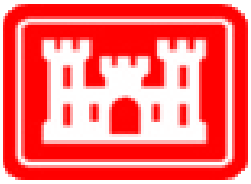
2016 WATER QUALITY MONITORING
F.E. WALTER RESERVOIR
WHITE HAVEN, PENNSYLVANIA



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

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2016 Water Quality Monitoring
F.E. Walter Reservoir
White Haven, Pennsylvania

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1.0 INTRODUCTION

1.1 DESCRIPTION OF F.E. WALTER RESERVOIR

The U.S. Army Corps of Engineers (USACE) manages F.E. Walter Reservoir located in northeastern Pennsylvania within the Delaware River Basin. F.E. Walter Reservoir is an integral part of the Lehigh River Flood Control Program. The authorized purpose of this project is flood control. The reservoir project was authorized for recreation and specifically white water recreation as part of Public Law 100-676, Section 6, dated November 17, 1988. Located about 9 miles southeast of Wilkes-Barre, PA, the reservoir dams a drainage area of 288 square miles. The dam can impound up to 35.8 billion gallons of floodwater. The primary surface water input into the reservoir is the Lehigh River as it flows west between Luzerne and Carbon Counties. Bear Creek, a secondary surface water input, enters the reservoir from the north. Tobyhanna Creek drains an area to the southeast and joins the Lehigh River near the headwaters of the reservoir. The reservoir is approximately 3 miles long and approximately 50 feet deep when not operating for flood control or recreation. In an effort to maximize recreational potential in the reservoir and on the Lehigh River downstream, specifically recreational boating and fishing, the normal operating pool of 50 feet was raised an additional 70 feet in March/April of 2016. The additional storage was used to augment low flows in the Lehigh River downstream as a fishery management tool and increase the number of recreational boating releases throughout the summer recreation season.

1.2 PURPOSE OF THE MONITORING PROGRAM

Foremost, F.E. Walter Reservoir provides flood control to downstream communities on the Lehigh River. Additionally, the reservoir provides important habitat for fish, waterfowl, and other wildlife, and recreational opportunities through fishing and boating both within the lake and downstream. Drinking water intakes exist at various locations on the Lehigh River downstream of the dam. Due to the broad range of uses and demands F.E. Walter Reservoir serves, the USACE monitors water quality and other aspects related to reservoir health primarily to ensure public health safety and protection of the environment. Water quality monitoring results are compared to state water quality standards and used to diagnose problems that commonly effect reservoir health such as nutrient enrichment and toxic loadings. This report summarizes the results of water quality monitoring at F.E. Walter Reservoir and its tributaries from May through September 2016.

1.3 ELEMENTS OF THE STUDY

The USACE, Philadelphia District, has been monitoring the water quality of F.E. Walter Reservoir since 1975. Over this time, yearly monitoring program designs have evolved to address new areas of concern such as human health aspects of drinking water, sediment contaminants within the reservoir basin, and a 2002 investigation of a hydrogen sulfide smell near the tail water of the dam. The 2016 monitoring program was similar to those in recent

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

2.0 METHODS

2.1 PHYSICAL STRATIFICATION MONITORING

Physical stratification monitoring of the water column of F.E. Walter Reservoir was conducted five times between June and September 2016 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 of 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 data recorded from stratification monitoring were compared to applicable water quality standards mandated by the Pennsylvania Department of Environmental Protection (PADEP Chapter 93). The standard for DO is a minimum concentration of 5 mg/L, and that for pH is an acceptable range from 6 to 9. All of the water quality data collected during physical stratification monitoring is summarized in Appendix A.

2.2 WATER COLUMN CHEMISTRY MONITORING

Water column chemistry monitoring was conducted five times at F.E. Walter Reservoir between May and September 2016 (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 0.5-1 foot below the water's surface. Middle and bottom samples were collected with a Van Dorn design water bottle sampler. All samples were placed on ice in a cooler and shipped to a certified laboratory for testing. MJ Reider Associates in Reading, Pennsylvania conducted the laboratory water analysis for 2016.

Water samples collected from surface, middle, and bottom depths were analyzed for ammonia, nitrite, nitrate, total Kjeldahl nitrogen (TKN), total phosphorus, diss./ortho-phosphate, soluble phosphorus, total dissolved solids (TDS), total suspended solids (TSS), biochemical oxygen demand (BOD), alkalinity, 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.

Table 2-1. F.E. Walter Reservoir water quality schedule for 2016 monitoring

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
11 May	X	X	X	X	NS	NS	NS
07 June	X	X	X	X	NS	NS	NS
19 July	X	X	X	X	NS	NS	NS
17 August	X	X	X	X	NS	NS	NS
13 September	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. They are periodically downloaded.
(3) Physical stratification monitoring is conducted at all stations during routine monthly sampling.
(4) Sediment Sampling was not conducted in 2016 based on historic sampling results showing low probability of sediment contamination.
NS- Not Sampled

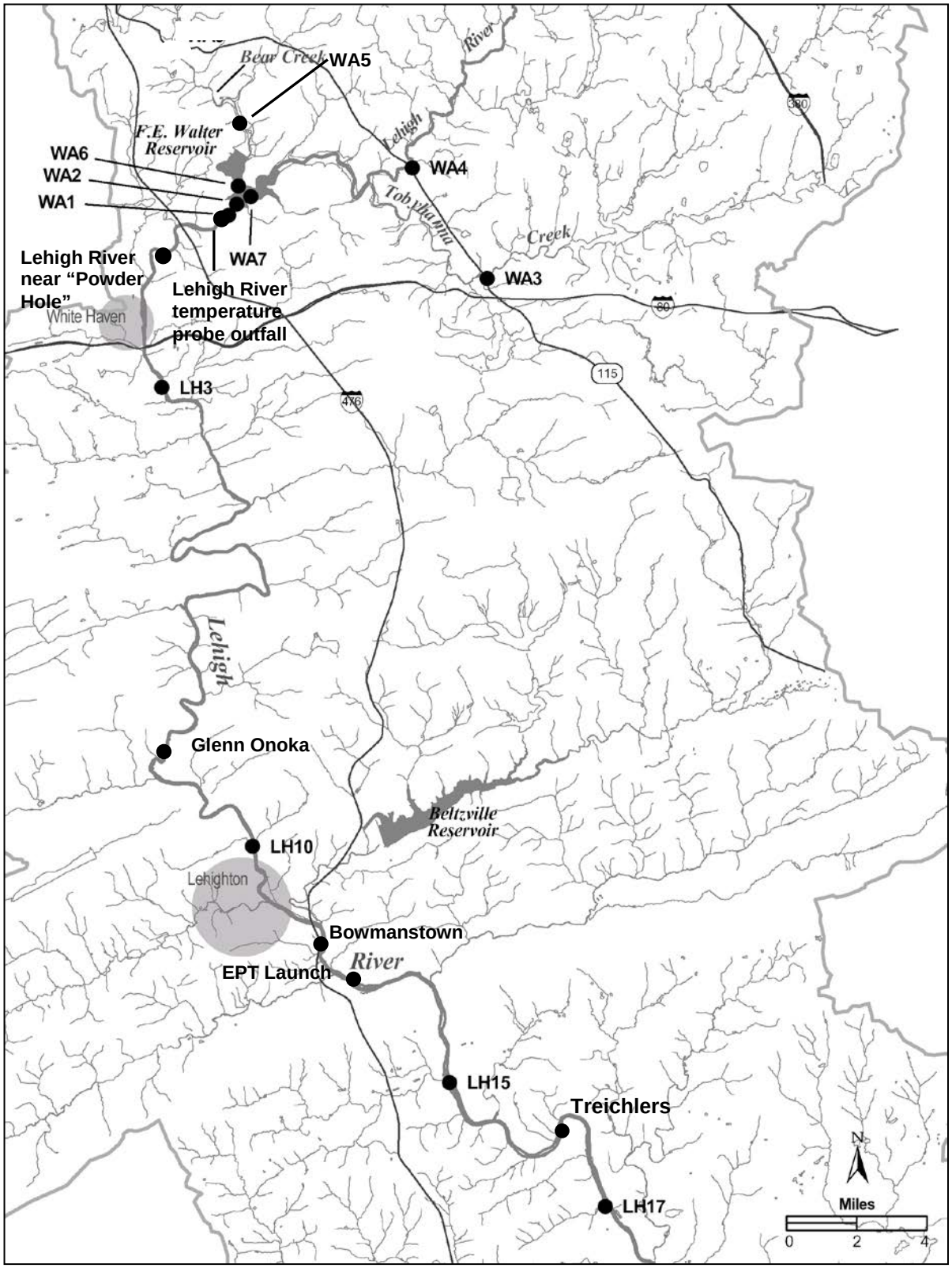

Figure 2-1. Location map for F.E. Walter Reservoir and historically sampled Lehigh River temperature probe monitoring stations.

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 2016

Parameter	(2) Method	Reporting Limit	PADEP Surface Water Quality Criteria	Allowable Hold Times (Days)
Total Alkalinity	SM20 2320B	1.0 mg/L	Min. 20 mg/L $CaCO_3$	14
Biochemical Oxygen Demand (BOD)	SM20 5210B	2.0 mg/L	None	2
Total Phosphorus	SM20 4500P-E	0.01 mg/L	None	28
Diss./Ortho-Phosphate	SM20 4500P-E	0.01 mg/L	None	28
Soluble Phosphorus	SM-20 4500-PE	0.05 mg/L	None	28
Total Organic Carbon (TOC)	SM-20 5310C	1.0 mg/L	None	28
Total Inorganic Carbon (TIC)	SM-20 5310B	NA	None	28
Total Carbon (TOC + TIC)	SM-20 5310B	NA	None	28
(1) Chlorophyll *a*			None	
Total Kjeldahl Nitrogen	MCAWW 351.2	0.25 mg/L	None	28
Ammonia	D6919-03	0.05 mg/L	Temp. and pH dependent	28
Nitrate	MCAWW 353.2	0.05 mg/L	Maximum 10 mg/L (nitrate + nitrite)	28
Nitrite	MCAWW 353.2	0.05 mg/L		28
Total Dissolved Solids	SM20 2540C	5.0 mg/L	Maximum 750 mg/L	7
Total Suspended Solids	SM20 2540D	3.0 mg/L	None	7

(1) Chlorophyll *a* samples were recorded using a YSI 6600 V2-4 with a chlorophyll sensor.
(2) Laboratory Methods Reference:
MCAWW- "Methods for Chemical Analysis of Water and Wastes", EPA-600/4-79-020, March 1983 and subsequent revisions.
SM-20- "Standard Methods for the Examination of Water and Wastewater", 22nd Edition, 2012.
SW846- "Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods", 3rd. Edition, November 1986 and updates.
NA- Total Inorganic Carbon and Total Carbon were not sampled for in 2016

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* concentrations, and secchi disk depth. Surface water measures of total phosphorus and chlorophyll *a* from chemistry monitoring were used independently in determining monthly TSI values. Secchi disk depth was measured only in surface waters in the reservoir-body. Trophic state determinations were calculated only for Station WA-2 within the reservoir.

2.4 RESERVOIR BACTERIA MONITORING

Monitoring for coliform bacteria contaminants was conducted five times between May and September 2016 at F.E. Walter Reservoir. Surface water samples were collected in the same manner as for chemical parameter samples, and analyzed for total and fecal coliform and e-coli bacteria contamination. Table 2-3 presents the test methods, detection limits, PADEP standards, and sample holding times for the bacteria parameters monitored at F.E. Walter Reservoir in 2016. The bacteria analytical method was based on a membrane filtration technique. All of the samples were analyzed within their maximum allowable hold times. MJ Reider Associates Laboratory in Reading, Pennsylvania conducted the bacteria analysis for 2016.

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

Table 2-3. Water quality test methods, detection limits, PADEP water quality standards, and sample holding times for bacteria parameters monitored at F.E. Walter Reservoir in 2016

Parameter	Total coliform	Fecal coliform
Test method	SM 9223B	SM9222D
Detection limit	1 clns/100-mls	2 clns/100-ml
PADEP standard	-	Geometric mean less than 200 clns/100-ml (application of this standard is conservative because swimming is not permitted in the reservoir)
Maximum allowable holding time	30 hours	30 hours
Achieved holding time	< 30 hours	< 30 hours

3.0 RESULTS AND DISCUSSION

3.1 STRATIFICATION MONITORING

The following sections 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 2016. Additionally, patterns related to season and depths are described for station WA-2 which is located near the operations tower and maintains the greatest water depths in the reservoir. Maximum depths for WA-2, during five separate monthly sampling days, vary between approximately 52 to 120 feet depending on 2016 reservoir operations (recreation and flood control) at the time of sampling. All of the stratification data collected during the 2016 monitoring period is presented in Appendix A.

3.1.1 Temperature

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

Temperatures of the tributary surface waters (Stations WA-3S, -4S, and -5S) of the F.E. Walter Reservoir watershed generally followed a similar seasonal pattern throughout the monitoring period. Monthly sampling showed temperatures rising through spring and early summer with a peak during mid-August (Fig. 3-1). Downstream release (Station WA-1S) surface water temperatures showed a similar trend with August and September temperatures slightly warmer than tributary inflow temperatures. A maximum inflow temperature of 22.89 ºC (WA-5S) was measured in August and maximum outflow temperature of 23.92 ºC (WA-1S) was also seen in August. Surface water temperatures of the reservoir-body (Station WA-2S, -6S, and -7S) were generally warmer than in tributaries and downstream of the dam as a result of warming from the sun. In-lake reservoir surface temperatures peaked in mid-August at approximately 26.78 ºC (Station WA-6S). In 2016, tributary and release water temperatures, at times, exceeded the Pennsylvania state water quality criteria for cold water fisheries.

The water column of F.E. Walter Reservoir was temperature stratified during the 2016 sampling season (Fig. 3-2). Due to operations in 2016, specifically the raising of the base pool level and recreational release operations, the temperature stratification within the reservoir was likely affected by bottom flood gate releases on various occasions during the season. This was particular evident in August and September when the pool level was drawn down considerably. The reservoir operations tower was constructed with bottom flood control gates only and does not have the flexibility to withdrawal water from other locations in the water column. As a result, deeper and typically cooler bottom waters are withdrawn first, likely causing a disruption in stratification and accelerated depletion of cooler bottom waters. Overall, 2016 in reservoir lake temperatures showed a pronounced stratification from June through August. Cooler deep water temperatures were available into the late July time period of the recreational season.

3.1.2 Dissolved Oxygen

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

In 2016, DO in the tributary surface waters (stations WA-3S, -4S, and -5S) of F.E. Walter Reservoir remained relatively constant from May through September sampling with recorded values ranging from 8.05 mg/L to 10.82 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 7.88 mg/L to 10.75 mg/L. This can be attributed, in part, to the aeration of reservoir bottom waters as it passes through the conduit system of the dam and is released downstream.

The water column of F.E. Walter Reservoir was weakly stratified with respect to DO during most of the sampling season (Fig. 3-4). July sampling showed the most pronounced evidence of stratification. The reservoir profile showed the formation of a metalimnetic dissolved oxygen minimum as was documented during 2015 sampling. 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 Corps 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 this occurrence appears influenced by seasonal recreational and flood control operations. In either case, the potential exists for negative impacts on water quality, recreational use, and aquatic species such as fish. The occurrence and severity of this DO formation will be monitored during future sampling efforts. In all months sampled the DO concentrations remained above state epilimnion criteria (minimum 5 mg/l).

The health of aquatic ecosystems can be impaired by low DO concentrations in the water column. The lowest DO concentration (0.06 mg/L) was recorded at the bottom of the reservoir during the 19 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 experience short term hypoxic conditions during the 2016 sampling season. Low oxygen reservoir waters are re-aerated as they pass through the conduit system of the reservoir during release. As a result, water releases from the deeper portions of the reservoir containing lower DO concentration did not 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. A pH below 7 is considered acidic and a pH above 7 is basic. The pH scale is 0-14 with the lower numbers being more acidic and the higher numbers being more basic. High pH values tend to facilitate solubilization of ammonia, salts, and heavy metals. Low pH levels tend to increase carbonic acid and carbon dioxide concentrations. Lethal effects of pH on aquatic life typically occur below pH 4.5 and above pH 9.5.

Measures of pH in tributary surface (WA-3S, -4S, and –5S) waters of F.E. Walter Reservoir generally followed a similar pattern during 2016 and remained relatively constant or within a narrow range of values (6.53-7.94) throughout the sampling season. The lowest pH level of 6.53 recorded during the sampling season occurred at station WA-5S during the June sampling and the highest pH reading of 7.94 was recorded at Station WA-4S in May. Measures of pH at the downstream station WA-1S are directly influenced by bottom water column releases from the reservoir. Readings of pH at this station ranged from a high of 7.89 in May to a low of 6.64 in July (Fig. 3-5).

In 2016, measures of reservoir pH stayed within a tight range of values (6.23-7.53) from the surface to the bottom throughout the sampling season (Fig. 3-6). Slightly higher pH values were measured near the surface and bottom waters of the lake. Many factors can influence the pH of the reservoir water such as geology, acid rain, algal productivity, deep water biological productivity and others. Measures of pH throughout the water column in all months sampled remained in compliance with PADEP water quality standards. The water quality standard for pH is a range of acceptable measures between 6 and 9.

3.2 WATER COLUMN CHEMISTRY MONITORING

Table 3-1 provides a summary of water column chemistry sampling for all stations and dates sampled at F.E. Walter Reservoir in 2016. The following sections describe the temporal, spatial, and depth related patterns for these water quality measures.

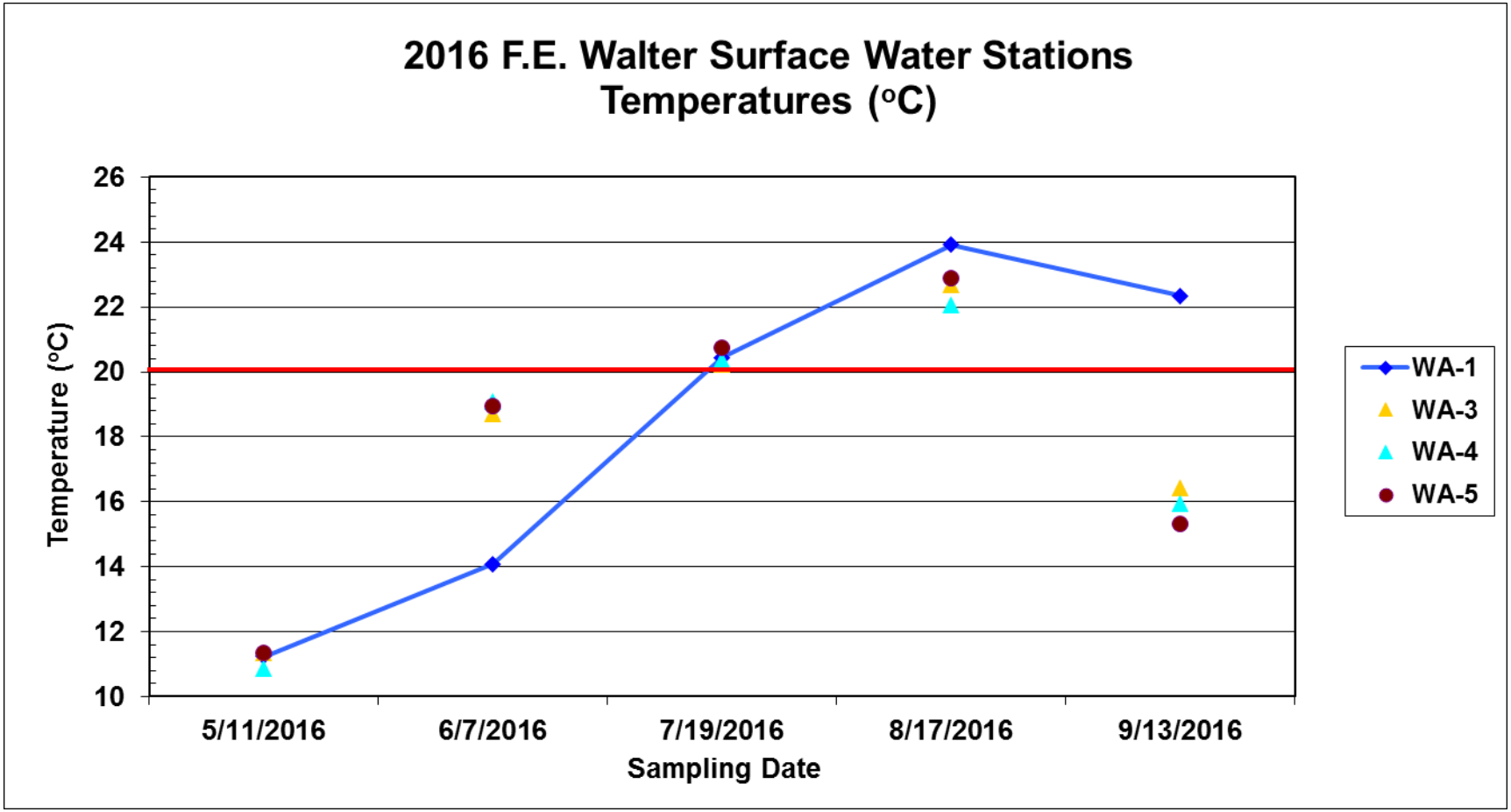

Figure 3-1. Temperature measured in tributary and release (WA-1) surface waters of F.E. Walter Reservoir during 2016. See Appendix A for a summary of the plotted values. The coldwater species preference temperature of 20°C is shown as a red line reference.

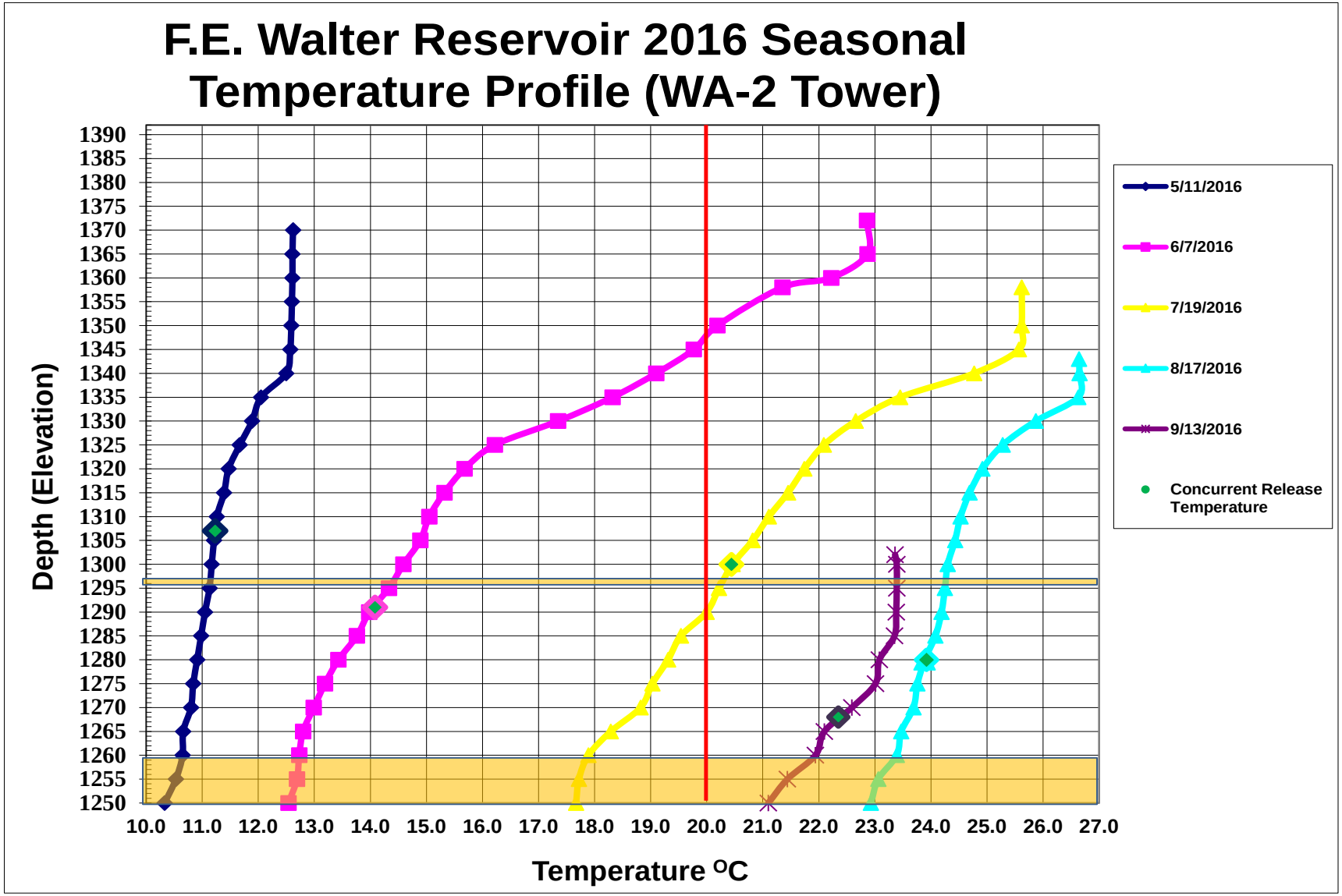

Figure 3-2. Stratification of temperature measured in the water column of F. E. Walter Reservoir at station WA-2 during 2016. See Appendix A for a summary of the plotted values. The coldwater species preference temperature of 20°C is shown as a red line reference.

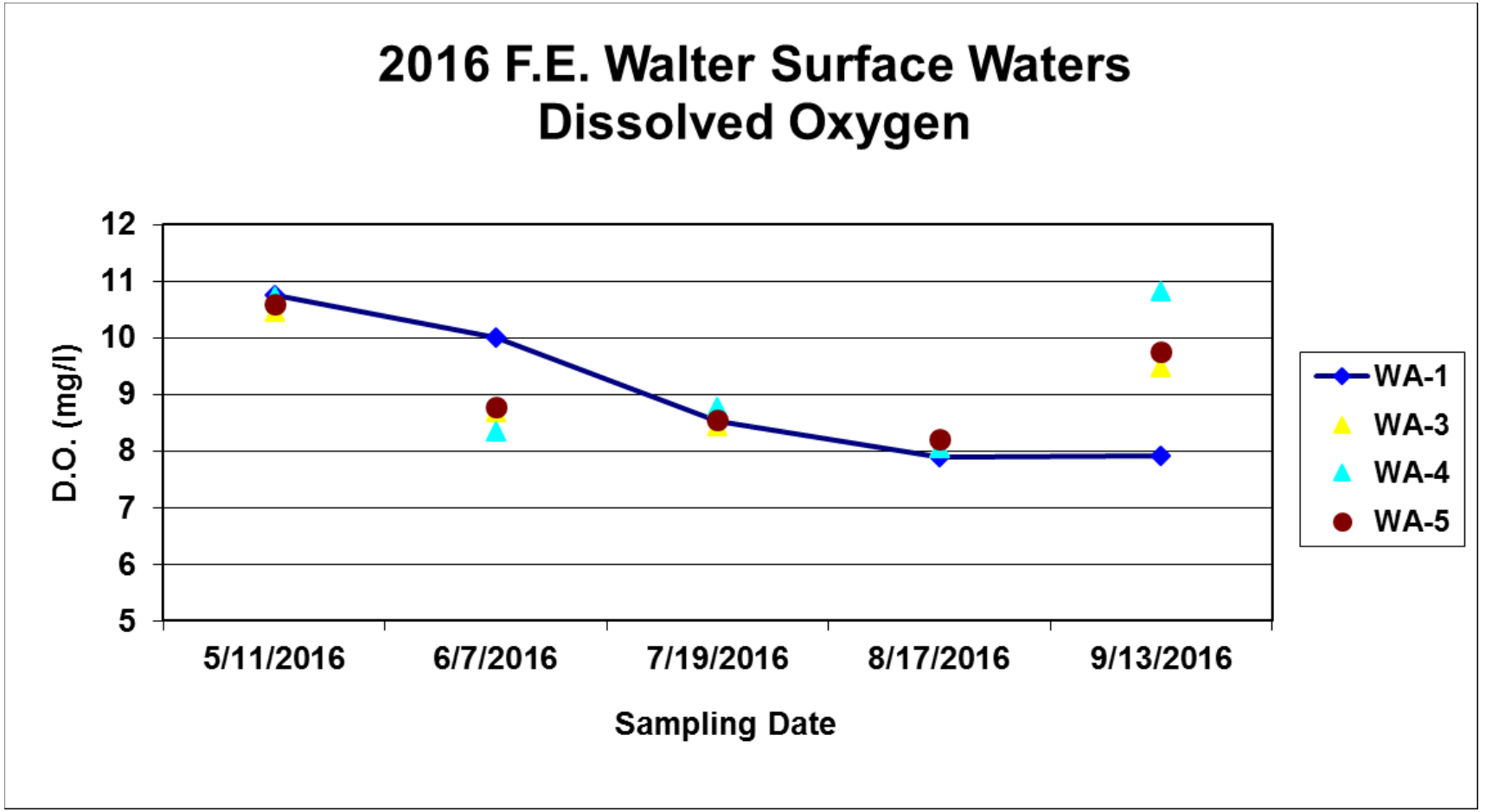

Figure 3-3. Dissolved oxygen measured in tributary and release (WA-1) surface waters of F. E. Walter Reservoir during 2016. See Appendix A for a summary of the plotted value.

