

**2021 WATER QUALITY MONITORING  
F.E. WALTER RESERVOIR  
WHITE HAVEN, PENNSYLVANIA**



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

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**2021 Water Quality Monitoring  
F.E. Walter Reservoir  
White Haven, Pennsylvania**

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## **F.E. Walter Reservoir**

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# 2021 Water Quality Monitoring

## F.E. Walter Reservoir

### White Haven, Pennsylvania

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## **1.0 INTRODUCTION**

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

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

### **1.2 PURPOSE OF THE MONITORING PROGRAM**

Foremost, F.E. Walter Reservoir provides flood control to downstream communities on the Lehigh River. Additionally, the reservoir provides important habitat for fish, waterfowl, and other wildlife, and recreational opportunities through fishing and boating both within the lake and downstream. Drinking water intakes exist at various locations on the Lehigh River downstream of the dam. Due to the broad range of uses and demands F.E. Walter Reservoir serves, the USACE monitors water quality and other aspects related to reservoir health primarily to ensure public health safety and protection of the environment. Water quality monitoring results are compared to state 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 F.E. Walter Reservoir and its tributaries from May through August 2021.

### **1.3 ELEMENTS OF THE STUDY**

The USACE, Philadelphia District, has been monitoring the water quality of F.E. Walter Reservoir since 1975. Over this time, yearly monitoring program designs have

evolved to address new areas of concern such as human health aspects of drinking water, sediment contaminants within the reservoir basin, a 2002 investigation of a hydrogen sulfide release near the tail water of the dam, and water quality modeling studies in 2009 and 2013. The 2021 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 August to evaluate compliance with the Pennsylvania state water quality standards and to monitor the overall health of the reservoir.

## 2.0 METHODS

### 2.1 PHYSICAL STRATIFICATION MONITORING

Physical stratification monitoring of the water column of F.E. Walter Reservoir was conducted five times between May and August 2021 at all stations (Table 2-1). Physical stratification parameters included temperature, dissolved oxygen (DO), pH, ORP, Chlorophyll a, depth, turbidity, and conductivity. Monitoring was conducted at seven fixed stations located throughout the reservoir watershed (Fig. 2-1). Surface water quality was monitored at stations downstream (outfall discharge) of the reservoir (WA-1S) and upstream tributary stations on Tobyhanna Creek (WA-3S), the Lehigh River (WA-4S), and Bear Creek (WA-5S). Stratification monitoring was conducted within the reservoir at a reservoir tower station (WA-2), Bear Creek arm of the lake (WA-6), and Lehigh River arm of the lake (WA-7) with water quality measured from the water surface to the bottom at 5-ft intervals. All the water quality monitoring was conducted with a calibrated YSI 6600 V2-4 multi-parameter water quality sonde.

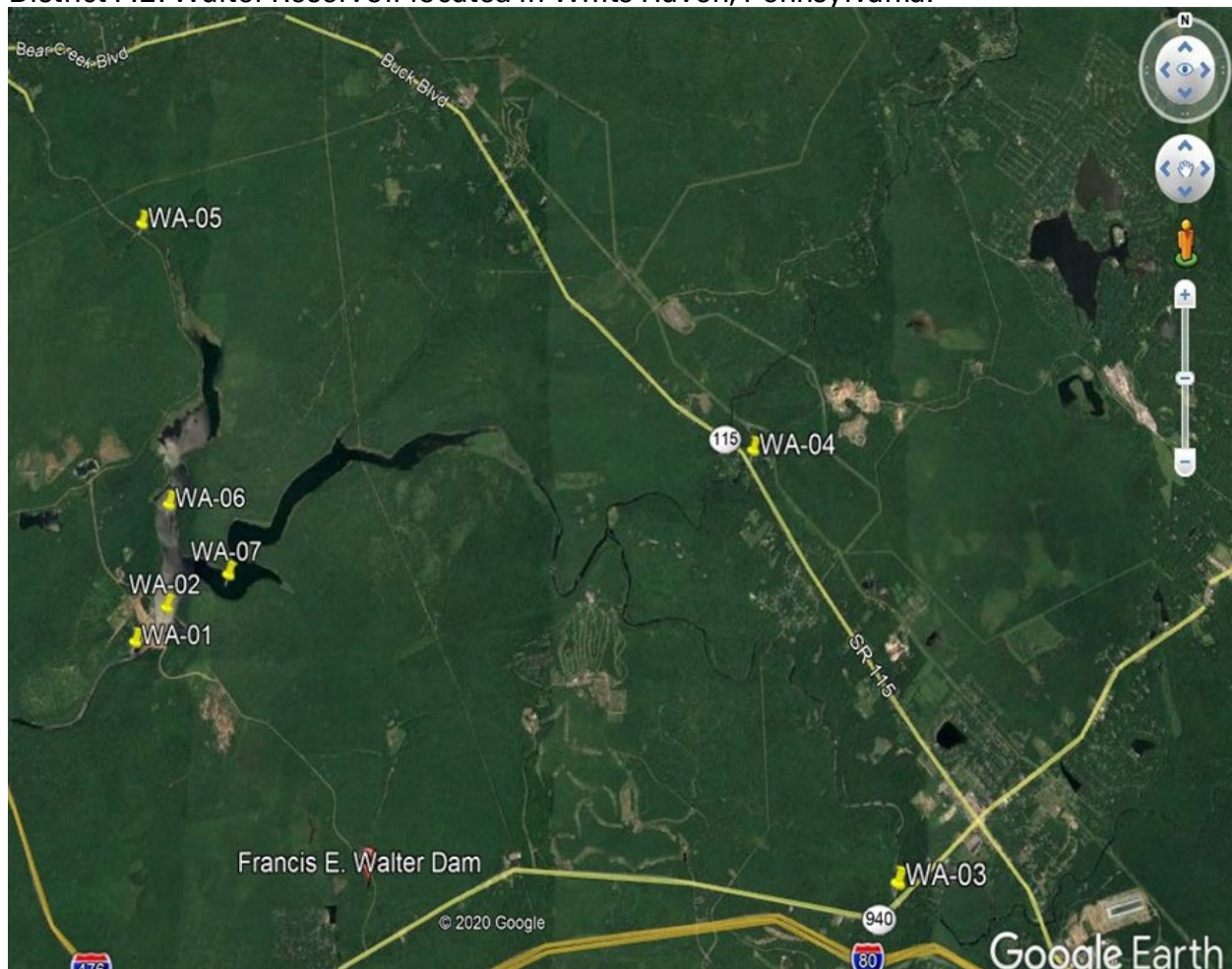
In this report, when applicable, water quality monitoring results were compared to water quality standards mandated by the Pennsylvania Department of Environmental Protection (PADEP Chapter 93). The standard for DO is a minimum concentration of 5 mg/L, and that for pH is an acceptable range from 6 to 9. Temperature criteria are based on seasonal 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 F.E. Walter Reservoir between May and August 2021 (Table 2-1). Water samples were collected at the seven fixed stations throughout the reservoir drainage area (Fig. 2-1). Surface water samples were collected at stations downstream of the reservoir (WA-1S) and upstream on Tobyhanna Creek (WA-3S), the Lehigh River (WA-4S), and Bear Creek (WA-5S). Surface, middle, and bottom water samples were collected at each of the reservoir-body stations WA-2, WA-6, and WA-7. Surface water samples were collected by opening the sample containers approximately 1 foot below the water's surface. Middle and bottom samples were collected with a Van Dorn design water bottle sampler. All samples were placed on ice in a cooler and 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 collected from surface, middle, and bottom depths were analyzed for ammonia, nitrite, nitrate, total Kjeldahl nitrogen (TKN), total phosphorus, soluble phosphorus, total dissolved solids (TDS), total suspended solids (TSS), biochemical oxygen demand (BOD), alkalinity, and total organic carbon (TOC). Table 2-2 summarizes the water quality parameters; laboratory method detection limits, laboratory required reporting limits, state water quality standards, and allowable maximum hold times for each.

**Figure 2-1.** Seven fixed water quality sampling stations at the USACE Philadelphia District F.E. Walter Reservoir located in White Haven, Pennsylvania.



<b>Table 2-1. F.E. Walter Reservoir water quality schedule for 2021 monitoring</b>							
Date of Sample Collection	(3) Physical Stratification Monitoring (All Stations)	Water Column Chemistry Monitoring (All Stations)	Trophic State Determination (WA-2)	Coliform Bacteria Monitoring (All Stations)	(4) Sediment Priority Pollutant Monitoring (WA-2)	(2) Lehigh Temperature Probes	(1) Drinking Water Monitoring
12 May	X	X	X	X	NS	NS	NS
09 June	X	X	X	X	NS	NS	NS
30 June	X	X	X	X	NS	NS	NS
21 July	X	X	X	X	NS	NS	NS
18 August	X	X	X	X	NS	NS	NS
(1) Drinking water samples are sampled quarterly by personnel at each reservoir. (2) Lehigh River temperature probes continuously monitor river temperatures throughout the sampling period. (3) Physical stratification monitoring is conducted at all stations during routine monthly sampling. (4) Sediment Sampling was not conducted in 2021 based on historic sampling results showing low probability of sediment contamination. NS- Not Sampled							

**Table 2-2.** Water quality test methods, detection limits, state regulatory criteria, and sample holding times for water quality parameters monitored at F.E. Walter Reservoir in 2021

Parameter	(2) Method	Laboratory Limit of Reporting	PADEP Surface Water Quality Criteria	Allowable Hold Times (Days)
Total Alkalinity	SM20 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	0.50 mg/L	None	28
Ammonia	ASTM D6919-03	0.10 mg/L	Temp. and pH dependent	28
Nitrate	EPA 300.0 Rev 2.1	1.00 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.

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

\* Total Inorganic Carbon and Total Carbon were not sampled for in 2021

## 2.3 TROPHIC STATE DETERMINATION

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

## 2.4 RESERVOIR BACTERIA MONITORING

Monitoring for coliform bacteria contaminants was conducted five times at each sampling station between May and August 2021 at F.E. Walter Reservoir. Surface water samples were collected in the same manner as for chemical parameter samples and analyzed for total and escherichia coliform contamination as indicators of risk. 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 F.E. Walter Reservoir in 2021. The bacteria analytical method was based on a membrane filtration technique. Laboratory analysis was conducted by M.J. Reider Associates, Inc Environmental Testing Laboratory located in Reading, Pennsylvania (U.S. EPA/PA DEP #06-00003).

Monthly bacteria counts were compared to the EPA primary recreation water quality single sample standard for *Escherichia coli* bacteria. Application of this standard is not directly applicable at F.E. Walter Reservoir because swimming and other primary human/water contact recreation is prohibited in the reservoir. However, it is useful in evaluating the bacteria conditions in the lake and watershed as it relates to secondary contact recreation.

**Table 2-3.** Water quality test methods, detection limits, PADEP standards, and sample holding times for bacteria parameters monitored at F.E. Walter Reservoir in 2021.

Parameter	Total Coliform	Escherichia Coliform
Test method	SM 9223 B	SM 9223 B
Limit of Quantification	1 mpn/100-ml	1 mpn/100-ml
EPA/PADEP standard	None	Geometric mean <126 mpn/100 ml or a single sample reading of <235 mpn/100 ml
Max. allowable holding time	30 hours	30 hours
Achieved holding time	< 30 hours	< 30 hours

## **3.0 RESULTS AND DISCUSSION**

### **3.1 STRATIFICATION MONITORING**

The following sections describe temporal and spatial patterns for the water quality parameters of temperature, dissolved oxygen (DO) and pH measured throughout the F.E. Walter Reservoir and watershed during 2021. Patterns related to season and depths are described for station WA-2 which is located at the operations tower and maintains the greatest water depths in the reservoir. Maximum depths at station WA-2, during five separate sampling days, varied between approximately 110 to 120 feet depending on 2021 reservoir operations (recreation and flood management storage) at the time of sampling. The stratification data collected during the 2021 monitoring is 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 and in conjunction with reduced oxygen solubility can impact many aquatic species. Vertical temperature stratification patterns naturally occurring in lakes affect the distribution of dissolved and suspended compounds.

Temperatures of the tributary surface waters (Stations WA-3S, -4S, and -5S) in the F.E. Walter Reservoir watershed generally followed a similar seasonal pattern throughout the monitoring period. Monthly sampling showed tributary surface water temperatures rising from May into late June and decreasing slightly in July and August (Fig. 3-1). Reservoir downstream release (Station WA-1S) surface water temperatures showed release temperatures cooler than tributary inflow temperatures through late June with release water temperatures slightly exceeding inflow temperatures in July and August. Deep cooler water storage in lake, stored and held in preparation for the recreational season, provides for cooler water recreational and fishery related releases during the early summer recreational season until these cooler waters are exhausted. A maximum inflow temperature of 23.15 °C (WA-4S) was measured in late June with a maximum outflow temperature of 21.92 °C (WA-1S) observed in August. Surface water temperatures of the reservoir-body (Stations WA-2S, -6S, and -7S) were generally warmer than in tributaries and downstream of the dam because of warming from the sun, residence time within the lake, and deep reservoir downstream releases only (no surface water withdrawals). In-lake reservoir surface temperatures peaked in late June at approximately 26.53 °C (Station WA-6S). In 2021, tributary and release water temperatures, at times, exceeded the Pennsylvania state water quality criteria for maintenance of a cold-water fisheries.

The water column of F.E. Walter Reservoir was temperature stratified during the 2021 sampling season (Fig. 3-2). Due to operations in 2021, specifically the raising of the

base pool level and recreational release operations, the temperature stratification within the reservoir is influenced by constant bottom flood control gate releases and occasional flood management storage and recreational releases during the summer season. The reservoir tower was constructed with bottom flood control gates only and does not have the flexibility to withdrawal water from other locations in the water column apart from a small bypass control at elevation 1297 feet. As a result, deeper and typically cooler bottom waters are released first, likely causing a disruption in typical seasonal lake stratification processes and accelerates the depletion of cooler bottom waters captured during spring storage. Overall, reservoir lake temperatures in 2021 showed stratification in June through mid-August. Cooler deep-water temperatures (less than 20°C as a fishery temperature target downstream) were available for release downstream into mid-July of the summer recreational season which is typical for most years under the current operating plan.

### 3.1.2 Dissolved Oxygen

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

In 2021, DO in the tributary surface waters (stations WA-3S, -4S, and -5S) of F.E. Walter Reservoir remained relatively constant and within acceptable freshwater concentrations from May through September with recorded values ranging from 8.26 mg/L to 11.21 mg/L. These values can be attributed to typically well oxygenated stream and river systems and seasonal changes in water temperature. Station WA-1S located downstream of F.E. Walter Reservoir also maintained a similar seasonal pattern with recorded values ranging from 8.30 mg/L to 10.91 mg/L. This can be attributed, in part, to the re-aeration of reservoir bottom waters as it passes through the conduit system of the dam and is released downstream.

The water column of F.E. Walter Reservoir was weakly stratified with respect to DO during most of the sampling season (Fig. 3-4). Unlike sampling in 2020, the reservoir profile did not show the early formation of a metalimnetic dissolved oxygen minimum. As seen in some oxygen versus depth profiles of lakes or reservoirs, concentrations of dissolved oxygen may be depleted in the metalimnion of the lake profile. This depletion is termed a negative heterograde curve or metalimnetic oxygen minimum. Metalimnetic minimums of dissolved oxygen in deep mesotrophic reservoirs are often seen and have been shown to also exist in the US Army Corps of Engineers Philadelphia District's Beltzville Reservoir. This water column profile formation may be a natural occurrence and/or man induced. In the case of F.E. Walter Reservoir, the severity of formation appears influenced by seasonal recreational and flood management operations and

associated pool heights and bottom water release rates. The potential exists for negative impacts on water quality, recreational use, and aquatic species such as fish. The occurrence and severity of this DO formation will be monitored during future sampling efforts.

In all months sampled the DO concentrations remained above state epilimnion DO state criteria (minimum 5 mg/l). The health of aquatic ecosystems can be impaired by low DO concentrations in the water column (<5.0 mg/L). The deeper portions of the reservoir pool experienced these conditions in June, July, and August. August sampling showed that much of the water column was less than 5 mg/L. The lowest DO concentration (2.32 mg/L) was recorded at the bottom of the reservoir during the 21 July sampling event (Fig. 3-4). Hypoxia, or conditions of DO concentrations less than 2 mg/L, is generally accepted as the threshold at which the most severe effects on biota occur. F.E. Walter Reservoir did not experience hypoxic conditions in deeper reservoir waters during the 2021 sampling season. It is believed that bottom water releases associated with the current operating plan helps reduce the severity and formation of low oxygen in the bottom waters of the reservoir pool. Low oxygen reservoir waters are re-aerated as they pass through the conduit system of the reservoir during releases downstream. As a result, water releases from the deeper portions of the reservoir containing lower DO concentration did not negatively impact the DO concentrations of the Lehigh River downstream.

### 3.1.3 pH

PH is the measure of the hydrogen -ion concentration in the water. The pH scale is 0-14 with lower numbers below a pH of 7 considered acidic and higher numbers above a pH of 7 considered 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. The Lehigh River and many of its tributaries are naturally acidic due to tannic acids and the types of geology found throughout the upper watershed.

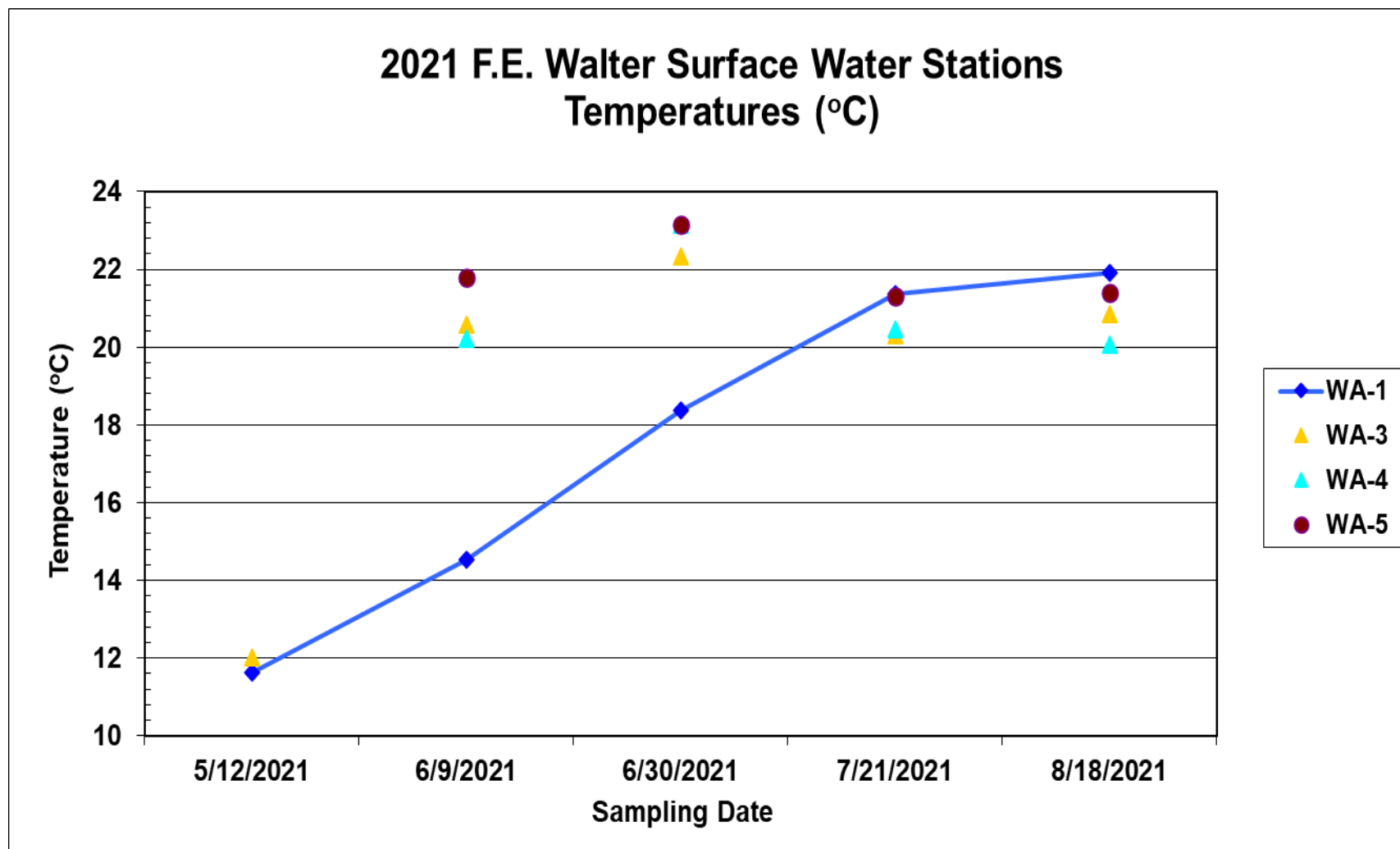
Measures of pH in tributary (WA-3S, -4S, and -5S) surface waters of F.E. Walter Reservoir generally followed a similar pattern during the 2021 sampling season and remained relatively constant or within a narrow range of slightly acidic values (5.63-6.91). The lowest pH value of 5.63 occurred at station WA-5S during the 12 May sampling with the highest pH reading of 6.91 being recorded at Station WA-3S in late June. Measures of pH at the downstream station WA-1S are directly influenced by tributary inflows and bottom water column releases from the reservoir. Readings of pH at this station ranged from a high of 6.44 in July to a low of 6.13 in May (Fig. 3-5).

For the 2021 sampling season, measures of reservoir in-lake pH from the water surface to the lake bottom ranged in values from 5.99 to 7.13 (Fig. 3-6). July sampling showed the lowest pH values in the lower half of the water column. Slightly higher pH values were measured in the surface waters and bottom waters of the lake during all

months sampled. Many factors can influence the pH of the reservoir waters such as geology, wind, acid rain, algal productivity, deep water biological productivity and others. Measures of pH throughout the water column did not remain in compliance with PADEP water quality standards during the month of July. One sample collected on 21 July measured 5.99 units. The water quality standard for pH is a range of acceptable measures between 6 and 9.

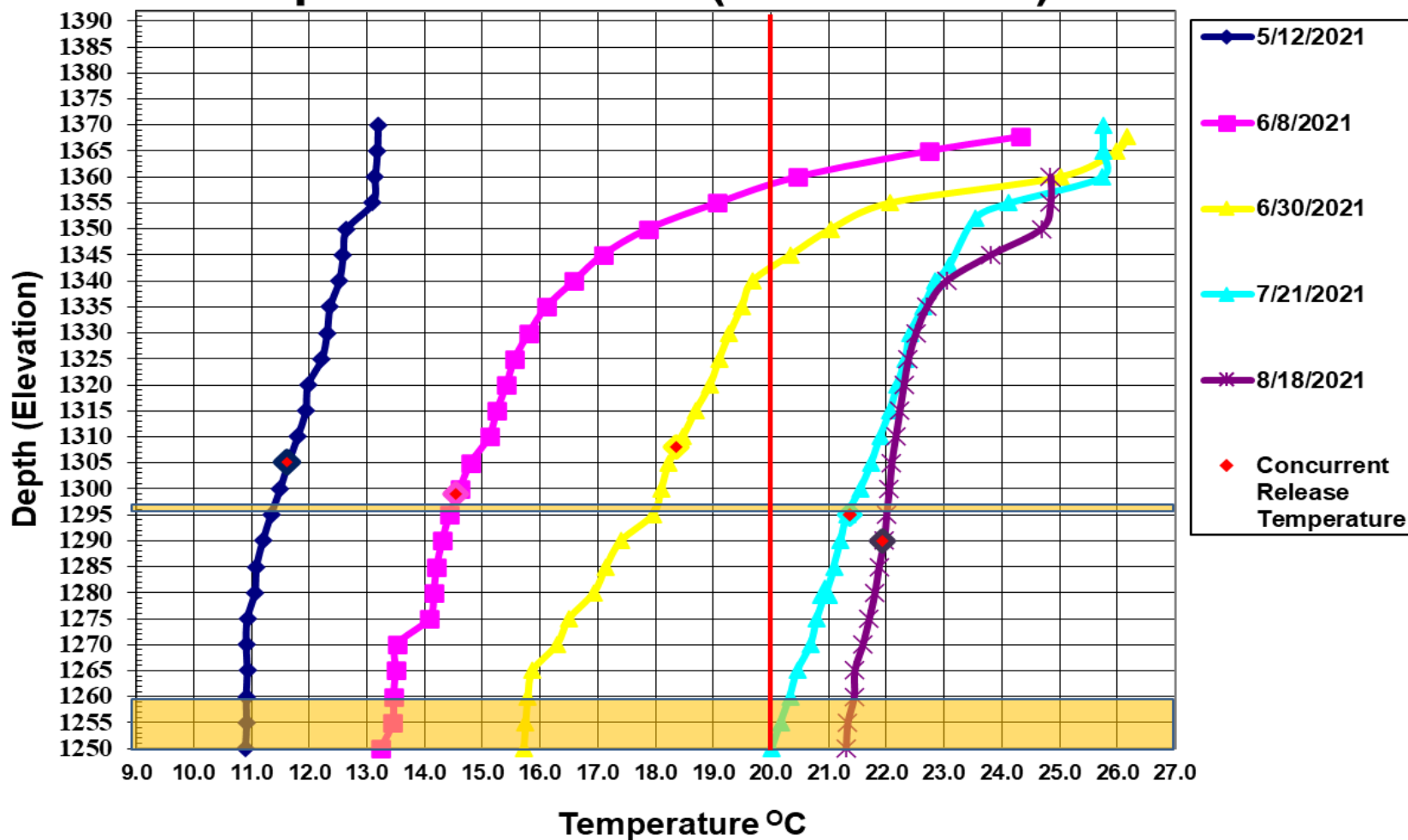
### **3.2 WATER COLUMN CHEMISTRY MONITORING**

Table 3-1 provides a summary of water column chemistry sampling for all stations and dates sampled at F.E. Walter Reservoir in 2021. The following sections describe the temporal, spatial, and depth related patterns for these water quality measures.

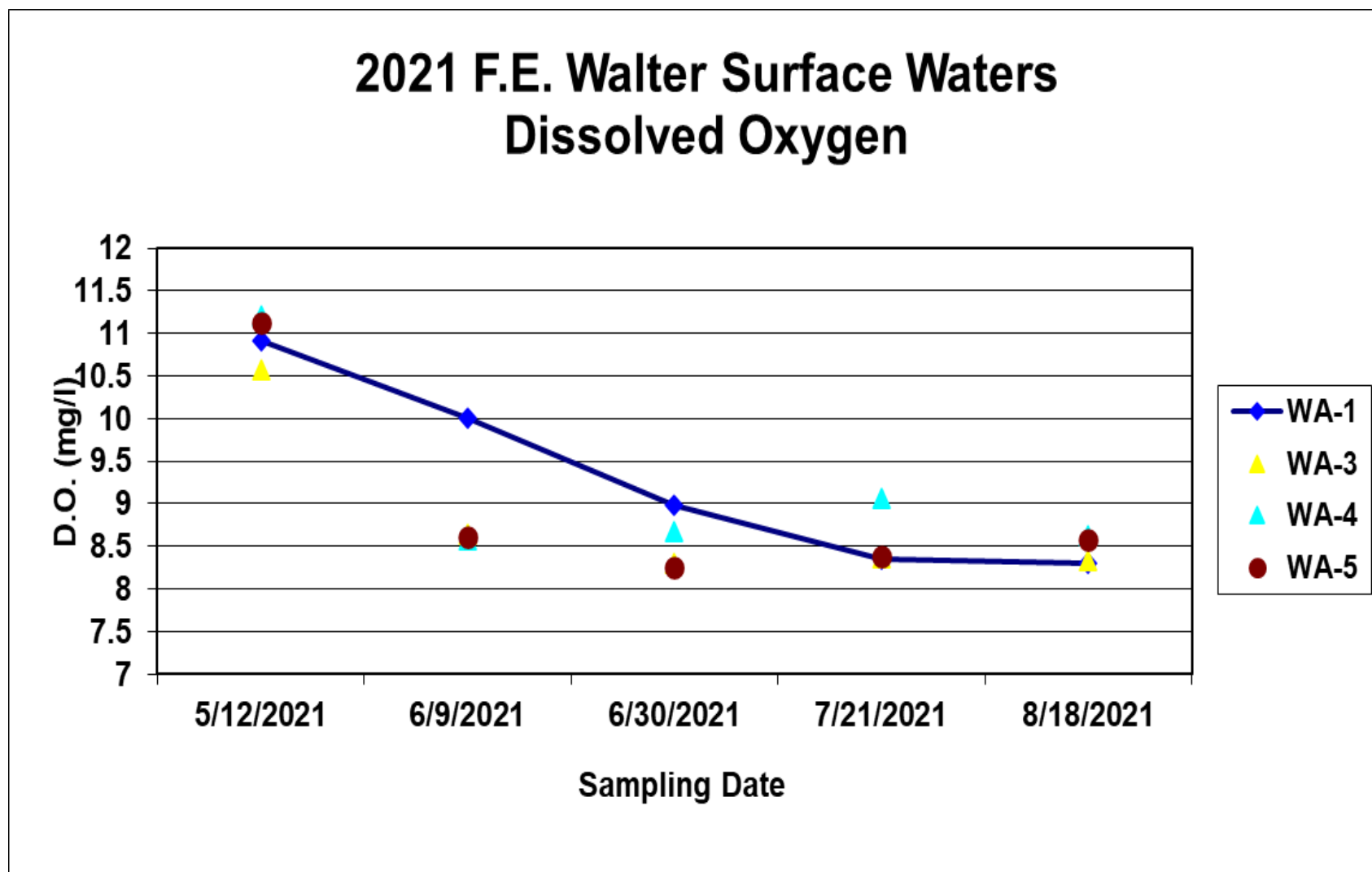


**Figure 3-1.** Temperature measured in tributary and release (WA-1) surface waters of F.E. Walter Reservoir during 2021. See Appendix A for a summary of the plotted values.

## F.E. Walter Reservoir 2021 Seasonal Temperature Profile (WA-2 Tower)

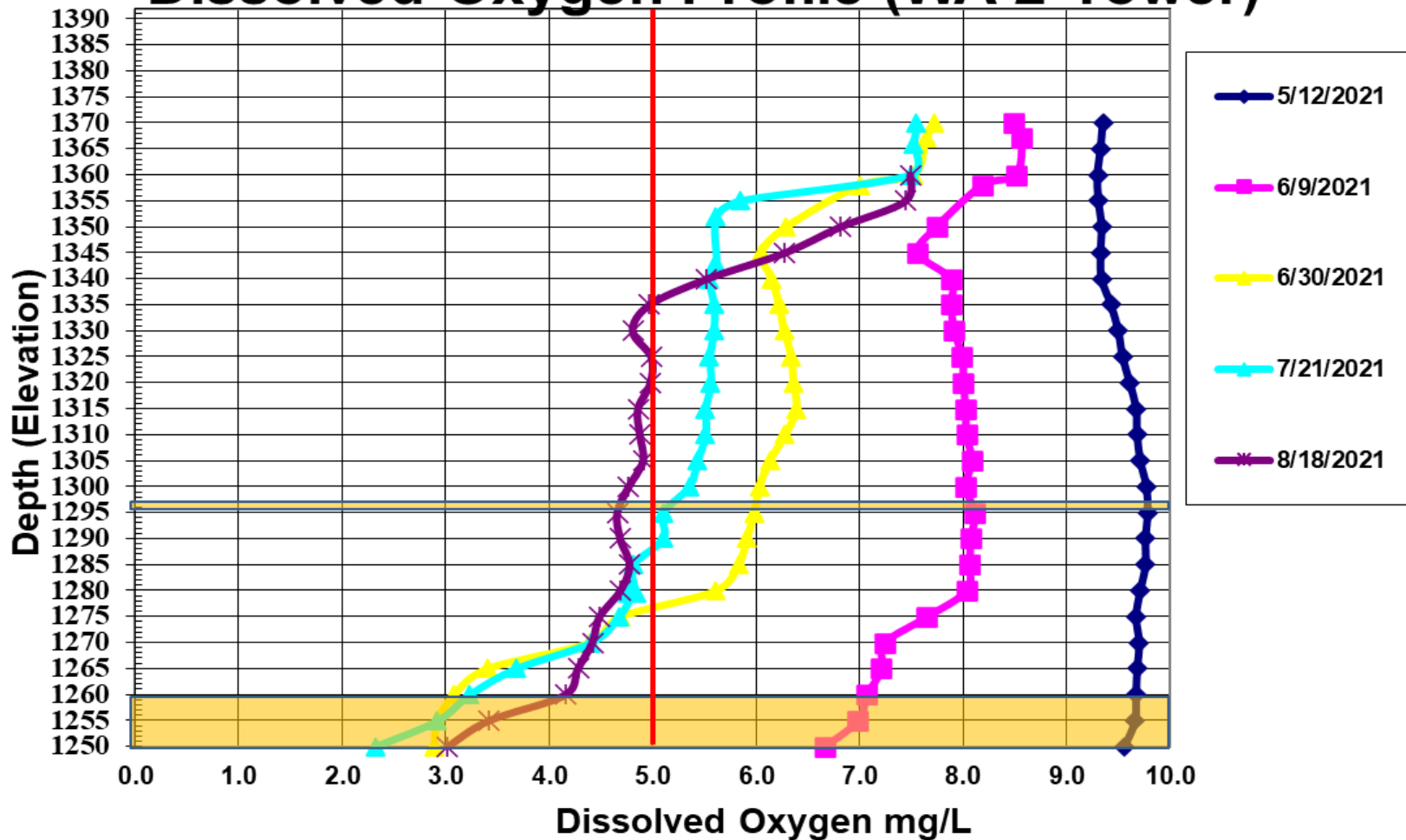


**Figure 3-2.** Stratification of temperature measured in the water column of F. E. Walter Reservoir at station WA-2 during 2021. See Appendix A for a summary of the plotted values. The cold-water species preference temperature of 20°C is shown as a red line reference.

