregory Wacik  
(Full Name)

2216593-09 BZ-6M

BOD SM 5210B, NO2-N EPA 300.0, NO3-N EPA 300.0, NO2-N, NO3-N, Combined NO3+NO2, PO4-D SM 4500P-F  
Alk SM 2320B, PO4 SM 4500P-F, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D, NH3-N EPA 350.1

Matrix: Non-Potable Water

Date: 5/12/22

Type: Grab

Time: 0730

- A - Pl 500ml NP, minimal hdspc
- B - Pl Liter NP
- C - Pl 500ml H2SO4
- D - Pl 250ml NP
- E - Pl 500ml Lab Filtered
- F - Vial Amber 40ml H3PO4, minimal hdspc
- G - Vial Amber 40ml H3PO4, minimal hdspc
- H - Vial Amber 40ml H3PO4, minimal hdspc

2216593-10 BZ-6D

BOD SM 5210B, NO2-N EPA 300.0, NO3-N EPA 300.0, NO2-N, NO3-N, Combined NO3+NO2, PO4-D SM 4500P-F  
Alk SM 2320B, NH3-N EPA 350.1, PO4 SM 4500P-F, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D

Matrix: Non-Potable Water

Date: 5/12/22

Type: Grab

Time: 0730

- A - Pl 500ml NP, minimal hdspc
- B - Pl Liter NP
- C - Pl 500ml H2SO4
- D - Pl 250ml NP
- E - Pl 500ml Lab Filtered
- F - Vial Amber 40ml H3PO4, minimal hdspc
- G - Vial Amber 40ml H3PO4, minimal hdspc
- H - Vial Amber 40ml H3PO4, minimal hdspc

2216593-11 BZ-7S

BOD SM 5210B, EC (#) SM 9223B Confirmation, NO2-N EPA 300.0, NO3-N EPA 300.0, NO2-N, NO3-N, Combined NO3+NO2, PO4-D SM 4500P-F, TC (#) SM 9223B  
Alk SM 2320B, NH3-N EPA 350.1, PO4 SM 4500P-F, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D

Matrix: Non-Potable Water

Date: 5/12/22

Type: Grab

Time: 0920

- A - Pl 500ml NP, minimal hdspc
- B - Pl Liter NP
- C - Sterile Pl 125ml NaThio
- D - Pl 500ml H2SO4
- E - Pl 250ml NP
- F - Pl 500ml Lab Filtered
- G - Vial Amber 40ml H3PO4, minimal hdspc
- H - Vial Amber 40ml H3PO4, minimal hdspc
- I - Vial Amber 40ml H3PO4, minimal hdspc

Relinquished By: Gregory Wacik Date/Time: 5/12/22 1130 Received By: Benny Wacik Date/Time: 5-12-22 1135

Relinquished By: \_\_\_\_\_ Date/Time: \_\_\_\_\_ Received By: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Relinquished By: \_\_\_\_\_ Date/Time: \_\_\_\_\_ Received at Laboratory By: Benny Wacik Date/Time: 5-12-22 1315

Sample Kit Prepared By:	Date/Time
Sample Temp (°C):	<u>5.7</u>
Samples on Ice?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA
Approved By:	<u>BSW</u>
Entered By:	<u>W</u>



Client Code: 3157

Client: Tetra Tech

Project Manager: Richard A Wheeler

Project: 2022 - Beltville Reservoir

Collected By: (Full Name)

Gregory Wacik

Comments:

2216593-12 BZ-7M

BOD SM 5210B, NO2-N EPA 300.0, NO3-N EPA 300.0, NO2-N, NO3-N, Combined NO3+NO2, PO4-D SM 4500P-F Alk SM 2320B, NH3-N EPA 350.1, PO4 SM 4500P-F, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D

Matrix: Non-Potable Water

Type: Grab

Date: 5/12/22 Time: 0920

- A - Pl 500ml NP, minimal hdspc B - Pl Liter NP C - Pl 500ml H2SO4 D - Pl 250ml NP E - Pl 500ml Lab Filtered F - Vial Amber 40ml H3PO4, minimal hdspc G - Vial Amber 40ml H3PO4, minimal hdspc H - Vial Amber 40ml H3PO4, minimal hdspc

2216593-13 BZ-7D

BOD SM 5210B, NO2-N EPA 300.0, NO3-N EPA 300.0, NO2-N, NO3-N, Combined NO3+NO2, PO4-D SM 4500P-F Alk SM 2320B, NH3-N EPA 350.1, PO4 SM 4500P-F, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D

Matrix: Non-Potable Water

Type: Grab

Date: 5/12/22 Time: 0920

- A - Pl 500ml NP, minimal hdspc B - Pl Liter NP C - Pl 500ml H2SO4 D - Pl 250ml NP E - Pl 500ml Lab Filtered F - Vial Amber 40ml H3PO4, minimal hdspc G - Vial Amber 40ml H3PO4, minimal hdspc H - Vial Amber 40ml H3PO4, minimal hdspc

Relinquished By: [Signature] Date/Time: 5/12/22 1130 Received By: [Signature] Date/Time: 5-12-22 1135

Sample Kit Prepared By: Date/Time: Sample Temp (°C): Samples on Ice? (Yes/No/NA) Approved By: Entered By:

**M.J. Reider Associates, Inc.**

**MJRA Terms & Conditions**

All samples submitted must be accompanied by signed documentation representing a Chain of Custody (COC). The COC Record acts as a contract between the client and MJRA. Signing the COC form gives approval for MJRA to perform the requested analyses and is an agreement to pay for the cost of such analyses. COC Records must be completed in black or blue indelible ink (must not run when wet). COC documentation begins at the time of sample collection. Client is required to document all sample details prior to releasing samples to MJRA. All samples must be placed on ice immediately after sampling and shipped or delivered to the laboratory in a manner that will maintain the sample temperature above freezing and below 6C (loose ice is preferred).

**Sample Submission, Sample Acceptance & Sampling Containers**

Included on the COC must be the sample description, date and time of collection (including start and stop for composites), container size and type, preservative information, sample matrix, indication of whether the sample is a grab or composite, number of containers & a list of the tests to be performed. Poor sample collection technique, inappropriate sampling containers and/or improper sample preservation may lead to sample rejection. Suitable sample containers, labels, and preservatives (as applicable), along with blank COCs are provided at no additional cost.

**Turnaround Times (TAT)**

Average TAT for test results range from 5 to 15 working days depending on the specific analyses and time of year submitted. Faster turnaround times (\*RUSH TAT) may be available depending on the current workload in a particular department and the nature of the analyses requested. We encourage you to verify requests for expedited sample results with one of our Technical Directors prior to sample submittal. Without confirmation from a Technical Director, your results may not be completed by your deadline. \*RUSH TAT Surcharges are applied for expedited turnaround times.

**Analytical Results, Sample Collection Integrity & Subcontracting**

Analytical values are for the sample as submitted and relate only to the item tested. The value indicates a snapshot of the constituent content of the sample at the time of sample collection. Analytical results can be impacted by poor sample collection technique and/or improper preservation. All sample collection completed by MJRA was performed in accordance with applicable regulatory protocols or as specified in customer specific sampling plans. Constituent content will vary over time based on the matrix of the sample and the physical and chemical changes to its environment. All sample results and laboratory reports are strictly confidential. Results will not be available to anyone except the primary client or authorized party representing the client unless MJRA receives additional permissions from the client. When necessary, MJRA will subcontract certain analyses to a third party accredited laboratory. If client prohibits subcontracting, it must be provided in writing and include instruction on how to proceed with client samples that require third party analyses.

**Payment Terms**

Payment Terms are Net 30 days. Prices are subject to change without notice. A standing monthly charge of 1.5% of the clients over-30-day-unpaid balance may be added to the balance after 30 days and each month thereafter (day 31, 61, 91 etc.). The laboratory accepts all major credit cards, ACH transactions, checks and cash. New clients must pay for all services rendered prior to sample collection and/or in some cases report processing. Clients must contact the MJRA accounting department to pursue a credit-based account. MJRA reserves the right to terminate the client's credit account and to refuse to perform additional services on a credit basis if any balance is outstanding for more than 60 days.

**Warranty & Litigation**

MJRA does not guarantee any results of its services but has agreed to use its best efforts, in accordance with the standards and practices of the industry, to cause such results to be accurate and complete. We disclaim any other warranties, expressed or implied, including a warranty of fitness for a particular purpose and warranty of merchantability. Clients agree that they shall reimburse MJRA for any and all fees, cost and litigation expenses, including reasonable attorney fees incurred by MJRA in obtaining payment for the services rendered. All costs associated with compliance with any subpoena for documents, testimony, or any other purpose relating to work performed by MJRA, for a client, shall be paid by that client. MJRA's aggregate liability for negligent acts and omissions and of an intentional breach by MJRA will not exceed the fee paid for the services. Client agrees to indemnify and hold MJRA harmless for any and all liabilities in excess of said amount. Neither MJRA nor the client shall be liable to the other for special, incidental consequential or punitive liability or damages included but not limited to those arising from delay, loss of use, loss of profits or revenues. MJRA will not be liable to the client unless the client has notified MJRA of the discovery of the alleged negligent act, error, omissions or breach within 30 days of the day of its discovery and within one year of the date of invoice.

Reviewed and Approved by:



Richard A Wheeler  
Director of Field Services



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# Certificate of Analysis

**M.J. Reider Associates, Inc.**

ENVIRONMENTAL TESTING LABORATORY  
U.S. EPA/PA DEP #06-00003

**Laboratory No.:** 2216900

**Report:** 07/06/22

**Lab Contact:** Richard A Wheeler

**Attention:** David Wertz

**Project:** 2022 - Beltzville Reservoir

**Reported To:** Tetra Tech

USACE, Phila Dist. Env.Resources Branch 100 Penn Square E.  
Arlington, VA 22201

**Lab ID:** 2216900-01

**Collected By:** Client

**Sampled:** 06/16/22 07:00

**Received:** 06/16/22 14:15

**Sample Desc:** BZ-1S

**Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
<b>Dissolved General Chemistry</b>								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	06/22/22	G-23, G-24	MRW
<b>General Chemistry</b>								
Alkalinity, Total to pH 4.5	12	mg CaCO <sub>3</sub> /L		2	SM 2320 B	06/17/22	C-51d	APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1	06/22/22	U	MRW
Biochemical Oxygen Demand	4.3	mg/l	2.0	2.0	SM 5210 B	06/16/22 17:00		KMS
Nitrate as N	0.87	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	06/16/22 22:56	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	06/16/22 22:56	U	JAF
Nitrate+Nitrite as N	<0.88	mg/l	0.122	1.10	CALCULATED	06/16/22 22:56		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	06/23/22	U	MRW
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	06/22/22		MRW
Solids, Total Dissolved	35	mg/l	4	5	SM 2540 C	06/17/22		TMH
Total Organic Carbon	1.8	mg/l	0.3	0.5	SM 5310 C	06/20/22		ALD
Solids, Total Suspended	2	mg/l	1	1	SM 2540 D	06/17/22		ALD
<b>Microbiology</b>								
Escherichia coli	14	mpn/100ml	1		SM 9223 B/Quantitray	6/16/22 15:46	6/17/22 13:18	M-08 JMW
Total Coliform	980	mpn/100ml	1		SM 9223 B/Quantitray	6/16/22 15:46	6/17/22 13:18	M-08 JMW



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**M.J. Reider Associates, Inc.**

**Lab ID:** 2216900-02      **Collected By:** Client      **Sampled:** 06/16/22 08:45      **Received:** 06/16/22 14:15  
**Sample Desc:** BZ-2S      **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
<b>Dissolved General Chemistry</b>								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	06/22/22	G-23, G-24	MRW
<b>General Chemistry</b>								
Alkalinity, Total to pH 4.5	10	mg CaCO <sub>3</sub> /L		2	SM 2320 B	06/17/22	C-511	APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1	06/22/22	U	MRW
Biochemical Oxygen Demand	2.0	mg/l	2.0	2.0	SM 5210 B	06/16/22 17:00		KMS
Nitrate as N	0.40	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	06/17/22 0:04	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	06/17/22 0:04	U	JAF
Nitrate+Nitrite as N	<0.41	mg/l	0.122	1.10	CALCULATED	06/17/22 0:04		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	06/23/22	U	MRW
Phosphorus as P, Total	0.04	mg/l	0.01	0.01	SM 4500-P F	06/22/22		MRW
Solids, Total Dissolved	50	mg/l	4	5	SM 2540 C	06/17/22		TMH
Total Organic Carbon	3.4	mg/l	0.3	0.5	SM 5310 C	06/20/22		ALD
Solids, Total Suspended	71	mg/l	1	1	SM 2540 D	06/17/22		ALD
<b>Microbiology</b>								
Escherichia coli	2420	mpn/100ml	1		SM 9223 B/Quantitray	6/16/22 15:46	6/17/22 13:18	JMW
Total Coliform	>2420	mpn/100ml	1		SM 9223 B/Quantitray	6/16/22 15:46	6/17/22 13:18	JMW



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**M.J. Reider Associates, Inc.**

**Lab ID:** 2216900-03      **Collected By:** Client      **Sampled:** 06/16/22 10:30      **Received:** 06/16/22 14:15  
**Sample Desc:** BZ-3S      **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
<b>Dissolved General Chemistry</b>								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	06/22/22	G-23, G-24	MRW
<b>General Chemistry</b>								
Alkalinity, Total to pH 4.5	11	mg CaCO <sub>3</sub> /L		2	SM 2320 B	06/17/22	C-51	APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1	06/21/22	U	MRW
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	06/16/22 17:00		KMS
Nitrate as N	0.69	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	06/17/22 0:37	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	06/17/22 0:37	U	JAF
Nitrate+Nitrite as N	<0.70	mg/l	0.122	1.10	CALCULATED	06/17/22 0:37		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	06/23/22	U	MRW
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	06/21/22		MRW
Solids, Total Dissolved	58	mg/l	4	5	SM 2540 C	06/17/22		TMH
Total Organic Carbon	1.8	mg/l	0.3	0.5	SM 5310 C	06/20/22		ALD
Solids, Total Suspended	<1	mg/l	1	1	SM 2540 D	06/17/22		ALD
<b>Microbiology</b>								
Escherichia coli	<1	mpn/100ml	1		SM 9223 B/Quantitray	6/16/22 15:46	6/17/22 13:18	JMW
Total Coliform	108	mpn/100ml	1		SM 9223 B/Quantitray	6/16/22 15:46	6/17/22 13:18	JMW



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**M.J. Reider Associates, Inc.**

**Lab ID:** 2216900-04      **Collected By:** Client      **Sampled:** 06/16/22 10:30      **Received:** 06/16/22 14:15  
**Sample Desc:** BZ-3M      **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
<b>Dissolved General Chemistry</b>								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	06/22/22	G-23, G-24	MRW
<b>General Chemistry</b>								
Alkalinity, Total to pH 4.5	12	mg CaCO <sub>3</sub> /L		2	SM 2320 B	06/17/22	C-51c	APR
Ammonia as N	0.02	mg/l	0.02	0.02	EPA 350.1	06/22/22	J	MRW
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	06/16/22 17:00		KMS
Nitrate as N	0.88	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	06/16/22 23:47	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	06/16/22 23:47	U	JAF
Nitrate+Nitrite as N	<0.89	mg/l	0.122	1.10	CALCULATED	06/16/22 23:47		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	06/23/22	U	MRW
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	06/22/22		MRW
Solids, Total Dissolved	60	mg/l	4	5	SM 2540 C	06/17/22		TMH
Total Organic Carbon	1.4	mg/l	0.3	0.5	SM 5310 C	06/20/22		ALD
Solids, Total Suspended	<1	mg/l	1	1	SM 2540 D	06/17/22		ALD

**Lab ID:** 2216900-05      **Collected By:** Client      **Sampled:** 06/16/22 10:30      **Received:** 06/16/22 14:15  
**Sample Desc:** BZ-3D      **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
<b>Dissolved General Chemistry</b>								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	06/22/22	G-23, G-24	MRW
<b>General Chemistry</b>								
Alkalinity, Total to pH 4.5	12	mg CaCO <sub>3</sub> /L		2	SM 2320 B	06/17/22	C-51e	APR
Ammonia as N	0.02	mg/l	0.02	0.02	EPA 350.1	06/22/22		MRW
Biochemical Oxygen Demand	2.2	mg/l	2.0	2.0	SM 5210 B	06/16/22 17:00		KMS
Nitrate as N	0.84	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	06/17/22 1:11	J	JAF
Nitrite as N	0.03	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	06/17/22 1:11	J	JAF
Nitrate+Nitrite as N	0.87	mg/l	0.122	1.10	CALCULATED	06/17/22 1:11		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	06/23/22	U	MRW
Phosphorus as P, Total	0.02	mg/l	0.01	0.01	SM 4500-P F	06/22/22		MRW
Solids, Total Dissolved	50	mg/l	4	5	SM 2540 C	06/17/22		TMH
Total Organic Carbon	1.3	mg/l	0.3	0.5	SM 5310 C	06/20/22		ALD
Solids, Total Suspended	<1	mg/l	1	1	SM 2540 D	06/17/22		ALD



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**M.J. Reider Associates, Inc.**

**Lab ID:** 2216900-06      **Collected By:** Client      **Sampled:** 06/16/22 08:20      **Received:** 06/16/22 14:15  
**Sample Desc:** BZ-4S      **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
<b>Dissolved General Chemistry</b>								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	06/22/22	G-23, G-24	MRW
<b>General Chemistry</b>								
Alkalinity, Total to pH 4.5	7	mg CaCO <sub>3</sub> /L		2	SM 2320 B	06/17/22	C-51i	APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1	06/22/22	U	MRW
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	06/16/22 17:00		KMS
Nitrate as N	0.21	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	06/16/22 21:49	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	06/16/22 21:49	U	JAF
Nitrate+Nitrite as N	<0.22	mg/l	0.122	1.10	CALCULATED	06/16/22 21:49		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	06/23/22	U	MRW
Phosphorus as P, Total	0.01	mg/l	0.01	0.01	SM 4500-P F	06/22/22		MRW
Solids, Total Dissolved	16	mg/l	4	5	SM 2540 C	06/17/22		TMH
Total Organic Carbon	2.5	mg/l	0.3	0.5	SM 5310 C	06/20/22		ALD
Solids, Total Suspended	7	mg/l	1	1	SM 2540 D	06/17/22		ALD
<b>Microbiology</b>								
Escherichia coli	980	mpn/100ml	1		SM 9223 B/Quantitray	6/16/22 15:46	6/17/22 13:18	JMW
Total Coliform	>2420	mpn/100ml	1		SM 9223 B/Quantitray	6/16/22 15:46	6/17/22 13:18	JMW



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**M.J. Reider Associates, Inc.**

**Lab ID:** 2216900-07      **Collected By:** Client      **Sampled:** 06/16/22 08:00      **Received:** 06/16/22 14:15  
**Sample Desc:** BZ-5S      **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
<b>Dissolved General Chemistry</b>								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	06/22/22	G-23, G-24	MRW
<b>General Chemistry</b>								
Alkalinity, Total to pH 4.5	16	mg CaCO <sub>3</sub> /L		2	SM 2320 B	06/17/22	C-51h	APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1	06/22/22	U	MRW
Biochemical Oxygen Demand	2.5	mg/l	2.0	2.0	SM 5210 B	06/16/22 17:00		KMS
Nitrate as N	1.12	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	06/17/22 0:20		JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	06/17/22 0:20	U	JAF
Nitrate+Nitrite as N	<1.13	mg/l	0.122	1.10	CALCULATED	06/17/22 0:20		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	06/23/22	U	MRW
Phosphorus as P, Total	0.05	mg/l	0.01	0.01	SM 4500-P F	06/22/22		MRW
Solids, Total Dissolved	62	mg/l	4	5	SM 2540 C	06/17/22		TMH
Total Organic Carbon	2.7	mg/l	0.3	0.5	SM 5310 C	06/20/22		ALD
Solids, Total Suspended	106	mg/l	1	1	SM 2540 D	06/17/22		ALD
<b>Microbiology</b>								
Escherichia coli	>2420	mpn/100ml	1		SM 9223 B/Quantitray	6/16/22 15:46	6/17/22 13:18	JMW
Total Coliform	>2420	mpn/100ml	1		SM 9223 B/Quantitray	6/16/22 15:46	6/17/22 13:18	JMW



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**M.J. Reider Associates, Inc.**

**Lab ID:** 2216900-08      **Collected By:** Client      **Sampled:** 06/16/22 09:30      **Received:** 06/16/22 14:15  
**Sample Desc:** BZ-6S      **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
<b>Dissolved General Chemistry</b>								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	06/22/22	G-23, G-24	MRW
<b>General Chemistry</b>								
Alkalinity, Total to pH 4.5	10	mg CaCO <sub>3</sub> /L		2	SM 2320 B	06/17/22	C-51k	APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1	06/21/22	U	MRW
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	06/16/22 17:00		KMS
Nitrate as N	0.70	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	06/16/22 22:39	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	06/16/22 22:39	U	JAF
Nitrate+Nitrite as N	<0.71	mg/l	0.122	1.10	CALCULATED	06/16/22 22:39		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	06/23/22	U	MRW
Phosphorus as P, Total	0.02	mg/l	0.01	0.01	SM 4500-P F	06/21/22		MRW
Solids, Total Dissolved	49	mg/l	4	5	SM 2540 C	06/17/22		TMH
Total Organic Carbon	1.8	mg/l	0.3	0.5	SM 5310 C	06/20/22		ALD
Solids, Total Suspended	<1	mg/l	1	1	SM 2540 D	06/17/22		ALD
<b>Microbiology</b>								
Escherichia coli	1	mpn/100ml	1		SM 9223 B/Quantitray	6/16/22 15:46	6/17/22 13:18	JMW
Total Coliform	272	mpn/100ml	1		SM 9223 B/Quantitray	6/16/22 15:46	6/17/22 13:18	JMW



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**M.J. Reider Associates, Inc.**

**Lab ID:** 2216900-09      **Collected By:** Client      **Sampled:** 06/16/22 09:30      **Received:** 06/16/22 14:15  
**Sample Desc:** BZ-6M      **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
<b>Dissolved General Chemistry</b>								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	06/22/22	G-23, G-24	MRW
<b>General Chemistry</b>								
Alkalinity, Total to pH 4.5	11	mg CaCO <sub>3</sub> /L		2	SM 2320 B	06/17/22	C-51a	APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1	06/22/22	U	MRW
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	06/16/22 17:00		KMS
Nitrate as N	0.88	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	06/17/22 1:28	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	06/17/22 1:28	U	JAF
Nitrate+Nitrite as N	<0.89	mg/l	0.122	1.10	CALCULATED	06/17/22 1:28		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	06/23/22	U	MRW
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	06/22/22		MRW
Solids, Total Dissolved	58	mg/l	4	5	SM 2540 C	06/17/22		TMH
Total Organic Carbon	1.3	mg/l	0.3	0.5	SM 5310 C	06/20/22		ALD
Solids, Total Suspended	<1	mg/l	1	1	SM 2540 D	06/17/22		ALD