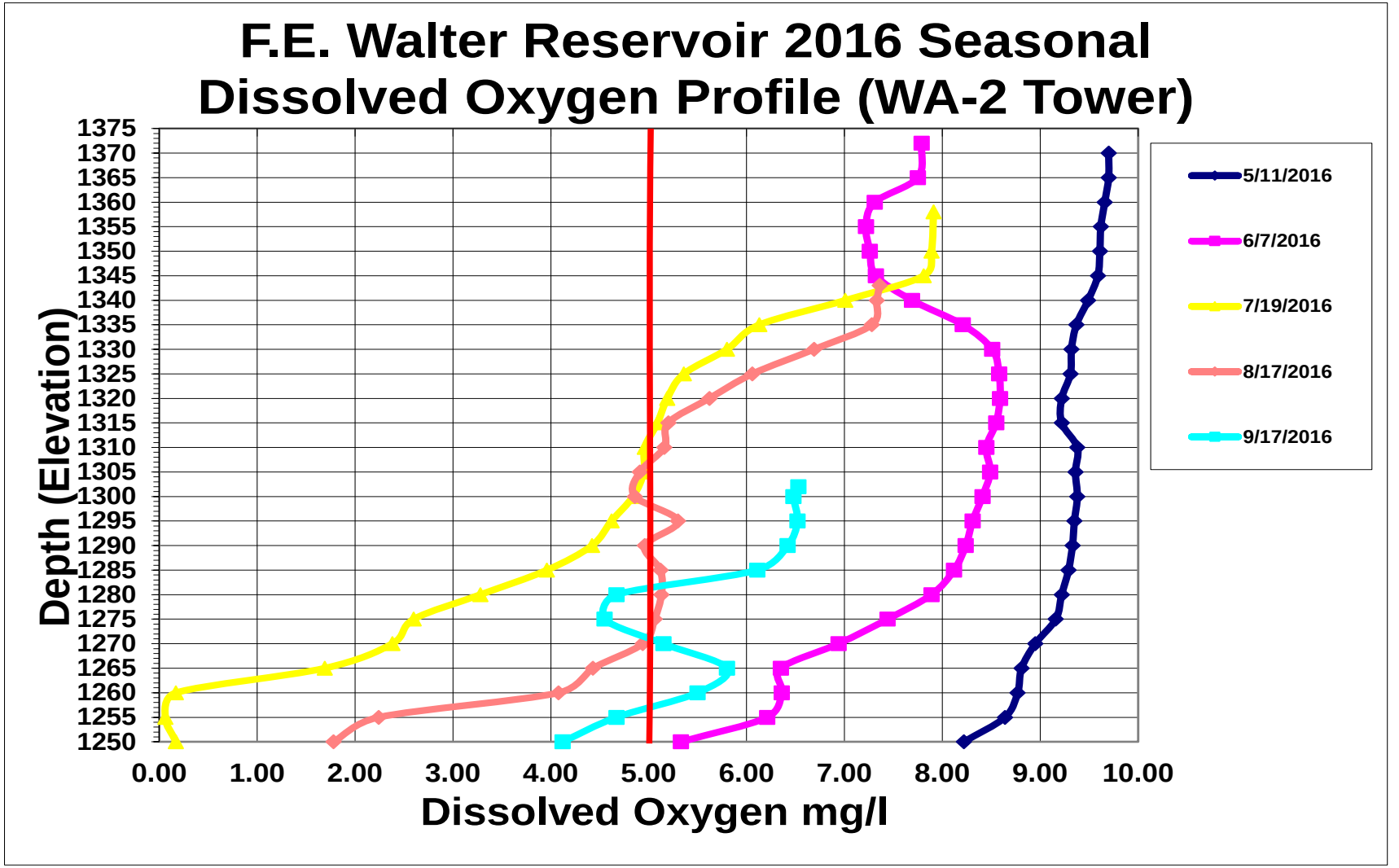

Figure 3-4. Dissolved oxygen measured in the water column of F.E. Walter Reservoir at station WA-2 during 2016. The PADEP WQ standard for DO is an epilimnion minimum concentration of 5 mg/L. See Appendix A for a summary of the plotted values.

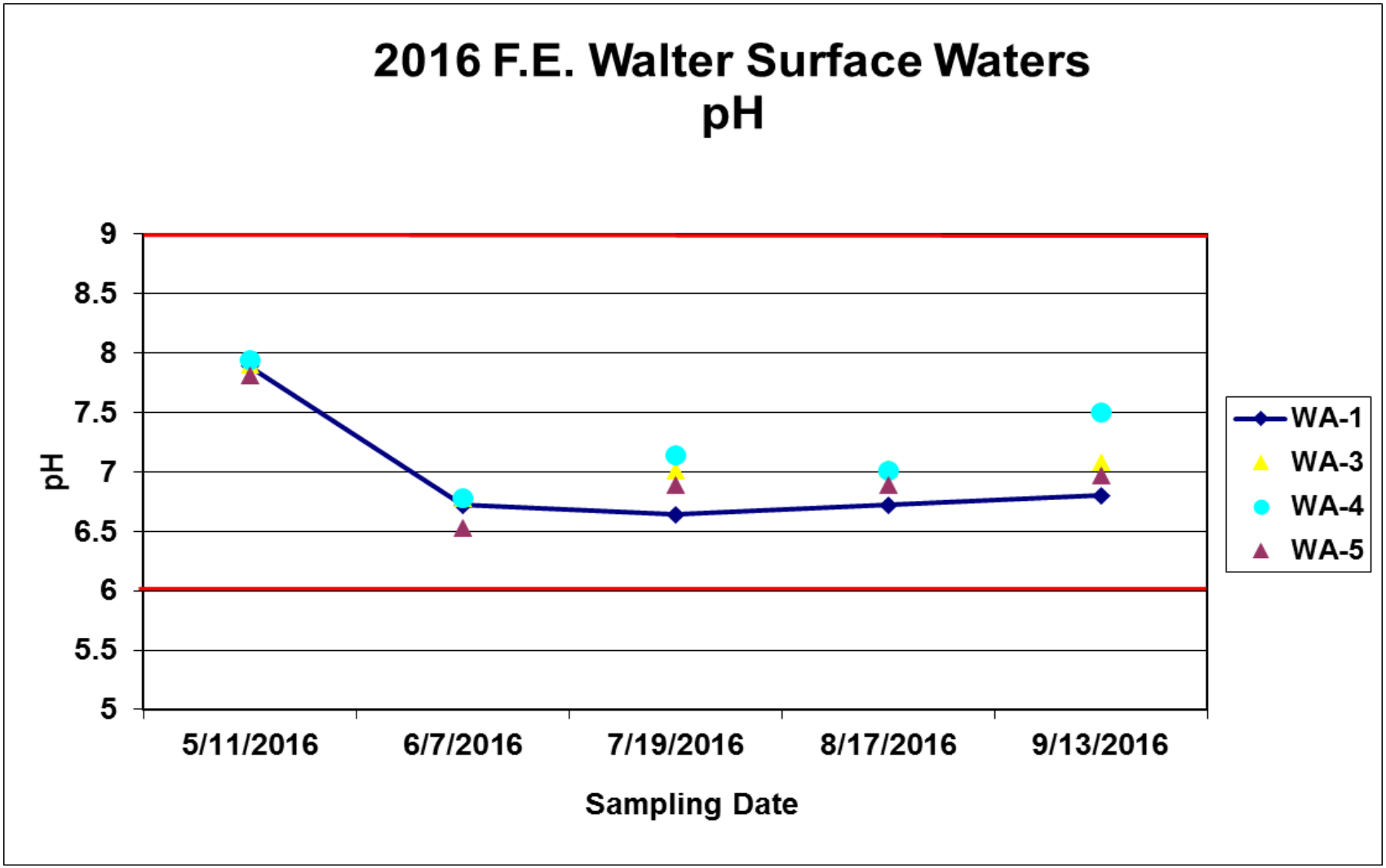

Figure 3-5. Measures of pH in tributary and release (WA-1) surface waters of F.E. Walter Reservoir during 2016. The PADEP WQ standard for pH is an acceptable range from 6 to 9. See Appendix A for a summary of the plotted values

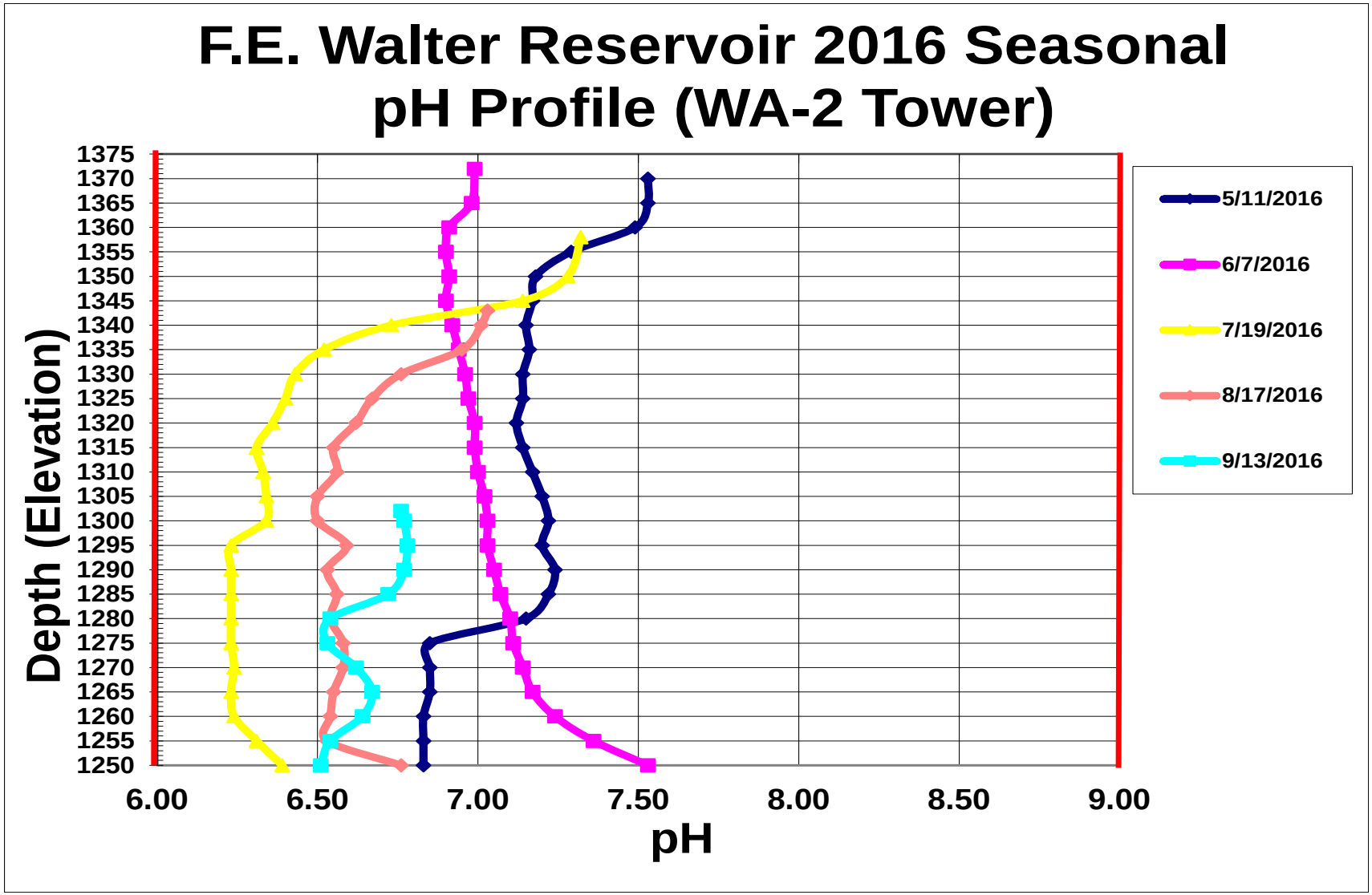

Figure 3-6. Stratification of pH measured in the water column of F.E. Walter Reservoir at station WA-2 during 2016. The PADEP water quality standard pH is an acceptable range from 6 to 9. See Appendix A for a summary of the plotted value.

Table 3-1. Summary of surface, middle, and bottom water quality monitoring data for F.E. Walter Reservoir in 2016

Station	Date	ALK mg/L	BOD5 mg/L	DISS-P mg/L	NH3 mg/L	NO2 mg/L	NO3 mg/L	PO4 mg/L	TDS mg/L	TKN mg/L	TOC mg/L	TP mg/L	TSS mg/L
WA-01S	5/11/2016	6	<2	<.05	<.05	<.05	0.06	<.01	37	0.32	3.7	<.01	<3
	6/7/2016	6	<2	<.05	<.05	<.05	0.08	<.01	60	0.3	3.2	<.01	<3
	7/19/2016	7	<2	<.05	<.05	<.05	0.11	0.01	39	0.31	3.9	<.01	<3
	8/17/2016	10	<2	<.05	<.05	<.05	0.09	0.02	74	0.46	5.3	<.01	<3
	9/13/2016	11	<2	<.05	<.05	<.05	0.06	<.01	57	0.4	3.7	0.04	11
	Mean	8	2	0.05	0.05	0.05	0.08	0.012	53	0.36	4.0	0.02	5
	Stdev	2	0	0	0	0	0.02	0.004	15	0.07	0.8	0.01	4
	Max	11	2	0.05	0.05	0.05	0.11	0.02	74	0.46	5.3	0.04	11
	Min	6	2	0.05	0.05	0.05	0.06	0.01	37	0.3	3.2	0.01	3
	No. of Det	5	0	0	0	0	5	2	5	5	5	1	1
WA-02S	5/11/2016	5	<2	<.05	<.05	<.05	0.07	<.01	22	0.49	3.2	0.07	<3
	6/7/2016	6	<2	<.05	<.05	<.05	0.08	<.01	33	0.31	4.1	0.03	<3
	7/19/2016	7	<2	<.05	<.05	<.05	0.06	0.01	35	0.28	4	<.01	<3
	8/17/2016	8	<2	<.05	<.05	<.05	0.06	0.02	56	0.4	4	<.01	<3
	9/13/2016	9	<2	<.05	<.05	<.05	0.05	<.01	65	0.31	4.4	<.01	3
	Mean	7	2	0.05	0.05	0.05	0.06	0.01	42	0.36	3.9	0.03	3
	Stdev	2	0	0	0	0	0.01	0	18	0.09	0.4	0.03	0
	Max	9	2	0.05	0.05	0.05	0.08	0.02	65	0.49	4.4	0.07	3
	Min	5	2	0.05	0.05	0.05	0.05	0.01	22	0.28	3.2	0.01	3
	No. of Det	5	0	0	0	0	5	2	5	5	5	2	1

Table 3-1 continued. Summary of surface, middle, and bottom water quality monitoring data for F.E. Walter Reservoir in 2016

Station	Date	ALK mg/L	BOD5 mg/L	DISS-P mg/L	NH3 mg/L	NO2 mg/L	NO3 mg/L	PO4 mg/L	TDS mg/L	TKN mg/L	TOC mg/L	TP mg/L	TSS mg/L
WA-02M	5/11/2016	6	<2	<.05	<.05	<.05	0.07	<.01	31	0.3	3.8	<.01	<3
	6/7/2016	5	<2	<.05	<.05	<.05	0.06	<.01	29	<.25	3.1	<.01	<3
	7/19/2016	7	<2	<.05	<.05	<.05	0.1	<.01	40	0.3	3.7	0.03	<3
	8/17/2016	9	<2	<.05	<.05	<.05	0.08	0.02	55	0.34	3.6	<.01	<3
	9/13/2016	10	<2	<.05	<.05	<.05	0.05	<.01	79	0.34	3.8	<.01	<3
	Mean	7	2	0.05	0.05	0.05	0.07	0.012	47	0.31	3.6	0.014	3
	Stdev	2	0	0	0	0	0.02	0.004	21	0.04	0.3	0.009	0
	Max	10	2	0.05	0.05	0.05	0.1	0.02	79	0.34	3.8	0.03	3
	Min	5	2	0.05	0.05	0.05	0.05	0.01	29	0.25	3.1	0.01	3
	No. of Det	5	0	0	0	0	5	1	5	4	5	1	0
WA-02B	5/11/2016	7	<2	<.05	<.05	<.05	0.06	<.01	33	0.36	3.8	<.01	5
	6/7/2016	6	<2	<.05	<.05	<.05	0.08	<.01	46	0.46	3.8	<.01	11
	7/19/2016	158	<2	<.05	0.26	<.05	0.06	0.02	52	0.77	4.7	0.01	16
	8/17/2016	11	<2	<.05	0.11	<.05	0.08	<.01	81	0.58	5.3	<.01	20
	9/13/2016	11	<2	<.05	<.05	<.05	0.09	<.01	76	0.41	3.6	<.01	14
	Mean	39	2	0.05	0.10	0.05	0.07	0.012	58	0.52	4.2	0.01	13
	Stdev	67	0	0	0.09	0	0.01	0.004	20	0.16	0.7	0	6
	Max	158	2	0.05	0.26	0.05	0.09	0.02	81	0.77	5.3	0.01	20
	Min	6	2	0.05	0.05	0.05	0.06	0.01	33	0.36	3.6	0.01	5
	No. of Det	5	0	0	2	0	5	1	5	5	5	1	5

Table 3-1 continued. Summary of surface, middle, and bottom water quality monitoring data for F.E. Walter Reservoir in 2016

Station	Date	ALK mg/L	BOD5 mg/L	DISS-P mg/L	NH3 mg/L	NO2 mg/L	NO3 mg/L	PO4 mg/L	TDS mg/L	TKN mg/L	TOC mg/L	TP mg/L	TSS mg/L
WA-03S	5/11/2016	8	<2	<.05	<.05	<.05	0.08	<.01	54	0.47	5	<.01	<3
	6/7/2016	8	<2	0.06	<.05	<.05	0.16	<.01	61	0.59	5.4	0.07	<3
	7/19/2016	55	<2	<.05	<.05	<.05	0.21	<.01	68	0.32	4.3	<.01	<3
	8/17/2016	12	<2	<.05	<.05	<.05	0.14	0.02	106	0.39	7.4	<.01	3
	9/13/2016	12	<2	<.05	<.05	<.05	0.12	<.01	95	0.28	3.9	<.01	<3
	Mean	19	2	0.05	0.05	0.05	0.14	0.012	77	0.41	5.2	0.02	3
	Stdev	20	0	0	0	0	0.05	0.004	23	0.12	1.4	0.03	0
	Max	55	2	0.06	0.05	0.05	0.21	0.02	106	0.59	7.4	0.07	3
	Min	8	2	0.05	0.05	0.05	0.08	0.01	54	0.28	3.9	0.01	3
	No. of Det	5	0	1	0	0	5	1	5	5	5	1	1
WA-04S	5/11/2016	15	66	<.05	<.05	<.05	<.05	0.01	83	4.78	<1	0.09	299
	6/7/2016	8	<2	<.05	<.05	<.05	0.08	<.01	74	0.56	7.7	<.01	3
	7/19/2016	59	<2	<.05	<.05	<.05	0.14	<.01	55	1.21	3.5	0.01	10
	8/17/2016	11	<2	<.05	<.05	<.05	0.06	0.02	54	0.56	8.2	<.01	10
	9/13/2016	14	<2	<.05	<.05	<.05	<.05	<.01	84	0.29	2.7	<.01	<3
	Mean	21	15	0.05	0.05	0.05	0.08	0.012	70	1.48	4.6	0.03	65
	Stdev	21	29	0	0	0	0.04	0.004	15	1.88	3.2	0.04	131
	Max	59	66	0.05	0.05	0.05	0.14	0.02	84	4.78	8.2	0.09	299
	Min	8	2	0.05	0.05	0.05	0.05	0.01	54	0.29	1	0.01	3
	No. of Det	5	1	0	0	0	3	2	5	5	4	2	4

Table 3-1 continued. Summary of surface, middle, and bottom water quality monitoring data for F.E. Walter Reservoir in 2016

Station	Date	ALK mg/L	BOD5 mg/L	DISS-P mg/L	NH3 mg/L	NO2 mg/L	NO3 mg/L	PO4 mg/L	TDS mg/L	TKN mg/L	TOC mg/L	TP mg/L	TSS mg/L
WA-05S	5/11/2016	2	<2	<.05	<.05	<.05	<.05	<.01	25	0.3	3.3	<.01	<3
	6/7/2016	3	<2	<.05	<.05	<.05	<.05	<.01	33	0.63	7.7	0.05	4
	7/19/2016	61	<2	<.05	<.05	<.05	<.05	0.01	35	<.25	3.9	<.01	31
	8/17/2016	5	<2	<.05	<.05	<.05	<.05	0.01	58	0.8	5.8	<.01	100
	9/13/2016	6	<2	<.05	<.05	<.05	0.05	<.01	68	<.25	3.1	0.05	<3
	Mean	15	2	0.05	0.05	0.05	0.05	0.01	44	0.45	4.8	0.03	28
	Stdev	26	0	0	0	0	0	0	18	0.25	2.0	0.02	42
	Max	61	2	0.05	0.05	0.05	0.05	0.01	68	0.8	7.7	0.05	100
	Min	2	2	0.05	0.05	0.05	0.05	0.01	25	0.25	3.1	0.01	3
	No. of Det	5	0	0	0	0	1	2	5	3	5	2	3
WA-06S	5/11/2016	5	<2	<.05	<.05	<.05	0.07	<.01	40	0.29	3.2	0.01	<3
	6/7/2016	6	<2	<.05	<.05	<.05	0.08	<.01	50	0.39	3.9	0.04	<3
	7/19/2016	45	<2	<.05	<.05	<.05	0.06	<.01	44	<.25	4	<.01	<3
	8/17/2016	8	<2	<.05	<.05	<.05	0.06	0.01	76	0.33	4.9	<.01	<3
	9/13/2016	10	<2	<.05	<.05	<.05	0.05	<.01	72	0.6	3.7	<.01	<3
	Mean	14.8	2	0.05	0.05	0.05	0.06	0.01	56	0.37	3.9	0.02	3
	Stdev	17.0	0	0	0	0	0.01	0	17	0.14	0.6	0.01	0
	Max	45	2	0.05	0.05	0.05	0.08	0.01	76	0.6	4.9	0.04	3
	Min	5	2	0.05	0.05	0.05	0.05	0.01	40	0.25	3.2	0.01	3
	No. of Det	5	0	0	0	0	5	1	5	4	5	2	0

Table 3-1 continued. Summary of surface, middle, and bottom water quality monitoring data for F.E. Walter Reservoir in 2016

Station	Date	ALK mg/L	BOD5 mg/L	DISS-P mg/L	NH3 mg/L	NO2 mg/L	NO3 mg/L	PO4 mg/L	TDS mg/L	TKN mg/L	TOC mg/L	TP mg/L	TSS mg/L
WA-06M	5/11/2016	5	<2	<.05	<.05	<.05	0.06	<.01	37	0.32	3.1	0.04	<3
	6/7/2016	5	<2	<.05	<.05	<.05	0.06	<.01	51	0.33	3.1	0.07	<3
	7/19/2016	31	<2	<.05	<.05	<.05	0.08	<.01	47	<.25	3.7	<.01	<3
	8/17/2016	8	<2	<.05	<.05	<.05	0.07	<.01	86	0.37	3.6	<.01	<3
	9/13/2016	10	<2	<.05	<.05	<.05	0.05	<.01	77	0.27	3.8	<.01	<3
	Mean	12	2	0.05	0.05	0.05	0.06	0.01	60	0.31	3.5	0.03	3
	Stdev	11	0	0	0	0	0.01	0	21	0.05	0.3	0.03	0
	Max	31	2	0.05	0.05	0.05	0.08	0.01	86	0.37	3.8	0.07	3
	Min	5	2	0.05	0.05	0.05	0.05	0.01	37	0.25	3.1	0.01	3
	No. of Det	5	0	0	0	0	5	0	5	4	5	2	0
WA-06B	5/11/2016	5	<2	<.05	<.05	<.05	0.06	<.01	37	0.29	3.8	<.01	<3
	6/7/2016	4	<2	<.05	<.05	<.05	0.06	<.01	58	0.34	3.1	<.01	<3
	7/19/2016	54	<2	<.05	<.05	<.05	0.11	<.01	54	0.38	3.9	<.01	<3
	8/17/2016	10	<2	<.05	<.05	<.05	0.08	<.01	64	0.44	5.5	<.01	16
	9/13/2016	11	<2	<.05	<.05	<.05	0.05	<.01	86	0.39	3.7	<.01	28
	Mean	16.8	2	0.05	0.05	0.05	0.07	0.01	60	0.37	4.0	0.01	11
	Stdev	21.0	0	0	0	0	0.02	0	18	0.06	0.9	0	11
	Max	54	2	0.05	0.05	0.05	0.11	0.01	86	0.44	5.5	0.01	28
	Min	4	2	0.05	0.05	0.05	0.05	0.01	37	0.29	3.1	0.01	3
	No. of Det	5	0	0	0	0	5	0	5	5	5	0	2

Table 3-1 continued. Summary of surface, middle, and bottom water quality monitoring data for F.E. Walter Reservoir in 2016

Station	Date	ALK mg/L	BOD5 mg/L	DISS-P mg/L	NH3 mg/L	NO2 mg/L	NO3 mg/L	PO4 mg/L	TDS mg/L	TKN mg/L	TOC mg/L	TP mg/L	TSS mg/L
WA-07S	5/11/2016	5	<2	<.05	<.05	<.05	0.07	<.01	47	0.3	3.7	<.01	<3
	6/7/2016	7	<2	0.08	<.05	<.05	0.08	0.01	72	0.57	3.9	0.08	<3
	7/19/2016	144	<2	<.05	<.05	<.05	0.14	<.01	56	0.27	4.1	0.02	<3
	8/17/2016	9	<2	<.05	<.05	<.05	0.06	0.02	71	0.36	4.6	<.01	<3
	9/13/2016	10	<2	<.05	<.05	<.05	0.05	<.01	79	0.33	3.8	<.01	<3
	Mean	35	2	0.06	0.05	0.05	0.08	0.012	65	0.37	4.0	0.03	3
	Stdev	61	0	0.01	0	0	0.04	0.004	13	0.12	0.4	0.03	0
	Max	144	2	0.08	0.05	0.05	0.14	0.02	79	0.57	4.6	0.08	3
	Min	5	2	0.05	0.05	0.05	0.05	0.01	47	0.27	3.7	0.01	3
	No. of Det	5	0	1	0	0	5	2	5	5	5	2	0
WA-07M	5/11/2016	5	<2	<.05	<.05	<.05	0.07	<.01	39	0.34	3.5	0.02	<3
	6/7/2016	5	<2	<.05	<.05	<.05	0.16	<.01	41	0.39	3.4	0.21	<3
	7/19/2016	45	<2	<.05	<.05	<.05	0.09	0.01	56	0.26	3.8	<.01	<3
	8/17/2016	9	<2	<.05	0.05	<.05	0.08	0.01	51	0.36	4.8	<.01	<3
	9/13/2016	10	<2	<.05	<.05	<.05	<.05	<.01	69	0.32	3.7	<.01	<3
	Mean	15	2	0.05	0.05	0.05	0.09	0.01	51	0.33	3.8	0.05	3
	Stdev	17	0	0	0	0	0.04	0	12	0.05	0.6	0.09	0
	Max	45	2	0.05	0.05	0.05	0.16	0.01	69	0.39	4.8	0.21	3
	Min	5	2	0.05	0.05	0.05	0.05	0.01	39	0.26	3.4	0.01	3
	No. of Det	5	0	0	1	0	4	2	5	5	5	2	0

Table 3-1 continued. Summary of surface, middle, and bottom water quality monitoring data for F.E. Walter Reservoir in 2016

Station	Date	ALK mg/L	BOD5 mg/L	DISS-P mg/L	NH3 mg/L	NO2 mg/L	NO3 mg/L	PO4 mg/L	TDS mg/L	TKN mg/L	TOC mg/L	TP mg/L	TSS mg/L
WA-07B	5/11/2016	5	<2	<.05	<.05	<.05	0.06	<.01	45	0.27	4.3	0.02	5
	6/7/2016	7	<2	<.05	<.05	<.05	0.1	<.01	55	1.02	3.5	<.01	33
	7/19/2016	50	<2	<.05	0.12	<.05	0.1	0.01	64	0.51	4.1	<.01	10
	8/17/2016	11	<2	<.05	<.05	<.05	0.08	0.01	75	0.47	6.6	<.01	5
	9/13/2016	12	<2	<.05	<.05	<.05	0.07	<.01	84	0.35	3.5	<.01	48
	Mean	17	2	0.05	0.06	0.05	0.08	0.01	65	0.52	4.4	0.012	20
	Stdev	19	0	0	0.03	0	0.02	0	16	0.29	1.3	0.004	19
	Max	50	2	0.05	0.12	0.05	0.1	0.01	84	1.02	6.6	0.02	48
	Min	5	2	0.05	0.05	0.05	0.06	0.01	45	0.27	3.5	0.01	5
	No. of Det	5	0	0	1	0	5	2	5	5	5	1	5

3.2.1 Ammonia

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

Ammonia in the water column of F.E. Walter Reservoir was consistently low throughout the monitoring period with only three samples of sixty five total samples measuring greater than the laboratory reporting limit (<0.05 mg/L). The maximum measure of 0.26 mg/L of ammonia was collected at station WA-2B on 19 July (Table 3-1). F.E. Walter Reservoir was in compliance with the PADEP water quality standard for ammonia during 2016. The water quality standard of ammonia is dependent on temperature and pH (Table 3-2). Throughout the monitoring period, all measures of ammonia were less than their respective criteria values.