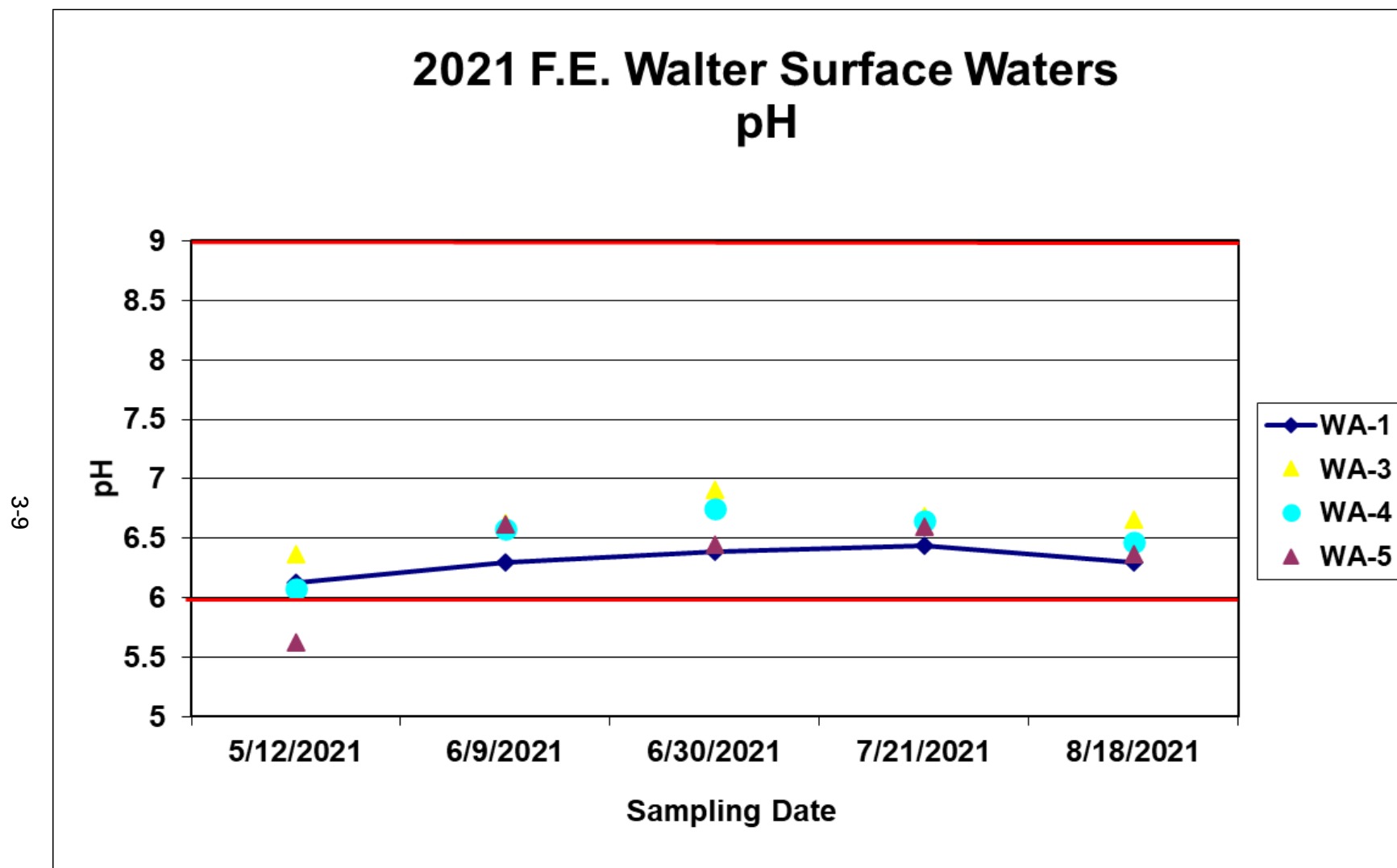


**Figure 3-3.** Dissolved oxygen measured in tributary and release (WA-1) surface waters of F. E. Walter Reservoir during 2021. See Appendix A for a summary of the plotted value.

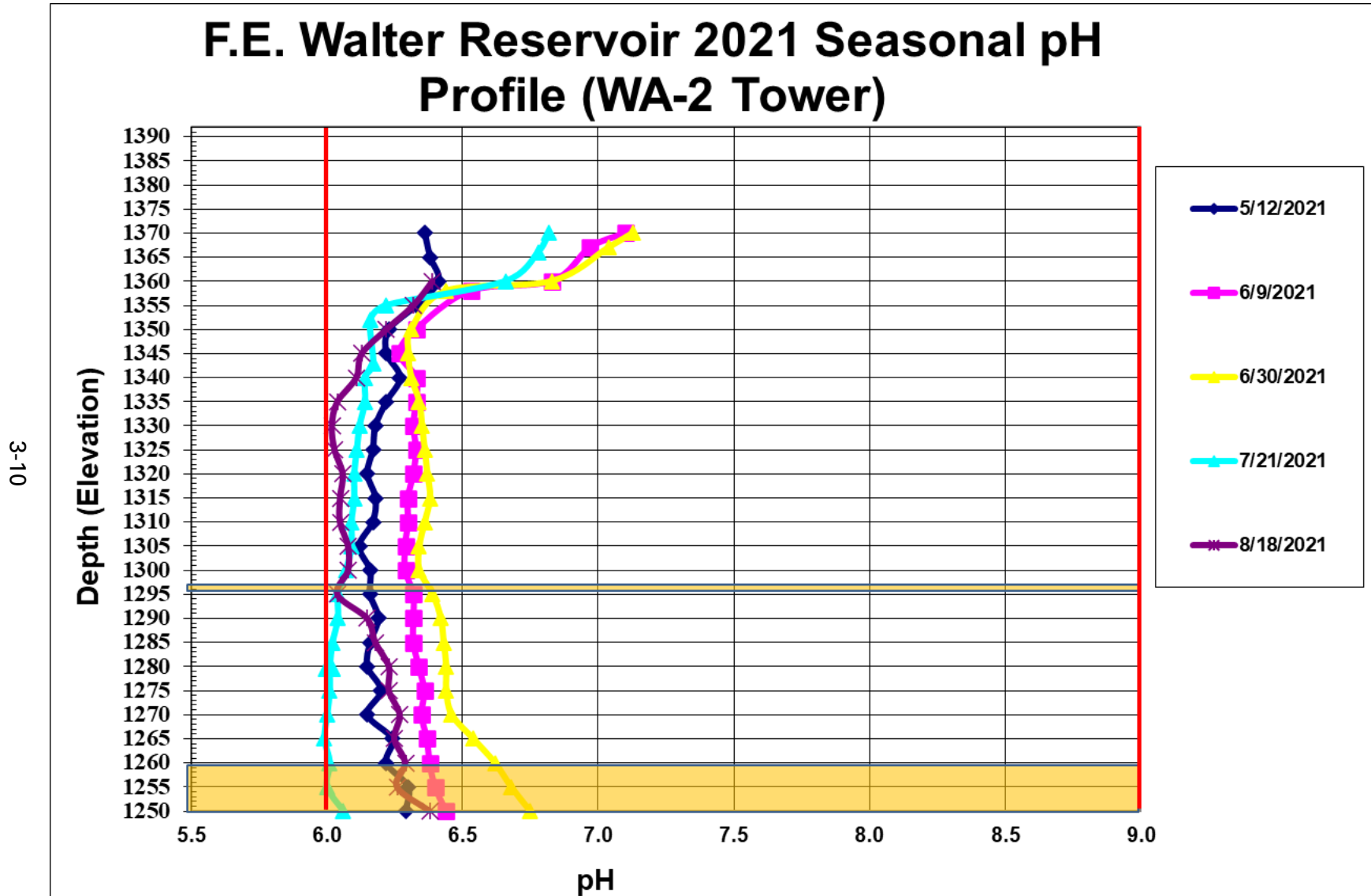
## F.E. Walter Reservoir 2021 Seasonal Dissolved Oxygen Profile (WA-2 Tower)



**Figure 3-4.** Dissolved oxygen measured in the water column of F.E. Walter Reservoir at station WA-2 during 2021. The PADEP WQ standard for DO is an epilimnion minimum concentration of 5 mg/L. See Appendix A for a summary of the plotted values.



**Figure 3-5.** Measures of pH in tributary and release (WA-1) surface waters of F.E. Walter Reservoir during 2021. The PADEP WQ standard for pH is an acceptable range from 6 to 9. See Appendix A for a summary of the plotted values



**Figure 3-6.** Stratification of pH measured in the water column of F.E. Walter Reservoir at station WA-2 during 2021. The PADEP water quality standard pH is an acceptable range from 6 to 9. See Appendix A for a summary of the plotted value.

Table 3-1. Summary of surface, middle, and bottom water quality monitoring data for F.E. Walter Reservoir in 2021

Station	Date	ALK	BOD5	DISS-P	NH3	NO2	NO3	NO2- NO3	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
WA-01S	5/12/2021	6	14.8	<0.05	<0.05	<0.01	0.2	0.21	78	<0.48	5.8	<0.01	<1
	6/9/2021	7	<2.0	0.04	<0.05	<0.01	0.2	0.21	51	<0.48	5.2	<0.01	1
	6/30/2021	8	<2.0	<0.01	<0.05	<0.01	0.25	0.26	54	<0.43	4.9	<0.01	1
	7/21/2021	9	2.3	0.01	<0.05	<0.01	0.26	0.27	60	<0.43	6.7	<0.01	2
	8/18/2021	9	<2.0	0.01	<0.05	<0.01	0.27	0.28	78	<0.43	5.8	0.03	5
	Mean	8	4.6	0.024	0.05	0.01	0.24	0.25	64	0.45	5.7	0.01	2
	Stdev	1	5.7	0.0195	0.00	0	0.03	0.03	13	0.03	0.7	0.01	2
	Max	9	14.8	0.05	0.05	0.01	0.27	0.28	78	0.48	6.7	0.03	5
	Min	6	2	0.01	0.05	0.01	0.2	0.21	51	0.43	4.9	0.01	1
	No. of Det.	5	2	3	0	0	5	5	5	0	5	1	4
WA-02S	5/12/2021	6	<2.0	<0.05	<0.05	<0.01	0.22	0.23	98	<0.48	5.2	<0.01	<1
	6/9/2021	6	<2.0	0.05	<0.05	<0.01	0.18	0.19	54	<0.48	4.6	<0.01	<1
	6/30/2021	7	<2.0	<0.01	<0.05	<0.01	0.2	0.21	44	<0.43	4.9	<0.01	<1
	7/21/2021	8	<2.0	<0.01	<0.05	<0.01	0.23	0.24	61	<0.43	5.0	<0.01	<1
	8/18/2021	8	<2.0	<0.01	<0.05	<0.01	0.23	0.24	61	0.45	5.2	<0.01	5
	Mean	7	2.0	0.03	0.05	0.01	0.212	0.22	64	0.45	5.0	0.01	1.8
	Stdev	1	0.0	0.02	0	0	0.0217	0.02	20	0.03	0.2	0.00	2
	Max	8	2.0	0.05	0.05	0.01	0.23	0.24	98	0.48	5.2	0.01	5
	Min	6	2.0	0.01	0.05	0.01	0.18	0.19	44	0.43	4.6	0.01	1
	No. of Det.	5	0	1	0	0	5	5	5	1	5	0	1

Table 3-1 continued. Summary of surface, middle, and bottom water quality monitoring data for F.E. Walter Reservoir in 2021

Station	Date	ALK	BOD5	DISS-P	NH3	NO2	NO3	NO2-NO3	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
WA-02M	5/12/2021	6	<2.0	<0.05	<0.05	<0.01	0.2	0.21	106	<0.48	6.2	<0.01	<1
	6/9/2021	7	<2.0	<0.01	<0.05	<0.01	0.2	0.21	61	0.61	4.9	0.02	1
	6/30/2021	7	<2.0	<0.01	<0.05	<0.01	0.21	0.22	40	<0.43	4.9	<0.01	<1
	7/21/2021	8	<2.0	0.01	<0.05	<0.01	0.23	0.24	62	<0.43	5.4	<0.01	<1
	8/18/2021	7	<2.0	0.01	<0.05	<0.01	0.27	0.28	67	<0.43	5.4	<0.01	3
	Mean	7	2.0	0.02	0.05	0.01	0.22	0.23	67	0.48	5.36	0.01	1
	Stdev	1	0.0	0.02	0.00	0	0.029	0.03	24	0.08	0.5	0.00	1
	Max	8	2.0	0.05	0.05	0.01	0.27	0.28	106	0.61	6.2	0.02	3
	Min	6	2	0.01	0.05	0.01	0.2	0.21	40	0.43	4.9	0.01	1
	No. of Det.	5	0	2	0	0	5	5	5	1	5	1	2
WA-02D	5/12/2021	6	<2.0	<0.05	<0.05	<0.01	0.2	0.21	85	<0.48	5.8	<0.01	<1
	6/9/2021	8	<2.0	0.02	<0.05	<0.01	0.2	0.21	38	<0.48	5.7	0.04	2
	6/30/2021	7	<2.0	<0.01	<0.05	<0.01	0.22	0.23	69	<0.43	5.6	0.1	<1
	7/21/2021	9	<2.0	0.01	<0.05	<0.01	0.24	0.25	58	<0.43	7.9	<0.01	<1
	8/18/2021	8	<2.0	<0.01	<0.05	<0.01	0.26	0.27	66	<0.43	5.3	<0.01	2
	Mean	8	2.0	0.02	0.05	0.01	0.22	0.23	63	0.45	6.1	0.03	1
	Stdev	1	0.0	0.02	0.00	0	0.03	0.03	17	0.03	1.0	0.04	1
	Max	9	2.0	0.05	0.05	0.01	0.26	0.27	85	0.48	7.9	0.1	2
	Min	6	2	0.01	0.05	0.01	0.2	0.21	38	0.43	5.3	0.01	1
	No. of Det.	5	0	2	0	0	5	5	5	0	5	2	2

Table 3-1 continued. Summary of surface, middle, and bottom water quality monitoring data for F.E. Walter Reservoir in 2021

Station	Date	ALK	BOD5	DISS-P	NH3	NO2	NO3	NO2- NO3	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
WA-03S	5/12/2021	7	<2.0	<0.05	<0.05	<0.01	0.23	0.24	80	<0.48	6.7	<0.01	<1
	6/9/2021	8	4.4	0.01	<0.05	<0.01	0.18	0.19	57	<0.48	8.4	0.03	19
	6/30/2021	10	<2.0	<0.01	<0.05	<0.01	0.22	0.23	77	<0.43	5.1	<0.01	2
	7/21/2021	10	2	0.01	<0.05	<0.01	0.42	0.43	61	<0.43	7.5	<0.01	<1
	8/18/2021	10	<2.0	0.01	<0.05	<0.01	0.49	0.50	98	<0.43	7.0	<0.01	4
	Mean	9	2.5	0.02	0.05	0.01	0.31	0.32	75	0.45	6.9	0.01	5
	Stdev	1	1.1	0	0	0	0.14	0.14	16	0.03	1.2	0.01	8
	Max	10	4.4	0.05	0.05	0.01	0.49	0.5	98	0.48	8.4	0.03	19
	Min	7	2	0.01	0.05	0.01	0.18	0.19	57	0.43	5.1	0.01	1
	No. of Det.	5	2	3	0	0	5	5	5	0	5	1	3
WA-04S	5/12/2021	7	2.2	<0.05	<0.05	<0.01	0.20	0.21	79	<0.48	5.6	0.01	<1
	6/9/2021	10	<2.0	0.01	<0.05	<0.01	0.20	0.21	71	<0.48	7.8	0.01	9
	6/30/2021	11	<2.0	<0.01	<0.05	<0.01	0.30	0.31	61	<0.43	3.9	<0.01	1
	7/21/2021	11	2.0	0.01	<0.05	<0.01	0.23	0.24	59	<0.43	6	<0.01	<1
	8/18/2021	12	<2.0	0.01	<0.05	<0.01	0.31	0.32	77	<0.43	4.3	<0.01	5
	Mean	10	2.0	0.02	0.05	0.01	0.25	0.26	69	0.45	5.5	0.01	3
	Stdev	2	0.1	0.018	0	0	0.054	0.05	9	0.03	1.5	0.00	4
	Max	12	2.2	0.05	0.05	0.01	0.31	0.32	79	0.48	7.8	0.01	9
	Min	7	2	0.01	0.05	0.01	0.2	0.21	59	0.43	3.9	0.01	1
	No. of Det.	5	2	3	0	0	5	5	5	0	5	2	3

Table 3-1 continued. Summary of surface, middle, and bottom water quality monitoring data for F.E. Walter Reservoir in 2021

Station	Date	ALK	BOD5	DISS-P	NH3	NO2	NO3	NO2- NO3	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
WA-05S	5/12/2021	3	<2.0	<0.05	<0.05	<0.01	0.13	0.14	50	<0.48	4.2	<0.01	<1
	6/9/2021	4	<2.0	<0.01	<0.05	<0.01	0.13	0.14	91	<0.48	4.5	<0.01	1
	6/30/2021	5	<2.0	<0.01	<0.05	<0.01	0.20	0.21	56	<0.43	4.0	0.01	<1
	7/21/2021	5	2	0.21	<0.05	<0.01	0.19	0.20	68	<0.43	5.8	0.05	<1
	8/18/2021	5	<2.0	0.01	<0.05	<0.01	0.2	0.21	69	<0.43	4.5	<0.01	3
	Mean	4	2.0	0.06	0.05	0.01	0.17	0.18	67	0.45	4.6	0.02	1
	Stdev	1	0.0	0.09	0	0	0.037	0.04	16	0.03	0.7	0.02	1
	Max	5	2	0.21	0.05	0.01	0.2	0.21	91	0.48	5.8	0.05	3
	Min	3	2	0.01	0.05	0.01	0.13	0.14	50	0.43	4	0.01	1
	No. of Det.	5	1	2	0	0	5	5	5	0	5	2	2
WA-06S	5/12/2021	6	<2.0	<0.05	<0.05	<0.01	0.21	0.22	59	<0.48	5.4	<0.01	<1
	6/9/2021	6	<2.0	<0.01	<0.05	<0.01	0.18	0.19	62	<0.48	4.7	<0.01	<1
	6/30/2021	8	<2.0	<0.01	<0.05	<0.01	0.21	0.22	59	<0.43	4.9	<0.01	<1
	7/21/2021	8	<2.0	<0.01	<0.05	<0.01	0.23	0.24	57	<0.43	5.0	<0.01	<1
	8/18/2021	8	<2.0	<0.01	<0.05	<0.01	0.23	0.24	72	<0.43	5	<0.01	3
	Mean	7	2.0	0.02	0.05	0.01	0.21	0.22	62	0.45	5.0	0.01	1
	Stdev	1	0.0	0.018	0	0	0.021	0.02	6	0.03	0.3	0.00	1
	Max	8	2	0.05	0.05	0.01	0.23	0.24	72	0.48	5.4	0.01	3
	Min	6	2	0.01	0.05	0.01	0.18	0.19	57	0.43	4.7	0.01	1
	No. of Det.	5	0	0	0	0	5	5	5	0	5	0	1

Table 3-1 continued. Summary of surface, middle, and bottom water quality monitoring data for F.E. Walter Reservoir in 2021

Station	Date	ALK	BOD5	DISS-P	NH3	NO2	NO3	NO2- NO3	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
WA-06M	5/12/2021	4	<2.0	<0.05	<0.05	<0.01	0.19	0.20	43	<0.48	4.5	<0.01	<1
	6/9/2021	6	<2.0	<0.01	<0.05	<0.01	0.2	0.21	61	<0.48	4.7	<0.01	<1
	6/30/2021	8	<2.0	<0.01	<0.05	<0.01	0.21	0.22	64	<0.43	4.9	<0.01	1
	7/21/2021	9	<2.0	0.01	<0.05	<0.01	0.24	0.25	68	<0.43	6.7	<0.01	<1
	8/18/2021	7	<2.0	<0.01	<0.05	<0.01	0.25	0.26	69	<0.43	5.0	<0.01	2
	Mean	7	2.0	0.02	0.05	0.01	0.22	0.23	61	0.45	5.2	0.01	1
	Stdev	2	0.0	0.018	0.00	0	0.026	0.03	11	0.03	0.9	0.00	0
	Max	9	2	0.05	0.05	0.01	0.25	0.26	69	0.48	6.7	0.01	2
	Min	4	2	0.01	0.05	0.01	0.19	0.2	43	0.43	4.5	0.01	1
	No. of Det.	5	0	1	0	0	5	5	5	0	5	0	2
WA-06D	5/12/2021	5	<2.0	<0.05	<0.05	<0.01	0.18	0.19	14	<0.48	4.5	<0.01	<1
	6/9/2021	6	<2.0	0.01	<0.05	<0.01	0.19	0.20	71	<0.48	4.7	0.02	<1
	6/30/2021	8	<2.0	<0.01	<0.05	<0.01	0.23	0.24	64	<0.43	5.3	<0.01	<1
	7/21/2021	8	<2.0	<0.01	<0.05	<0.01	0.24	0.25	59	<0.43	5.3	<0.01	<1
	8/18/2021	8	<2.0	<0.01	<0.05	<0.01	0.25	0.26	72	<0.43	4.8	<0.01	1
	Mean	7	2.0	0.02	0.05	0.01	0.22	0.23	56	0.45	4.9	0.01	1
	Stdev	1	0.0	0.018	0.00	0	0.03	0	24	0.03	0.4	0.00	0
	Max	8	2	0.05	0.05	0.01	0.25	0.26	72	0.48	5.3	0.02	1
	Min	5	2	0.01	0.05	0.01	0.18	0.19	14	0.43	4.5	0.01	1
	No. of Det.	5	0	1	0	0	5	5	5	0	5	1	1

Table 3-1 continued. Summary of surface, middle, and bottom water quality monitoring data for F.E. Walter Reservoir in 2021

Station	Date	ALK	BOD5	DISS-P	NH3	NO2	NO3	NO2- NO3	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
WA-07S	5/12/2021	6	<2.0	<0.05	<0.05	<0.01	0.22	0.23	70	<0.48	5.4	<0.01	<1
	6/9/2021	6	<2.0	<0.01	<0.05	<0.01	0.18	0.19	41	<0.48	4.4	<0.01	<1
	6/30/2021	7	<2.0	<0.01	<0.05	<0.01	0.19	0.20	59	<0.43	4.9	<0.01	2
	7/21/2021	8	<2.0	<0.01	<0.05	<0.01	0.23	0.24	54	<0.43	5.6	<0.01	<1
	8/18/2021	8	<2.0	<0.01	0.06	<0.01	0.24	0.25	76	<0.43	5.1	<0.01	2
	Mean	7	2.0	0.02	0.05	0.01	0.21	0.22	60	0.45	5.1	0.01	1
	Stdev	1	0.0	0.02	0.004	0	0.026	0.03	14	0.03	0.5	0.00	1
	Max	8	2	0.05	0.06	0.01	0.24	0.25	76	0.48	5.6	0.01	2
	Min	6	2	0.01	0.05	0.01	0.18	0.19	41	0.43	4.4	0.01	1
	No. of Det.	5	0	0	1	0	5	5	5	0	5	0	2
WA-07M	5/12/2021	6	<2.0	<0.05	<0.05	<0.01	0.2	0.21	51	<0.48	6.2	<0.01	<1
	6/9/2021	7	<2.0	<0.01	<0.05	<0.01	0.19	0.20	55	<0.48	4.8	0.09	<1
	6/30/2021	7	<2.0	<0.01	<0.05	<0.01	0.20	0.21	62	<0.43	4.9	<0.01	1
	7/21/2021	8	3.7	<0.01	<0.05	<0.01	0.23	0.24	56	<0.43	5.5	0.04	1
	8/18/2021	8	<2.0	0.02	<0.05	<0.01	0.24	0.25	71	<0.43	5.1	<0.01	<1
	Mean	7	2.3	0.02	0.05	0.01	0.21	0.22	59	0.45	5.3	0.03	1
	Stdev	1	0.8	0.017	0.00	0	0.02	0.02	8	0.03	0.6	0.03	0
	Max	8	3.7	0.05	0.05	0.01	0.24	0.25	71	0.48	6.2	0.09	1
	Min	6	2	0.01	0.05	0.01	0.19	0.2	51	0.43	4.8	0.01	1
	No. of Det.	5	1	1	0	0	5	5	5	0	5	2	2

Table 3-1 continued. Summary of surface, middle, and bottom water quality monitoring data for F.E. Walter Reservoir in 2021

Station	Date	ALK	BOD5	DISS-P	NH3	NO2	NO3	NO2- NO3	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
WA-07D	5/12/2021	6	<2.0	<0.05	<0.05	<0.01	0.21	0.22	45	<0.48	6.4	<0.01	<1
	6/9/2021	8	<2.0	0.01	<0.05	<0.01	0.2	0.21	65	0.59	6.1	0.05	19
	6/30/2021	7	<2.0	<0.01	<0.05	<0.01	0.2	0.21	63	<0.43	4.8	<0.01	<1
	7/21/2021	9	<2.0	<0.01	<0.05	<0.01	0.24	0.25	60	<0.43	7	<0.01	<1
	8/18/2021	8	<2.0	0.02	<0.05	<0.01	0.26	0.27	68	<0.43	5.4	<0.01	3
	Mean	8	2.0	0.02	0.05	0.01	0.22	0.23	60	0.47	5.9	0.02	5
	Stdev	1	0.0	0.017	0.00	0	0.03	0.03	9	0.07	0.9	0.02	8
	Max	9	2	0.05	0.05	0.01	0.26	0.27	68	0.59	7	0.05	19
	Min	6	2	0.01	0.05	0.01	0.2	0.21	45	0.43	4.8	0.01	1
	No. of Det.	5	0	2	0	0	5	5	5	1	5	1	2

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

NS- Not Sampled

### 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 is an essential plant nutrient, it contributes to the trophic status of a water body. Excess ammonia contributes to eutrophication of water bodies. This can result in excessive algal growths and impacts on recreation and drinking water supplies. In high concentrations, ammonia is toxic to aquatic life.

Ammonia in the water column of F.E. Walter Reservoir was consistently low throughout the monitoring period with all but one sample less than the minimum laboratory reporting limit (0.05 mg/L). The maximum NH<sub>3</sub> value of 0.06 mg/L was observed in a surface water sample at Station WA-7S on 18 August. All F.E. Walter Reservoir samples were less than the PADEP water quality standard for ammonia during 2021. The water quality standard of ammonia is dependent on temperature and pH (Table 3-2).

<b>Table 3.2 Environmental Protection Agency Ammonia Freshwater Criteria 2013</b>	
2013 Final Aquatic Life Criteria for Ammonia (Magnitude, Frequency, and Duration) (mg TAN/L) pH 7.0, T=20°C	
Acute (1-hour average)	17
Chronic (30-day rolling average)	1.9*
*Not to exceed 2.5 times the CCC as a 4-day average within the 30-days, i.e. 4.8 mg TAN/L at pH 7 and 20°C, more than once in three years on average. Criteria frequency: Not to be exceeded more than once in three years on average.	

### 3.2.2 Nitrite and Nitrate

Nitrite (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. Concentrations of nitrite at F.E. Walter Reservoir were consistently low at all sampling stations during 2021. Concentrations of nitrite measured at all stations and depths were less than the minimum laboratory reporting limit of 0.01 mg/L (Table 3-1).

Nitrate (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 also consistently low at F.E. Walter Reservoir during 2021. For all stations and depths, sample results ranged from 0.13 mg/L to a maximum of 0.49 mg/L in the upstream tributary surface waters at station WA-3S on 18 August.

In 2021, F.E. Walter Reservoir complied with the PADEP water quality standard for nitrogen. The water quality standard for nitrogen is a summed concentration of nitrite and nitrate of less than 10-mg/L. Throughout the monitoring period, the summed concentrations for each station were well below this standard. The maximum summed concentration for any single sample did not exceed 0.50 mg/L.

### **3.2.3 Total Kjeldahl Nitrogen**

Total Kjeldahl nitrogen (TKN) is a measure of organic nitrogen that includes ammonia. Organic nitrogen is not immediately available for biological activity and is therefore not available for plant growth until decomposition to an inorganic form occurs. TKN in the water column of F.E. Walter Reservoir remained low during 2021 (Table 3-1). Concentrations measured at all reservoir stations ranged from less than the minimum laboratory reporting limit of 0.43 mg/L to a high of 0.61 mg/L in the reservoir mid-depth waters at station WA-2M on 9 June.

### **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. For all stations and depths, concentrations ranged from less than the reporting limit of 0.01 mg/L to a high of 0.09 mg/L in the mid-depth waters of station WA-7M on 9 June (Table 3-1).

### **3.2.5 Dissolved Phosphorus**

Dissolved or soluble phosphorus (DISS P) in the waters of F.E. Walter Reservoir and its upstream tributaries remained consistently low during 2021. For all stations and depths, concentrations ranged from less than the reporting limit of 0.01 mg/L to a maximum of 0.21 mg/L (Table 3-1) measured at upstream tributary station WA-5S on 21 July. In freshwater environments, dissolved phosphorus is usually a limiting nutrient and is utilized by freshwater plants and algae during photosynthesis.

### **3.2.6 Total Dissolved Solids**

Total Dissolved Solids (TDS) is a measure of the amount of filterable dissolved material in the water. Dissolved salts such as sulfate, magnesium, chloride, and sodium

contribute to elevated levels. TDS in the lake and tributary stations of F.E. Walter Reservoir remained relatively constant and low during 2021. Concentrations at all stations and depths ranged from 14 to 106 mg/L (Table 3-1). F.E. Walter Reservoir and its tributaries stayed in compliance with the PADEP water quality standard for total dissolved solids during 2021. The water quality standard is a maximum allowable concentration of 500-mg/L.

### 3.2.7 Total Suspended Solids

Total Suspended Solids (TSS) is a measure of the amount of non-filterable particulate matter that is suspended within the water column. High concentrations increase the turbidity of the water and can hinder photosynthetic activity, result in damage to fish gills, and cause impairment to spawning habitat (smothering). TSS measures in the water column of F.E. Walter Reservoir were low in 2021 with most results less than the reporting limit of 1.0 mg/L and ranging to a maximum concentration of 19 mg/L (Table 3-1). Elevated TSS results are predominantly seen in the lake bottom water samples. This is often a result of sampling error and suspended bottom sediments being captured in the sample during lake bottom water grab sampling. These elevated results do not always accurately reflect conditions at those stations and depths. For example, a TSS reading of 19 mg/L was recorded in the lake bottom water sample at station WA-7D on 9 June. These results did not correlate with other samples collected throughout the lake during the same sampling period.

### 3.2.8 Biochemical Oxygen Demand

Five-day biochemical oxygen demand (BOD) is a measure of the oxygen-depleting burden imposed by organic material present in water. It measures the rate of oxygen uptake by organisms in the water sample over a laboratory method time limit. It is an indicator of the quality of a water body and the degree of pollution caused by biodegradable organic matter can therefore be inferred. The five-day biochemical oxygen demand concentrations 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 concentrations in the waters of F.E. Walter Reservoir remained low in 2021 (Table 3-2). Sampling results ranged from less than the reporting limit of 2.0 mg/L to 14.8 mg/L. Sixty one of the 65 total samples collected were less than or equal to the 2.0 mg/L laboratory minimal reporting limit. In considering the overall

infrequency of samples showing higher readings, it is inferred that F.E. Walter Reservoir and its associated tributaries contained very clean water with little biodegradable organic wastes during the 2021 sampling season.

### **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  $\text{CaCO}_3$  except where natural conditions are less.

Alkalinity measurements in the waters of F.E. Walter Reservoir were low during 2021. Concentrations measured at all stations and depths ranged from 3.0 mg/L to 12.0 mg/L  $\text{CaCO}_3$  throughout the monitoring period (Table 3-1). The natural alkalinity of water is largely dependent on the underlying geology and soils within the surrounding watershed. The low alkalinity typically measured at F.E. Walter Reservoir probably results from the regional geology, which is primarily sandstone and shale (Van Diver 1990).

### **3.2.10 Total Organic Carbon**

Total Organic Carbon (TOC) is a measure of the dissolved and particulate organic carbon in water. The bulk of organic carbon in water is composed of humic substances and partly degraded animal and plant materials. High levels of organic carbon coincide with a lowering of dissolved oxygen concentrations. It is an indicator of potential contamination and the organic character of a waterbody. Carbon is a nutrient required for biological processes. Total Organic Carbon was measured in the water column and tributaries of F.E. Walter Reservoir (Table 3-1). Concentrations of TOC ranged from 3.9 mg/L to 8.4 mg/L and were similar across all stations and depths. No criteria exist for TOC and findings are used as a monitoring tool.

### **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. Concentrations for all sampling dates for lake stations at depths from 0-10 feet ranged from 1.4 ug/L to 3.7 ug/L (Appendix A). Average concentrations monthly in May (3.16 ug/L), early June (2.46 ug/L), late June (2.23 ug/L), July (2.66 ug/L) and August (2.57 ug/L) shown that lake surface water algae productivity peaked during the early springtime period.

### 3.3 TROPHIC STATE DETERMINATION

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

TSIs calculated for measures of total phosphorus classified F.E. Walter Reservoir as oligotrophic in May (37.35), early June (37.35), late June (37.35), July (37.35) and August (37.35). TSIs calculated for measures of secchi disk depth classified F.E. Walter Reservoir as mesotrophic in May (44.17), early June (43.47), late June (40.39), July (42.37) and August (41.95). TSIs calculated for measures of chlorophyll *a* classified F.E. Walter Reservoir as mesotrophic in May (41.86) and oligotrophic in early June (39.47), late June (37.05), July (39.59) and August (39.06).

Carlson (1977) warned against averaging TSI values estimated for different parameters, and instead suggested giving priority to chlorophyll *a* in the summer and to phosphorus in the spring, fall, and winter. The trophic state of the reservoir, based on TSI's, was oligotrophic/mesotrophic throughout the 2021 sampling season. The EPA (1983) also provides criteria for classifying the trophic conditions of lakes of the North Temperate Zone based on concentrations of total phosphorus, chlorophyll *a*, and secchi disk depth (Table 3-3). Considering the general agreement between the EPA classifications with that of the Carlson TSIs, the trophic condition of F.E. Walter Reservoir fluctuated between being oligotrophic and mesotrophic throughout much of the 2021 sampling season.