**Lab ID:** 2216900-10      **Collected By:** Client      **Sampled:** 06/16/22 09:30      **Received:** 06/16/22 14:15  
**Sample Desc:** BZ-6D      **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
<b>Dissolved General Chemistry</b>								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	06/22/22	G-23, G-24	MRW
<b>General Chemistry</b>								
Alkalinity, Total to pH 4.5	12	mg CaCO <sub>3</sub> /L		2	SM 2320 B	06/17/22	C-51f	APR
Ammonia as N	0.04	mg/l	0.02	0.02	EPA 350.1	06/22/22		MRW
Biochemical Oxygen Demand	4.1	mg/l	2.0	2.0	SM 5210 B	06/16/22 17:00		KMS
Nitrate as N	0.83	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	06/16/22 20:58	J	JAF
Nitrite as N	0.03	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	06/16/22 20:58	J	JAF
Nitrate+Nitrite as N	0.86	mg/l	0.122	1.10	CALCULATED	06/16/22 20:58		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	06/23/22	U	MRW
Phosphorus as P, Total	0.02	mg/l	0.01	0.01	SM 4500-P F	06/22/22		MRW
Solids, Total Dissolved	68	mg/l	4	5	SM 2540 C	06/17/22		TMH
Total Organic Carbon	1.2	mg/l	0.3	0.5	SM 5310 C	06/20/22		ALD
Solids, Total Suspended	<1	mg/l	1	1	SM 2540 D	06/17/22		ALD



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**M.J. Reider Associates, Inc.**

**Lab ID:** 2216900-11      **Collected By:** Client      **Sampled:** 06/16/22 11:30      **Received:** 06/16/22 14:15  
**Sample Desc:** BZ-7S      **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
<b>Dissolved General Chemistry</b>								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	06/22/22	G-23, G-24	MRW
<b>General Chemistry</b>								
Alkalinity, Total to pH 4.5	9	mg CaCO <sub>3</sub> /L		2	SM 2320 B	06/17/22	C-51j	APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1	06/22/22	U	MRW
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	06/16/22 17:00		KMS
Nitrate as N	0.51	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	06/16/22 21:15	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	06/16/22 21:15	U	JAF
Nitrate+Nitrite as N	<0.52	mg/l	0.122	1.10	CALCULATED	06/16/22 21:15		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	06/23/22	U	MRW
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	06/22/22		MRW
Solids, Total Dissolved	37	mg/l	4	5	SM 2540 C	06/17/22		TMH
Total Organic Carbon	1.7	mg/l	0.3	0.5	SM 5310 C	06/20/22		ALD
Solids, Total Suspended	3	mg/l	1	1	SM 2540 D	06/17/22		ALD
<b>Microbiology</b>								
Escherichia coli	5	mpn/100ml	1		SM 9223 B/Quantitray	6/16/22 15:46	6/17/22 13:18	JMW
Total Coliform	276	mpn/100ml	1		SM 9223 B/Quantitray	6/16/22 15:46	6/17/22 13:18	JMW



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**M.J. Reider Associates, Inc.**

**Lab ID:** 2216900-12      **Collected By:** Client      **Sampled:** 06/16/22 11:30      **Received:** 06/16/22 14:15  
**Sample Desc:** BZ-7M      **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
<b>Dissolved General Chemistry</b>								
Phosphorus as P, Dissolved	0.01	mg/l		0.01	SM 4500-P F	06/22/22	G-23, G-24	MRW
<b>General Chemistry</b>								
Alkalinity, Total to pH 4.5	14	mg CaCO <sub>3</sub> /L		2	SM 2320 B	06/17/22	C-51g	APR
Ammonia as N	0.02	mg/l	0.02	0.02	EPA 350.1	06/22/22		MRW
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	06/16/22 18:00		KMS
Nitrate as N	1.13	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	06/17/22 0:54		JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	06/17/22 0:54	U	JAF
Nitrate+Nitrite as N	<1.14	mg/l	0.122	1.10	CALCULATED	06/17/22 0:54		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	06/23/22	U	MRW
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	06/22/22		MRW
Solids, Total Dissolved	65	mg/l	4	5	SM 2540 C	06/17/22		TMH
Total Organic Carbon	1.7	mg/l	0.3	0.5	SM 5310 C	06/20/22		ALD
Solids, Total Suspended	1	mg/l	1	1	SM 2540 D	06/17/22		ALD

**Lab ID:** 2216900-13      **Collected By:** Client      **Sampled:** 06/16/22 11:30      **Received:** 06/16/22 14:15  
**Sample Desc:** BZ-7D      **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
<b>Dissolved General Chemistry</b>								
Phosphorus as P, Dissolved	0.01	mg/l		0.01	SM 4500-P F	06/22/22	G-23, G-24	MRW
<b>General Chemistry</b>								
Alkalinity, Total to pH 4.5	11	mg CaCO <sub>3</sub> /L		2	SM 2320 B	06/17/22	C-51b	APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1	06/21/22	U	MRW
Biochemical Oxygen Demand	3.9	mg/l	2.0	2.0	SM 5210 B	06/16/22 18:00		KMS
Nitrate as N	0.86	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	06/16/22 21:32	J	JAF
Nitrite as N	0.02	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	06/16/22 21:32	J	JAF
Nitrate+Nitrite as N	0.88	mg/l	0.122	1.10	CALCULATED	06/16/22 21:32		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	06/23/22	U	MRW
Phosphorus as P, Total	0.03	mg/l	0.01	0.01	SM 4500-P F	06/21/22		MRW
Solids, Total Dissolved	58	mg/l	4	5	SM 2540 C	06/17/22		TMH
Total Organic Carbon	1.5	mg/l	0.3	0.5	SM 5310 C	06/20/22		ALD
Solids, Total Suspended	8	mg/l	1	1	SM 2540 D	06/17/22		ALD



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**M.J. Reider Associates, Inc.**

**Preparation Methods**

Specific Method	Preparation Method	Prep Batch	Prepared Date	Prepared By
<b>2216900-01</b>				
<b>Dissolved General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B2F1186	06/21/2022	MRW
<b>General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B2F1252	06/22/2022	MRW
<b>2216900-02</b>				
<b>Dissolved General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B2F1186	06/21/2022	MRW
<b>General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B2F1252	06/22/2022	MRW
<b>2216900-03</b>				
<b>Dissolved General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B2F1186	06/21/2022	MRW
<b>General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B2F1176	06/21/2022	MRW
<b>2216900-04</b>				
<b>Dissolved General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B2F1186	06/21/2022	MRW
<b>General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B2F1252	06/22/2022	MRW
<b>2216900-05</b>				
<b>Dissolved General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B2F1186	06/21/2022	MRW
<b>General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B2F1252	06/22/2022	MRW
<b>2216900-06</b>				
<b>Dissolved General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B2F1186	06/21/2022	MRW
<b>General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B2F1252	06/22/2022	MRW
<b>2216900-07</b>				
<b>Dissolved General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B2F1186	06/21/2022	MRW
<b>General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B2F1252	06/22/2022	MRW
<b>2216900-08</b>				
<b>Dissolved General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B2F1186	06/21/2022	MRW
<b>General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B2F1176	06/21/2022	MRW
<b>2216900-09</b>				



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**Dissolved General Chemistry**

SM 4500-P F	SM 4500-P B	B2F1186	06/21/2022	MRW
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**General Chemistry**

SM 4500-P F	SM 4500-P B	B2F1252	06/22/2022	MRW
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**2216900-10**

**Dissolved General Chemistry**

SM 4500-P F	SM 4500-P B	B2F1186	06/21/2022	MRW
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**General Chemistry**

SM 4500-P F	SM 4500-P B	B2F1252	06/22/2022	MRW
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**2216900-11**

**Dissolved General Chemistry**

SM 4500-P F	SM 4500-P B	B2F1186	06/21/2022	MRW
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**General Chemistry**

SM 4500-P F	SM 4500-P B	B2F1252	06/22/2022	MRW
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**2216900-12**

**Dissolved General Chemistry**

SM 4500-P F	SM 4500-P B	B2F1186	06/21/2022	MRW
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**General Chemistry**

SM 4500-P F	SM 4500-P B	B2F1252	06/22/2022	MRW
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**2216900-13**

**Dissolved General Chemistry**

SM 4500-P F	SM 4500-P B	B2F1186	06/21/2022	MRW
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**General Chemistry**

SM 4500-P F	SM 4500-P B	B2F1176	06/21/2022	MRW
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**Notes and Definitions**

- C-51 The alkalinity to pH 4.2 = 10.7 mg CaCO<sub>3</sub>/L.
- C-51a The alkalinity to pH 4.2 = 10.9 mg CaCO<sub>3</sub>/L.
- C-51b The alkalinity to pH 4.2 = 11.4 mg CaCO<sub>3</sub>/L.
- C-51c The alkalinity to pH 4.2 = 11.7 mg CaCO<sub>3</sub>/L.
- C-51d The alkalinity to pH 4.2 = 12.2 mg CaCO<sub>3</sub>/L.
- C-51e The alkalinity to pH 4.2 = 12.4 mg CaCO<sub>3</sub>/L.
- C-51f The alkalinity to pH 4.2 = 12.5 mg CaCO<sub>3</sub>/L.
- C-51g The alkalinity to pH 4.2 = 13.6 mg CaCO<sub>3</sub>/L.
- C-51h The alkalinity to pH 4.2 = 15.7 mg CaCO<sub>3</sub>/L.
- C-51i The alkalinity to pH 4.2 = 7.2 mg CaCO<sub>3</sub>/L.
- C-51j The alkalinity to pH 4.2 = 9.0 mg CaCO<sub>3</sub>/L.
- C-51k The alkalinity to pH 4.2 = 9.7 mg CaCO<sub>3</sub>/L.
- C-51l The alkalinity to pH 4.2 = 9.8 mg CaCO<sub>3</sub>/L.
- G-23 The sample was filtered after it was received at the laboratory and outside of the 15-minute hold time.
- G-24 The sample was preserved in the laboratory and outside of the 15-minute hold time.
- J Estimated value
- M-08 The analysis hold time of 8 hours was exceeded by 46 minutes.
- U Analyte was not detected above the indicated value.



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**WORK ORDER  
Chain of Custody**

2216900



Client Code: 3157

Project Manager: Richard A Wheeler

Report To: Tetra Tech - David Wertz - USACE, Phila Dist. Env. Resources Branch 100 Penn Square E., Arlington, VA 22201

Invoice To: Tetra Tech - David Wertz - USACE, Phila Dist. Env. Resources Branch 100 Penn Square E., Arlington, VA 22201

Client: Tetra Tech

Project: 2022 - Beltzville Reservoir

Comments: \_\_\_\_\_

Collected By: Gregory Wacik  
(Full Name)

**2216900-01 BZ-1S**

**BOD SM 5210B, EC (#) SM 9223B Confirmation, NO2-N EPA 300.0, NO3-N EPA 300.0, NO2-N, NO3-N, Combined NO3+NO2, PO4-D SM 4500P-F, TC (#) SM 9223B**  
Alk SM 2320B, NH3-N EPA 350.1, TKN EPA 351.2, PO4 SM 4500P-F, TDS SM 2540C, TOC SM 5310C, TSS SM 2540D

Matrix: Non-Potable Water

Type: Grab

Date: 6/16/22  
Time: 0700

- A - PI 500ml NP, minimal hdspc
- B - PI Liter NP
- C - Sterile PI 125ml NaThio
- D - PI 500ml H2SO4
- E - PI 250ml NP
- F - PI 500ml Lab Filtered
- G - Vial Amber 40ml H3PO4, minimal hdspc
- H - Vial Amber 40ml H3PO4, minimal hdspc
- I - Vial Amber 40ml H3PO4, minimal hdspc

**2216900-02 BZ-2S**

**EC (#) SM 9223B Confirmation, NO2-N EPA 300.0, NO3-N EPA 300.0, NO2-N, NO3-N, Combined NO3+NO2, PO4-D SM 4500P-F, TC (#) SM 9223B, BOD SM 5210B**  
NH3-N EPA 350.1, PO4 SM 4500P-F, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D, Alk SM 2320B

Matrix: Non-Potable Water

Type: Grab

Date: 6/16/22  
Time: 0845

- A - PI 500ml NP, minimal hdspc
- B - PI Liter NP
- C - Sterile PI 125ml NaThio
- D - PI 500ml H2SO4
- E - PI 250ml NP
- F - PI 500ml Lab Filtered
- G - Vial Amber 40ml H3PO4, minimal hdspc
- H - Vial Amber 40ml H3PO4, minimal hdspc
- I - Vial Amber 40ml H3PO4, minimal hdspc

Relinquished By: [Signature] Date/Time: 6/16/22 1200 Received By: Benny Nant Date/Time: 6-16-22 1210

Relinquished By: \_\_\_\_\_ Date/Time: \_\_\_\_\_ Received By: Benny Nant Date/Time: 6-16-22 1415

Relinquished By: \_\_\_\_\_ Date/Time: \_\_\_\_\_ Received at Laboratory By: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Sample Kit Prepared By: <u>JBS</u>	Date/Time
Sample Temp (°C): <u>6.0</u>	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> NA <input type="checkbox"/>
Approved By: <u>[Signature]</u>	
Entered By: <u>[Signature]</u>	

The Client, by signing (or having the client's agent sign), agrees to MJRA's Terms and Conditions and to pay for the above requested services including any additional associated fees incurred.



Client Code: 3157

Client: Tetra Tech

Project Manager: Richard A Wheeler

Project: 2022 - Beltzville Reservoir

Comments: \_\_\_\_\_

Collected By : Gregory Wacik  
(Full Name)

2216900-03 BZ-3S

*LAF* *LAF*  
BOD SM 5210B, EC (#) SM 9223B Confirmation, NO2-N EPA 300.0, NO3-N EPA 300.0, NO2-N, NO3-N, Combined NO3+NO2, PO4-D SM 4500P-F, TC (#) SM 9223B  
Alk SM 2320B, NH3-N EPA 350.1, PO4 SM 4500P-F, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D, TDS SM 2540C

Matrix: Non-Potable Water

Date: 6/16/22

Type: Grab

Time: 1030

- A - Pl 500ml NP, minimal hdspc
- B - Pl Liter NP
- C - Sterile Pl 125ml NaThio
- D - Pl 500ml H2SO4
- E - Pl 250ml NP
- F - Pl 500ml Lab Filtered
- G - Vial Amber 40ml H3PO4, minimal hdspc
- H - Vial Amber 40ml H3PO4, minimal hdspc
- I - Vial Amber 40ml H3PO4, minimal hdspc

2216900-04 BZ-3M

*JAF* *ASD*  
NO2-N EPA 300.0, NO3-N EPA 300.0, BOD SM 5210B, NO2-N, NO3-N, Combined NO3+NO2, PO4-D SM 4500P-F  
TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, Alk SM 2320B, NH3-N EPA 350.1, PO4 SM 4500P-F, TSS SM 2540D

Matrix: Non-Potable Water

Date: 6/16/22

Type: Grab

Time: 1030

- A - Pl 500ml NP, minimal hdspc
- B - Pl Liter NP
- C - Pl 500ml H2SO4
- D - Pl 250ml NP
- E - Pl 500ml Lab Filtered
- F - Vial Amber 40ml H3PO4, minimal hdspc
- G - Vial Amber 40ml H3PO4, minimal hdspc
- H - Vial Amber 40ml H3PO4, minimal hdspc

2216900-05 BZ-3D

*JAF* *ASD*  
NO2-N EPA 300.0, NO3-N EPA 300.0, BOD SM 5210B, NO2-N, NO3-N, Combined NO3+NO2, PO4-D SM 4500P-F  
NH3-N EPA 350.1, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, Alk SM 2320B, PO4 SM 4500P-F, TSS SM 2540D

Matrix: Non-Potable Water

Date: 6/16/22

Type: Grab

Time: 1030

- A - Pl 500ml NP, minimal hdspc
- B - Pl Liter NP
- C - Pl 500ml H2SO4
- D - Pl 250ml NP
- E - Pl 500ml Lab Filtered
- F - Vial Amber 40ml H3PO4, minimal hdspc
- G - Vial Amber 40ml H3PO4, minimal hdspc
- H - Vial Amber 40ml H3PO4, minimal hdspc

*Gregory Wacik* 6/16/22 1700

*Benny Nant* 6/16/22 1210

Relinquished By \_\_\_\_\_ Date/Time \_\_\_\_\_

Received By \_\_\_\_\_ Date/Time \_\_\_\_\_

Relinquished By \_\_\_\_\_ Date/Time \_\_\_\_\_

Received By \_\_\_\_\_ Date/Time \_\_\_\_\_

Relinquished By \_\_\_\_\_ Date/Time \_\_\_\_\_

Received at Laboratory By *Benny Nant* 6-16-22 1415

Sample Kit Prepared By:	Date/Time
Sample Temp (°C):	<u>6.8</u>
Samples on Ice?	<input checked="" type="radio"/> Yes <input type="radio"/> No <input type="radio"/> NA
Approved By:	<u>BW</u>
Entered By:	<u>(Signature)</u>



Client Code: 3157

Client: Tetra Tech

Project Manager: Richard A Wheeler

Project: 2022 - Beltzville Reservoir

Collected By: Gregory Wack  
(Full Name)

Comments: \_\_\_\_\_

**2216900-06 BZ-4S**

**EC (#) SM 9223B Confirmation, NO2-N EPA 300.0, PO4-D SM 4500P-F, TC (#) SM 9223B, BOD SM 5210B, NO3-N EPA 300.0, NO2-N, NO3-N, Combined NO3+NO2**  
NH3-N EPA 350.1, TDS SM 2540C, Alk SM 2320B, PO4 SM 4500P-F, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D

Matrix: Non-Potable Water

Date: 6/16/22

Type: Grab

Time: 0820

- A - Pl 500ml NP, minimal hdspc
- B - Pl Liter NP
- C - Sterile Pl 125ml NaThio
- D - Pl 500ml H2SO4
- E - Pl 250ml NP
- F - Pl 500ml Lab Filtered
- G - Vial Amber 40ml H3PO4, minimal hdspc
- H - Vial Amber 40ml H3PO4, minimal hdspc
- I - Vial Amber 40ml H3PO4, minimal hdspc

**2216900-07 BZ-5S**

**BOD SM 5210B, EC (#) SM 9223B Confirmation, NO2-N, NO3-N, Combined NO3+NO2, PO4-D SM 4500P-F, TC (#) SM 9223B, NO2-N EPA 300.0, NO3-N EPA 300.0**  
Alk SM 2320B, TSS SM 2540D, PO4 SM 4500P-F, NH3-N EPA 350.1, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C

Matrix: Non-Potable Water

Date: 6/16/22

Type: Grab

Time: 0800

- A - Pl 500ml NP, minimal hdspc
- B - Pl Liter NP
- C - Sterile Pl 125ml NaThio
- D - Pl 500ml H2SO4
- E - Pl 250ml NP
- F - Pl 500ml Lab Filtered
- G - Vial Amber 40ml H3PO4, minimal hdspc
- H - Vial Amber 40ml H3PO4, minimal hdspc
- I - Vial Amber 40ml H3PO4, minimal hdspc

**2216900-08 BZ-6S**

**BOD SM 5210B, NO3-N EPA 300.0, NO2-N, NO3-N, Combined NO3+NO2, EC (#) SM 9223B Confirmation, NO2-N EPA 300.0, PO4-D SM 4500P-F, TC (#) SM 9223B**  
Alk SM 2320B, PO4 SM 4500P-F, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D, NH3-N EPA 350.1, TDS SM 2540C

Matrix: Non-Potable Water

Date: 6/16/22

Type: Grab

Time: 0930

- A - Pl 500ml NP, minimal hdspc
- B - Pl Liter NP
- C - Sterile Pl 125ml NaThio
- D - Pl 500ml H2SO4
- E - Pl 250ml NP
- F - Pl 500ml Lab Filtered
- G - Vial Amber 40ml H3PO4, minimal hdspc
- H - Vial Amber 40ml H3PO4, minimal hdspc
- I - Vial Amber 40ml H3PO4, minimal hdspc

Relinquished By: [Signature] Date/Time: 6/16/22 1200

Received By: Benny Wack Date/Time: 6-16-22 1210

Relinquished By: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Received By: Benny Wack Date/Time: 6-16-22 1415

Relinquished By: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Received at Laboratory By: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Sample Kit Prepared By:	Date/Time
Sample Temp (°C):	<u>6.0</u>
Samples on Ice?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> NA <input type="checkbox"/>
Approved By:	<u>[Signature]</u>
Entered By:	<u>[Signature]</u>



Client Code: 3157

Client: Tetra Tech

Project Manager: Richard A Wheeler

Project: 2022 - Beltzville Reservoir

Collected By :  
(Full Name)

*Gregory Wacik*

Comments: \_\_\_\_\_

**2216900-09 BZ-6M**

**BOD SM 5210B, NO2-N EPA 300.0, NO3-N EPA 300.0, NO2-N, NO3-N, Combined NO3+NO2, PO4-D SM 4500P-F**  
Alk SM 2320B, NH3-N EPA 350.1, PO4 SM 4500P-F, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D

Matrix: Non-Potable Water

Type: Grab

Date: 6/16/22  
Time: 0930

- A - PI 500ml NP, minimal hdspc
- B - PI Liter NP
- C - PI 500ml H2SO4
- D - PI 250ml NP
- E - PI 500ml Lab Filtered
- F - Vial Amber 40ml H3PO4, minimal hdspc
- G - Vial Amber 40ml H3PO4, minimal hdspc
- H - Vial Amber 40ml H3PO4, minimal hdspc

**2216900-10 BZ-6D**

**BOD SM 5210B, NO2-N EPA 300.0, NO3-N EPA 300.0, NO2-N, NO3-N, Combined NO3+NO2, PO4-D SM 4500P-F**  
Alk SM 2320B, NH3-N EPA 350.1, PO4 SM 4500P-F, TDS SM 2540C, TOC SM 5310C, TSS SM 2540D, TKN EPA 351.2

Matrix: Non-Potable Water

Type: Grab

Date: 6/16/22  
Time: 0930

- A - PI 500ml NP, minimal hdspc
- B - PI Liter NP
- C - PI 500ml H2SO4
- D - PI 250ml NP
- E - PI 500ml Lab Filtered
- F - Vial Amber 40ml H3PO4, minimal hdspc
- G - Vial Amber 40ml H3PO4, minimal hdspc
- H - Vial Amber 40ml H3PO4, minimal hdspc

**2216900-11 BZ-7S**

**EC (#) SM 9223B Confirmation, BOD SM 5210B, NO2-N EPA 300.0, NO3-N EPA 300.0, NO2-N, NO3-N, Combined NO3+NO2, PO4-D SM 4500P-F, TC (#) SM 9223B**  
Alk SM 2320B, NH3-N EPA 350.1, PO4 SM 4500P-F, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D

Matrix: Non-Potable Water

Type: Grab

Date: 6/16/22  
Time: 1130

- A - PI 500ml NP, minimal hdspc
- B - PI Liter NP
- C - Sterile PI 125ml NaThio
- D - PI 500ml H2SO4
- E - PI 250ml NP
- F - PI 500ml Lab Filtered
- G - Vial Amber 40ml H3PO4, minimal hdspc
- H - Vial Amber 40ml H3PO4, minimal hdspc
- I - Vial Amber 40ml H3PO4, minimal hdspc

*[Signature]* 6/16/22 1200 Relinquished By Date/Time

*Benny Nant* 6-16-22 1710 Received By Date/Time

*Benny Nant* 6-16-22 1415 Received at Laboratory By Date/Time

Sample Kit Prepared By:	Date/Time
Sample Temp (°C):	<u>6.0</u>
Samples on Ice?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA
Approved By:	<i>[Signature]</i>
Entered By:	<i>[Signature]</i>



Client Code: 3157

Client: Tetra Tech

Project Manager: Richard A Wheeler

Project: 2022 - Beltzville Reservoir

Collected By: (Full Name)

Gregory Wack

Comments:

2216900-12 BZ-7M

JAC JAC

BOD SM 5210B, NO2-N EPA 300.0, NO3-N EPA 300.0, NO2-N, NO3-N, Combined NO3+NO2, PO4-D SM 4500P-F TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, Alk SM 2320B, NH3-N EPA 350.1, PO4 SM 4500P-F, TSS SM 2540D

Matrix: Non-Potable Water

Type: Grab

Date: 6/16/22 Time: 1130

- A - Pl 500ml NP, minimal hdspc B - Pl Liter NP C - Pl 500ml H2SO4 D - Pl 250ml NP E - Pl 500ml Lab Filtered F - Vial Amber 40ml H3PO4, minimal hdspc G - Vial Amber 40ml H3PO4, minimal hdspc H - Vial Amber 40ml H3PO4, minimal hdspc

2216900-13 BZ-7D

JAC JAC

NO2-N EPA 300.0, NO3-N EPA 300.0, BOD SM 5210B, NO2-N, NO3-N, Combined NO3+NO2, PO4-D SM 4500P-F NH3-N EPA 350.1, TDS SM 2540C, TOC SM 5310C, TSS SM 2540D, Alk SM 2320B, PO4 SM 4500P-F, TKN EPA 351.2

Matrix: Non-Potable Water

Type: Grab

Date: 6/16/22 Time: 1130

- A - Pl 500ml NP, minimal hdspc B - Pl Liter NP C - Pl 500ml H2SO4 D - Pl 250ml NP E - Pl 500ml Lab Filtered F - Vial Amber 40ml H3PO4, minimal hdspc G - Vial Amber 40ml H3PO4, minimal hdspc H - Vial Amber 40ml H3PO4, minimal hdspc

Relinquished By: [Signature] Date/Time: 6/16/22 1200 Received By: Benny Wack Date/Time: 6-16-22 1210 Relinquished By: Date/Time: Received By: Benny Wack Date/Time: 6-16-22 1415 Relinquished By: Date/Time: Received at Laboratory By: Date/Time:

Sample Kit Prepared By: Date/Time: Sample Temp (°C): Samples on Ice? Yes No NA Approved By: Entered By:

**M.J. Reider Associates, Inc.**

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**MJRA Terms & Conditions**

All samples submitted must be accompanied by signed documentation representing a Chain of Custody (COC). The COC Record acts as a contract between the client and MJRA. Signing the COC form gives approval for MJRA to perform the requested analyses and is an agreement to pay for the cost of such analyses. COC Records must be completed in black or blue indelible ink (must not run when wet). COC documentation begins at the time of sample collection. Client is required to document all sample details prior to releasing samples to MJRA. All samples must be placed on ice immediately after sampling and shipped or delivered to the laboratory in a manner that will maintain the sample temperature above freezing and below 6C (loose ice is preferred).