Table 3-2. PADEP ammonia nitrogen criteria (Pennsylvania Code, Title 25, Chapter 93 1984 and 1997). Specific ammonia criteria dependent on temperature and pH.

PH	0 °C	5 °C	10 °C	15 °C	20 °C	25 °C	30 °C
6.50	25.5	25.5	25.5	17.4	12.0	8.4	5.9
6.75	23.6	23.6	23.6	16.0	11.1	7.7	5.5
7.00	20.6	20.6	20.6	14.0	9.7	6.8	4.8
7.25	16.7	16.7	16.7	11.4	7.8	5.5	3.9
7.50	12.4	12.4	12.4	8.5	5.9	4.1	2.9
7.75	8.5	8.5	8.5	5.8	4.0	2.8	2.0
8.00	5.5	5.5	5.5	5.8	4.0	2.8	2.0
8.25	3.4	3.4	3.4	2.3	1.6	1.2	0.9
8.50	2.0	2.0	2.0	1.4	1.0	0.7	0.6
8.75	1.2	1.2	1.2	0.9	0.6	0.5	0.4
9.00	0.8	0.8	0.8	0.5	0.4	0.3	0.3

3.2.2 Nitrite and Nitrate

Nitrite (NO2) is a measure of a form of nitrogen that occurs as an intermediate in the nitrogen cycle. It is unstable and can rapidly be oxidized to nitrate or reduced to nitrogen gas. Nitrite is a source of nutrients for plants and can be toxic to aquatic life in relatively low concentrations. Concentrations of nitrite at F.E. Walter Reservoir were consistently low during 2016. Concentrations of nitrite measured at all stations and depths were less than the reporting limit of 0.05 mg/L (Table 3-1).

Nitrate (NO3) is the measure of the most oxidized and stable form of nitrogen. It is the principal form of combined nitrogen in natural waters. Nitrate is the primary form of nitrogen used by plants as a nutrient to stimulate plant growth. Nitrate was also consistently low at F.E. Walter Reservoir during 2016. For all stations and depths, sample results ranged from less than

the reporting limit of 0.05 mg/L to a high of 0.21 mg/L in the surface waters at station WA-3S on 19 July.

In 2016, F.E. Walter Reservoir was in compliance with the PADEP water quality standard for nitrogen. The water quality standard for nitrogen is a summed concentration of nitrite and nitrate of less than 10-mg/L. Throughout the monitoring period, the summed concentrations for each station were well below this standard. The maximum summed concentration for any one sampling station did not exceed 0.26 mg/L.

3.2.3 Total Kjeldahl Nitrogen

Total Kjeldahl nitrogen (TKN) is a measure of organic nitrogen that includes ammonia. Organic nitrogen is not immediately available for biological activity and is therefore not available for plant growth until decomposition to an inorganic form occurs. TKN in the water column of F.E. Walter Reservoir was low during 2016 (Table 3-1). Concentrations measured at all reservoir stations ranged from less than the reporting limit of 0.25 mg/L to a high of 4.78 mg/L at station WA-4S on 11 May. Slightly higher concentrations were most often observed in the bottom waters at all lake sampling stations.

3.2.4 Total Phosphorus

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

EPA guidance for nutrient criteria in lakes and reservoirs suggests a maximum concentration for total phosphorus of 0.01-mg/L (EPA 2000). Lakes and reservoirs exceeding this concentration are more likely to experience algal bloom problems during the growing season. Concentrations of total phosphorus were occasionally elevated at some of the reservoir sampling stations during the sampling season (Table 3-1). For all stations and depths, concentrations ranged from less than the reporting limit of 0.01 mg/L to a high of 0.21 mg/L. The maximum single sample concentration of 0.21 mg/L was measured on 07 June at station WA-07M.

3.2.5 Dissolved Phosphorus

Dissolved or soluble phosphorus (DISS P) in the water column of F.E. Walter Reservoir remained consistently low during 2016. With the exception of two samples (0.08 mg/L and 0.06 mg/L), concentrations at all stations and depths during the sampling season were below the reporting limit of 0.05 mg/L (Table 3-1). In freshwater environments, dissolved phosphorus is usually a limiting nutrient and is utilized by freshwater plants and algae during photosynthesis.

3.2.6 Dissolved Phosphate

Dissolved Phosphate or Orthophosphate (PO4) is a measure of the inorganic oxidized form of soluble phosphorus. This form of phosphorus is the most readily available for uptake during photosynthesis. In 2016, concentrations of dissolved phosphate were near or below the reporting limit of 0.01 mg/L at all stations and depths (Table 3-1). The single highest measure of 0.02 mg/L was recorded seven times at various sampling stations during the monitoring season.

3.2.7 Total Dissolved Solids

Total Dissolved Solids (TDS) is a measure of the amount of filterable dissolved material in the water. Dissolved salts such as sulfate, magnesium, chloride, and sodium contribute to elevated levels. TDS in the lake and tributary stations of F.E. Walter Reservoir remained relatively constant and low during 2016. Concentrations at all stations and depths over the monitoring period ranged from 22 to 106 mg/L (Table 3-1). The highest mean seasonal concentration of 77 mg/L was seen at the upstream surface tributary station WA-3S. F.E. Walter Reservoir and its tributaries were in compliance with the PADEP water quality standard for total dissolved solids during 2016. The water quality standard is a maximum concentration of 500-mg/L.

3.2.8 Total Suspended Solids

Total Suspended Solids (TSS) is a measure of the amount of non-filterable particulate matter that is suspended within the water column. High concentrations increase the turbidity of the water and can hinder photosynthetic activity, result in damage to fish gills, and cause impairment to spawning habitat (smothering). TSS measures in the water column of F.E. Walter Reservoir were low in 2016 with most sample results less than the reporting limit of 3.0 mg/L with a maximum concentration of 299 mg/L (Table 3-1). Elevated results were most seen in the lake bottom water samples. This is likely a result of sampling error and resulting interference of suspended sediment in the sampling apparatus during lake bottom water sample collection. On occasion, bottom sediments are re-suspended during the process of collecting a sample from deeper waters. These elevated results do not always accurately reflect conditions at those stations and depths.

3.2.9 Biochemical Oxygen Demand

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

- 1-2 mg/L is associated with very clean water and little biodegradable wastes;
- 3-5 mg/L is associated with moderately clean water with some biodegradable wastes;

- 6-9 mg/L is associated with fairly polluted water, many bacteria, and much biodegradable wastes;
- 10+ mg/L is associated with very polluted water and large amounts of biodegradable wastes.

Measurements of 5-day Biochemical oxygen demand (BOD) for all but one sample (measured 66.0 mg/L at Station WA-4S on 11 May) at F.E. Walter Reservoir and its tributary stations in 2016 were below the reporting limit of 2.0 mg/L. It is therefore inferred that F.E. Walter Reservoir and its associated tributaries contain very clean water with little biodegradable organic wastes. The 11 May sample result at Station-4S was not consistent with other sample results from that time period and may be the result of sampling error or an unusual event at the station and time.

3.2.10 Alkalinity

Alkalinity (ALK) is a measure of the acid-neutralizing capacity of water. Waters that have high alkalinity values are considered undesirable because of excessive hardness and high concentrations of sodium salts. Water with low alkalinity has little capacity to buffer acidic inputs and is susceptible to acidification (low pH). The PADEP standard is a minimum concentration of 20-mg/L $CaCO_3$ except where natural conditions are less.

Alkalinity measurements in the waters of F.E. Walter Reservoir were routinely low during 2016. Concentrations measured at all stations and depths ranged from 2.0 mg/L to 158.0 mg/L $CaCO_3$ throughout the monitoring period (Table 3-1). Based on historic readings at F.E. Walter Reservoir, unusually high alkalinity readings were seen at most stations during the 19 July sampling event. These high readings were correlated with a rainfall event during the sampling period. However, readings of this level have not been seen in past sampling and the soils and regional geology do not support the theory that they were caused by a precipitation and runoff event. 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). The reason for these high readings is unknown at this time.

3.2.11 Total Organic Carbon

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

Total Organic Carbon (TOC) was measured in the water column and tributaries of F.E. Walter Reservoir (Table 3-1). Concentrations of TOC at all stations and depths ranged from <1.0 mg/L to 8.2 mg/L. The highest single measured concentration of 8.2 mg/L was in the surface waters at tributary station WA-4S on 17 August.

3.2.12 Chlorophyll *a*

Chlorophyll a is the measure of the plant chlorophyll "a" primary pigment which helps plants get energy from light. It is found in most plants, algae, and cyanobacteria. Chlorophyll a measures increase in relation to algal densities in a water body. As a result of equipment failure in the sampling months of May and June, no chlorophyll a measures were taken. For the remainder of the sampling season, chlorophyll *a* was low in the surface waters of F.E. Walter Reservoir (Appendix A). Concentrations for all sampling dates for tributary and lake stations at depths from 0-15 feet ranged from 0.1 ug/L to 4.2 ug/L.

3.3 TROPHIC STATE DETERMINATION

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

TSIs calculated for measures of total phosphorus classified F.E. Walter Reservoir as oligotrophic in July (37.35), August (37.35), and September (37.35), and Eutrophic in May (65.41) and June (53.20). TSIs calculated for measures of secchi disk depth classified F.E. Walter Reservoir as mesotrophic in May (44.17), June (43.84), July (48.64), August (47.87) and September (50.01). TSIs calculated for measures of chlorophyll *a* classified F.E. Walter Reservoir as oligotrophic in July (32.39), August (22.32), and September (36.90). Sampling equipment failure prevented the measure of chlorophyll during the May and June 2016 sampling events.

Carlson (1977) warned against averaging TSI values estimated for different parameters, and instead suggested giving priority to chlorophyll a during the summer and to phosphorus in the spring, fall, and winter. With this in mind, and based on the pattern of TSI values for secchi disk depth, chlorophyll a and total phosphorus, F.E. Walter Reservoir was Eutrophic in May and June and transitioning to oligotrophic in July, August, and September. Cumulatively, F.E. Walter Reservoir can be considered mesotrophic during the 2016 sampling season.

The EPA (1983) also provides criteria for classifying the trophic conditions of lakes of the North Temperate Zone based on concentrations of total phosphorus, chlorophyll *a*, and secchi disk depth (Table 3-3). Taking into account the general agreement between the EPA classifications with that of the Carlson TSIs, the trophic condition of F.E. Walter Reservoir fluctuated between being eutrophic and oligotrophic throughout much of the 2016 sampling season.

Table 3-3. EPA trophic classification criteria and average monthly measures for F.E. Walter Reservoir in 2016. "EF"- Equipment Failure

Water Quality Variable	Oligo-trophic	Meso-trophic	Eutrophic	03 June	30 June	22 July	12 Aug.	01 Sep.
Total Phosphorus (ppb)	<10	10-20	>20	70	30	<10	<10	<10
Chlorophyll a (ppb)	<4	4-10	>10	EF	EF	1.2	0.43	1.9
Secchi Depth (m)	>4	2-4	<2	3	3.07	2.2	2.32	2

3.4 RESERVOIR BACTERIA MONITORING

Two forms of coliform bacteria were monitored in the tributary and lake surface waters at F.E. Walter Reservoir during 2016 including total and fecal coliform (Table 3-4). Total coliform includes *Escherica coliform* (*E. coli*) and related bacteria that are associated with fecal discharges. Fecal coliform bacteria are a subgroup of the total coliform and are normally associated with waste derived from human and other warm-blooded animals and indicate the presence of fecal contamination but not the associated risk. Total coliform measures for all lake and tributary stations at F.E. Walter Reservoir during 2016, ranged from 43-clns/100-ml to greater than the detection limit of 2400-clns/100-ml. Fecal coliform counts ranged from less than the detection limit of 2-clns/100-ml to 340-clns/100-ml for the monitoring period. Overall, bacteria levels were low at F.E. Walter Reservoir with respect to PADEP water quality standards. Elevated bacteria levels were seen primarily in tributary surface water stations WA-3S, WA-4S, and WA-5S and are directly affected by upstream watershed activity. For waters with contact recreation, the water quality standard for bacterial contamination is a single fecal sample standard of 1000 colonies/100-ml. No fecal coliform bacteria samples exceeded the PADEP water contact recreation standard. Water contact recreation is not permitted at F.E. Walter Reservoir.

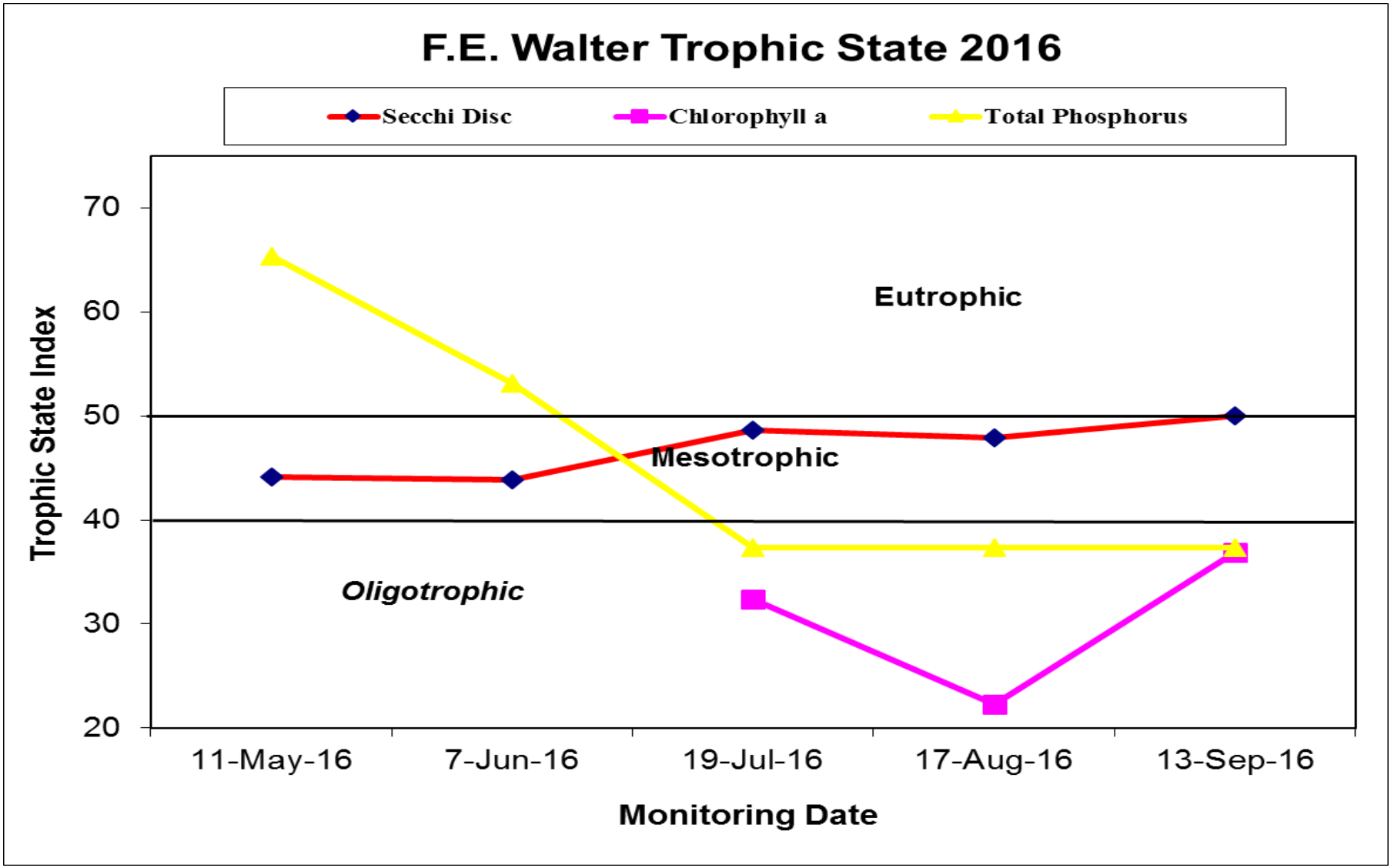

Figure 3-7. Carlson Trophic state indices calculated from secchi disk depth, concentrations of chlorophyll a and Total Phosphorus measured in surface waters of F.E. Walter Reservoir at Station WA-2 during 2016.

Table 3-4. Surface water bacteria counts (colonies/100 ml) at Walter Reservoir during 2016. Shaded values exceed State bacteria criteria. NS = Not Sampled in 2016

STATION	DATE	Total Coliform		Fecal Coliform		Escherichia coli	
WA-1S	5/11/16		350	<	2		NS
	6/7/16		290	<	2		NS
	7/19/16		1300		2		NS
	8/17/16		1400		11		NS
	9/13/16		980		5		NS
WA-2S	5/11/16		43	<	2		NS
	6/7/16		550		26		NS
	7/19/16	>	2400	<	2		NS
	8/17/16		980		2		NS
	9/13/16		250	<	2		NS
WA-3S	5/11/16		610		3		NS
	6/7/16	>	2400		30		NS
	7/19/16	>	2400		15		NS
	8/17/16	>	2400		18		NS
	9/13/16	>	2400		11		NS
WA-4S	5/11/16	>	2400		16		NS
	6/7/16	>	2400		250		NS
	7/19/16	>	2400		200		NS
	8/17/16	>	2400		280		NS
	9/13/16		2400		28		NS
WA-5S	5/11/16		650		2		NS
	6/7/16	>	2400		340		NS
	7/19/16	>	2400		28		NS
	8/17/16	>	2400		31		NS
	9/13/16		2400		20		NS
WA-6S	5/11/16		2400	<	2		NS
	6/7/16		520		2		NS
	7/19/16	>	2400	<	2		NS
	8/17/16		870		2		NS
	9/13/16		280		2		NS
WA-7S	5/11/16		770	<	2		NS
	6/7/16		690		15		NS
	7/19/16	>	2400	<	2		NS
	8/17/16		690	<	2		NS
	9/13/16		330	<	2		NS

4.0 REFERENCES

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APPENDIX A

STRATIFICATION DATA TABLES

2016 F.E. Walter Water Quality Profiles

Station	Date	Time	Depth	Temp	DO	DO	pH	pHmV	ORP	Turbidity	Chloro.	SpCond
	M/D/Y	hh:mm:ss	ft	C	%	mg/L		mV	mV	NTU	ug/L	mS/cm
	5/11/2016	9:42:11	0.5	11.23	98	10.75	7.89	-103	155	NA	NA	NA
	6/7/2016	9:37:57	0.5	14.08	97.2	10	6.72	-37.1	217	NA	NA	NA
WA-1	7/19/2016	9:40:46	0.5	20.44	94.5	8.52	6.64	-0.5	164.3	3.7	4.2	0.103
Outfall	8/17/2016	9:11:38	0.5	23.92	93.5	7.88	6.72	-4.9	127.5	16.5	1.2	0.113
	9/13/2016	10:13:13	0.5	22.35	91.2	7.92	6.8	-9.5	160.5	24.5	1.8	0.116
		8:02:46	0.5	12.62	91.3	9.70	7.53	-82.6	186.8	NA	NA	NA
		8:02:15	5	12.61	91.2	9.70	7.53	-82.6	187	NA	NA	NA
		8:01:28	10	12.61	90.9	9.66	7.49	-80.2	189.8	NA	NA	NA
		7:59:52	15	12.6	90.5	9.62	7.29	-68.8	201.4	NA	NA	NA
		7:59:03	20	12.59	90.4	9.61	7.18	-62.8	207.5	NA	NA	NA
		7:58:10	25	12.57	90.1	9.59	7.17	-62.5	207.9	NA	NA	NA
		7:57:22	30	12.5	89	9.49	7.15	-61.4	208.9	NA	NA	NA
WA-2		7:56:18	35	12.05	87.1	9.37	7.16	-61.5	209	NA	NA	NA
		7:55:23	40	11.89	86.3	9.32	7.14	-60.6	210.2	NA	NA	NA
Lake		7:54:18	45	11.67	85.8	9.31	7.14	-60.3	210.7	NA	NA	NA
Tower	5/11/2016	7:53:00	50	11.47	84.5	9.22	7.12	-59.6	211.6	NA	NA	NA
		7:51:38	55	11.39	84.4	9.22	7.14	-60.2	211.2	NA	NA	NA
Lake		7:50:39	60	11.26	85.6	9.38	7.17	-62	210	NA	NA	NA
Tower		7:48:59	65	11.21	85.4	9.36	7.20	-63.6	209.2	NA	NA	NA
Secchi		7:48:01	70	11.17	85.4	9.38	7.22	-64.9	208.5	NA	NA	NA
		7:47:02	75	11.13	85.1	9.35	7.20	-63.9	210.2	NA	NA	NA
3.00 m		7:45:47	80	11.05	84.7	9.33	7.24	-65.8	208.8	NA	NA	NA
		7:44:34	85	10.98	84.2	9.29	7.22	-64.7	210.8	NA	NA	NA
		7:43:32	90	10.91	83.5	9.22	7.15	-61	214.9	NA	NA	NA
		7:42:18	95	10.84	82.8	9.16	6.85	-44.3	232.4	NA	NA	NA
		7:41:18	100	10.8	80.8	8.95	6.85	-44.2	233.5	NA	NA	NA
		7:40:26	105	10.66	79.3	8.81	6.85	-44	234.7	NA	NA	NA
		7:39:42	110	10.65	78.9	8.77	6.83	-43.1	236.1	NA	NA	NA
		7:38:34	115	10.53	77.5	8.64	6.83	-43	237.1	NA	NA	NA
		7:36:33	120	10.33	73.4	8.22	6.83	-43.3	231.9	NA	NA	NA

2016 F.E. Walter Water Quality Profiles

Station	Date	Time	Depth	Temp	DO	DO	pH	pHmV	ORP	Turbidity	Chloro.	SpCond
	M/D/Y	hh:mm:ss	ft	C	%	mg/L		mV	mV	NTU	ug/L	mS/cm
		8:01:32	0.5	22.86	90.6	7.79	6.99	-52.1	225.0	NA	NA	NA
		8:00:38	5	22.87	90.1	7.75	6.98	-51.5	224.7	NA	NA	NA
		7:59:20	10	22.22	84.0	7.31	6.91	-47.2	227.4	NA	NA	NA
		7:58:39	15	21.35	81.5	7.22	6.90	-46.7	228.4	NA	NA	NA
WA-2		7:57:39	20	20.19	80.1	7.26	6.91	-47.3	229.0	NA	NA	NA
		7:56:45	25	19.77	80.2	7.32	6.90	-46.9	229.4	NA	NA	NA
Lake		7:55:49	30	19.10	83.1	7.69	6.92	-47.8	229.0	NA	NA	NA
Tower		7:54:13	35	18.32	87.3	8.21	6.94	-49.1	228.4	NA	NA	NA
Secchi		7:53:14	40	17.35	88.8	8.51	6.96	-50.5	227.7	NA	NA	NA
		7:52:20	45	16.22	87.4	8.58	6.97	-51.2	227.7	NA	NA	NA
3.07 M	6/7/2016	7:51:34	50	15.68	86.5	8.59	6.99	-51.9	227.4	NA	NA	NA
		7:50:51	55	15.32	85.3	8.55	6.99	-52.3	227.3	NA	NA	NA
		7:49:54	60	15.05	83.8	8.45	7.00	-52.9	227.1	NA	NA	NA
		7:48:48	65	14.89	84.0	8.49	7.02	-54	226.0	NA	NA	NA
		7:47:41	70	14.59	82.7	8.41	7.03	-54.5	225.7	NA	NA	NA
		7:46:22	75	14.33	81.2	8.31	7.03	-54.6	225.2	NA	NA	NA
		7:45:18	80	13.98	80.0	8.24	7.05	-55.2	224.6	NA	NA	NA
		7:44:10	85	13.76	78.4	8.12	7.07	-56.5	223.8	NA	NA	NA
		7:42:36	90	13.43	75.6	7.89	7.10	-58.4	222.3	NA	NA	NA
		7:41:19	95	13.19	70.9	7.44	7.11	-59.1	221.6	NA	NA	NA
		7:40:03	100	12.99	65.9	6.94	7.14	-60.4	221.1	NA	NA	NA
		7:38:54	105	12.80	60.0	6.35	7.17	-62.2	220.6	NA	NA	NA
		7:37:23	110	12.73	60.0	6.36	7.24	-66.3	218.9	NA	NA	NA
		7:35:40	115	12.69	58.5	6.21	7.36	-72.8	216.5	NA	NA	NA
		7:32:46	120	12.54	50.1	5.33	7.53	-82.6	211.8	NA	NA	NA
		8:10:00	0.5	25.62	96.8	7.91	7.32	-40.5	127.7	0.4	0.9	0.105
		8:09:07	5	25.62	96.5	7.89	7.28	-37.7	127.7	0.1	1.4	0.105
		8:07:47	10	25.57	95.5	7.81	7.14	-29.6	128.8	0.0	1.4	0.105
		8:06:10	15	24.77	84.5	7.01	6.73	-5.5	134.2	0.0	0.2	0.103
		8:05:01	20	23.45	72.1	6.13	6.52	7.2	135.5	0.0	0.1	0.102
		8:03:53	25	22.66	67.1	5.80	6.43	12.1	135.2	0.8	0.1	0.102
WA-2		8:02:51	30	22.09	61.4	5.36	6.40	13.7	134.2	0.0	0.9	0.105
Lake		8:01:49	35	21.74	59.1	5.19	6.36	16.4	132.7	0.0	0.0	0.103
Tower		8:00:57	40	21.45	57.6	5.09	6.31	18.9	131.4	0.0	0.0	0.101
		8:00:04	45	21.11	55.7	4.96	6.33	17.7	129.5	0.0	0.3	0.103
Secchi	7/19/2016	7:59:12	50	20.82	55.3	4.95	6.34	17.3	127.1	0.0	0.9	0.103
		7:58:06	55	20.46	53.8	4.84	6.34	17.5	124.6	0.5	0.7	0.103
2.20 M		7:56:53	60	20.22	51.1	4.62	6.23	23.9	122.9	1.4	0.0	0.099
		7:55:50	65	20.00	48.6	4.42	6.23	23.5	119.3	3.3	0.5	0.100
		7:54:52	70	19.54	43.2	3.96	6.23	23.3	116.1	6.0	1.4	0.103
		7:53:06	75	19.31	35.6	3.28	6.23	23.6	109.5	6.7	0.8	0.105
		7:51:37	80	19.03	28.1	2.60	6.23	23.1	102.2	8.4	1.0	0.107
		7:50:52	85	18.82	25.5	2.38	6.24	23	98.3	8.2	0.5	0.107
		7:49:35	90	18.29	18.0	1.69	6.23	23.5	91.1	12.0	1.9	0.107
		7:47:47	95	17.89	1.8	0.17	6.24	22.7	78	24.9	1.5	0.110
		7:45:21	100	17.72	0.6	0.06	6.31	18.7	54.8	39.3	0.8	0.113
		7:41:52	104	17.67	1.8	0.17	6.39	13.8	64.3	39.2	0.8	0.115

2016 F.E. Walter Water Quality Profiles

Station	Date	Time	Depth	Temp	DO	DO	pH	pHmV	ORP	Turbidity	Chloro.	SpCond
	M/D/Y	hh:mm:ss	ft	C	%	mg/L		mV	mV	NTU	ug/L	mS/cm
		7:59:02	0.5	26.64	91.7	7.36	7.03	-22.8	104.2	2.90	0.5	0.112
		7:58:12	5	26.65	91.4	7.33	7.01	-21.6	102.5	3.00	0.2	0.112
		7:57:33	10	26.63	90.8	7.28	6.95	-18.5	101.8	3.40	0.6	0.112
		7:56:40	15	25.87	82.2	6.69	6.76	-6.9	103.7	2.60	0.1	0.111
		7:55:34	20	25.28	73.7	6.06	6.67	-2.0	102.0	2.10	0.4	0.112
		7:54:46	25	24.92	68	5.62	6.62	1.2	100.1	2.10	0.0	0.112
		7:53:37	30	24.69	62.6	5.20	6.55	5.3	97.8	0.30	1.2	0.112
		7:52:40	35	24.53	61.9	5.16	6.56	4.7	94.3	1.80	1.5	0.113
		7:51:27	40	24.43	58.8	4.91	6.5	8.1	91.3	1.60	0.0	0.112
WA-2		7:51:02	45	24.30	58.1	4.86	6.5	8.0	88.9	2.00	0.5	0.111
Lake	8/17/2016	7:49:50	50	24.25	63.3	5.30	6.59	3.1	82.3	2.70	1.1	0.113
Tower		7:49:11	55	24.19	59.1	4.96	6.53	6.3	79.7	3.40	0.0	0.111
		7:48:42	60	24.08	60.9	5.12	6.56	4.4	76.0	3.30	0.5	0.113
Secchi		7:47:49	65	23.89	60.8	5.13	6.54	6.1	70.5	7.70	0.0	0.112
		7:46:20	70	23.76	59.9	5.06	6.58	3.2	59.0	9.60	0.8	0.114
2.32		7:45:35	75	23.69	58.3	4.94	6.58	3.6	51.3	12.90	2.0	0.115
		7:44:21	80	23.47	52.2	4.43	6.55	5.4	36.4	12.00	1.2	0.115
		7:43:15	85	23.39	47.9	4.08	6.54	6.0	15.3	17.90	0.9	0.115
		7:42:10	90	23.06	26.2	2.24	6.53	6.1	-21.9	64.60	32.2	0.117
		7:40:48	92	22.93	20.8	1.78	6.76	-7.1	-119.1	71.70	1.5	0.118
		8:12:56	0.5	23.36	76.7	6.53	6.76	-7.0	173.4	3.40	2.4	0.112
		8:09:33	5	23.39	76.1	6.48	6.77	-7.6	170.3	4.30	1.7	0.112
WA-2		8:08:03	10	23.39	76.6	6.52	6.78	-8.4	169.3	2.80	1.7	0.112
		8:06:13	15	23.38	75.4	6.42	6.77	-7.9	166.8	3.30	1.4	0.112
Lake		8:03:51	20	23.35	71.7	6.11	6.72	-4.8	164.6	3.10	0.7	0.112
Tower		8:02:06	25	23.08	54.6	4.67	6.54	6.0	165.3	6.80	0.2	0.114
		8:00:57	30	23.01	53.1	4.55	6.53	6.1	162.7	8.50	1.0	0.114
Secchi		7:58:45	35	22.59	59.6	5.15	6.62	1.3	155.2	12.80	1.9	0.116
	9/13/2016	7:57:13	40	22.10	66.5	5.8	6.67	-1.8	149.5	20.30	1.5	0.118
2.00 m		7:55:01	45	21.94	62.8	5.5	6.64	-0.4	139.9	27.70	1.7	0.117
		7:52:56	50	21.44	52.8	4.67	6.54	5.8	120.5	119.60	3.1	0.117
		7:51:28	52	21.10	46.4	4.12	6.51	7.4	118.5	153.40	2.8	0.119