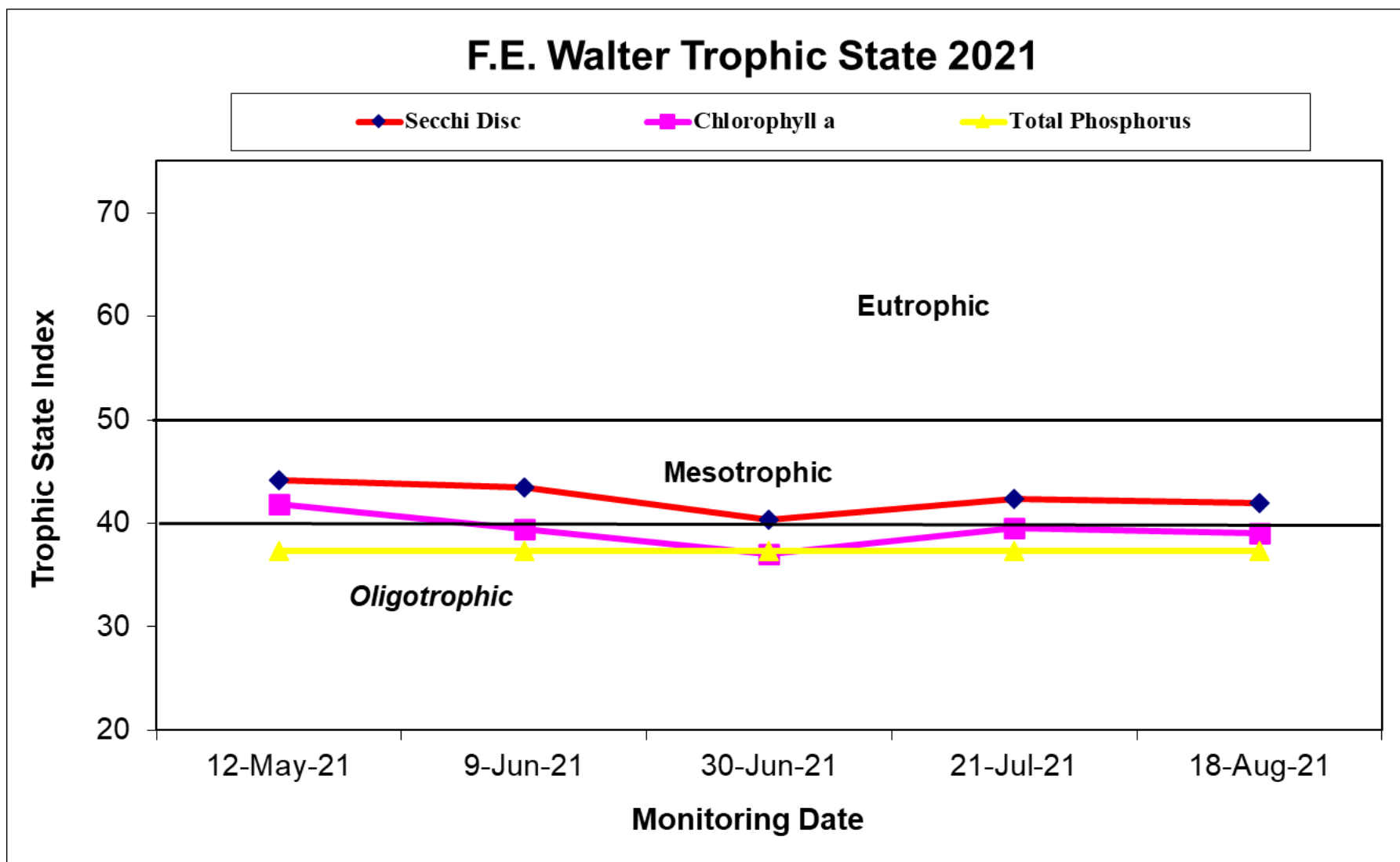
<b>Table 3-3. EPA trophic classification criteria and average monthly measures for F.E. Walter Reservoir in 2021.</b>								
<b>Water Quality Variable</b>	<b>Oligo-trophic</b>	<b>Meso-trophic</b>	<b>Eutrophic</b>	<b>12 May</b>	<b>09 June</b>	<b>30 June</b>	<b>21 July</b>	<b>18 Aug.</b>
Total Phosphorus (ppb)	<10	10-20	>20	<10	<10	<10	<10	<10
Chlorophyll <i>a</i> (ppb)	<4	4-10	>10	3.15	2.47	1.93	2.50	2.37
Secchi Depth (m)	>4	2-4	<2	3.00	3.15	3.90	3.40	3.50

### 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 has been replaced with a recommended e-coli criteria. Bacteria contamination was monitored in the tributary and lake surface waters at F.E. Walter Reservoir (May-August) during 2021 (Table 3-4). FE Walter surface water samples were not analyzed for fecal coliform bacteria in 2021.

*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.

Total coliform values for all stations and dates ranged from 197 colonies/100-ml to >2420 colonies/100-ml. Bacteria in natural waters are 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 2021. Bacteria contamination was low in F.E. Walter Reservoir and its upstream tributaries during 2021. Two individual samples collected once at each of the upstream tributary stations WA-5S and WA-3S did exceed the EPA single sample criteria. Water contact recreation is not permitted at F.E. Walter Reservoir.



**Figure 3-7.** Carlson Trophic state indices calculated from secchi disk depth, concentrations of chlorophyll a and Total Phosphorus measured in surface waters of F.E. Walter Reservoir at Station WA-2 during 2021.

**Table 3-4.** Surface water bacteria counts (colonies/100 ml) at F.E. Walter Reservoir during 2021. Shaded values exceed State bacteria criteria. NS = Not Sampled in 2021

STATION	DATE		Total Coliform		Fecal Coliform		Escherichia coli
WA-1S	5/12/2021		722		NS		12
	6/9/2021		501		NS		6
	6/30/2021	>	2420		NS	<	1
	7/20/2021	>	2420		NS		3
	8/18/2021		1990		NS		3
WA-2S	5/12/2021		197		NS		14
	6/9/2021		1300		NS		1
	6/30/2021	>	2420		NS		2
	7/20/2021	>	2420		NS		1
	8/18/2021		1730		NS		1
WA-3S	5/12/2021		921		NS		5
	6/9/2021	>	2420		NS		185
	6/30/2021	>	2420		NS		17
	7/20/2021	>	2420		NS		16
	8/18/2021	>	2420		NS		38
WA-4S	5/12/2021	>	2420		NS		10
	6/9/2021	>	2420		NS		866
	6/30/2021	>	2420		NS		50
	7/20/2021	>	2420		NS		63
	8/18/2021	>	2420		NS		147
WA-5S	5/12/2021		1550		NS		5
	6/9/2021	>	2420		NS		42
	6/30/2021	>	2420		NS	>	2420
	7/20/2021	>	2420		NS		39
	8/18/2021	>	2420		NS		35
WA-6S	5/12/2021		214		NS		16
	6/9/2021		1050		NS		3
	6/30/2021	>	2420		NS	<	1
	7/20/2021	>	2420		NS		1
	8/18/2021		2420		NS	<	1
WA-7S	5/12/2021		291		NS		8
	6/9/2021		1050		NS		2
	6/30/2021	>	2420		NS		11
	7/20/2022	>	2420		NS		2
	8/18/2021		2420		NS	<	1

## **4.0 REFERENCES**

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# **APPENDIX A**

## **FE WALTER RESERVOIR 2021 STRATIFICATION DATA TABLES**

## 2021 F.E. Walter Water Quality Profiles

Station	Date	Time	Depth	Temp	DO	DO	pH	pHmV	ORP	Turbidity	Chloro.	Cond
	M/D/Y	hh:mm:ss	ft	C	%	mg/L		mV	mV	NTU	ug/L	mS/cm
<b>WA-1 Outfall</b>	5/12/2021	10:40:20	0.5	11.62	100.4	10.91	6.13	7.4	140.5	5.2	10.6	0.06
	6/9/2021	10:22:34	0.5	14.54	98.3	10.01	6.3	-1.4	169.3	3.0	21.9	0.07
	6/30/2021	9:47:14	0.5	18.36	95.7	8.99	6.39	-6.2	162.9	0.1	29.7	0.083
	7/21/2021	9:40:09	0.5	21.38	94.4	0	6.44	-8.9	169.3	1.4	3.0	0.088
	8/18/2021	9:22:28	0.5	21.92	94.8	8.3	6.3	-0.5	178.8	2.8	2.5	0.091
<b>WA-2  Lake Tower  Secchi 3.0 M</b>	5/12/2021	8:33:51	0.5	13.19	89.1	9.35	6.36	-5	123.7	0.0	3.2	0.069
		8:33:14	5	13.18	88.9	9.33	6.38	-6.5	122.1	0.0	3.1	0.069
		8:32:33	10	13.14	88.5	9.30	6.41	-8.2	119.9	0.0	3.1	0.069
		8:31:47	15	13.1	88.6	9.31	6.33	-3.2	123.8	0.0	3.1	0.069
		8:29:05	20	12.65	88	9.34	6.23	1.9	126.2	0.2	3.9	0.063
		8:28:39	25	12.59	87.8	9.33	6.22	2.7	126.8	0.0	3.9	0.063
		8:28:17	30	12.52	87.7	9.34	6.27	0.1	124.5	0.2	3.4	0.062
		8:26:14	35	12.36	88.2	9.43	6.22	2.5	126.8	0.0	3.8	0.062
		8:25:21	40	12.31	88.8	9.50	6.18	5	129	0.1	3.7	0.062
		8:24:38	45	12.22	89	9.54	6.17	5.2	129.3	0.0	3.3	0.061
		8:23:58	50	11.98	89.1	9.61	6.15	6.6	131.1	0.0	3.2	0.061
		8:23:23	55	11.94	89.6	9.67	6.18	4.9	130.2	0.0	2.9	0.061
		8:22:40	60	11.8	89.4	9.68	6.17	5.6	130.9	0.0	3.3	0.062
		8:21:59	65	11.64	89.4	9.71	6.12	8.3	133.7	0.0	4.2	0.061
		8:21:28	70	11.5	89.6	9.77	6.16	5.7	131.4	0.1	3.7	0.061
		8:20:54	75	11.34	89.4	9.78	6.16	5.8	131.7	0.4	3.5	0.06
		8:20:24	80	11.2	88.9	9.76	6.19	4.2	130.1	0.0	3.8	0.061
		8:19:33	85	11.09	88.7	9.76	6.16	5.9	131.4	0.0	3.0	0.058
		8:18:39	90	11.06	88.2	9.71	6.15	6.2	132.7	0.0	3.0	0.058
		8:17:52	95	10.93	87.6	9.67	6.20	3.6	131.1	0.5	3.8	0.06
		8:17:20	100	10.91	87.8	9.70	6.15	6.1	134	0.7	4.2	0.061
		8:16:39	105	10.93	87.6	9.68	6.24	1.4	130.2	0.6	4.0	0.061
		8:15:59	110	10.91	87.6	9.67	6.22	2.3	131.5	0.4	3.8	0.061
		8:15:24	115	10.92	87.4	9.66	6.30	-1.8	128	0.5	4.0	0.061
		8:14:27	120	10.9	86.6	9.56	6.29	-1.4	128.4	1.0	3.4	0.062

## 2021 F.E. Walter Water Quality Profiles

Station	Date	Time	Depth	Temp	DO	DO	pH	pHmV	ORP	Turbidity	Chloro.	Cond
	M/D/Y	hh:mm:ss	ft	C	%	mg/L		mV	mV	NTU	ug/L	mS/cm
<b>WA-2 Lake Tower  Secchi 3.15 M</b>	6/9/2021	8:06:28	0.5	24.32	101.5	8.49	7.10	-46.7	119.3	0.0	2.1	0.083
		8:05:33	5	22.74	99.3	8.56	6.97	-39.2	124.7	0.0	2.6	0.081
		8:04:24	10	20.46	94.4	8.51	6.83	-31.5	131.5	0.0	2.7	0.078
		8:03:10	15	19.07	88.3	8.18	6.53	-13.9	147.2	0.0	2.8	0.076
		8:02:02	20	17.87	81.6	7.74	6.33	-2.7	156.7	0.0	2.7	0.073
		8:00:50	25	17.09	78.4	7.56	6.27	0.7	160.2	0.0	2.2	0.072
		8:00:06	30	16.59	80.8	7.88	6.33	-2.9	158.3	0.0	3.1	0.073
		7:59:09	35	16.11	80.0	7.88	6.33	-2.9	158.4	0.0	2.8	0.073
		7:57:50	40	15.81	79.9	7.91	6.32	-2.3	158.6	0.0	2.7	0.072
		7:57:13	45	15.56	80.3	7.99	6.33	-3.1	158.2	0.0	2.4	0.072
		7:55:54	50	15.42	80.1	8.00	6.32	-2.7	158.4	0.0	2.5	0.072
		7:54:32	55	15.25	80.0	8.02	6.30	-1.6	158.9	0.0	2.7	0.072
		7:53:36	60	15.12	79.8	8.03	6.30	-1.3	159.0	0.0	2.9	0.071
		7:52:44	65	14.80	79.8	8.08	6.29	-1	159.0	0.0	2	0.07
		7:51:57	70	14.61	78.9	8.02	6.29	-1.2	159.0	0.0	2.3	0.069
		7:50:42	75	14.43	79.5	8.11	6.32	-2.8	157.8	0.0	2.3	0.07
		7:50:03	80	14.31	78.9	8.07	6.32	-2.7	157.6	0.0	2.6	0.07
		7:49:07	85	14.21	78.6	8.06	6.32	-2.8	157.6	0.0	2.7	0.069
		7:48:11	90	14.16	78.2	8.03	6.34	-3.8	156.9	0.3	2.7	0.069
		7:46:07	95	14.08	74.3	7.65	6.36	-4.9	155.1	0.4	3.4	0.07
		7:45:13	100	13.52	69.5	7.24	6.35	-4.4	155.3	1.3	2.7	0.071
<b>WA-2 Lake Tower  Secchi 3.90 M</b>	6/30/2021	7:44:31	105	13.50	69.2	7.21	6.37	-5.4	154.4	0.9	2.5	0.071
		7:43:38	110	13.46	67.8	7.07	6.38	-6.4	153.4	1.6	3.5	0.071
		7:43:08	115	13.45	66.9	6.98	6.40	-7.3	152.8	2.6	2.3	0.071
		7:41:21	120	13.24	63.5	6.66	6.44	-9.4	150.4	7.2	3.5	0.071
		8:06:32	0.5	26.16	95.5	7.72	7.13	-48.5	145.8	0.0	1.4	0.092
		8:05:50	5	25.99	94.2	7.64	7.04	-43.2	150.3	0.0	2.5	0.092
		8:05:02	10	25.01	91.0	7.52	6.83	-30.9	161.6	0.0	1.9	0.091
		8:03:31	15	22.06	80.1	7.00	6.44	-8.8	181	0.0	1.9	0.084
		8:02:10	20	21.04	70.7	6.29	6.31	-1	185.7	0.0	2.5	0.081
		8:01:20	25	20.34	67.0	6.05	6.30	-0.5	186.3	0.0	3.6	0.082
		8:00:30	30	19.68	67.2	6.15	6.31	-1.6	186	0.0	2.9	0.082
		7:59:39	35	19.49	67.8	6.22	6.34	-2.9	185.7	0.0	3.0	0.082
		7:58:50	40	19.28	68.0	6.27	6.35	-3.8	185.6	0.0	3.0	0.083
		7:57:53	45	19.10	68.4	6.34	6.36	-4.3	185.7	0.0	2.3	0.083
		7:56:52	50	18.94	68.4	6.36	6.37	-4.8	185.7	0.0	2.9	0.084
		7:55:44	55	18.69	68.5	6.39	6.38	-5.5	186	0.0	3.4	0.085
		7:54:47	60	18.47	67.0	6.28	6.36	-4.3	187	0.0	2.4	0.083
		7:53:58	65	18.23	65.1	6.13	6.34	-3.2	188.1	0.0	1.7	0.080
		7:53:07	70	18.10	63.8	6.03	6.34	-3.6	188.2	0.0	2.7	0.078
		7:52:17	75	17.95	63.1	5.98	6.39	-6.4	186.8	0.0	2.5	0.081
		7:51:37	80	17.40	61.7	5.91	6.42	-7.9	186.6	0.1	2.0	0.084
		7:51:04	85	17.14	60.5	5.83	6.43	-8.7	186.5	0.0	1.7	0.083
		7:50:14	90	16.93	57.9	5.61	6.44	-9.4	186.5	0.3	2.1	0.084
		7:48:51	95	16.50	48.0	4.69	6.44	-9.1	187.4	1.6	2.5	0.081
		7:48:02	100	16.29	44.8	4.39	6.46	-10.3	187	2.2	2.5	0.079
		7:46:05	105	15.87	34.3	3.40	6.54	-14.8	184.5	5.0	2.2	0.078
		7:44:51	110	15.79	31.1	3.08	6.62	-19.7	181.7	6.0	2.3	0.078
		7:44:06	115	15.75	29.4	2.92	6.68	-23	180.3	8.0	1.7	0.078
		7:43:18	120	15.72	29.2	2.89	6.75	-26.9	179.3	8.7	2.2	0.079

## 2021 F.E. Walter Water Quality Profiles

Station	Date	Time	Depth	Temp	DO	DO	pH	pHmV	ORP	Turbidity	Chloro.	Cond
	M/D/Y	hh:mm:ss	ft	C	%	mg/L		mV	mV	NTU	ug/L	mS/cm
<b>WA-2 Lake Tower  Secchi 3.40 M</b>	7/21/2021	8:06:09	0.5	25.75	92.6	7.55	6.82	-30.3	170.7	0.0	2.7	0.094
		8:05:20	5	25.75	92.3	7.52	6.78	-28.4	171.5	0.0	2.0	0.094
		8:04:33	10	25.73	91.9	7.49	6.66	-21.1	177.6	0.0	2.8	0.094
		8:02:28	15	24.12	69.7	5.85	6.22	4.5	193.1	0.0	3.6	0.094
		8:01:24	20	23.53	66.1	5.61	6.16	7.8	195.5	0.0	2.9	0.094
		8:00:41	25	23.09	65.5	5.61	6.17	7.3	194.9	0.0	3.0	0.094
		7:59:41	30	22.85	64.5	5.54	6.14	9.1	196.2	0.0	3.1	0.093
		7:58:57	35	22.64	64.8	5.59	6.14	8.7	195.4	0.0	3.3	0.093
		7:57:31	40	22.41	64.4	5.59	6.12	10.0	196.1	0.0	3.3	0.092
		7:56:47	45	22.33	63.9	5.55	6.11	10.7	196.2	0.0	3.4	0.091
		7:56:03	50	22.19	63.9	5.56	6.1	11.1	196.1	0.0	3.3	0.090
		7:55:22	55	22.06	63.1	5.51	6.1	10.8	195.7	0.0	3.6	0.091
		7:54:43	60	21.89	62.9	5.51	6.09	11.7	196.2	0.0	3.2	0.090
		7:54:06	65	21.74	61.8	5.43	6.09	11.4	195.1	0.0	3.0	0.089
		7:53:05	70	21.55	60.7	5.35	6.07	12.4	195.6	0.0	4.2	0.089
		7:52:22	75	21.32	57.6	5.10	6.04	14.4	196.4	0.0	2.5	0.089
		7:51:44	80	21.21	57.4	5.10	6.04	14.4	196.3	0.3	3.5	0.088
		7:50:16	85	21.09	54.1	4.81	6.02	15.3	195.7	0.5	3.7	0.088
		7:49:11	90	20.95	53.9	4.81	6.01	15.8	195.3	0.4	3.3	0.087
		7:48:21	95	20.80	52.2	4.67	6.01	15.9	194.8	0.8	3.2	0.087
		7:46:39	100	20.69	49.1	4.40	6	16.6	194.3	0.9	3.1	0.087
<b>WA-2 Lake Tower  Secchi 3.5 M</b>	8/18/2021	7:44:40	105	20.46	40.8	3.68	5.99	17.2	193.1	3.0	2.7	0.088
		7:43:00	110	20.33	35.7	3.23	6.01	16.1	190.3	7.0	2.9	0.088
		7:41:26	115	20.17	32.2	2.92	6	16.6	190.3	10.8	2.6	0.088
		7:39:00	120	20.02	25.5	2.32	6.06	12.8	186.9	20.2	3.4	0.088
		7:47:19	0.5	24.84	90.4	7.49	6.39	-5.6	173.8	0.0	2.8	0.093
		7:46:36	5	24.84	89.8	7.44	6.32	-1.4	177.4	0.0	2.0	0.093
		7:45:14	10	24.68	82	6.81	6.22	4.8	178.8	0.0	2.3	0.093
		7:43:59	15	23.81	74.2	6.27	6.13	9.3	181.5	0.0	2.4	0.092
		7:42:54	20	23.04	64.4	5.52	6.11	10.9	181.4	0.0	2.6	0.090
		7:39:34	25	22.70	57.6	4.97	6.04	14.7	182.0	0.0	2.9	0.090
		7:38:59	30	22.51	55.6	4.81	6.02	15.6	182.1	0.0	3.1	0.090
		7:38:13	35	22.38	57.5	4.99	6.03	15.0	180.9	0.0	2.9	0.088
		7:37:31	40	22.30	57.3	4.98	6.06	13.2	178.4	0.0	1.7	0.088
		7:36:28	45	22.23	55.8	4.86	6.05	14.1	178.6	0.0	2.7	0.088
		7:35:52	50	22.16	56	4.88	6.05	14.2	178.5	0.0	2.0	0.088
		7:35:26	55	22.09	56.2	4.91	6.08	12.4	176.4	0.0	2.4	0.088
		7:34:50	60	22.05	54.6	4.77	6.08	12.3	175.9	0.0	2.6	0.089
		7:34:08	65	22.00	53.3	4.66	6.04	14.4	177.3	0.0	2.9	0.089
		7:29:58	70	21.96	53.6	4.69	6.15	8.2	165.7	0.0	2.5	0.089
		7:28:44	75	21.87	54.6	4.78	6.18	6.4	162.6	1.1	3.0	0.092
		7:27:17	80	21.80	53.4	4.69	6.23	3.5	156.9	0.6	2.7	0.092
		7:26:10	85	21.70	51.1	4.49	6.23	3.4	155.0	10.8	2.9	0.092
		7:25:22	90	21.59	50.2	4.42	6.27	1.1	151.0	5.2	2.6	0.093
		7:23:46	95	21.45	48.4	4.28	6.25	2.4	149.6	12.5	3.2	0.094
		7:22:57	100	21.44	47.1	4.16	6.29	-0.3	143.9	7.7	2.2	0.094
		7:21:38	105	21.33	38.6	3.42	6.26	1.7	140.9	17.1	2.5	0.094
		7:18:57	110	21.3	34.1	3.02	6.38	-5	130.7	20.4	3.3	0.094

## 2021 F.E. Walter Water Quality Profiles

Station	Date	Time	Depth	Temp	DO	DO	pH	pHmV	ORP	Turbidity	Chloro.	Cond
	M/D/Y	hh:mm:ss	ft	C	%	mg/L		mV	mV	NTU	ug/L	mS/cm
<b>WA-3</b> Tobyhanna Creek Upstream	5/12/2021	11:47:01	0.5	12.01	98.2	10.58	6.37	-6.1	141.3	0.8	4	0.085
	6/9/2021	11:36:20	0.5	20.59	96.1	8.64	6.63	-19.9	167.1	2.2	5	0.097
	6/30/2021	10:48:55	0.5	22.32	95.5	8.3	6.91	-35.8	179	1.1	2.4	0.114
	7/21/2021	10:06:00	0.5	20.31	92.5	8.36	6.69	-23.2	170.9	0	3.8	0.104
	8/18/2021	9:47:47	0.5	20.85	93.2	8.33	6.66	-21.4	168.1	0	3.5	0.119
<b>WA-4</b> Lehigh River Upstream	5/12/2021	11:21:12	0.5	9.88	99.1	11.21	6.08	10.3	147.8	0.0	2.3	0.046
	6/9/2021	11:15:36	0.5	20.22	94.8	8.58	6.58	-16.6	181.4	2.2	5.5	0.099
	6/30/2021	10:29:11	0.5	23.15	101.3	8.67	6.75	-26.8	167.4	0.0	2.1	0.097
	7/21/2021	10:25:17	0.5	20.45	100.5	9.06	6.65	-21.1	179.8	0.0	3.2	0.089
	8/18/2021	10:06:38	0.5	20.08	95.1	8.63	6.47	-10.8	174.9	0.0	2.4	0.079
<b>WA-5</b> Bear Creek Upstream	5/12/2021	11:01:30	0.5	9.86	98.2	11.12	5.63	35.0	155.5	0.0	3.0	0.044
	6/9/2021	10:51:08	0.5	21.78	98.0	8.61	6.62	-19.3	160.0	0.0	1.8	0.076
	6/30/2021	10:06:19	0.5	23.14	96.6	8.26	6.45	-8.8	176.8	0.0	1.3	0.090
	7/21/2021	10:49:05	0.5	21.32	94.7	8.39	6.6	-18.0	179.6	0.0	2.3	0.092
	8/18/2021	10:30:14	0.5	21.39	97.0	8.58	6.37	-4.5	172.4	0.0	1.8	0.085
<b>WA-6</b> Bear Creek Lake Arm	5/12/2021	9:17:00	0.5	12.97	89.1	9.39	6.16	5.8	132.1	0.0	3.0	0.067
		9:16:05	5	12.95	88.8	9.37	6.20	4.0	129.6	0.0	3.7	0.067
		9:15:37	10	12.93	88.9	9.38	6.20	3.8	129.0	0.0	3.0	0.067
		9:14:27	15	12.92	88.5	9.34	6.12	8.2	131.9	0.0	3.8	0.067
		9:13:34	20	12.87	88.6	9.37	6.06	11.9	134.1	0.0	3.2	0.066
		9:12:30	25	12.57	88.5	9.41	6.00	14.9	135.6	0.0	3.3	0.063
		9:11:33	30	12.41	89.2	9.53	5.94	18.3	138.6	0.0	3.5	0.063
		9:10:54	35	12.33	89.7	9.59	5.91	20.2	139.4	0.0	2.5	0.061
		9:10:24	40	12.21	89.6	9.61	5.93	19.0	138.2	0.0	2.3	0.061
		9:09:35	45	11.95	90.1	9.72	5.92	19.3	138.1	0.1	2.2	0.059
		9:08:56	50	11.74	90.0	9.76	5.92	19.4	138.1	0.0	2.1	0.059
		9:08:20	55	11.67	90.2	9.79	5.85	23.3	141.6	0.2	2.2	0.058
		9:07:49	60	11.59	90.2	9.82	5.90	20.4	138.7	0.0	2.2	0.058
		9:07:05	65	11.46	90.7	9.89	5.82	25.1	143.0	0.0	1.8	0.057
		9:06:17	70	11.21	90.2	9.89	5.81	25.2	142.9	0.0	2.4	0.055
		9:05:41	75	11.12	90.2	9.92	5.86	22.4	140.2	0.0	2.4	0.054
		9:05:15	80	11.09	90.3	9.93	5.84	23.8	141.8	0.0	3.0	0.055
		9:04:17	85	11.04	89.9	9.90	5.85	23.3	142.4	0.0	2.1	0.054
<b>WA-6</b> Bear Creek Lake Arm	6/9/2021	8:59:54	0.5	24.56	102.3	8.52	6.51	-12.5	170.1	0.0	1.9	0.083
		8:58:58	5	23.29	100.9	8.61	6.27	1.1	182.2	0.0	2.4	0.082
		8:58:14	10	20.84	95.8	8.57	6.24	2.9	183.2	0.0	2.4	0.079
		8:57:19	15	19.16	88.9	8.22	6.18	6.2	184.6	0.0	2.0	0.077
		8:55:45	20	17.86	83.3	7.9	6.11	9.6	186.3	0.0	1.8	0.073
		8:54:57	25	17.00	81.4	7.87	6.09	10.7	187.3	0.0	2.4	0.071
		8:53:40	30	16.47	81.2	7.93	6.12	8.7	186.9	0.0	2.3	0.073
		8:52:45	35	16.09	80.7	7.95	6.11	9.7	188	0.0	2.2	0.071
		8:51:30	40	15.82	80.3	7.95	6.09	10.4	189.1	0.0	2.6	0.071
		8:50:29	45	15.50	80.1	7.99	6.09	10.4	190	0.0	2.9	0.069
		8:49:27	50	15.36	80.1	8.01	6.10	10.1	190.7	0.0	2.5	0.071
		8:48:53	55	15.15	79.9	8.03	6.08	11	192	0.0	2.4	0.069
		8:48:25	60	15.01	79.3	7.99	6.08	11	192.9	0.0	2.2	0.069
		8:47:56	65	14.93	78.8	7.96	6.08	10.8	194.1	0.0	2.3	0.068
		8:47:22	70	14.88	78.5	7.93	6.10	9.6	194.5	0.1	2.6	0.068
		8:46:39	75	14.70	78.1	7.92	6.14	7.5	195.5	0.4	2.5	0.067
		8:46:04	80	14.34	77.0	7.88	6.18	5.2	196.1	0.3	2.8	0.07
		8:44:46	85	14	75.8	7.81	6.3	-1.4	198.4	1.5	2.1	0.069

## 2021 F.E. Walter Water Quality Profiles

Station	Date	Time	Depth	Temp	DO	DO	pH	pHmV	ORP	Turbidity	Chloro.	Cond
	M/D/Y	hh:mm:ss	ft	C	%	mg/L		mV	mV	NTU	ug/L	mS/cm
WA-6 Bear Creek Lake Arm	6/30/2021	8:39:38	0.5	26.53	95.4	7.67	6.81	-30.1	166.3	0.0	1.6	0.092
		8:39:01	5	26.15	94.7	7.66	6.60	-17.8	178.9	0.0	2.0	0.092
		8:37:21	10	23.98	88.2	7.43	6.28	0.9	194.1	0.0	2.5	0.088
		8:36:29	15	22.23	79.9	6.95	6.19	6.2	196.5	0.0	2.2	0.085
		8:35:35	20	21.09	73.1	6.51	6.10	10.8	198.6	0.0	2.5	0.082
		8:34:09	25	20.59	69.8	6.27	6.07	12.4	198.7	0.0	2.5	0.081
		8:33:14	30	20.17	68.4	6.20	6.07	12.5	198.3	0.0	2.4	0.080
		8:32:38	35	19.69	67.8	6.20	6.06	12.7	198.3	0.0	2.6	0.079
		8:31:52	40	19.36	67.1	6.18	6.05	13.6	198.8	0.0	1.8	0.077
		8:30:44	45	19.00	65.9	6.11	6.06	13.1	198.1	0.0	1.9	0.076
		8:29:57	50	18.76	65.2	6.07	6.08	11.9	197.4	0.0	2.2	0.077
		8:28:53	55	18.52	63.6	5.95	6.08	11.6	197.3	0.7	1.6	0.076
		8:27:58	60	18.24	64.0	6.03	6.13	8.9	196.1	0.0	2.0	0.078
		8:26:12	65	18.10	66.5	6.28	6.24	2.2	192.9	0.0	3.0	0.085
		8:25:05	70	17.99	65.8	6.23	6.23	3.2	194.1	0.0	2.6	0.083
		8:23:57	75	17.74	63.6	6.06	6.23	3.1	195.8	0.0	2.4	0.085
		8:23:24	80	17.66	63.1	6.01	6.22	3.6	197.2	0.2	2.2	0.087
		8:20:38	85	17.23	59.4	5.71	6.13	8.2	206.1	3.6	2.8	0.085
WA-6 Bear Creek Lake Arm	7/21/2021	8:30:07	0.5	25.65	92.1	7.52	6.52	-13.1	191	0	2.1	0.093
		8:29:31	5	25.62	90.9	7.43	6.42	-7.2	195.0	0.0	3.3	0.093
		8:28:46	10	25.37	86.6	7.11	6.35	-2.9	195.6	0.0	2.6	0.092
		8:27:44	15	24.09	69.2	5.81	6.15	8.5	200.9	0.0	2.5	0.093
		8:26:55	20	23.53	67.4	5.73	6.10	11.2	203.7	0.0	2.9	0.093
		8:26:16	25	23.15	66.5	5.69	6.12	10.1	202.5	0.0	3	0.093
		8:25:22	30	22.81	65.6	5.65	6.11	10.8	202.4	0.0	4	0.093
		8:24:37	35	22.60	64.2	5.55	5.96	19.4	210.0	0.0	3.3	0.091
		8:24:15	40	22.43	64.0	5.55	6.05	14.2	204.6	0.0	3	0.091
		8:23:36	45	22.27	63.5	5.53	6.04	14.8	203.5	0.0	2.2	0.089
		8:22:52	50	22.18	63.3	5.51	6.00	17.1	205.4	0.0	2.5	0.089
		8:22:21	55	22.04	62.4	5.45	5.99	17.2	204.6	0.0	2.3	0.088
		8:21:34	60	21.91	60.7	5.31	5.98	18.0	204.4	0.4	2.1	0.087
		8:20:59	65	21.76	59.0	5.18	5.96	19.1	205.4	1.2	2.1	0.087
		8:20:25	70	21.65	57.4	5.05	5.99	17.6	203.5	1.3	1.4	0.087
		8:19:18	75	21.40	53.7	4.75	6.01	16.4	201.9	4.6	2.3	0.087
		8:18:22	80	21.18	51.8	4.60	6.08	12.3	198.4	5.0	3.3	0.087
		8:17:05	85	21.06	50.3	4.48	6.1	10.8	197.5	7.2	2.6	0.087
WA-6 Bear Creek Lake Arm	8/18/2021	8:09:54	0.5	24.88	91.6	7.58	6.32	-1.3	188.2	0.0	2.6	0.093
		8:09:18	5	24.90	91.3	7.56	6.31	-0.9	187.6	0.0	2.4	0.093
		8:08:30	10	24.90	89.9	7.44	6.29	0.2	186.8	0.0	2.4	0.093
		8:06:59	15	23.89	73.0	6.16	6.07	13.4	193.6	0.0	1.8	0.089
		8:06:16	20	23.08	63.7	5.45	6.04	14.8	194.4	0.0	2.7	0.091
		8:05:19	25	22.74	58.8	5.07	6	16.8	195.5	0.0	2.3	0.09
		8:03:48	30	22.51	57.8	5.00	5.96	19.3	197.2	0.0	2.4	0.089
		8:02:42	35	22.41	58.0	5.03	5.99	17.6	194.8	0.0	2.6	0.089
		8:01:47	40	22.30	60.8	5.29	6	17.2	194.5	0.0	2.4	0.088
		8:01:02	45	22.25	60.3	5.25	6	17.0	193.9	0.0	1.8	0.087
		8:00:17	50	22.19	59.4	5.18	6	17.1	193.7	0.0	1.6	0.087
		7:59:26	55	22.14	58.2	5.08	6	17.0	193.2	0.0	2	0.087
		7:58:22	60	22.08	57.0	4.98	6.01	16.5	192.4	0.1	1.9	0.087
		7:57:44	65	22.01	56.0	4.90	6.02	15.6	191.7	0.0	2.5	0.088
		7:56:47	70	21.95	54.3	4.75	6.05	13.7	190.0	0.5	1.9	0.088
		7:56:01	75	21.87	53.2	4.67	6.06	13.3	190.2	2.5	2.5	0.088