**Sample Submission, Sample Acceptance & Sampling Containers**

Included on the COC must be the sample description, date and time of collection (including start and stop for composites), container size and type, preservative information, sample matrix, indication of whether the sample is a grab or composite, number of containers & a list of the tests to be performed. Poor sample collection technique, inappropriate sampling containers and/or improper sample preservation may lead to sample rejection. Suitable sample containers, labels, and preservatives (as applicable), along with blank COCs are provided at no additional cost.

**Turnaround Times (TAT)**

Average TAT for test results range from 5 to 15 working days depending on the specific analyses and time of year submitted. Faster turnaround times (\*RUSH TAT) may be available depending on the current workload in a particular department and the nature of the analyses requested. We encourage you to verify requests for expedited sample results with one of our Technical Directors prior to sample submittal. Without confirmation from a Technical Director, your results may not be completed by your deadline. \*RUSH TAT Surcharges are applied for expedited turnaround times.

**Analytical Results, Sample Collection Integrity & Subcontracting**

Analytical values are for the sample as submitted and relate only to the item tested. The value indicates a snapshot of the constituent content of the sample at the time of sample collection. Analytical results can be impacted by poor sample collection technique and/or improper preservation. All sample collection completed by MJRA was performed in accordance with applicable regulatory protocols or as specified in customer specific sampling plans. Constituent content will vary over time based on the matrix of the sample and the physical and chemical changes to its environment. All sample results and laboratory reports are strictly confidential. Results will not be available to anyone except the primary client or authorized party representing the client unless MJRA receives additional permissions from the client. When necessary, MJRA will subcontract certain analyses to a third party accredited laboratory. If client prohibits subcontracting, it must be provided in writing and include instruction on how to proceed with client samples that require third party analyses.

**Payment Terms**

Payment Terms are Net 30 days. Prices are subject to change without notice. A standing monthly charge of 1.5% of the clients over-30-day-unpaid balance may be added to the balance after 30 days and each month thereafter (day 31, 61, 91 etc.). The laboratory accepts all major credit cards, ACH transactions, checks and cash. New clients must pay for all services rendered prior to sample collection and/or in some cases report processing. Clients must contact the MJRA accounting department to pursue a credit-based account. MJRA reserves the right to terminate the client's credit account and to refuse to perform additional services on a credit basis if any balance is outstanding for more than 60 days.

**Warranty & Litigation**

MJRA does not guarantee any results of its services but has agreed to use its best efforts, in accordance with the standards and practices of the industry, to cause such results to be accurate and complete. We disclaim any other warranties, expressed or implied, including a warranty of fitness for a particular purpose and warranty of merchantability. Clients agree that they shall reimburse MJRA for any and all fees, cost and litigation expenses, including reasonable attorney fees incurred by MJRA in obtaining payment for the services rendered. All costs associated with compliance with any subpoena for documents, testimony, or any other purpose relating to work performed by MJRA, for a client, shall be paid by that client. MJRA's aggregate liability for negligent acts and omissions and of an intentional breach by MJRA will not exceed the fee paid for the services. Client agrees to indemnify and hold MJRA harmless for any and all liabilities in excess of said amount. Neither MJRA nor the client shall be liable to the other for special, incidental consequential or punitive liability or damages included but not limited to those arising from delay, loss of use, loss of profits or revenues. MJRA will not be liable to the client unless the client has notified MJRA of the discovery of the alleged negligent act, error, omissions or breach within 30 days of the day of its discovery and within one year of the date of invoice.

Reviewed and Approved by:



Richard A Wheeler  
Director of Field Services



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Additional accreditations by MD (261), NY(12094)



# Certificate of Analysis

**M.J. Reider Associates, Inc.**

ENVIRONMENTAL TESTING LABORATORY  
U.S. EPA/PA DEP #06-00003

**Laboratory No.:** 2220746

**Report:** 07/25/22

**Lab Contact:** Richard A Wheeler

**Attention:** David Wertz

**Project:** 2022 - Beltzville Reservoir

**Reported To:** Tetra Tech

USACE, Phila Dist. Env.Resources Branch 100 Penn Square E.  
Arlington, VA 22201

**Lab ID:** 2220746-01

**Collected By:** Client

**Sampled:** 07/14/22 06:45

**Received:** 07/14/22 13:39

**Sample Desc:** BZ-1S

**Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
<b>Dissolved General Chemistry</b>								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	07/21/22	G-23, G-24	MRW
<b>General Chemistry</b>								
Alkalinity, Total to pH 4.5	12	mg CaCO <sub>3</sub> /L		2	SM 2320 B	07/19/22	C-51c	MPB
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1	07/15/22	U	MRW
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	07/14/22 14:25		NKH
Nitrate as N	0.92	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	07/14/22 16:11	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	07/14/22 16:11	U	JAF
Nitrate+Nitrite as N	<0.93	mg/l	0.122	1.10	CALCULATED	07/14/22 16:11		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	07/21/22	U	MRW
Phosphorus as P, Total	0.02	mg/l	0.01	0.01	SM 4500-P F	07/15/22		MRW
Solids, Total Dissolved	58	mg/l	4	5	SM 2540 C	07/15/22		TMH
Total Organic Carbon	1.9	mg/l	0.3	0.5	SM 5310 C	07/14/22		ALD
Solids, Total Suspended	6	mg/l	1	1	SM 2540 D	07/15/22		ALD
<b>Microbiology</b>								
Escherichia coli	2	mpn/100ml	1		SM 9223 B/Quantitray	7/14/22 14:19	7/15/22 8:56	JMW
Total Coliform	>2420	mpn/100ml	1		SM 9223 B/Quantitray	7/14/22 14:19	7/15/22 8:56	JMW



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**M.J. Reider Associates, Inc.**

**Lab ID:** 2220746-02      **Collected By:** Client      **Sampled:** 07/14/22 11:20      **Received:** 07/14/22 13:39  
**Sample Desc:** BZ-2S      **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
<b>Dissolved General Chemistry</b>								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	07/16/22	G-23, G-24	MRW
<b>General Chemistry</b>								
Alkalinity, Total to pH 4.5	9	mg CaCO <sub>3</sub> /L		2	SM 2320 B	07/19/22	C-511	MPB
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1	07/15/22	U	MRW
Biochemical Oxygen Demand	4.1	mg/l	2.0	2.0	SM 5210 B	07/14/22 14:25		NKH
Nitrate as N	0.35	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	07/14/22 16:45	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	07/14/22 16:45	U	JAF
Nitrate+Nitrite as N	<0.36	mg/l	0.122	1.10	CALCULATED	07/14/22 16:45		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	07/21/22	U	MRW
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	07/15/22		MRW
Solids, Total Dissolved	32	mg/l	4	5	SM 2540 C	07/15/22		TMH
Total Organic Carbon	0.7	mg/l	0.3	0.5	SM 5310 C	07/14/22		ALD
Solids, Total Suspended	3	mg/l	1	1	SM 2540 D	07/15/22		ALD
<b>Microbiology</b>								
Escherichia coli	44	mpn/100ml	1		SM 9223 B/Quantitray	7/14/22 14:19	7/15/22 8:56	JMW
Total Coliform	1120	mpn/100ml	1		SM 9223 B/Quantitray	7/14/22 14:19	7/15/22 8:56	JMW



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**M.J. Reider Associates, Inc.**

**Lab ID:** 2220746-03      **Collected By:** Client      **Sampled:** 07/14/22 08:30      **Received:** 07/14/22 13:39  
**Sample Desc:** BZ-3S      **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
<b>Dissolved General Chemistry</b>								
Phosphorus as P, Dissolved	0.01	mg/l		0.01	SM 4500-P F	07/16/22	G-23, G-24	MRW
<b>General Chemistry</b>								
Alkalinity, Total to pH 4.5	11	mg CaCO <sub>3</sub> /L		2	SM 2320 B	07/19/22	C-51b	MPB
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1	07/15/22	U	MRW
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	07/14/22 14:25		NKH
Nitrate as N	0.58	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	07/14/22 20:07	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	07/14/22 20:07	U	JAF
Nitrate+Nitrite as N	<0.59	mg/l	0.122	1.10	CALCULATED	07/14/22 20:07		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	07/21/22	U	MRW
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	07/15/22		MRW
Solids, Total Dissolved	60	mg/l	4	5	SM 2540 C	07/15/22		TMH
Total Organic Carbon	1.6	mg/l	0.3	0.5	SM 5310 C	07/14/22		ALD
Solids, Total Suspended	1	mg/l	1	1	SM 2540 D	07/15/22	Q-19	ALD
	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
<b>Microbiology</b>								
Escherichia coli	3	mpn/100ml	1	SM 9223 B/Quantitray	7/14/22 14:19	7/15/22 8:56		JMW
Total Coliform	133	mpn/100ml	1	SM 9223 B/Quantitray	7/14/22 14:19	7/15/22 8:56		JMW



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**M.J. Reider Associates, Inc.**

**Lab ID:** 2220746-04      **Collected By:** Client      **Sampled:** 07/14/22 08:30      **Received:** 07/14/22 13:39  
**Sample Desc:** BZ-3M      **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
<b>Dissolved General Chemistry</b>								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	07/16/22	G-23, G-24	MRW
<b>General Chemistry</b>								
Alkalinity, Total to pH 4.5	13	mg CaCO <sub>3</sub> /L		2	SM 2320 B	07/19/22	C-51e	MPB
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1	07/15/22	U	MRW
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	07/14/22 14:25		NKH
Nitrate as N	0.90	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	07/14/22 19:50	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	07/14/22 19:50	U	JAF
Nitrate+Nitrite as N	<0.91	mg/l	0.122	1.10	CALCULATED	07/14/22 19:50		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	07/21/22	U	MRW
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	07/15/22		MRW
Solids, Total Dissolved	46	mg/l	4	5	SM 2540 C	07/15/22		TMH
Total Organic Carbon	1.3	mg/l	0.3	0.5	SM 5310 C	07/14/22		ALD
Solids, Total Suspended	1	mg/l	1	1	SM 2540 D	07/15/22		ALD

**Lab ID:** 2220746-05      **Collected By:** Client      **Sampled:** 07/14/22 08:30      **Received:** 07/14/22 13:39  
**Sample Desc:** BZ-3D      **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
<b>Dissolved General Chemistry</b>								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	07/16/22	G-23, G-24	MRW
<b>General Chemistry</b>								
Alkalinity, Total to pH 4.5	14	mg CaCO <sub>3</sub> /L		2	SM 2320 B	07/19/22	C-51i	MPB
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1	07/15/22	Q-10, U	MRW
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	07/14/22 14:25		NKH
Nitrate as N	0.83	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	07/14/22 19:33	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	07/14/22 19:33	U	JAF
Nitrate+Nitrite as N	<0.84	mg/l	0.122	1.10	CALCULATED	07/14/22 19:33		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	07/21/22	U	MRW
Phosphorus as P, Total	0.01	mg/l	0.01	0.01	SM 4500-P F	07/15/22		MRW
Solids, Total Dissolved	57	mg/l	4	5	SM 2540 C	07/15/22		TMH
Total Organic Carbon	1.3	mg/l	0.3	0.5	SM 5310 C	07/14/22		ALD
Solids, Total Suspended	5	mg/l	1	1	SM 2540 D	07/15/22		ALD



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**M.J. Reider Associates, Inc.**

**Lab ID:** 2220746-06      **Collected By:** Client      **Sampled:** 07/14/22 11:00      **Received:** 07/14/22 13:39  
**Sample Desc:** BZ-4S      **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
<b>Dissolved General Chemistry</b>								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	07/16/22	G-23, G-24	MRW
<b>General Chemistry</b>								
Alkalinity, Total to pH 4.5	7	mg CaCO <sub>3</sub> /L		2	SM 2320 B	07/19/22	C-51k	MPB
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1	07/15/22	U	MRW
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	07/14/22 14:25		NKH
Nitrate as N	0.18	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	07/14/22 17:18	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	07/14/22 17:18	U	JAF
Nitrate+Nitrite as N	<0.19	mg/l	0.122	1.10	CALCULATED	07/14/22 17:18		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	07/21/22	U	MRW
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	07/15/22		MRW
Solids, Total Dissolved	32	mg/l	4	5	SM 2540 C	07/15/22		TMH
Total Organic Carbon	1.2	mg/l	0.3	0.5	SM 5310 C	07/14/22		ALD
Solids, Total Suspended	2	mg/l	1	1	SM 2540 D	07/15/22		ALD
<b>Microbiology</b>								
Escherichia coli	8	mpn/100ml	1		SM 9223 B/Quantitray	7/14/22 14:19	7/15/22 8:56	JMW
Total Coliform	>2420	mpn/100ml	1		SM 9223 B/Quantitray	7/14/22 14:19	7/15/22 8:56	JMW



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**M.J. Reider Associates, Inc.**

**Lab ID:** 2220746-07      **Collected By:** Client      **Sampled:** 07/14/22 10:45      **Received:** 07/14/22 13:39  
**Sample Desc:** BZ-5S      **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
<b>Dissolved General Chemistry</b>								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	07/16/22	G-23, G-24	MRW
<b>General Chemistry</b>								
Alkalinity, Total to pH 4.5	15	mg CaCO <sub>3</sub> /L		2	SM 2320 B	07/19/22	C-51j	MPB
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1	07/15/22	U	MRW
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	07/14/22 14:25		NKH
Nitrate as N	1.27	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	07/14/22 17:35		JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	07/14/22 17:35	U	JAF
Nitrate+Nitrite as N	<1.28	mg/l	0.122	1.10	CALCULATED	07/14/22 17:35		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	07/21/22	U	MRW
Phosphorus as P, Total	0.03	mg/l	0.01	0.01	SM 4500-P F	07/15/22		MRW
Solids, Total Dissolved	66	mg/l	4	5	SM 2540 C	07/15/22		TMH
Total Organic Carbon	1.5	mg/l	0.3	0.5	SM 5310 C	07/14/22		ALD
Solids, Total Suspended	<1	mg/l	1	1	SM 2540 D	07/15/22		ALD
<b>Microbiology</b>								
Escherichia coli	99	mpn/100ml	1		SM 9223 B/Quantitray	7/14/22 14:19	7/15/22 8:56	JMW
Total Coliform	>2420	mpn/100ml	1		SM 9223 B/Quantitray	7/14/22 14:19	7/15/22 8:56	JMW



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**M.J. Reider Associates, Inc.**

**Lab ID:** 2220746-08      **Collected By:** Client      **Sampled:** 07/14/22 07:45      **Received:** 07/14/22 13:39  
**Sample Desc:** BZ-6S      **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
<b>Dissolved General Chemistry</b>								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	07/16/22	G-23, G-24	MRW
<b>General Chemistry</b>								
Alkalinity, Total to pH 4.5	11	mg CaCO <sub>3</sub> /L		2	SM 2320 B	07/19/22	C-51a	MPB
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1	07/15/22	U	MRW
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	07/14/22 14:25		NKH
Nitrate as N	0.58	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	07/14/22 18:43	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	07/14/22 18:43	U	JAF
Nitrate+Nitrite as N	<0.59	mg/l	0.122	1.10	CALCULATED	07/14/22 18:43		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	07/21/22	U	MRW
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	07/15/22		MRW
Solids, Total Dissolved	30	mg/l	4	5	SM 2540 C	07/15/22		TMH
Total Organic Carbon	1.6	mg/l	0.3	0.5	SM 5310 C	07/14/22		ALD
Solids, Total Suspended	<1	mg/l	1	1	SM 2540 D	07/15/22		ALD
<b>Microbiology</b>								
Escherichia coli	1	mpn/100ml	1		SM 9223 B/Quantitray	7/14/22 14:19	7/15/22 8:56	JMW
Total Coliform	210	mpn/100ml	1		SM 9223 B/Quantitray	7/14/22 14:19	7/15/22 8:56	JMW



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**M.J. Reider Associates, Inc.**

**Lab ID:** 2220746-09      **Collected By:** Client      **Sampled:** 07/14/22 07:45      **Received:** 07/14/22 13:39  
**Sample Desc:** BZ-6M      **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
<b>Dissolved General Chemistry</b>								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	07/21/22	G-23, G-24	MRW
<b>General Chemistry</b>								
Alkalinity, Total to pH 4.5	13	mg CaCO <sub>3</sub> /L		2	SM 2320 B	07/19/22	C-51d	MPB
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1	07/15/22	U	MRW
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	07/14/22 14:25		NKH
Nitrate as N	0.90	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	07/14/22 17:02	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	07/14/22 17:02	U	JAF
Nitrate+Nitrite as N	<0.91	mg/l	0.122	1.10	CALCULATED	07/14/22 17:02		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	07/21/22	U	MRW
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	07/15/22		MRW
Solids, Total Dissolved	40	mg/l	4	5	SM 2540 C	07/15/22		TMH
Total Organic Carbon	1.5	mg/l	0.3	0.5	SM 5310 C	07/15/22		ALD
Solids, Total Suspended	1	mg/l	1	1	SM 2540 D	07/15/22		ALD

**Lab ID:** 2220746-10      **Collected By:** Client      **Sampled:** 07/14/22 07:45      **Received:** 07/14/22 13:39  
**Sample Desc:** BZ-6D      **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
<b>Dissolved General Chemistry</b>								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	07/16/22	G-23, G-24	MRW
<b>General Chemistry</b>								
Alkalinity, Total to pH 4.5	13	mg CaCO <sub>3</sub> /L		2	SM 2320 B	07/19/22	C-51f	MPB
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1	07/15/22	U	MRW
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	07/14/22 14:25		NKH
Nitrate as N	0.84	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	07/14/22 20:24	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	07/14/22 20:24	U	JAF
Nitrate+Nitrite as N	<0.85	mg/l	0.122	1.10	CALCULATED	07/14/22 20:24		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	07/21/22	U	MRW
Phosphorus as P, Total	0.01	mg/l	0.01	0.01	SM 4500-P F	07/15/22		MRW
Solids, Total Dissolved	54	mg/l	4	5	SM 2540 C	07/15/22		TMH
Total Organic Carbon	1.5	mg/l	0.3	0.5	SM 5310 C	07/15/22		ALD
Solids, Total Suspended	1	mg/l	1	1	SM 2540 D	07/15/22		ALD



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**M.J. Reider Associates, Inc.**

**Lab ID:** 2220746-11      **Collected By:** Client      **Sampled:** 07/14/22 09:10      **Received:** 07/14/22 13:39  
**Sample Desc:** BZ-7S      **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
<b>Dissolved General Chemistry</b>								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	07/16/22	G-23, G-24	MRW
<b>General Chemistry</b>								
Alkalinity, Total to pH 4.5	10	mg CaCO <sub>3</sub> /L		2	SM 2320 B	07/19/22	C-51	MPB
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1	07/15/22	U	MRW
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	07/14/22 14:25		NKH
Nitrate as N	0.54	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	07/14/22 20:40	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	07/14/22 20:40	U	JAF
Nitrate+Nitrite as N	<0.55	mg/l	0.122	1.10	CALCULATED	07/14/22 20:40		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	07/21/22	U	MRW
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	07/15/22		MRW
Solids, Total Dissolved	52	mg/l	4	5	SM 2540 C	07/15/22		TMH
Total Organic Carbon	1.6	mg/l	0.3	0.5	SM 5310 C	07/15/22		ALD
Solids, Total Suspended	3	mg/l	1	1	SM 2540 D	07/15/22		ALD
<b>Microbiology</b>								
Escherichia coli	<1	mpn/100ml	1		SM 9223 B/Quantitray	7/14/22 14:19	7/15/22 8:56	JMW
Total Coliform	291	mpn/100ml	1		SM 9223 B/Quantitray	7/14/22 14:19	7/15/22 8:56	JMW



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**M.J. Reider Associates, Inc.**

**Lab ID:** 2220746-12      **Collected By:** Client      **Sampled:** 07/14/22 09:10      **Received:** 07/14/22 13:39  
**Sample Desc:** BZ-7M      **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
<b>Dissolved General Chemistry</b>								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	07/16/22	G-23, G-24	MRW
<b>General Chemistry</b>								
Alkalinity, Total to pH 4.5	13	mg CaCO <sub>3</sub> /L		2	SM 2320 B	07/19/22	C-51g	MPB
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1	07/15/22	U	MRW
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	07/14/22 14:25		NKH
Nitrate as N	1.02	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	07/14/22 16:28		JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	07/14/22 16:28	U	JAF
Nitrate+Nitrite as N	<1.03	mg/l	0.122	1.10	CALCULATED	07/14/22 16:28		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	07/21/22	U	MRW
Phosphorus as P, Total	0.01	mg/l	0.01	0.01	SM 4500-P F	07/15/22		MRW
Solids, Total Dissolved	75	mg/l	4	5	SM 2540 C	07/15/22		TMH
Total Organic Carbon	1.6	mg/l	0.3	0.5	SM 5310 C	07/15/22		ALD
Solids, Total Suspended	2	mg/l	1	1	SM 2540 D	07/15/22		ALD