2016 F.E. Walter Water Quality Profiles

Station	Date	Time	Depth	Temp	DO	DO	pH	pHmV	ORP	Turbidity	Chloro.	SpCond
	M/D/Y	hh:mm:ss	ft	C	%	mg/L		mV	mV	NTU	ug/L	mS/cm
WA-3 Tobyhanna Creek Upstream	5/11/2016	10:01:11	0.5	11.36	95.6	10.46	7.9	-103	165.6	NA	NA	NA
	6/7/2016	9:57:51	0.5	18.7	93.2	8.69	6.78	-40.2	211.2	NA	NA	NA
	7/19/2016	10:01:25	0.5	20.21	93.2	8.44	7.01	-21.9	171.4	1.7	1.5	0.144
	8/17/2016	9:35:03	0.5	22.68	93.3	8.05	7.03	-23.2	129.9	5.3	2.7	0.130
	9/13/2016	10:39:38	0.5	16.42	97	9.49	7.08	-25.8	196.4	0.9	2.3	0.116
WA-4 Lehigh River Upstream	5/11/2016	10:10:51	0.5	10.86	97.1	10.74	7.94	-105	131.5	NA	NA	NA
	6/7/2016	10:07:38	0.5	19.07	90.1	8.35	6.78	-39.8	210.1	NA	NA	NA
	7/19/2016	10:13:19	0.5	20.36	97.3	8.78	7.14	-29.7	182.6	1.2	0.8	0.114
	8/17/2016	9:44:43	0.5	22.06	92.3	8.06	7.01	-21.8	132.4	7.0	3.6	0.088
	9/13/2016	10:54:25	0.5	15.94	109.5	10.82	7.50	-50	196.5	0.1	1.7	0.104
WA-5 Bear Creek Upstream	05/11/16	10:30:42	0.5	11.36	96.9	10.60	7.81	-98.3	159.4	NA	NA	NA
	6/7/2016	10:29:48	0.5	18.95	94.6	8.78	6.53	-25.9	201.0	NA	NA	NA
	7/19/2016	10:49:14	0.5	20.73	95.4	8.55	6.89	-14.7	233.5	0.3	0.9	0.096
	8/17/2016	10:06:43	0.5	22.89	95.6	8.21	6.89	-14.8	138.9	1.2	2.1	0.102
	9/13/2016	11:21:48	0.5	15.31	97.5	9.76	6.97	-19.6	219.2	0.0	0.5	0.111
WA-6 Bear Creek Lake Arm	5/11/2016	8:27:31	0.5	12.79	91.8	9.71	7.24	-65.9	177.6	NA	NA	NA
		8:26:55	5	12.70	91.4	9.69	7.31	-69.9	173.5	NA	NA	NA
		8:26:15	10	12.69	91.3	9.68	7.28	-68.5	174.5	NA	NA	NA
		8:25:43	15	12.68	91.2	9.67	7.26	-67.2	175.3	NA	NA	NA
		8:24:57	20	12.67	90.5	9.60	7.25	-66.7	175.0	NA	NA	NA
		8:24:19	25	12.56	89.6	9.54	7.25	-66.8	174.1	NA	NA	NA
		8:23:45	30	12.31	88.5	9.46	7.23	-65.5	174.9	NA	NA	NA
		8:23:06	35	11.85	87.5	9.46	7.23	-65.6	174.5	NA	NA	NA
		8:22:27	40	11.66	87.1	9.46	7.24	-66.1	173.6	NA	NA	NA
		8:21:47	45	11.51	86.6	9.43	7.22	-64.8	174.4	NA	NA	NA
		8:20:56	50	11.41	86.4	9.44	7.21	-64.7	173.7	NA	NA	NA
		8:20:05	55	11.28	86.4	9.47	7.22	-65.0	172.6	NA	NA	NA
		8:19:21	60	11.19	86.1	9.45	7.26	-67.1	169.8	NA	NA	NA
		8:18:41	65	11.13	85.8	9.43	7.23	-65.5	170.3	NA	NA	NA
		8:17:58	70	11.09	85.9	9.45	7.24	-66.0	168.2	NA	NA	NA
		8:16:52	75	11.09	85.3	9.38	7.27	-67.7	163.4	NA	NA	NA
		8:16:12	80	11.05	84.8	9.34	7.27	-67.6	160.4	NA	NA	NA
		8:15:08	85	10.91	83.3	9.20	7.28	-68.4	155.5	NA	NA	NA
WA-6 Bear Creek Lake Arm	6/7/2016	8:50:05	0.5	22.88	91.1	7.83	6.60	-29.1	229.1	NA	NA	NA
		8:49:21	5	22.85	90.0	7.74	6.56	-27.2	229.6	NA	NA	NA
		8:48:37	10	22.27	85.2	7.41	6.50	-23.4	231.9	NA	NA	NA
		8:47:59	15	21.29	82.4	7.3	6.47	-22	233.2	NA	NA	NA
		8:47:24	20	20.54	81.1	7.3	6.45	-21	234.1	NA	NA	NA
		8:46:12	25	19.96	84.4	7.68	6.46	-21.3	232.9	NA	NA	NA
		8:45:35	30	19.29	85.7	7.9	6.44	-20.4	234.1	NA	NA	NA
		8:44:51	35	17.98	86.4	8.18	6.44	-20.3	234.5	NA	NA	NA
		8:44:11	40	17.34	86.4	8.29	6.43	-20.3	234.6	NA	NA	NA
		8:43:31	45	16.15	84.7	8.33	6.43	-20.3	235.1	NA	NA	NA
		8:42:53	50	15.74	83.8	8.32	6.43	-20.5	235	NA	NA	NA
		8:41:45	55	15.30	82.8	8.29	6.44	-21.2	234.7	NA	NA	NA
		8:40:57	60	14.83	81.3	8.23	6.46	-22.2	234.3	NA	NA	NA
		8:40:04	65	14.71	82.4	8.36	6.50	-24.3	233	NA	NA	NA
		8:38:45	70	14.40	81.2	8.29	6.51	-24.9	232.5	NA	NA	NA
		8:37:57	75	14.09	79.8	8.2	6.51	-25.2	232.4	NA	NA	NA
		8:37:14	80	13.93	78.1	8.06	6.53	-26.2	231.2	NA	NA	NA
		8:36:23	85	13.73	77.1	7.99	6.56	-27.9	228.8	NA	NA	NA
		8:35:33	90	13.45	76.1	7.93	6.6	-30.1	235.3	NA	NA	NA

2016 F.E. Walter Water Quality Profiles

Station	Date	Time	Depth	Temp	DO	DO	pH	pHmV	ORP	Turbidity	Chloro.	SpCond
	M/D/Y	hh:mm:ss	ft	C	%	mg/L		mV	mV	NTU	ug/L	mS/cm
WA-6 Bear Creek Lake Arm	7/19/2016	8:33:12	0.5	25.78	97.4	7.93	7.32	-40.1	158.2	0.0	1.8	0.105
		8:32:29	5	25.78	97.1	7.91	7.25	-36.0	159.0	0.0	1.9	0.104
		8:31:35	10	25.72	95.8	7.81	7.12	-28.4	160.3	0.0	1.5	0.105
		8:30:17	15	24.63	78.9	6.57	6.66	-1.2	168.8	0.2	1.8	0.108
		8:29:27	20	23.51	69.8	5.92	6.53	6.4	170.6	0.0	1.7	0.108
		8:28:51	25	22.89	66.6	5.72	6.45	11.1	171.4	0.0	1.4	0.107
		8:28:11	30	22.23	64.1	5.58	6.34	17.6	171.8	0.4	1.2	0.100
		8:26:54	35	21.72	60.5	5.31	6.27	21.7	171.8	0.7	1.5	0.099
		8:26:08	40	21.39	57.8	5.11	6.21	25.2	172.0	1.3	0.9	0.098
		8:25:25	45	21.12	55.8	4.96	6.19	26.0	171.3	1.5	1.4	0.098
		8:24:21	50	20.75	53.6	4.80	6.19	26.1	169.8	2.7	1.5	0.098
		8:23:41	55	20.51	51.8	4.66	6.19	26.0	168.8	3.6	1.6	0.098
		8:22:37	60	20.08	51.7	4.69	6.27	21.5	167.0	2.0	2.3	0.105
		8:21:19	65	19.91	49.5	4.50	6.27	21.4	165.6	4.1	1.7	0.104
		8:20:23	70	19.71	46.2	4.22	6.22	24.0	165.3	7.1	2.1	0.103
		8:19:05	75	19.64	43.2	3.95	6.18	26.6	163.6	14.6	1.5	0.102
WA-6 Bear Creek Lake Arm	8/17/2016	8:16:14	0.5	26.78	92.7	7.42	7.02	-22.7	119.9	2.0	0.5	0.113
		8:15:40	5	26.80	92.0	7.36	6.99	-20.7	119.7	2.6	0.8	0.113
		8:15:06	10	26.65	87.4	7.01	6.88	-14.2	120.9	3.2	1.2	0.114
		8:14:12	15	25.78	79.3	6.46	6.70	-3.4	123.1	2.5	1.3	0.112
		8:13:27	20	25.23	75.1	6.18	6.65	-0.8	122.6	1.6	0.3	0.112
		8:12:24	25	25.06	70.8	5.84	6.59	2.8	121.0	1.8	0.2	0.112
		8:11:26	30	24.72	66.2	5.50	6.49	9.2	120.8	3.0	0.1	0.109
		8:10:51	35	24.57	64.8	5.39	6.44	11.8	119.9	4.4	1.5	0.108
		8:09:46	40	24.36	62.7	5.24	6.43	12.5	115.9	6.1	0.4	0.108
		8:08:48	45	24.21	61.9	5.19	6.45	11.2	111.5	5.9	0.3	0.109
		8:07:31	50	24.11	69.1	5.81	6.60	2.4	103.9	7.4	2.4	0.114
		8:06:47	55	24.01	68.4	5.75	6.58	3.3	99.5	10.0	2.2	0.115
		8:05:22	60	23.95	63.0	5.31	6.48	9.1	88.2	22.4	2	0.113

2016 F.E. Walter Water Quality Profiles

Station	Date	Time	Depth	Temp	DO	DO	pH	pHmV	ORP	Turbidity	Chloro.	SpCond
	M/D/Y	hh:mm:ss	ft	C	%	mg/L		mV	mV	NTU	ug/L	mS/cm
WA-6 Bear Creek Lake Arm	9/13/2016	8:43:24	0.5	23.50	78.3	6.65	6.8	-9.2	157.6	6.2	1.6	0.113
		8:42:10	5	23.49	78.4	6.66	6.8	-9.4	155.0	6.2	2.5	0.113
		8:40:49	10	23.49	78.3	6.65	6.8	-9.7	151.3	4.6	1.8	0.112
		8:38:44	15	23.45	78.1	6.64	6.81	-10.0	145.4	4.8	2.4	0.112
WA-7 Lehigh Lake Arm	5/11/2016	8:51:22	0.5	13.01	92.4	9.73	7.16	-61.7	189.0	NA	NA	NA
		8:49:57	5	12.81	91.3	9.66	7.06	-55.9	194.8	NA	NA	NA
		8:49:20	10	12.67	90.7	9.62	7.05	-55.6	194.8	NA	NA	NA
		8:48:47	15	12.59	89.9	9.56	7.03	-54.4	195.9	NA	NA	NA
		8:48:19	20	12.54	89.4	9.51	7.01	-53.4	196.7	NA	NA	NA
		8:47:37	25	12.19	88.0	9.44	7.00	-52.6	197.5	NA	NA	NA
		8:45:26	30	12.15	87.8	9.43	7.00	-52.8	197.3	NA	NA	NA
		8:43:41	35	12.01	87.3	9.41	7.01	-53.2	196.6	NA	NA	NA
		8:42:57	40	11.85	86.9	9.4	7.01	-53.5	196.2	NA	NA	NA
		8:42:04	45	11.64	86.1	9.35	7.01	-53.4	196.1	NA	NA	NA
		8:41:14	50	11.56	86.1	9.37	6.98	-51.7	197.6	NA	NA	NA
		8:40:26	55	11.39	85.4	9.34	6.96	-50.2	198.9	NA	NA	NA
		8:39:26	60	11.30	85.8	9.39	6.96	-50.3	198.4	NA	NA	NA
		8:38:30	65	11.20	85.1	9.33	6.96	-50.7	197.6	NA	NA	NA
		8:37:47	70	11.08	84.6	9.31	6.97	-51.0	197.2	NA	NA	NA
		8:36:49	75	10.99	84.4	9.31	6.99	-52.3	195.7	NA	NA	NA
		8:35:44	80	10.93	83.5	9.22	7.04	-54.9	193.2	NA	NA	NA
		8:34:56	85	10.90	82.7	9.14	7.08	-56.9	191.6	NA	NA	NA
		8:34:04	87	10.89	82.5	9.12	7.14	-60.3	188.8	NA	NA	NA

2016 F.E. Walter Water Quality Profiles

Station	Date	Time	Depth	Temp	DO	DO	pH	pHmV	ORP	Turbidity	Chloro.	SpCond
	M/D/Y	hh:mm:ss	ft	C	%	mg/L		mV	mV	NTU	ug/L	mS/cm
		8:26:19	0.5	22.76	90.2	7.77	6.77	-39.1	212.2	NA	NA	NA
		8:25:52	5	22.76	89.5	7.71	6.76	-38.9	211.8	NA	NA	NA
		8:24:49	10	22.58	88.1	7.62	6.73	-37.0	211.9	NA	NA	NA
		8:23:42	15	21.27	82.7	7.33	6.68	-33.9	213.6	NA	NA	NA
		8:22:38	20	20.35	80.9	7.31	6.66	-33.2	213.7	NA	NA	NA
WA-7		8:21:40	25	19.80	80.3	7.33	6.65	-32.6	213.3	NA	NA	NA
Lehigh		8:20:32	30	18.89	80.3	7.46	6.63	-31.5	213.3	NA	NA	NA
Lake Arm		8:19:32	35	18.07	84.3	7.97	6.64	-31.9	212.4	NA	NA	NA
	6/7/2016	8:18:38	40	17.32	86.7	8.32	6.66	-33.1	210.6	NA	NA	NA
		8:17:49	45	16.34	85.8	8.41	6.67	-33.7	209.6	NA	NA	NA
		8:16:58	50	15.77	83.1	8.24	6.67	-33.9	208.7	NA	NA	NA
		8:16:00	55	15.55	80.9	8.06	6.67	-33.9	207.2	NA	NA	NA
		8:14:53	60	15.27	79.1	7.93	6.66	-33.5	205.4	NA	NA	NA
		8:14:00	65	14.98	76.4	7.71	6.66	-33.2	203.7	NA	NA	NA
		8:13:16	70	14.52	72.2	7.35	6.65	-32.7	202.2	NA	NA	NA
		8:12:33	75	14.27	70.3	7.20	6.66	-33.2	199.1	NA	NA	NA
		8:11:27	80	13.87	64.5	6.66	6.66	-33.7	191.4	NA	NA	NA
		8:10:17	85	13.72	62.1	6.44	6.71	-36.5	178.0	NA	NA	NA
		8:55:21	0.5	25.93	95.1	7.72	7.19	-32.3	175.0	0.30	1.0	0.108
		8:54:45	5	25.91	95.0	7.72	7.15	-29.9	175.9	1.20	2.2	0.108
		8:53:20	10	25.67	93.2	7.61	6.99	-20.8	177.9	0.30	1.7	0.106
		8:52:15	15	24.44	79.4	6.63	6.65	-0.5	183.3	0.00	1.5	0.105
		8:51:26	20	23.65	70.6	5.98	6.55	5.2	184.8	0.10	1.4	0.109
WA-7		8:50:51	25	22.70	64.9	5.6	6.49	8.8	185.8	0.00	1.2	0.110
Lehigh		8:49:59	30	22.22	62.2	5.41	6.41	13.1	186.2	0.50	2.4	0.106
Lake Arm	7/19/2016	8:49:17	35	21.88	59.6	5.22	6.41	13.5	186.2	0.10	1.3	0.108
		8:48:16	40	21.43	57.7	5.1	6.39	14.5	186.0	0.90	1.9	0.108
		8:47:03	45	21.07	57.6	5.12	6.42	12.5	185.3	1.30	2.5	0.111
		8:45:35	50	20.90	56.9	5.08	6.43	11.9	184.1	1.80	1.5	0.113
		8:44:13	55	20.67	54.9	4.92	6.42	12.6	183.8	2.50	2.0	0.113
		8:43:05	60	20.45	51.5	4.64	6.39	14.2	183.7	3.20	1.8	0.114
		8:42:04	65	20.10	44.4	4.03	6.33	17.5	184.5	9.00	2.2	0.115
		8:40:49	70	19.62	32.5	2.98	6.25	22.1	184.4	16.70	2.2	0.114

2016 F.E. Walter Water Quality Profiles

Station	Date	Time	Depth	Temp	DO	DO	pH	pHmV	ORP	Turbidity	Chloro.	SpCond
	M/D/Y	hh:mm:ss	ft	C	%	mg/L		mV	mV	NTU	ug/L	mS/cm
		8:35:02	0.5	26.57	92.1	7.39	7.03	-22.9	113.4	3.0	1.8	0.114
		8:34:14	5	26.60	91.4	7.34	7.01	-21.8	112.1	3.0	1.8	0.114
		8:33:18	10	26.54	90.2	7.25	6.96	-19	111.0	4.9	1.4	0.115
		8:32:06	15	25.91	80.6	6.55	6.77	-7.7	113.2	8.3	2.4	0.117
		8:31:31	20	25.42	76.7	6.29	6.73	-5.2	112.2	5.7	2.7	0.116
		8:30:35	25	24.84	71.5	5.92	6.64	0.2	111.5	4.9	2.4	0.115
WA-7		8:29:49	30	24.66	67.2	5.58	6.58	3.6	109.9	4.1	1.1	0.113
Lehigh		8:28:45	35	24.57	66.3	5.52	6.58	3.4	105.0	3.8	1.4	0.114
Lake Arm		8:27:41	40	24.52	70.3	5.86	6.64	-0.2	98.4	3.9	3.1	0.115
	8/17/2016	8:26:51	45	24.39	74	6.18	6.70	-3.4	92.2	7.6	3.4	0.117
		8:25:58	50	24.31	74.3	6.22	6.70	-3.7	85.8	8.1	2.4	0.117
		8:24:17	55	24.16	71.6	6.01	6.67	-1.7	65.9	17.5	2.3	0.117
		8:22:49	60	24.06	63.2	5.31	6.55	5.5	-16.1	55.6	24.0	0.118
		9:11:57	0.5	23.21	78.8	6.73	6.85	-12.3	156.6	4	1.7	0.115
		9:11:07	5	23.21	78.7	6.73	6.85	-12.3	154.9	4.7	1.9	0.115
		9:09:49	10	23.20	78.5	6.70	6.86	-12.9	151.2	4.1	3.2	0.115
WA-7		9:07:04	15	23.01	80	6.86	6.90	-15.5	140.6	4.7	3.3	0.115
Lehigh	9/13/2016	9:05:39	20	18.88	86.6	8.05	6.98	-19.8	128.4	31.3	2.8	0.116
Lake Arm												

APPENDIX B

LABORATORY CUSTODY SHEETS

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

Attention: David Wertz
Reported To: Tetra Tech (Beltzville Dam)
1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Date of Report: 05/24/16
Lab ID: 3157-16-0016748

Date Collected: 05/11/16 09:40
Collected By: Client

Sample Desc: WA-1 Surface

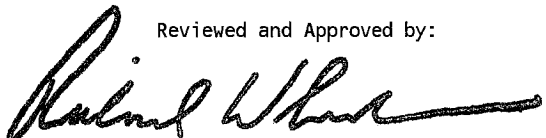
Date Received: 05/11/16 16:40

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Fecal Coliform	<2	/100ml	2	1	SM 9222D	05/11	17:13	TNS
Total Coliform	350	mpn/100ml	1	1	SM 9223B	05/12	11:45	KAW
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	05/12	09:45	AEH
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	05/12	17:20	AEH
Phosphorus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	05/12	17:40	AEH
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	05/12	15:59	JCL
Nitrogen, Nitrate	0.06	mg/l	.05	1	EPA 353.2	05/12	17:07	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	05/12	15:38	JCL
Nitrogen, Total Kjeldahl	0.32	mg/l	.25	1	EPA 351.2	05/18	14:53	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	05/12	11:45	EMW
Total Organic Carbon	3.7	mg/l	1	1	SM5310 C	05/13	15:57	ALD
RESIDUES								
Solids, Total Dissolved	37	mg/l	5	1	SM 2540C	05/13	12:50	TMH
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	05/13	12:50	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	6	mg/l	1	1	SM 2320 B	05/16	09:30	AEH

Distribution of Reports:
Gregory Wacik - USACE (Beltzville Dam)

Reviewed and Approved by:



Richard Wheeler

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

Attention: David Wertz
Reported To: Tetra Tech (Beltzville Dam)
1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Date of Report: 05/24/16
Lab ID: 3157-16-0016748
Date Collected: 05/11/16 09:40
Collected By: Client

Sample Desc: WA-1 Surface

Date Received: 05/11/16 16:40

PWSID: 3130843

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

COMMENTS

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

02 The total coliform sample was placed in the incubator on 05/11/2016 at 17:35.

Distribution of Reports:
Gregory Wacik - USACE (Beltzville Dam)

Reviewed and Approved by:

Richard Wheeler

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Attention: David Wertz
Reported To: Tetra Tech (Beltzville Dam)
1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Date of Report: 05/24/16
Lab ID: 3157-16-0016749

Date Collected: 05/11/16 07:45
Collected By: Client

Sample Desc: WA-2 Surface

Date Received: 05/11/16 16:40

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Fecal Coliform	<2	/100ml	2	1	SM 9222D	05/11	17:13	TNS
Total Coliform	43	mpn/100ml	1	1	SM 9223B	05/12	11:45	KAW
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	05/12	09:45	AEH
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	05/12	17:20	AEH
Phosphorus as P, Total	0.07	mg/l	.01	1	SM 4500P-E	05/12	17:40	AEH
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	05/12	16:14	JCL
Nitrogen, Nitrate	0.07	mg/l	.05	1	EPA 353.2	05/12	17:08	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	05/12	15:41	JCL
Nitrogen, Total Kjeldahl	0.49	mg/l	.25	1	EPA 351.2	05/18	14:54	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	05/12	11:45	EMW
Total Organic Carbon	3.2	mg/l	1	1	SM5310 C	05/13	16:09	ALD
RESIDUES								
Solids, Total Dissolved	22	mg/l	5	1	SM 2540C	05/13	12:50	TMH
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	05/13	12:50	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	5	mg/l	1	1	SM 2320 B	05/16	09:30	AEH

Distribution of Reports:
Gregory Wacik - USACE (Beltzville Dam)

Reviewed and Approved by:

Richard Wheeler

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Reported To: Tetra Tech (Beltzville Dam)
1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Date of Report: 05/24/16
Lab ID: 3157-16-0016749

Date Collected: 05/11/16 07:45
Collected By: Client

Sample Desc: WA-2 Surface

Date Received: 05/11/16 16:40

PWSID: 3130843

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

COMMENTS

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

02 The total coliform sample was placed in the incubator on 05/11/2016 at 17:35.

Distribution of Reports:
Gregory Wacik - USACE (Beltzville Dam)

Reviewed and Approved by:

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Attention: David Wertz
Reported To: Tetra Tech (Beltzville Dam)
1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Date of Report: 05/24/16
Lab ID: 3157-16-0016750

Date Collected: 05/11/16 07:45
Collected By: Client

Sample Desc: WA-2 Mid-Depth

Date Received: 05/11/16 16:40

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	05/12	09:45	AEH
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	05/12	17:20	AEH
Phosphorus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	05/12	17:40	AEH
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	05/12	16:28	JCL
Nitrogen, Nitrate	0.07	mg/l	.05	1	EPA 353.2	05/12	17:11	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	05/12	15:42	JCL
Nitrogen, Total Kjeldahl	0.30	mg/l	.25	1	EPA 351.2	05/18	14:55	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	05/12	11:45	EMW
Total Organic Carbon	3.8	mg/l	1	1	SM5310 C	05/13	16:21	ALD
RESIDUES								
Solids, Total Dissolved	31	mg/l	5	1	SM 2540C	05/13	12:50	TMH
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	05/13	12:50	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	6	mg/l	1	1	SM 2320 B	05/16	09:30	AEH

COMMENTS

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

Distribution of Reports:
Gregory Wacik - USACE (Beltzville Dam)

Reviewed and Approved by:

Richard Wheeler

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Attention: David Wertz
Reported To: Tetra Tech (Beltzville Dam)
1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Date of Report: 05/24/16
Lab ID: 3157-16-0016751

Date Collected: 05/11/16 07:45
Collected By: Client

Sample Desc: WA-2 Deep

Date Received: 05/11/16 16:40

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	05/12	09:45	AEH
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	05/12	17:20	AEH
Phosphorus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	05/12	17:40	AEH
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	05/12	16:43	JCL
Nitrogen, Nitrate	0.06	mg/l	.05	1	EPA 353.2	05/12	17:12	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	05/12	15:43	JCL
Nitrogen, Total Kjeldahl	0.36	mg/l	.25	1	EPA 351.2	05/18	14:56	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	05/12	11:45	EMW
Total Organic Carbon	3.8	mg/l	1	1	SM5310 C	05/13	16:34	ALD
RESIDUES								
Solids, Total Dissolved	33	mg/l	5	1	SM 2540C	05/13	12:50	TMH
Solids, Total Suspended	5	mg/l	3	1	SM 2540D	05/13	12:50	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	7	mg/l	1	1	SM 2320 B	05/16	09:30	AEH

COMMENTS

01 The Ammonia matrix spike was low indicating possible sample matrix interference.

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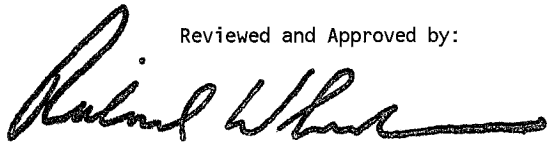
Reviewed and Approved by:



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Attention: David Wertz
Reported To: Tetra Tech (Beltzville Dam)
1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Date of Report: 05/24/16
Lab ID: 3157-16-0016751

Date Collected: 05/11/16 07:45
Collected By: Client

Sample Desc: WA-2 Deep

Date Received: 05/11/16 16:40

PWSID: 3130843

		Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
02	The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.								