## 2021 F.E. Walter Water Quality Profiles

Station	Date	Time	Depth	Temp	DO	DO	pH	pHmV	ORP	Turbidity	Chloro.	Cond
	M/D/Y	hh:mm:ss	ft	C	%	mg/L		mV	mV	NTU	ug/L	mS/cm
WA-7 Lehigh Lake Arm	5/12/2021	9:57:40	0.5	13.22	89.5	9.38	6.08	10.6	125.3	0.0	2.9	0.069
		9:57:08	5	13.18	89.1	9.35	6.15	6.4	120.9	0.0	3.1	0.069
		9:56:10	10	13.12	89.0	9.35	6.12	8.4	121.4	0.0	3.3	0.068
		9:55:24	15	13.09	88.7	9.32	6.09	9.9	121.8	0.0	2.5	0.069
		9:54:29	20	12.98	88.4	9.31	6.05	12.2	122.5	0.0	3.8	0.067
		9:53:02	25	12.72	88.5	9.38	6.01	14.3	123.1	0.0	3.9	0.065
		9:52:19	30	12.59	88.5	9.41	6.07	11.0	119.4	0.0	3.6	0.064
		9:51:20	35	12.54	88.9	9.46	6.01	14.5	121.4	0.0	3.7	0.064
		9:51:00	40	12.29	88.8	9.5	6.03	13.5	120.3	0.0	3.8	0.064
		9:49:40	45	11.99	89.7	9.66	6.14	6.9	113.2	0.0	3.8	0.064
		9:48:55	50	11.87	89.5	9.67	6.15	6.2	111.3	0.0	4.6	0.064
		9:47:35	55	11.82	89.4	9.67	6.13	7.6	109.7	0.1	4.0	0.063
		9:46:58	60	11.72	89.2	9.67	6.17	5.0	106.1	0.0	3.8	0.063
		9:46:01	65	11.50	89.1	9.72	6.18	4.6	103.7	0.0	4.0	0.063
		9:44:48	70	11.45	87.5	9.55	6.26	0.1	95.8	0.0	4.3	0.063
		9:44:27	75	11.24	86.2	9.45	6.36	-5.3	89.6	0.0	4.2	0.063
WA-7 Lehigh Lake Arm	6/9/2021	9:42:30	80	11.03	65.5	7.21	6.59	-18.4	50.6	0.6	3.7	0.062
		9:41:16	85	10.97	18.3	2.02	6.46	-11.1	20.4	2.3	4.7	0.063
		9:31:52	0.5	24.85	101.5	8.41	6.3	-0.2	175.1	0.0	2.2	0.085
		9:31:25	5	23.28	97.4	8.31	6.25	2.4	176.1	0.0	2.7	0.085
		9:30:52	10	20.90	91.0	8.13	6.2	5.3	177.7	0.0	3.1	0.081
		9:30:04	15	19.14	86.5	8.00	6.16	7.1	178.1	0.0	2.3	0.078
		9:29:23	20	18.11	84.2	7.95	6.14	8.0	178.1	0.0	2.6	0.075
		9:28:19	25	17.02	81.9	7.91	6.14	7.9	177.4	0.0	2.6	0.074
		9:27:11	30	16.42	81.3	7.95	6.15	7.1	175.8	0.0	3.1	0.074
		9:26:07	35	16.10	82.1	8.09	6.17	5.9	174.0	0.0	2.3	0.074
		9:25:19	40	15.84	82.4	8.16	6.18	5.5	172.8	0.0	3.3	0.074
		9:24:30	45	15.60	82.1	8.18	6.18	5.2	171.4	0.0	3.1	0.074
		9:23:51	50	15.39	82.1	8.20	6.18	5.2	170.4	0.0	2.8	0.074
		9:23:13	55	15.24	81.8	8.21	6.18	5.4	169.4	0.0	3.5	0.073
		9:21:56	60	15.09	81.0	8.15	6.19	4.5	166.6	0.1	2.8	0.074
		9:21:03	65	14.86	79.5	8.04	6.19	4.6	164.5	0.2	2.4	0.074
WA-7 Lehigh Lake Arm	6/30/2021	9:20:23	70	14.75	77.6	7.86	6.18	5.0	163.1	0.2	3.1	0.074
		9:19:43	75	14.53	74.3	7.57	6.16	6.3	162.2	0.4	3.1	0.074
		9:18:56	80	14.43	72.4	7.39	6.15	6.9	159.2	1.7	3.6	0.074
		9:18:18	85	14.35	71.0	7.26	6.13	8.3	157.2	6.4	3.9	0.074
		9:07:42	0.5	26.7	95.6	7.66	6.45	-8.8	155.4	0.0	2.7	0.1
		9:06:46	5	25.86	93.8	7.63	6.36	-3.8	157.3	0.0	3.4	0.095
		9:06:05	10	24.51	89.1	7.43	6.29	0.3	157.5	0.0	2.1	0.091
		9:05:06	15	22.16	78.2	6.81	6.19	5.6	158.0	0.0	2.7	0.090
		9:04:08	20	21.20	71.2	6.32	6.11	10.1	157.6	0.0	1.2	0.085
		9:03:34	25	20.19	68.6	6.21	6.09	11.5	156.8	0.0	2.2	0.081
		9:02:52	30	19.97	68.1	6.19	6.14	8.3	152.9	0.0	2.2	0.085
		9:02:21	35	19.51	68.1	6.25	6.17	6.6	151.1	0.0	2.7	0.088
		9:01:32	40	19.36	68.7	6.33	6.20	4.6	147.8	0.0	2.3	0.089
		9:00:50	45	19.11	68.1	6.3	6.21	4.5	145.8	0.0	3.0	0.088
		9:00:10	50	18.90	67.9	6.31	6.21	4.0	143.6	0.0	2.8	0.088
		8:59:26	55	18.78	67.6	6.3	6.22	3.7	141.0	0.0	2.2	0.089
		8:58:30	60	18.55	66.8	6.25	6.22	3.3	137.7	0.0	2.2	0.089
		8:56:55	65	18.35	65.1	6.12	6.21	4.3	131.9	0.0	2.6	0.090
		8:55:39	70	18.17	60.7	5.73	6.17	6.3	126.2	0.1	2.7	0.089
		8:55:02	75	17.98	56.3	5.33	6.14	8.2	123.6	1.0	2.5	0.090
		8:54:12	80	17.63	46.2	4.4	6.07	11.8	118.0	2.8	2.4	0.09
		8:52:34	85	17.46	42.0	4.02	6.13	8.6	84.8	33.5	3.4	0.09

### 2021 F.E. Walter Water Quality Profiles

Station	Date	Time	Depth	Temp	DO	DO	pH	pHmV	ORP	Turbidity	Chloro.	Cond
	M/D/Y	hh:mm:ss	ft	C	%	mg/L		mV	mV	NTU	ug/L	mS/cm
WA-7 Lehigh Lake Arm	7/21/2021	8:58:39	0.5	25.85	91.6	7.45	6.68	-22.4	176.9	0	2.2	0.096
		8:57:56	5	25.82	91.2	7.42	6.6	-17.7	180.7	0	3.3	0.095
		8:56:39	10	25.62	86.6	7.07	6.33	-1.5	192.6	0.0	2.9	0.094
		8:55:23	15	24.31	71	5.94	6.17	7.3	195.2	0.0	3.2	0.093
		8:54:43	20	23.41	68.4	5.82	6.18	6.9	194.4	0.0	3.9	0.094
		8:53:54	25	23.11	70	5.99	6.12	10.1	198.3	0.0	3.6	0.094
		8:53:25	30	22.80	69	5.94	6.13	9.3	196.7	0.0	4.0	0.094
		8:52:45	35	22.56	69.8	6.04	6.15	8.5	195.9	0.0	4.2	0.094
		8:51:51	40	22.40	68.2	5.92	6.14	9	195.1	0.0	3.9	0.093
		8:51:17	45	22.28	66.7	5.80	6.14	8.9	193.9	0.0	4.5	0.093
		8:50:32	50	22.12	65.3	5.70	6.13	9.6	193.6	0.0	4.2	0.093
		8:49:48	55	21.97	64.3	5.62	6.13	9.5	192.8	0.3	4.2	0.093
		8:48:56	60	21.89	63.1	5.52	6.11	10.4	192.8	0.3	3.9	0.092
		8:48:08	65	21.80	62.1	5.45	6.14	8.7	190.0	0.2	3.5	0.093
		8:47:15	70	21.62	62.3	5.49	6.12	9.7	190.1	0.5	4.6	0.093
		8:46:34	75	21.53	63.7	5.62	6.15	8.1	187.5	1.1	3.5	0.093
		8:45:26	80	21.41	62.1	5.49	6.17	7.1	182.6	0.3	4	0.091
		8:44:27	85	21.36	61.9	5.48	6.16	7.2	178.7	6.6	4.8	0.092
WA-7 Lehigh Lake Arm	8/18/2021	8:41:45	0.5	25.08	90.1	7.44	6.34	-2.3	186.7	0.0	3.2	0.095
		8:40:58	5	25.03	87.5	7.23	6.23	3.8	191	0.0	2.6	0.095
		8:40:04	10	24.37	79.7	6.66	6.13	9.6	192.7	0.0	2.8	0.092
		8:38:48	15	23.67	71.5	6.06	6.13	9.4	190.8	0.0	2.6	0.094
		8:37:27	20	23.13	64.3	5.50	6.09	11.7	191.9	0.0	2.8	0.093
		8:34:32	25	22.73	58.5	5.05	5.99	17.4	194.8	0.0	2.6	0.092
		8:33:33	30	22.52	56.7	4.91	5.99	17.6	193.9	0.0	2.4	0.091
		8:32:23	35	22.37	54.5	4.73	5.99	17.4	192.1	0.0	2.4	0.090
		8:31:06	40	22.28	54.8	4.76	6.02	15.8	189.5	0.0	2.4	0.090
		8:29:53	45	22.24	55.1	4.79	6.02	15.5	188.2	0.0	3.2	0.090
		8:28:36	50	22.18	55.3	4.82	6.04	14.4	185.9	0.0	2.8	0.091
		8:27:33	55	22.13	56	4.88	6.08	12.5	182.8	0.0	2.3	0.091
		8:26:10	60	22.09	64.2	5.61	6.14	8.5	179.3	0.9	2.4	0.095
		8:25:14	65	22.02	63.5	5.55	6.13	9.1	178.4	0.5	2.9	0.095
		8:24:14	70	21.93	64.6	5.66	6.13	9.1	176.8	1.3	2.9	0.096
		8:22:12	75	21.91	64.2	5.63	6.19	5.8	167.2	2.2	3.1	0.096

# **APPENDIX B**

**FE WALTER RESERVOIR 2021  
LABORATORY CUSTODY SHEETS**

**M.J. Reider Associates, Inc.**ENVIRONMENTAL TESTING LABORATORY  
U.S. EPA/PA DEP #06-00003**Certificate of Analysis****Laboratory No.:** 2114821**Report:** 05/21/21**Lab Contact:** Richard A Wheeler**Attention:** David Wertz**Project:** 2021 - Walter Reservoir**Reported To:** Tetra TechUSACE, Phila Dist. Env.Resources Branch 100 Penn Square E.  
Arlington, VA 22201**Lab ID:** 2114821-01**Collected By:** Client**Sampled:** 05/12/21 10:30**Received:** 05/12/21 14:46**Sample Desc:** WA-1S**Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.05	mg/l		0.05	SM 4500-P F	05/14/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	6	mg CaCO <sub>3</sub> /L		2	SM 2320 B	05/18/21	C-51b	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	05/13/21	U	APR
Biochemical Oxygen Demand	14.8	mg/l	2.0	2.0	SM 5210 B	05/12/21 17:17		SWA
Nitrate as N	0.20	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	05/12/21 18:58	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	05/12/21 18:58	U	JAF
Nitrate+Nitrite as N	<0.21	mg/l	0.108	1.10	CALCULATED	05/12/21 18:58		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.48	mg/l	0.48	0.50	EPA 351.2	05/19/21	U	TML
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	05/14/21		TML
Solids, Total Dissolved	78	mg/l	4	5	SM 2540 C	05/13/21		TMH
Total Organic Carbon	5.8	mg/l	0.3	0.5	SM 5310 C	05/14/21		ALD
Solids, Total Suspended	<1	mg/l	1	1	SM 2540 D	05/13/21		ALD
Microbiology								
Escherichia coli	12	mpn/100ml	1		SM 9223 B/Quantitray	5/12/21 15:45	5/13/21 15:55	JMW
Total Coliform	722	mpn/100ml	1		SM 9223 B/Quantitray	5/12/21 15:45	5/13/21 15:55	JMW

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

**Lab ID:** 2114821-02      **Collected By:** Client      **Sampled:** 05/12/21 08:00      **Received:** 05/12/21 14:46  
**Sample Desc:** WA-2S      **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		0.05	SM 4500-P F	05/14/21	G-11, G-17	TML
<b>General Chemistry</b>								
Alkalinity, Total to pH 4.5	6	mg CaCO <sub>3</sub> /L		2	SM 2320 B	05/18/21	C-51b	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	05/13/21	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	05/12/21 17:17		SWA
Nitrate as N	0.22	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	05/12/21 19:14	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	05/12/21 19:14	U	JAF
Nitrate+Nitrite as N	<0.23	mg/l	0.108	1.10	CALCULATED	05/12/21 19:14		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.48	mg/l	0.48	0.50	EPA 351.2	05/18/21	U	TML
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	05/14/21		TML
Solids, Total Dissolved	98	mg/l	4	5	SM 2540 C	05/13/21		TMH
Total Organic Carbon	5.2	mg/l	0.3	0.5	SM 5310 C	05/14/21		ALD
Solids, Total Suspended	<1	mg/l	1	1	SM 2540 D	05/13/21		ALD
<b>Microbiology</b>								
Escherichia coli	14	mpn/100ml	1		SM 9223 B/Quantitray	5/12/21 15:45	5/13/21 15:55	JMW
Total Coliform	197	mpn/100ml	1		SM 9223 B/Quantitray	5/12/21 15:45	5/13/21 15:55	JMW



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M.J. Reider Associates, Inc.

**Lab ID:** 2114821-03    **Collected By:** Client    **Sampled:** 05/12/21 08:00    **Received:** 05/12/21 14:46  
**Sample Desc:** WA-2M    **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.05	mg/l		0.05	SM 4500-P F	05/14/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	6	mg CaCO <sub>3</sub> /L		2	SM 2320 B	05/18/21	C-51b	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	05/13/21	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	05/12/21 17:17		SWA
Nitrate as N	0.20	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	05/12/21 19:31	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	05/12/21 19:31	U	JAF
Nitrate+Nitrite as N	<0.21	mg/l	0.108	1.10	CALCULATED	05/12/21 19:31		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.48	mg/l	0.48	0.50	EPA 351.2	05/18/21	U	TML
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	05/14/21		TML
Solids, Total Dissolved	106	mg/l	4	5	SM 2540 C	05/13/21		TMH
Total Organic Carbon	6.2	mg/l	0.3	0.5	SM 5310 C	05/14/21		ALD
Solids, Total Suspended	<1	mg/l	1	1	SM 2540 D	05/13/21		ALD

**Lab ID:** 2114821-04    **Collected By:** Client    **Sampled:** 05/12/21 08:00    **Received:** 05/12/21 14:46  
**Sample Desc:** WA-2D    **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.05	mg/l		0.05	SM 4500-P F	05/14/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	6	mg CaCO <sub>3</sub> /L		2	SM 2320 B	05/18/21	C-51b	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	05/13/21	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	05/12/21 17:17		SWA
Nitrate as N	0.20	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	05/12/21 19:48	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	05/12/21 19:48	U	JAF
Nitrate+Nitrite as N	<0.21	mg/l	0.108	1.10	CALCULATED	05/12/21 19:48		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.48	mg/l	0.48	0.50	EPA 351.2	05/18/21	U	TML
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	05/14/21		TML
Solids, Total Dissolved	85	mg/l	4	5	SM 2540 C	05/13/21		TMH
Total Organic Carbon	5.8	mg/l	0.3	0.5	SM 5310 C	05/14/21		ALD
Solids, Total Suspended	<1	mg/l	1	1	SM 2540 D	05/13/21		ALD



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Lab ID: 2114821-05      Collected By: Client      Sampled: 05/12/21 11:40      Received: 05/12/21 14:46  
Sample Desc: WA-3S      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		0.05	SM 4500-P F	05/14/21	G-11, G-17	TML
<b>General Chemistry</b>								
Alkalinity, Total to pH 4.5	7	mg CaCO <sub>3</sub> /L		2	SM 2320 B	05/18/21	C-51c	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	05/13/21	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	05/12/21 17:17		SWA
Nitrate as N	0.23	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	05/12/21 20:05	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	05/12/21 20:05	U	JAF
Nitrate+Nitrite as N	<0.24	mg/l	0.108	1.10	CALCULATED	05/12/21 20:05		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.48	mg/l	0.48	0.50	EPA 351.2	05/18/21	U	TML
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	05/14/21		TML
Solids, Total Dissolved	80	mg/l	4	5	SM 2540 C	05/13/21		TMH
Total Organic Carbon	6.7	mg/l	0.3	0.5	SM 5310 C	05/14/21		ALD
Solids, Total Suspended	<1	mg/l	1	1	SM 2540 D	05/13/21		ALD
<b>Microbiology</b>								
Escherichia coli	5	mpn/100ml	1		SM 9223 B/Quantitray	5/12/21 15:45	5/13/21 15:55	JMW
Total Coliform	921	mpn/100ml	1		SM 9223 B/Quantitray	5/12/21 15:45	5/13/21 15:55	JMW



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Lab ID: 2114821-06 Collected By: Client Sampled: 05/12/21 11:15 Received: 05/12/21 14:46  
Sample Desc: WA-4S Sample Type: Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.05	mg/l		0.05	SM 4500-P F	05/14/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	7	mg CaCO <sub>3</sub> /L		2	SM 2320 B	05/18/21	C-51c	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	05/13/21	U	APR
Biochemical Oxygen Demand	2.2	mg/l	2.0	2.0	SM 5210 B	05/12/21 17:17		SWA
Nitrate as N	0.20	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	05/12/21 20:22	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	05/12/21 20:22	U	JAF
Nitrate+Nitrite as N	<0.21	mg/l	0.108	1.10	CALCULATED	05/12/21 20:22		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.48	mg/l	0.48	0.50	EPA 351.2	05/18/21	U	TML
Phosphorus as P, Total	0.01	mg/l	0.01	0.01	SM 4500-P F	05/14/21		TML
Solids, Total Dissolved	79	mg/l	4	5	SM 2540 C	05/13/21		TMH
Total Organic Carbon	5.6	mg/l	0.3	0.5	SM 5310 C	05/14/21		ALD
Solids, Total Suspended	<1	mg/l	1	1	SM 2540 D	05/13/21		ALD
Microbiology								
Escherichia coli	10	mpn/100ml	1		SM 9223 B/Quantitray	5/12/21 15:45	5/13/21 15:55	JMW
Total Coliform	>2420	mpn/100ml	1		SM 9223 B/Quantitray	5/12/21 15:45	5/13/21 15:55	JMW



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

**Lab ID:** 2114821-07      **Collected By:** Client      **Sampled:** 05/12/21 11:00      **Received:** 05/12/21 14:46  
**Sample Desc:** WA-5S      **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		0.05	SM 4500-P F	05/14/21	G-11, G-17	TML
<b>General Chemistry</b>								
Alkalinity, Total to pH 4.5	3	mg CaCO <sub>3</sub> /L		2	SM 2320 B	05/18/21	C-51	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	05/13/21	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	05/12/21 17:17		SWA
Nitrate as N	0.13	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	05/12/21 20:39	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	05/12/21 20:39	U	JAF
Nitrate+Nitrite as N	<0.14	mg/l	0.108	1.10	CALCULATED	05/12/21 20:39		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.48	mg/l	0.48	0.50	EPA 351.2	05/18/21	U	TML
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	05/14/21		TML
Solids, Total Dissolved	50	mg/l	4	5	SM 2540 C	05/13/21		TMH
Total Organic Carbon	4.2	mg/l	0.3	0.5	SM 5310 C	05/14/21		ALD
Solids, Total Suspended	<1	mg/l	1	1	SM 2540 D	05/13/21		ALD
<b>Microbiology</b>								
Escherichia coli	5	mpn/100ml	1		SM 9223 B/Quantitray	5/12/21 15:45	5/13/21 15:55	JMW
Total Coliform	1550	mpn/100ml	1		SM 9223 B/Quantitray	5/12/21 15:45	5/13/21 15:55	JMW



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M.J. Reider Associates, Inc.

Lab ID: 2114821-08      Collected By: Client      Sampled: 05/12/21 08:45      Received: 05/12/21 14:46  
Sample Desc: WA-6S      Sample Type: Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.05	mg/l		0.05	SM 4500-P F	05/14/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	6	mg CaCO <sub>3</sub> /L		2	SM 2320 B	05/18/21	C-51b	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	05/13/21	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	05/12/21 17:17		SWA
Nitrate as N	0.21	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	05/12/21 22:20	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	05/12/21 22:20	U	JAF
Nitrate+Nitrite as N	<0.22	mg/l	0.108	1.10	CALCULATED	05/12/21 22:20		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.48	mg/l	0.48	0.50	EPA 351.2	05/18/21	U	TML
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	05/14/21		TML
Solids, Total Dissolved	59	mg/l	4	5	SM 2540 C	05/13/21		TMH
Total Organic Carbon	5.4	mg/l	0.3	0.5	SM 5310 C	05/14/21		ALD
Solids, Total Suspended	<1	mg/l	1	1	SM 2540 D	05/13/21		ALD
	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	16	mpn/100ml	1	SM 9223 B/Quantitray	5/12/21 15:45	5/13/21 15:55		JMW
Total Coliform	214	mpn/100ml	1	SM 9223 B/Quantitray	5/12/21 15:45	5/13/21 15:55		JMW



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M.J. Reider Associates, Inc.

**Lab ID:** 2114821-09    **Collected By:** Client    **Sampled:** 05/12/21 08:45    **Received:** 05/12/21 14:46  
**Sample Desc:** WA-6M    **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.05	mg/l		0.05	SM 4500-P F	05/14/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	4	mg CaCO <sub>3</sub> /L		2	SM 2320 B	05/18/21	C-51a	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	05/13/21	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	05/12/21 17:17		SWA
Nitrate as N	0.19	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	05/12/21 22:36	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	05/12/21 22:36	U	JAF
Nitrate+Nitrite as N	<0.20	mg/l	0.108	1.10	CALCULATED	05/12/21 22:36		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.48	mg/l	0.48	0.50	EPA 351.2	05/18/21	U	TML
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	05/14/21		TML
Solids, Total Dissolved	43	mg/l	4	5	SM 2540 C	05/13/21		TMH
Total Organic Carbon	4.5	mg/l	0.3	0.5	SM 5310 C	05/14/21		ALD
Solids, Total Suspended	<1	mg/l	1	1	SM 2540 D	05/13/21		ALD

**Lab ID:** 2114821-10    **Collected By:** Client    **Sampled:** 05/12/21 08:45    **Received:** 05/12/21 14:46  
**Sample Desc:** WA-6D    **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.05	mg/l		0.05	SM 4500-P F	05/14/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	5	mg CaCO <sub>3</sub> /L		2	SM 2320 B	05/18/21	C-51a	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	05/13/21	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	05/12/21 17:17		SWA
Nitrate as N	0.18	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	05/12/21 22:03	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	05/12/21 22:03	U	JAF
Nitrate+Nitrite as N	<0.19	mg/l	0.108	1.10	CALCULATED	05/12/21 22:03		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.48	mg/l	0.48	0.50	EPA 351.2	05/18/21	U	TML
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	05/14/21		TML
Solids, Total Dissolved	14	mg/l	4	5	SM 2540 C	05/13/21		TMH
Total Organic Carbon	4.5	mg/l	0.3	0.5	SM 5310 C	05/14/21		ALD
Solids, Total Suspended	<1	mg/l	1	1	SM 2540 D	05/13/21		ALD



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

**Lab ID:** 2114821-11      **Collected By:** Client      **Sampled:** 05/12/21 09:30      **Received:** 05/12/21 14:46  
**Sample Desc:** WA-7S      **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		0.05	SM 4500-P F	05/14/21	G-11, G-17	TML
<b>General Chemistry</b>								
Alkalinity, Total to pH 4.5	6	mg CaCO <sub>3</sub> /L		2	SM 2320 B	05/18/21	C-51b	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	05/13/21	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	05/12/21 17:17		SWA
Nitrate as N	0.22	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	05/12/21 21:46	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	05/12/21 21:46	U	JAF
Nitrate+Nitrite as N	<0.23	mg/l	0.108	1.10	CALCULATED	05/12/21 21:46		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.48	mg/l	0.48	0.50	EPA 351.2	05/18/21	U	TML
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	05/14/21		TML
Solids, Total Dissolved	70	mg/l	4	5	SM 2540 C	05/13/21		TMH
Total Organic Carbon	5.4	mg/l	0.3	0.5	SM 5310 C	05/14/21		ALD
Solids, Total Suspended	<1	mg/l	1	1	SM 2540 D	05/13/21		ALD
<b>Microbiology</b>								
Escherichia coli	8	mpn/100ml	1		SM 9223 B/Quantitray	5/12/21 15:45	5/13/21 15:55	JMW
Total Coliform	291	mpn/100ml	1		SM 9223 B/Quantitray	5/12/21 15:45	5/13/21 15:55	JMW



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Lab ID: 2114821-12      Collected By: Client      Sampled: 05/12/21 09:30      Received: 05/12/21 14:46  
Sample Desc: WA-7M      Sample Type: Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.05	mg/l		0.05	SM 4500-P F	05/14/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	6	mg CaCO <sub>3</sub> /L		2	SM 2320 B	05/18/21	C-51b	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	05/13/21	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	05/12/21 17:17		SWA
Nitrate as N	0.20	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	05/12/21 23:27	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	05/12/21 23:27	U	JAF
Nitrate+Nitrite as N	<0.21	mg/l	0.108	1.10	CALCULATED	05/12/21 23:27		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.48	mg/l	0.48	0.50	EPA 351.2	05/18/21	U	TML
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	05/14/21		TML
Solids, Total Dissolved	51	mg/l	4	5	SM 2540 C	05/13/21		TMH
Total Organic Carbon	6.2	mg/l	0.3	0.5	SM 5310 C	05/14/21		ALD
Solids, Total Suspended	<1	mg/l	1	1	SM 2540 D	05/13/21		ALD

Lab ID: 2114821-13      Collected By: Client      Sampled: 05/12/21 09:30      Received: 05/12/21 14:46  
Sample Desc: WA-7D      Sample Type: Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.05	mg/l		0.05	SM 4500-P F	05/14/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	6	mg CaCO <sub>3</sub> /L		2	SM 2320 B	05/18/21	C-51b	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	05/13/21	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	05/12/21 17:17		SWA
Nitrate as N	0.21	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	05/12/21 23:44	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	05/12/21 23:44	U	JAF
Nitrate+Nitrite as N	<0.22	mg/l	0.108	1.10	CALCULATED	05/12/21 23:44		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.48	mg/l	0.48	0.50	EPA 351.2	05/18/21	U	TML
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	05/14/21		TML
Solids, Total Dissolved	45	mg/l	4	5	SM 2540 C	05/13/21		TMH
Total Organic Carbon	6.4	mg/l	0.3	0.5	SM 5310 C	05/14/21		ALD
Solids, Total Suspended	<1	mg/l	1	1	SM 2540 D	05/13/21		ALD



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## Preparation Methods

Specific Method	Preparation Method	Prep Batch	Prepared Date	Prepared By
<b>2114821-01</b>				
<b>Dissolved General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B1E0663	05/13/2021	TML
<b>General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B1E0680	05/13/2021	TML
<b>2114821-02</b>				
<b>Dissolved General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B1E0663	05/13/2021	TML
<b>General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B1E0680	05/13/2021	TML
<b>2114821-03</b>				
<b>Dissolved General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B1E0663	05/13/2021	TML
<b>General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B1E0680	05/13/2021	TML
<b>2114821-04</b>				
<b>Dissolved General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B1E0663	05/13/2021	TML
<b>General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B1E0680	05/13/2021	TML
<b>2114821-05</b>				
<b>Dissolved General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B1E0663	05/13/2021	TML
<b>General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B1E0680	05/13/2021	TML
<b>2114821-06</b>				
<b>Dissolved General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B1E0663	05/13/2021	TML
<b>General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B1E0680	05/13/2021	TML
<b>2114821-07</b>				
<b>Dissolved General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B1E0663	05/13/2021	TML
<b>General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B1E0680	05/13/2021	TML
<b>2114821-08</b>				
<b>Dissolved General Chemistry</b>				



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SM 4500-P F	SM 4500-P B	B1E0663	05/13/2021	TML
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**General Chemistry**

SM 4500-P F	SM 4500-P B	B1E0680	05/13/2021	TML
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**2114821-09**

**Dissolved General Chemistry**

SM 4500-P F	SM 4500-P B	B1E0663	05/13/2021	TML
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**General Chemistry**

SM 4500-P F	SM 4500-P B	B1E0680	05/13/2021	TML
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**2114821-10**

**Dissolved General Chemistry**

SM 4500-P F	SM 4500-P B	B1E0663	05/13/2021	TML
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**General Chemistry**

SM 4500-P F	SM 4500-P B	B1E0680	05/13/2021	TML
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**2114821-11**

**Dissolved General Chemistry**

SM 4500-P F	SM 4500-P B	B1E0663	05/13/2021	TML
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**General Chemistry**

SM 4500-P F	SM 4500-P B	B1E0680	05/13/2021	TML
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**2114821-12**

**Dissolved General Chemistry**

SM 4500-P F	SM 4500-P B	B1E0663	05/13/2021	TML
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**General Chemistry**

SM 4500-P F	SM 4500-P B	B1E0680	05/13/2021	TML
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**2114821-13**

**Dissolved General Chemistry**

SM 4500-P F	SM 4500-P B	B1E0663	05/13/2021	TML
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**General Chemistry**

SM 4500-P F	SM 4500-P B	B1E0680	05/13/2021	TML
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**Notes and Definitions**

- C-51 The alkalinity to pH 4.2 = 3 mg CaCO<sub>3</sub>/L.
- C-51a The alkalinity to pH 4.2 = 5 mg CaCO<sub>3</sub>/L.
- C-51b The alkalinity to pH 4.2 = 6 mg CaCO<sub>3</sub>/L.
- C-51c The alkalinity to pH 4.2 = 7 mg CaCO<sub>3</sub>/L.
- G-11 The sample was filtered after it was received at the laboratory.
- G-17 The sample was preserved in the laboratory.
- J Estimated value
- U Analyte was not detected above the indicated value.



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Chain of Custody****2114821**

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: 2021 - Walter Reservoir

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

Collected By :

(Full Name)

Gregory Wacik**2114821-01 WA-1S**BOD SM 5210B, EC (#) SM 9223B Confirmation, 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, TC (#) SM 9223BAlk SM 2320B, NH<sub>3</sub>-N D6919-03, TDS SM 2540C, TKN EPA 351.2, PO<sub>4</sub> SM 4500P-E, TOC SM 5310C, TSS SM 2540D

Matrix: Non-Potable Water

Type: Grab

Date: 5/12/21Time: 1030

A - Pl 500ml NP, minimal hdspc

B - Pl Liter NP

C - Sterile Pl 125ml NaThio

D - Pl 500ml H<sub>2</sub>SO<sub>4</sub>

E - Pl 250ml NP

F - Pl 500ml Lab Filtered

G - Vial Amber 40ml H<sub>3</sub>PO<sub>4</sub>, minimal hdspcH - Vial Amber 40ml H<sub>3</sub>PO<sub>4</sub>, minimal hdspcI - Vial Amber 40ml H<sub>3</sub>PO<sub>4</sub>, minimal hdspc**2114821-02 WA-2S**EC (#) SM 9223B Confirmation, 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, TC (#) SM 9223BAlk SM 2320B, NH<sub>3</sub>-N D6919-03, PO<sub>4</sub> SM 4500P-E, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D

Matrix: Non-Potable Water

Type: Grab

Date: 5/12/21Time: 0800

A - Pl 500ml NP, minimal hdspc

B - Pl Liter NP

C - Sterile Pl 125ml NaThio

D - Pl 500ml H<sub>2</sub>SO<sub>4</sub>

E - Pl 250ml NP

F - Pl 500ml Lab Filtered

G - Vial Amber 40ml H<sub>3</sub>PO<sub>4</sub>, minimal hdspcH - Vial Amber 40ml H<sub>3</sub>PO<sub>4</sub>, minimal hdspcI - Vial Amber 40ml H<sub>3</sub>PO<sub>4</sub>, minimal hdspc

Relinquished By

Date/Time

5/12/21 1300

Received By

Date/Time

5-12-21 1315

Relinquished By

Date/Time

Received By

Date/Time

5-12-21 1446

Relinquished By

Date/Time

Received at Laboratory By

Date/Time

Sample Kit Prepared By:	Date/Time
<u>SV @</u>	<u>4-28-21</u>
Sample Temp (°C):	
Samples on Ice?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> NA <input type="checkbox"/>
Approved By:	
Entered By:	

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.