**Lab ID:** 2220746-13      **Collected By:** Client      **Sampled:** 07/14/22 09:10      **Received:** 07/14/22 13:39  
**Sample Desc:** BZ-7D      **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
<b>Dissolved General Chemistry</b>								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	07/16/22	G-23, G-24	MRW
<b>General Chemistry</b>								
Alkalinity, Total to pH 4.5	14	mg CaCO <sub>3</sub> /L		2	SM 2320 B	07/19/22	C-51h	MPB
Ammonia as N	0.03	mg/l	0.02	0.02	EPA 350.1	07/15/22		MRW
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	07/14/22 14:25		NKH
Nitrate as N	0.86	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	07/14/22 15:54	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	07/14/22 15:54	U	JAF
Nitrate+Nitrite as N	<0.87	mg/l	0.122	1.10	CALCULATED	07/14/22 15:54		JAF
Nitrogen, Total Kjeldahl (TKN)	0.87	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	07/21/22		MRW
Phosphorus as P, Total	0.18	mg/l	0.01	0.01	SM 4500-P F	07/15/22		MRW
Solids, Total Dissolved	63	mg/l	4	5	SM 2540 C	07/15/22		TMH
Total Organic Carbon	3.4	mg/l	0.3	0.5	SM 5310 C	07/15/22		ALD
Solids, Total Suspended	108	mg/l	1	1	SM 2540 D	07/15/22		ALD



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**Preparation Methods**

Specific Method	Preparation Method	Prep Batch	Prepared Date	Prepared By
<b>2220746-01</b>				
<b>Dissolved General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B2G1116	07/20/2022	MRW
<b>General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B2G0798	07/15/2022	MRW
<b>2220746-02</b>				
<b>Dissolved General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B2G0809	07/15/2022	MRW
<b>General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B2G0798	07/15/2022	MRW
<b>2220746-03</b>				
<b>Dissolved General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B2G0809	07/15/2022	MRW
<b>General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B2G0798	07/15/2022	MRW
<b>2220746-04</b>				
<b>Dissolved General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B2G0809	07/15/2022	MRW
<b>General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B2G0798	07/15/2022	MRW
<b>2220746-05</b>				
<b>Dissolved General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B2G0809	07/15/2022	MRW
<b>General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B2G0798	07/15/2022	MRW
<b>2220746-06</b>				
<b>Dissolved General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B2G0809	07/15/2022	MRW
<b>General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B2G0798	07/15/2022	MRW
<b>2220746-07</b>				
<b>Dissolved General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B2G0809	07/15/2022	MRW
<b>General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B2G0798	07/15/2022	MRW
<b>2220746-08</b>				
<b>Dissolved General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B2G0809	07/15/2022	MRW
<b>General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B2G0798	07/15/2022	MRW
<b>2220746-09</b>				



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**Dissolved General Chemistry**

SM 4500-P F SM 4500-P B B2G1116 07/20/2022 MRW

**General Chemistry**

SM 4500-P F SM 4500-P B B2G0798 07/15/2022 MRW

**2220746-10**

**Dissolved General Chemistry**

SM 4500-P F SM 4500-P B B2G0809 07/15/2022 MRW

**General Chemistry**

SM 4500-P F SM 4500-P B B2G0798 07/15/2022 MRW

**2220746-11**

**Dissolved General Chemistry**

SM 4500-P F SM 4500-P B B2G0809 07/15/2022 MRW

**General Chemistry**

SM 4500-P F SM 4500-P B B2G0798 07/15/2022 MRW

**2220746-12**

**Dissolved General Chemistry**

SM 4500-P F SM 4500-P B B2G0809 07/15/2022 MRW

**General Chemistry**

SM 4500-P F SM 4500-P B B2G0798 07/15/2022 MRW

**2220746-13**

**Dissolved General Chemistry**

SM 4500-P F SM 4500-P B B2G0809 07/15/2022 MRW

**General Chemistry**

SM 4500-P F SM 4500-P B B2G0798 07/15/2022 MRW

**Notes and Definitions**

- C-51 The alkalinity to pH 4.2=10.3 mg CaCO<sub>3</sub>/L.
- C-51a The alkalinity to pH 4.2=11.1 mg CaCO<sub>3</sub>/L.
- C-51b The alkalinity to pH 4.2=11.4 mg CaCO<sub>3</sub>/L.
- C-51c The alkalinity to pH 4.2=12.0 mg CaCO<sub>3</sub>/L.
- C-51d The alkalinity to pH 4.2=12.6 mg CaCO<sub>3</sub>/L.
- C-51e The alkalinity to pH 4.2=12.7 mg CaCO<sub>3</sub>/L.
- C-51f The alkalinity to pH 4.2=13.0 mg CaCO<sub>3</sub>/L.
- C-51g The alkalinity to pH 4.2=13.2 mg CaCO<sub>3</sub>/L.
- C-51h The alkalinity to pH 4.2=13.4 mg CaCO<sub>3</sub>/L.
- C-51i The alkalinity to pH 4.2=13.7 mg CaCO<sub>3</sub>/L.
- C-51j The alkalinity to pH 4.2=15.2 mg CaCO<sub>3</sub>/L.
- C-51k The alkalinity to pH 4.2=7.1 mg CaCO<sub>3</sub>/L.
- C-51l The alkalinity to pH 4.2=9.2 mg CaCO<sub>3</sub>/L.
- G-23 The sample was filtered after it was received at the laboratory and outside of the 15-minute hold time.
- G-24 The sample was preserved in the laboratory and outside of the 15-minute hold time.
- J Estimated value
- Q-10 The matrix spike(s) were outside acceptable limits of 90-110% recovery at 89.8% and 86.9%.
- Q-19 The duplicate RPD was greater than 10% at 66.7%.
- U Analyte was not detected above the indicated value.



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610-374-5129 www.mjreider.com

**WORK ORDER  
Chain of Custody**

2220746



Client Code: 3157  
Project Manager: Richard A Wheeler

Client: Tetra Tech  
Project: 2022 - Beltzville Reservoir

Report To: Tetra Tech - David Wertz - USACE, Phila Dist. Env.Resources Branch 100 Penn Square E., Arlington, VA 22201

Invoice To: Tetra Tech - David Wertz - USACE, Phila Dist. Env.Resources Branch 100 Penn Square E., Arlington, VA 22201

Collected By:

*Gregory Wacik*

Comments:

**2220746-01 BZ-1S**

*NKH* BOD SM 5210B, *JAC* EC (#) SM 9223B Confirmation, *JAC* NO2-N EPA 300.0, NO3-N EPA 300.0, NO2-N, NO3-N, Combined NO3+NO2, PO4-D SM 4500P-F, TC (#) SM 9223B  
Alk SM 2320B, NH3-N EPA 350.1, TKN EPA 351.2, TDS SM 2540C, PO4 SM 4500P-F, TOC SM 5310C, TSS SM 2540D

Matrix: Non-Potable Water  
Type: Grab

Date: 7/14/22  
Time: 0045

- A - Pl 500ml NP, minimal hdspc
- B - Pl Liter NP
- C - Sterile Pl 125ml NaThio
- D - Pl 500ml H2SO4
- E - Pl 250ml NP
- F - Pl 500ml Lab Filtered
- G - Vial Amber 40ml H3PO4, minimal hdspc
- H - Vial Amber 40ml H3PO4, minimal hdspc
- I - Vial Amber 40ml H3PO4, minimal hdspc

**2220746-02 BZ-2S**

*JAC* NO2-N EPA 300.0, *JAC* NO3-N EPA 300.0, NO2-N, NO3-N, Combined NO3+NO2, *NKH* BOD SM 5210B, EC (#) SM 9223B Confirmation, PO4-D SM 4500P-F, TC (#) SM 9223B  
NH3-N EPA 350.1, Alk SM 2320B, PO4 SM 4500P-F, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D

Matrix: Non-Potable Water  
Type: Grab

Date: 7/14-22  
Time: 1120

- A - Pl 500ml NP, minimal hdspc
- B - Pl Liter NP
- C - Sterile Pl 125ml NaThio
- D - Pl 500ml H2SO4
- E - Pl 250ml NP
- F - Pl 500ml Lab Filtered
- G - Vial Amber 40ml H3PO4, minimal hdspc
- H - Vial Amber 40ml H3PO4, minimal hdspc
- I - Vial Amber 40ml H3PO4, minimal hdspc

*[Signature]*

7/14/22 1145

*[Signature]*

7/14-22 1145

Relinquished By

Date/Time

Received By

Date/Time

Relinquished By

Date/Time

Received By

7-14-22 1339

Relinquished By

Date/Time

Received at Laboratory By

Date/Time

Sample Kit Prepared By: <i>JBS</i>	Date/Time
Sample Temp (°C): <u>5.0</u>	
Samples on Ice? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA	
Approved By: <i>JBS</i>	
Entered By:	



Client Code: 3157  
Project Manager: Richard A Wheeler

Client: Tetra Tech  
Project: 2022 - Beltzville Reservoir

Comments: \_\_\_\_\_

Collected By : Gregory Wack  
(Full Name)

**2220746-03 BZ-3S**

*NKH* BOD SM 5210B, EC (#) SM 9223B Confirmation, NO<sub>2</sub>-N EPA 300.0, NO<sub>3</sub>-N EPA 300.0, TC (#) SM 9223B, NO<sub>2</sub>-N, NO<sub>3</sub>-N, Combined NO<sub>3</sub>+NO<sub>2</sub>, PO<sub>4</sub>-D SM 4500P-F  
Alk SM 2320B, NH<sub>3</sub>-N EPA 350.1, TDS SM 2540C, TKN EPA 351.2, PO<sub>4</sub> SM 4500P-F, TOC SM 5310C, TSS SM 2540D

Matrix: Non-Potable Water  
Type: Grab

Date: 7/14/22  
Time: 0830

- A - Pl 500ml NP, minimal hdspc
- B - Pl Liter NP
- C - Sterile Pl 125ml NaThio
- D - Pl 500ml H2SO4
- E - Pl 250ml NP
- F - Pl 500ml Lab Filtered
- G - Vial Amber 40ml H3PO4, minimal hdspc
- H - Vial Amber 40ml H3PO4, minimal hdspc
- I - Vial Amber 40ml H3PO4, minimal hdspc

**2220746-04 BZ-3M**

*NKH* BOD SM 5210B, NO<sub>2</sub>-N EPA 300.0, PO<sub>4</sub>-D SM 4500P-F, NO<sub>3</sub>-N EPA 300.0, NO<sub>2</sub>-N, NO<sub>3</sub>-N, Combined NO<sub>3</sub>+NO<sub>2</sub>  
NH<sub>3</sub>-N EPA 350.1, TOC SM 5310C, TSS SM 2540D, Alk SM 2320B, PO<sub>4</sub> SM 4500P-F, TDS SM 2540C, TKN EPA 351.2

Matrix: Non-Potable Water  
Type: Grab

Date: 7/14/22  
Time: 0830

- A - Pl 500ml NP, minimal hdspc
- B - Pl Liter NP
- C - Pl 500ml H2SO4
- D - Pl 250ml NP
- E - Pl 500ml Lab Filtered
- F - Vial Amber 40ml H3PO4, minimal hdspc
- G - Vial Amber 40ml H3PO4, minimal hdspc
- H - Vial Amber 40ml H3PO4, minimal hdspc

**2220746-05 BZ-3D**

*NKH* NO<sub>2</sub>-N EPA 300.0, NO<sub>3</sub>-N EPA 300.0, BOD SM 5210B, NO<sub>2</sub>-N, NO<sub>3</sub>-N, Combined NO<sub>3</sub>+NO<sub>2</sub>, PO<sub>4</sub>-D SM 4500P-F  
TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, Alk SM 2320B, NH<sub>3</sub>-N EPA 350.1, PO<sub>4</sub> SM 4500P-F, TSS SM 2540D

Matrix: Non-Potable Water  
Type: Grab

Date: 7/14/22  
Time: 0830

- A - Pl 500ml NP, minimal hdspc
- B - Pl Liter NP
- C - Pl 500ml H2SO4
- D - Pl 250ml NP
- E - Pl 500ml Lab Filtered
- F - Vial Amber 40ml H3PO4, minimal hdspc
- G - Vial Amber 40ml H3PO4, minimal hdspc
- H - Vial Amber 40ml H3PO4, minimal hdspc

*Gregory Wack* 7/14/22 1145

Relinquished By	Date/Time	Received By	Date/Time
<i>Gregory Wack</i>	7/14/22 1145	<i>[Signature]</i>	7/14/22 1145
Relinquished By	Date/Time	Received By	Date/Time
		<i>[Signature]</i>	7-14-22 1339
Relinquished By	Date/Time	Received at Laboratory By	Date/Time

Sample Kit Prepared By:	Date/Time
Sample Temp (°C):	<u>5.0</u>
Samples on Ice?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA
Approved By:	<i>[Signature]</i>
Entered By:	<i>[Signature]</i>



Client Code: 3157  
Project Manager: Richard A Wheeler

Client: Tetra Tech  
Project: 2022 - Beltzville Reservoir

Comments: \_\_\_\_\_

Collected By : Gregory Wack  
(Full Name)

2220746-06 BZ-4S

*JAR*  
EC (#) SM 9223B Confirmation, NO2-N EPA 300.0, BOD SM 5210B, NO3-N EPA 300.0, NO2-N, NO3-N, Combined NO3+NO2, PO4-D SM 4500P-F, TC (#) SM 9223B  
NH3-N EPA 350.1, Alk SM 2320B, PO4 SM 4500P-F, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D

Matrix: Non-Potable Water  
Type: Grab

Date: 7/14/22  
Time: 1100

- A - Pl 500ml NP, minimal hdspc
- B - Pl Liter NP
- C - Sterile Pl 125ml NaThio
- D - Pl 500ml H2SO4
- E - Pl 250ml NP
- F - Pl 500ml Lab Filtered
- G - Vial Amber 40ml H3PO4, minimal hdspc
- H - Vial Amber 40ml H3PO4, minimal hdspc
- I - Vial Amber 40ml H3PO4, minimal hdspc

2220746-07 BZ-5S

*AKH*  
BOD SM 5210B, EC (#) SM 9223B Confirmation, NO2-N, NO3-N, Combined NO3+NO2, PO4-D SM 4500P-F, TC (#) SM 9223B, NO2-N EPA 300.0, NO3-N EPA 300.0  
TOC SM 5310C, TSS SM 2540D, TDS SM 2540C, Alk SM 2320B, PO4 SM 4500P-F, NH3-N EPA 350.1, TKN EPA 351.2

Matrix: Non-Potable Water  
Type: Grab

Date: 7/14/22  
Time: 1645

- A - Pl 500ml NP, minimal hdspc
- B - Pl Liter NP
- C - Sterile Pl 125ml NaThio
- D - Pl 500ml H2SO4
- E - Pl 250ml NP
- F - Pl 500ml Lab Filtered
- G - Vial Amber 40ml H3PO4, minimal hdspc
- H - Vial Amber 40ml H3PO4, minimal hdspc
- I - Vial Amber 40ml H3PO4, minimal hdspc

2220746-08 BZ-6S

*JAR*  
NO2-N EPA 300.0, NO3-N EPA 300.0, TC (#) SM 9223B, BOD SM 5210B, EC (#) SM 9223B Confirmation, NO2-N, NO3-N, Combined NO3+NO2, PO4-D SM 4500P-F  
Alk SM 2320B, NH3-N EPA 350.1, TDS SM 2540C, PO4 SM 4500P-F, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D

Matrix: Non-Potable Water  
Type: Grab

Date: 7/14/22  
Time: 0745

- A - Pl 500ml NP, minimal hdspc
- B - Pl Liter NP
- C - Sterile Pl 125ml NaThio
- D - Pl 500ml H2SO4
- E - Pl 250ml NP
- F - Pl 500ml Lab Filtered
- G - Vial Amber 40ml H3PO4, minimal hdspc
- H - Vial Amber 40ml H3PO4, minimal hdspc
- I - Vial Amber 40ml H3PO4, minimal hdspc

*[Signature]*  
Relinquished By \_\_\_\_\_ Date/Time 7/14/22 1145

*[Signature]*  
Received By \_\_\_\_\_ Date/Time 7/14/22 1145

Relinquished By \_\_\_\_\_ Date/Time \_\_\_\_\_

Received By \_\_\_\_\_ Date/Time 7/14/22 1339

Relinquished By \_\_\_\_\_ Date/Time \_\_\_\_\_

Received at Laboratory By \_\_\_\_\_ Date/Time \_\_\_\_\_

Sample Kit Prepared By:	Date/Time
Sample Temp (°C):	<u>5.0</u>
Samples on Ice?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> NA <input type="checkbox"/>
Approved By:	<i>[Signature]</i>
Entered By:	<i>[Signature]</i>



M.J. Reider Associates, Inc.

2220746

Client Code: 3157
Project Manager: Richard A Wheeler

Client: Tetra Tech
Project: 2022 - Beltzville Reservoir

Collected By: Gregory Wacik

Comments:

2220746-09 BZ-6M

BOD SM 5210B, NO2-N EPA 300.0, NO3-N EPA 300.0, NO2-N, NO3-N, Combined NO3+NO2, PO4-D SM 4500P-F
Alk SM 2320B, NH3-N EPA 350.1, PO4 SM 4500P-F, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D

Matrix: Non-Potable Water
Type: Grab

Date: 7/14/22
Time: 09:20:0745

- A - Pl 500ml NP, minimal hdspc
B - Pl Liter NP
C - Pl 500ml H2SO4
D - Pl 250ml NP
E - Pl 500ml Lab Filtered
F - Vial Amber 40ml H3PO4, minimal hdspc
G - Vial Amber 40ml H3PO4, minimal hdspc
H - Vial Amber 40ml H3PO4, minimal hdspc

2220746-10 BZ-6D

BOD SM 5210B, NO2-N EPA 300.0, NO3-N EPA 300.0, NO2-N, NO3-N, Combined NO3+NO2, PO4-D SM 4500P-F
Alk SM 2320B, NH3-N EPA 350.1, PO4 SM 4500P-F, TDS SM 2540C, TOC SM 5310C, TSS SM 2540D, TKN EPA 351.2

Matrix: Non-Potable Water
Type: Grab

Date: 7/14/22
Time: 09:20:7450

- A - Pl 500ml NP, minimal hdspc
B - Pl Liter NP
C - Pl 500ml H2SO4
D - Pl 250ml NP
E - Pl 500ml Lab Filtered
F - Vial Amber 40ml H3PO4, minimal hdspc
G - Vial Amber 40ml H3PO4, minimal hdspc
H - Vial Amber 40ml H3PO4, minimal hdspc

2220746-11 BZ-7S

BOD SM 5210B, EC (#) SM 9223B Confirmation, NO2-N EPA 300.0, NO3-N EPA 300.0, NO2-N, NO3-N, Combined NO3+NO2, PO4-D SM 4500P-F, TC (#) SM 9223B
Alk SM 2320B, NH3-N EPA 350.1, PO4 SM 4500P-F, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D

Matrix: Non-Potable Water
Type: Grab

Date: 7/14/22
Time: 09:10

- A - Pl 500ml NP, minimal hdspc
B - Pl Liter NP
C - Sterile Pl 125ml NaThio
D - Pl 500ml H2SO4
E - Pl 250ml NP
F - Pl 500ml Lab Filtered
G - Vial Amber 40ml H3PO4, minimal hdspc
H - Vial Amber 40ml H3PO4, minimal hdspc
I - Vial Amber 40ml H3PO4, minimal hdspc

Relinquished By: [Signature] Date/Time: 7/14/22 1145

Received By: [Signature] Date/Time: 7-14-22 1145

Relinquished By: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Received By: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Relinquished By: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Received at Laboratory By: [Signature] Date/Time: 7-14-22 1339

Table with 2 columns: Sample Kit Prepared By, Date/Time; Sample Temp (°C), Samples on Ice?, Approved By, Entered By.



Client Code: 3157

Client: Tetra Tech

Project Manager: Richard A Wheeler

Project: 2022 - Beltzville Reservoir

Comments: \_\_\_\_\_

Collected By :  
(Full Name)

*Gregory Wacik*

**2220746-12 BZ-7M**

*NKH*

*JAR* *JAR* *aw*  
BOD SM 5210B, NO<sub>2</sub>-N EPA 300.0, NO<sub>3</sub>-N EPA 300.0, NO<sub>2</sub>-N, NO<sub>3</sub>-N, Combined NO<sub>3</sub>+NO<sub>2</sub>, PO<sub>4</sub>-D SM 4500P-F  
Alk SM 2320B, NH<sub>3</sub>-N EPA 350.1, PO<sub>4</sub> SM 4500P-F, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D

Matrix: Non-Potable Water  
Type: Grab

Date: 7/14/22  
Time: 0910

- A - Pl 500ml NP, minimal hdspc
- B - Pl Liter NP
- C - Pl 500ml H<sub>2</sub>SO<sub>4</sub>
- D - Pl 250ml NP
- E - Pl 500ml Lab Filtered
- F - Vial Amber 40ml H<sub>3</sub>PO<sub>4</sub>, minimal hdspc
- G - Vial Amber 40ml H<sub>3</sub>PO<sub>4</sub>, minimal hdspc
- H - Vial Amber 40ml H<sub>3</sub>PO<sub>4</sub>, minimal hdspc

**2220746-13 BZ-7D**

*NKH*

*JAR* *JAR* *aw*  
BOD SM 5210B, NO<sub>2</sub>-N EPA 300.0, NO<sub>3</sub>-N EPA 300.0, NO<sub>2</sub>-N, NO<sub>3</sub>-N, Combined NO<sub>3</sub>+NO<sub>2</sub>, PO<sub>4</sub>-D SM 4500P-F  
TSS SM 2540D, TOC SM 5310C, Alk SM 2320B, NH<sub>3</sub>-N EPA 350.1, PO<sub>4</sub> SM 4500P-F, TDS SM 2540C, TKN EPA 351.2

Matrix: Non-Potable Water  
Type: Grab

Date: 7/14/22  
Time: 0910

- A - Pl 500ml NP, minimal hdspc
- B - Pl Liter NP
- C - Pl 500ml H<sub>2</sub>SO<sub>4</sub>
- D - Pl 250ml NP
- E - Pl 500ml Lab Filtered
- F - Vial Amber 40ml H<sub>3</sub>PO<sub>4</sub>, minimal hdspc
- G - Vial Amber 40ml H<sub>3</sub>PO<sub>4</sub>, minimal hdspc
- H - Vial Amber 40ml H<sub>3</sub>PO<sub>4</sub>, minimal hdspc

*[Signature]* 7/14/22 1145

Relinquished By \_\_\_\_\_ Date/Time \_\_\_\_\_

*[Signature]* 7/14-22 1145

Received By \_\_\_\_\_ Date/Time \_\_\_\_\_

Relinquished By \_\_\_\_\_ Date/Time \_\_\_\_\_

*[Signature]* 7/14-22 1339

Received By \_\_\_\_\_ Date/Time \_\_\_\_\_

Relinquished By \_\_\_\_\_ Date/Time \_\_\_\_\_

*[Signature]* 7/14-22 1339

Received at Laboratory By \_\_\_\_\_ Date/Time \_\_\_\_\_

Sample Kit Prepared By:	Date/Time
Sample Temp (°C):	<u>5.0</u>
Samples on Ice?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA
Approved By:	<i>[Signature]</i>
Entered By:	<i>[Signature]</i>

**M.J. Reider Associates, Inc.**

**MJRA Terms & Conditions**

All samples submitted must be accompanied by signed documentation representing a Chain of Custody (COC). The COC Record acts as a contract between the client and MJRA. Signing the COC form gives approval for MJRA to perform the requested analyses and is an agreement to pay for the cost of such analyses. COC Records must be completed in black or blue indelible ink (must not run when wet). COC documentation begins at the time of sample collection. Client is required to document all sample details prior to releasing samples to MJRA. All samples must be placed on ice immediately after sampling and shipped or delivered to the laboratory in a manner that will maintain the sample temperature above freezing and below 6C (loose ice is preferred).