Distribution of Reports:
Gregory Wacik - USACE (Beltzville Dam)

Reviewed and Approved by:

Richard Wheeler

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1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Date of Report: 05/24/16
Lab ID: 3157-16-0016752

Date Collected: 05/11/16 09:55
Collected By: Client

Sample Desc: WA-3 Surface

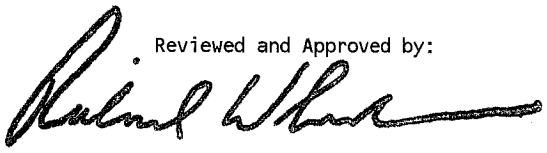
Date Received: 05/11/16 16:40

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Fecal Coliform	3	/100ml	2	1	SM 9222D	05/11	17:13	TNS
Total Coliform	610	mpn/100ml	1	1	SM 9223B	05/12	11:45	KAW
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	05/12	09:45	AEH
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	05/12	17:25	AEH
Phosphorus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	05/12	17:40	AEH
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	05/12	17:27	JCL
Nitrogen, Nitrate	0.08	mg/l	.05	1	EPA 353.2	05/12	17:13	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	05/12	15:44	JCL
Nitrogen, Total Kjeldahl	0.47	mg/l	.25	1	EPA 351.2	05/18	14:57	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	05/12	11:45	EMW
Total Organic Carbon	5.0	mg/l	1	1	SM5310 C	05/13	17:58	ALD
RESIDUES								
Solids, Total Dissolved	54	mg/l	5	1	SM 2540C	05/13	12:50	TMH
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	05/13	12:50	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	8	mg/l	1	1	SM 2320 B	05/16	09:30	AEH

Distribution of Reports:
Gregory Wacik - USACE (Beltzville Dam)

Reviewed and Approved by:



Richard Wheeler

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1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Date of Report: 05/24/16
Lab ID: 3157-16-0016752

Date Collected: 05/11/16 09:55
Collected By: Client

Sample Desc: WA-3 Surface

Date Received: 05/11/16 16:40

PWSID: 3130843

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

COMMENTS

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

02 The total coliform sample was placed in the incubator on 05/11/2016 at 17:35.

Distribution of Reports:
Gregory Wacik - USACE (Beltzville Dam)

Reviewed and Approved by:

Richard Wheeler

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Reported To: Tetra Tech (Beltzville Dam)
1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Date of Report: 05/24/16
Lab ID: 3157-16-0016753

Date Collected: 05/11/16 10:15
Collected By: Client

Sample Desc: WA-4 Surface

Date Received: 05/11/16 16:40

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Fecal Coliform	16	/100ml	2	1	SM 9222D	05/11	17:13	TNS
Total Coliform	>2400	mpn/100ml	1	1	SM 9223B	05/12	11:45	KAW
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	0.01	mg/l	.01	1	SM 4500P-E	05/12	09:45	AEH
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	05/12	17:25	AEH
Phosphorus as P, Total	0.09	mg/l	.01	1	SM 4500P-E	05/12	17:45	AEH
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	05/12	17:41	JCL
Nitrogen, Nitrate	<.05	mg/l	.05	1	EPA 353.2	05/12	17:14	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	05/12	15:44	JCL
Nitrogen, Total Kjeldahl	4.78	mg/l	.25	1	EPA 351.2	05/18	15:00	JCL
OTHER								
Biochemical Oxygen Demand	66	mg/l	2	1	SM 5210B	05/12	11:45	EMW
Total Organic Carbon	<1	mg/l	1	1	SM5310 C	05/13	18:26	ALD
RESIDUES								
Solids, Total Dissolved	83	mg/l	5	1	SM 2540C	05/13	12:50	TMH
Solids, Total Suspended	299	mg/l	3	1	SM 2540D	05/13	12:50	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	15	mg/l	1	1	SM 2320 B	05/16	09:30	AEH

Distribution of Reports:
Gregory Wacik - USACE (Beltzville Dam)

Reviewed and Approved by:

Richard Wheeler

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Arlington VA 22201

Date of Report: 05/24/16
Lab ID: 3157-16-0016753

Date Collected: 05/11/16 10:15
Collected By: Client

Sample Desc: WA-4 Surface

Date Received: 05/11/16 16:40

PWSID: 3130843

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

COMMENTS

01 Sample was heavy with plant material.

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

03 The total coliform sample was placed in the incubator on 05/11/2016 at 17:35.

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Richard Wheeler

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1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Date of Report: 05/24/16
Lab ID: 3157-16-0016754

Date Collected: 05/11/16 10:25
Collected By: Client

Sample Desc: WA-5 Surface

Date Received: 05/11/16 16:40

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Fecal Coliform	2	/100ml	2	1	SM 9222D	05/11	17:13	TNS
Total Coliform	650	mpn/100ml	1	1	SM 9223B	05/12	11:45	KAW
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	05/12	09:45	AEH
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	05/12	17:25	AEH
Phosphorus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	05/12	17:45	AEH
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	05/12	17:56	JCL
Nitrogen, Nitrate	<.05	mg/l	.05	1	EPA 353.2	05/12	17:15	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	05/12	15:45	JCL
Nitrogen, Total Kjeldahl	0.30	mg/l	.25	1	EPA 351.2	05/18	15:01	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	05/12	11:45	EMW
Total Organic Carbon	3.3	mg/l	1	1	SM5310 C	05/13	19:01	ALD
RESIDUES								
Solids, Total Dissolved	25	mg/l	5	1	SM 2540C	05/13	12:50	TMH
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	05/13	12:50	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	2	mg/l	1	1	SM 2320 B	05/16	09:30	AEH

Distribution of Reports:
Gregory Wacik - USACE (Beltzville Dam)

Reviewed and Approved by:

Richard Wheeler

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Reported To: Tetra Tech (Beltzville Dam)
1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Date of Report: 05/24/16
Lab ID: 3157-16-0016754

Date Collected: 05/11/16 10:25
Collected By: Client

Sample Desc: WA-5 Surface

Date Received: 05/11/16 16:40

PWSID: 3130843

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

COMMENTS

01 The total coliform sample was placed in the incubator on 05/11/2016 at 17:35.

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

Distribution of Reports:
Gregory Wacik - USACE (Beltzville Dam)

Reviewed and Approved by:

Richard Wheeler

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Reported To: Tetra Tech (Beltzville Dam)
1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Date of Report: 05/24/16
Lab ID: 3157-16-0016755

Date Collected: 05/11/16 08:15
Collected By: Client

Sample Desc: WA-6 Surface

Date Received: 05/11/16 16:40

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Fecal Coliform	<2	/100ml	2	1	SM 9222D	05/11	17:13	TNS
Total Coliform	58	mpn/100ml	1	1	SM 9223B	05/12	11:45	KAW
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	05/12	09:45	AEH
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	05/12	17:25	AEH
Phosphorus as P, Total	0.01	mg/l	.01	1	SM 4500P-E	05/12	17:45	AEH
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	05/12	18:11	JCL
Nitrogen, Nitrate	0.07	mg/l	.05	1	EPA 353.2	05/12	17:16	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	05/12	15:46	JCL
Nitrogen, Total Kjeldahl	0.29	mg/l	.25	1	EPA 351.2	05/18	15:02	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	05/12	11:45	EMW
Total Organic Carbon	3.2	mg/l	1	1	SM5310 C	05/13	19:13	ALD
RESIDUES								
Solids, Total Dissolved	40	mg/l	5	1	SM 2540C	05/13	12:50	TMH
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	05/13	12:50	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	5	mg/l	1	1	SM 2320 B	05/16	09:30	AEH

Distribution of Reports:
Gregory Wacik - USACE (Beltzville Dam)

Reviewed and Approved by:

Richard Wheeler

THE NELAC INSTITUTE

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PHONE: 610-374-5129 • FAX: 610-374-7234 • **www.mjreider.com**

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

Attention: David Wertz
Reported To: Tetra Tech (Beltzville Dam)
1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Date of Report: 05/24/16
Lab ID: 3157-16-0016755

Date Collected: 05/11/16 08:15
Collected By: Client

Sample Desc: WA-6 Surface

Date Received: 05/11/16 16:40

PWSID: 3130843

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

COMMENTS

01 The total coliform sample was placed in the incubator on 05/11/2016 at 17:35.

02 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2S04 to pH <2 after the sample was received at the laboratory.

Distribution of Reports:
Gregory Wacik - USACE (Beltzville Dam)

Reviewed and Approved by:

Richard Wheeler

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M.J. Reider Associates, Inc.

Attention: David Wertz
Reported To: Tetra Tech (Beltzville Dam)
1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Date of Report: 05/24/16
Lab ID: 3157-16-0016756

Date Collected: 05/11/16 08:15
Collected By: Client

Sample Desc: WA-6 Mid-Depth

Date Received: 05/11/16 16:40

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	05/12	09:45	AEH
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	05/12	17:25	AEH
Phosphorus as P, Total	0.04	mg/l	.01	1	SM 4500P-E	05/12	17:45	AEH
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	05/12	18:27	JCL
Nitrogen, Nitrate	0.06	mg/l	.05	1	EPA 353.2	05/12	17:18	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	05/12	15:49	JCL
Nitrogen, Total Kjeldahl	0.32	mg/l	.25	1	EPA 351.2	05/18	15:04	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	05/12	11:45	EMW
Total Organic Carbon	3.1	mg/l	1	1	SM5310 C	05/13	19:26	ALD
RESIDUES								
Solids, Total Dissolved	37	mg/l	5	1	SM 2540C	05/13	12:50	TMH
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	05/13	12:50	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	5	mg/l	1	1	SM 2320 B	05/16	09:30	AEH

COMMENTS

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

Distribution of Reports:
Gregory Wacik - USACE (Beltzville Dam)

Reviewed and Approved by:

Richard Wheeler

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

Attention: David Wertz
Reported To: Tetra Tech (Beltzville Dam)
1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Date of Report: 05/24/16
Lab ID: 3157-16-0016757

Date Collected: 05/11/16 08:15
Collected By: Client

Sample Desc: WA-6 Deep

Date Received: 05/11/16 16:40

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	05/12	09:45	AEH
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	05/12	17:25	AEH
Phosphorus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	05/12	17:45	AEH
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	05/12	18:40	JCL
Nitrogen, Nitrate	0.06	mg/l	.05	1	EPA 353.2	05/12	17:19	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	05/12	15:50	JCL
Nitrogen, Total Kjeldahl	0.29	mg/l	.25	1	EPA 351.2	05/18	15:05	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	05/12	11:45	EMW
Total Organic Carbon	3.8	mg/l	1	1	SM5310 C	05/13	19:38	ALD
RESIDUES								
Solids, Total Dissolved	37	mg/l	5	1	SM 2540C	05/13	12:50	TMH
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	05/13	12:50	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	5	mg/l	1	1	SM 2320 B	05/16	09:30	AEH

COMMENTS

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

Distribution of Reports:
Gregory Wacik - USACE (Beltzville Dam)

Reviewed and Approved by:

Richard Wheeler

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Attention: David Wertz
Reported To: Tetra Tech (Beltzville Dam)
1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Date of Report: 05/24/16
Lab ID: 3157-16-0016758

Date Collected: 05/11/16 08:45
Collected By: Client

Sample Desc: WA-7 Surface

Date Received: 05/11/16 16:40

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Fecal Coliform	<2	/100ml	2	1	SM 9222D	05/11	17:13	TNS
Total Coliform	770	mpn/100ml	1	1	SM 9223B	05/12	11:45	KAW
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	05/12	09:45	AEH
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	05/12	17:30	AEH
Phosphorus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	05/12	17:45	AEH
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	05/12	18:54	JCL
Nitrogen, Nitrate	0.07	mg/l	.05	1	EPA 353.2	05/12	17:20	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	05/12	15:51	JCL
Nitrogen, Total Kjeldahl	0.30	mg/l	.25	1	EPA 351.2	05/18	15:06	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	05/12	11:45	EMW
Total Organic Carbon	3.7	mg/l	1	1	SM5310 C	05/13	19:51	ALD
RESIDUES								
Solids, Total Dissolved	47	mg/l	5	1	SM 2540C	05/13	13:30	TMH
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	05/13	13:30	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	5	mg/l	1	1	SM 2320 B	05/16	12:05	AEH

Distribution of Reports:
Gregory Wacik - USACE (Beltzville Dam)

Reviewed and Approved by:

Richard Wheeler

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Attention: David Wertz
Reported To: Tetra Tech (Beltzville Dam)
1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Date of Report: 05/24/16
Lab ID: 3157-16-0016758

Date Collected: 05/11/16 08:45
Collected By: Client

Sample Desc: WA-7 Surface

Date Received: 05/11/16 16:40

PWSID: 3130843

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

COMMENTS

01 The total coliform sample was placed in the incubator on 05/11/2016 at 17:35.

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

Distribution of Reports:
Gregory Wacik - USACE (Beltzville Dam)

Reviewed and Approved by:

Richard Wheeler

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M.J. Reider Associates, Inc.

Attention: David Wertz
Reported To: Tetra Tech (Beltzville Dam)
1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Date of Report: 05/24/16
Lab ID: 3157-16-0016759

Date Collected: 05/11/16 08:45
Collected By: Client

Sample Desc: WA-7 Mid-Depth

Date Received: 05/11/16 16:40

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	05/12	09:55	AEH
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	05/12	17:30	AEH
Phosphorus as P, Total	0.02	mg/l	.01	1	SM 4500P-E	05/12	17:50	AEH
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	05/12	19:09	JCL
Nitrogen, Nitrate	0.07	mg/l	.05	1	EPA 353.2	05/12	17:21	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	05/12	15:54	JCL
Nitrogen, Total Kjeldahl	0.34	mg/l	.25	1	EPA 351.2	05/18	15:07	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	05/12	11:45	EMW
Total Organic Carbon	3.5	mg/l	1	1	SM5310 C	05/13	20:03	ALD
RESIDUES								
Solids, Total Dissolved	39	mg/l	5	1	SM 2540C	05/13	13:30	TMH
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	05/13	13:30	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	5	mg/l	1	1	SM 2320 B	05/16	12:05	AEH

COMMENTS

01 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2S04 to pH <2 after the sample was received at the laboratory.

Distribution of Reports:
Gregory Wacik - USACE (Beltzville Dam)

Reviewed and Approved by:

Richard Wheeler

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M.J. Reider Associates, Inc.

Attention: David Wertz
Reported To: Tetra Tech (Beltzville Dam)
1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Date of Report: 05/24/16
Lab ID: 3157-16-0016760

Date Collected: 05/11/16 08:45
Collected By: Client

Sample Desc: WA-7 Deep

Date Received: 05/11/16 16:40

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	05/12	09:55	AEH
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	05/12	17:30	AEH
Phosphorus as P, Total	0.02	mg/l	.01	1	SM 4500P-E	05/12	17:50	AEH
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	05/12	19:54	JCL
Nitrogen, Nitrate	0.06	mg/l	.05	1	EPA 353.2	05/12	17:24	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	05/12	15:55	JCL
Nitrogen, Total Kjeldahl	0.27	mg/l	.25	1	EPA 351.2	05/18	16:56	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	05/12	11:45	EMW
Total Organic Carbon	4.3	mg/l	1	1	SM5310 C	05/13	20:16	ALD
RESIDUES								
Solids, Total Dissolved	45	mg/l	5	1	SM 2540C	05/13	13:30	TMH
Solids, Total Suspended	5	mg/l	3	1	SM 2540D	05/13	13:30	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	5	mg/l	1	1	SM 2320 B	05/16	12:05	AEH

COMMENTS

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

Distribution of Reports:
Gregory Wacik - USACE (Beltzville Dam)

Reviewed and Approved by:

Richard Wheeler

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rxw
04/26/16 12:24:23 PM

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COFC.
Page:

Chain of Custody

Account: 3157 Work Order: 006224 Project Leader: rxw No: 274494
Work Order Description: Walter Resevior

Customer: David Wertz

Address: Tetra Tech (Beltzville Dam)
1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Remarks: _____

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

Phone: 703-387-5516 Ext:

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

Samplers: WACiK

16748
Sample No: 1 Desc: WA-1 Surface

nh3-n, tkn, alk, tds, tss, po4-p, toc,

no2-n, no3-n, d-po4-p, o-po4, bod,

fc, tc,

Matrix: o Date: 5/11/16
Time: 0940

A - 1 X Pt nh3 p w/ H2SO4(pH<2);
B - 1 X 8oz Alk p w/ Cool to 6 C;
C - 1 X 2xambervoa g w/ H3PO4/zero headspac
D - 1 X L bod p w/ Cool to 6 C;
E - 1 X Pt no3no2 p w/ Cool to 6 C;
F - 1 X 250mlMicro p w/ Sterile/Na2S203;

16749 TNS
Sample No: 2 Desc: WA-2 Surface

nh3-n, tkn, alk, tds, tss, po4-p, toc,

no2-n, no3-n, d-po4-p, o-po4, bod,

fc, tc,

Matrix: o Date: 5/11/16
Time: 0745

A - 1 X Pt nh3 p w/ H2SO4(pH<2);
B - 1 X 8oz Alk p w/ Cool to 6 C;
C - 1 X 2xambervoa g w/ H3PO4/zero headspac
D - 1 X L bod p w/ Cool to 6 C;
E - 1 X Pt no3no2 p w/ Cool to 6 C;
F - 1 X 250mlMicro p w/ Sterile/Na2S203;

16750 TNS
Sample No: 3 Desc: WA-2 Mid-Depth

nh3-n, tkn, alk, tds, tss, po4-p, toc,

no2-n, no3-n, d-po4-p, o-po4, bod,

Matrix: o Date: 5/11/16
Time: 0745

A - 1 X Pt nh3 p w/ H2SO4(pH<2);
B - 1 X 8oz Alk p w/ Cool to 6 C;
C - 1 X 2xambervoa g w/ H3PO4/zero headspac
D - 1 X L bod p w/ Cool to 6 C;
E - 1 X Pt no3no2 p w/ Cool to 6 C;

Relinquished by: _____ Received by: _____ Received for laboratory by: _____

Date: 5/11/16 Time: 1530 5/11/16 1515 Date: 5/11/16 Time: 1640

Sample entered by: _____

rxw
04/26/16 12:24:23 PM

M. J. REIDER ASSOCIATES, INC.

COFC.
Page:

Chain of Custody

Account: 3157 Work Order: 006224 Project Leader: rxw No: 274494
Work Order Description: Walter Resevior

Customer: David Wertz

Address: Tetra Tech (Beltzville Dam)
1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Remarks: _____

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

Phone: 703-387-5516 Ext:

Laboratory Receipt Temp: 8 Deg C. If Temp Unacceptable, On Ice? (Y) N
Approved By: RES

Samplers: WACiK

16751
Sample No: 4 Desc: WA-2 Deep

nh3-n, tkn, alk, tds, tss, po4-p, toc,
M AW
no2-n, no3-n, d-po4-p, o-po4, bod
B

Matrix: o Date: 5/11/16
Time: 0745
A - 1 X Pt nh3 p w/ H2SO4(pH<2);
B - 1 X 8oz Alk p w/ Cool to 6 C;
C - 1 X 2xambervoa g w/ H3PO4/zero headspac
D - 1 X L bod p w/ Cool to 6 C;
E - 1 X Pt no3no2 p w/ Cool to 6 C;

16752
Sample No: 5 Desc: WA-3 Surface

nh3-n, tkn, alk, tds, tss, po4-p, toc,
M AW
no2-n, no3-n, d-po4-p, o-po4, bod
B
fc, tc,
TNTC

Matrix: o Date: 5/11/16
Time: 0955
A - 1 X Pt nh3 p w/ H2SO4(pH<2);
B - 1 X 8oz Alk p w/ Cool to 6 C;
C - 1 X 2xambervoa g w/ H3PO4/zero headspac
D - 1 X L bod p w/ Cool to 6 C;
E - 1 X Pt no3no2 p w/ Cool to 6 C;
F - 1 X 250mlMicro p w/ Sterile/Na2S203;

16753
Sample No: 6 Desc: WA-4 Surface

nh3-n, tkn, alk, tds, tss, po4-p, toc,
M AW
no2-n, no3-n, d-po4-p, o-po4, bod
B
fc, tc,
TNTC

Matrix: o Date: 5/11/16
Time: 1015
A - 1 X Pt nh3 p w/ H2SO4(pH<2);
B - 1 X 8oz Alk p w/ Cool to 6 C;
C - 1 X 2xambervoa g w/ H3PO4/zero headspac
D - 1 X L bod p w/ Cool to 6 C;
E - 1 X Pt no3no2 p w/ Cool to 6 C;
F - 1 X 250mlMicro p w/ Sterile/Na2S203;

Relinquished by: _____ Received by: _____ Received for laboratory by: _____

Date: 5/11/16 Time: 1530 5/11/16 1515 Date: 5/11/16 Time: 1640

Sample entered by: PSM

rxw
04/26/16 12:24:24 PM

M. J. REIDER ASSOCIATES, INC.

COFC.
Page:

Chain of Custody

Account: 3157 Work Order: 006224 Project Leader: rxw No: 274494
Work Order Description: Walter Resevior

Customer: David Wertz

Address: Tetra Tech (Beltzville Dam)
1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Remarks: _____

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

Phone: 703-387-5516 Ext:

Laboratory Receipt Temp: 6 Deg C If Temp Unacceptable, On Ice? (Y) N
Approved By: RES

Samplers: WACiK

16754
Sample No: 7 Desc: WA-5 Surface

nh3-n, tkn, alk, tds, tss, po4-p, toc,

no2-n, no3-n, d-po4-p, o-po4, bod

Matrix: o Date: 5/11/16
Time: 1025

A - 1 X Pt nh3 p w/ H2SO4(pH<2);
B - 1 X 8oz Alk p w/ Cool to 6 C;
C - 1 X 2xambervoa g w/ H3PO4/zero headspac
D - 1 X L bod p w/ Cool to 6 C;
E - 1 X Pt no3no2 p w/ Cool to 6 C;
F - 1 X 250mlMicro p w/ Sterile/Na2S2O3;

16755
Sample No: 8 Desc: WA-6 Surface

nh3-n, tkn, alk, tds, tss, po4-p, toc,

no2-n, no3-n, d-po4-p, o-po4, bod

Matrix: o Date: 5/11/16
Time: 0815

A - 1 X Pt nh3 p w/ H2SO4(pH<2);
B - 1 X 8oz Alk p w/ Cool to 6 C;
C - 1 X 2xambervoa g w/ H3PO4/zero headspac
D - 1 X L bod p w/ Cool to 6 C;
E - 1 X Pt no3no2 p w/ Cool to 6 C;
F - 1 X 250mlMicro p w/ Sterile/Na2S2O3;

16756
Sample No: 9 Desc: WA-6 Mid-Depth

nh3-n, tkn, alk, tds, tss, po4-p, toc,

no2-n, no3-n, d-po4-p, o-po4, bod

Matrix: o Date: 5/11/16
Time: 0815

A - 1 X Pt nh3 p w/ H2SO4(pH<2);
B - 1 X 8oz Alk p w/ Cool to 6 C;
C - 1 X 2xambervoa g w/ H3PO4/zero headspac
D - 1 X L bod p w/ Cool to 6 C;
E - 1 X Pt no3no2 p w/ Cool to 6 C;

Relinquished by: _____ Received by: _____ Received for laboratory by: _____

Date: 5/11/16 Time: 1530 5/11/16 1515 Date: 5/11/16 Time: 1640

Sample entered by: BSM

rxw
04/26/16 12:24:24 PM

M. J. REIDER ASSOCIATES, INC.

COFC.
Page:

Chain of Custody

Account: 3157 Work Order: 006224 Project Leader: rxw No: 274494
Work Order Description: Walter Resevior

Customer: David Wertz

Address: Tetra Tech (Beltzville Dam)
1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Remarks: _____

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

Phone: 703-387-5516 Ext:

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

Samplers: WACiK

16757
Sample No: 10 Desc: WA-6 Deep

nh3-n, tkn, alk, tds, tss, po4-p, toc,
no2-n, no3-n, d-po4-p, o-po4, bod,

Matrix: o Date: 5/11/16
Time: 0815
A - 1 X Pt nh3 p w/ H2SO4(pH<2);
B - 1 X 8oz Alk p w/ Cool to 6 C;
C - 1 X 2xambervoa g w/ H3PO4/zero headspac
D - 1 X L bod p w/ Cool to 6 C;
E - 1 X Pt no3no2 p w/ Cool to 6 C;

16758
Sample No: 11 Desc: WA-7 Surface

nh3-n, tkn, alk, tds, tss, po4-p, toc,
no2-n, no3-n, d-po4-p, o-po4, bod,

Matrix: o Date: 5/11/16
Time: 0845
A - 1 X Pt nh3 p w/ H2SO4(pH<2);
B - 1 X 8oz Alk p w/ Cool to 6 C;
C - 1 X 2xambervoa g w/ H3PO4/zero headspac
D - 1 X L bod p w/ Cool to 6 C;
E - 1 X Pt no3no2 p w/ Cool to 6 C;
F - 1 X 250mlMicro p w/ Sterile/Na2S203;

16759 fc, tc,
Sample No: 12 Desc: WA-7 Mid-Depth

nh3-n, tkn, alk, tds, tss, po4-p, toc,
no2-n, no3-n, d-po4-p, o-po4, bod,

Matrix: o Date: 5/11/16
Time: 0845
A - 1 X Pt nh3 p w/ H2SO4(pH<2);
B - 1 X 8oz Alk p w/ Cool to 6 C;
C - 1 X 2xambervoa g w/ H3PO4/zero headspac
D - 1 X L bod p w/ Cool to 6 C;
E - 1 X Pt no3no2 p w/ Cool to 6 C;

Relinquished by: _____ Received by: _____ Received for laboratory by: _____

Date: 5/11/12 Time: 1530 5/11/16 1515 Date: 5/11/16 Time: 1640

Sample entered by: RSM

rxw
04/26/16 12:24:24 PM

M. J. REIDER ASSOCIATES, INC.

COFC.
Page:

Chain of Custody

Account: 3157 Work Order: 006224 Project Leader: rxw No: 274494
Work Order Description: Walter Resevior

Customer: David Wertz

Address: Tetra Tech (Beltzville Dam)
1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Remarks: _____

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

Phone: 703-387-5516 Ext:

Laboratory Receipt Temp: 6 Deg C. If Temp Unacceptable, On Ice? (Y) N
Approved By: RES

Samplers: WACIK

==========

16760
Sample No: 13 Desc: WA-7 Deep

Matrix: o Date: 5/11/16
Time: 0845

nh3-n, tkn, alk, tds, tss, po4-p, toc,

no2-n, no3-n, d-po4-p, o-po4, bod

A - 1 X Pt nh3 p w/ H2SO4(pH<2);
B - 1 X 8oz Alk p w/ Cool to 6 C;
C - 1 X 2xambervoa g w/ H3PO4/zero headspac
D - 1 X L bod p w/ Cool to 6 C;
E - 1 X Pt no3no2 p w/ Cool to 6 C;

Relinquished by: _____ Received by: _____ Received for laboratory by: _____

Date: 5/11/16 Time: 1530

5/11/16 1515

Date: 5/11/16 Time: 1640

Sample entered by: _____

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

Attention: David Wertz
Reported To: Tetra Tech (Beltzville Dam)
1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Date of Report: 06/21/16
Lab ID: 3157-16-0018010

Date Collected: 06/07/16 09:25
Collected By: Client

Sample Desc: WA-1 Surface

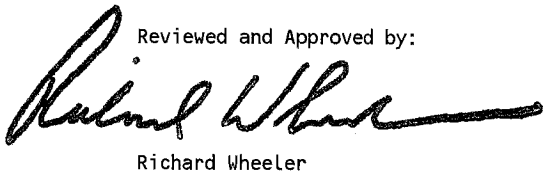
Date Received: 06/07/16 16:30

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Fecal Coliform	<2	/100ml	2	1	SM 9222D	06/07	17:05	TNS
Total Coliform	290	mpn/100ml	1	1	SM 9223B	06/08	11:25	PLW
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	06/06	14:10	AEH
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	06/08	16:45	AEH
Phosphorus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	06/08	17:10	AEH
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	06/08	18:32	JCL
Nitrogen, Nitrate	0.08	mg/l	.05	1	EPA 353.2	06/08	15:51	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	06/08	14:14	JCL
Nitrogen, Total Kjeldahl	0.30	mg/l	.25	1	EPA 351.2	06/16	17:23	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	06/08	13:15	EMW
Total Organic Carbon	3.2	mg/l	1	1	SM5310 C	06/09	20:58	HRG
RESIDUES								
Solids, Total Dissolved	60	mg/l	5	1	SM 2540C	06/10	12:20	TMH
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	06/10	12:20	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	6	mg/l	1	1	SM 2320 B	06/17	12:00	AEH

Distribution of Reports:
Gregory Wacik - USACE (Beltzville Dam)

Reviewed and Approved by:



Richard Wheeler

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

Attention: David Wertz
Reported To: Tetra Tech (Beltzville Dam)
1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Date of Report: 06/21/16
Lab ID: 3157-16-0018010

Date Collected: 06/07/16 09:25
Collected By: Client

Sample Desc: WA-1 Surface

Date Received: 06/07/16 16:30

PWSID: 3130843

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

COMMENTS

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

02 The total coliform sample was placed in the incubator on 06/07/2016 at 17:00.

Distribution of Reports:
Gregory Wacik - USACE (Beltzville Dam)

Reviewed and Approved by:

Richard Wheeler

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QUALITY ETHICS SERVICES ACIL Seal of Excellence

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Attention: David Wertz
Reported To: Tetra Tech (Beltzville Dam)
1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Date of Report: 06/21/16
Lab ID: 3157-16-0018011

Date Collected: 06/07/16 07:25
Collected By: Client

Sample Desc: WA-2 Surface

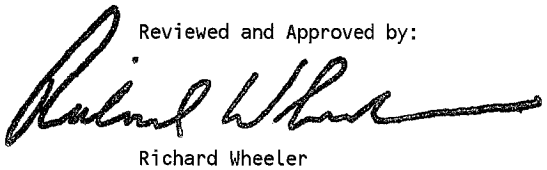
Date Received: 06/07/16 16:30

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Fecal Coliform	26	/100ml	2	1	SM 9222D	06/07	17:05	TNS
Total Coliform	550	mpn/100ml	1	1	SM 9223B	06/08	11:25	PLW
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	06/08	14:10	AEH
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	06/08	16:45	AEH
Phosphorus as P, Total	0.03	mg/l	.01	1	SM 4500P-E	06/08	17:10	AEH
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	06/08	18:47	JCL
Nitrogen, Nitrate	0.08	mg/l	.05	1	EPA 353.2	06/08	15:52	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	06/08	14:17	JCL
Nitrogen, Total Kjeldahl	0.31	mg/l	.25	1	EPA 351.2	06/16	17:24	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	06/08	13:15	EMW
Total Organic Carbon	4.1	mg/l	1	1	SM5310 C	06/09	21:23	HRG
RESIDUES								
Solids, Total Dissolved	33	mg/l	5	1	SM 2540C	06/10	12:20	TMH
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	06/10	12:20	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	6	mg/l	1	1	SM 2320 B	06/17	12:00	AEH

Distribution of Reports:
Gregory Wacik - USACE (Beltzville Dam)

Reviewed and Approved by:



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M.J. Reider Associates, Inc.