# M.J. Reider Associates, Inc.

2114821

Client Code: 3157

Project Manager: Richard A Wheeler

Client: Tetra Tech

Project: 2021 - Walter Reservoir

Comments:

Collected By :

(Full Name)

Gregory Wacik

## 2114821-03 WA-2M

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 D6919-03, PO<sub>4</sub> SM 4500P-E, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D

Matrix: Non-Potable Water

Type: Grab

Date:

Time:

5/12/21

0800

- A - Pl 500ml NP, minimal hdspe
- 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 hdspe
- G - Vial Amber 40ml H<sub>3</sub>PO<sub>4</sub>, minimal hdspe
- H - Vial Amber 40ml H<sub>3</sub>PO<sub>4</sub>, minimal hdspe

## 2114821-04 WA-2D

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 D6919-03, PO<sub>4</sub> SM 4500P-E, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D

Matrix: Non-Potable Water

Type: Grab

Date:

Time:

5/12/21

0800

- A - Pl 500ml NP, minimal hdspe
- 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 hdspe
- G - Vial Amber 40ml H<sub>3</sub>PO<sub>4</sub>, minimal hdspe
- H - Vial Amber 40ml H<sub>3</sub>PO<sub>4</sub>, minimal hdspe

## 2114821-05 WA-3S

BOD SM 5210B, EC (#) SM 9223B Confirmation, 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, TC (#) SM 9223B  
Alk SM 2320B, NH<sub>3</sub>-N D6919-03, TDS SM 2540C, TKN EPA 351.2, PO<sub>4</sub> SM 4500P-E, TOC SM 5310C, TSS SM 2540D

Matrix: Non-Potable Water

Type: Grab

Date:

Time:

5/12/21

1140

- A - Pl 500ml NP, minimal hdspe
- B - Pl Liter NP
- C - Sterile Pl 125ml NaThio
- D - Pl 500ml H<sub>2</sub>SO<sub>4</sub>
- E - Pl 250ml NP
- F - Pl 500ml Lab Filtered
- G - Vial Amber 40ml H<sub>3</sub>PO<sub>4</sub>, minimal hdspe
- H - Vial Amber 40ml H<sub>3</sub>PO<sub>4</sub>, minimal hdspe
- I - Vial Amber 40ml H<sub>3</sub>PO<sub>4</sub>, minimal hdspe

Relinquished By

Date/Time

5/12/21 1300

Received By

Date/Time

5-12-21 1315

Relinquished By

Date/Time

Received By

Date/Time

5-12-21 1440

Relinquished By

Date/Time

Received at Laboratory By

Date/Time

Sample Kit Prepared By:	Date/Time
TSV	5-12-21
Sample Temp (°C):	
Samples on Ice?	No NA
Approved By:	
Entered By:	



# M.J. Reider Associates, Inc.

2114821

Client Code: 3157

Project Manager: Richard A Wheeler

Client: Tetra Tech

Project: 2021 - Walter Reservoir

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

Collected By : Gregory Wacik  
(Full Name)

## 2114821-06 WA-4S

EC (#) SM 9223B Confirmation, NO<sub>2</sub>-N EPA 300.0, NO<sub>3</sub>-N EPA 300.0, PO<sub>4</sub>-D SM 4500P-F, TC (#) SM 9223B, BOD SM 5210B, NO<sub>2</sub>-N, NO<sub>3</sub>-N, Combined NO<sub>3</sub>+NO<sub>2</sub>  
NH<sub>3</sub>-N D6919-03, TSS SM 2540D, TDS SM 2540C, Alk SM 2320B, PO<sub>4</sub> SM 4500P-E, TKN EPA 351.2, TOC SM 5310C

Matrix: Non-Potable Water

Type: Grab

Date: 5/12/21  
Time: 1115

- A - PI 500ml NP, minimal hdspc
- B - PI Liter NP
- C - Sterile PI 125ml NaThio
- D - PI 500ml H<sub>2</sub>SO<sub>4</sub>
- E - PI 250ml NP
- F - PI 500ml Lab Filtered
- 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
- I - Vial Amber 40ml H<sub>3</sub>PO<sub>4</sub>, minimal hdspc

## 2114821-07 WA-5S

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, PO<sub>4</sub> SM 4500P-E, NH<sub>3</sub>-N D6919-03, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D

Matrix: Non-Potable Water

Type: Grab

Date: 5/12/21  
Time: 1100

- A - PI 500ml NP, minimal hdspc
- B - PI Liter NP
- C - Sterile PI 125ml NaThio
- D - PI 500ml H<sub>2</sub>SO<sub>4</sub>
- E - PI 250ml NP
- F - PI 500ml Lab Filtered
- 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
- I - Vial Amber 40ml H<sub>3</sub>PO<sub>4</sub>, minimal hdspc

## 2114821-08 WA-6S

BOD SM 5210B, EC (#) SM 9223B Confirmation, 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, NO<sub>2</sub>-N, NO<sub>3</sub>-N, Combined NO<sub>3</sub>+NO<sub>2</sub>  
Alk SM 2320B, NH<sub>3</sub>-N D6919-03, PO<sub>4</sub> SM 4500P-E, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D

Matrix: Non-Potable Water

Type: Grab

Date: 5/12/21  
Time: 0845

- A - PI 500ml NP, minimal hdspc
- B - PI Liter NP
- C - Sterile PI 125ml NaThio
- D - PI 500ml H<sub>2</sub>SO<sub>4</sub>
- E - PI 250ml NP
- F - PI 500ml Lab Filtered
- 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
- I - Vial Amber 40ml H<sub>3</sub>PO<sub>4</sub>, minimal hdspc

Relinquished By: [Signature] Date/Time: 5/12/21 1300

Received By: [Signature] Date/Time: 5-12-21 1315

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

Received By: [Signature] Date/Time: 5-12-21 1446

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

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

Sample Kit Prepared By: <u>JSV</u>	Date/Time: <u>4-28-21</u>
Sample Temp (°C): _____	Samples on Ice? <u>Yes</u> No NA
Approved By: <u>[Signature]</u>	Entered By: <u>[Signature]</u>



# M.J. Reider Associates, Inc.

2114821

Client Code: 3157

Project Manager: Richard A Wheeler

Client: Tetra Tech

Project: 2021 - Walter Reservoir

Comments:

Collected By:  
(Full Name)

Gregory Wacik

## 2114821-09 WA-6M

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 D6919-03, TOC SM 5310C, TSS SM 2540D, TDS SM 2540C, TKN EPA 351.2, PO<sub>4</sub> SM 4500P-E

Matrix: Non-Potable Water

Type: Grab

Date: 5/12/21  
Time: 0845

A - PI 500ml NP, minimal hdspc  
B - PI Liter NP  
C - PI 500ml H<sub>2</sub>SO<sub>4</sub>  
D - PI 250ml NP  
E - PI 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

## 2114821-10 WA-6D

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 D6919-03, PO<sub>4</sub> SM 4500P-E, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D

Matrix: Non-Potable Water

Type: Grab

Date: 5/12/21  
Time: 0845

A - PI 500ml NP, minimal hdspc  
B - PI Liter NP  
C - PI 500ml H<sub>2</sub>SO<sub>4</sub>  
D - PI 250ml NP  
E - PI 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

## 2114821-11 WA-7S

BOD SM 5210B, EC (#) SM 9223B Confirmation, 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, TC (#) SM 9223B  
Alk SM 2320B, NH<sub>3</sub>-N D6919-03, PO<sub>4</sub> SM 4500P-E, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D

Matrix: Non-Potable Water

Type: Grab

Date: 5/12/21  
Time: 0930

A - PI 500ml NP, minimal hdspc  
B - PI Liter NP  
C - Sterile PI 125ml NaThio  
D - PI 500ml H<sub>2</sub>SO<sub>4</sub>  
E - PI 250ml NP  
F - PI 500ml Lab Filtered  
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  
I - Vial Amber 40ml H<sub>3</sub>PO<sub>4</sub>, minimal hdspc

Relinquished By: [Signature] Date/Time: 5/12/21 1300

Received By: [Signature] Date/Time: 5-12-21 1315

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

Received By: [Signature] Date/Time: 5-12-21 1446

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

Received at Laboratory By: [Signature] 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: [Signature]	Date/Time: 4-28-21
Sample Temp (°C):	
Samples on Ice?	Yes No NA
Approved By: [Signature]	
Entered By: [Signature]	



# M.J. Reider Associates, Inc.

2114821

Client Code: 3157

Project Manager: Richard A Wheeler

Client: Tetra Tech

Project: 2021 - Walter Reservoir

Comments:

Collected By :

(Full Name)

Gregory Wacik

## 2114821-12 WA-7M

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, TSS SM 2540D, Alk SM 2320B, NH3-N D6919-03, PO4 SM 4500P-E, TKN EPA 351.2

Matrix: Non-Potable Water

Type: Grab

Date:

Time:

5/12/21

0930

- 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

## 2114821-13 WA-7D

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  
Alk SM 2320B, NH3-N D6919-03, PO4 SM 4500P-E, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D

Matrix: Non-Potable Water

Type: Grab

Date:

Time:

5/12/21

0930

- 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

5/12/21 1300

Received By

Date/Time

5-12-21 1300

Relinquished By

Date/Time

Received By

Date/Time

Relinquished By

Date/Time

Received at Laboratory By

Date/Time

5-12-21 1446

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
JSV @	4-28-21
Sample Temp (°C):	
Samples on Ice?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> 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.

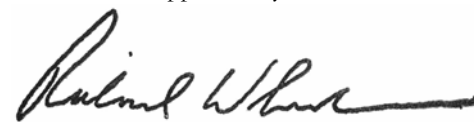
**Payment Terms**

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



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

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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.

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

# Certificate of Analysis

**Laboratory No.:** 2116075

**Report:** 06/21/21

**Lab Contact:** Richard A Wheeler

**Attention:** David Wertz

**Project:** 2021 - Walter Reservoir

**Reported To:** Tetra Tech

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

**Lab ID:** 2116075-01

**Collected By:** Client

**Sampled:** 06/09/21 10:15

**Received:** 06/09/21 14:00

**Sample Desc:** WA-1S

**Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst	
Dissolved General Chemistry									
Phosphorus as P, Dissolved	0.04	mg/l		0.01	SM 4500-P F	06/10/21	G-11, G-17	TML	
General Chemistry									
Alkalinity, Total to pH 4.5	7	mg CaCO3/L		2	SM 2320 B	06/14/21	C-51h	APR	
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	06/10/21	U	APR	
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	06/09/21 16:51	C-37	SWA	
Nitrate as N	0.20	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	06/09/21 23:12	J	JAF	
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	06/09/21 23:12	U	JAF	
Nitrate+Nitrite as N	<0.21	mg/l	0.108	1.10	CALCULATED	06/09/21 23:12		JAF	
Nitrogen, Total Kjeldahl (TKN)	<0.48	mg/l	0.48	0.50	EPA 351.2	06/12/21	U	TML	
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	06/15/21		TML	
Solids, Total Dissolved	51	mg/l	4	5	SM 2540 C	06/10/21		TMH	
Total Organic Carbon	5.2	mg/l	0.3	0.5	SM 5310 C	06/10/21		ALD	
Solids, Total Suspended	1	mg/l	1	1	SM 2540 D	06/10/21		ALD	
	Result	Unit	Rep. Limit		Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology									
Escherichia coli	6	mpn/100ml	1		SM 9223 B/Quantitray	6/9/21 15:00	6/10/21 15:26		JMW
Total Coliform	501	mpn/100ml	1		SM 9223 B/Quantitray	6/9/21 15:00	6/10/21 15:26		JMW



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Lab ID: 2116075-02      Collected By: Client      Sampled: 06/09/21 07:30      Received: 06/09/21 14:00  
Sample Desc: WA-2S      Sample Type: Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	0.05	mg/l		0.01	SM 4500-P F	06/10/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	6	mg CaCO <sub>3</sub> /L		2	SM 2320 B	06/14/21	C-51d	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	06/10/21	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	06/09/21 16:51	C-37	SWA
Nitrate as N	0.18	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	06/09/21 20:24	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	06/09/21 20:24	U	JAF
Nitrate+Nitrite as N	<0.19	mg/l	0.108	1.10	CALCULATED	06/09/21 20:24		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.48	mg/l	0.48	0.50	EPA 351.2	06/12/21	U	TML
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	06/15/21		TML
Solids, Total Dissolved	54	mg/l	4	5	SM 2540 C	06/10/21		TMH
Total Organic Carbon	4.6	mg/l	0.3	0.5	SM 5310 C	06/10/21		ALD
Solids, Total Suspended	<1	mg/l	1	1	SM 2540 D	06/10/21		ALD
Microbiology								
Escherichia coli	1	mpn/100ml	1		SM 9223 B/Quantitray	6/9/21 15:00	6/10/21 15:26	JMW
Total Coliform	1300	mpn/100ml	1		SM 9223 B/Quantitray	6/9/21 15:00	6/10/21 15:26	JMW



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M.J. Reider Associates, Inc.

Lab ID: 2116075-03      Collected By: Client      Sampled: 06/09/21 07:30      Received: 06/09/21 14:00  
Sample Desc: WA-2M      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	06/10/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	7	mg CaCO <sub>3</sub> /L		2	SM 2320 B	06/14/21	C-51f	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	06/10/21	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	06/09/21 16:51	C-37	SWA
Nitrate as N	0.20	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	06/09/21 22:39	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	06/09/21 22:39	U	JAF
Nitrate+Nitrite as N	<0.21	mg/l	0.108	1.10	CALCULATED	06/09/21 22:39		JAF
Nitrogen, Total Kjeldahl (TKN)	0.61	mg/l	0.48	0.50	EPA 351.2	06/16/21		TML
Phosphorus as P, Total	0.02	mg/l	0.01	0.01	SM 4500-P F	06/15/21		TML
Solids, Total Dissolved	61	mg/l	4	5	SM 2540 C	06/10/21		TMH
Total Organic Carbon	4.9	mg/l	0.3	0.5	SM 5310 C	06/10/21		ALD
Solids, Total Suspended	1	mg/l	1	1	SM 2540 D	06/10/21		ALD

Lab ID: 2116075-04      Collected By: Client      Sampled: 06/09/21 07:30      Received: 06/09/21 14:00  
Sample Desc: WA-2D      Sample Type: Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	0.02	mg/l		0.01	SM 4500-P F	06/10/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	8	mg CaCO <sub>3</sub> /L		2	SM 2320 B	06/14/21	C-51i	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	06/10/21	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	06/10/21 13:45		SWA
Nitrate as N	0.20	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	06/09/21 20:41	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	06/09/21 20:41	U	JAF
Nitrate+Nitrite as N	<0.21	mg/l	0.108	1.10	CALCULATED	06/09/21 20:41		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.48	mg/l	0.48	0.50	EPA 351.2	06/16/21	U	TML
Phosphorus as P, Total	0.04	mg/l	0.01	0.01	SM 4500-P F	06/15/21		TML
Solids, Total Dissolved	38	mg/l	4	5	SM 2540 C	06/10/21		TMH
Total Organic Carbon	5.7	mg/l	0.3	0.5	SM 5310 C	06/10/21		ALD
Solids, Total Suspended	2	mg/l	1	1	SM 2540 D	06/10/21		ALD



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Lab ID: 2116075-05      Collected By: Client      Sampled: 06/09/21 12:00      Received: 06/09/21 14:00  
Sample Desc: WA-3S      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	06/10/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	8	mg CaCO <sub>3</sub> /L		2	SM 2320 B	06/14/21	C-51k	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	06/10/21	U	APR
Biochemical Oxygen Demand	4.4	mg/l	2.0	2.0	SM 5210 B	06/10/21 13:45		SWA
Nitrate as N	0.18	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	06/09/21 21:48	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	06/09/21 21:48	U	JAF
Nitrate+Nitrite as N	<0.19	mg/l	0.108	1.10	CALCULATED	06/09/21 21:48		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.48	mg/l	0.48	0.50	EPA 351.2	06/16/21	U	TML
Phosphorus as P, Total	0.03	mg/l	0.01	0.01	SM 4500-P F	06/15/21		TML
Solids, Total Dissolved	57	mg/l	4	5	SM 2540 C	06/10/21		TMH
Total Organic Carbon	8.4	mg/l	0.3	0.5	SM 5310 C	06/10/21		ALD
Solids, Total Suspended	19	mg/l	1	1	SM 2540 D	06/10/21		ALD
Microbiology								
Escherichia coli	185	mpn/100ml	1		SM 9223 B/Quantitray	6/9/21 15:00	6/10/21 15:26	JMW
Total Coliform	>2420	mpn/100ml	1		SM 9223 B/Quantitray	6/9/21 15:00	6/10/21 15:26	JMW



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Lab ID: 2116075-06      Collected By: Client      Sampled: 06/09/21 11:10      Received: 06/09/21 14:00  
Sample Desc: WA-4S      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	06/10/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	10	mg CaCO <sub>3</sub> /L		2	SM 2320 B	06/14/21	C-51	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	06/10/21	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	06/09/21 16:51	C-37	SWA
Nitrate as N	0.20	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	06/09/21 22:55	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	06/09/21 22:55	U	JAF
Nitrate+Nitrite as N	<0.21	mg/l	0.108	1.10	CALCULATED	06/09/21 22:55		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.48	mg/l	0.48	0.50	EPA 351.2	06/16/21	U	TML
Phosphorus as P, Total	0.01	mg/l	0.01	0.01	SM 4500-P F	06/15/21		TML
Solids, Total Dissolved	71	mg/l	4	5	SM 2540 C	06/10/21		TMH
Total Organic Carbon	7.8	mg/l	0.3	0.5	SM 5310 C	06/10/21		ALD
Solids, Total Suspended	9	mg/l	1	1	SM 2540 D	06/10/21	Q-19	ALD
	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	866	mpn/100ml	1	SM 9223 B/Quantitray	6/9/21 15:00	6/10/21 15:26		JMW
Total Coliform	>2420	mpn/100ml	1	SM 9223 B/Quantitray	6/9/21 15:00	6/10/21 15:26		JMW



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M.J. Reider Associates, Inc.

Lab ID: 2116075-07      Collected By: Client      Sampled: 06/09/21 10:45      Received: 06/09/21 14:00  
Sample Desc: WA-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	06/10/21	G-11, G-17	TML
<b>General Chemistry</b>								
Alkalinity, Total to pH 4.5	4	mg CaCO <sub>3</sub> /L		2	SM 2320 B	06/14/21	C-51a	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	06/10/21	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	06/09/21 16:51	C-37	SWA
Nitrate as N	0.13	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	06/10/21 0:53	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	06/10/21 0:53	U	JAF
Nitrate+Nitrite as N	<0.14	mg/l	0.108	1.10	CALCULATED	06/10/21 0:53		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.48	mg/l	0.48	0.50	EPA 351.2	06/16/21	U	TML
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	06/15/21		TML
Solids, Total Dissolved	91	mg/l	4	5	SM 2540 C	06/10/21		TMH
Total Organic Carbon	4.5	mg/l	0.3	0.5	SM 5310 C	06/10/21		ALD
Solids, Total Suspended	1	mg/l	1	1	SM 2540 D	06/10/21		ALD
<b>Microbiology</b>								
Escherichia coli	42	mpn/100ml	1		SM 9223 B/Quantitray	6/9/21 15:00	6/10/21 15:26	JMW
Total Coliform	>2420	mpn/100ml	1		SM 9223 B/Quantitray	6/9/21 15:00	6/10/21 15:26	JMW



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

**Lab ID:** 2116075-08      **Collected By:** Client      **Sampled:** 06/09/21 08:30      **Received:** 06/09/21 14:00  
**Sample Desc:** WA-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	06/10/21	G-11, G-17	TML
<b>General Chemistry</b>								
Alkalinity, Total to pH 4.5	6	mg CaCO <sub>3</sub> /L		2	SM 2320 B	06/14/21	C-51b	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	06/10/21	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	06/09/21 16:51	C-37	SWA
Nitrate as N	0.18	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	06/09/21 20:58	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	06/09/21 20:58	U	JAF
Nitrate+Nitrite as N	<0.19	mg/l	0.108	1.10	CALCULATED	06/09/21 20:58		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.48	mg/l	0.48	0.50	EPA 351.2	06/16/21	U	TML
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	06/15/21		TML
Solids, Total Dissolved	62	mg/l	4	5	SM 2540 C	06/10/21		TMH
Total Organic Carbon	4.7	mg/l	0.3	0.5	SM 5310 C	06/10/21		ALD
Solids, Total Suspended	<1	mg/l	1	1	SM 2540 D	06/10/21		ALD
	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
<b>Microbiology</b>								
Escherichia coli	3	mpn/100ml	1	SM 9223 B/Quantitray	6/9/21 15:00	6/10/21 15:26		JMW
Total Coliform	1050	mpn/100ml	1	SM 9223 B/Quantitray	6/9/21 15:00	6/10/21 15:26		JMW



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**Lab ID:** 2116075-09    **Collected By:** Client    **Sampled:** 06/09/21 08:30    **Received:** 06/09/21 14:00  
**Sample Desc:** WA-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	06/10/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	6	mg CaCO <sub>3</sub> /L		2	SM 2320 B	06/14/21	C-51c	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	06/10/21	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	06/10/21 13:45		SWA
Nitrate as N	0.20	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	06/10/21 0:20	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	06/10/21 0:20	U	JAF
Nitrate+Nitrite as N	<0.21	mg/l	0.108	1.10	CALCULATED	06/10/21 0:20		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.48	mg/l	0.48	0.50	EPA 351.2	06/16/21	U	TML
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	06/15/21		TML
Solids, Total Dissolved	61	mg/l	4	5	SM 2540 C	06/10/21		TMH
Total Organic Carbon	4.7	mg/l	0.3	0.5	SM 5310 C	06/10/21		ALD
Solids, Total Suspended	<1	mg/l	1	1	SM 2540 D	06/10/21		ALD

**Lab ID:** 2116075-10    **Collected By:** Client    **Sampled:** 06/09/21 08:30    **Received:** 06/09/21 14:00  
**Sample Desc:** WA-6D    **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	06/10/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	6	mg CaCO <sub>3</sub> /L		2	SM 2320 B	06/14/21	C-51b	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	06/10/21	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	06/10/21 13:45		SWA
Nitrate as N	0.19	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	06/09/21 21:31	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	06/09/21 21:31	U	JAF
Nitrate+Nitrite as N	<0.20	mg/l	0.108	1.10	CALCULATED	06/09/21 21:31		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.48	mg/l	0.48	0.50	EPA 351.2	06/16/21	U	TML
Phosphorus as P, Total	0.02	mg/l	0.01	0.01	SM 4500-P F	06/15/21		TML
Solids, Total Dissolved	71	mg/l	4	5	SM 2540 C	06/10/21		TMH
Total Organic Carbon	4.7	mg/l	0.3	0.5	SM 5310 C	06/10/21		ALD
Solids, Total Suspended	<1	mg/l	1	1	SM 2540 D	06/10/21		ALD



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Lab ID: 2116075-11      Collected By: Client      Sampled: 06/09/21 09:30      Received: 06/09/21 14:00  
Sample Desc: WA-7S      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	06/10/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	6	mg CaCO <sub>3</sub> /L		2	SM 2320 B	06/14/21	C-51e	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	06/10/21	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	06/10/21 13:45		SWA
Nitrate as N	0.18	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	06/10/21 0:03	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	06/10/21 0:03	U	JAF
Nitrate+Nitrite as N	<0.19	mg/l	0.108	1.10	CALCULATED	06/10/21 0:03		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.48	mg/l	0.48	0.50	EPA 351.2	06/16/21	U	TML
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	06/15/21		TML
Solids, Total Dissolved	41	mg/l	4	5	SM 2540 C	06/10/21		TMH
Total Organic Carbon	4.4	mg/l	0.3	0.5	SM 5310 C	06/10/21		ALD
Solids, Total Suspended	<1	mg/l	1	1	SM 2540 D	06/10/21		ALD
Microbiology								
Escherichia coli	2	mpn/100ml	1		SM 9223 B/Quantitray	6/9/21 15:00	6/10/21 15:26	JMW
Total Coliform	1050	mpn/100ml	1		SM 9223 B/Quantitray	6/9/21 15:00	6/10/21 15:26	JMW



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

M.J. Reider Associates, Inc.

**Lab ID:** 2116075-12    **Collected By:** Client    **Sampled:** 06/09/21 09:30    **Received:** 06/09/21 14:00  
**Sample Desc:** WA-7M    **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	06/10/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	7	mg CaCO <sub>3</sub> /L		2	SM 2320 B	06/14/21	C-51g	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	06/10/21	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	06/09/21 16:51	C-37	SWA
Nitrate as N	0.19	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	06/10/21 0:36	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	06/10/21 0:36	U	JAF
Nitrate+Nitrite as N	<0.20	mg/l	0.108	1.10	CALCULATED	06/10/21 0:36		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.48	mg/l	0.48	0.50	EPA 351.2	06/16/21	Q-10, U	TML
Phosphorus as P, Total	0.09	mg/l	0.01	0.01	SM 4500-P F	06/15/21		TML
Solids, Total Dissolved	55	mg/l	4	5	SM 2540 C	06/10/21		TMH
Total Organic Carbon	4.8	mg/l	0.3	0.5	SM 5310 C	06/10/21		ALD
Solids, Total Suspended	<1	mg/l	1	1	SM 2540 D	06/10/21		ALD

**Lab ID:** 2116075-13    **Collected By:** Client    **Sampled:** 06/09/21 09:30    **Received:** 06/09/21 14:00  
**Sample Desc:** WA-7D    **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	06/10/21	Q-10a, G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	8	mg CaCO <sub>3</sub> /L		2	SM 2320 B	06/14/21	C-51j	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	06/10/21	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	06/09/21 16:51	C-37	SWA
Nitrate as N	0.20	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	06/09/21 21:15	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	06/09/21 21:15	U	JAF
Nitrate+Nitrite as N	<0.21	mg/l	0.108	1.10	CALCULATED	06/09/21 21:15		JAF
Nitrogen, Total Kjeldahl (TKN)	0.59	mg/l	0.48	0.50	EPA 351.2	06/16/21		TML
Phosphorus as P, Total	0.05	mg/l	0.01	0.01	SM 4500-P F	06/15/21		TML
Solids, Total Dissolved	65	mg/l	4	5	SM 2540 C	06/10/21		TMH
Total Organic Carbon	6.1	mg/l	0.3	0.5	SM 5310 C	06/10/21		ALD
Solids, Total Suspended	19	mg/l	1	1	SM 2540 D	06/10/21		ALD



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

**Preparation Methods**

Specific Method	Preparation Method	Prep Batch	Prepared Date	Prepared By
<b>2116075-01</b>				
<b>Dissolved General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B1F0505	06/09/2021	TML
<b>General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B1F0757	06/11/2021	TML
<b>2116075-02</b>				
<b>Dissolved General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B1F0505	06/09/2021	TML
<b>General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B1F0757	06/11/2021	TML
<b>2116075-03</b>				
<b>Dissolved General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B1F0505	06/09/2021	TML
<b>General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B1F0757	06/11/2021	TML
<b>2116075-04</b>				
<b>Dissolved General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B1F0505	06/09/2021	TML
<b>General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B1F0757	06/11/2021	TML
<b>2116075-05</b>				
<b>Dissolved General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B1F0505	06/09/2021	TML
<b>General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B1F0757	06/11/2021	TML
<b>2116075-06</b>				
<b>Dissolved General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B1F0505	06/09/2021	TML
<b>General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B1F0757	06/11/2021	TML
<b>2116075-07</b>				
<b>Dissolved General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B1F0505	06/09/2021	TML
<b>General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B1F0757	06/11/2021	TML
<b>2116075-08</b>				
<b>Dissolved General Chemistry</b>				



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SM 4500-P F	SM 4500-P B	B1F0505	06/09/2021	TML
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**General Chemistry**

SM 4500-P F	SM 4500-P B	B1F0757	06/11/2021	TML
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**2116075-09**

**Dissolved General Chemistry**

SM 4500-P F	SM 4500-P B	B1F0505	06/09/2021	TML
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**General Chemistry**

SM 4500-P F	SM 4500-P B	B1F0757	06/11/2021	TML
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**2116075-10**

**Dissolved General Chemistry**

SM 4500-P F	SM 4500-P B	B1F0505	06/09/2021	TML
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**General Chemistry**

SM 4500-P F	SM 4500-P B	B1F0757	06/11/2021	TML
-------------	-------------	---------	------------	-----

**2116075-11**

**Dissolved General Chemistry**

SM 4500-P F	SM 4500-P B	B1F0505	06/09/2021	TML
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**General Chemistry**

SM 4500-P F	SM 4500-P B	B1F0757	06/11/2021	TML
-------------	-------------	---------	------------	-----

**2116075-12**

**Dissolved General Chemistry**

SM 4500-P F	SM 4500-P B	B1F0505	06/09/2021	TML
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**General Chemistry**

SM 4500-P F	SM 4500-P B	B1F0757	06/11/2021	TML
-------------	-------------	---------	------------	-----

**2116075-13**

**Dissolved General Chemistry**

SM 4500-P F	SM 4500-P B	B1F0505	06/09/2021	TML
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**General Chemistry**

SM 4500-P F	SM 4500-P B	B1F0757	06/11/2021	TML
-------------	-------------	---------	------------	-----



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**Notes and Definitions**

- C-37 The dissolved oxygen depletion for the dilution water blank was greater than 0.20mg/L at 0.24mg/L.
- C-51 The alkalinity to pH 4.2 = 10.2 mg CaCO<sub>3</sub>/L.
- C-51a The alkalinity to pH 4.2 = 3.5 mg CaCO<sub>3</sub>/L.
- C-51b The alkalinity to pH 4.2 = 5.9 mg CaCO<sub>3</sub>/L.
- C-51c The alkalinity to pH 4.2 = 6.2 mg CaCO<sub>3</sub>/L.
- C-51d The alkalinity to pH 4.2 = 6.4 mg CaCO<sub>3</sub>/L.
- C-51e The alkalinity to pH 4.2 = 6.5 mg CaCO<sub>3</sub>/L.
- C-51f The alkalinity to pH 4.2 = 6.6 mg CaCO<sub>3</sub>/L.
- C-51g The alkalinity to pH 4.2 = 6.7 mg CaCO<sub>3</sub>/L.
- C-51h The alkalinity to pH 4.2 = 6.9 mg CaCO<sub>3</sub>/L.
- C-51i The alkalinity to pH 4.2 = 7.7 mg CaCO<sub>3</sub>/L.
- C-51j The alkalinity to pH 4.2 = 8.1 mg CaCO<sub>3</sub>/L.
- C-51k The alkalinity to pH 4.2 = 8.2 mg CaCO<sub>3</sub>/L.
- G-11 The sample was filtered after it was received at the laboratory.
- G-17 The sample was preserved in the laboratory.
- J Estimated value
- Q-10 The matrix spike(s) were outside acceptable limits of 90-110% recovery at 112%.
- Q-10a The matrix spike(s) were outside acceptable limits of 90-110% recovery at 75.8% and 72.9%.
- Q-19 The duplicate RPD was greater than 10% at 20.0%.
- U Analyte was not detected above the indicated value.