**Sample Submission, Sample Acceptance & Sampling Containers**

Included on the COC must be the sample description, date and time of collection (including start and stop for composites), container size and type, preservative information, sample matrix, indication of whether the sample is a grab or composite, number of containers & a list of the tests to be performed. Poor sample collection technique, inappropriate sampling containers and/or improper sample preservation may lead to sample rejection. Suitable sample containers, labels, and preservatives (as applicable), along with blank COCs are provided at no additional cost.

**Turnaround Times (TAT)**

Average TAT for test results range from 5 to 15 working days depending on the specific analyses and time of year submitted. Faster turnaround times (\*RUSH TAT) may be available depending on the current workload in a particular department and the nature of the analyses requested. We encourage you to verify requests for expedited sample results with one of our Technical Directors prior to sample submittal. Without confirmation from a Technical Director, your results may not be completed by your deadline. \*RUSH TAT Surcharges are applied for expedited turnaround times.

**Analytical Results, Sample Collection Integrity & Subcontracting**

Analytical values are for the sample as submitted and relate only to the item tested. The value indicates a snapshot of the constituent content of the sample at the time of sample collection. Analytical results can be impacted by poor sample collection technique and/or improper preservation. All sample collection completed by MJRA was performed in accordance with applicable regulatory protocols or as specified in customer specific sampling plans. Constituent content will vary over time based on the matrix of the sample and the physical and chemical changes to its environment. All sample results and laboratory reports are strictly confidential. Results will not be available to anyone except the primary client or authorized party representing the client unless MJRA receives additional permissions from the client. When necessary, MJRA will subcontract certain analyses to a third party accredited laboratory. If client prohibits subcontracting, it must be provided in writing and include instruction on how to proceed with client samples that require third party analyses.

**Payment Terms**

Payment Terms are Net 30 days. Prices are subject to change without notice. A standing monthly charge of 1.5% of the clients over-30-day-unpaid balance may be added to the balance after 30 days and each month thereafter (day 31, 61, 91 etc.). The laboratory accepts all major credit cards, ACH transactions, checks and cash. New clients must pay for all services rendered prior to sample collection and/or in some cases report processing. Clients must contact the MJRA accounting department to pursue a credit-based account. MJRA reserves the right to terminate the client's credit account and to refuse to perform additional services on a credit basis if any balance is outstanding for more than 60 days.

**Warranty & Litigation**

MJRA does not guarantee any results of its services but has agreed to use its best efforts, in accordance with the standards and practices of the industry, to cause such results to be accurate and complete. We disclaim any other warranties, expressed or implied, including a warranty of fitness for a particular purpose and warranty of merchantability. Clients agree that they shall reimburse MJRA for any and all fees, cost and litigation expenses, including reasonable attorney fees incurred by MJRA in obtaining payment for the services rendered. All costs associated with compliance with any subpoena for documents, testimony, or any other purpose relating to work performed by MJRA, for a client, shall be paid by that client. MJRA's aggregate liability for negligent acts and omissions and of an intentional breach by MJRA will not exceed the fee paid for the services. Client agrees to indemnify and hold MJRA harmless for any and all liabilities in excess of said amount. Neither MJRA nor the client shall be liable to the other for special, incidental consequential or punitive liability or damages included but not limited to those arising from delay, loss of use, loss of profits or revenues. MJRA will not be liable to the client unless the client has notified MJRA of the discovery of the alleged negligent act, error, omissions or breach within 30 days of the day of its discovery and within one year of the date of invoice.

Reviewed and Approved by:



Richard A Wheeler  
Director of Field Services



107 Angelica Street ○ Reading, PA 19611 ○ [www.mjreider.com](http://www.mjreider.com) ○ (610) 374-5129 ○ fax (610) 374-7234

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NELAP accredited by PA. (PADEP #06-00003) Visit our website to view our current  
NELAC accreditations for various drinking water, wastewater and solid & chemical materials analytes.  
Additional accreditations by MD (261), NY(12094)





# Certificate of Analysis

**M.J. Reider Associates, Inc.**

ENVIRONMENTAL TESTING LABORATORY  
U.S. EPA/PA DEP #06-00003

**Laboratory No.:** 2226695

**Report:** 09/15/22

**Lab Contact:** Richard A Wheeler

**Attention:** David Wertz

**Project:** 2022 - Beltzville Reservoir

**Reported To:** Tetra Tech

USACE, Phila Dist. Env.Resources Branch 100 Penn Square E.  
Arlington, VA 22201

**Narrative:** Amended  
09/15/2022

2226695 received on 08/18/2022 14:00 was originally reported on 08/31/2022.

This certificate is a supplement to the original and has been amended to document the MDL change for NO3-N EPA 300.0.

**Lab ID:** 2226695-01      **Collected By:** Client      **Sampled:** 08/18/22 06:40      **Received:** 08/18/22 14:00  
**Sample Desc:** BZ-1S      **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
<b>Dissolved General Chemistry</b>								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	08/20/22	G-23, G-24	MRW
<b>General Chemistry</b>								
Alkalinity, Total to pH 4.5	12	mg CaCO3/L		2	SM 2320 B	08/23/22	C-51e	APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1 Rev 2.0	08/24/22	U	MRW
Biochemical Oxygen Demand	5.1	mg/l	2.0	2.0	SM 5210 B	08/18/22 17:43		ASD
Nitrate as N	0.90	mg/l	0.18	1.00	EPA 300.0 Rev 2.1	08/18/22 19:51	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	08/18/22 19:51	U	JAF
Nitrate+Nitrite as N	<0.91	mg/l	0.198	1.10	CALCULATED	08/18/22 19:51		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	08/29/22	Q-10, U	SNF
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	08/24/22		MRW
Solids, Total Dissolved	34	mg/l	4	5	SM 2540 C	08/19/22		TMH
Total Organic Carbon	1.5	mg/l	0.3	0.5	SM 5310 C	08/18/22		ALD
Solids, Total Suspended	<1	mg/l	1	1	SM 2540 D	08/19/22		ALD
<b>Microbiology</b>								
Escherichia coli	8	mpn/100ml	1		SM 9223 B/Quantitray	8/18/22 14:28	8/19/22 8:58	JMW
Total Coliform	1300	mpn/100ml	1		SM 9223 B/Quantitray	8/18/22 14:28	8/19/22 8:58	JMW



107 Angelica Street ○ Reading, PA 19611 ○ www.mjreider.com ○ (610) 374-5129 ○ fax (610) 374-7234

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NELAP accredited by PA. (PADEP #06-00003) Visit our website to view our current  
NELAC accreditations for various drinking water, wastewater and solid & chemical materials analytes.  
Additional accreditations by MD (261), NY(12094)

**M.J. Reider Associates, Inc.**

**Lab ID:** 2226695-02      **Collected By:** Client      **Sampled:** 08/18/22 08:20      **Received:** 08/18/22 14:00  
**Sample Desc:** BZ-2S      **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
<b>Dissolved General Chemistry</b>								
Phosphorus as P, Dissolved	0.01	mg/l		0.01	SM 4500-P F	08/20/22	G-23, G-24	MRW
<b>General Chemistry</b>								
Alkalinity, Total to pH 4.5	8	mg CaCO <sub>3</sub> /L		2	SM 2320 B	08/23/22	C-511	APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1 Rev 2.0	08/24/22	U	MRW
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	08/18/22 17:43		ASD
Nitrate as N	0.44	mg/l	0.18	1.00	EPA 300.0 Rev 2.1	08/18/22 16:46	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	08/18/22 16:46	U	JAF
Nitrate+Nitrite as N	<0.45	mg/l	0.198	1.10	CALCULATED	08/18/22 16:46		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	08/29/22	U	SNF
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	08/24/22		MRW
Solids, Total Dissolved	5	mg/l	4	5	SM 2540 C	08/19/22		TMH
Total Organic Carbon	0.8	mg/l	0.3	0.5	SM 5310 C	08/18/22		ALD
Solids, Total Suspended	<1	mg/l	1	1	SM 2540 D	08/19/22		ALD
<b>Microbiology</b>								
Escherichia coli	86	mpn/100ml	1		SM 9223 B/Quantitray	8/18/22 14:28	8/19/22 8:58	JMW
Total Coliform	2420	mpn/100ml	1		SM 9223 B/Quantitray	8/18/22 14:28	8/19/22 8:58	JMW



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**M.J. Reider Associates, Inc.**

**Lab ID:** 2226695-03      **Collected By:** Client      **Sampled:** 08/18/22 10:15      **Received:** 08/18/22 14:00  
**Sample Desc:** BZ-3S      **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
<b>Dissolved General Chemistry</b>								
Phosphorus as P, Dissolved	0.07	mg/l		0.01	SM 4500-P F	08/20/22	G-23, G-24	MRW
<b>General Chemistry</b>								
Alkalinity, Total to pH 4.5	10	mg CaCO <sub>3</sub> /L		2	SM 2320 B	08/23/22	C-51	APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1 Rev 2.0	08/24/22	U	MRW
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	08/18/22 17:43		ASD
Nitrate as N	0.47	mg/l	0.18	1.00	EPA 300.0 Rev 2.1	08/18/22 18:43	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	08/18/22 18:43	U	JAF
Nitrate+Nitrite as N	<0.48	mg/l	0.198	1.10	CALCULATED	08/18/22 18:43		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	08/29/22	U	SNF
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	08/24/22		MRW
Solids, Total Dissolved	38	mg/l	4	5	SM 2540 C	08/19/22		TMH
Total Organic Carbon	1.9	mg/l	0.3	0.5	SM 5310 C	08/18/22		ALD
Solids, Total Suspended	1	mg/l	1	1	SM 2540 D	08/19/22		ALD
<b>Microbiology</b>								
Escherichia coli	<1	mpn/100ml	1		SM 9223 B/Quantitray	8/18/22 14:28	8/19/22 8:58	JMW
Total Coliform	108	mpn/100ml	1		SM 9223 B/Quantitray	8/18/22 14:28	8/19/22 8:58	JMW



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**M.J. Reider Associates, Inc.**

**Lab ID:** 2226695-04      **Collected By:** Client      **Sampled:** 08/18/22 10:15      **Received:** 08/18/22 14:00  
**Sample Desc:** BZ-3M      **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
<b>Dissolved General Chemistry</b>								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	08/20/22	G-23, G-24	MRW
<b>General Chemistry</b>								
Alkalinity, Total to pH 4.5	13	mg CaCO <sub>3</sub> /L		2	SM 2320 B	08/23/22	C-51f	APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1 Rev 2.0	08/24/22	U	MRW
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	08/18/22 17:43		ASD
Nitrate as N	0.90	mg/l	0.18	1.00	EPA 300.0 Rev 2.1	08/18/22 19:34	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	08/18/22 19:34	U	JAF
Nitrate+Nitrite as N	<0.91	mg/l	0.198	1.10	CALCULATED	08/18/22 19:34		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	08/29/22	U	SNF
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	08/24/22		MRW
Solids, Total Dissolved	32	mg/l	4	5	SM 2540 C	08/19/22		TMH
Total Organic Carbon	1.5	mg/l	0.3	0.5	SM 5310 C	08/18/22		ALD
Solids, Total Suspended	1	mg/l	1	1	SM 2540 D	08/19/22		ALD

**Lab ID:** 2226695-05      **Collected By:** Client      **Sampled:** 08/18/22 10:15      **Received:** 08/18/22 14:00  
**Sample Desc:** BZ-3D      **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
<b>Dissolved General Chemistry</b>								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	08/20/22	G-23, G-24	MRW
<b>General Chemistry</b>								
Alkalinity, Total to pH 4.5	12	mg CaCO <sub>3</sub> /L		2	SM 2320 B	08/23/22	C-51d	APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1 Rev 2.0	08/24/22	U	MRW
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	08/18/22 17:43		ASD
Nitrate as N	0.86	mg/l	0.18	1.00	EPA 300.0 Rev 2.1	08/18/22 20:25	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	08/18/22 20:25	U	JAF
Nitrate+Nitrite as N	<0.87	mg/l	0.198	1.10	CALCULATED	08/18/22 20:25		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	08/29/22	U	SNF
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	08/24/22		MRW
Solids, Total Dissolved	52	mg/l	4	5	SM 2540 C	08/19/22		TMH
Total Organic Carbon	1.4	mg/l	0.3	0.5	SM 5310 C	08/18/22		ALD
Solids, Total Suspended	12	mg/l	1	1	SM 2540 D	08/19/22		ALD



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**M.J. Reider Associates, Inc.**

**Lab ID:** 2226695-06      **Collected By:** Client      **Sampled:** 08/18/22 08:00      **Received:** 08/18/22 14:00  
**Sample Desc:** BZ-4S      **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
<b>Dissolved General Chemistry</b>								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	08/20/22	G-23, G-24	MRW
<b>General Chemistry</b>								
Alkalinity, Total to pH 4.5	7	mg CaCO <sub>3</sub> /L		2	SM 2320 B	08/23/22	C-51k	APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1 Rev 2.0	08/24/22	U	MRW
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	08/18/22 17:43		ASD
Nitrate as N	<0.18	mg/l	0.18	1.00	EPA 300.0 Rev 2.1	08/18/22 16:12	U	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	08/18/22 16:12	U	JAF
Nitrate+Nitrite as N	<0.19	mg/l	0.198	1.10	CALCULATED	08/18/22 16:12		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	08/29/22	U	SNF
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	08/24/22		MRW
Solids, Total Dissolved	23	mg/l	4	5	SM 2540 C	08/19/22		TMH
Total Organic Carbon	1.8	mg/l	0.3	0.5	SM 5310 C	08/18/22		ALD
Solids, Total Suspended	4	mg/l	1	1	SM 2540 D	08/19/22		ALD
<b>Microbiology</b>								
Escherichia coli	24	mpn/100ml	1		SM 9223 B/Quantitray	8/18/22 14:28	8/19/22 8:58	JMW
Total Coliform	>2420	mpn/100ml	1		SM 9223 B/Quantitray	8/18/22 14:28	8/19/22 8:58	JMW



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**M.J. Reider Associates, Inc.**

**Lab ID:** 2226695-07      **Collected By:** Client      **Sampled:** 08/18/22 07:40      **Received:** 08/18/22 14:00  
**Sample Desc:** BZ-5S      **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
<b>Dissolved General Chemistry</b>								
Phosphorus as P, Dissolved	0.02	mg/l		0.01	SM 4500-P F	08/20/22	G-23, G-24	MRW
<b>General Chemistry</b>								
Alkalinity, Total to pH 4.5	16	mg CaCO <sub>3</sub> /L		2	SM 2320 B	08/23/22	C-51j	APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1 Rev 2.0	08/24/22	U	MRW
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	08/18/22 17:43		ASD
Nitrate as N	1.27	mg/l	0.18	1.00	EPA 300.0 Rev 2.1	08/18/22 15:55		JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	08/18/22 15:55	U	JAF
Nitrate+Nitrite as N	<1.28	mg/l	0.198	1.10	CALCULATED	08/18/22 15:55		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	08/29/22	U	SNF
Phosphorus as P, Total	0.01	mg/l	0.01	0.01	SM 4500-P F	08/24/22		MRW
Solids, Total Dissolved	45	mg/l	4	5	SM 2540 C	08/19/22		TMH
Total Organic Carbon	1.2	mg/l	0.3	0.5	SM 5310 C	08/18/22		ALD
Solids, Total Suspended	10	mg/l	1	1	SM 2540 D	08/19/22		ALD
<b>Microbiology</b>								
Escherichia coli	78	mpn/100ml	1		SM 9223 B/Quantitray	8/18/22 14:28	8/19/22 8:58	JMW
Total Coliform	2420	mpn/100ml	1		SM 9223 B/Quantitray	8/18/22 14:28	8/19/22 8:58	JMW



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**M.J. Reider Associates, Inc.**

**Lab ID:** 2226695-08      **Collected By:** Client      **Sampled:** 08/18/22 09:00      **Received:** 08/18/22 14:00  
**Sample Desc:** BZ-6S      **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
<b>Dissolved General Chemistry</b>								
Phosphorus as P, Dissolved	0.01	mg/l		0.01	SM 4500-P F	08/20/22	G-23, G-24	MRW
<b>General Chemistry</b>								
Alkalinity, Total to pH 4.5	11	mg CaCO <sub>3</sub> /L		2	SM 2320 B	08/23/22	C-51b	APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1 Rev 2.0	08/24/22	U	MRW
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	08/18/22 17:43		ASD
Nitrate as N	0.48	mg/l	0.18	1.00	EPA 300.0 Rev 2.1	08/18/22 15:38	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	08/18/22 15:38	U	JAF
Nitrate+Nitrite as N	<0.49	mg/l	0.198	1.10	CALCULATED	08/18/22 15:38		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	08/29/22	U	SNF
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	08/24/22		MRW
Solids, Total Dissolved	47	mg/l	4	5	SM 2540 C	08/19/22		TMH
Total Organic Carbon	1.9	mg/l	0.3	0.5	SM 5310 C	08/18/22		ALD
Solids, Total Suspended	1	mg/l	1	1	SM 2540 D	08/19/22		ALD
<b>Microbiology</b>								
Escherichia coli	<1	mpn/100ml	1		SM 9223 B/Quantitray	8/18/22 14:28	8/19/22 8:58	JMW
Total Coliform	261	mpn/100ml	1		SM 9223 B/Quantitray	8/18/22 14:28	8/19/22 8:58	JMW



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**M.J. Reider Associates, Inc.**

**Lab ID:** 2226695-09      **Collected By:** Client      **Sampled:** 08/18/22 09:00      **Received:** 08/18/22 14:00  
**Sample Desc:** BZ-6M      **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
<b>Dissolved General Chemistry</b>								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	08/20/22	G-23, G-24	MRW
<b>General Chemistry</b>								
Alkalinity, Total to pH 4.5	11	mg CaCO <sub>3</sub> /L		2	SM 2320 B	08/23/22	C-51a	APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1 Rev 2.0	08/25/22	U	MRW
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	08/18/22 17:43		ASD
Nitrate as N	0.89	mg/l	0.18	1.00	EPA 300.0 Rev 2.1	08/18/22 20:08	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	08/18/22 20:08	U	JAF
Nitrate+Nitrite as N	<0.90	mg/l	0.198	1.10	CALCULATED	08/18/22 20:08		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	08/29/22	U	SNF
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	08/25/22		MRW
Solids, Total Dissolved	72	mg/l	4	5	SM 2540 C	08/19/22		TMH
Total Organic Carbon	1.4	mg/l	0.3	0.5	SM 5310 C	08/18/22		ALD
Solids, Total Suspended	1	mg/l	1	1	SM 2540 D	08/19/22		ALD

**Lab ID:** 2226695-10      **Collected By:** Client      **Sampled:** 08/18/22 09:00      **Received:** 08/18/22 14:00  
**Sample Desc:** BZ-6D      **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
<b>Dissolved General Chemistry</b>								
Phosphorus as P, Dissolved	0.03	mg/l		0.01	SM 4500-P F	08/20/22	G-23, G-24	MRW
<b>General Chemistry</b>								
Alkalinity, Total to pH 4.5	15	mg CaCO <sub>3</sub> /L		2	SM 2320 B	08/23/22	C-51i	APR
Ammonia as N	0.06	mg/l	0.02	0.02	EPA 350.1 Rev 2.0	08/25/22		MRW
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	08/18/22 17:43		ASD
Nitrate as N	0.71	mg/l	0.18	1.00	EPA 300.0 Rev 2.1	08/18/22 16:29	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	08/18/22 16:29	U	JAF
Nitrate+Nitrite as N	<0.72	mg/l	0.198	1.10	CALCULATED	08/18/22 16:29		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	08/29/22	U	SNF
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	08/25/22		MRW
Solids, Total Dissolved	50	mg/l	4	5	SM 2540 C	08/19/22		TMH
Total Organic Carbon	1.8	mg/l	0.3	0.5	SM 5310 C	08/18/22		ALD
Solids, Total Suspended	20	mg/l	1	1	SM 2540 D	08/19/22		ALD



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**M.J. Reider Associates, Inc.**

**Lab ID:** 2226695-11      **Collected By:** Client      **Sampled:** 08/18/22 10:45      **Received:** 08/18/22 14:00  
**Sample Desc:** BZ-7S      **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
<b>Dissolved General Chemistry</b>								
Phosphorus as P, Dissolved	0.03	mg/l		0.01	SM 4500-P F	08/20/22	G-23, G-24	MRW
<b>General Chemistry</b>								
Alkalinity, Total to pH 4.5	12	mg CaCO <sub>3</sub> /L		2	SM 2320 B	08/23/22	C-51c	APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1 Rev 2.0	08/25/22	U	MRW
Biochemical Oxygen Demand	4.3	mg/l	2.0	2.0	SM 5210 B	08/18/22 17:43		ASD
Nitrate as N	0.47	mg/l	0.18	1.00	EPA 300.0 Rev 2.1	08/18/22 17:36	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	08/18/22 17:36	U	JAF
Nitrate+Nitrite as N	<0.48	mg/l	0.198	1.10	CALCULATED	08/18/22 17:36		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	08/29/22	Q-10a, U	SNF
Phosphorus as P, Total	0.01	mg/l	0.01	0.01	SM 4500-P F	08/25/22		MRW
Solids, Total Dissolved	37	mg/l	4	5	SM 2540 C	08/19/22		TMH
Total Organic Carbon	1.7	mg/l	0.3	0.5	SM 5310 C	08/18/22		ALD
Solids, Total Suspended	<1	mg/l	1	1	SM 2540 D	08/19/22		ALD
<b>Microbiology</b>								
Escherichia coli	<1	mpn/100ml	1		SM 9223 B/Quantitray	8/18/22 14:28	8/19/22 8:58	JMW
Total Coliform	488	mpn/100ml	1		SM 9223 B/Quantitray	8/18/22 14:28	8/19/22 8:58	JMW



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**M.J. Reider Associates, Inc.**

**Lab ID:** 2226695-12      **Collected By:** Client      **Sampled:** 08/18/22 10:45      **Received:** 08/18/22 14:00  
**Sample Desc:** BZ-7M      **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
<b>Dissolved General Chemistry</b>								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	08/20/22	G-23, G-24	MRW
<b>General Chemistry</b>								
Alkalinity, Total to pH 4.5	13	mg CaCO <sub>3</sub> /L		2	SM 2320 B	08/23/22	C-51g	APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1 Rev 2.0	08/25/22	U	MRW
Biochemical Oxygen Demand	4.3	mg/l	2.0	2.0	SM 5210 B	08/18/22 17:43		ASD
Nitrate as N	0.91	mg/l	0.18	1.00	EPA 300.0 Rev 2.1	08/18/22 17:19	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	08/18/22 17:19	U	JAF
Nitrate+Nitrite as N	<0.92	mg/l	0.198	1.10	CALCULATED	08/18/22 17:19		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	08/29/22	U	SNF
Phosphorus as P, Total	0.01	mg/l	0.01	0.01	SM 4500-P F	08/25/22		MRW
Solids, Total Dissolved	55	mg/l	4	5	SM 2540 C	08/19/22		TMH
Total Organic Carbon	1.4	mg/l	0.3	0.5	SM 5310 C	08/18/22		ALD
Solids, Total Suspended	2	mg/l	1	1	SM 2540 D	08/19/22		ALD

**Lab ID:** 2226695-13      **Collected By:** Client      **Sampled:** 08/18/22 10:45      **Received:** 08/18/22 14:00  
**Sample Desc:** BZ-7D      **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
<b>Dissolved General Chemistry</b>								
Phosphorus as P, Dissolved	0.02	mg/l		0.01	SM 4500-P F	08/20/22	G-23, G-24	MRW
<b>General Chemistry</b>								
Alkalinity, Total to pH 4.5	14	mg CaCO <sub>3</sub> /L		2	SM 2320 B	08/23/22	C-51h	APR
Ammonia as N	0.03	mg/l	0.02	0.02	EPA 350.1 Rev 2.0	08/25/22		MRW
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	08/18/22 17:43		ASD
Nitrate as N	0.79	mg/l	0.18	1.00	EPA 300.0 Rev 2.1	08/18/22 17:03	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	08/18/22 17:03	U	JAF
Nitrate+Nitrite as N	<0.80	mg/l	0.198	1.10	CALCULATED	08/18/22 17:03		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	08/29/22	U	SNF
Phosphorus as P, Total	0.02	mg/l	0.01	0.01	SM 4500-P F	08/25/22		MRW
Solids, Total Dissolved	54	mg/l	4	5	SM 2540 C	08/19/22		TMH
Total Organic Carbon	1.5	mg/l	0.3	0.5	SM 5310 C	08/18/22		ALD
Solids, Total Suspended	6	mg/l	1	1	SM 2540 D	08/19/22		ALD



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 Additional accreditations by MD (261), NY(12094)

M.J. Reider Associates, Inc.