Attention: David Wertz
Reported To: Tetra Tech (Beltzville Dam)
1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Date of Report: 06/21/16
Lab ID: 3157-16-0018011

Date Collected: 06/07/16 07:25
Collected By: Client

Sample Desc: WA-2 Surface

Date Received: 06/07/16 16:30

PWSID: 3130843

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

COMMENTS

01 The total coliform sample was placed in the incubator on 06/07/2016 at 17:00.

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

Distribution of Reports:
Gregory Wacik - USACE (Beltzville Dam)

Reviewed and Approved by:

Richard Wheeler

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Attention: David Wertz
Reported To: Tetra Tech (Beltzville Dam)
1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Date of Report: 06/21/16
Lab ID: 3157-16-0018012

Date Collected: 06/07/16 07:25
Collected By: Client

Sample Desc: WA-2 Mid-Depth

Date Received: 06/07/16 16:30

PWSID: 3130843

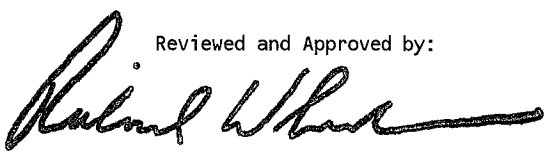
	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	06/08	14:10	AEH
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	06/08	16:45	AEH
Phosphorus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	06/08	17:15	AEH
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	06/08	19:01	JCL
Nitrogen, Nitrate	0.06	mg/l	.05	1	EPA 353.2	06/08	15:55	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	06/08	14:18	JCL
Nitrogen, Total Kjeldahl	<.25	mg/l	.25	1	EPA 351.2	06/16	17:25	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	06/08	13:15	EMW
Total Organic Carbon	3.1	mg/l	1	1	SM5310 C	06/09	22:00	HRG
RESIDUES								
Solids, Total Dissolved	29	mg/l	5	1	SM 2540C	06/10	12:20	TMH
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	06/10	12:20	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	5	mg/l	1	1	SM 2320 B	06/17	12:00	AEH

COMMENTS

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

Distribution of Reports:
Gregory Wacik - USACE (Beltzville Dam)

Reviewed and Approved by:



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Attention: David Wertz
Reported To: Tetra Tech (Beltzville Dam)
1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Date of Report: 06/21/16
Lab ID: 3157-16-0018013

Date Collected: 06/07/16 07:25
Collected By: Client

Sample Desc: WA-2 Deep

Date Received: 06/07/16 16:30

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	06/08	14:10	AEH
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	06/08	16:45	AEH
Phosphorus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	06/08	17:15	AEH
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	06/08	19:16	JCL
Nitrogen, Nitrate	0.08	mg/l	.05	1	EPA 353.2	06/08	15:56	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	06/08	14:19	JCL
Nitrogen, Total Kjeldahl	0.46	mg/l	.25	1	EPA 351.2	06/16	17:26	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	06/08	13:15	EMW
Total Organic Carbon	3.8	mg/l	1	1	SM5310 C	06/09	22:13	HRG
RESIDUES								
Solids, Total Dissolved	46	mg/l	5	1	SM 2540C	06/10	12:20	TMH
Solids, Total Suspended	11	mg/l	3	1	SM 2540D	06/10	12:20	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	6	mg/l	1	1	SM 2320 B	06/17	12:00	AEH

COMMENTS

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

Distribution of Reports:
Gregory Wacik - USACE (Beltzville Dam)

Reviewed and Approved by:

Richard Wheeler

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Attention: David Wertz
Reported To: Tetra Tech (Beltzville Dam)
1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Date of Report: 06/21/16
Lab ID: 3157-16-0018014

Date Collected: 06/07/16 09:45
Collected By: Client

Sample Desc: WA-3 Surface

Date Received: 06/07/16 16:30

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Fecal Coliform	30	/100ml	2	1	SM 9222D	06/07	17:05	TNS
Total Coliform	>2400	mpn/100ml	1	1	SM 9223B	06/08	11:25	PLW
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	06/08	14:10	AEH
Phosphorus as P, Dissolved	0.06	mg/l	.05	1	SM 4500P-E	06/08	16:50	AEH
Phosphorus as P, Total	0.07	mg/l	.01	1	SM 4500P-E	06/08	17:15	AEH
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	06/08	19:30	JCL
Nitrogen, Nitrate	0.16	mg/l	.05	1	EPA 353.2	06/08	15:57	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	06/08	14:20	JCL
Nitrogen, Total Kjeldahl	0.59	mg/l	.25	1	EPA 351.2	06/16	17:27	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	06/08	13:15	EMW
Total Organic Carbon	5.4	mg/l	1	1	SM5310 C	06/09	22:26	HRG
RESIDUES								
Solids, Total Dissolved	61	mg/l	5	1	SM 2540C	06/10	12:20	TMH
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	06/10	12:20	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	8	mg/l	1	1	SM 2320 B	06/17	12:00	AEH

Distribution of Reports:
Gregory Wacik - USACE (Beltzville Dam)

Reviewed and Approved by:

Richard Wheeler

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1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Date of Report: 06/21/16
Lab ID: 3157-16-0018014

Date Collected: 06/07/16 09:45
Collected By: Client

Sample Desc: WA-3 Surface

Date Received: 06/07/16 16:30

PWSID: 3130843

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

COMMENTS

01 The total coliform sample was placed in the incubator on 06/07/2016 at 17:00.

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

Distribution of Reports:
Gregory Wacik - USACE (Beltzville Dam)

Reviewed and Approved by:

Richard Wheeler

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M.J. Reider Associates, Inc.

Attention: David Wertz
Reported To: Tetra Tech (Beltzville Dam)
1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Date of Report: 06/21/16
Lab ID: 3157-16-0018015

Date Collected: 06/07/16 10:00
Collected By: Client

Sample Desc: WA-4 Surface

Date Received: 06/07/16 16:30

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Fecal Coliform	250	/100ml	2	1	SM 9222D	06/07	17:05	TNS
Total Coliform	>2400	mpn/100ml	1	1	SM 9223B	06/08	11:25	PLW
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	06/08	14:20	AEH
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	06/08	16:50	AEH
Phosphorus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	06/08	17:15	AEH
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	06/08	19:45	JCL
Nitrogen, Nitrate	0.08	mg/l	.05	1	EPA 353.2	06/08	15:58	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	06/08	14:21	JCL
Nitrogen, Total Kjeldahl	0.56	mg/l	.25	1	EPA 351.2	06/16	17:30	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	06/08	13:15	EMW
Total Organic Carbon	7.7	mg/l	1	1	SM5310 C	06/09	22:40	HRG
RESIDUES								
Solids, Total Dissolved	74	mg/l	5	1	SM 2540C	06/10	12:20	TMH
Solids, Total Suspended	3	mg/l	3	1	SM 2540D	06/10	12:20	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	8	mg/l	1	1	SM 2320 B	06/17	12:00	AEH

Distribution of Reports:
Gregory Wacik - USACE (Beltzville Dam)

Reviewed and Approved by:

Richard Wheeler

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Reported To: Tetra Tech (Beltzville Dam)
1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Date of Report: 06/21/16
Lab ID: 3157-16-0018015

Date Collected: 06/07/16 10:00
Collected By: Client

Sample Desc: WA-4 Surface

Date Received: 06/07/16 16:30

PWSID: 3130843

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

COMMENTS

01 The total coliform sample was placed in the incubator on 06/07/2016 at 17:00.

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

Distribution of Reports:
Gregory Wacik - USACE (Beltzville Dam)

Reviewed and Approved by:

Richard Wheeler

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Attention: David Wertz
Reported To: Tetra Tech (Beltzville Dam)
1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Date of Report: 06/21/16
Lab ID: 3157-16-0018016

Date Collected: 06/07/16 10:15
Collected By: Client

Sample Desc: WA-5 Surface

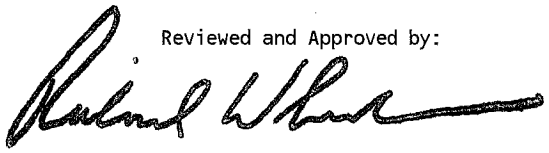
Date Received: 06/07/16 16:30

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Fecal Coliform	340	/100ml	2	1	SM 9222D	06/07	17:05	TNS
Total Coliform	>2400	mpn/100ml	1	1	SM 9223B	06/08	11:25	PLW
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	06/08	14:20	AEH
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	06/08	16:50	AEH
Phosphorus as P, Total	0.05	mg/l	.01	1	SM 4500P-E	06/08	17:15	AEH
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	06/08	20:00	JCL
Nitrogen, Nitrate	<.05	mg/l	.05	1	EPA 353.2	06/08	15:59	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	06/08	14:22	JCL
Nitrogen, Total Kjeldahl	0.63	mg/l	.25	1	EPA 351.2	06/16	17:31	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	06/08	13:15	EMW
Total Organic Carbon	7.7	mg/l	1	1	SM5310 C	06/09	22:54	HRG
RESIDUES								
Solids, Total Dissolved	33	mg/l	5	1	SM 2540C	06/10	12:20	TMH
Solids, Total Suspended	4	mg/l	3	1	SM 2540D	06/10	12:20	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	3	mg/l	1	1	SM 2320 B	06/17	12:00	AEH

Distribution of Reports:
Gregory Wacik - USACE (Beltzville Dam)

Reviewed and Approved by:



Richard Wheeler

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

Attention: David Wertz
Reported To: Tetra Tech (Beltzville Dam)
1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Date of Report: 06/21/16
Lab ID: 3157-16-0018016

Date Collected: 06/07/16 10:15
Collected By: Client

Sample Desc: WA-5 Surface

Date Received: 06/07/16 16:30

PWSID: 3130843

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

COMMENTS

01 The total coliform sample was placed in the incubator on 06/07/2016 at 17:00.

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

Distribution of Reports:
Gregory Wacik - USACE (Beltzville Dam)

Reviewed and Approved by:

Richard Wheeler

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M.J. Reider Associates, Inc.

Attention: David Wertz
Reported To: Tetra Tech (Beltzville Dam)
1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Date of Report: 06/21/16
Lab ID: 3157-16-0018017
Date Collected: 06/07/16 08:35
Collected By: Client

Sample Desc: WA-6 Surface

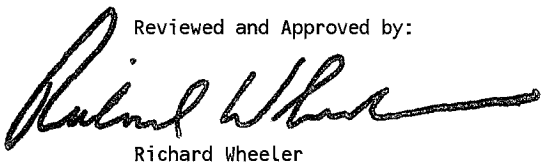
Date Received: 06/07/16 16:30

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Fecal Coliform	2	/100ml	2	1	SM 9222D	06/07	17:05	TNS
Total Coliform	520	mpn/100ml	1	1	SM 9223B	06/08	11:25	PLW
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	06/08	14:20	AEH
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	06/08	16:50	AEH
Phosphorus as P, Total	0.04	mg/l	.01	1	SM 4500P-E	06/08	17:15	AEH
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	06/08	20:14	JCL
Nitrogen, Nitrate	0.08	mg/l	.05	1	EPA 353.2	06/08	15:59	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	06/08	14:23	JCL
Nitrogen, Total Kjeldahl	0.39	mg/l	.25	1	EPA 351.2	06/16	17:32	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	06/08	13:15	EMW
Total Organic Carbon	3.9	mg/l	1	1	SM5310 C	06/09	23:07	HRG
RESIDUES								
Solids, Total Dissolved	50	mg/l	5	1	SM 2540C	06/10	12:20	TMH
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	06/10	12:20	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	6	mg/l	1	1	SM 2320 B	06/17	12:00	AEH

Distribution of Reports:
Gregory Wacik - USACE (Beltzville Dam)

Reviewed and Approved by:



Richard Wheeler

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M.J. Reider Associates, Inc.

Attention: David Wertz
Reported To: Tetra Tech (Beltzville Dam)
1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Date of Report: 06/21/16
Lab ID: 3157-16-0018017

Date Collected: 06/07/16 08:35
Collected By: Client

Sample Desc: WA-6 Surface

Date Received: 06/07/16 16:30

PWSID: 3130843

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

COMMENTS

01 The total coliform sample was placed in the incubator on 06/07/2016 at 17:00.

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

Distribution of Reports:
Gregory Wacik - USACE (Beltzville Dam)

Reviewed and Approved by:

Richard Wheeler

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Attention: David Wertz
Reported To: Tetra Tech (Beltzville Dam)
1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Date of Report: 06/21/16
Lab ID: 3157-16-0018018
Date Collected: 06/07/16 08:35
Collected By: Client

Sample Desc: WA-6 Mid-Depth

Date Received: 06/07/16 16:30

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	06/08	14:20	AEH
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	06/08	16:50	AEH
Phosphorus as P, Total	0.07	mg/l	.01	1	SM 4500P-E	06/08	17:15	AEH
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	06/08	20:29	JCL
Nitrogen, Nitrate	0.06	mg/l	.05	1	EPA 353.2	06/08	16:02	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	06/08	14:26	JCL
Nitrogen, Total Kjeldahl	0.33	mg/l	.25	1	EPA 351.2	06/16	17:34	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	06/08	13:15	EMW
Total Organic Carbon	3.1	mg/l	1	1	SM5310 C	06/09	23:20	HRG
RESIDUES								
Solids, Total Dissolved	51	mg/l	5	1	SM 2540C	06/10	12:20	TMH
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	06/10	12:20	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	5	mg/l	1	1	SM 2320 B	06/17	12:00	AEH

COMMENTS

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

Distribution of Reports:
Gregory Wacik - USACE (Beltzville Dam)

Reviewed and Approved by:

Richard Wheeler

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Attention: David Wertz
Reported To: Tetra Tech (Beltzville Dam)
1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Date of Report: 06/21/16
Lab ID: 3157-16-0018019

Date Collected: 06/07/16 08:35
Collected By: Client

Sample Desc: WA-6 Deep

Date Received: 06/07/16 16:30

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	06/08	14:20	AEH
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	06/08	16:50	AEH
Phosphorus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	06/08	17:15	AEH
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	06/08	21:13	JCL
Nitrogen, Nitrate	0.06	mg/l	.05	1	EPA 353.2	06/08	16:03	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	06/08	14:27	JCL
Nitrogen, Total Kjeldahl	0.34	mg/l	.25	1	EPA 351.2	06/16	17:35	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	06/08	13:15	EMW
Total Organic Carbon	3.1	mg/l	1	1	SM5310 C	06/09	23:32	HRG
RESIDUES								
Solids, Total Dissolved	58	mg/l	5	1	SM 2540C	06/10	12:20	TMH
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	06/10	12:20	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	4	mg/l	1	1	SM 2320 B	06/17	13:30	AEH

COMMENTS

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

Distribution of Reports:
Gregory Wacik - USACE (Beltzville Dam)

Reviewed and Approved by:

Richard Wheeler

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Attention: David Wertz
Reported To: Tetra Tech (Beltzville Dam)
1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Date of Report: 06/21/16
Lab ID: 3157-16-0018020

Date Collected: 06/07/16 08:00
Collected By: Client

Sample Desc: WA-7 Surface

Date Received: 06/07/16 16:30

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Fecal Coliform	15	/100ml	2	1	SM 9222D	06/07	17:05	TNS
Total Coliform	690	mpn/100ml	1	1	SM 9223B	06/08	11:25	PLW
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	0.01	mg/l	.01	1	SM 4500P-E	06/08	14:20	AEH
Phosphorus as P, Dissolved	0.08	mg/l	.05	1	SM 4500P-E	06/08	16:55	AEH
Phosphorus as P, Total	0.08	mg/l	.01	1	SM 4500P-E	06/08	17:20	AEH
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	06/08	21:27	JCL
Nitrogen, Nitrate	0.08	mg/l	.05	1	EPA 353.2	06/08	16:05	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	06/08	14:28	JCL
Nitrogen, Total Kjeldahl	0.57	mg/l	.25	1	EPA 351.2	06/16	17:36	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	06/08	13:15	EMW
Total Organic Carbon	3.9	mg/l	1	1	SM5310 C	06/10	00:19	HRG
RESIDUES								
Solids, Total Dissolved	72	mg/l	5	1	SM 2540C	06/10	12:45	TMH
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	06/10	12:20	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	7	mg/l	1	1	SM 2320 B	06/17	13:30	AEH

Distribution of Reports:
Gregory Wacik - USACE (Beltzville Dam)

Reviewed and Approved by:

Richard Wheeler

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Attention: David Wertz
Reported To: Tetra Tech (Beltzville Dam)
1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Date of Report: 06/21/16
Lab ID: 3157-16-0018020

Date Collected: 06/07/16 08:00
Collected By: Client

Sample Desc: WA-7 Surface

Date Received: 06/07/16 16:30

PWSID: 3130843

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

COMMENTS

01 The total coliform sample was placed in the incubator on 06/07/2016 at 17:00.

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

Distribution of Reports:
Gregory Wacik - USACE (Beltzville Dam)

Reviewed and Approved by:

Richard Wheeler

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M.J. Reider Associates, Inc.

Attention: David Wertz
Reported To: Tetra Tech (Beltzville Dam)
1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Date of Report: 06/21/16
Lab ID: 3157-16-0018021

Date Collected: 06/07/16 08:00
Collected By: Client

Sample Desc: WA-7 Mid-Depth

Date Received: 06/07/16 16:30

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	06/08	14:30	AEH
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	06/08	16:55	AEH
Phosphorus as P, Total	0.21	mg/l	.01	1	SM 4500P-E	06/08	17:20	AEH
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	06/08	21:42	JCL
Nitrogen, Nitrate	0.16	mg/l	.05	1	EPA 353.2	06/08	18:06	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	06/08	14:30	JCL
Nitrogen, Total Kjeldahl	0.39	mg/l	.25	1	EPA 351.2	06/16	17:37	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	06/08	13:15	EMW
Total Organic Carbon	3.4	mg/l	1	1	SM5310 C	06/10	00:44	HRG
RESIDUES								
Solids, Total Dissolved	41	mg/l	5	1	SM 2540C	06/10	12:45	TMH
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	06/10	12:45	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	5	mg/l	1	1	SM 2320 B	06/17	13:30	AEH

COMMENTS

01 The toc matrix spike was high indicating possible sample matrix interference.

Distribution of Reports:
Gregory Wacik - USACE (Beltzville Dam)

Reviewed and Approved by:

Richard Wheeler

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Date of Report: 06/21/16
Lab ID: 3157-16-0018021

Date Collected: 06/07/16 08:00
Collected By: Client

Sample Desc: WA-7 Mid-Depth

Date Received: 06/07/16 16:30

PWSID: 3130843

		Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
02	The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.								

Distribution of Reports:
Gregory Wacik - USACE (Beltzville Dam)

Reviewed and Approved by:

Richard Wheeler

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Attention: David Wertz
Reported To: Tetra Tech (Beltzville Dam)
1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Date of Report: 06/21/16
Lab ID: 3157-16-0018022

Date Collected: 06/07/16 08:00
Collected By: Client

Sample Desc: WA-7 Deep

Date Received: 06/07/16 16:30

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	06/08	14:30	AEH
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	06/08	16:55	AEH
Phosphorus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	06/08	17:20	AEH
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	06/08	21:57	JCL
Nitrogen, Nitrate	0.10	mg/l	.05	1	EPA 353.2	06/08	16:09	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	06/08	14:31	JCL
Nitrogen, Total Kjeldahl	1.02	mg/l	.25	1	EPA 351.2	06/16	17:38	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	06/08	13:15	EMW
Total Organic Carbon	3.5	mg/l	1	1	SM5310 C	06/10	01:23	HRG
RESIDUES								
Solids, Total Dissolved	55	mg/l	5	1	SM 2540C	06/10	12:45	TMH
Solids, Total Suspended	33	mg/l	3	1	SM 2540D	06/10	12:45	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	7	mg/l	1	1	SM 2320 B	06/17	13:30	AEH

COMMENTS

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

Distribution of Reports:
Gregory Wacik - USACE (Beltzville Dam)

Reviewed and Approved by:

Richard Wheeler

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M. J. REIDER ASSOCIATES, INC.

Chain of Custody

Account: 3157 Work Order: 006224 Project Leader: rxw No: 275161
Work Order Description: Walter Resevior

Customer: David Wertz

Address: Tetra Tech (Beltzville Dam)
1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Remarks: _____

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

Phone: 703-387-5516 Ext:

Laboratory Receipt Temp: 3 Deg C. If Temp Unacceptable, On Ice? (Y) N
Approved By: RES

Samplers: WACIK

==========

18010 Sample No: 1 Desc: WA-1 Surface

nh3-n, tkn, alk, tds, tss, po4-p, toc,

no2-n, no3-n, d-po4-p, o-po4, bod,

fc, tc,

Matrix: o Date: 6/7/16
Time: 0925

A - 1 X Pt nh3 p w/ H2SO4(pH<2);
B - 1 X 8oz Alk p w/ Cool to 6 C;
C - 1 X 2xambervoa g w/ H3PO4/zero headspace;
D - 1 X L bod p w/ Cool to 6 C;
E - 1 X Pt no3no2 p w/ Cool to 6 C;
F - 1 X 250mlMicro p w/ Sterile/Na2S2O3;

18011 Sample No: 2 Desc: WA-2 Surface

nh3-n, tkn, alk, tds, tss, po4-p, toc,

no2-n, no3-n, d-po4-p, o-po4, bod,

fc, tc,

Matrix: o Date: 6/7/16
Time: 0725

A - 1 X Pt nh3 p w/ H2SO4(pH<2);
B - 1 X 8oz Alk p w/ Cool to 6 C;
C - 1 X 2xambervoa g w/ H3PO4/zero headspace;
D - 1 X L bod p w/ Cool to 6 C;
E - 1 X Pt no3no2 p w/ Cool to 6 C;
F - 1 X 250mlMicro p w/ Sterile/Na2S2O3;

18012 Sample No: 3 Desc: WA-2 Mid-Depth

nh3-n, tkn, alk, tds, tss, po4-p, toc,

no2-n, no3-n, d-po4-p, o-po4, bod,

Matrix: o Date: 6/7/16
Time: 0725

A - 1 X Pt nh3 p w/ H2SO4(pH<2);
B - 1 X 8oz Alk p w/ Cool to 6 C;
C - 1 X 2xambervoa g w/ H3PO4/zero headspace;
D - 1 X L bod p w/ Cool to 6 C;
E - 1 X Pt no3no2 p w/ Cool to 6 C;

Relinquished by: _____ Received by: _____ Received for laboratory by: _____

Date: 6/7/16 Time: 3:00 Date: 6/7/16 Time: 1630

Sample entered by: _____

Chain of Custody

Account: 3157 Work Order: 006224 Project Leader: rxw No: 275161
Work Order Description: Walter Resevior

Customer: David Wertz

Address: Tetra Tech (Beltzville Dam)
1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Phone: 703-387-5516 Ext:

Samplers: WACiK

Remarks: _____

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

Laboratory Receipt Temp: 3 Deg C. If Temp Unacceptable, On Ice? (Y) N
Approved By: RES

==========

18013 Sample No: 4 Desc: WA-2 Deep

nh3-n, tkn, alk, tds, tss, po4-p, toc,

no2-n, no3-n, d-po4-p, o-po4, bod

Matrix: o Date: 6/7/16
Time: 0725

A - 1 X Pt nh3 p w/ H2SO4(pH<2);
B - 1 X 8oz Alk p w/ Cool to 6 C;
C - 1 X 2xambervoa g w/ H3PO4/zero headspace;
D - 1 X L bod p w/ Cool to 6 C;
E - 1 X Pt no3no2 p w/ Cool to 6 C;

18014 Sample No: 5 Desc: WA-3 Surface

nh3-n, tkn, alk, tds, tss, po4-p, toc,

no2-n, no3-n, d-po4-p, o-po4, bod

fc, tc,
RES

Matrix: o Date: 6/7/16
Time: 0945

A - 1 X Pt nh3 p w/ H2SO4(pH<2);
B - 1 X 8oz Alk p w/ Cool to 6 C;
C - 1 X 2xambervoa g w/ H3PO4/zero headspace;
D - 1 X L bod p w/ Cool to 6 C;
E - 1 X Pt no3no2 p w/ Cool to 6 C;
F - 1 X 250mlMicro p w/ Sterile/Na2S2O3;

18015 Sample No: 6 Desc: WA-4 Surface

nh3-n, tkn, alk, tds, tss, po4-p, toc,

no2-n, no3-n, d-po4-p, o-po4, bod

fc, tc,
RES

Matrix: o Date: 6/7/16
Time: 1000

A - 1 X Pt nh3 p w/ H2SO4(pH<2);
B - 1 X 8oz Alk p w/ Cool to 6 C;
C - 1 X 2xambervoa g w/ H3PO4/zero headspace;
D - 1 X L bod p w/ Cool to 6 C;
E - 1 X Pt no3no2 p w/ Cool to 6 C;
F - 1 X 250mlMicro p w/ Sterile/Na2S2O3;

Relinquished by: _____ Received by: _____ Received for laboratory by: _____

Date: 6/7/16 Time: 3:00 Date: 6/7/16 Time: 1630

Sample entered by: _____

Chain of Custody

Account: 3157 Work Order: 006224 Project Leader: rxw No: 275161
Work Order Description: Walter Resevior

Customer: David Wertz

Address: Tetra Tech (Beltzville Dam)
1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Phone: 703-387-5516 Ext:

Samplers: _____

Remarks: _____

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

Laboratory Receipt Temp: 3 Deg C. If Temp Unacceptable, On Ice? (Y) N
Approved By: RES

==========

18016 Sample No: 7 Desc: WA-5 Surface

nh3-n, tkn, alk, tds, tss, po4-p, toc,

no2-n, no3-n, d-po4-p, o-po4, bod

fc, tc,

Matrix: o Date: 6/7/16
Time: 1015

A - 1 X Pt nh3 p w/ H2SO4(pH<2);
B - 1 X 8oz Alk p w/ Cool to 6 C;
C - 1 X 2xambervoa g w/ H3PO4/zero headspace;
D - 1 X L bod p w/ Cool to 6 C;
E - 1 X Pt no3no2 p w/ Cool to 6 C;
F - 1 X 250mlMicro p w/ Sterile/Na2S2O3;

18017 Sample No: 8 Desc: WA-6 Surface

nh3-n, tkn, alk, tds, tss, po4-p, toc,

no2-n, no3-n, d-po4-p, o-po4, bod

fc, tc,

Matrix: o Date: 6/7/16
Time: 0935

A - 1 X Pt nh3 p w/ H2SO4(pH<2);
B - 1 X 8oz Alk p w/ Cool to 6 C;
C - 1 X 2xambervoa g w/ H3PO4/zero headspace;
D - 1 X L bod p w/ Cool to 6 C;
E - 1 X Pt no3no2 p w/ Cool to 6 C;
F - 1 X 250mlMicro p w/ Sterile/Na2S2O3;

18018 Sample No: 9 Desc: WA-6 Mid-Depth

nh3-n, tkn, alk, tds, tss, po4-p, toc,

no2-n, no3-n, d-po4-p, o-po4, bod

Matrix: o Date: 6/7/16
Time: 0855

A - 1 X Pt nh3 p w/ H2SO4(pH<2);
B - 1 X 8oz Alk p w/ Cool to 6 C;
C - 1 X 2xambervoa g w/ H3PO4/zero headspace;
D - 1 X L bod p w/ Cool to 6 C;
E - 1 X Pt no3no2 p w/ Cool to 6 C;

Relinquished by: _____ Received by: Rachel Stump Received for laboratory by: Rachel Stump

Date: 6/7/16 Time: 3:00 Date: 6/7/16 Time: 1630

Sample entered by: _____

Chain of Custody

Account: 3157 Work Order: 006224 Project Leader: rxw No: 275161
Work Order Description: Walter Resevior

Customer: David Wertz

Address: Tetra Tech (Beltzville Dam)
1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Phone: 703-387-5516 Ext:

Samplers: WACIK

Remarks: _____

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

Laboratory Receipt Temp: 3 Deg C. If Temp Unacceptable, On Ice? (Y) N
Approved By: RES

18019 Sample No: 10 Desc: WA-6 Deep

nh3-n, tkn, alk, tds, tss, po4-p, toc,

no2-n, no3-n, d-po4-p, o-po4, bod

Matrix: o Date: 6/7/16
Time: 0835

A - 1 X Pt nh3 p w/ H2SO4(pH<2);
B - 1 X 8oz Alk p w/ Cool to 6 C;
C - 1 X 2xambervoa g w/ H3PO4/zero headspace;
D - 1 X L bod p w/ Cool to 6 C;
E - 1 X Pt no3no2 p w/ Cool to 6 C;

18020 Sample No: 11 Desc: WA-7 Surface

nh3-n, tkn, alk, tds, tss, po4-p, toc,

no2-n, no3-n, d-po4-p, o-po4, bod

fc, tc

Matrix: o Date: 6/7/16
Time: 0860

A - 1 X Pt nh3 p w/ H2SO4(pH<2);
B - 1 X 8oz Alk p w/ Cool to 6 C;
C - 1 X 2xambervoa g w/ H3PO4/zero headspace;
D - 1 X L bod p w/ Cool to 6 C;
E - 1 X Pt no3no2 p w/ Cool to 6 C;
F - 1 X 250mlMicro p w/ Sterile/Na2S2O3;

18021 Sample No: 12 Desc: WA-7 Mid-Depth

nh3-n, tkn, alk, tds, tss, po4-p, toc,

no2-n, no3-n, d-po4-p, o-po4, bod

Matrix: o Date: 6/7/16
Time: 0800

A - 1 X Pt nh3 p w/ H2SO4(pH<2);
B - 1 X 8oz Alk p w/ Cool to 6 C;
C - 1 X 2xambervoa g w/ H3PO4/zero headspace;
D - 1 X L bod p w/ Cool to 6 C;
E - 1 X Pt no3no2 p w/ Cool to 6 C;

Relinquished by: _____ Received by: _____ Received for laboratory by: _____

Date: 6/7/16 Time: 3:00 Date: 6/7/16 Time: 1630

Sample entered by: _____

Chain of Custody

Account: 3157 Work Order: 006224 Project Leader: rxw No: 275161
Work Order Description: Walter Resevior

Customer: David Wertz

Address: Tetra Tech (Beltzville Dam)
1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Remarks: _____

Phone: 703-387-5516 Ext:

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

Samplers: WACiK

Laboratory Receipt Temp: 3 Deg C. If Temp Unacceptable, On Ice? (Y) N
Approved By: RES

==========

18022 Sample No: 13 Desc: WA-7 Deep

Matrix: o Date: 6/7/16
Time: 0800

nh3-n, tkn, alk, tds, tss, po4-p, toc,
on AH
no2-n, no3-n, d-po4-p, o-po4, bod,
BW

A - 1 X Pt nh3 p w/ H2SO4(pH<2);
B - 1 X 8oz Alk p w/ Cool to 6 C;
C - 1 X 2xambervoa g w/ H3PO4/zero headspace;
D - 1 X L bod p w/ Cool to 6 C;
E - 1 X Pt no3no2 p w/ Cool to 6 C;

Relinquished by: _____ Received by: _____ Received for laboratory by: _____

Date: 6/7/16 Time: 3104 Date: 6/7/16 Time: 1630

Sample entered by: _____

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

Attention: David Wertz
Reported To: Tetra Tech (Beltzville Dam)
1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Date of Report: 08/03/16
Lab ID: 3157-16-0018932

Date Collected: 07/19/16 09:25
Collected By: Client

Sample Desc: WA-1 Surface

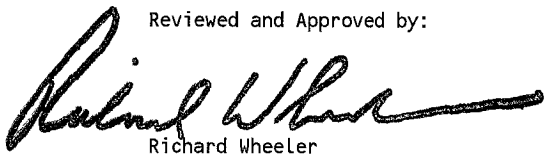
Date Received: 07/19/16 17:15

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Fecal Coliform	2	/100ml	2	1	SM 9222D	07/19	17:40	TNS
Total Coliform	1300	mpn/100ml	1	1	SM 9223B	07/20	12:00	PLW
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	0.01	mg/l	.01	1	SM 4500P-E	07/21	06:50	AEH
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	07/21	17:25	AEH
Phosphorus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	07/21	17:55	AEH
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	07/20	12:23	JCL
Nitrogen, Nitrate	0.11	mg/l	.05	1	EPA 353.2	07/20	16:10	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	07/20	14:13	JCL
Nitrogen, Total Kjeldahl	0.31	mg/l	.25	1	EPA 351.2	07/27	17:50	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	07/20	12:05	EMW
Total Organic Carbon	3.9	mg/l	1	1	SM5310 C	07/20	14:40	ALD
RESIDUES								
Solids, Total Dissolved	39	mg/l	5	1	SM 2540C	07/21	13:35	TMH
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	07/21	13:35	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	7	mg/l	1	1	SM 2320 B	07/25	10:10	AEH

Distribution of Reports:
Gregory Wacik - USACE (Beltzville Dam)

Reviewed and Approved by:



Richard Wheeler

THE NELAC INSTITUTE

ENVIRONMENTAL TESTING LABORATORY 107 ANGELICA STREET, READING, PA 19611
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CERTIFICATE OF ANALYSIS
M.J. Reider Associates, Inc.