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**M.J. Reider Associates, Inc.**107 Angelica St, Reading PA, 19611  
610-374-5129 www.mjreider.com**WORK ORDER  
Chain of Custody****2116075**

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: 2021 - Walter Reservoir

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

Collected By: Gregory Wacik  
(Full Name)**2116075-01 WA-1S**BOD SM 5210B, EC (#) SM 9223B Confirmation, 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, TC (#) SM 9223B  
Alk SM 2320B, NH<sub>3</sub>-N D6919-03, 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: 6/9/21  
Time: 1015A - PI 500ml NP, minimal hdspc  
B - PI Liter NP  
C - Sterile PI 125ml NaThio  
D - PI 500ml H<sub>2</sub>SO<sub>4</sub>  
E - PI 250ml NP  
F - PI 500ml Lab Filtered  
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  
I - Vial Amber 40ml H<sub>3</sub>PO<sub>4</sub>, minimal hdspc**2116075-02 WA-2S**BOD SM 5210B, EC (#) SM 9223B Confirmation, 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, TC (#) SM 9223B  
Alk SM 2320B, NH<sub>3</sub>-N D6919-03, 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: 6/9/21  
Time: 0730A - PI 500ml NP, minimal hdspc  
B - PI Liter NP  
C - Sterile PI 125ml NaThio  
D - PI 500ml H<sub>2</sub>SO<sub>4</sub>  
E - PI 250ml NP  
F - PI 500ml Lab Filtered  
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  
I - Vial Amber 40ml H<sub>3</sub>PO<sub>4</sub>, minimal hdspcRelinquished By: [Signature] Date/Time: 6/9/21 1230Received By: Ben [Signature] Date/Time: 6-9-21 1230

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

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

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

Received at Laboratory By: Ben [Signature] Date/Time: 6-9-21 1400

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: <u>CML</u>	Date/Time <u>5/7</u>
Sample Temp (°C): Samples on Ice?	<u>5</u> Yes No NA
Approved By: <u>[Signature]</u>	
Entered By: <u>[Signature]</u>	



# M.J. Reider Associates, Inc.

2116075

Client Code: 3157

Client: Tetra Tech

Project Manager: Richard A Wheeler

Project: 2021 - Walter Reservoir

Comments:

Collected By:

(Full Name)

Gregory Wacik

Date: 6/9/21  
Time: 0730

Matrix: Non-Potable Water

Type: Grab

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

2116075-03 WA-2M

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  
PO4 SM 4500P-F, Alk SM 2320B, NH3-N D6919-03, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D

Date: 6/9/21  
Time: 0730

Matrix: Non-Potable Water

Type: Grab

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

2116075-04 WA-2D

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 D6919-03, PO4 SM 4500P-F, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D

Date: 6/9/21  
Time: 1200

Matrix: Non-Potable Water

Type: Grab

- A - Pl 500ml NP, minimal hdspe
- 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 hdspe
- H - Vial Amber 40ml H3PO4, minimal hdspe
- I - Vial Amber 40ml H3PO4, minimal hdspe

2116075-05 WA-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 D6919-03, PO4 SM 4500P-F, TOC SM 5310C, TSS SM 2540D, TDS SM 2540C, TKN EPA 351.2

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

Sample Kit Prepared By:	Date/Time
CML	5/7
Sample Temp (°C):	5
Samples on Ice?	Yes No NA
Approved By:	3521
Entered By:	



# M.J. Reider Associates, Inc.

2116075

Client Code: 3157

Project Manager: Richard A Wheeler

Client: Tetra Tech

Project: 2021 - Walter Reservoir

Comments:

Collected By :

(Full Name)

Gregory Wacik

Date: 6/9/21  
Time: 1110

## 2116075-06 WA-4S

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, TC (#) SM 9223B, EC (#) SM 9223B Confirmation, NO<sub>2</sub>-N EPA 300.0, NO<sub>3</sub>-N EPA 300.0  
Alk SM 2320B, PO<sub>4</sub> SM 4500P-F, NH<sub>3</sub>-N D6919-03, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D

Matrix: Non-Potable Water

Type: Grab

- A - Pl 500ml NP, minimal hdspc
- B - Pl Liter NP
- C - Sterile Pl 125ml NaThio
- D - Pl 500ml H<sub>2</sub>SO<sub>4</sub>
- E - Pl 250ml NP
- F - Pl 500ml Lab Filtered
- 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
- I - Vial Amber 40ml H<sub>3</sub>PO<sub>4</sub>, minimal hdspc

## 2116075-07 WA-5S

BOD SM 5210B, EC (#) SM 9223B Confirmation, 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, NO<sub>2</sub>-N, NO<sub>3</sub>-N, Combined NO<sub>3</sub>+NO<sub>2</sub>  
Alk SM 2320B, NH<sub>3</sub>-N D6919-03, 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

- A - Pl 500ml NP, minimal hdspc
- B - Pl Liter NP
- C - Sterile Pl 125ml NaThio
- D - Pl 500ml H<sub>2</sub>SO<sub>4</sub>
- E - Pl 250ml NP
- F - Pl 500ml Lab Filtered
- 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
- I - Vial Amber 40ml H<sub>3</sub>PO<sub>4</sub>, minimal hdspc

Date: 6/9/21  
Time: 1045

Relinquished By

Date/Time

6/9/21 1230

Received By

Date/Time

6-9-21 1230

Relinquished By

Date/Time

Received By

Date/Time

6-9-21 1400

Relinquished By

Date/Time

Received at Laboratory By

Date/Time

Sample Kit Prepared By:

Date/Time

CML

5/7

Sample Temp (°C):

Samples on Ice?

Approved By:

Entered By:

Yes No NA

BSW

SW

Page 16 of 19

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.

Page 3 of 5

Printed: 5/7/2021 8:29:32AM

Report Template: wko-WorkOrder COC 1s



# M.J. Reider Associates, Inc.

2116075

Client Code: 3157

Project Manager: Richard A Wheeler

Client: Tetra Tech

Project: 2021 - Walter Reservoir

Comments:

Collected By :

(Full Name)

*Gregory Wacik*

## 2116075-08 WA-6S

*JAF* *JAF* *epm*  
EC (#) SM 9223B Confirmation, 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>-P SM 4500P-F, TC (#) SM 9223B  
NH<sub>3</sub>-N D6919-03, Alk SM 2320B, 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:

Time:

*6/9/21*  
*0830*

A - PI 500ml NP, minimal hdspc  
B - PI Liter NP  
C - Sterile PI 125ml NaThio  
D - PI 500ml H<sub>2</sub>SO<sub>4</sub>  
E - PI 250ml NP  
F - PI 500ml Lab Filtered  
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  
I - Vial Amber 40ml H<sub>3</sub>PO<sub>4</sub>, minimal hdspc

## 2116075-09 WA-6M

*JAF* *JAF* *epm*  
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 D6919-03, 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:

Time:

*6/9/21*  
*0830*

A - PI 500ml NP, minimal hdspc  
B - PI Liter NP  
C - PI 500ml H<sub>2</sub>SO<sub>4</sub>  
D - PI 250ml NP  
E - PI 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

## 2116075-10 WA-6D

*JAF* *JAF* *epm*  
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 D6919-03, 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:

Time:

*6/9/21*  
*0830*

A - PI 500ml NP, minimal hdspc  
B - PI Liter NP  
C - PI 500ml H<sub>2</sub>SO<sub>4</sub>  
D - PI 250ml NP  
E - PI 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

Relinquished By

Date/Time

*6/9/21 1230*

Received By

Date/Time

*Bay North*

*6-9-21*

*1230 6-9-21 BSW*

Relinquished By

Date/Time

Received By

Date/Time

*Bay North*

*6-9-21*

*1400*

Relinquished By

Date/Time

Received at Laboratory By

Date/Time

Sample Kit Prepared By:	Date/Time
<i>CML</i>	<i>5/7</i>
Sample Temp (°C):	<i>5</i>
Samples on Ice?	<i>Yes</i> <i>No</i> <i>NA</i>
Approved By:	<i>B. S. W.</i>
Entered By:	<i>J</i>



# M.J. Reider Associates, Inc.

2116075

Client Code: 3157

Project Manager: Richard A Wheeler

Client: Tetra Tech

Project: 2021 - Walter Reservoir

Comments:

Collected By:

(Full Name)

Gregory Wacik

## 2116075-11 WA-7S

BOD SM 5210B, EC (#) SM 9223B Confirmation, 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, TC (#) SM 9223B  
PO<sub>4</sub> SM 4500P-F, Alk SM 2320B, NH<sub>3</sub>-N D6919-03, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D

Matrix: Non-Potable Water

Type: Grab

Date:

Time:

6/9/21  
0930

A - PI 500ml NP, minimal hdspe  
B - PI Liter NP  
C - Sterile PI 125ml NaThio  
D - PI 500ml H<sub>2</sub>SO<sub>4</sub>  
E - PI 250ml NP  
F - PI 500ml Lab Filtered  
G - Vial Amber 40ml H<sub>3</sub>PO<sub>4</sub>, minimal hdspe  
H - Vial Amber 40ml H<sub>3</sub>PO<sub>4</sub>, minimal hdspe  
I - Vial Amber 40ml H<sub>3</sub>PO<sub>4</sub>, minimal hdspe

## 2116075-12 WA-7M

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 D6919-03, 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:

Time:

6/9/21  
0930

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

## 2116075-13 WA-7D

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  
TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D, Alk SM 2320B, NH<sub>3</sub>-N D6919-03, PO<sub>4</sub> SM 4500P-F, TDS SM 2540C

Matrix: Non-Potable Water

Type: Grab

Date:

Time:

6/9/21  
0930

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

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.

Page 5 of 5

Printed: 5/7/2021 8:29:32AM

Sample Kit Prepared By:	Date/Time
CML	5/7
Sample Temp (°C):	5
Samples on Ice?	Yes No NA
Approved By:	BSW
Entered By:	

Report Template: wko WorkOrder COC Is

Page 18 of 19

**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.

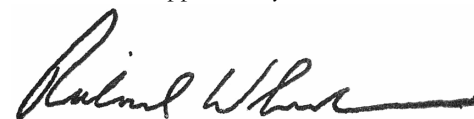
**Payment Terms**

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



# M.J. Reider Associates, Inc.

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

# Certificate of Analysis

**Laboratory No.:** 2119110

**Report:** 07/07/21

**Lab Contact:** Richard A Wheeler

**Attention:** David Wertz

**Project:** 2021 - Walter Reservoir

**Reported To:** Tetra Tech

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

**Lab ID:** 2119110-01

**Collected By:** Client

**Sampled:** 06/30/21 09:45

**Received:** 06/30/21 13:35

**Sample Desc:** WA-1S

**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	07/03/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	8	mg CaCO <sub>3</sub> /L		2	SM 2320 B	07/01/21	C-51j	MPB
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	07/01/21	U	RCE
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	06/30/21 16:50		ORS
Nitrate as N	0.25	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	06/30/21 16:51	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	06/30/21 16:51	U	JAF
Nitrate+Nitrite as N	<0.26	mg/l	0.108	1.10	CALCULATED	06/30/21 16:51		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2	07/06/21	U	SNF
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	07/02/21		TML
Solids, Total Dissolved	54	mg/l	4	5	SM 2540 C	07/01/21		TMH
Total Organic Carbon	4.9	mg/l	0.3	0.5	SM 5310 C	07/01/21		ALD
Solids, Total Suspended	1	mg/l	1	1	SM 2540 D	07/01/21		ALD
	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	<1	mpn/100ml	1	SM 9223 B/Quantitray	6/30/21 14:36	7/1/21 9:36		JMW
Total Coliform	>2420	mpn/100ml	1	SM 9223 B/Quantitray	6/30/21 14:36	7/1/21 9:36		JMW



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M.J. Reider Associates, Inc.

Lab ID: 2119110-02      Collected By: Client      Sampled: 06/30/21 07:35      Received: 06/30/21 13:35  
Sample Desc: WA-2S      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	07/03/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	7	mg CaCO <sub>3</sub> /L		2	SM 2320 B	07/01/21	C-51f	MPB
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	07/01/21	U	RCE
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	06/30/21 16:50		ORS
Nitrate as N	0.20	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	06/30/21 14:36	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	06/30/21 14:36	U	JAF
Nitrate+Nitrite as N	<0.21	mg/l	0.108	1.10	CALCULATED	06/30/21 14:36		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2	07/06/21	U	SNF
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	07/02/21		TML
Solids, Total Dissolved	44	mg/l	4	5	SM 2540 C	07/01/21		TMH
Total Organic Carbon	4.9	mg/l	0.3	0.5	SM 5310 C	07/01/21		ALD
Solids, Total Suspended	<1	mg/l	1	1	SM 2540 D	07/01/21		ALD
	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	2	mpn/100ml	1	SM 9223 B/Quantitray	6/30/21 14:36	7/1/21 9:36		JMW
Total Coliform	>2420	mpn/100ml	1	SM 9223 B/Quantitray	6/30/21 14:36	7/1/21 9:36		JMW



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M.J. Reider Associates, Inc.

Lab ID: 2119110-03 Collected By: Client Sampled: 06/30/21 07:35 Received: 06/30/21 13:35  
Sample Desc: WA-2M 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	07/03/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	7	mg CaCO <sub>3</sub> /L		2	SM 2320 B	07/01/21	C-51g	MPB
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	06/30/21	U	RCE
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	06/30/21 16:50		ORS
Nitrate as N	0.21	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	06/30/21 14:53	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	06/30/21 14:53	U	JAF
Nitrate+Nitrite as N	<0.22	mg/l	0.108	1.10	CALCULATED	06/30/21 14:53		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2	07/06/21	U	SNF
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	07/02/21		TML
Solids, Total Dissolved	40	mg/l	4	5	SM 2540 C	07/01/21		TMH
Total Organic Carbon	4.9	mg/l	0.3	0.5	SM 5310 C	07/01/21		ALD
Solids, Total Suspended	<1	mg/l	1	1	SM 2540 D	07/01/21		ALD

Lab ID: 2119110-04 Collected By: Client Sampled: 06/30/21 07:35 Received: 06/30/21 13:35  
Sample Desc: WA-2D 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	07/03/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	7	mg CaCO <sub>3</sub> /L		2	SM 2320 B	07/01/21	C-51f	MPB
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	07/01/21	U	RCE
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	06/30/21 16:50		ORS
Nitrate as N	0.22	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	06/30/21 15:10	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	06/30/21 15:10	U	JAF
Nitrate+Nitrite as N	<0.23	mg/l	0.108	1.10	CALCULATED	06/30/21 15:10		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2	07/06/21	U	SNF
Phosphorus as P, Total	0.10	mg/l	0.01	0.01	SM 4500-P F	07/02/21		TML
Solids, Total Dissolved	69	mg/l	4	5	SM 2540 C	07/01/21		TMH
Total Organic Carbon	5.6	mg/l	0.3	0.5	SM 5310 C	07/01/21		ALD
Solids, Total Suspended	<1	mg/l	1	1	SM 2540 D	07/01/21		ALD



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

**Lab ID:** 2119110-05      **Collected By:** Client      **Sampled:** 06/30/21 10:50      **Received:** 06/30/21 13:35  
**Sample Desc:** WA-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	07/03/21	G-11, G-17	TML
<b>General Chemistry</b>								
Alkalinity, Total to pH 4.5	10	mg CaCO <sub>3</sub> /L		2	SM 2320 B	07/01/21	C-511	MPB
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	06/30/21	U	RCE
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	06/30/21 16:50		ORS
Nitrate as N	0.22	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	06/30/21 15:27	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	06/30/21 15:27	U	JAF
Nitrate+Nitrite as N	<0.23	mg/l	0.108	1.10	CALCULATED	06/30/21 15:27		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2	07/06/21	U	SNF
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	07/02/21		TML
Solids, Total Dissolved	77	mg/l	4	5	SM 2540 C	07/01/21		TMH
Total Organic Carbon	5.1	mg/l	0.3	0.5	SM 5310 C	07/01/21		ALD
Solids, Total Suspended	2	mg/l	1	1	SM 2540 D	07/01/21		ALD
<b>Microbiology</b>								
Escherichia coli	17	mpn/100ml	1		SM 9223 B/Quantitray	6/30/21 14:36	7/1/21 9:36	JMW
Total Coliform	>2420	mpn/100ml	1		SM 9223 B/Quantitray	6/30/21 14:36	7/1/21 9:36	JMW



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M.J. Reider Associates, Inc.

Lab ID: 2119110-06      Collected By: Client      Sampled: 06/30/21 10:40      Received: 06/30/21 13:35  
Sample Desc: WA-4S      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	07/03/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	11	mg CaCO <sub>3</sub> /L		2	SM 2320 B	07/01/21	C-51	MPB
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	07/01/21	U	RCE
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	06/30/21 16:38		ORS
Nitrate as N	0.30	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	06/30/21 15:44	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	06/30/21 15:44	U	JAF
Nitrate+Nitrite as N	<0.31	mg/l	0.108	1.10	CALCULATED	06/30/21 15:44		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2	07/06/21	U	SNF
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	07/02/21		TML
Solids, Total Dissolved	61	mg/l	4	5	SM 2540 C	07/01/21		TMH
Total Organic Carbon	3.9	mg/l	0.3	0.5	SM 5310 C	07/01/21		ALD
Solids, Total Suspended	1	mg/l	1	1	SM 2540 D	07/01/21		ALD
Microbiology								
Escherichia coli	50	mpn/100ml	1		SM 9223 B/Quantitray	6/30/21 14:36	7/1/21 9:36	JMW
Total Coliform	>2420	mpn/100ml	1		SM 9223 B/Quantitray	6/30/21 14:36	7/1/21 9:36	JMW



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M.J. Reider Associates, Inc.

Lab ID: 2119110-07      Collected By: Client      Sampled: 06/30/21 10:10      Received: 06/30/21 13:35  
Sample Desc: WA-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	07/03/21	G-11, G-17	TML
<b>General Chemistry</b>								
Alkalinity, Total to pH 4.5	5	mg CaCO <sub>3</sub> /L		2	SM 2320 B	07/01/21	C-51a	MPB
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	06/30/21	U	RCE
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	06/30/21 16:38		ORS
Nitrate as N	0.20	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	06/30/21 16:00	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	06/30/21 16:00	U	JAF
Nitrate+Nitrite as N	<0.21	mg/l	0.108	1.10	CALCULATED	06/30/21 16:00		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2	07/06/21	U	SNF
Phosphorus as P, Total	0.01	mg/l	0.01	0.01	SM 4500-P F	07/02/21		TML
Solids, Total Dissolved	56	mg/l	4	5	SM 2540 C	07/01/21		TMH
Total Organic Carbon	4.0	mg/l	0.3	0.5	SM 5310 C	07/01/21		ALD
Solids, Total Suspended	<1	mg/l	1	1	SM 2540 D	07/01/21		ALD
<b>Microbiology</b>								
Escherichia coli	>2420	mpn/100ml	1		SM 9223 B/Quantitray	6/30/21 14:36	7/1/21 9:36	JMW
Total Coliform	>2420	mpn/100ml	1		SM 9223 B/Quantitray	6/30/21 14:36	7/1/21 9:36	JMW



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M.J. Reider Associates, Inc.

Lab ID: 2119110-08      Collected By: Client      Sampled: 06/30/21 08:10      Received: 06/30/21 13:35  
Sample Desc: WA-6S      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	07/03/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	8	mg CaCO <sub>3</sub> /L		2	SM 2320 B	07/01/21	C-51k	MPB
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	07/01/21	U	RCE
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	06/30/21 16:38		ORS
Nitrate as N	0.21	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	06/30/21 17:08	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	06/30/21 17:08	U	JAF
Nitrate+Nitrite as N	<0.22	mg/l	0.108	1.10	CALCULATED	06/30/21 17:08		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2	07/06/21	U	SNF
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	07/02/21		TML
Solids, Total Dissolved	59	mg/l	4	5	SM 2540 C	07/01/21		TMH
Total Organic Carbon	4.9	mg/l	0.3	0.5	SM 5310 C	07/01/21		ALD
Solids, Total Suspended	<1	mg/l	1	1	SM 2540 D	07/01/21		ALD
Microbiology								
Escherichia coli	<1	mpn/100ml	1		SM 9223 B/Quantitray	6/30/21 14:36	7/1/21 9:36	JMW
Total Coliform	>2420	mpn/100ml	1		SM 9223 B/Quantitray	6/30/21 14:36	7/1/21 9:36	JMW



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M.J. Reider Associates, Inc.

Lab ID: 2119110-09 Collected By: Client Sampled: 06/30/21 08:10 Received: 06/30/21 13:35  
Sample Desc: WA-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	07/03/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	8	mg CaCO <sub>3</sub> /L		2	SM 2320 B	07/01/21	C-51h	MPB
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	07/01/21	U	RCE
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	06/30/21 16:50		ORS
Nitrate as N	0.21	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	06/30/21 17:25	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	06/30/21 17:25	U	JAF
Nitrate+Nitrite as N	<0.22	mg/l	0.108	1.10	CALCULATED	06/30/21 17:25		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2	07/06/21	U	SNF
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	07/02/21		TML
Solids, Total Dissolved	64	mg/l	4	5	SM 2540 C	07/01/21		TMH
Total Organic Carbon	4.9	mg/l	0.3	0.5	SM 5310 C	07/01/21		ALD
Solids, Total Suspended	1	mg/l	1	1	SM 2540 D	07/01/21		ALD

Lab ID: 2119110-10 Collected By: Client Sampled: 06/30/21 08:10 Received: 06/30/21 13:35  
Sample Desc: WA-6D 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	07/03/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	8	mg CaCO <sub>3</sub> /L		2	SM 2320 B	07/01/21	C-51i	MPB
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	07/01/21	U	RCE
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	06/30/21 16:38		ORS
Nitrate as N	0.23	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	06/30/21 17:41	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	06/30/21 17:41	U	JAF
Nitrate+Nitrite as N	<0.24	mg/l	0.108	1.10	CALCULATED	06/30/21 17:41		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2	07/06/21	U	SNF
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	07/02/21		TML
Solids, Total Dissolved	64	mg/l	4	5	SM 2540 C	07/01/21		TMH
Total Organic Carbon	5.3	mg/l	0.3	0.5	SM 5310 C	07/01/21		ALD
Solids, Total Suspended	<1	mg/l	1	1	SM 2540 D	07/01/21		ALD



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M.J. Reider Associates, Inc.

Lab ID: 2119110-11      Collected By: Client      Sampled: 06/30/21 08:40      Received: 06/30/21 13:35  
Sample Desc: WA-7S      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	07/03/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	7	mg CaCO <sub>3</sub> /L		2	SM 2320 B	07/01/21	C-51c	MPB
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	07/01/21	U	RCE
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	06/30/21 16:38		ORS
Nitrate as N	0.19	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	06/30/21 17:58	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	06/30/21 17:58	U	JAF
Nitrate+Nitrite as N	<0.20	mg/l	0.108	1.10	CALCULATED	06/30/21 17:58		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2	07/06/21	U	SNF
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	07/02/21		TML
Solids, Total Dissolved	59	mg/l	4	5	SM 2540 C	07/01/21		TMH
Total Organic Carbon	4.9	mg/l	0.3	0.5	SM 5310 C	07/01/21		ALD
Solids, Total Suspended	2	mg/l	1	1	SM 2540 D	07/01/21		ALD
Microbiology								
Escherichia coli	11	mpn/100ml	1		SM 9223 B/Quantitray	6/30/21 14:36	7/1/21 9:36	JMW
Total Coliform	>2420	mpn/100ml	1		SM 9223 B/Quantitray	6/30/21 14:36	7/1/21 9:36	JMW



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M.J. Reider Associates, Inc.

Lab ID: 2119110-12      Collected By: Client      Sampled: 06/30/21 08:40      Received: 06/30/21 13:35  
Sample Desc: WA-7M      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	07/03/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	7	mg CaCO <sub>3</sub> /L		2	SM 2320 B	07/01/21	C-51d	MPB
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	07/01/21	U	RCE
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	06/30/21 16:38		ORS
Nitrate as N	0.20	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	06/30/21 18:15	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	06/30/21 18:15	U	JAF
Nitrate+Nitrite as N	<0.21	mg/l	0.108	1.10	CALCULATED	06/30/21 18:15		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2	07/06/21	U	SNF
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	07/02/21		TML
Solids, Total Dissolved	62	mg/l	4	5	SM 2540 C	07/01/21		TMH
Total Organic Carbon	4.9	mg/l	0.3	0.5	SM 5310 C	07/01/21		ALD
Solids, Total Suspended	1	mg/l	1	1	SM 2540 D	07/01/21		ALD

Lab ID: 2119110-13      Collected By: Client      Sampled: 06/30/21 08:40      Received: 06/30/21 13:35  
Sample Desc: WA-7D      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	07/03/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	7	mg CaCO <sub>3</sub> /L		2	SM 2320 B	07/01/21	C-51b	MPB
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	07/01/21	U	RCE
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	06/30/21 16:38		ORS
Nitrate as N	0.20	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	06/30/21 18:32	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	06/30/21 18:32	U	JAF
Nitrate+Nitrite as N	<0.21	mg/l	0.108	1.10	CALCULATED	06/30/21 18:32		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2	07/06/21	U	SNF
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	07/02/21		TML
Solids, Total Dissolved	63	mg/l	4	5	SM 2540 C	07/01/21		TMH
Total Organic Carbon	4.8	mg/l	0.3	0.5	SM 5310 C	07/01/21		ALD
Solids, Total Suspended	<1	mg/l	1	1	SM 2540 D	07/01/21		ALD



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## M.J. Reider Associates, Inc.

## Preparation Methods

Specific Method	Preparation Method	Prep Batch	Prepared Date	Prepared By
<b>2119110-01</b>				
<b>Dissolved General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B1G0015	07/01/2021	TML
<b>General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B1G0044	07/01/2021	TML
<b>2119110-02</b>				
<b>Dissolved General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B1G0015	07/01/2021	TML
<b>General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B1G0044	07/01/2021	TML
<b>2119110-03</b>				
<b>Dissolved General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B1G0015	07/01/2021	TML
<b>General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B1G0044	07/01/2021	TML
<b>2119110-04</b>				
<b>Dissolved General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B1G0015	07/01/2021	TML
<b>General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B1G0044	07/01/2021	TML
<b>2119110-05</b>				
<b>Dissolved General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B1G0015	07/01/2021	TML
<b>General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B1G0044	07/01/2021	TML
<b>2119110-06</b>				
<b>Dissolved General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B1G0015	07/01/2021	TML
<b>General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B1G0044	07/01/2021	TML
<b>2119110-07</b>				
<b>Dissolved General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B1G0015	07/01/2021	TML
<b>General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B1G0044	07/01/2021	TML
<b>2119110-08</b>				
<b>Dissolved General Chemistry</b>				



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SM 4500-P F	SM 4500-P B	B1G0015	07/01/2021	TML
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**General Chemistry**

SM 4500-P F	SM 4500-P B	B1G0044	07/01/2021	TML
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**2119110-09**

**Dissolved General Chemistry**

SM 4500-P F	SM 4500-P B	B1G0015	07/01/2021	TML
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**General Chemistry**

SM 4500-P F	SM 4500-P B	B1G0044	07/01/2021	TML
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**2119110-10**

**Dissolved General Chemistry**

SM 4500-P F	SM 4500-P B	B1G0015	07/01/2021	TML
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**General Chemistry**

SM 4500-P F	SM 4500-P B	B1G0044	07/01/2021	TML
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**2119110-11**

**Dissolved General Chemistry**

SM 4500-P F	SM 4500-P B	B1G0015	07/01/2021	TML
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**General Chemistry**

SM 4500-P F	SM 4500-P B	B1G0044	07/01/2021	TML
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**2119110-12**

**Dissolved General Chemistry**

SM 4500-P F	SM 4500-P B	B1G0101	07/02/2021	TML
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**General Chemistry**

SM 4500-P F	SM 4500-P B	B1G0044	07/01/2021	TML
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**2119110-13**

**Dissolved General Chemistry**

SM 4500-P F	SM 4500-P B	B1G0101	07/02/2021	TML
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**General Chemistry**

SM 4500-P F	SM 4500-P B	B1G0044	07/01/2021	TML
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**Notes and Definitions**

- C-51 The alkalinity to pH 4.2=10.6 mg CaCO<sub>3</sub>/L.  
C-51a The alkalinity to pH 4.2=4.4 mg CaCO<sub>3</sub>/L.  
C-51b The alkalinity to pH 4.2=6.6 mg CaCO<sub>3</sub>/L.  
C-51c The alkalinity to pH 4.2=6.7 mg CaCO<sub>3</sub>/L.  
C-51d The alkalinity to pH 4.2=6.8 mg CaCO<sub>3</sub>/L.  
C-51f The alkalinity to pH 4.2=7.1 mg CaCO<sub>3</sub>/L.  
C-51g The alkalinity to pH 4.2=7.2 mg CaCO<sub>3</sub>/L.  
C-51h The alkalinity to pH 4.2=7.4 mg CaCO<sub>3</sub>/L.  
C-51i The alkalinity to pH 4.2=7.7 mg CaCO<sub>3</sub>/L.  
C-51j The alkalinity to pH 4.2=7.8 mg CaCO<sub>3</sub>/L.  
C-51k The alkalinity to pH 4.2=8.0 mg CaCO<sub>3</sub>/L.  
C-51l The alkalinity to pH 4.2=9.4 mg CaCO<sub>3</sub>/L.  
G-11 The sample was filtered after it was received at the laboratory.  
G-17 The sample was preserved in the laboratory.  
J Estimated value  
U Analyte was not detected above the indicated value.



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610-374-5129 www.mjreider.com**WORK ORDER  
Chain of Custody****2119110**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: **2021 - Walter Reservoir**

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

Collected By :  
(Full Name)Gregory Wacik**2119110-01 WA-1S**BOD SM 5210B, EC (#) SM 9223B Confirmation, 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, TC (#) SM 9223B  
Alk SM 2320B, NH<sub>3</sub>-N D6919-03, NDS 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: 6/30/21Time: 0945

- A - PI 500ml NP, minimal hdspe
- B - PI Liter NP
- C - Sterile PI 125ml NaThio
- D - PI 500ml H<sub>2</sub>SO<sub>4</sub>
- E - PI 250ml NP
- F - PI 500ml Lab Filtered
- G - Vial Amber 40ml H<sub>3</sub>PO<sub>4</sub>, minimal hdspe
- H - Vial Amber 40ml H<sub>3</sub>PO<sub>4</sub>, minimal hdspe
- I - Vial Amber 40ml H<sub>3</sub>PO<sub>4</sub>, minimal hdspe

**2119110-02 WA-2S**BOD SM 5210B, EC (#) SM 9223B Confirmation, 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, TC (#) SM 9223B  
Alk SM 2320B, NH<sub>3</sub>-N D6919-03, 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: 6/30/21Time: 0735

- A - PI 500ml NP, minimal hdspe
- B - PI Liter NP
- C - Sterile PI 125ml NaThio
- D - PI 500ml H<sub>2</sub>SO<sub>4</sub>
- E - PI 250ml NP
- F - PI 500ml Lab Filtered
- G - Vial Amber 40ml H<sub>3</sub>PO<sub>4</sub>, minimal hdspe
- H - Vial Amber 40ml H<sub>3</sub>PO<sub>4</sub>, minimal hdspe
- I - Vial Amber 40ml H<sub>3</sub>PO<sub>4</sub>, minimal hdspe

Relinquished By: [Signature] Date/Time: 6/30/21 1200Received By: By N/A Date/Time: 6-30-21 1210

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

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

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

Received at Laboratory By: By N/A Date/Time: 6-30-21 1335

Sample Kit Prepared By: <u>JS / sn</u>	Date/Time: <u>6/3/21</u>
Sample Temp (°C): <u>9</u>	
Samples on Ice? <u>Yes</u>	No <u>NA</u>
Approved By: <u>[Signature]</u>	
Entered By: <u>[Signature]</u>	Page 14 of 19



# M.J. Reider Associates, Inc.

2119110

Client Code: 3157

Project Manager: Richard A Wheeler

Client: Tetra Tech

Project: 2021 - Walter Reservoir

Comments:

Collected By :

(Full Name)

Gregory Wacik

## 2119110-03 WA-2M

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 D6919-03, 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: 6/30/21  
Time: 0735

A - Pl 500ml NP, minimal hdspe  
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 hdspe  
G - Vial Amber 40ml H<sub>3</sub>PO<sub>4</sub>, minimal hdspe  
H - Vial Amber 40ml H<sub>3</sub>PO<sub>4</sub>, minimal hdspe

## 2119110-04 WA-2D

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 D6919-03, PO<sub>4</sub> SM 4500P-F, TDS SM 2540C, TOC SM 5310C, TSS SM 2540D, TKN EPA 351.2

Matrix: Non-Potable Water

Type: Grab

Date: 6/30/21  
Time: 0735

A - Pl 500ml NP, minimal hdspe  
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 hdspe  
G - Vial Amber 40ml H<sub>3</sub>PO<sub>4</sub>, minimal hdspe  
H - Vial Amber 40ml H<sub>3</sub>PO<sub>4</sub>, minimal hdspe

## 2119110-05 WA-3S

BOD SM 5210B, EC (#) SM 9223B Confirmation, 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, TC (#) SM 9223B  
Alk SM 2320B, NH<sub>3</sub>-N D6919-03, PO<sub>4</sub> SM 4500P-F, TOC SM 5310C, TSS SM 2540D, TDS SM 2540C, TKN EPA 351.2

Matrix: Non-Potable Water

Type: Grab

Date: 6/30/21  
Time: 1050

A - Pl 500ml NP, minimal hdspe  
B - Pl Liter NP  
C - Sterile Pl 125ml NaThio  
D - Pl 500ml H<sub>2</sub>SO<sub>4</sub>  
E - Pl 250ml NP  
F - Pl 500ml Lab Filtered  
G - Vial Amber 40ml H<sub>3</sub>PO<sub>4</sub>, minimal hdspe  
H - Vial Amber 40ml H<sub>3</sub>PO<sub>4</sub>, minimal hdspe  
I - Vial Amber 40ml H<sub>3</sub>PO<sub>4</sub>, minimal hdspe

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

Sample Kit Prepared By:	Date/Time
JS/er	6/3/21
Sample Temp (°C):	9
Samples on Ice?	Yes No NA
Approved By:	ASW
Entered By:	A



# M.J. Reider Associates, Inc.

2119110

Client Code: 3157

Project Manager: Richard A Wheeler

Client: Tetra Tech

Project: 2021 - Walter Reservoir

Comments:

Collected By :

(Full Name)

*Gregory Wacik*

## 2119110-06 WA-4S

*gms*  
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, TC (#) SM 9223B, EC (#) SM 9223B Confirmation, NO<sub>2</sub>-N EPA 300.0, NO<sub>3</sub>-N EPA 300.0  
Alk SM 2320B, PO<sub>4</sub> SM 4500P-F, NH<sub>3</sub>-N D6919-03, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D

Matrix: Non-Potable Water

Type: Grab

Date: *6/30/21*  
Time: *1040*

- A - Pl 500ml NP, minimal hdspe
- B - Pl Liter NP
- C - Sterile Pl 125ml NaThio
- D - Pl 500ml H<sub>2</sub>SO<sub>4</sub>
- E - Pl 250ml NP
- F - Pl 500ml Lab Filtered
- G - Vial Amber 40ml H<sub>3</sub>PO<sub>4</sub>, minimal hdspe
- H - Vial Amber 40ml H<sub>3</sub>PO<sub>4</sub>, minimal hdspe
- I - Vial Amber 40ml H<sub>3</sub>PO<sub>4</sub>, minimal hdspe

## 2119110-07 WA-5S

*gms*  
BOD SM 5210B, EC (#) SM 9223B Confirmation, 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, TC (#) SM 9223B  
TOC SM 5310C, TSS SM 2540D, Alk SM 2320B, NH<sub>3</sub>-N D6919-03, TDS SM 2540C, TKN EPA 351.2, PO<sub>4</sub> SM 4500P-F