Preparation Methods

Specific Method	Preparation Method	Prep Batch	Prepared Date	Prepared By
<b>2226695-01</b>				
<b>Dissolved General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B2H1209	08/19/2022	MRW
<b>General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B2H1428	08/24/2022	MRW
<b>2226695-02</b>				
<b>Dissolved General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B2H1209	08/19/2022	MRW
<b>General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B2H1428	08/24/2022	MRW
<b>2226695-03</b>				
<b>Dissolved General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B2H1209	08/19/2022	MRW
<b>General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B2H1428	08/24/2022	MRW
<b>2226695-04</b>				
<b>Dissolved General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B2H1209	08/19/2022	MRW
<b>General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B2H1428	08/24/2022	MRW
<b>2226695-05</b>				
<b>Dissolved General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B2H1209	08/19/2022	MRW
<b>General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B2H1428	08/24/2022	MRW
<b>2226695-06</b>				
<b>Dissolved General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B2H1209	08/19/2022	MRW
<b>General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B2H1428	08/24/2022	MRW
<b>2226695-07</b>				
<b>Dissolved General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B2H1209	08/19/2022	MRW
<b>General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B2H1428	08/24/2022	MRW
<b>2226695-08</b>				
<b>Dissolved General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B2H1209	08/19/2022	MRW
<b>General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B2H1428	08/24/2022	MRW
<b>2226695-09</b>				



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Additional accreditations by MD (261), NY(12094)

M.J. Reider Associates, Inc.

**Dissolved General Chemistry**

SM 4500-P F SM 4500-P B B2H1209 08/19/2022 MRW

**General Chemistry**

SM 4500-P F SM 4500-P B B2H1508 08/25/2022 SNF

**2226695-10**

**Dissolved General Chemistry**

SM 4500-P F SM 4500-P B B2H1209 08/19/2022 MRW

**General Chemistry**

SM 4500-P F SM 4500-P B B2H1508 08/25/2022 SNF

**2226695-11**

**Dissolved General Chemistry**

SM 4500-P F SM 4500-P B B2H1209 08/19/2022 MRW

**General Chemistry**

SM 4500-P F SM 4500-P B B2H1508 08/25/2022 SNF

**2226695-12**

**Dissolved General Chemistry**

SM 4500-P F SM 4500-P B B2H1209 08/19/2022 MRW

**General Chemistry**

SM 4500-P F SM 4500-P B B2H1508 08/25/2022 SNF

**2226695-13**

**Dissolved General Chemistry**

SM 4500-P F SM 4500-P B B2H1209 08/19/2022 MRW

**General Chemistry**

SM 4500-P F SM 4500-P B B2H1508 08/25/2022 SNF

**Notes and Definitions**

- C-51 The alkalinity to pH 4.2 = 10.4 mg CaCO<sub>3</sub>/L.
- C-51a The alkalinity to pH 4.2 = 11.0 mg CaCO<sub>3</sub>/L.
- C-51b The alkalinity to pH 4.2 = 11.2 mg CaCO<sub>3</sub>/L.
- C-51c The alkalinity to pH 4.2 = 11.6 mg CaCO<sub>3</sub>/L.
- C-51d The alkalinity to pH 4.2 = 12.2 mg CaCO<sub>3</sub>/L.
- C-51e The alkalinity to pH 4.2 = 12.3 mg CaCO<sub>3</sub>/L.
- C-51f The alkalinity to pH 4.2 = 12.6 mg CaCO<sub>3</sub>/L.
- C-51g The alkalinity to pH 4.2 = 13.4 mg CaCO<sub>3</sub>/L.
- C-51h The alkalinity to pH 4.2 = 13.9 mg CaCO<sub>3</sub>/L.
- C-51i The alkalinity to pH 4.2 = 14.9 mg CaCO<sub>3</sub>/L.
- C-51j The alkalinity to pH 4.2 = 15.8 mg CaCO<sub>3</sub>/L.
- C-51k The alkalinity to pH 4.2 = 6.6 mg CaCO<sub>3</sub>/L.
- C-51l The alkalinity to pH 4.2 = 8.1 mg CaCO<sub>3</sub>/L.
- G-23 The sample was filtered after it was received at the laboratory and outside of the 15-minute hold time.
- G-24 The sample was preserved in the laboratory and outside of the 15-minute hold time.
- J Estimated value
- Q-10 The matrix spike(s) were outside acceptable limits of 90-110% recovery at 113% and 113%.
- Q-10a The matrix spike(s) were outside acceptable limits of 90-110% recovery at 113% and 116%.
- U Analyte was not detected above the indicated value.



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**M.J. Reider Associates, Inc.**

107 Angelica St, Reading PA, 19611  
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**WORK ORDER  
Chain of Custody**

2226695



Client Code: 3157

Project Manager: Richard A Wheeler

Report To: Tetra Tech - David Wertz - USACE, Phila Dist. Env.Resources Branch 100 Penn Square E., Arlington, VA 22201

Invoice To: Tetra Tech - David Wertz - USACE, Phila Dist. Env.Resources Branch 100 Penn Square E., Arlington, VA 22201

Client: Tetra Tech

Project: 2022 - Beltzville Reservoir

Comments: \_\_\_\_\_

Collected By :

(Full Name)

Gregory Wacik

**2226695-01 BZ-1S**

*NKH*  
BOD SM 5210B, EC (#) SM 9223B Confirmation, NO2-N EPA 300.0, NO3-N EPA 300.0, NO2-N, NO3-N, Combined NO3+NO2, PO4-D SM 4500P-F, TC (#) SM 9223B  
Alk SM 2320B, NH3-N EPA 350.1, PO4 SM 4500P-F, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D

Matrix: Non-Potable Water

Type: Grab

Date: 8/18/22  
Time: 0640

- A - PI 500ml NP, minimal hdspc
- B - PI Liter NP
- C - Sterile PI 125ml NaThio
- D - PI 500ml H2SO4
- E - PI 250ml NP
- F - PI 500ml Lab Filtered
- G - Vial Amber 40ml H3PO4, minimal hdspc
- H - Vial Amber 40ml H3PO4, minimal hdspc
- I - Vial Amber 40ml H3PO4, minimal hdspc

**2226695-02 BZ-2S**

*NKH*  
BOD SM 5210B, EC (#) SM 9223B Confirmation, NO2-N EPA 300.0, NO3-N EPA 300.0, PO4-D SM 4500P-F, TC (#) SM 9223B, NO2-N, NO3-N, Combined NO3+NO2  
Alk SM 2320B, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D, PO4 SM 4500P-F, NH3-N EPA 350.1

Matrix: Non-Potable Water

Type: Grab

Date: 8/18/22  
Time: 0820

- A - PI 500ml NP, minimal hdspc
- B - PI Liter NP
- C - Sterile PI 125ml NaThio
- D - PI 500ml H2SO4
- E - PI 250ml NP
- F - PI 500ml Lab Filtered
- G - Vial Amber 40ml H3PO4, minimal hdspc
- H - Vial Amber 40ml H3PO4, minimal hdspc
- I - Vial Amber 40ml H3PO4, minimal hdspc

[Signature] 8/18/22 1145 Received By [Signature] 8-18-22 1200  
 Relinquished By Date/Time Received By Date/Time  
 Relinquished By Date/Time Received By Date/Time  
 Relinquished By Date/Time Received at Laboratory By [Signature] 8-18-22 1400 Date/Time

Sample Kit Prepared By: <u>JBS</u>	Date/Time
Sample Temp (°C): <u>4.8</u>	
Samples on Ice? <input checked="" type="radio"/> Yes <input type="radio"/> No <input type="radio"/> NA	
Approved By: <u>[Signature]</u>	
Entered By: <u>[Signature]</u>	



Client Code: 3157  
Project Manager: Richard A Wheeler

Client: Tetra Tech  
Project: 2022 - Beltzville Reservoir

Collected By: Gregory Wacik  
(Full Name)

Comments: \_\_\_\_\_

2226695-03 BZ-3S

*NW* BOD SM 5210B, EC (#) SM 9223B Confirmation, NO2-N, NO3-N, Combined NO3+NO2, PO4-D SM 4500P-F, NO2-N EPA 300.0, NO3-N EPA 300.0, TC (#) SM 9223B  
TOC SM 5310C, TSS SM 2540D, Alk SM 2320B, NH3-N EPA 350.1, PO4 SM 4500P-F, TDS SM 2540C, TKN EPA 351.2

Matrix: Non-Potable Water  
Type: Grab

Date: 8/18/22  
Time: 1015

- A - PI 500ml NP, minimal hdspc
- B - PI Liter NP
- C - Sterile PI 125ml NaThio
- D - PI 500ml H2SO4
- E - PI 250ml NP
- F - PI 500ml Lab Filtered
- G - Vial Amber 40ml H3PO4, minimal hdspc
- H - Vial Amber 40ml H3PO4, minimal hdspc
- I - Vial Amber 40ml H3PO4, minimal hdspc

2226695-04 BZ-3M

*NW* BOD SM 5210B, NO2-N, NO3-N, Combined NO3+NO2, PO4-D SM 4500P-F, NO2-N EPA 300.0, NO3-N EPA 300.0  
Alk SM 2320B, NH3-N EPA 350.1, PO4 SM 4500P-F, TSS SM 2540D, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C

Matrix: Non-Potable Water  
Type: Grab

Date: 8/18/22  
Time: 1015

- A - PI 500ml NP, minimal hdspc
- B - PI Liter NP
- C - PI 500ml H2SO4
- D - PI 250ml NP
- E - PI 500ml Lab Filtered
- F - Vial Amber 40ml H3PO4, minimal hdspc
- G - Vial Amber 40ml H3PO4, minimal hdspc
- H - Vial Amber 40ml H3PO4, minimal hdspc

2226695-05 BZ-3D

*NW* BOD SM 5210B, NO2-N EPA 300.0, PO4-D SM 4500P-F, NO3-N EPA 300.0, NO2-N, NO3-N, Combined NO3+NO2  
Alk SM 2320B, NH3-N EPA 350.1, PO4 SM 4500P-F, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D

Matrix: Non-Potable Water  
Type: Grab

Date: 8/18/22  
Time: 1015

- A - PI 500ml NP, minimal hdspc
- B - PI Liter NP
- C - PI 500ml H2SO4
- D - PI 250ml NP
- E - PI 500ml Lab Filtered
- F - Vial Amber 40ml H3PO4, minimal hdspc
- G - Vial Amber 40ml H3PO4, minimal hdspc
- H - Vial Amber 40ml H3PO4, minimal hdspc

Relinquished By: [Signature] Date/Time: 8/18/22 1145  
 Received By: By NW Date/Time: 8-18-22 1200

Relinquished By: \_\_\_\_\_ Date/Time: \_\_\_\_\_  
 Received By: By NW Date/Time: 8-18-22 1400

Relinquished By: \_\_\_\_\_ Date/Time: \_\_\_\_\_  
 Received at Laboratory By: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Sample Kit Prepared By:	Date/Time
Sample Temp (°C):	<u>3.8</u> <u>4.8</u> <u>8.18.22</u>
Samples on Ice?	Yes No NA
Approved By:	<u>[Signature]</u>
Entered By:	



Client Code: 3157

Client: Tetra Tech

Project Manager: Richard A Wheeler

Project: 2022 - Beltzville Reservoir

Collected By :  
(Full Name)

*Gregory Wacik*

Comments: \_\_\_\_\_

2226695-06 BZ-4S

*NKH* BOD SM 5210B, EC (#) SM 9223B Confirmation, NO<sub>2</sub>-N, NO<sub>3</sub>-N, Combined NO<sub>3</sub>+NO<sub>2</sub>, PO<sub>4</sub>-D SM 4500P-F, TC (#) SM 9223B, NO<sub>2</sub>-N EPA 300.0, NO<sub>3</sub>-N EPA 300.0  
Alk SM 2320B, TOC SM 5310C, NH<sub>3</sub>-N EPA 350.1, TDS SM 2540C, TKN EPA 351.2, PO<sub>4</sub> SM 4500P-F, TSS SM 2540D

Matrix: Non-Potable Water  
Type: Grab

Date: 8/18/22  
Time: 0800

- A - PI 500ml NP, minimal hdspc
- B - PI Liter NP
- C - Sterile PI 125ml NaThio
- D - PI 500ml H2SO4
- E - PI 250ml NP
- F - PI 500ml Lab Filtered
- G - Vial Amber 40ml H3PO4, minimal hdspc
- H - Vial Amber 40ml H3PO4, minimal hdspc
- I - Vial Amber 40ml H3PO4, minimal hdspc

2226695-07 BZ-5S

*NKH* NO<sub>2</sub>-N EPA 300.0, NO<sub>3</sub>-N EPA 300.0, TC (#) SM 9223B, BOD SM 5210B, EC (#) SM 9223B Confirmation, NO<sub>2</sub>-N, NO<sub>3</sub>-N, Combined NO<sub>3</sub>+NO<sub>2</sub>, PO<sub>4</sub>-D SM 4500P-F  
Alk SM 2320B, TDS SM 2540C, TKN EPA 351.2, NH<sub>3</sub>-N EPA 350.1, PO<sub>4</sub> SM 4500P-F, TOC SM 5310C, TSS SM 2540D

Matrix: Non-Potable Water  
Type: Grab

Date: 8/18/22  
Time: 0740

- A - PI 500ml NP, minimal hdspc
- B - PI Liter NP
- C - Sterile PI 125ml NaThio
- D - PI 500ml H2SO4
- E - PI 250ml NP
- F - PI 500ml Lab Filtered
- G - Vial Amber 40ml H3PO4, minimal hdspc
- H - Vial Amber 40ml H3PO4, minimal hdspc
- I - Vial Amber 40ml H3PO4, minimal hdspc

2226695-08 BZ-6S

*NKH* BOD SM 5210B, EC (#) SM 9223B Confirmation, NO<sub>2</sub>-N, NO<sub>3</sub>-N, Combined NO<sub>3</sub>+NO<sub>2</sub>, PO<sub>4</sub>-D SM 4500P-F, NO<sub>2</sub>-N EPA 300.0, NO<sub>3</sub>-N EPA 300.0, TC (#) SM 9223B  
NH<sub>3</sub>-N EPA 350.1, PO<sub>4</sub> SM 4500P-F, Alk SM 2320B, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D

Matrix: Non-Potable Water  
Type: Grab

Date: 8/18/22  
Time: 0900

- A - PI 500ml NP, minimal hdspc
- B - PI Liter NP
- C - Sterile PI 125ml NaThio
- D - PI 500ml H2SO4
- E - PI 250ml NP
- F - PI 500ml Lab Filtered
- G - Vial Amber 40ml H3PO4, minimal hdspc
- H - Vial Amber 40ml H3PO4, minimal hdspc
- I - Vial Amber 40ml H3PO4, minimal hdspc

*[Signature]* 8/18/22 1145  
Relinquished By \_\_\_\_\_ Date/Time \_\_\_\_\_

*[Signature]* 8-18-22 1200  
Received By \_\_\_\_\_ Date/Time \_\_\_\_\_

Relinquished By \_\_\_\_\_ Date/Time \_\_\_\_\_

*[Signature]* 8-18-22 1400  
Received By \_\_\_\_\_ Date/Time \_\_\_\_\_

Relinquished By \_\_\_\_\_ Date/Time \_\_\_\_\_

Received at Laboratory By \_\_\_\_\_ Date/Time \_\_\_\_\_

Sample Kit Prepared By:	Date/Time
Sample Temp (°C):	<u>4.8</u>
Samples on Ice?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA
Approved By:	<i>[Signature]</i>
Entered By:	<i>[Signature]</i>



M.J. Reider Associates, Inc.

2226695

Client Code: 3157

Client: Tetra Tech

Project Manager: Richard A Wheeler

Project: 2022 - Beltzville Reservoir

Comments: \_\_\_\_\_

Collected By : Gregory Wacik  
(Full Name)

2226695-09 BZ-6M

*NKH* BOD SM 5210B, NO2-N EPA 300.0, NO3-N EPA 300.0, NO2-N, NO3-N, Combined NO3+NO2, PO4-D SM 4500P-F  
Alk SM 2320B, NH3-N EPA 350.1, TDS SM 2540C, TOC SM 5310C, TSS SM 2540D, TKN EPA 351.2, PO4 SM 4500P-F

Matrix: Non-Potable Water

Date: 8/18/22  
Time: 0900

Type: Grab

- A - Pl 500ml NP, minimal hdspc
- B - Pl Liter NP
- C - Pl 500ml H2SO4
- D - Pl 250ml NP
- E - Pl 500ml Lab Filtered
- F - Vial Amber 40ml H3PO4, minimal hdspc
- G - Vial Amber 40ml H3PO4, minimal hdspc
- H - Vial Amber 40ml H3PO4, minimal hdspc

2226695-10 BZ-6D

*NKH* BOD SM 5210B, NO2-N EPA 300.0, NO3-N EPA 300.0, NO2-N, NO3-N, Combined NO3+NO2, PO4-D SM 4500P-F  
Alk SM 2320B, NH3-N EPA 350.1, PO4 SM 4500P-F, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D

Matrix: Non-Potable Water

Date: 8/18/22  
Time: 0900

Type: Grab

- A - Pl 500ml NP, minimal hdspc
- B - Pl Liter NP
- C - Pl 500ml H2SO4
- D - Pl 250ml NP
- E - Pl 500ml Lab Filtered
- F - Vial Amber 40ml H3PO4, minimal hdspc
- G - Vial Amber 40ml H3PO4, minimal hdspc
- H - Vial Amber 40ml H3PO4, minimal hdspc

2226695-11 BZ-7S

*NKH* BOD SM 5210B, EC (#) SM 9223B Confirmation, NO2-N EPA 300.0, NO3-N EPA 300.0, NO2-N, NO3-N, Combined NO3+NO2, PO4-D SM 4500P-F, TC (#) SM 9223B  
Alk SM 2320B, NH3-N EPA 350.1, PO4 SM 4500P-F, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D

Matrix: Non-Potable Water

Date: 8/18/22  
Time: 1045

Type: Grab

- A - Pl 500ml NP, minimal hdspc
- B - Pl Liter NP
- C - Sterile Pl 125ml NaThio
- D - Pl 500ml H2SO4
- E - Pl 250ml NP
- F - Pl 500ml Lab Filtered
- G - Vial Amber 40ml H3PO4, minimal hdspc
- H - Vial Amber 40ml H3PO4, minimal hdspc
- I - Vial Amber 40ml H3PO4, minimal hdspc

Relinquished By: [Signature] Date/Time: 8/18/22 1145

Received By: [Signature] Date/Time: 8-18-22 1200

Relinquished By: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Received By: [Signature] Date/Time: 8-18-22 1400

Relinquished By: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Received at Laboratory By: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Sample Kit Prepared By:	Date/Time
Sample Temp (°C):	<u>4.8</u>
Samples on Ice?	<input checked="" type="radio"/> Yes <input type="radio"/> No <input type="radio"/> NA
Approved By:	<u>[Signature]</u>
Entered By:	<u>[Signature]</u>

The Client, by signing (or having the client's agent sign), agrees to MJRA's Terms and Conditions and to pay for the above requested services including any additional associated fees incurred.





Client Code: 3157

Client: Tetra Tech

Project Manager: Richard A Wheeler

Project: 2022 - Beltzville Reservoir

Collected By: (Full Name)

Gregory Wacik

Comments: \_\_\_\_\_

2226695-12 BZ-7M

BOD SM 5210B, NO2-N EPA 300.0, NO3-N EPA 300.0, NO2-N, NO3-N, Combined NO3+NO2, PO4-D SM 4500P-F Alk SM 2320B, NH3-N EPA 350.1, PO4 SM 4500P-F, TDS SM 2540C, TOC SM 5310C, TSS SM 2540D, TKN EPA 351.2

Matrix: Non-Potable Water Type: Grab

Date: 8/15/22 Time: 1045

- A - Pl 500ml NP, minimal hdspc B - Pl Liter NP C - Pl 500ml H2SO4 D - Pl 250ml NP E - Pl 500ml Lab Filtered F - Vial Amber 40ml H3PO4, minimal hdspc G - Vial Amber 40ml H3PO4, minimal hdspc H - Vial Amber 40ml H3PO4, minimal hdspc

2226695-13 BZ-7D

BOD SM 5210B, NO2-N EPA 300.0, NO3-N EPA 300.0, NO2-N, NO3-N, Combined NO3+NO2, PO4-D SM 4500P-F Alk SM 2320B, NH3-N EPA 350.1, PO4 SM 4500P-F, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D

Matrix: Non-Potable Water Type: Grab

Date: 8/18/22 Time: 1045

- A - Pl 500ml NP, minimal hdspc B - Pl Liter NP C - Pl 500ml H2SO4 D - Pl 250ml NP E - Pl 500ml Lab Filtered F - Vial Amber 40ml H3PO4, minimal hdspc G - Vial Amber 40ml H3PO4, minimal hdspc H - Vial Amber 40ml H3PO4, minimal hdspc

Handwritten signatures and dates for Relinquished By, Received By, and Received at Laboratory By.

Table with fields: Sample Kit Prepared By, Date/Time, Sample Temp (°C), Samples on Ice?, Approved By, Entered By.

**M.J. Reider Associates, Inc.**

**MJRA Terms & Conditions**

All samples submitted must be accompanied by signed documentation representing a Chain of Custody (COC). The COC Record acts as a contract between the client and MJRA. Signing the COC form gives approval for MJRA to perform the requested analyses and is an agreement to pay for the cost of such analyses. COC Records must be completed in black or blue indelible ink (must not run when wet). COC documentation begins at the time of sample collection. Client is required to document all sample details prior to releasing samples to MJRA. All samples must be placed on ice immediately after sampling and shipped or delivered to the laboratory in a manner that will maintain the sample temperature above freezing and below 6C (loose ice is preferred).

**Sample Submission, Sample Acceptance & Sampling Containers**

Included on the COC must be the sample description, date and time of collection (including start and stop for composites), container size and type, preservative information, sample matrix, indication of whether the sample is a grab or composite, number of containers & a list of the tests to be performed. Poor sample collection technique, inappropriate sampling containers and/or improper sample preservation may lead to sample rejection. Suitable sample containers, labels, and preservatives (as applicable), along with blank COCs are provided at no additional cost.

**Turnaround Times (TAT)**

Average TAT for test results range from 5 to 15 working days depending on the specific analyses and time of year submitted. Faster turnaround times (\*RUSH TAT) may be available depending on the current workload in a particular department and the nature of the analyses requested. We encourage you to verify requests for expedited sample results with one of our Technical Directors prior to sample submittal. Without confirmation from a Technical Director, your results may not be completed by your deadline. \*RUSH TAT Surcharges are applied for expedited turnaround times.