Attention: David Wertz
Reported To: Tetra Tech (Beltzville Dam)
1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Date of Report: 08/03/16
Lab ID: 3157-16-0018932

Date Collected: 07/19/16 09:25
Collected By: Client

Sample Desc: WA-1 Surface

Date Received: 07/19/16 17:15

PWSID: 3130843

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

COMMENTS

01 The total coliform sample was placed in the incubator on 07/19/2016 at 17:50.

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

Distribution of Reports:
Gregory Wacik - USACE (Beltzville Dam)

Reviewed and Approved by:

Richard Wheeler

ENVIRONMENTAL TESTING LABORATORY 107 ANGELICA STREET, READING, PA 19611
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M.J. Reider Associates, Inc.

Attention: David Wertz
Reported To: Tetra Tech (Beltzville Dam)
1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Date of Report: 08/03/16
Lab ID: 3157-16-0018933

Date Collected: 07/19/16 07:30
Collected By: Client

Sample Desc: WA-2 Surface

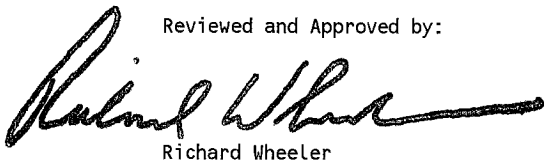
Date Received: 07/19/16 17:15

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Fecal Coliform	<2	/100ml	2	1	SM 9222D	07/19	17:40	TNS
Total Coliform	>2400	mpn/100ml	1	1	SM 9223B	07/20	12:00	PLW
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	0.01	mg/l	.01	1	SM 4500P-E	07/21	06:50	AEH
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	07/21	17:25	AEH
Phosphorus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	07/21	17:55	AEH
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	07/20	12:38	JCL
Nitrogen, Nitrate	0.06	mg/l	.05	1	EPA 353.2	07/20	16:10	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	07/20	14:16	JCL
Nitrogen, Total Kjeldahl	0.28	mg/l	.25	1	EPA 351.2	07/27	17:53	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	07/20	12:05	EMW
Total Organic Carbon	4.0	mg/l	1	1	SM5310 C	07/20	14:52	ALD
RESIDUES								
Solids, Total Dissolved	35	mg/l	5	1	SM 2540C	07/21	13:35	TMH
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	07/21	13:35	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	7	mg/l	1	1	SM 2320 B	07/25	10:10	AEH

Distribution of Reports:
Gregory Wacik - USACE (Beltzville Dam)

Reviewed and Approved by:



Richard Wheeler

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QUALITY ETHICS SERVICES ACIL Seal of Excellence

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

Attention: David Wertz
Reported To: Tetra Tech (Beltzville Dam)
1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Date of Report: 08/03/16
Lab ID: 3157-16-0018933

Date Collected: 07/19/16 07:30
Collected By: Client

Sample Desc: WA-2 Surface

Date Received: 07/19/16 17:15

PWSID: 3130843

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

COMMENTS

01 The total coliform sample was placed in the incubator on 07/19/2016 at 17:50.

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

Distribution of Reports:
Gregory Wacik - USACE (Beltzville Dam)

Reviewed and Approved by:

Richard Wheeler

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M.J. Reider Associates, Inc.

Attention: David Wertz
Reported To: Tetra Tech (Beltzville Dam)
1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Date of Report: 08/03/16
Lab ID: 3157-16-0018934

Date Collected: 07/19/16 07:30
Collected By: Client

Sample Desc: WA-2 Mid-Depth

Date Received: 07/19/16 17:15

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	07/21	06:50	AEH
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	07/21	17:25	AEH
Phosphorus as P, Total	0.03	mg/l	.01	1	SM 4500P-E	07/21	17:55	AEH
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	07/20	12:52	JCL
Nitrogen, Nitrate	0.10	mg/l	.05	1	EPA 353.2	07/20	16:13	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	07/20	14:17	JCL
Nitrogen, Total Kjeldahl	0.30	mg/l	.25	1	EPA 351.2	07/27	17:54	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	07/20	12:05	EMW
Total Organic Carbon	3.7	mg/l	1	1	SM5310 C	07/20	15:04	ALD
RESIDUES								
Solids, Total Dissolved	40	mg/l	5	1	SM 2540C	07/21	13:35	TMH
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	07/21	13:35	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	7	mg/l	1	1	SM 2320 B	07/25	10:10	AEH

COMMENTS

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

Distribution of Reports:
Gregory Wacik - USACE (Beltzville Dam)

Reviewed and Approved by:

Richard Wheeler

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M.J. Reider Associates, Inc.

Attention: David Wertz
Reported To: Tetra Tech (Beltzville Dam)
1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Date of Report: 08/03/16
Lab ID: 3157-16-0018935

Date Collected: 07/19/16 07:30
Collected By: Client

Sample Desc: WA-2 Deep

Date Received: 07/19/16 17:15

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	0.02	mg/l	.01	1	SM 4500P-E	07/21	06:50	AEH
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	07/21	17:25	AEH
Phosphorus as P, Total	0.01	mg/l	.01	1	SM 4500P-E	07/21	17:55	AEH
NITROGENS								
Nitrogen, Ammonia	0.26	mg/l	.05	1	D6919-03	07/20	13:07	JCL
Nitrogen, Nitrate	0.06	mg/l	.05	1	EPA 353.2	07/20	16:14	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	07/20	14:18	JCL
Nitrogen, Total Kjeldahl	0.77	mg/l	.25	1	EPA 351.2	07/27	17:55	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	07/20	12:05	EMW
Total Organic Carbon	4.7	mg/l	1	1	SM5310 C	07/20	15:30	ALD
RESIDUES								
Solids, Total Dissolved	52	mg/l	5	1	SM 2540C	07/21	13:35	TMH
Solids, Total Suspended	16	mg/l	3	1	SM 2540D	07/21	13:35	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	158	mg/l	1	1	SM 2320 B	07/25	10:10	AEH

COMMENTS

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

Distribution of Reports:
Gregory Wacik - USACE (Beltzville Dam)

Reviewed and Approved by:

Richard Wheeler

ENVIRONMENTAL TESTING LABORATORY 107 ANGELICA STREET, READING, PA 19611
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CERTIFICATE OF ANALYSIS
M.J. Reider Associates, Inc.

Attention: David Wertz
Reported To: Tetra Tech (Beltzville Dam)
1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Date of Report: 08/03/16
Lab ID: 3157-16-0018936

Date Collected: 07/19/16 09:45
Collected By: Client

Sample Desc: WA-3 Surface

Date Received: 07/19/16 17:15

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Fecal Coliform	15	/100ml	2	1	SM 9222D	07/19	17:40	TNS
Total Coliform	>2400	mpn/100ml	1	1	SM 9223B	07/20	12:00	PLW
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	07/21	06:50	AEH
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	07/21	17:25	AEH
Phosphorus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	07/21	18:00	AEH
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	07/20	13:22	JCL
Nitrogen, Nitrate	0.21	mg/l	.05	1	EPA 353.2	07/20	16:15	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	07/20	14:19	JCL
Nitrogen, Total Kjeldahl	0.32	mg/l	.25	1	EPA 351.2	07/27	17:56	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	07/20	12:05	EMW
Total Organic Carbon	4.3	mg/l	1	1	SM5310 C	07/20	15:42	ALD
RESIDUES								
Solids, Total Dissolved	68	mg/l	5	1	SM 2540C	07/21	13:35	TMH
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	07/21	13:35	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	55	mg/l	1	1	SM 2320 B	07/25	10:10	AEH

Distribution of Reports:
Gregory Wacik - USACE (Beltzville Dam)

Reviewed and Approved by:

Richard Wheeler

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M.J. Reider Associates, Inc.

Attention: David Wertz
Reported To: Tetra Tech (Beltzville Dam)
1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Date of Report: 08/03/16
Lab ID: 3157-16-0018936

Date Collected: 07/19/16 09:45
Collected By: Client

Sample Desc: WA-3 Surface

Date Received: 07/19/16 17:15

PWSID: 3130843

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

COMMENTS

01 The total coliform sample was placed in the incubator on 07/19/2016 at 17:50.

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

Distribution of Reports:
Gregory Wacik - USACE (Beltzville Dam)

Reviewed and Approved by:

Richard Wheeler

ENVIRONMENTAL TESTING LABORATORY 107 ANGELICA STREET, READING, PA 19611
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CERTIFICATE OF ANALYSIS
M.J. Reider Associates, Inc.

Attention: David Wertz
Reported To: Tetra Tech (Beltzville Dam)
1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Date of Report: 08/03/16
Lab ID: 3157-16-0018937

Date Collected: 07/19/16 10:00
Collected By: Client

Sample Desc: WA-4 Surface

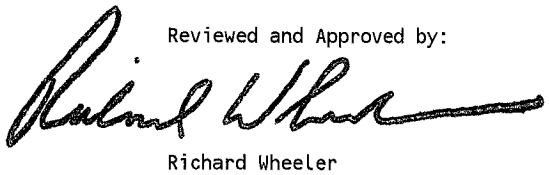
Date Received: 07/19/16 17:15

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Fecal Coliform	200	/100ml	2	1	SM 9222D	07/19	17:40	TNS
Total Coliform	>2400	mpn/100ml	1	1	SM 9223B	07/20	12:00	PLW
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	07/21	06:50	AEH
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	07/21	17:25	AEH
Phosphorus as P, Total	0.01	mg/l	.01	1	SM 4500P-E	07/21	18:00	AEH
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	07/20	13:36	JCL
Nitrogen, Nitrate	0.14	mg/l	.05	1	EPA 353.2	07/20	16:16	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	07/20	14:19	JCL
Nitrogen, Total Kjeldahl	1.21	mg/l	.25	1	EPA 351.2	07/27	17:56	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	07/20	12:05	EMW
Total Organic Carbon	3.5	mg/l	1	1	SM5310 C	07/20	16:43	ALD
RESIDUES								
Solids, Total Dissolved	55	mg/l	5	1	SM 2540C	07/21	13:35	TMH
Solids, Total Suspended	10	mg/l	3	1	SM 2540D	07/21	13:35	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	59	mg/l	1	1	SM 2320 B	07/25	10:10	AEH

Distribution of Reports:
Gregory Wacik - USACE (Beltzville Dam)

Reviewed and Approved by:



Richard Wheeler

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Attention: David Wertz
Reported To: Tetra Tech (Beltzville Dam)
1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Date of Report: 08/03/16
Lab ID: 3157-16-0018937

Date Collected: 07/19/16 10:00
Collected By: Client

Sample Desc: WA-4 Surface

Date Received: 07/19/16 17:15

PWSID: 3130843

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

COMMENTS

01 The total coliform sample was placed in the incubator on 07/19/2016 at 17:50.

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

Distribution of Reports:
Gregory Wacik - USACE (Beltzville Dam)

Reviewed and Approved by:

Richard Wheeler

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Attention: David Wertz
Reported To: Tetra Tech (Beltzville Dam)
1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Date of Report: 08/03/16
Lab ID: 3157-16-0018938

Date Collected: 07/19/16 10:30
Collected By: Client

Sample Desc: WA-5 Surface

Date Received: 07/19/16 17:15

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Fecal Coliform	28	/100ml	2	1	SM 9222D	07/19	17:40	TNS
Total Coliform	>2400	mpn/100ml	1	1	SM 9223B	07/20	12:00	PLW
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	0.01	mg/l	.01	1	SM 4500P-E	07/21	06:50	AEH
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	07/21	17:30	AEH
Phosphorus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	07/21	18:00	AEH
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	07/20	13:51	JCL
Nitrogen, Nitrate	<.05	mg/l	.05	1	EPA 353.2	07/20	16:17	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	07/20	14:20	JCL
Nitrogen, Total Kjeldahl	<.25	mg/l	.25	1	EPA 351.2	07/27	17:57	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	07/20	12:05	EMW
Total Organic Carbon	3.9	mg/l	1	1	SM5310 C	07/20	16:55	ALD
RESIDUES								
Solids, Total Dissolved	35	mg/l	5	1	SM 2540C	07/21	13:35	TMH
Solids, Total Suspended	31	mg/l	3	1	SM 2540D	07/21	13:35	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	61	mg/l	1	1	SM 2320 B	07/25	10:10	AEH

Distribution of Reports:
Gregory Wacik - USACE (Beltzville Dam)

Reviewed and Approved by:

Richard Wheeler

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1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Date of Report: 08/03/16
Lab ID: 3157-16-0018938

Date Collected: 07/19/16 10:30
Collected By: Client

Sample Desc: WA-5 Surface

Date Received: 07/19/16 17:15

PWSID: 3130843

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

COMMENTS

01 The total coliform sample was placed in the incubator on 07/19/2016 at 17:50.

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

Distribution of Reports:
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Reported To: Tetra Tech (Beltzville Dam)
1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Date of Report: 08/03/16
Lab ID: 3157-16-0018939

Date Collected: 07/19/16 08:05
Collected By: Client

Sample Desc: WA-6 Surface

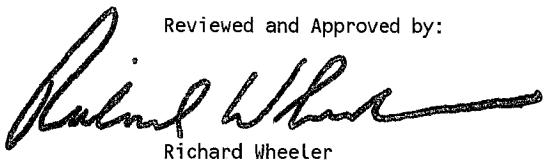
Date Received: 07/19/16 17:15

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Fecal Coliform	<2	/100ml	2	1	SM 9222D	07/19	17:40	TNS
Total Coliform	>2400	mpn/100ml	1	1	SM 9223B	07/20	12:00	PLW
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	07/21	06:50	AEH
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	07/21	17:30	AEH
Phosphorus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	07/21	18:00	AEH
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	07/20	14:05	JCL
Nitrogen, Nitrate	0.06	mg/l	.05	1	EPA 353.2	07/20	16:18	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	07/20	14:21	JCL
Nitrogen, Total Kjeldahl	<.25	mg/l	.25	1	EPA 351.2	07/27	17:58	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	07/20	12:05	EMW
Total Organic Carbon	4.0	mg/l	1	1	SM5310 C	07/20	17:07	ALD
RESIDUES								
Solids, Total Dissolved	44	mg/l	5	1	SM 2540C	07/21	13:35	TMH
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	07/21	13:35	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	45	mg/l	1	1	SM 2320 B	07/25	10:10	AEH

Distribution of Reports:
Gregory Wacik - USACE (Beltzville Dam)

Reviewed and Approved by:



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Attention: David Wertz
Reported To: Tetra Tech (Beltzville Dam)
1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Date of Report: 08/03/16
Lab ID: 3157-16-0018939

Date Collected: 07/19/16 08:05
Collected By: Client

Sample Desc: WA-6 Surface

Date Received: 07/19/16 17:15

PWSID: 3130843

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

COMMENTS

01 The total coliform sample was placed in the incubator on 07/19/2016 at 17:50.

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

Distribution of Reports:
Gregory Wacik - USACE (Beltzville Dam)

Reviewed and Approved by:

Richard Wheeler

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Reported To: Tetra Tech (Beltzville Dam)
1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Date of Report: 08/03/16
Lab ID: 3157-16-0018940

Date Collected: 07/19/16 08:05
Collected By: Client

Sample Desc: WA-6 Mid-Depth

Date Received: 07/19/16 17:15

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	07/21	06:50	AEH
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	07/21	17:30	AEH
Phosphorus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	07/21	18:00	AEH
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	07/20	14:49	JCL
Nitrogen, Nitrate	0.08	mg/l	.05	1	EPA 353.2	07/20	16:21	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	07/20	14:24	JCL
Nitrogen, Total Kjeldahl	<.25	mg/l	.25	1	EPA 351.2	07/28	15:12	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	07/20	12:05	EMW
Total Organic Carbon	3.7	mg/l	1	1	SM5310 C	07/20	17:20	ALD
RESIDUES								
Solids, Total Dissolved	47	mg/l	5	1	SM 2540C	07/21	13:35	TMH
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	07/21	13:35	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	31	mg/l	1	1	SM 2320 B	07/25	10:10	AEH

COMMENTS

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

Distribution of Reports:
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Reported To: Tetra Tech (Beltzville Dam)
1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Date of Report: 08/03/16
Lab ID: 3157-16-0018941

Date Collected: 07/19/16 08:15
Collected By: Client

Sample Desc: WA-6 Deep

Date Received: 07/19/16 17:15

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	07/21	06:50	AEH
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	07/21	17:30	AEH
Phosphorus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	07/21	18:00	AEH
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	07/20	15:04	JCL
Nitrogen, Nitrate	0.11	mg/l	.05	1	EPA 353.2	07/20	16:22	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	07/20	14:25	JCL
Nitrogen, Total Kjeldahl	0.38	mg/l	.25	1	EPA 351.2	07/28	15:15	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	07/20	12:05	EMW
Total Organic Carbon	3.9	mg/l	1	1	SM5310 C	07/20	17:44	ALD
RESIDUES								
Solids, Total Dissolved	54	mg/l	5	1	SM 2540C	07/21	13:35	TMH
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	07/21	13:35	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	54	mg/l	1	1	SM 2320 B	07/25	10:10	AEH

COMMENTS

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

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1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Date of Report: 08/03/16
Lab ID: 3157-16-0018942

Date Collected: 07/19/16 08:35
Collected By: Client

Sample Desc: WA-7 Surface

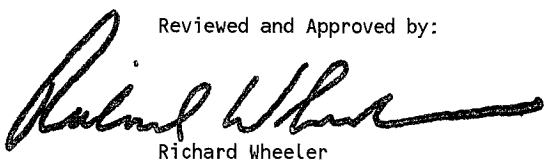
Date Received: 07/19/16 17:15

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Fecal Coliform	<2	/100ml	2	1	SM 9222D	07/19	17:40	TNS
Total Coliform	>2400	mpn/100ml	1	1	SM 9223B	07/20	12:00	PLW
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	07/21	06:50	AEH
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	07/21	17:30	AEH
Phosphorus as P, Total	0.02	mg/l	.01	1	SM 4500P-E	07/21	18:00	AEH
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	07/20	15:18	JCL
Nitrogen, Nitrate	0.14	mg/l	.05	1	EPA 353.2	07/20	16:23	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	07/20	14:26	JCL
Nitrogen, Total Kjeldahl	0.27	mg/l	.25	1	EPA 351.2	07/28	15:16	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	07/20	12:05	EMW
Total Organic Carbon	4.1	mg/l	1	1	SM5310 C	07/20	18:21	ALD
RESIDUES								
Solids, Total Dissolved	56	mg/l	5	1	SM 2540C	07/21	13:50	TMH
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	07/21	13:50	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	144	mg/l	1	1	SM 2320 B	07/25	11:10	AEH

Distribution of Reports:
Gregory Wacik - USACE (Beltzville Dam)

Reviewed and Approved by:



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1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Date of Report: 08/03/16
Lab ID: 3157-16-0018942

Date Collected: 07/19/16 08:35
Collected By: Client

Sample Desc: WA-7 Surface

Date Received: 07/19/16 17:15

PWSID: 3130843

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

COMMENTS

01 The total coliform sample was placed in the incubator on 07/19/2016 at 17:50.

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

Distribution of Reports:
Gregory Wacik - USACE (Beltzville Dam)

Reviewed and Approved by:

Richard Wheeler

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1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Date of Report: 08/03/16
Lab ID: 3157-16-0018943

Date Collected: 07/19/16 08:35
Collected By: Client

Sample Desc: WA-7 Mid-Depth

Date Received: 07/19/16 17:15

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	0.01	mg/l	.01	1	SM 4500P-E	07/21	06:50	AEH
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	07/21	17:35	AEH
Phosphorus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	07/21	18:05	AEH
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	07/20	15:33	JCL
Nitrogen, Nitrate	0.09	mg/l	.05	1	EPA 353.2	07/20	16:24	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	07/20	14:29	JCL
Nitrogen, Total Kjeldahl	0.26	mg/l	.25	1	EPA 351.2	07/28	15:17	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	07/20	12:05	EMW
Total Organic Carbon	3.8	mg/l	1	1	SM5310 C	07/20	18:33	ALD
RESIDUES								
Solids, Total Dissolved	56	mg/l	5	1	SM 2540C	07/21	13:50	TMH
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	07/21	13:50	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	45	mg/l	1	1	SM 2320 B	07/25	11:10	AEH

COMMENTS

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

Distribution of Reports:
Gregory Wacik - USACE (Beltzville Dam)

Reviewed and Approved by:

Richard Wheeler

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Attention: David Wertz
Reported To: Tetra Tech (Beltzville Dam)
1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Date of Report: 08/03/16
Lab ID: 3157-16-0018944

Date Collected: 07/19/16 08:35
Collected By: Client

Sample Desc: WA-7 Deep

Date Received: 07/19/16 17:15

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	0.01	mg/l	.01	1	SM 4500P-E	07/21	07:00	AEH
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	07/21	17:35	AEH
Phosphorus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	07/21	18:05	AEH
NITROGENS								
Nitrogen, Ammonia	0.12	mg/l	.05	1	D6919-03	07/20	15:48	JCL
Nitrogen, Nitrate	0.10	mg/l	.05	1	EPA 353.2	07/20	16:27	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	07/20	14:30	JCL
Nitrogen, Total Kjeldahl	0.51	mg/l	.25	1	EPA 351.2	07/28	15:18	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	07/20	12:05	EMW
Total Organic Carbon	4.1	mg/l	1	1	SM5310 C	07/20	18:46	ALD
RESIDUES								
Solids, Total Dissolved	64	mg/l	5	1	SM 2540C	07/21	13:50	TMH
Solids, Total Suspended	10	mg/l	3	1	SM 2540D	07/21	13:50	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	50	mg/l	1	1	SM 2320 B	07/25	11:10	AEH

COMMENTS

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

Distribution of Reports:
Gregory Wacik - USACE (Beltzville Dam)

Reviewed and Approved by:

Richard Wheeler

ENVIRONMENTAL TESTING LABORATORY 107 ANGELICA STREET, READING, PA 19611
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M. J. REIDER ASSOCIATES, INC.