Matrix: Non-Potable Water

Type: Grab

Date: *6/30/21*  
Time: *1010*

- A - Pl 500ml NP, minimal hdspe
- B - Pl Liter NP
- C - Sterile Pl 125ml NaThio
- D - Pl 500ml H<sub>2</sub>SO<sub>4</sub>
- E - Pl 250ml NP
- F - Pl 500ml Lab Filtered
- G - Vial Amber 40ml H<sub>3</sub>PO<sub>4</sub>, minimal hdspe
- H - Vial Amber 40ml H<sub>3</sub>PO<sub>4</sub>, minimal hdspe
- I - Vial Amber 40ml H<sub>3</sub>PO<sub>4</sub>, minimal hdspe

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

Sample Kit Prepared By:	Date/Time
<i>SS/8r</i>	<i>6/30/21</i>
Sample Temp (°C):	<i>9</i>
Samples on Ice?	<input checked="" type="radio"/> Yes <input type="radio"/> No <input type="radio"/> NA
Approved By:	<i>ASW</i>
Entered By:	



# M.J. Reider Associates, Inc.

2119110

Client Code: 3157

Client: Tetra Tech

Project Manager: Richard A Wheeler

Project: 2021 - Walter Reservoir

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

Collected By :

(Full Name)

*Gregory Wacik*

## 2119110-08 WA-6S

*SWW*  
BOD SM 5210B, NO<sub>3</sub>-N EPA 300.0, PO<sub>4</sub>-D SM 4500P-F, TC (#) SM 9223B, NO<sub>2</sub>-N EPA 300.0, EC (#) SM 9223B  
Confirmation, NO<sub>2</sub>-N, NO<sub>3</sub>-N, Combined NO<sub>3</sub>+NO<sub>2</sub>  
TOC SM 5310C, TSS SM 2540D, TDS SM 2540C, Alk SM 2320B, NH<sub>3</sub>-N D6919-03, PO<sub>4</sub> SM 4500P-F, TKN EPA 351.2

Matrix: Non-Potable Water

Type: Grab

Date: *6/30/21*

Time: *0810*

- A - Pl 500ml NP, minimal hdspc
- B - Pl Liter NP
- C - Sterile Pl 125ml NaThio
- D - Pl 500ml H<sub>2</sub>SO<sub>4</sub>
- E - Pl 250ml NP
- F - Pl 500ml Lab Filtered
- 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
- I - Vial Amber 40ml H<sub>3</sub>PO<sub>4</sub>, minimal hdspc

## 2119110-09 WA-6M

*SWW*  
PO<sub>4</sub>-D SM 4500P-F, 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>  
Alk SM 2320B, TDS SM 2540C, TOC SM 5310C, TSS SM 2540D, TKN EPA 351.2, PO<sub>4</sub> SM 4500P-F, NH<sub>3</sub>-N  
D6919-03

Matrix: Non-Potable Water

Type: Grab

Date: *6/30/21*

Time: *0810*

- 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

## 2119110-10 WA-6D

*SWW*  
NO<sub>2</sub>-N EPA 300.0, BOD SM 5210B, 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>  
Alk SM 2320B, NH<sub>3</sub>-N D6919-03, TDS SM 2540C, TOC SM 5310C, TSS SM 2540D, TKN EPA 351.2, PO<sub>4</sub> SM  
4500P-F

Matrix: Non-Potable Water

Type: Grab

Date: *6/30/21*

Time: *0810*

- 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

Relinquished By *Gregory Wacik* Date/Time *6/30/21 1200*

Received By *Ben Webb* Date/Time *6-30-21 1210*

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

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

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

Received at Laboratory By *Ben Webb* Date/Time *6-30-21 1335*

Sample Kit Prepared By: <i>SWW / SWW</i>	Date/Time <i>6/3/21</i>
Sample Temp (°C): <i>9</i>	
Samples on Ice?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> NA <input type="checkbox"/>
Approved By:	<i>Ben Webb</i>
Entered By:	<i>Ben Webb</i>



# M.J. Reider Associates, Inc.

2119110

Client Code: 3157

Client: Tetra Tech

Project Manager: Richard A Wheeler

Project: 2021 - Walter Reservoir

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

Collected By :

(Full Name)

*Gregory Wacik*

## 2119110-11 WA-7S

*Sum*  
BOD SM 5210B, EC (#) SM 9223B Confirmation, 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, TC (#) SM 9223B  
Alk SM 2320B, NH<sub>3</sub>-N D6919-03, 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:

Time:

*6/30/21*

*0840*

A - Pl 500ml NP, minimal hdspe  
B - Pl Liter NP  
C - Sterile Pl 125ml NaThio  
D - Pl 500ml H<sub>2</sub>SO<sub>4</sub>  
E - Pl 250ml NP  
F - Pl 500ml Lab Filtered  
G - Vial Amber 40ml H<sub>3</sub>PO<sub>4</sub>, minimal hdspe  
H - Vial Amber 40ml H<sub>3</sub>PO<sub>4</sub>, minimal hdspe  
I - Vial Amber 40ml H<sub>3</sub>PO<sub>4</sub>, minimal hdspe

## 2119110-12 WA-7M

*Sum*  
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, BOD SM 5210B  
TKN EPA 351.2, TDS SM 2540C, TOC SM 5310C, TSS SM 2540D, Alk SM 2320B, NH<sub>3</sub>-N D6919-03, PO<sub>4</sub> SM 4500P-F

Matrix: Non-Potable Water

Type: Grab

Date:

Time:

*6/30/21*

*0840*

A - Pl 500ml NP, minimal hdspe  
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 hdspe  
G - Vial Amber 40ml H<sub>3</sub>PO<sub>4</sub>, minimal hdspe  
H - Vial Amber 40ml H<sub>3</sub>PO<sub>4</sub>, minimal hdspe

## 2119110-13 WA-7D

*Sum*  
BOD SM 5210B, NO<sub>2</sub>-N EPA 300.0, NO<sub>3</sub>-N EPA 300.0, PO<sub>4</sub>-D SM 4500P-F, NO<sub>2</sub>-N, NO<sub>3</sub>-N, Combined NO<sub>3</sub>+NO<sub>2</sub>  
PO<sub>4</sub> SM 4500P-F, TKN EPA 351.2, Alk SM 2320B, TDS SM 2540C, TOC SM 5310C, TSS SM 2540D, NH<sub>3</sub>-N D6919-03

Matrix: Non-Potable Water

Type: Grab

Date:

Time:

*6/30/21*

*0840*

A - Pl 500ml NP, minimal hdspe  
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 hdspe  
G - Vial Amber 40ml H<sub>3</sub>PO<sub>4</sub>, minimal hdspe  
H - Vial Amber 40ml H<sub>3</sub>PO<sub>4</sub>, minimal hdspe

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

Sample Kit Prepared By:	Date/Time
<i>SW / SR</i>	<i>6/3/21</i>
Sample Temp (°C):	
Samples on Ice?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> NA <input type="checkbox"/>
Approved By:	
Entered By:	

Page 18 of 19

**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.

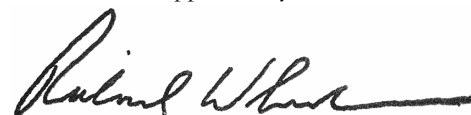
**Payment Terms**

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)



# M.J. Reider Associates, Inc.

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

# Certificate of Analysis

**Laboratory No.:** 2122142

**Report:** 07/29/21

**Lab Contact:** Richard A Wheeler

**Attention:** David Wertz

**Project:** 2021 - Walter Reservoir

**Reported To:** Tetra Tech

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

**Lab ID:** 2122142-01

**Collected By:** Client

**Sampled:** 07/21/21 09:25

**Received:** 07/21/21 14:25

**Sample Desc:** WA-1S

**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	07/28/21	G-11, G-17	TML	
General Chemistry									
Alkalinity, Total to pH 4.5	9	mg CaCO3/L		2	SM 2320 B	07/22/21	C-51h	APR	
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	07/22/21	U	APR	
Biochemical Oxygen Demand	2.3	mg/l	2.0	2.0	SM 5210 B	07/21/21 17:14	C-37	SLP	
Nitrate as N	0.26	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	07/21/21 23:24	J	JAF	
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	07/21/21 23:24	U	JAF	
Nitrate+Nitrite as N	<0.27	mg/l	0.119	1.10	CALCULATED	07/21/21 23:24		JAF	
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2	07/26/21	U	TML	
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	07/27/21		TML	
Solids, Total Dissolved	60	mg/l	4	5	SM 2540 C	07/22/21		TMH	
Total Organic Carbon	6.7	mg/l	0.3	0.5	SM 5310 C	07/22/21		ALD	
Solids, Total Suspended	2	mg/l	1	1	SM 2540 D	07/22/21		ALD	
	Result	Unit	Rep. Limit		Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology									
Escherichia coli	3	mpn/100ml	1		SM 9223 B/Quantitray	7/21/21 15:29	7/22/21 10:05		DRW
Total Coliform	>2420	mpn/100ml	1		SM 9223 B/Quantitray	7/21/21 15:29	7/22/21 10:05		DRW



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

**Lab ID:** 2122142-02      **Collected By:** Client      **Sampled:** 07/21/21 07:45      **Received:** 07/21/21 14:25  
**Sample Desc:** WA-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	07/28/21	G-11, G-17	TML
<b>General Chemistry</b>								
Alkalinity, Total to pH 4.5	8	mg CaCO <sub>3</sub> /L		2	SM 2320 B	07/22/21	C-51b	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	07/22/21	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	07/21/21 17:14	C-37	SLP
Nitrate as N	0.23	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	07/21/21 23:58	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	07/21/21 23:58	U	JAF
Nitrate+Nitrite as N	<0.24	mg/l	0.119	1.10	CALCULATED	07/21/21 23:58		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2	07/26/21	U	TML
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	07/27/21		TML
Solids, Total Dissolved	61	mg/l	4	5	SM 2540 C	07/22/21		TMH
Total Organic Carbon	5.0	mg/l	0.3	0.5	SM 5310 C	07/22/21		ALD
Solids, Total Suspended	<1	mg/l	1	1	SM 2540 D	07/22/21		ALD
<b>Microbiology</b>								
Escherichia coli	1	mpn/100ml	1		SM 9223 B/Quantitray	7/21/21 15:29	7/22/21 10:05	DRW
Total Coliform	>2420	mpn/100ml	1		SM 9223 B/Quantitray	7/21/21 15:29	7/22/21 10:05	DRW



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**Lab ID:** 2122142-03      **Collected By:** Client      **Sampled:** 07/21/21 07:45      **Received:** 07/21/21 14:25  
**Sample Desc:** WA-2M      **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	07/28/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	8	mg CaCO <sub>3</sub> /L		2	SM 2320 B	07/22/21	C-51e	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	07/22/21	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	07/21/21 17:14	C-37	SLP
Nitrate as N	0.23	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	07/22/21 1:39	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	07/22/21 1:39	U	JAF
Nitrate+Nitrite as N	<0.24	mg/l	0.119	1.10	CALCULATED	07/22/21 1:39		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2	07/26/21	U	TML
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	07/27/21		TML
Solids, Total Dissolved	62	mg/l	4	5	SM 2540 C	07/22/21		TMH
Total Organic Carbon	5.4	mg/l	0.3	0.5	SM 5310 C	07/22/21		ALD
Solids, Total Suspended	<1	mg/l	1	1	SM 2540 D	07/22/21		ALD

**Lab ID:** 2122142-04      **Collected By:** Client      **Sampled:** 07/21/21 07:45      **Received:** 07/21/21 14:25  
**Sample Desc:** WA-2D      **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	07/28/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	9	mg CaCO <sub>3</sub> /L		2	SM 2320 B	07/22/21	C-51g	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	07/22/21	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	07/21/21 17:14	C-37	SLP
Nitrate as N	0.24	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	07/21/21 23:41	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	07/21/21 23:41	U	JAF
Nitrate+Nitrite as N	<0.25	mg/l	0.119	1.10	CALCULATED	07/21/21 23:41		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2	07/26/21	U	TML
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	07/27/21		TML
Solids, Total Dissolved	58	mg/l	4	5	SM 2540 C	07/22/21		TMH
Total Organic Carbon	7.9	mg/l	0.3	0.5	SM 5310 C	07/22/21		ALD
Solids, Total Suspended	<1	mg/l	1	1	SM 2540 D	07/22/21		ALD



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Lab ID: 2122142-05      Collected By: Client      Sampled: 07/21/21 10:00      Received: 07/21/21 14:25  
Sample Desc: WA-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	07/28/21	G-11, G-17	TML
<b>General Chemistry</b>								
Alkalinity, Total to pH 4.5	10	mg CaCO <sub>3</sub> /L		2	SM 2320 B	07/22/21	C-51i	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	07/22/21	U	APR
Biochemical Oxygen Demand	2.0	mg/l	2.0	2.0	SM 5210 B	07/21/21 17:16	C-37a	ASD
Nitrate as N	0.42	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	07/22/21 1:22	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	07/22/21 1:22	U	JAF
Nitrate+Nitrite as N	<0.43	mg/l	0.119	1.10	CALCULATED	07/22/21 1:22		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2	07/26/21	U	TML
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	07/27/21		TML
Solids, Total Dissolved	61	mg/l	4	5	SM 2540 C	07/22/21		TMH
Total Organic Carbon	7.5	mg/l	0.3	0.5	SM 5310 C	07/22/21		ALD
Solids, Total Suspended	<1	mg/l	1	1	SM 2540 D	07/22/21		ALD
<b>Microbiology</b>								
Escherichia coli	16	mpn/100ml	1		SM 9223 B/Quantitray	7/21/21 15:29	7/22/21 10:05	DRW
Total Coliform	>2420	mpn/100ml	1		SM 9223 B/Quantitray	7/21/21 15:29	7/22/21 10:05	DRW



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Lab ID: 2122142-06      Collected By: Client      Sampled: 07/21/21 10:30      Received: 07/21/21 14:25  
Sample Desc: WA-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	07/28/21	G-11, G-17	TML
<b>General Chemistry</b>								
Alkalinity, Total to pH 4.5	11	mg CaCO <sub>3</sub> /L		2	SM 2320 B	07/22/21	C-51	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	07/22/21	U	APR
Biochemical Oxygen Demand	2.0	mg/l	2.0	2.0	SM 5210 B	07/21/21 17:16	C-37a	ASD
Nitrate as N	0.23	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	07/21/21 21:26	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	07/21/21 21:26	U	JAF
Nitrate+Nitrite as N	<0.24	mg/l	0.119	1.10	CALCULATED	07/21/21 21:26		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2	07/26/21	U	TML
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	07/27/21		TML
Solids, Total Dissolved	59	mg/l	4	5	SM 2540 C	07/22/21		TMH
Total Organic Carbon	6.0	mg/l	0.3	0.5	SM 5310 C	07/22/21		ALD
Solids, Total Suspended	<1	mg/l	1	1	SM 2540 D	07/22/21		ALD
<b>Microbiology</b>								
Escherichia coli	63	mpn/100ml	1		SM 9223 B/Quantitray	7/21/21 15:29	7/22/21 10:05	DRW
Total Coliform	>2420	mpn/100ml	1		SM 9223 B/Quantitray	7/21/21 15:29	7/22/21 10:05	DRW



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M.J. Reider Associates, Inc.

Lab ID: 2122142-07      Collected By: Client      Sampled: 07/21/21 10:45      Received: 07/21/21 14:25  
Sample Desc: WA-5S      Sample Type: Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	0.21	mg/l		0.01	SM 4500-P F	07/28/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	5	mg CaCO <sub>3</sub> /L		2	SM 2320 B	07/22/21	C-51a	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	07/22/21	U	APR
Biochemical Oxygen Demand	2.0	mg/l	2.0	2.0	SM 5210 B	07/21/21 17:16	C-37a	ASD
Nitrate as N	0.19	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	07/21/21 22:34	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	07/21/21 22:34	U	JAF
Nitrate+Nitrite as N	<0.20	mg/l	0.119	1.10	CALCULATED	07/21/21 22:34		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2	07/26/21	U	TML
Phosphorus as P, Total	0.05	mg/l	0.01	0.01	SM 4500-P F	07/27/21		TML
Solids, Total Dissolved	68	mg/l	4	5	SM 2540 C	07/22/21		TMH
Total Organic Carbon	5.8	mg/l	0.3	0.5	SM 5310 C	07/22/21		ALD
Solids, Total Suspended	<1	mg/l	1	1	SM 2540 D	07/22/21		ALD
Microbiology								
Escherichia coli	39	mpn/100ml	1		SM 9223 B/Quantitray	7/21/21 15:29	7/22/21 10:05	DRW
Total Coliform	>2420	mpn/100ml	1		SM 9223 B/Quantitray	7/21/21 15:29	7/22/21 10:05	DRW



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M.J. Reider Associates, Inc.

Lab ID: 2122142-08      Collected By: Client      Sampled: 07/21/21 08:15      Received: 07/21/21 14:25  
Sample Desc: WA-6S      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	07/28/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	8	mg CaCO <sub>3</sub> /L		2	SM 2320 B	07/22/21	C-51b	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	07/22/21	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	07/21/21 17:16	C-37a	ASD
Nitrate as N	0.23	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	07/21/21 21:43	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	07/21/21 21:43	U	JAF
Nitrate+Nitrite as N	<0.24	mg/l	0.119	1.10	CALCULATED	07/21/21 21:43		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2	07/26/21	U	TML
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	07/27/21		TML
Solids, Total Dissolved	57	mg/l	4	5	SM 2540 C	07/22/21		TMH
Total Organic Carbon	5.0	mg/l	0.3	0.5	SM 5310 C	07/22/21		ALD
Solids, Total Suspended	<1	mg/l	1	1	SM 2540 D	07/22/21		ALD
	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	1	mpn/100ml	1	SM 9223 B/Quantitray	7/21/21 15:29	7/22/21 10:05		DRW
Total Coliform	>2420	mpn/100ml	1	SM 9223 B/Quantitray	7/21/21 15:29	7/22/21 10:05		DRW



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**Lab ID:** 2122142-09    **Collected By:** Client    **Sampled:** 07/21/21 08:15    **Received:** 07/21/21 14:25  
**Sample Desc:** WA-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	07/28/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	9	mg CaCO <sub>3</sub> /L		2	SM 2320 B	07/22/21	C-51f	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	07/22/21	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	07/21/21 17:16	C-37a	ASD
Nitrate as N	0.24	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	07/21/21 22:00	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	07/21/21 22:00	U	JAF
Nitrate+Nitrite as N	<0.25	mg/l	0.119	1.10	CALCULATED	07/21/21 22:00		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2	07/26/21	U	TML
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	07/27/21		TML
Solids, Total Dissolved	68	mg/l	4	5	SM 2540 C	07/22/21		TMH
Total Organic Carbon	6.7	mg/l	0.3	0.5	SM 5310 C	07/22/21		ALD
Solids, Total Suspended	<1	mg/l	1	1	SM 2540 D	07/22/21		ALD

**Lab ID:** 2122142-10    **Collected By:** Client    **Sampled:** 07/21/21 08:15    **Received:** 07/21/21 14:25  
**Sample Desc:** WA-6D    **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	07/28/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	8	mg CaCO <sub>3</sub> /L		2	SM 2320 B	07/22/21	C-51d	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	07/22/21	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	07/21/21 17:16	C-37a	ASD
Nitrate as N	0.24	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	07/22/21 1:05	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	07/22/21 1:05	U	JAF
Nitrate+Nitrite as N	<0.25	mg/l	0.119	1.10	CALCULATED	07/22/21 1:05		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2	07/26/21	U	TML
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	07/27/21		TML
Solids, Total Dissolved	59	mg/l	4	5	SM 2540 C	07/22/21		TMH
Total Organic Carbon	5.3	mg/l	0.3	0.5	SM 5310 C	07/22/21		ALD
Solids, Total Suspended	<1	mg/l	1	1	SM 2540 D	07/22/21		ALD



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Lab ID: 2122142-11 Collected By: Client Sampled: 07/21/21 08:45 Received: 07/21/21 14:25  
Sample Desc: WA-7S 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	07/28/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	8	mg CaCO <sub>3</sub> /L		2	SM 2320 B	07/22/21	C-51d	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	07/22/21	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	07/21/21 17:16	C-37a	ASD
Nitrate as N	0.23	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	07/21/21 21:09	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	07/21/21 21:09	U	JAF
Nitrate+Nitrite as N	<0.24	mg/l	0.119	1.10	CALCULATED	07/21/21 21:09		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2	07/26/21	U	TML
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	07/27/21		TML
Solids, Total Dissolved	54	mg/l	4	5	SM 2540 C	07/22/21		TMH
Total Organic Carbon	5.6	mg/l	0.3	0.5	SM 5310 C	07/22/21		ALD
Solids, Total Suspended	<1	mg/l	1	1	SM 2540 D	07/22/21		ALD
	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	2	mpn/100ml	1	SM 9223 B/Quantitray	7/21/21 15:29	7/22/21 10:05		DRW
Total Coliform	>2420	mpn/100ml	1	SM 9223 B/Quantitray	7/21/21 15:29	7/22/21 10:05		DRW



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

M.J. Reider Associates, Inc.

Lab ID: 2122142-12 Collected By: Client Sampled: 07/21/21 08:45 Received: 07/21/21 14:25  
Sample Desc: WA-7M 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	07/28/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	8	mg CaCO <sub>3</sub> /L		2	SM 2320 B	07/22/21	C-51c	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	07/22/21	U	APR
Biochemical Oxygen Demand	3.7	mg/l	2.0	2.0	SM 5210 B	07/21/21 17:50	C-37a	ASD
Nitrate as N	0.23	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	07/21/21 22:17	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	07/21/21 22:17	U	JAF
Nitrate+Nitrite as N	<0.24	mg/l	0.119	1.10	CALCULATED	07/21/21 22:17		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2	07/26/21	U	TML
Phosphorus as P, Total	0.04	mg/l	0.01	0.01	SM 4500-P F	07/24/21		SNF
Solids, Total Dissolved	56	mg/l	4	5	SM 2540 C	07/22/21		TMH
Total Organic Carbon	5.5	mg/l	0.3	0.5	SM 5310 C	07/22/21		ALD
Solids, Total Suspended	1	mg/l	1	1	SM 2540 D	07/22/21		ALD

Lab ID: 2122142-13 Collected By: Client Sampled: 07/21/21 08:45 Received: 07/21/21 14:25  
Sample Desc: WA-7D 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	07/28/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	9	mg CaCO <sub>3</sub> /L		2	SM 2320 B	07/22/21	C-51f	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	07/22/21	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	07/21/21 17:16	C-37a	ASD
Nitrate as N	0.24	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	07/22/21 0:48	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	07/22/21 0:48	U	JAF
Nitrate+Nitrite as N	<0.25	mg/l	0.119	1.10	CALCULATED	07/22/21 0:48		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2	07/26/21	U	TML
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	07/24/21		SNF
Solids, Total Dissolved	60	mg/l	4	5	SM 2540 C	07/22/21		TMH
Total Organic Carbon	7.0	mg/l	0.3	0.5	SM 5310 C	07/22/21		ALD
Solids, Total Suspended	<1	mg/l	1	1	SM 2540 D	07/22/21		ALD



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

**Preparation Methods**

Specific Method	Preparation Method	Prep Batch	Prepared Date	Prepared By
<b>2122142-01</b>				
<b>Dissolved General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B1G1441	07/27/2021	TML
<b>General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B1G1373	07/22/2021	SNF
<b>2122142-02</b>				
<b>Dissolved General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B1G1441	07/27/2021	TML
<b>General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B1G1373	07/22/2021	SNF
<b>2122142-03</b>				
<b>Dissolved General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B1G1441	07/27/2021	TML
<b>General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B1G1373	07/22/2021	SNF
<b>2122142-04</b>				
<b>Dissolved General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B1G1441	07/27/2021	TML
<b>General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B1G1373	07/22/2021	SNF
<b>2122142-05</b>				
<b>Dissolved General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B1G1441	07/27/2021	TML
<b>General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B1G1373	07/22/2021	SNF
<b>2122142-06</b>				
<b>Dissolved General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B1G1441	07/27/2021	TML
<b>General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B1G1373	07/22/2021	SNF
<b>2122142-07</b>				
<b>Dissolved General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B1G1441	07/27/2021	TML
<b>General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B1G1373	07/22/2021	SNF
<b>2122142-08</b>				
<b>Dissolved General Chemistry</b>				



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

SM 4500-P F	SM 4500-P B	B1G1441	07/27/2021	TML
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**General Chemistry**

SM 4500-P F	SM 4500-P B	B1G1373	07/22/2021	SNF
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**2122142-09**

**Dissolved General Chemistry**

SM 4500-P F	SM 4500-P B	B1G1441	07/27/2021	TML
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**General Chemistry**

SM 4500-P F	SM 4500-P B	B1G1373	07/22/2021	SNF
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**2122142-10**

**Dissolved General Chemistry**

SM 4500-P F	SM 4500-P B	B1G1441	07/27/2021	TML
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**General Chemistry**

SM 4500-P F	SM 4500-P B	B1G1373	07/22/2021	SNF
-------------	-------------	---------	------------	-----

**2122142-11**

**Dissolved General Chemistry**

SM 4500-P F	SM 4500-P B	B1G1441	07/27/2021	TML
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**General Chemistry**

SM 4500-P F	SM 4500-P B	B1G1373	07/22/2021	SNF
-------------	-------------	---------	------------	-----

**2122142-12**

**Dissolved General Chemistry**

SM 4500-P F	SM 4500-P B	B1G1441	07/27/2021	TML
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**General Chemistry**

SM 4500-P F	SM 4500-P B	B1G1228	07/22/2021	SNF
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**2122142-13**

**Dissolved General Chemistry**

SM 4500-P F	SM 4500-P B	B1G1441	07/27/2021	TML
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**General Chemistry**

SM 4500-P F	SM 4500-P B	B1G1228	07/22/2021	SNF
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**M.J. Reider Associates, Inc.**

**Notes and Definitions**

- C-37 The dissolved oxygen depletion for the dilution water blank was greater than 0.20mg/L at 0.73mg/L.
- C-37a The dissolved oxygen depletion for the dilution water blank was greater than 0.20mg/L at 0.77mg/L.
- C-51 The alkalinity to pH 4.2 = 11.1 mg CaCO<sub>3</sub>/L.
- C-51a The alkalinity to pH 4.2 = 4.8 mg CaCO<sub>3</sub>/L.
- C-51b The alkalinity to pH 4.2 = 7.6 mg CaCO<sub>3</sub>/L.
- C-51c The alkalinity to pH 4.2 = 8.0 mg CaCO<sub>3</sub>/L.
- C-51d The alkalinity to pH 4.2 = 8.1 mg CaCO<sub>3</sub>/L.
- C-51e The alkalinity to pH 4.2 = 8.3 mg CaCO<sub>3</sub>/L.
- C-51f The alkalinity to pH 4.2 = 8.7 mg CaCO<sub>3</sub>/L.
- C-51g The alkalinity to pH 4.2 = 8.8 mg CaCO<sub>3</sub>/L.
- C-51h The alkalinity to pH 4.2 = 8.9 mg CaCO<sub>3</sub>/L.
- C-51i The alkalinity to pH 4.2 = 9.5 mg CaCO<sub>3</sub>/L.
- G-11 The sample was filtered after it was received at the laboratory.
- G-17 The sample was preserved in the laboratory.
- J Estimated value
- U Analyte was not detected above the indicated value.



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**M.J. Reider Associates, Inc.**107 Angelica St, Reading PA, 19611  
610-374-5129 www.mjreider.com**WORK ORDER  
Chain of Custody**

2122142



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: 2021 - Walter Reservoir

Collected By :

(Full Name)

Gregory Wacik

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

**2122142-01 WA-1S**BOD SM 5210B, EC (#) SM 9223B Confirmation, 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, TC (#) SM 9223B  
Alk SM 2320B, NH<sub>3</sub>-N D6919-03, 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: 7/21/21Time: 0925A - Pl 500ml NP, minimal hdspc  
B - Pl Liter NP  
C - Sterile Pl 125ml NaThio  
D - Pl 500ml H<sub>2</sub>SO<sub>4</sub>  
E - Pl 250ml NP  
F - Pl 500ml Lab Filtered  
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  
I - Vial Amber 40ml H<sub>3</sub>PO<sub>4</sub>, minimal hdspc**2122142-02 WA-2S**BOD SM 5210B, EC (#) SM 9223B Confirmation, 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, TC (#) SM 9223B  
Alk SM 2320B, NH<sub>3</sub>-N D6919-03, 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: 7/21/21Time: 0745A - Pl 500ml NP, minimal hdspc  
B - Pl Liter NP  
C - Sterile Pl 125ml NaThio  
D - Pl 500ml H<sub>2</sub>SO<sub>4</sub>  
E - Pl 250ml NP  
F - Pl 500ml Lab Filtered  
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  
I - Vial Amber 40ml H<sub>3</sub>PO<sub>4</sub>, minimal hdspc

Relinquished By

Date/Time

7/21/21 1255

Received By

Date/Time

Ben Nott 7-21-21 1255

Relinquished By

Date/Time

Received By

Date/Time

Ben Nott 7-21-21 1425

Relinquished By

Date/Time

Received at Laboratory by

Date/Time

Sample Kit Prepared By:	Date/Time
<u>TSV/KW</u>	<u>6-24-21</u>
Sample Temp (°C):	<u>8</u>
Samples on Ice?	<input checked="" type="radio"/> Yes <input type="radio"/> No <input type="radio"/> N/A
Approved By:	<u>BSW</u>
Entered By:	



# M.J. Reider Associates, Inc.

2122142

Client Code: 3157

Client: Tetra Tech

Project Manager: Richard A Wheeler

Project: 2021 - Walter Reservoir

Comments:

Collected By:

(Full Name)

Gregory Wacik

## 2122142-03 WA-2M

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 D6919-03, 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: 7/21/21

Time: 0745

- A - Pl 500ml NP, minimal hdspe
- 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 hdspe
- G - Vial Amber 40ml H<sub>3</sub>PO<sub>4</sub>, minimal hdspe
- H - Vial Amber 40ml H<sub>3</sub>PO<sub>4</sub>, minimal hdspe

## 2122142-04 WA-2D

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, Alk SM 2320B, NH<sub>3</sub>-N D6919-03, PO<sub>4</sub> SM 4500P-F, TDS SM 2540C, TOC SM 5310C, TKN EPA 351.2

Matrix: Non-Potable Water

Type: Grab

Date: 7/21/21

Time: 0745

- A - Pl 500ml NP, minimal hdspe
- 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 hdspe
- G - Vial Amber 40ml H<sub>3</sub>PO<sub>4</sub>, minimal hdspe
- H - Vial Amber 40ml H<sub>3</sub>PO<sub>4</sub>, minimal hdspe

## 2122142-05 WA-3S

BOD SM 5210B, EC (#) SM 9223B Confirmation, 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, TC (#) SM 9223B  
Alk SM 2320B, NH<sub>3</sub>-N D6919-03, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D, PO<sub>4</sub> SM 4500P-F

Matrix: Non-Potable Water

Type: Grab

Date: 7/21/21

Time: 1000

- A - Pl 500ml NP, minimal hdspe
- B - Pl Liter NP
- C - Sterile Pl 125ml NaThio
- D - Pl 500ml H<sub>2</sub>SO<sub>4</sub>
- E - Pl 250ml NP
- F - Pl 500ml Lab Filtered
- G - Vial Amber 40ml H<sub>3</sub>PO<sub>4</sub>, minimal hdspe
- H - Vial Amber 40ml H<sub>3</sub>PO<sub>4</sub>, minimal hdspe
- I - Vial Amber 40ml H<sub>3</sub>PO<sub>4</sub>, minimal hdspe

Relinquished By

Date/Time

7/21/21 1255

Received By

Date/Time

7/21/21 1255

Relinquished By

Date/Time

Received By

Date/Time

Relinquished By

Date/Time

Received at Laboratory By

Date/Time

7/21/21 1425

Sample Kit Prepared By:	Date/Time
JSV/SW	6-24-21
Sample Temp (°C):	8
Samples on Ice?	Yes No NA
Approved By:	B SW
Entered By:	



# M.J. Reider Associates, Inc.

2122142

Client Code: 3157

Client: Tetra Tech

Project Manager: Richard A Wheeler

Project: 2021 - Walter Reservoir

Comments:

Collected By:  
(Full Name)

Gregory Wacik

2122142-06 WA-4S

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>, BOD SM 5210B, EC (#) SM 9223B Confirmation, PO<sub>4</sub>-D SM 4500P-F, TC (#) SM 9223B  
TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D, Alk SM 2320B, NH<sub>3</sub>-N D6919-03, PO<sub>4</sub> SM 4500P-F, TDS SM 2540C

Matrix: Non-Potable Water

Type: Grab

Date: 7/21/21

Time: 1030

- A - Pl 500ml NP, minimal hdspc
- B - Pl Liter NP
- C - Sterile Pl 125ml NaThio
- D - Pl 500ml H<sub>2</sub>SO<sub>4</sub>
- E - Pl 250ml NP
- F - Pl 500ml Lab Filtered
- 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
- I - Vial Amber 40ml H<sub>3</sub>PO<sub>4</sub>, minimal hdspc

2122142-07 WA-5S

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, TC (#) SM 9223B, BOD SM 5210B, EC (#) SM 9223B Confirmation, NO<sub>2</sub>-N EPA 300.0  
Alk SM 2320B, NH<sub>3</sub>-N D6919-03, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D, PO<sub>4</sub> SM 4500P-F

Matrix: Non-Potable Water

Type: Grab

Date: 7/21/21

Time: 1045

- A - Pl 500ml NP, minimal hdspc
- B - Pl Liter NP
- C - Sterile Pl 125ml NaThio
- D - Pl 500ml H<sub>2</sub>SO<sub>4</sub>
- E - Pl 250ml NP
- F - Pl 500ml Lab Filtered
- 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
- I - Vial Amber 40ml H<sub>3</sub>PO<sub>4</sub>, minimal hdspc

Relinquished By

Date/Time

7/21/21 1255

Received By

Date/Time

7-21-21 1255

Relinquished By

Date/Time

Received By

Date/Time

7-21-21 1425

Relinquished By

Date/Time

Received at Laboratory By

Date/Time

Sample Kit Prepared By:	Date/Time
JSV/SW	6-24-21
Sample Temp (°C):	8
Samples on Ice?	Yes No NA
Approved By:	BSW
Entered By:	



# M.J. Reider Associates, Inc.

2122142

Client Code: 3157

Client: Tetra Tech

Project Manager: Richard A Wheeler

Project: 2021 - Walter Reservoir

Comments:

Collected By :  
(Full Name)

Gregory Wacik

## 2122142-08 WA-6S

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  
Alk SM 2320B, NH3-N D6919-03, PO4 SM 4500P-F, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D

Matrix: Non-Potable Water

Type: Grab

Date: 7/21/21

Time: 0815

- A - Pl 500ml NP, minimal hdspe
- 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 hdspe
- H - Vial Amber 40ml H3PO4, minimal hdspe
- I - Vial Amber 40ml H3PO4, minimal hdspe

## 2122142-09 WA-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 D6919-03, PO4 SM 4500P-F, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D

Matrix: Non-Potable Water

Type: Grab

Date: 7/21/21

Time: 0815

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

## 2122142-10 WA-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 D6919-03, TSS SM 2540D, PO4 SM 4500P-F, TDS SM 2540C, TOC SM 5310C, TKN EPA 351.2

Matrix: Non-Potable Water

Type: Grab

Date: 7/21/21

Time: 0815

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

Relinquished By: [Signature] Date/Time: 7/21/21 1255

Received By: [Signature] Date/Time: 7-21-21 1255

Relinquished By: Date/Time:

Received By: [Signature] Date/Time: 7-21-21 1425

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: JSV/SPV	Date/Time: 6-24-21
Sample Temp (°C): 8	Samples on Ice? Yes No NA
Approved By: [Signature]	Entered By: [Signature]



# M.J. Reider Associates, Inc.

2122142

Client Code: 3157

Client: Tetra Tech

Project Manager: Richard A Wheeler

Project: 2021 - Walter Reservoir

Comments:

Collected By :  
(Full Name)

*Gregory Wacik*

## 2122142-11 WA-7S

BOD SM 5210B, EC (#) SM 9223B Confirmation, 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, TC (#) SM 9223B  
Alk SM 2320B, NH<sub>3</sub>-N D6919-03, 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: 7/21/21  
Time: 0845

- A - Pl 500ml NP, minimal hdspc
- B - Pl Liter NP
- C - Sterile Pl 125ml NaThio
- D - Pl 500ml H<sub>2</sub>SO<sub>4</sub>
- E - Pl 250ml NP
- F - Pl 500ml Lab Filtered
- 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
- I - Vial Amber 40ml H<sub>3</sub>PO<sub>4</sub>, minimal hdspc

## 2122142-12 WA-7M

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 D6919-03, 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: 7/21/21  
Time: 0845

- 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

## 2122142-13 WA-7D

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 D6919-03, PO<sub>4</sub> SM 4500P-F, TDS SM 2540C, TOC SM 5310C, TSS SM 2540D, TKN EPA 351.2

Matrix: Non-Potable Water

Type: Grab

Date: 7/21/21  
Time: 0845

- 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

Relinquished By: *Gregory Wacik* Date/Time: 7/21/21 1255

Received By: *Bay North* Date/Time: 7-21-21 1255

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

Received By: *Bay North* Date/Time: 7-21-21 1425

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

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

Sample Kit Prepared By: <i>JSV/SW</i>	Date/Time <i>6-24-21</i>
Sample Temp (°C): <i>8</i>	Samples on Ice? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA
Approved By: <i>BSH</i>	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.