**Analytical Results, Sample Collection Integrity & Subcontracting**

Analytical values are for the sample as submitted and relate only to the item tested. The value indicates a snapshot of the constituent content of the sample at the time of sample collection. Analytical results can be impacted by poor sample collection technique and/or improper preservation. All sample collection completed by MJRA was performed in accordance with applicable regulatory protocols or as specified in customer specific sampling plans. Constituent content will vary over time based on the matrix of the sample and the physical and chemical changes to its environment. All sample results and laboratory reports are strictly confidential. Results will not be available to anyone except the primary client or authorized party representing the client unless MJRA receives additional permissions from the client. When necessary, MJRA will subcontract certain analyses to a third party accredited laboratory. If client prohibits subcontracting, it must be provided in writing and include instruction on how to proceed with client samples that require third party analyses.

**Payment Terms**

Payment Terms are Net 30 days. Prices are subject to change without notice. A standing monthly charge of 1.5% of the clients over-30-day-unpaid balance may be added to the balance after 30 days and each month thereafter (day 31, 61, 91 etc.). The laboratory accepts all major credit cards, ACH transactions, checks and cash. New clients must pay for all services rendered prior to sample collection and/or in some cases report processing. Clients must contact the MJRA accounting department to pursue a credit-based account. MJRA reserves the right to terminate the client's credit account and to refuse to perform additional services on a credit basis if any balance is outstanding for more than 60 days.

**Warranty & Litigation**

MJRA does not guarantee any results of its services but has agreed to use its best efforts, in accordance with the standards and practices of the industry, to cause such results to be accurate and complete. We disclaim any other warranties, expressed or implied, including a warranty of fitness for a particular purpose and warranty of merchantability. Clients agree that they shall reimburse MJRA for any and all fees, cost and litigation expenses, including reasonable attorney fees incurred by MJRA in obtaining payment for the services rendered. All costs associated with compliance with any subpoena for documents, testimony, or any other purpose relating to work performed by MJRA, for a client, shall be paid by that client. MJRA's aggregate liability for negligent acts and omissions and of an intentional breach by MJRA will not exceed the fee paid for the services. Client agrees to indemnify and hold MJRA harmless for any and all liabilities in excess of said amount. Neither MJRA nor the client shall be liable to the other for special, incidental consequential or punitive liability or damages included but not limited to those arising from delay, loss of use, loss of profits or revenues. MJRA will not be liable to the client unless the client has notified MJRA of the discovery of the alleged negligent act, error, omissions or breach within 30 days of the day of its discovery and within one year of the date of invoice.

Reviewed and Approved by:



Richard A Wheeler  
Director of Field Services



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# Certificate of Analysis

**M.J. Reider Associates, Inc.**

ENVIRONMENTAL TESTING LABORATORY  
U.S. EPA/PA DEP #06-00003

**Laboratory No.:** 2229485

**Report:** 09/29/22

**Lab Contact:** Richard A Wheeler

**Attention:** David Wertz

**Project:** 2022 - Beltzville Reservoir

**Reported To:** Tetra Tech

USACE, Phila Dist. Env.Resources Branch 100 Penn Square E.  
Arlington, VA 22201

**Lab ID:** 2229485-01

**Collected By:** Client

**Sampled:** 09/15/22 06:50

**Received:** 09/15/22 14:00

**Sample Desc:** BZ-1S

**Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
<b>Dissolved General Chemistry</b>								
Phosphorus as P, Dissolved	0.03	mg/l		0.01	SM 4500-P F	09/21/22	G-23, G-24	SNF
<b>General Chemistry</b>								
Alkalinity, Total to pH 4.5	13	mg CaCO <sub>3</sub> /L		2	SM 2320 B	09/16/22	C-51b	APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1 Rev 2.0	09/26/22	U	SNF
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	09/15/22 16:56		NKH
Nitrate as N	0.83	mg/l	0.18	1.00	EPA 300.0 Rev 2.1	09/16/22 1:25	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	09/16/22 1:25	U	JAF
Nitrate+Nitrite as N	<0.84	mg/l	0.198	1.10	CALCULATED	09/16/22 1:25		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	09/22/22	U	SNF
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	09/26/22		SNF
Solids, Total Dissolved	95	mg/l	4	5	SM 2540 C	09/16/22		TMH
Total Organic Carbon	1.7	mg/l	0.3	0.5	SM 5310 C	09/20/22		HRG
Solids, Total Suspended	<1	mg/l	1	1	SM 2540 D	09/16/22		TMH
<b>Microbiology</b>								
Escherichia coli	11	mpn/100ml	1		SM 9223 B/Quantitray	9/15/22 14:25	9/16/22 11:35	JMW
Total Coliform	2420	mpn/100ml	1		SM 9223 B/Quantitray	9/15/22 14:25	9/16/22 11:35	JMW



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**M.J. Reider Associates, Inc.**

**Lab ID:** 2229485-02      **Collected By:** Client      **Sampled:** 09/15/22 08:00      **Received:** 09/15/22 14:00  
**Sample Desc:** BZ-2S      **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
<b>Dissolved General Chemistry</b>								
Phosphorus as P, Dissolved	0.03	mg/l		0.01	SM 4500-P F	09/21/22	G-23, G-24	SNF
<b>General Chemistry</b>								
Alkalinity, Total to pH 4.5	15	mg CaCO <sub>3</sub> /L		2	SM 2320 B	09/16/22	C-51g	APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1 Rev 2.0	09/26/22	U	SNF
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	09/15/22 16:57		NKH
Nitrate as N	0.51	mg/l	0.18	1.00	EPA 300.0 Rev 2.1	09/15/22 21:44	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	09/15/22 21:44	U	JAF
Nitrate+Nitrite as N	<0.52	mg/l	0.198	1.10	CALCULATED	09/15/22 21:44		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	09/22/22	U	SNF
Phosphorus as P, Total	0.02	mg/l	0.01	0.01	SM 4500-P F	09/26/22		SNF
Solids, Total Dissolved	99	mg/l	4	5	SM 2540 C	09/16/22		TMH
Total Organic Carbon	1.4	mg/l	0.3	0.5	SM 5310 C	09/20/22		HRG
Solids, Total Suspended	1	mg/l	1	1	SM 2540 D	09/16/22		TMH
<b>Microbiology</b>								
Escherichia coli	105	mpn/100ml	1		SM 9223 B/Quantitray	9/15/22 14:25	9/16/22 11:35	JMW
Total Coliform	>2420	mpn/100ml	1		SM 9223 B/Quantitray	9/15/22 14:25	9/16/22 11:35	JMW



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**M.J. Reider Associates, Inc.**

**Lab ID:** 2229485-03      **Collected By:** Client      **Sampled:** 09/15/22 09:45      **Received:** 09/15/22 14:00  
**Sample Desc:** BZ-3S      **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
<b>Dissolved General Chemistry</b>								
Phosphorus as P, Dissolved	0.03	mg/l		0.01	SM 4500-P F	09/21/22	G-23, G-24	SNF
<b>General Chemistry</b>								
Alkalinity, Total to pH 4.5	12	mg CaCO <sub>3</sub> /L		2	SM 2320 B	09/16/22	C-51a	APR
Ammonia as N	0.03	mg/l	0.02	0.02	EPA 350.1 Rev 2.0	09/26/22		SNF
Biochemical Oxygen Demand	2.5	mg/l	2.0	2.0	SM 5210 B	09/16/22 10:37		NKH
Nitrate as N	0.45	mg/l	0.18	1.00	EPA 300.0 Rev 2.1	09/16/22 0:51	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	09/16/22 0:51	U	JAF
Nitrate+Nitrite as N	<0.46	mg/l	0.198	1.10	CALCULATED	09/16/22 0:51		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	09/22/22	U	SNF
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	09/26/22		SNF
Solids, Total Dissolved	118	mg/l	4	5	SM 2540 C	09/16/22		TMH
Total Organic Carbon	1.7	mg/l	0.3	0.5	SM 5310 C	09/20/22		HRG
Solids, Total Suspended	2	mg/l	1	1	SM 2540 D	09/16/22		TMH
<b>Microbiology</b>								
Escherichia coli	<1	mpn/100ml	1		SM 9223 B/Quantitray	9/15/22 14:25	9/16/22 11:35	JMW
Total Coliform	111	mpn/100ml	1		SM 9223 B/Quantitray	9/15/22 14:25	9/16/22 11:35	JMW



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**M.J. Reider Associates, Inc.**

**Lab ID:** 2229485-04      **Collected By:** Client      **Sampled:** 09/15/22 09:45      **Received:** 09/15/22 14:00  
**Sample Desc:** BZ-3M      **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
<b>Dissolved General Chemistry</b>								
Phosphorus as P, Dissolved	0.02	mg/l		0.01	SM 4500-P F	09/21/22	G-23, G-24	SNF
<b>General Chemistry</b>								
Alkalinity, Total to pH 4.5	13	mg CaCO <sub>3</sub> /L		2	SM 2320 B	09/16/22	C-51e	APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1 Rev 2.0	09/26/22	U	SNF
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	09/15/22 16:56		NKH
Nitrate as N	0.91	mg/l	0.18	1.00	EPA 300.0 Rev 2.1	09/15/22 22:17	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	09/15/22 22:17	U	JAF
Nitrate+Nitrite as N	<0.92	mg/l	0.198	1.10	CALCULATED	09/15/22 22:17		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	09/22/22	U	SNF
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	09/26/22		SNF
Solids, Total Dissolved	115	mg/l	4	5	SM 2540 C	09/16/22		TMH
Total Organic Carbon	1.7	mg/l	0.3	0.5	SM 5310 C	09/20/22		HRG
Solids, Total Suspended	<1	mg/l	1	1	SM 2540 D	09/16/22		TMH

**Lab ID:** 2229485-05      **Collected By:** Client      **Sampled:** 09/15/22 09:45      **Received:** 09/15/22 14:00  
**Sample Desc:** BZ-3D      **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
<b>Dissolved General Chemistry</b>								
Phosphorus as P, Dissolved	0.03	mg/l		0.01	SM 4500-P F	09/21/22	G-23, G-24	SNF
<b>General Chemistry</b>								
Alkalinity, Total to pH 4.5	13	mg CaCO <sub>3</sub> /L		2	SM 2320 B	09/16/22	C-51c	APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1 Rev 2.0	09/26/22	U	SNF
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	09/15/22 16:57		NKH
Nitrate as N	0.82	mg/l	0.18	1.00	EPA 300.0 Rev 2.1	09/15/22 23:42	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	09/15/22 23:42	U	JAF
Nitrate+Nitrite as N	<0.83	mg/l	0.198	1.10	CALCULATED	09/15/22 23:42		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	09/22/22	U	SNF
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	09/26/22		SNF
Solids, Total Dissolved	96	mg/l	4	5	SM 2540 C	09/16/22		TMH
Total Organic Carbon	1.4	mg/l	0.3	0.5	SM 5310 C	09/20/22		HRG
Solids, Total Suspended	1	mg/l	1	1	SM 2540 D	09/16/22		TMH



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**M.J. Reider Associates, Inc.**

**Lab ID:** 2229485-06      **Collected By:** Client      **Sampled:** 09/15/22 07:40      **Received:** 09/15/22 14:00  
**Sample Desc:** BZ-4S      **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
<b>Dissolved General Chemistry</b>								
Phosphorus as P, Dissolved	0.05	mg/l		0.01	SM 4500-P F	09/21/22	G-23, G-24	SNF
<b>General Chemistry</b>								
Alkalinity, Total to pH 4.5	7	mg CaCO <sub>3</sub> /L		2	SM 2320 B	09/16/22	C-51k	APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1 Rev 2.0	09/26/22	U	SNF
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	09/15/22 16:57		NKH
Nitrate as N	<0.18	mg/l	0.18	1.00	EPA 300.0 Rev 2.1	09/15/22 22:34	U	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	09/15/22 22:34	U	JAF
Nitrate+Nitrite as N	<0.19	mg/l	0.198	1.10	CALCULATED	09/15/22 22:34		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	09/22/22	U	SNF
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	09/26/22		SNF
Solids, Total Dissolved	61	mg/l	4	5	SM 2540 C	09/16/22		TMH
Total Organic Carbon	1.2	mg/l	0.3	0.5	SM 5310 C	09/20/22		HRG
Solids, Total Suspended	1	mg/l	1	1	SM 2540 D	09/16/22		TMH
<b>Microbiology</b>								
Escherichia coli	2	mpn/100ml	1		SM 9223 B/Quantitray	9/15/22 14:25	9/16/22 11:35	JMW
Total Coliform	1410	mpn/100ml	1		SM 9223 B/Quantitray	9/15/22 14:25	9/16/22 11:35	JMW



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**M.J. Reider Associates, Inc.**

**Lab ID:** 2229485-07      **Collected By:** Client      **Sampled:** 09/15/22 07:20      **Received:** 09/15/22 14:00  
**Sample Desc:** BZ-5S      **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
<b>Dissolved General Chemistry</b>								
Phosphorus as P, Dissolved	0.06	mg/l		0.01	SM 4500-P F	09/21/22	G-23, G-24	SNF
<b>General Chemistry</b>								
Alkalinity, Total to pH 4.5	19	mg CaCO <sub>3</sub> /L		2	SM 2320 B	09/16/22	C-51j	APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1 Rev 2.0	09/26/22	U	SNF
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	09/15/22 16:56		NKH
Nitrate as N	1.46	mg/l	0.18	1.00	EPA 300.0 Rev 2.1	09/16/22 2:00		JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	09/16/22 2:00	U	JAF
Nitrate+Nitrite as N	<1.47	mg/l	0.198	1.10	CALCULATED	09/16/22 2:00		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	09/22/22	U	SNF
Phosphorus as P, Total	0.03	mg/l	0.01	0.01	SM 4500-P F	09/26/22		SNF
Solids, Total Dissolved	115	mg/l	4	5	SM 2540 C	09/16/22		TMH
Total Organic Carbon	2.1	mg/l	0.3	0.5	SM 5310 C	09/20/22		HRG
Solids, Total Suspended	5	mg/l	1	1	SM 2540 D	09/16/22		TMH
<b>Microbiology</b>								
Escherichia coli	345	mpn/100ml	1		SM 9223 B/Quantitray	9/15/22 14:25	9/16/22 11:35	JMW
Total Coliform	>2420	mpn/100ml	1		SM 9223 B/Quantitray	9/15/22 14:25	9/16/22 11:35	JMW



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**M.J. Reider Associates, Inc.**

**Lab ID:** 2229485-08      **Collected By:** Client      **Sampled:** 09/15/22 08:45      **Received:** 09/15/22 14:00  
**Sample Desc:** BZ-6S      **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
<b>Dissolved General Chemistry</b>								
Phosphorus as P, Dissolved	0.04	mg/l		0.01	SM 4500-P F	09/21/22	G-23, G-24	SNF
<b>General Chemistry</b>								
Alkalinity, Total to pH 4.5	13	mg CaCO <sub>3</sub> /L		2	SM 2320 B	09/16/22	C-51b	APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1 Rev 2.0	09/26/22	U	SNF
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	09/15/22 16:56		NKH
Nitrate as N	0.45	mg/l	0.18	1.00	EPA 300.0 Rev 2.1	09/16/22 1:08	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	09/16/22 1:08	U	JAF
Nitrate+Nitrite as N	<0.46	mg/l	0.198	1.10	CALCULATED	09/16/22 1:08		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	09/22/22	U	SNF
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	09/26/22		SNF
Solids, Total Dissolved	96	mg/l	4	5	SM 2540 C	09/16/22		TMH
Total Organic Carbon	1.6	mg/l	0.3	0.5	SM 5310 C	09/20/22		HRG
Solids, Total Suspended	1	mg/l	1	1	SM 2540 D	09/16/22		TMH
<b>Microbiology</b>								
Escherichia coli	4	mpn/100ml	1		SM 9223 B/Quantitray	9/15/22 14:25	9/16/22 11:35	JMW
Total Coliform	161	mpn/100ml	1		SM 9223 B/Quantitray	9/15/22 14:25	9/16/22 11:35	JMW



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**M.J. Reider Associates, Inc.**

**Lab ID:** 2229485-09      **Collected By:** Client      **Sampled:** 09/15/22 08:45      **Received:** 09/15/22 14:00  
**Sample Desc:** BZ-6M      **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
<b>Dissolved General Chemistry</b>								
Phosphorus as P, Dissolved	0.04	mg/l		0.01	SM 4500-P F	09/21/22	G-23, G-24	SNF
<b>General Chemistry</b>								
Alkalinity, Total to pH 4.5	13	mg CaCO <sub>3</sub> /L		2	SM 2320 B	09/16/22	C-51d	APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1 Rev 2.0	09/26/22	U	SNF
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	09/15/22 16:56		NKH
Nitrate as N	0.87	mg/l	0.18	1.00	EPA 300.0 Rev 2.1	09/15/22 22:01	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	09/15/22 22:01	U	JAF
Nitrate+Nitrite as N	<0.88	mg/l	0.198	1.10	CALCULATED	09/15/22 22:01		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	09/22/22	U	SNF
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	09/26/22		SNF
Solids, Total Dissolved	98	mg/l	4	5	SM 2540 C	09/16/22		TMH
Total Organic Carbon	1.4	mg/l	0.3	0.5	SM 5310 C	09/20/22		HRG
Solids, Total Suspended	2	mg/l	1	1	SM 2540 D	09/16/22		TMH

**Lab ID:** 2229485-10      **Collected By:** Client      **Sampled:** 09/15/22 08:45      **Received:** 09/15/22 14:00  
**Sample Desc:** BZ-6D      **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
<b>Dissolved General Chemistry</b>								
Phosphorus as P, Dissolved	0.05	mg/l		0.01	SM 4500-P F	09/21/22	G-23, G-24	SNF
<b>General Chemistry</b>								
Alkalinity, Total to pH 4.5	15	mg CaCO <sub>3</sub> /L		2	SM 2320 B	09/16/22	C-51i	APR
Ammonia as N	0.11	mg/l	0.02	0.02	EPA 350.1 Rev 2.0	09/26/22		SNF
Biochemical Oxygen Demand	2.1	mg/l	2.0	2.0	SM 5210 B	09/15/22 16:57		NKH
Nitrate as N	0.78	mg/l	0.18	1.00	EPA 300.0 Rev 2.1	09/15/22 23:25	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	09/15/22 23:25	U	JAF
Nitrate+Nitrite as N	<0.79	mg/l	0.198	1.10	CALCULATED	09/15/22 23:25		JAF
Nitrogen, Total Kjeldahl (TKN)	1.42	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	09/22/22		SNF
Phosphorus as P, Total	0.13	mg/l	0.01	0.01	SM 4500-P F	09/26/22		SNF
Solids, Total Dissolved	101	mg/l	4	5	SM 2540 C	09/16/22	Q-19	TMH
Total Organic Carbon	2.0	mg/l	0.3	0.5	SM 5310 C	09/20/22		HRG
Solids, Total Suspended	215	mg/l	1	1	SM 2540 D	09/16/22		TMH



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**M.J. Reider Associates, Inc.**

**Lab ID:** 2229485-11      **Collected By:** Client      **Sampled:** 09/15/22 10:45      **Received:** 09/15/22 14:00  
**Sample Desc:** BZ-7S      **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
<b>Dissolved General Chemistry</b>								
Phosphorus as P, Dissolved	0.04	mg/l		0.01	SM 4500-P F	09/21/22	G-23, G-24	SNF
<b>General Chemistry</b>								
Alkalinity, Total to pH 4.5	12	mg CaCO <sub>3</sub> /L		2	SM 2320 B	09/16/22	C-51	APR
Ammonia as N	0.04	mg/l	0.02	0.02	EPA 350.1 Rev 2.0	09/26/22		SNF
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	09/15/22 16:57		NKH
Nitrate as N	0.43	mg/l	0.18	1.00	EPA 300.0 Rev 2.1	09/15/22 23:58	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	09/15/22 23:58	U	JAF
Nitrate+Nitrite as N	<0.44	mg/l	0.198	1.10	CALCULATED	09/15/22 23:58		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	09/22/22	U	SNF
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	09/26/22		SNF
Solids, Total Dissolved	72	mg/l	4	5	SM 2540 C	09/16/22		TMH
Total Organic Carbon	1.6	mg/l	0.3	0.5	SM 5310 C	09/20/22		HRG
Solids, Total Suspended	4	mg/l	1	1	SM 2540 D	09/16/22		TMH
<b>Microbiology</b>								
Escherichia coli	1	mpn/100ml	1		SM 9223 B/Quantitray	9/15/22 14:25	9/16/22 11:35	JMW
Total Coliform	579	mpn/100ml	1		SM 9223 B/Quantitray	9/15/22 14:25	9/16/22 11:35	JMW



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**M.J. Reider Associates, Inc.**

**Lab ID:** 2229485-12      **Collected By:** Client      **Sampled:** 09/15/22 10:45      **Received:** 09/15/22 14:00  
**Sample Desc:** BZ-7M      **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
<b>Dissolved General Chemistry</b>								
Phosphorus as P, Dissolved	0.04	mg/l		0.01	SM 4500-P F	09/21/22	G-23, G-24	SNF
<b>General Chemistry</b>								
Alkalinity, Total to pH 4.5	15	mg CaCO <sub>3</sub> /L		2	SM 2320 B	09/16/22	C-51f	APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1 Rev 2.0	09/26/22	U	SNF
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	09/15/22 16:56		NKH
Nitrate as N	0.80	mg/l	0.18	1.00	EPA 300.0 Rev 2.1	09/16/22 2:17	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	09/16/22 2:17	U	JAF
Nitrate+Nitrite as N	<0.81	mg/l	0.198	1.10	CALCULATED	09/16/22 2:17		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	09/22/22	U	SNF
Phosphorus as P, Total	0.01	mg/l	0.01	0.01	SM 4500-P F	09/26/22		SNF
Solids, Total Dissolved	90	mg/l	4	5	SM 2540 C	09/16/22		TMH
Total Organic Carbon	2.5	mg/l	0.3	0.5	SM 5310 C	09/20/22		HRG
Solids, Total Suspended	1	mg/l	1	1	SM 2540 D	09/16/22		TMH

**Lab ID:** 2229485-13      **Collected By:** Client      **Sampled:** 09/15/22 10:45      **Received:** 09/15/22 14:00  
**Sample Desc:** BZ-7D      **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
<b>Dissolved General Chemistry</b>								
Phosphorus as P, Dissolved	0.02	mg/l		0.01	SM 4500-P F	09/24/22	G-23, G-24	MRW
<b>General Chemistry</b>								
Alkalinity, Total to pH 4.5	15	mg CaCO <sub>3</sub> /L		2	SM 2320 B	09/16/22	C-51h	APR
Ammonia as N	0.04	mg/l	0.02	0.02	EPA 350.1 Rev 2.0	09/26/22		SNF
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	09/15/22 16:56		NKH
Nitrate as N	0.79	mg/l	0.18	1.00	EPA 300.0 Rev 2.1	09/16/22 1:43	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	09/16/22 1:43	U	JAF
Nitrate+Nitrite as N	<0.80	mg/l	0.198	1.10	CALCULATED	09/16/22 1:43		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	09/22/22	U	SNF
Phosphorus as P, Total	0.02	mg/l	0.01	0.01	SM 4500-P F	09/26/22		SNF
Solids, Total Dissolved	83	mg/l	4	5	SM 2540 C	09/16/22		TMH
Total Organic Carbon	1.6	mg/l	0.3	0.5	SM 5310 C	09/20/22		HRG
Solids, Total Suspended	2	mg/l	1	1	SM 2540 D	09/16/22		TMH



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Preparation Methods

Specific Method	Preparation Method	Prep Batch	Prepared Date	Prepared By
<b>2229485-01</b>				
<b>Dissolved General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B2I1154	09/20/2022	SNF
<b>General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B2I1437	09/26/2022	JMW
<b>2229485-02</b>				
<b>Dissolved General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B2I1154	09/20/2022	SNF
<b>General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B2I1437	09/26/2022	JMW
<b>2229485-03</b>				
<b>Dissolved General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B2I1154	09/20/2022	SNF
<b>General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B2I1437	09/26/2022	JMW
<b>2229485-04</b>				
<b>Dissolved General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B2I1154	09/20/2022	SNF
<b>General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B2I1437	09/26/2022	JMW
<b>2229485-05</b>				
<b>Dissolved General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B2I1154	09/20/2022	SNF
<b>General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B2I1437	09/26/2022	JMW
<b>2229485-06</b>				
<b>Dissolved General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B2I1154	09/20/2022	SNF
<b>General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B2I1437	09/26/2022	JMW
<b>2229485-07</b>				
<b>Dissolved General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B2I1154	09/20/2022	SNF
<b>General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B2I1437	09/26/2022	JMW
<b>2229485-08</b>				
<b>Dissolved General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B2I1154	09/20/2022	SNF
<b>General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B2I1437	09/26/2022	JMW
<b>2229485-09</b>				



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**Dissolved General Chemistry**

SM 4500-P F SM 4500-P B B2I1154 09/20/2022 SNF

**General Chemistry**

SM 4500-P F SM 4500-P B B2I1437 09/26/2022 JMW

**2229485-10**

**Dissolved General Chemistry**

SM 4500-P F SM 4500-P B B2I1154 09/20/2022 SNF

**General Chemistry**

SM 4500-P F SM 4500-P B B2I1437 09/26/2022 JMW

**2229485-11**

**Dissolved General Chemistry**

SM 4500-P F SM 4500-P B B2I1154 09/20/2022 SNF

**General Chemistry**

SM 4500-P F SM 4500-P B B2I1437 09/26/2022 JMW

**2229485-12**

**Dissolved General Chemistry**

SM 4500-P F SM 4500-P B B2I1154 09/20/2022 SNF

**General Chemistry**

SM 4500-P F SM 4500-P B B2I1437 09/26/2022 JMW

**2229485-13**

**Dissolved General Chemistry**

SM 4500-P F SM 4500-P B B2I1399 09/23/2022 MRW

**General Chemistry**

SM 4500-P F SM 4500-P B B2I1437 09/26/2022 JMW

**Notes and Definitions**

- C-51 The alkalinity to pH 4.2 = 11.7 mg CaCO<sub>3</sub>/L.
- C-51a The alkalinity to pH 4.2 = 11.9 mg CaCO<sub>3</sub>/L.
- C-51b The alkalinity to pH 4.2 = 12.7 mg CaCO<sub>3</sub>/L.
- C-51c The alkalinity to pH 4.2 = 12.8 mg CaCO<sub>3</sub>/L.
- C-51d The alkalinity to pH 4.2 = 12.9 mg CaCO<sub>3</sub>/L.
- C-51e The alkalinity to pH 4.2 = 13.3 mg CaCO<sub>3</sub>/L.
- C-51f The alkalinity to pH 4.2 = 14.7 mg CaCO<sub>3</sub>/L.
- C-51g The alkalinity to pH 4.2 = 14.8 mg CaCO<sub>3</sub>/L.
- C-51h The alkalinity to pH 4.2 = 14.9 mg CaCO<sub>3</sub>/L.
- C-51i The alkalinity to pH 4.2 = 15.0 mg CaCO<sub>3</sub>/L.
- C-51j The alkalinity to pH 4.2 = 18.6 mg CaCO<sub>3</sub>/L.
- C-51k The alkalinity to pH 4.2 = 7.4 mg CaCO<sub>3</sub>/L.
- G-23 The sample was filtered after it was received at the laboratory and outside of the 15-minute hold time.
- G-24 The sample was preserved in the laboratory and outside of the 15-minute hold time.
- J Estimated value
- Q-19 The duplicate RPD was greater than 10% at 17.2%.
- U Analyte was not detected above the indicated value.



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## WORK ORDER Chain of Custody

2229485



Client Code: 3157

Project Manager: Richard A Wheeler

Report To: Tetra Tech - David Wertz - USACE, Phila Dist. Env.Resources Branch 100 Penn Square E., Arlington, VA 22201

Invoice To: Tetra Tech - David Wertz - USACE, Phila Dist. Env.Resources Branch 100 Penn Square E., Arlington, VA 22201

Client: Tetra Tech

Project: 2022 - Beltzville Reservoir

Collected By:  
(Full Name)

*Gregory Wacik*

Comments: \_\_\_\_\_

### 2229485-01 BZ-1S

*JAC* *JAC*  
BOD SM 5210B, EC (#) SM 9223B Confirmation, NO2-N EPA 300.0, NO3-N EPA 300.0, NO2-N, NO3-N, Combined NO3+NO2, PO4-D SM 4500P-F, TC (#) SM 9223B  
Alk SM 2320B, NH3-N EPA 350.1, PO4 SM 4500P-F, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D

Matrix: Non-Potable Water

Type: Grab

Date: 9/15/22  
Time: 0650

- A - PI 500ml NP, minimal hdspc
- B - PI Liter NP
- C - Sterile PI 125ml NaThio
- D - PI 500ml H2SO4
- E - PI 250ml NP
- F - PI 500ml Lab Filtered
- G - Vial Amber 40ml H3PO4, minimal hdspc
- H - Vial Amber 40ml H3PO4, minimal hdspc
- I - Vial Amber 40ml H3PO4, minimal hdspc

### 2229485-02 BZ-2S

*km* *JAC* *JAC*  
EC (#) SM 9223B Confirmation, BOD SM 5210B, NO2-N EPA 300.0, NO3-N EPA 300.0, NO2-N, NO3-N, Combined NO3+NO2, PO4-D SM 4500P-F, TC (#) SM 9223B  
Alk SM 2320B, NH3-N EPA 350.1, PO4 SM 4500P-F, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D

Matrix: Non-Potable Water

Type: Grab

Date: 9/15/22  
Time: 0800

- A - PI 500ml NP, minimal hdspc
- B - PI Liter NP
- C - Sterile PI 125ml NaThio
- D - PI 500ml H2SO4
- E - PI 250ml NP
- F - PI 500ml Lab Filtered
- G - Vial Amber 40ml H3PO4, minimal hdspc
- H - Vial Amber 40ml H3PO4, minimal hdspc
- I - Vial Amber 40ml H3PO4, minimal hdspc

Relinquished By

Date/Time

Relinquished By

Date/Time

Relinquished By

Date/Time

Received By

Date/Time

Received By

Date/Time

Received at Laboratory By

Date/Time

*Benny Nant* 9-15-22 1155  
*Benny Nant* 9-15-22 1400

Sample Kit Prepared By:	Date/Time <b>AUG 01 2022</b>
Sample Temp (°C):	<u>3.8</u>
Samples on Ice?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA
Approved By:	<u>BSW</u>
Entered By:	<u>[Signature]</u>



Client Code: 3157

Client: Tetra Tech

Project Manager: Richard A Wheeler

Project: 2022 - Beltzville Reservoir

Collected By: (Full Name)

Gregory Wacik

Comments:

2229485-03 BZ-3S

PO4-D SM 4500P-F, TC (#) SM 9223B, BOD SM 5210B, EC (#) SM 9223B Confirmation, NO2-N EPA 300.0, NO3-N EPA 300.0, NO2-N, NO3-N, Combined NO3+NO2 Alk SM 2320B, NH3-N EPA 350.1, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, PO4 SM 4500P-F, TSS SM 2540D

Matrix: Non-Potable Water Type: Grab

Date: 9/15/22 Time: 0945

- A - Pl 500ml NP, minimal hdspc B - Pl Liter NP C - Sterile Pl 125ml NaThio D - Pl 500ml H2SO4 E - Pl 250ml NP F - Pl 500ml Lab Filtered G - Vial Amber 40ml H3PO4, minimal hdspc H - Vial Amber 40ml H3PO4, minimal hdspc I - Vial Amber 40ml H3PO4, minimal hdspc

2229485-04 BZ-3M

NO2-N EPA 300.0, NO3-N EPA 300.0, BOD SM 5210B, NO2-N, NO3-N, Combined NO3+NO2, PO4-D SM 4500P-F NH3-N EPA 350.1, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, Alk SM 2320B, PO4 SM 4500P-F, TSS SM 2540D

Matrix: Non-Potable Water Type: Grab

Date: 9/15/22 Time: 0945

- A - Pl 500ml NP, minimal hdspc B - Pl Liter NP C - Pl 500ml H2SO4 D - Pl 250ml NP E - Pl 500ml Lab Filtered F - Vial Amber 40ml H3PO4, minimal hdspc G - Vial Amber 40ml H3PO4, minimal hdspc H - Vial Amber 40ml H3PO4, minimal hdspc

2229485-05 BZ-3D

NO2-N EPA 300.0, NO3-N EPA 300.0, PO4-D SM 4500P-F, BOD SM 5210B, NO2-N, NO3-N, Combined NO3+NO2 NH3-N EPA 350.1, PO4 SM 4500P-F, TDS SM 2540C, Alk SM 2320B, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D

Matrix: Non-Potable Water Type: Grab

Date: 9/15/22 Time: 0945

- A - Pl 500ml NP, minimal hdspc B - Pl Liter NP C - Pl 500ml H2SO4 D - Pl 250ml NP E - Pl 500ml Lab Filtered F - Vial Amber 40ml H3PO4, minimal hdspc G - Vial Amber 40ml H3PO4, minimal hdspc H - Vial Amber 40ml H3PO4, minimal hdspc

Relinquished By: [Signature] Date/Time: 9/15/22 1145

Received By: Benny Nhat Date/Time: 9-15-22 1155

Relinquished By: Date/Time:

Received By: Benny Nhat Date/Time:

Relinquished By: Date/Time:

Received at Laboratory By: Date/Time: 9-15-22 1400

Sample Kit Prepared By: AUG 01 2022 Sample Temp (°C): 3.8 Samples on Ice? [Yes] No NA Approved By: [Signature] Entered By: [Signature]





Client Code: 3157
Project Manager: Richard A Wheeler

Client: Tetra Tech
Project: 2022 - Beltzville Reservoir

Collected By:
(Full Name)

Gregory Daick

Comments:

2229485-06 BZ-4S

BOD SM 5210B, EC (#) SM 9223B Confirmation, NO2-N, NO3-N, Combined NO3+NO2, PO4-D SM 4500P-F, TC (#) SM 9223B, NO2-N EPA 300.0, NO3-N EPA 300.0
Alk SM 2320B, TSS SM 2540D, NH3-N EPA 350.1, TDS SM 2540C, TOC SM 5310C, TKN EPA 351.2, PO4 SM 4500P-F

Matrix: Non-Potable Water
Type: Grab

Date: 9/15/22
Time: 0740

- A - Pl 500ml NP, minimal hdspc
B - Pl Liter NP
C - Sterile Pl 125ml NaThio
D - Pl 500ml H2SO4
E - Pl 250ml NP
F - Pl 500ml Lab Filtered
G - Vial Amber 40ml H3PO4, minimal hdspc
H - Vial Amber 40ml H3PO4, minimal hdspc
I - Vial Amber 40ml H3PO4, minimal hdspc

2229485-07 BZ-5S

BOD SM 5210B, EC (#) SM 9223B Confirmation, NO2-N, NO3-N, Combined NO3+NO2, PO4-D SM 4500P-F, NO2-N EPA 300.0, NO3-N EPA 300.0, TC (#) SM 9223B
Alk SM 2320B, PO4 SM 4500P-F, TOC SM 5310C, TSS SM 2540D, NH3-N EPA 350.1, TDS SM 2540C, TKN EPA 351.2

Matrix: Non-Potable Water
Type: Grab

Date: 9/15/22
Time: 0720

- A - Pl 500ml NP, minimal hdspc
B - Pl Liter NP
C - Sterile Pl 125ml NaThio
D - Pl 500ml H2SO4
E - Pl 250ml NP
F - Pl 500ml Lab Filtered
G - Vial Amber 40ml H3PO4, minimal hdspc
H - Vial Amber 40ml H3PO4, minimal hdspc
I - Vial Amber 40ml H3PO4, minimal hdspc

2229485-08 BZ-6S

NO2-N EPA 300.0, NO3-N EPA 300.0, TC (#) SM 9223B, BOD SM 5210B, EC (#) SM 9223B Confirmation, NO2-N, NO3-N, Combined NO3+NO2, PO4-D SM 4500P-F
Alk SM 2320B, TDS SM 2540C, TKN EPA 351.2, NH3-N EPA 350.1, PO4 SM 4500P-F, TOC SM 5310C, TSS SM 2540D

Matrix: Non-Potable Water
Type: Grab

Date: 9/15/22
Time: 0845

- A - Pl 500ml NP, minimal hdspc
B - Pl Liter NP
C - Sterile Pl 125ml NaThio
D - Pl 500ml H2SO4
E - Pl 250ml NP
F - Pl 500ml Lab Filtered
G - Vial Amber 40ml H3PO4, minimal hdspc
H - Vial Amber 40ml H3PO4, minimal hdspc
I - Vial Amber 40ml H3PO4, minimal hdspc

Relinquished By

Date/Time

Received By

Date/Time

Relinquished By

Date/Time

Received By

Date/Time

Relinquished By

Date/Time

Received at Laboratory By

Date/Time

9/15/22 1145

Benny Nant

9/15/22 1155

Benny Nant

9/15/22 1400

Sample Kit Prepared By: Date/Time AUG 01 2022
Sample Temp (°C): 3.8
Samples on Ice? Yes No NA
Approved By:
Entered By:



M.J. Reider Associates, Inc.

2229485

Client Code: 3157

Client: Tetra Tech

Project Manager: Richard A Wheeler

Project: 2022 - Beltzville Reservoir

Collected By :

Gregory Wacik

(Full Name)

Comments:

2229485-09 BZ-6M

BOD SM 5210B, NO2-N EPA 300.0, NO3-N EPA 300.0, NO2-N, NO3-N, Combined NO3+NO2, PO4-D SM 4500P-F Alk SM 2320B, NH3-N EPA 350.1, TOC SM 5310C, TSS SM 2540D, TDS SM 2540C, TKN EPA 351.2, PO4 SM 4500P-F

Matrix: Non-Potable Water

Type: Grab

Date: 9/15/22

Time: 0845

- A - PI 500ml NP, minimal hdspc
B - PI Liter NP
C - PI 500ml H2SO4
D - PI 250ml NP
E - PI 500ml Lab Filtered
F - Vial Amber 40ml H3PO4, minimal hdspc
G - Vial Amber 40ml H3PO4, minimal hdspc
H - Vial Amber 40ml H3PO4, minimal hdspc

2229485-10 BZ-6D

BOD SM 5210B, NO2-N EPA 300.0, NO3-N EPA 300.0, NO2-N, NO3-N, Combined NO3+NO2, PO4-D SM 4500P-F Alk SM 2320B, NH3-N EPA 350.1, PO4 SM 4500P-F, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D

Matrix: Non-Potable Water

Type: Grab

Date: 9/15/22

Time: 0845

- A - PI 500ml NP, minimal hdspc
B - PI Liter NP
C - PI 500ml H2SO4
D - PI 250ml NP
E - PI 500ml Lab Filtered
F - Vial Amber 40ml H3PO4, minimal hdspc
G - Vial Amber 40ml H3PO4, minimal hdspc
H - Vial Amber 40ml H3PO4, minimal hdspc

2229485-11 BZ-7S

BOD SM 5210B, EC (#) SM 9223B Confirmation, NO2-N EPA 300.0, NO3-N EPA 300.0, NO2-N, NO3-N, Combined NO3+NO2, PO4-D SM 4500P-F, TC (#) SM 9223B Alk SM 2320B, NH3-N EPA 350.1, PO4 SM 4500P-F, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D

Matrix: Non-Potable Water

Type: Grab

Date: 9/15/22

Time: 1045

- A - PI 500ml NP, minimal hdspc
B - PI Liter NP
C - Sterile PI 125ml NaThio
D - PI 500ml H2SO4
E - PI 250ml NP
F - PI 500ml Lab Filtered
G - Vial Amber 40ml H3PO4, minimal hdspc
H - Vial Amber 40ml H3PO4, minimal hdspc
I - Vial Amber 40ml H3PO4, minimal hdspc

Relinquished By

Date/Time

Received By

Date/Time

Relinquished By

Date/Time

Received By

Date/Time

Relinquished By

Date/Time

Received at Laboratory By

Date/Time

The Client, by signing (or having the client's agent sign), agrees to MJRA's Terms and Conditions and to pay for the above requested services including any additional associated fees incurred.

Sample Kit Prepared By: Date/Time AUG 01 2022
Sample Temp (°C): 3.8
Samples on Ice? Yes No NA
Approved By: BSW
Entered By:



Client Code: 3157

Client: Tetra Tech

Project Manager: Richard A Wheeler

Project: 2022 - Beltzville Reservoir

Collected By:

Gregory Wacik

(Full Name)

Comments:

2229485-12 BZ-7M

BOD SM 5210B, NO2-N EPA 300.0, NO3-N EPA 300.0, NO2-N, NO3-N, Combined NO3+NO2, PO4-D SM 4500P-F, Alk SM 2320B, NH3-N EPA 350.1, TDS SM 2540C, TOC SM 5310C, TSS SM 2540D, TKN EPA 351.2, PO4 SM 4500P-F

Matrix: Non-Potable Water

Type: Grab

Date:

9/15/22

Time:

1045

- A - Pl 500ml NP, minimal hdspc
B - Pl Liter NP
C - Pl 500ml H2SO4
D - Pl 250ml NP
E - Pl 500ml Lab Filtered
F - Vial Amber 40ml H3PO4, minimal hdspc
G - Vial Amber 40ml H3PO4, minimal hdspc
H - Vial Amber 40ml H3PO4, minimal hdspc

2229485-13 BZ-7D

PO4-D SM 4500P-F, BOD SM 5210B, NO2-N EPA 300.0, NO3-N EPA 300.0, NO2-N, NO3-N, Combined NO3+NO2, TDS SM 2540C, TOC SM 5310C, Alk SM 2320B, PO4 SM 4500P-F, NH3-N EPA 350.1, TKN EPA 351.2, TSS SM 2540D

Matrix: Non-Potable Water

Type: Grab

Date:

9/15/22

Time:

1045

- A - Pl 500ml NP, minimal hdspc
B - Pl Liter NP
C - Pl 500ml H2SO4
D - Pl 250ml NP
E - Pl 500ml Lab Filtered
F - Vial Amber 40ml H3PO4, minimal hdspc
G - Vial Amber 40ml H3PO4, minimal hdspc
H - Vial Amber 40ml H3PO4, minimal hdspc

Relinquished By

Date/Time

9/15/22 1145

Received By

Date/Time

Benny Math

9-15-22 1155

Relinquished By

Date/Time

Received By

Date/Time

Benny Math

9-15-22 1400

Relinquished By

Date/Time

Received at Laboratory/By

Date/Time

Table with 2 columns: Sample Kit Prepared By, Date/Time; Sample Temp (°C), Samples on Ice?, Approved By, Entered By.

**M.J. Reider Associates, Inc.**

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**MJRA Terms & Conditions**

All samples submitted must be accompanied by signed documentation representing a Chain of Custody (COC). The COC Record acts as a contract between the client and MJRA. Signing the COC form gives approval for MJRA to perform the requested analyses and is an agreement to pay for the cost of such analyses. COC Records must be completed in black or blue indelible ink (must not run when wet). COC documentation begins at the time of sample collection. Client is required to document all sample details prior to releasing samples to MJRA. All samples must be placed on ice immediately after sampling and shipped or delivered to the laboratory in a manner that will maintain the sample temperature above freezing and below 6C (loose ice is preferred).

**Sample Submission, Sample Acceptance & Sampling Containers**

Included on the COC must be the sample description, date and time of collection (including start and stop for composites), container size and type, preservative information, sample matrix, indication of whether the sample is a grab or composite, number of containers & a list of the tests to be performed. Poor sample collection technique, inappropriate sampling containers and/or improper sample preservation may lead to sample rejection. Suitable sample containers, labels, and preservatives (as applicable), along with blank COCs are provided at no additional cost.

**Turnaround Times (TAT)**

Average TAT for test results range from 5 to 15 working days depending on the specific analyses and time of year submitted. Faster turnaround times (\*RUSH TAT) may be available depending on the current workload in a particular department and the nature of the analyses requested. We encourage you to verify requests for expedited sample results with one of our Technical Directors prior to sample submittal. Without confirmation from a Technical Director, your results may not be completed by your deadline. \*RUSH TAT Surcharges are applied for expedited turnaround times.

**Analytical Results, Sample Collection Integrity & Subcontracting**

Analytical values are for the sample as submitted and relate only to the item tested. The value indicates a snapshot of the constituent content of the sample at the time of sample collection. Analytical results can be impacted by poor sample collection technique and/or improper preservation. All sample collection completed by MJRA was performed in accordance with applicable regulatory protocols or as specified in customer specific sampling plans. Constituent content will vary over time based on the matrix of the sample and the physical and chemical changes to its environment. All sample results and laboratory reports are strictly confidential. Results will not be available to anyone except the primary client or authorized party representing the client unless MJRA receives additional permissions from the client. When necessary, MJRA will subcontract certain analyses to a third party accredited laboratory. If client prohibits subcontracting, it must be provided in writing and include instruction on how to proceed with client samples that require third party analyses.

**Payment Terms**

Payment Terms are Net 30 days. Prices are subject to change without notice. A standing monthly charge of 1.5% of the clients over-30-day-unpaid balance may be added to the balance after 30 days and each month thereafter (day 31, 61, 91 etc.). The laboratory accepts all major credit cards, ACH transactions, checks and cash. New clients must pay for all services rendered prior to sample collection and/or in some cases report processing. Clients must contact the MJRA accounting department to pursue a credit-based account. MJRA reserves the right to terminate the client's credit account and to refuse to perform additional services on a credit basis if any balance is outstanding for more than 60 days.

**Warranty & Litigation**

MJRA does not guarantee any results of its services but has agreed to use its best efforts, in accordance with the standards and practices of the industry, to cause such results to be accurate and complete. We disclaim any other warranties, expressed or implied, including a warranty of fitness for a particular purpose and warranty of merchantability. Clients agree that they shall reimburse MJRA for any and all fees, cost and litigation expenses, including reasonable attorney fees incurred by MJRA in obtaining payment for the services rendered. All costs associated with compliance with any subpoena for documents, testimony, or any other purpose relating to work performed by MJRA, for a client, shall be paid by that client. MJRA's aggregate liability for negligent acts and omissions and of an intentional breach by MJRA will not exceed the fee paid for the services. Client agrees to indemnify and hold MJRA harmless for any and all liabilities in excess of said amount. Neither MJRA nor the client shall be liable to the other for special, incidental consequential or punitive liability or damages included but not limited to those arising from delay, loss of use, loss of profits or revenues. MJRA will not be liable to the client unless the client has notified MJRA of the discovery of the alleged negligent act, error, omissions or breach within 30 days of the day of its discovery and within one year of the date of invoice.

Reviewed and Approved by:



Richard A Wheeler  
Director of Field Services



107 Angelica Street ○ Reading, PA 19611 ○ [www.mjreider.com](http://www.mjreider.com) ○ (610) 374-5129 ○ fax (610) 374-7234

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NELAP accredited by PA. (PADEP #06-00003) Visit our website to view our current  
NELAC accreditations for various drinking water, wastewater and solid & chemical materials analytes.  
Additional accreditations by MD (261), NY(12094)