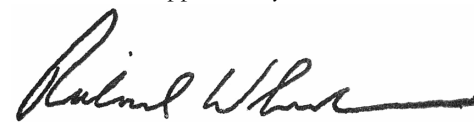
**Payment Terms**

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



## M.J. Reider Associates, Inc.

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

# Certificate of Analysis

**Laboratory No.:** 2125189

**Report:** 08/27/21

**Lab Contact:** Richard A Wheeler

**Attention:** David Wertz

**Project:** 2021 - Walter Reservoir

**Reported To:** Tetra Tech

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

**Lab ID:** 2125189-01

**Collected By:** Client

**Sampled:** 08/18/21 09:20

**Received:** 08/18/21 14:15

**Sample Desc:** WA-1S

**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	08/19/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	9	mg CaCO <sub>3</sub> /L		2	SM 2320 B	08/19/21	C-51j	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	08/19/21	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	08/18/21 15:44		ASD
Nitrate as N	0.27	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	08/18/21 21:12	J	MRW
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	08/18/21 21:12	U	MRW
Nitrate+Nitrite as N	<0.28	mg/l	0.119	1.10	CALCULATED	08/18/21 21:12		MRW
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2	08/20/21	U	TML
Phosphorus as P, Total	0.03	mg/l	0.01	0.01	SM 4500-P F	08/20/21		TML
Solids, Total Dissolved	78	mg/l	4	5	SM 2540 C	08/19/21		TMH
Total Organic Carbon	5.8	mg/l	0.3	0.5	SM 5310 C	08/20/21		ALD
Solids, Total Suspended	5	mg/l	1	1	SM 2540 D	08/19/21		ALD
Microbiology								
Escherichia coli	3	mpn/100ml	1		SM 9223 B/Quantitray	8/18/21 14:45	8/19/21 9:56	JMW
Total Coliform	1990	mpn/100ml	1		SM 9223 B/Quantitray	8/18/21 14:45	8/19/21 9:56	JMW



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

**Lab ID:** 2125189-02      **Collected By:** Client      **Sampled:** 08/18/21 07:15      **Received:** 08/18/21 14:15  
**Sample Desc:** WA-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	08/19/21	G-11, G-17	TML
<b>General Chemistry</b>								
Alkalinity, Total to pH 4.5	8	mg CaCO <sub>3</sub> /L		2	SM 2320 B	08/19/21	C-51e	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	08/19/21	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	08/18/21 15:44		ASD
Nitrate as N	0.23	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	08/18/21 21:29	J	MRW
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	08/18/21 21:29	U	MRW
Nitrate+Nitrite as N	<0.24	mg/l	0.119	1.10	CALCULATED	08/18/21 21:29		MRW
Nitrogen, Total Kjeldahl (TKN)	0.45	mg/l	0.43	0.50	EPA 351.2	08/20/21	J	TML
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	08/20/21		TML
Solids, Total Dissolved	61	mg/l	4	5	SM 2540 C	08/19/21		TMH
Total Organic Carbon	5.2	mg/l	0.3	0.5	SM 5310 C	08/20/21		ALD
Solids, Total Suspended	5	mg/l	1	1	SM 2540 D	08/19/21		ALD
	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
<b>Microbiology</b>								
Escherichia coli	1	mpn/100ml	1	SM 9223 B/Quantitray	8/18/21 14:45	8/19/21 9:56		JMW
Total Coliform	1730	mpn/100ml	1	SM 9223 B/Quantitray	8/18/21 14:45	8/19/21 9:56		JMW



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

M.J. Reider Associates, Inc.

**Lab ID:** 2125189-03    **Collected By:** Client    **Sampled:** 08/18/21 07:15    **Received:** 08/18/21 14:15  
**Sample Desc:** WA-2M    **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	08/19/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	7	mg CaCO <sub>3</sub> /L		2	SM 2320 B	08/19/21	C-51c	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	08/19/21	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	08/18/21 15:44		ASD
Nitrate as N	0.27	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	08/18/21 21:46	J	MRW
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	08/18/21 21:46	U	MRW
Nitrate+Nitrite as N	<0.28	mg/l	0.119	1.10	CALCULATED	08/18/21 21:46		MRW
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2	08/20/21	U	TML
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	08/20/21		TML
Solids, Total Dissolved	67	mg/l	4	5	SM 2540 C	08/19/21		TMH
Total Organic Carbon	5.4	mg/l	0.3	0.5	SM 5310 C	08/19/21		ALD
Solids, Total Suspended	3	mg/l	1	1	SM 2540 D	08/19/21		ALD

**Lab ID:** 2125189-04    **Collected By:** Client    **Sampled:** 08/18/21 07:15    **Received:** 08/18/21 14:15  
**Sample Desc:** WA-2D    **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	08/19/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	8	mg CaCO <sub>3</sub> /L		2	SM 2320 B	08/19/21	C-51i	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	08/19/21	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	08/18/21 15:44		ASD
Nitrate as N	0.26	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	08/18/21 22:03	J	MRW
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	08/18/21 22:03	U	MRW
Nitrate+Nitrite as N	<0.27	mg/l	0.119	1.10	CALCULATED	08/18/21 22:03		MRW
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2	08/20/21	U	TML
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	08/20/21		TML
Solids, Total Dissolved	66	mg/l	4	5	SM 2540 C	08/19/21		TMH
Total Organic Carbon	5.3	mg/l	0.3	0.5	SM 5310 C	08/19/21		ALD
Solids, Total Suspended	2	mg/l	1	1	SM 2540 D	08/19/21		ALD



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M.J. Reider Associates, Inc.

Lab ID: 2125189-05      Collected By: Client      Sampled: 08/18/21 09:45      Received: 08/18/21 14:15  
Sample Desc: WA-3S      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	08/19/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	10	mg CaCO <sub>3</sub> /L		2	SM 2320 B	08/19/21	C-51	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	08/19/21	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	08/18/21 15:44		ASD
Nitrate as N	0.49	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	08/18/21 22:19	J	MRW
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	08/18/21 22:19	U	MRW
Nitrate+Nitrite as N	<0.50	mg/l	0.119	1.10	CALCULATED	08/18/21 22:19		MRW
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2	08/20/21	U	TML
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	08/20/21		TML
Solids, Total Dissolved	98	mg/l	4	5	SM 2540 C	08/19/21		TMH
Total Organic Carbon	7.0	mg/l	0.3	0.5	SM 5310 C	08/19/21		ALD
Solids, Total Suspended	4	mg/l	1	1	SM 2540 D	08/19/21		ALD
Microbiology								
Escherichia coli	38	mpn/100ml	1		SM 9223 B/Quantitray	8/18/21 14:45	8/19/21 9:56	JMW
Total Coliform	>2420	mpn/100ml	1		SM 9223 B/Quantitray	8/18/21 14:45	8/19/21 9:56	JMW



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M.J. Reider Associates, Inc.

Lab ID: 2125189-06      Collected By: Client      Sampled: 08/18/21 10:15      Received: 08/18/21 14:15  
Sample Desc: WA-4S      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	08/19/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	12	mg CaCO <sub>3</sub> /L		2	SM 2320 B	08/19/21	C-51a	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	08/19/21	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	08/18/21 15:44		ASD
Nitrate as N	0.31	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	08/18/21 22:36	J	MRW
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	08/18/21 22:36	U	MRW
Nitrate+Nitrite as N	<0.32	mg/l	0.119	1.10	CALCULATED	08/18/21 22:36		MRW
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2	08/20/21	U	TML
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	08/20/21		TML
Solids, Total Dissolved	77	mg/l	4	5	SM 2540 C	08/19/21		TMH
Total Organic Carbon	4.3	mg/l	0.3	0.5	SM 5310 C	08/19/21		ALD
Solids, Total Suspended	5	mg/l	1	1	SM 2540 D	08/19/21		ALD
Microbiology								
Escherichia coli	147	mpn/100ml	1		SM 9223 B/Quantitray	8/18/21 14:45	8/19/21 9:56	JMW
Total Coliform	>2420	mpn/100ml	1		SM 9223 B/Quantitray	8/18/21 14:45	8/19/21 9:56	JMW



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M.J. Reider Associates, Inc.

Lab ID: 2125189-07      Collected By: Client      Sampled: 08/18/21 10:35      Received: 08/18/21 14:15  
Sample Desc: WA-5S      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	08/19/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	5	mg CaCO <sub>3</sub> /L		2	SM 2320 B	08/19/21	C-51b	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	08/19/21	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	08/18/21 15:44		ASD
Nitrate as N	0.20	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	08/18/21 17:16	J	MRW
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	08/18/21 17:16	U	MRW
Nitrate+Nitrite as N	<0.21	mg/l	0.119	1.10	CALCULATED	08/18/21 17:16		MRW
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2	08/20/21	U	TML
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	08/20/21		TML
Solids, Total Dissolved	69	mg/l	4	5	SM 2540 C	08/19/21		TMH
Total Organic Carbon	4.5	mg/l	0.3	0.5	SM 5310 C	08/19/21		ALD
Solids, Total Suspended	3	mg/l	1	1	SM 2540 D	08/19/21		ALD
Microbiology								
Escherichia coli	35	mpn/100ml	1		SM 9223 B/Quantitray	8/18/21 14:45	8/19/21 9:56	JMW
Total Coliform	>2420	mpn/100ml	1		SM 9223 B/Quantitray	8/18/21 14:45	8/19/21 9:56	JMW



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M.J. Reider Associates, Inc.

Lab ID: 2125189-08      Collected By: Client      Sampled: 08/18/21 08:00      Received: 08/18/21 14:15  
Sample Desc: WA-6S      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	08/19/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	8	mg CaCO <sub>3</sub> /L		2	SM 2320 B	08/19/21	C-51d	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	08/19/21	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	08/18/21 15:44		ASD
Nitrate as N	0.23	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	08/18/21 17:33	J	MRW
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	08/18/21 17:33	U	MRW
Nitrate+Nitrite as N	<0.24	mg/l	0.119	1.10	CALCULATED	08/18/21 17:33		MRW
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2	08/20/21	U	TML
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	08/20/21		TML
Solids, Total Dissolved	72	mg/l	4	5	SM 2540 C	08/19/21		TMH
Total Organic Carbon	5.0	mg/l	0.3	0.5	SM 5310 C	08/19/21		ALD
Solids, Total Suspended	3	mg/l	1	1	SM 2540 D	08/19/21		ALD
Microbiology								
Escherichia coli	<1	mpn/100ml	1		SM 9223 B/Quantitray	8/18/21 14:45	8/19/21 9:56	JMW
Total Coliform	2420	mpn/100ml	1		SM 9223 B/Quantitray	8/18/21 14:45	8/19/21 9:56	JMW



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M.J. Reider Associates, Inc.

**Lab ID:** 2125189-09    **Collected By:** Client    **Sampled:** 08/18/21 08:00    **Received:** 08/18/21 14:15  
**Sample Desc:** WA-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	08/19/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	7	mg CaCO <sub>3</sub> /L		2	SM 2320 B	08/19/21	C-51c	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	08/19/21	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	08/18/21 15:07		ASD
Nitrate as N	0.25	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	08/18/21 17:50	J	MRW
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	08/18/21 17:50	U	MRW
Nitrate+Nitrite as N	<0.26	mg/l	0.119	1.10	CALCULATED	08/18/21 17:50		MRW
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2	08/20/21	U	TML
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	08/20/21		TML
Solids, Total Dissolved	69	mg/l	4	5	SM 2540 C	08/19/21		TMH
Total Organic Carbon	5.0	mg/l	0.3	0.5	SM 5310 C	08/19/21		ALD
Solids, Total Suspended	2	mg/l	1	1	SM 2540 D	08/19/21		ALD

**Lab ID:** 2125189-10    **Collected By:** Client    **Sampled:** 08/18/21 08:00    **Received:** 08/18/21 14:15  
**Sample Desc:** WA-6D    **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	08/19/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	8	mg CaCO <sub>3</sub> /L		2	SM 2320 B	08/19/21	C-51d	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	08/19/21	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	08/18/21 15:44		ASD
Nitrate as N	0.25	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	08/18/21 18:07	J	MRW
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	08/18/21 18:07	U	MRW
Nitrate+Nitrite as N	<0.26	mg/l	0.119	1.10	CALCULATED	08/18/21 18:07		MRW
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2	08/20/21	U	TML
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	08/20/21		TML
Solids, Total Dissolved	72	mg/l	4	5	SM 2540 C	08/19/21		TMH
Total Organic Carbon	4.8	mg/l	0.3	0.5	SM 5310 C	08/19/21		ALD
Solids, Total Suspended	1	mg/l	1	1	SM 2540 D	08/19/21		ALD



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M.J. Reider Associates, Inc.

Lab ID: 2125189-11      Collected By: Client      Sampled: 08/18/21 08:30      Received: 08/18/21 14:15  
Sample Desc: WA-7S      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	08/19/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	8	mg CaCO <sub>3</sub> /L		2	SM 2320 B	08/19/21	C-51g	APR
Ammonia as N	0.06	mg/l	0.05	0.10	ASTM D6919-03	08/19/21	J	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	08/18/21 15:44		ASD
Nitrate as N	0.24	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	08/18/21 18:24	J	MRW
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	08/18/21 18:24	U	MRW
Nitrate+Nitrite as N	<0.25	mg/l	0.119	1.10	CALCULATED	08/18/21 18:24		MRW
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2	08/20/21	Q-10, U	TML
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	08/20/21		TML
Solids, Total Dissolved	76	mg/l	4	5	SM 2540 C	08/19/21		TMH
Total Organic Carbon	5.1	mg/l	0.3	0.5	SM 5310 C	08/19/21		ALD
Solids, Total Suspended	2	mg/l	1	1	SM 2540 D	08/19/21		ALD
Microbiology								
Escherichia coli	<1	mpn/100ml	1		SM 9223 B/Quantitray	8/18/21 14:45	8/19/21 9:56	JMW
Total Coliform	2420	mpn/100ml	1		SM 9223 B/Quantitray	8/18/21 14:45	8/19/21 9:56	JMW



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M.J. Reider Associates, Inc.

Lab ID: 2125189-12      Collected By: Client      Sampled: 08/18/21 08:30      Received: 08/18/21 14:15  
Sample Desc: WA-7M      Sample Type: Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	0.02	mg/l		0.01	SM 4500-P F	08/19/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	8	mg CaCO <sub>3</sub> /L		2	SM 2320 B	08/19/21	C-51f	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	08/19/21	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	08/18/21 15:44		ASD
Nitrate as N	0.24	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	08/18/21 20:05	J	MRW
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	08/18/21 20:05	U	MRW
Nitrate+Nitrite as N	<0.25	mg/l	0.119	1.10	CALCULATED	08/18/21 20:05		MRW
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2	08/20/21	U	TML
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	08/20/21		TML
Solids, Total Dissolved	71	mg/l	4	5	SM 2540 C	08/19/21		TMH
Total Organic Carbon	5.1	mg/l	0.3	0.5	SM 5310 C	08/19/21		ALD
Solids, Total Suspended	<1	mg/l	1	1	SM 2540 D	08/19/21		ALD

Lab ID: 2125189-13      Collected By: Client      Sampled: 08/18/21 08:30      Received: 08/18/21 14:15  
Sample Desc: WA-7D      Sample Type: Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	0.02	mg/l		0.01	SM 4500-P F	08/19/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	8	mg CaCO <sub>3</sub> /L		2	SM 2320 B	08/19/21	C-51h	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	08/19/21	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	08/18/21 15:44		ASD
Nitrate as N	0.26	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	08/18/21 20:22	J	MRW
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	08/18/21 20:22	U	MRW
Nitrate+Nitrite as N	<0.27	mg/l	0.119	1.10	CALCULATED	08/18/21 20:22		MRW
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2	08/20/21	U	TML
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	08/20/21		TML
Solids, Total Dissolved	68	mg/l	4	5	SM 2540 C	08/19/21		TMH
Total Organic Carbon	5.4	mg/l	0.3	0.5	SM 5310 C	08/19/21		ALD
Solids, Total Suspended	3	mg/l	1	1	SM 2540 D	08/19/21	Q-19	ALD



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## M.J. Reider Associates, Inc.

## Preparation Methods

Specific Method	Preparation Method	Prep Batch	Prepared Date	Prepared By
<b>2125189-01</b>				
<b>Dissolved General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B1H1042	08/18/2021	TML
<b>General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B1H1125	08/19/2021	TML
<b>2125189-02</b>				
<b>Dissolved General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B1H1042	08/18/2021	TML
<b>General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B1H1125	08/19/2021	TML
<b>2125189-03</b>				
<b>Dissolved General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B1H1042	08/18/2021	TML
<b>General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B1H1125	08/19/2021	TML
<b>2125189-04</b>				
<b>Dissolved General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B1H1042	08/18/2021	TML
<b>General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B1H1125	08/19/2021	TML
<b>2125189-05</b>				
<b>Dissolved General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B1H1042	08/18/2021	TML
<b>General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B1H1125	08/19/2021	TML
<b>2125189-06</b>				
<b>Dissolved General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B1H1042	08/18/2021	TML
<b>General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B1H1125	08/19/2021	TML
<b>2125189-07</b>				
<b>Dissolved General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B1H1042	08/18/2021	TML
<b>General Chemistry</b>				
SM 4500-P F	SM 4500-P B	B1H1125	08/19/2021	TML
<b>2125189-08</b>				
<b>Dissolved General Chemistry</b>				



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SM 4500-P F	SM 4500-P B	B1H1042	08/18/2021	TML
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**General Chemistry**

SM 4500-P F	SM 4500-P B	B1H1125	08/19/2021	TML
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**2125189-09**

**Dissolved General Chemistry**

SM 4500-P F	SM 4500-P B	B1H1042	08/18/2021	TML
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**General Chemistry**

SM 4500-P F	SM 4500-P B	B1H1125	08/19/2021	TML
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**2125189-10**

**Dissolved General Chemistry**

SM 4500-P F	SM 4500-P B	B1H1042	08/18/2021	TML
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**General Chemistry**

SM 4500-P F	SM 4500-P B	B1H1125	08/19/2021	TML
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**2125189-11**

**Dissolved General Chemistry**

SM 4500-P F	SM 4500-P B	B1H1042	08/18/2021	TML
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**General Chemistry**

SM 4500-P F	SM 4500-P B	B1H1125	08/19/2021	TML
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**2125189-12**

**Dissolved General Chemistry**

SM 4500-P F	SM 4500-P B	B1H1042	08/18/2021	TML
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**General Chemistry**

SM 4500-P F	SM 4500-P B	B1H1125	08/19/2021	TML
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**2125189-13**

**Dissolved General Chemistry**

SM 4500-P F	SM 4500-P B	B1H1042	08/18/2021	TML
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**General Chemistry**

SM 4500-P F	SM 4500-P B	B1H1125	08/19/2021	TML
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**Notes and Definitions**

- C-51 The alkalinity to pH 4.2 = 10.1 mg CaCO<sub>3</sub>/L.  
C-51a The alkalinity to pH 4.2 = 11.6 mg CaCO<sub>3</sub>/L.  
C-51b The alkalinity to pH 4.2 = 5.3 mg CaCO<sub>3</sub>/L.  
C-51c The alkalinity to pH 4.2 = 7.4 mg CaCO<sub>3</sub>/L.  
C-51d The alkalinity to pH 4.2 = 7.5 mg CaCO<sub>3</sub>/L.  
C-51e The alkalinity to pH 4.2 = 7.7 mg CaCO<sub>3</sub>/L.  
C-51f The alkalinity to pH 4.2 = 8.0 mg CaCO<sub>3</sub>/L.  
C-51g The alkalinity to pH 4.2 = 8.1 mg CaCO<sub>3</sub>/L.  
C-51h The alkalinity to pH 4.2 = 8.2 mg CaCO<sub>3</sub>/L.  
C-51i The alkalinity to pH 4.2 = 8.4 mg CaCO<sub>3</sub>/L.  
C-51j The alkalinity to pH 4.2 = 8.8 mg CaCO<sub>3</sub>/L.  
G-11 The sample was filtered after it was received at the laboratory.  
G-17 The sample was preserved in the laboratory.  
J Estimated value  
Q-10 The matrix spike(s) were outside acceptable limits of 90-110% recovery at 82.7%.  
Q-19 The duplicate RPD was greater than 10% at 100%.  
U Analyte was not detected above the indicated value.



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610-374-5129 www.mjreider.com**WORK ORDER  
Chain of Custody****2125189**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: **2021 - Walter Reservoir**Collected By :  
(Full Name)Gregory Wacik

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

**2125189-01 WA-1S**<sup>sum</sup>  
BOD SM 5210B, EC (#) SM 9223B Confirmation, 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, TC (#) SM 9223B  
Alk SM 2320B, NH<sub>3</sub>-N D6919-03, 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: 8/18/21  
Time: 9:20A - PI 500ml NP, minimal hdspc  
B - PI Liter NP  
C - Sterile PI 125ml NaThio  
D - PI 500ml H<sub>2</sub>SO<sub>4</sub>  
E - PI 250ml NP  
F - PI 500ml Lab Filtered  
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  
I - Vial Amber 40ml H<sub>3</sub>PO<sub>4</sub>, minimal hdspc**2125189-02 WA-2S**<sup>sum</sup>  
BOD SM 5210B, EC (#) SM 9223B Confirmation, 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, TC (#) SM 9223B  
Alk SM 2320B, NH<sub>3</sub>-N D6919-03, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D, PO<sub>4</sub> SM 4500P-F

Matrix: Non-Potable Water

Type: Grab

Date: 8/18/21  
Time: 0715A - PI 500ml NP, minimal hdspc  
B - PI Liter NP  
C - Sterile PI 125ml NaThio  
D - PI 500ml H<sub>2</sub>SO<sub>4</sub>  
E - PI 250ml NP  
F - PI 500ml Lab Filtered  
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  
I - Vial Amber 40ml H<sub>3</sub>PO<sub>4</sub>, minimal hdspc

Relinquished By

Date/Time

8/18/21 1230

Received By

Date/Time

8/18/21 1230

Relinquished By

Date/Time

Received By

Date/Time

8-18-21 1415

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
<u>Wacik</u>	<u>8/18/21</u>
Sample Temp (°C):	<u>8</u>
Samples on Ice?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> NA <input type="checkbox"/>
Approved By:	<u>Wacik</u>
Entered By:	<u>Wacik</u>



# M.J. Reider Associates, Inc.

2125189

Client Code: 3157

Client: Tetra Tech

Project Manager: Richard A Wheeler

Project: 2021 - Walter Reservoir

Comments:

Collected By:

(Full Name)

Gregory Wacik

## 2125189-03 WA-2M

<sup>SWA</sup> 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 D6919-03, 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:

Time:

8/18/21  
0715

- A - Pl 500ml NP, minimal hdspe
- 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 hdspe
- G - Vial Amber 40ml H<sub>3</sub>PO<sub>4</sub>, minimal hdspe
- H - Vial Amber 40ml H<sub>3</sub>PO<sub>4</sub>, minimal hdspe

## 2125189-04 WA-2D

<sup>SWA</sup> 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 D6919-03, 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:

Time:

8/18/21  
0715

- A - Pl 500ml NP, minimal hdspe
- 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 hdspe
- G - Vial Amber 40ml H<sub>3</sub>PO<sub>4</sub>, minimal hdspe
- H - Vial Amber 40ml H<sub>3</sub>PO<sub>4</sub>, minimal hdspe

## 2125189-05 WA-3S

<sup>SWA</sup> BOD SM 5210B, EC (#) SM 9223B Confirmation, NO<sub>2</sub>-N EPA 300.0, TC (#) SM 9223B, 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 D6919-03, TDS SM 2540C, TOC SM 5310C, PO<sub>4</sub> SM 4500P-F, TSS SM 2540D, TKN EPA 351.2

Matrix: Non-Potable Water

Type: Grab

Date:

Time:

8/18/21  
0945

- A - Pl 500ml NP, minimal hdspe
- B - Pl Liter NP
- C - Sterile Pl 125ml NaThio
- D - Pl 500ml H<sub>2</sub>SO<sub>4</sub>
- E - Pl 250ml NP
- F - Pl 500ml Lab Filtered
- G - Vial Amber 40ml H<sub>3</sub>PO<sub>4</sub>, minimal hdspe
- H - Vial Amber 40ml H<sub>3</sub>PO<sub>4</sub>, minimal hdspe
- I - Vial Amber 40ml H<sub>3</sub>PO<sub>4</sub>, minimal hdspe

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
	7/19/21
Sample Temp (°C):	8
Samples on Ice?	No NA
Approved By:	
Entered By:	



# M.J. Reider Associates, Inc.

2125189

Client Code: 3157

Client: Tetra Tech

Project Manager: Richard A Wheeler

Project: 2021 - Walter Reservoir

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

Collected By :  
(Full Name)

Gregory Wacik

## 2125189-06 WA-4S

TC (#) SM 9223B, EC (#) SM 9223B Confirmation, 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, BOD SM 5210B, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D, Alk SM 2320B, PO<sub>4</sub> SM 4500P-F, NH<sub>3</sub>-N D6919-03, TDS SM 2540C

Matrix: Non-Potable Water

Type: Grab

Date: 8/18/21  
Time: 1015

- A - Pl 500ml NP, minimal hdspc
- B - Pl Liter NP
- C - Sterile Pl 125ml NaThio
- D - Pl 500ml H<sub>2</sub>SO<sub>4</sub>
- E - Pl 250ml NP
- F - Pl 500ml Lab Filtered
- 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
- I - Vial Amber 40ml H<sub>3</sub>PO<sub>4</sub>, minimal hdspc

## 2125189-07 WA-5S

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, BOD SM 5210B, EC (#) SM 9223B Confirmation, NO<sub>2</sub>-N EPA 300.0, TC (#) SM 9223B, Alk SM 2320B, PO<sub>4</sub> SM 4500P-F, TSS SM 2540D, NH<sub>3</sub>-N D6919-03, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C

Matrix: Non-Potable Water

Type: Grab

Date: 8/18/21  
Time: 1035

- A - Pl 500ml NP, minimal hdspc
- B - Pl Liter NP
- C - Sterile Pl 125ml NaThio
- D - Pl 500ml H<sub>2</sub>SO<sub>4</sub>
- E - Pl 250ml NP
- F - Pl 500ml Lab Filtered
- 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
- I - Vial Amber 40ml H<sub>3</sub>PO<sub>4</sub>, minimal hdspc

Relinquished By: [Signature] Date/Time: 8/18/21 1230

Received By: [Signature] Date/Time: 8-18-21 1230

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

Received By: \_\_\_\_\_ Date/Time: 8-18-21 1415

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: <u>VB</u>	Date/Time <u>7/18/21</u>
Sample Temp (°C): Samples on Ice?	Yes <u>8</u> No <u>8</u> NA <u>8</u>
Approved By: <u>[Signature]</u>	
Entered By:	



# M.J. Reider Associates, Inc.

2125189

Client Code: 3157

Client: Tetra Tech

Project Manager: Richard A Wheeler

Project: 2021 - Walter Reservoir

Comments:

Collected By :

(Full Name)

*Gregory W. Dacik*

## 2125189-08 WA-6S

*SUN*  
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, PO<sub>4</sub> SM 4500P-F, NH<sub>3</sub>-N D6919-03, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D

Matrix: Non-Potable Water

Type: Grab

Date: *8/18/21*  
Time: *0800*

A - Pl 500ml NP, minimal hdspc  
B - Pl Liter NP  
C - Sterile Pl 125ml NaThio  
D - Pl 500ml H<sub>2</sub>SO<sub>4</sub>  
E - Pl 250ml NP  
F - Pl 500ml Lab Filtered  
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  
I - Vial Amber 40ml H<sub>3</sub>PO<sub>4</sub>, minimal hdspc

## 2125189-09 WA-6M

*SUN*  
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, PO<sub>4</sub> SM 4500P-F, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D, NH<sub>3</sub>-N D6919-03

Matrix: Non-Potable Water

Type: Grab

Date: *8/18/21*  
Time: *0800*

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

## 2125189-10 WA-6D

*SUN*  
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 D6919-03, 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: *8/18/21*  
Time: *0800*

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

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.

Page 4 of 5

Printed: 7/15/2021 9:32:59AM

Sample Kit Prepared By: <i>VB</i>	Date/Time <i>7/19/21</i>
Sample Temp (°C): Samples on Ice?	<i>8</i> Yes No NA
Approved By:	<i>[Signature]</i>
Entered By:	

Report Template: wko WorkOrder\_COC.rpt

Page 17 of 19



# M.J. Reider Associates, Inc.

2125189

Client Code: 3157

Client: Tetra Tech

Project Manager: Richard A Wheeler

Project: 2021 - Walter Reservoir

Comments:

Collected By:

(Full Name)

Gregory Wacik

## 2125189-11 WA-7S

BOD SM 5210B, EC (#) SM 9223B Confirmation, 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, TC (#) SM 9223B  
Alk SM 2320B, NH<sub>3</sub>-N D6919-03, 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:

Time:

8/18/21  
0830

- A - Pl 500ml NP, minimal hdspc
- B - Pl Liter NP
- C - Sterile Pl 125ml NaThio
- D - Pl 500ml H<sub>2</sub>SO<sub>4</sub>
- E - Pl 250ml NP
- F - Pl 500ml Lab Filtered
- 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
- I - Vial Amber 40ml H<sub>3</sub>PO<sub>4</sub>, minimal hdspc

## 2125189-12 WA-7M

PO<sub>4</sub>-D SM 4500P-F, 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>  
TOC SM 5310C, TSS SM 2540D, TDS SM 2540C, Alk SM 2320B, NH<sub>3</sub>-N D6919-03, PO<sub>4</sub> SM 4500P-F, TKN EPA 351.2

Matrix: Non-Potable Water

Type: Grab

Date:

Time:

8/18/21  
0830

- 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

## 2125189-13 WA-7D

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 D6919-03, 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:

Time:

8/18/21  
0830

- 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

Relinquished By

Date/Time

8/18/21 1730

Received By

Date/Time

8/18/21 1230

Relinquished By

Date/Time

Received By

Date/Time

8-18-21 1415

Relinquished By

Date/Time

Received at Laboratory By

Date/Time

Sample Kit Prepared By:	Date/Time
VBS	7/19/21
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.

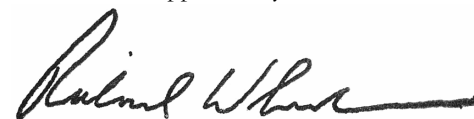
**Payment Terms**

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



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

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

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