Chain of Custody

Account: 3157 Work Order: 006224 Project Leader: rxw No: 275411
Work Order Description: Walter Resevior

Customer: David Wertz

Address: Tetra Tech (Beltzville Dam)
1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Phone: 703-387-5516 Ext:

Samplers: WACK

Remarks: (N) REPRESENTS NITRIC ACID IN THE "A" BOTTLES

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

Laboratory Receipt Temp: 10 Deg C. If Temp Unacceptable, On Ice? (Y) N
Approved By: RES

==========

18932 Sample No: 1 Desc: WA-1 Surface

nh3-n, tkn, alk, tds, tss, po4-p, toc,
m AH
no2-n, no3-n, d-po4-p, o-po4, bod,
BW
fc, RES tc,

Matrix: o Date: 7/19/16 Time: 0925

A - 1 X Pt nh3 p w/ H2SO4(pH<2);
B - 1 X 8oz Alk p w/ Cool to 6 C;
C - 1 X 2xambervoa g w/ H3PO4/zero headspace;
D - 1 X L bod p w/ Cool to 6 C;
E - 1 X Pt no3no2 p w/ Cool to 6 C;
F - 1 X 250mlMicro p w/ Sterile/Na2S2O3;

18933 Sample No: 2 Desc: WA-2 Surface

nh3-n, tkn, alk, tds, tss, po4-p, toc, (N)
m AH
no2-n, no3-n, d-po4-p, o-po4, bod,
BW
fc, RES tc,

Matrix: o Date: 7/19/16 Time: 0730

A - 1 X Pt nh3 p w/ H2SO4(pH<2);
B - 1 X 8oz Alk p w/ Cool to 6 C;
C - 1 X 2xambervoa g w/ H3PO4/zero headspace;
D - 1 X L bod p w/ Cool to 6 C;
E - 1 X Pt no3no2 p w/ Cool to 6 C;
F - 1 X 250mlMicro p w/ Sterile/Na2S2O3;

18934 Sample No: 3 Desc: WA-2 Mid-Depth

nh3-n, tkn, alk, tds, tss, po4-p, toc, (N)
m AK
no2-n, no3-n, d-po4-p, o-po4, bod,
BW

Matrix: o Date: 7/19/16 Time: 0730

A - 1 X Pt nh3 p w/ H2SO4(pH<2);
B - 1 X 8oz Alk p w/ Cool to 6 C;
C - 1 X 2xambervoa g w/ H3PO4/zero headspace;
D - 1 X L bod p w/ Cool to 6 C;
E - 1 X Pt no3no2 p w/ Cool to 6 C;

Relinquished by: _____ Received by: _____ Received for laboratory by: _____

Date: 7/19/16 Time: 1515 Date: 7/19/16 Time: 1715

Sample entered by: _____

Chain of Custody

Account: 3157 Work Order: 006224 Project Leader: rxw No: 275411
Work Order Description: Walter Resevior

Customer: David Wertz

Address: Tetra Tech (Beltzville Dam)
1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Phone: 703-387-5516 Ext:

Samplers: WACiK

Remarks: _____

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

Laboratory Receipt Temp: 10 Deg C. If Temp Unacceptable, On Ice? (Y) N
Approved By: RES

==========

18935 Sample No: 4 Desc: WA-2 Deep

nh3-n, tkn, alk, tds, tss, po4-p, toc,
no2-n, no3-n, d-po4-p, o-po4, bod,

Matrix: o Date: 7/19/16
Time: 0730

A - 1 X Pt nh3 p w/ H2SO4(pH<2);
B - 1 X 8oz Alk p w/ Cool to 6 C;
C - 1 X 2xambervoa g w/ H3PO4/zero headspace;
D - 1 X L bod p w/ Cool to 6 C;
E - 1 X Pt no3no2 p w/ Cool to 6 C;

18936 Sample No: 5 Desc: WA-3 Surface

nh3-n, tkn, alk, tds, tss, po4-p, toc,
no2-n, no3-n, d-po4-p, o-po4, bod,
fc, tc,

Matrix: o Date: 7/19/16
Time: 0945

A - 1 X Pt nh3 p w/ H2SO4(pH<2);
B - 1 X 8oz Alk p w/ Cool to 6 C;
C - 1 X 2xambervoa g w/ H3PO4/zero headspace;
D - 1 X L bod p w/ Cool to 6 C;
E - 1 X Pt no3no2 p w/ Cool to 6 C;
F - 1 X 250mlMicro p w/ Sterile/Na2S2O3;

18937 Sample No: 6 Desc: WA-4 Surface

nh3-n, tkn, alk, tds, tss, po4-p, toc,
no2-n, no3-n, d-po4-p, o-po4, bod,
fc, tc,

Matrix: o Date: 7/19/16
Time: 1000

A - 1 X Pt nh3 p w/ H2SO4(pH<2);
B - 1 X 8oz Alk p w/ Cool to 6 C;
C - 1 X 2xambervoa g w/ H3PO4/zero headspace;
D - 1 X L bod p w/ Cool to 6 C;
E - 1 X Pt no3no2 p w/ Cool to 6 C;
F - 1 X 250mlMicro p w/ Sterile/Na2S2O3;

Relinquished by: _____ Received by: _____ Received for laboratory by: _____

Date: 7/19/16 Time: 1515 Date: 7/19/16 Time: 1715

Sample entered by: _____

Chain of Custody

Account: 3157 Work Order: 006224 Project Leader: rxw No: 275411
Work Order Description: Walter Resevior

Customer: David Wertz

Address: Tetra Tech (Beltzville Dam)
1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Phone: 703-387-5516 Ext:

Samplers: WACIK

Remarks: _____

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

Laboratory Receipt Temp: 10 Deg C. If Temp Unacceptable, On Ice? (Y) N
Approved By: RES

==========

18938 Sample No: 7 Desc: WA-5 Surface

nh3-n, tkn, alk, tds, tss, po4-p, toc,

no2-n, no3-n, d-po4-p, o-po4, bod,

fc, RES tc,

Matrix: o Date: 7/19/16
Time: 1030

A - 1 X Pt nh3 p w/ H2SO4(pH<2);
B - 1 X 8oz Alk p w/ Cool to 6 C;
C - 1 X 2xambervoa g w/ H3PO4/zero headspace;
D - 1 X L bod p w/ Cool to 6 C;
E - 1 X Pt no3no2 p w/ Cool to 6 C;
F - 1 X 250mlMicro p w/ Sterile/Na2S2O3;

18939 Sample No: 8 Desc: WA-6 Surface

nh3-n, tkn, alk, tds, tss, po4-p, toc, (N)

no2-n, no3-n, d-po4-p, o-po4, bod,

fc, RES tc,

Matrix: o Date: 7/19/16
Time: 0805

A - 1 X Pt nh3 p w/ H2SO4(pH<2);
B - 1 X 8oz Alk p w/ Cool to 6 C;
C - 1 X 2xambervoa g w/ H3PO4/zero headspace;
D - 1 X L bod p w/ Cool to 6 C;
E - 1 X Pt no3no2 p w/ Cool to 6 C;
F - 1 X 250mlMicro p w/ Sterile/Na2S2O3;

18940 Sample No: 9 Desc: WA-6 Mid-Depth

nh3-n, tkn, alk, tds, tss, po4-p, toc, (N)

no2-n, no3-n, d-po4-p, o-po4, bod,

Matrix: o Date: 7/19/16
Time: 0805

A - 1 X Pt nh3 p w/ H2SO4(pH<2);
B - 1 X 8oz Alk p w/ Cool to 6 C;
C - 1 X 2xambervoa g w/ H3PO4/zero headspace;
D - 1 X L bod p w/ Cool to 6 C;
E - 1 X Pt no3no2 p w/ Cool to 6 C;

Relinquished by: _____ Received by: _____ Received for laboratory by: _____

Date: 7/19/16 Time: 1575 Date: 7/19/16 Time: 1715

Sample entered by: _____

Chain of Custody

Account: 3157 Work Order: 006224 Project Leader: rxw No: 275411
Work Order Description: Walter Resevior

Customer: David Wertz

Address: Tetra Tech (Beltzville Dam)
1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Phone: 703-387-5516 Ext:

Samplers: WACiK

Remarks: _____

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

Laboratory Receipt Temp: 10 Deg C. If Temp Unacceptable, On Ice? (Y) N
Approved By: RES

==========

18941 Sample No: 10 Desc: WA-6 Deep

nh3-n, tkn, alk, tds, tss, po4-p, toc, (N)

no2-n, no3-n, d-po4-p, o-po4, bod,

Matrix: o Date: 7/19/16
Time: 0815

A - 1 X Pt nh3 p w/ H2SO4(pH<2);
B - 1 X 8oz Alk p w/ Cool to 6 C;
C - 1 X 2xambervoa g w/ H3PO4/zero headspace;
D - 1 X L bod p w/ Cool to 6 C;
E - 1 X Pt no3no2 p w/ Cool to 6 C;

18942 Sample No: 11 Desc: WA-7 Surface

nh3-n, tkn, alk, tds, tss, po4-p, toc, (N)

no2-n, no3-n, d-po4-p, o-po4, bod,

fc, tc, RES

Matrix: o Date: 7/19/16
Time: 0835

A - 1 X Pt nh3 p w/ H2SO4(pH<2);
B - 1 X 8oz Alk p w/ Cool to 6 C;
C - 1 X 2xambervoa g w/ H3PO4/zero headspace;
D - 1 X L bod p w/ Cool to 6 C;
E - 1 X Pt no3no2 p w/ Cool to 6 C;
F - 1 X 250mlMicro p w/ Sterile/Na2S2O3;

18943 Sample No: 12 Desc: WA-7 Mid-Depth

nh3-n, tkn, alk, tds, tss, po4-p, toc, (N)

no2-n, no3-n, d-po4-p, o-po4, bod,

Matrix: o Date: 7/19/16
Time: 0835

A - 1 X Pt nh3 p w/ H2SO4(pH<2);
B - 1 X 8oz Alk p w/ Cool to 6 C;
C - 1 X 2xambervoa g w/ H3PO4/zero headspace;
D - 1 X L bod p w/ Cool to 6 C;
E - 1 X Pt no3no2 p w/ Cool to 6 C;

Relinquished by: _____ Received by: _____ Received for laboratory by: _____

Date: 7/19/16 Time: 1515 Date: 7/19/16 Time: 1715

Sample entered by: _____

Chain of Custody

Account: 3157 Work Order: 006224 Project Leader: rxw No: 275411
Work Order Description: Walter Resevior

Customer: David Wertz

Address: Tetra Tech (Beltzville Dam)
1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Phone: 703-387-5516 Ext:

Samplers: WACIK

Remarks: _____

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

Laboratory Receipt Temp: 3 Deg C. If Temp Unacceptable, On Ice? (Y) N
Approved By: ERS

==========

18944

Sample No: 13 Desc: WA-7 Deep

nh3-n, tkn, alk, tds, tss, po4-p, toc, (N)
m RM
no2-n, no3-n, d-po4-p, o-po4, bod,
8W

Matrix: o Date: 7/19/16
Time: 0835

A - 1 X Pt nh3 p w/ H2SO4(pH<2);
B - 1 X 8oz Alk p w/ Cool to 6 C;
C - 1 X 2xambervoa g w/ H3PO4/zero headspace;
D - 1 X L bod p w/ Cool to 6 C;
E - 1 X Pt no3no2 p w/ Cool to 6 C;

Relinquished by: _____ Received by: _____ Received for laboratory by: _____

Date: 7/19/16 Time: 1515 Date: 7/19/16 Time: 1715

Sample entered by: _____

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

Attention: David Wertz
Reported To: Tetra Tech (Beltzville Dam)
1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Date of Report: 08/30/16
Lab ID: 3157-16-0023478

Date Collected: 08/17/16 09:10
Collected By: Client

Sample Desc: WA-1 Surface

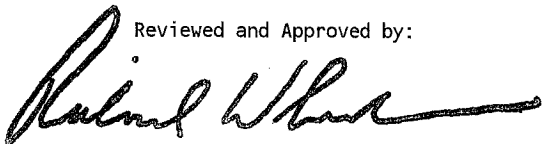
Date Received: 08/17/16 16:15

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Fecal Coliform	11	/100ml	2	1	SM 9222D	08/17	17:10	TNS
Total Coliform	1400	mpn/100ml	1	1	SM 9223B	08/18	11:40	ADD
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	0.02	mg/l	.01	1	SM 4500P-E	08/17	16:30	AEH
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	08/19	14:00	AEH
Phosphorus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	08/19	14:45	AEH
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	08/17	23:24	JCL
Nitrogen, Nitrate	0.09	mg/l	.05	1	EPA 353.2	08/18	16:22	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	08/18	14:47	JCL
Nitrogen, Total Kjeldahl	0.46	mg/l	.25	1	EPA 351.2	08/22	17:09	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	08/18	14:05	EMW
Total Organic Carbon	5.3	mg/l	1	1	SM5310 C	08/18	17:47	HRG
RESIDUES								
Solids, Total Dissolved	74	mg/l	5	1	SM 2540C	08/23	12:35	TMH
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	08/23	12:35	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	10	mg/l	1	1	SM 2320 B	08/26	12:15	AEH

Distribution of Reports:
Gregory Wacik - USACE (Beltzville Dam)

Reviewed and Approved by:



Richard Wheeler

THE NELAC INSTITUTE

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

Attention: David Wertz
Reported To: Tetra Tech (Beltzville Dam)
1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Date of Report: 08/30/16
Lab ID: 3157-16-0023478

Date Collected: 08/17/16 09:10
Collected By: Client

Sample Desc: WA-1 Surface

Date Received: 08/17/16 16:15

PWSID: 3130843

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

COMMENTS

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

02 The total coliform sample was placed in the incubator on 08/17/2016 at 17:30.

Distribution of Reports:
Gregory Wacik - USACE (Beltzville Dam)

Reviewed and Approved by:

Richard Wheeler

THE NELAC INSTITUTE

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

Attention: David Wertz
Reported To: Tetra Tech (Beltzville Dam)
1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Date of Report: 08/30/16
Lab ID: 3157-16-0023479

Date Collected: 08/17/16 07:35
Collected By: Client

Sample Desc: WA-2 Surface

Date Received: 08/17/16 16:15

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Fecal Coliform	2	/100ml	2	1	SM 9222D	08/17	17:10	TNS
Total Coliform	980	mpn/100ml	1	1	SM 9223B	08/18	11:40	ADD
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	0.02	mg/l	.01	1	SM 4500P-E	08/17	16:30	AEH
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	08/19	14:05	AEH
Phosphorus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	08/19	14:50	AEH
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	08/18	00:22	JCL
Nitrogen, Nitrate	0.06	mg/l	.05	1	EPA 353.2	08/18	16:23	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	08/18	14:50	JCL
Nitrogen, Total Kjeldahl	0.40	mg/l	.25	1	EPA 351.2	08/22	17:12	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	08/18	14:05	EMW
Total Organic Carbon	4.0	mg/l	1	1	SM5310 C	08/18	18:12	HRG
RESIDUES								
Solids, Total Dissolved	56	mg/l	5	1	SM 2540C	08/23	12:35	TMH
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	08/23	12:35	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	8	mg/l	1	1	SM 2320 B	08/26	12:15	AEH

Distribution of Reports:
Gregory Wacik - USACE (Beltzville Dam)

Reviewed and Approved by:

Richard Wheeler

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

Attention: David Wertz
Reported To: Tetra Tech (Beltzville Dam)
1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Date of Report: 08/30/16
Lab ID: 3157-16-0023479

Date Collected: 08/17/16 07:35
Collected By: Client

Sample Desc: WA-2 Surface

Date Received: 08/17/16 16:15

PWSID: 3130843

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

COMMENTS

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

02 The total coliform sample was placed in the incubator on 08/17/2016 at 17:30.

Distribution of Reports:
Gregory Wacik - USACE (Beltzville Dam)

Reviewed and Approved by:

Richard Wheeler

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

Attention: David Wertz
Reported To: Tetra Tech (Beltzville Dam)
1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Date of Report: 08/30/16
Lab ID: 3157-16-0023480

Date Collected: 08/17/16 07:35
Collected By: Client

Sample Desc: WA-2 Mid-Depth

Date Received: 08/17/16 16:15

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	0.02	mg/l	.01	1	SM 4500P-E	08/17	16:30	AEH
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	08/19	14:05	AEH
Phosphorus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	08/19	14:50	AEH
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	08/18	00:37	JCL
Nitrogen, Nitrate	0.08	mg/l	.05	1	EPA 353.2	08/18	16:26	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	08/18	14:51	JCL
Nitrogen, Total Kjeldahl	0.34	mg/l	.25	1	EPA 351.2	08/22	17:13	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	08/18	14:05	EMW
Total Organic Carbon	3.6	mg/l	1	1	SM5310 C	08/18	18:25	HRG
RESIDUES								
Solids, Total Dissolved	55	mg/l	5	1	SM 2540C	08/23	12:35	TMH
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	08/23	12:35	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	9	mg/l	1	1	SM 2320 B	08/26	13:35	AEH

COMMENTS

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

Distribution of Reports:
Gregory Wacik - USACE (Beltzville Dam)

Reviewed and Approved by:

Richard Wheeler

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

Attention: David Wertz
Reported To: Tetra Tech (Beltzville Dam)
1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Date of Report: 08/30/16
Lab ID: 3157-16-0023481

Date Collected: 08/17/16 07:35
Collected By: Client

Sample Desc: WA-2 Deep

Date Received: 08/17/16 16:15

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	08/17	16:30	AEH
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	08/19	14:05	AEH
Phosphorus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	08/19	14:50	AEH
NITROGENS								
Nitrogen, Ammonia	0.11	mg/l	.05	1	D6919-03	08/18	00:51	JCL
Nitrogen, Nitrate	0.08	mg/l	.05	1	EPA 353.2	08/18	16:27	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	08/18	14:52	JCL
Nitrogen, Total Kjeldahl	0.58	mg/l	.25	1	EPA 351.2	08/22	17:14	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	08/18	14:05	EMW
Total Organic Carbon	5.3	mg/l	1	1	SM5310 C	08/18	18:37	HRG
RESIDUES								
Solids, Total Dissolved	81	mg/l	5	1	SM 2540C	08/23	12:35	TMH
Solids, Total Suspended	20	mg/l	3	1	SM 2540D	08/23	12:35	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	11	mg/l	1	1	SM 2320 B	08/26	13:35	AEH

COMMENTS

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

Distribution of Reports:
Gregory Wacik - USACE (Beltzville Dam)

Reviewed and Approved by:

Richard Wheeler

ENVIRONMENTAL TESTING LABORATORY 107 ANGELICA STREET, READING, PA 19611
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CERTIFICATE OF ANALYSIS
M.J. Reider Associates, Inc.

Attention: David Wertz
Reported To: Tetra Tech (Beltzville Dam)
1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Date of Report: 08/30/16
Lab ID: 3157-16-0023482

Date Collected: 08/17/16 09:20
Collected By: Client

Sample Desc: WA-3 Surface

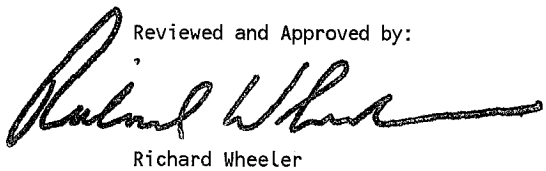
Date Received: 08/17/16 16:15

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Fecal Coliform	18	/100ml	2	1	SM 9222D	08/17	17:10	TNS
Total Coliform	>2400	mpn/100ml	1	1	SM 9223B	08/18	11:40	ADD
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	0.02	mg/l	.01	1	SM 4500P-E	08/17	16:30	AEH
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	08/19	14:05	AEH
Phosphorus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	08/19	14:50	AEH
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	08/18	01:06	JCL
Nitrogen, Nitrate	0.14	mg/l	.05	1	EPA 353.2	08/18	16:28	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	08/18	14:53	JCL
Nitrogen, Total Kjeldahl	0.39	mg/l	.25	1	EPA 351.2	08/22	17:15	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	08/18	14:05	EMW
Total Organic Carbon	7.4	mg/l	1	1	SM5310 C	08/18	18:51	HRG
RESIDUES								
Solids, Total Dissolved	106	mg/l	5	1	SM 2540C	08/23	12:35	TMH
Solids, Total Suspended	3	mg/l	3	1	SM 2540D	08/23	12:35	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	12	mg/l	1	1	SM 2320 B	08/26	13:35	AEH

Distribution of Reports:
Gregory Wacik - USACE (Beltzville Dam)

Reviewed and Approved by:



Richard Wheeler

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Reported To: Tetra Tech (Beltzville Dam)
1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Date of Report: 08/30/16
Lab ID: 3157-16-0023482

Date Collected: 08/17/16 09:20
Collected By: Client

Sample Desc: WA-3 Surface

Date Received: 08/17/16 16:15

PWSID: 3130843

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

COMMENTS

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

02 The total coliform sample was placed in the incubator on 08/17/2016 at 17:30.

Distribution of Reports:
Gregory Wacik - USACE (Beltzville Dam)

Reviewed and Approved by:

Richard Wheeler

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Reported To: Tetra Tech (Beltzville Dam)
1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Date of Report: 08/30/16
Lab ID: 3157-16-0023483

Date Collected: 08/17/16 09:35
Collected By: Client

Sample Desc: WA-4 Surface

Date Received: 08/17/16 16:15

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Fecal Coliform	280	/100ml	2	1	SM 9222D	08/17	17:10	TNS
Total Coliform	>2400	mpn/100ml	1	1	SM 9223B	08/18	11:40	ADD
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	0.02	mg/l	.01	1	SM 4500P-E	08/17	16:30	AEH
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	08/19	14:05	AEH
Phosphorus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	08/19	14:50	AEH
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	08/18	01:21	JCL
Nitrogen, Nitrate	0.06	mg/l	.05	1	EPA 353.2	08/18	16:29	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	08/18	14:54	JCL
Nitrogen, Total Kjeldahl	0.56	mg/l	.25	1	EPA 351.2	08/22	17:16	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	08/18	14:05	EMW
Total Organic Carbon	8.2	mg/l	1	1	SM5310 C	08/18	19:04	HRG
RESIDUES								
Solids, Total Dissolved	54	mg/l	5	1	SM 2540C	08/23	12:35	TMH
Solids, Total Suspended	10	mg/l	3	1	SM 2540D	08/23	12:35	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	11	mg/l	1	1	SM 2320 B	08/26	13:35	AEH

Distribution of Reports:
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Date of Report: 08/30/16
Lab ID: 3157-16-0023483

Date Collected: 08/17/16 09:35
Collected By: Client

Sample Desc: WA-4 Surface

Date Received: 08/17/16 16:15

PWSID: 3130843

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

COMMENTS

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

02 The total coliform sample was placed in the incubator on 08/17/2016 at 17:30.

Distribution of Reports:
Gregory Wacik - USACE (Beltzville Dam)

Reviewed and Approved by:

Richard Wheeler

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1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Date of Report: 08/30/16
Lab ID: 3157-16-0023484

Date Collected: 08/17/16 09:55
Collected By: Client

Sample Desc: WA-5 Surface

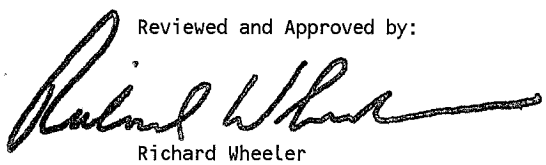
Date Received: 08/17/16 16:15

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Fecal Coliform	31	/100ml	2	1	SM 9222D	08/17	17:10	TNS
Total Coliform	>2400	mpn/100ml	1	1	SM 9223B	08/18	11:40	ADD
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	0.01	mg/l	.01	1	SM 4500P-E	08/17	16:30	AEH
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	08/19	14:05	AEH
Phosphorus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	08/19	14:50	AEH
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	08/18	01:35	JCL
Nitrogen, Nitrate	<.05	mg/l	.05	1	EPA 353.2	08/18	16:30	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	08/18	14:55	JCL
Nitrogen, Total Kjeldahl	0.80	mg/l	.25	1	EPA 351.2	08/22	17:17	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	08/18	14:05	EMW
Total Organic Carbon	5.8	mg/l	1	1	SM5310 C	08/18	19:17	HRG
RESIDUES								
Solids, Total Dissolved	58	mg/l	5	1	SM 2540C	08/23	12:35	TMH
Solids, Total Suspended	100	mg/l	3	1	SM 2540D	08/23	12:35	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	5	mg/l	1	1	SM 2320 B	08/26	13:35	AEH

Distribution of Reports:
Gregory Wacik - USACE (Beltzville Dam)

Reviewed and Approved by:



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M.J. Reider Associates, Inc.

Attention: David Wertz
Reported To: Tetra Tech (Beltzville Dam)
1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Date of Report: 08/30/16
Lab ID: 3157-16-0023484

Date Collected: 08/17/16 09:55
Collected By: Client

Sample Desc: WA-5 Surface

Date Received: 08/17/16 16:15

PWSID: 3130843

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

COMMENTS

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

02 The total coliform sample was placed in the incubator on 08/17/2016 at 17:30.

Distribution of Reports:
Gregory Wacik - USACE (Beltzville Dam)

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Reported To: Tetra Tech (Beltzville Dam)
1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Date of Report: 08/30/16
Lab ID: 3157-16-0023485

Date Collected: 08/17/16 08:10
Collected By: Client

Sample Desc: WA-6 Surface

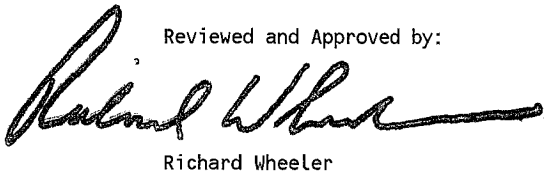
Date Received: 08/17/16 16:15

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Fecal Coliform	2	/100ml	2	1	SM 9222D	08/17	17:10	TNS
Total Coliform	870	mpn/100ml	1	1	SM 9223B	08/18	11:40	ADD
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	0.01	mg/l	.01	1	SM 4500P-E	08/17	16:30	AEH
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	08/19	14:05	AEH
Phosphorus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	08/19	14:50	AEH
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	08/18	01:50	JCL
Nitrogen, Nitrate	0.06	mg/l	.05	1	EPA 353.2	08/18	16:31	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	08/18	14:56	JCL
Nitrogen, Total Kjeldahl	0.33	mg/l	.25	1	EPA 351.2	08/22	17:18	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	08/18	14:05	EMW
Total Organic Carbon	4.9	mg/l	1	1	SM5310 C	08/18	19:30	HRG
RESIDUES								
Solids, Total Dissolved	76	mg/l	5	1	SM 2540C	08/23	12:35	TMH
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	08/23	12:35	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	8	mg/l	1	1	SM 2320 B	08/26	13:35	AEH

Distribution of Reports:
Gregory Wacik - USACE (Beltzville Dam)

Reviewed and Approved by:



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Attention: David Wertz
Reported To: Tetra Tech (Beltzville Dam)
1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Date of Report: 08/30/16
Lab ID: 3157-16-0023485

Date Collected: 08/17/16 08:10
Collected By: Client

Sample Desc: WA-6 Surface

Date Received: 08/17/16 16:15

PWSID: 3130843

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

COMMENTS

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

02 The total coliform sample was placed in the incubator on 08/17/2016 at 17:30.

Distribution of Reports:
Gregory Wacik - USACE (Beltzville Dam)

Reviewed and Approved by:

Richard Wheeler

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1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Date of Report: 08/30/16
Lab ID: 3157-16-0023486

Date Collected: 08/17/16 08:10
Collected By: Client

Sample Desc: WA-6 Mid-Depth

Date Received: 08/17/16 16:15

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	08/17	16:30	AEH
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	08/19	14:05	AEH
Phosphorus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	08/19	14:50	AEH
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	08/18	02:34	JCL
Nitrogen, Nitrate	0.07	mg/l	.05	1	EPA 353.2	08/18	16:34	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	08/18	14:59	JCL
Nitrogen, Total Kjeldahl	0.37	mg/l	.25	1	EPA 351.2	08/22	17:21	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	08/18	14:05	EMW
Total Organic Carbon	3.6	mg/l	1	1	SM5310 C	08/18	19:42	HRG
RESIDUES								
Solids, Total Dissolved	86	mg/l	5	1	SM 2540C	08/23	12:35	TMH
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	08/23	12:35	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	8	mg/l	1	1	SM 2320 B	08/26	13:35	AEH

COMMENTS

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

Distribution of Reports:
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Reviewed and Approved by:

Richard Wheeler

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1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Date of Report: 08/30/16
Lab ID: 3157-16-0023487

Date Collected: 08/17/16 08:10
Collected By: Client

Sample Desc: WA-6 Deep

Date Received: 08/17/16 16:15

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	08/17	16:30	AEH
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	08/19	14:10	AEH
Phosphorus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	08/19	14:55	AEH
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	08/18	02:48	JCL
Nitrogen, Nitrate	0.08	mg/l	.05	1	EPA 353.2	08/18	16:35	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	08/18	15:00	JCL
Nitrogen, Total Kjeldahl	0.44	mg/l	.25	1	EPA 351.2	08/22	17:22	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	08/18	14:05	EMW
Total Organic Carbon	5.5	mg/l	1	1	SM5310 C	08/18	20:20	HRG
RESIDUES								
Solids, Total Dissolved	64	mg/l	5	1	SM 2540C	08/23	12:35	TMH
Solids, Total Suspended	16	mg/l	3	1	SM 2540D	08/23	12:35	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	10	mg/l	1	1	SM 2320 B	08/26	13:35	AEH

COMMENTS

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

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Reviewed and Approved by:

Richard Wheeler

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Attention: David Wertz
Reported To: Tetra Tech (Beltzville Dam)
1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Date of Report: 08/30/16
Lab ID: 3157-16-0023488

Date Collected: 08/17/16 08:30
Collected By: Client

Sample Desc: WA-7 Surface

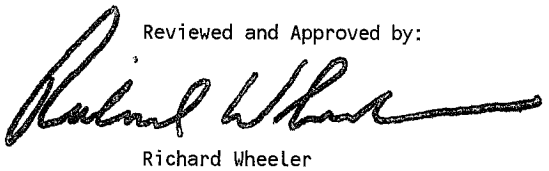
Date Received: 08/17/16 16:15

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Fecal Coliform	<2	/100ml	2	1	SM 9222D	08/17	17:10	TNS
Total Coliform	690	mpn/100ml	1	1	SM 9223B	08/18	11:40	ADD
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	0.02	mg/l	.01	1	SM 4500P-E	08/17	16:30	AEH
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	08/19	14:10	AEH
Phosphorus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	08/19	14:55	AEH
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	08/18	03:03	JCL
Nitrogen, Nitrate	0.06	mg/l	.05	1	EPA 353.2	08/18	16:36	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	08/18	15:01	JCL
Nitrogen, Total Kjeldahl	0.36	mg/l	.25	1	EPA 351.2	08/22	17:23	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	08/18	14:05	EMW
Total Organic Carbon	4.6	mg/l	1	1	SM5310 C	08/18	20:56	HRG
RESIDUES								
Solids, Total Dissolved	71	mg/l	5	1	SM 2540C	08/23	13:10	TMH
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	08/23	13:10	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	9	mg/l	1	1	SM 2320 B	08/26	13:35	AEH

Distribution of Reports:
Gregory Wacik - USACE (Beltzville Dam)

Reviewed and Approved by:



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

Attention: David Wertz
Reported To: Tetra Tech (Beltzville Dam)
1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Date of Report: 08/30/16
Lab ID: 3157-16-0023488

Date Collected: 08/17/16 08:30
Collected By: Client

Sample Desc: WA-7 Surface

Date Received: 08/17/16 16:15

PWSID: 3130843

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

COMMENTS

01 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2S04 to pH <2 after the sample was received at the laboratory.

02 The total coliform sample was placed in the incubator on 08/17/2016 at 17:30.

Distribution of Reports:
Gregory Wacik - USACE (Beltzville Dam)

Reviewed and Approved by:

Richard Wheeler

ENVIRONMENTAL TESTING LABORATORY 107 ANGELICA STREET, READING, PA 19611
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CERTIFICATE OF ANALYSIS
M.J. Reider Associates, Inc.

Attention: David Wertz
Reported To: Tetra Tech (Beltzville Dam)
1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Date of Report: 08/30/16
Lab ID: 3157-16-0023489

Date Collected: 08/17/16 08:30
Collected By: Client

Sample Desc: WA-7 Mid-Depth

Date Received: 08/17/16 16:15

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	0.01	mg/l	.01	1	SM 4500P-E	08/17	16:30	AEH
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	08/19	14:10	AEH
Phosphorus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	08/19	14:55	AEH
NITROGENS								
Nitrogen, Ammonia	0.05	mg/l	.05	1	D6919-03	08/18	03:17	JCL
Nitrogen, Nitrate	0.08	mg/l	.05	1	EPA 353.2	08/18	16:37	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	08/18	15:04	JCL
Nitrogen, Total Kjeldahl	0.36	mg/l	.25	1	EPA 351.2	08/22	17:26	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	08/18	14:05	EMW
Total Organic Carbon	4.8	mg/l	1	1	SM5310 C	08/18	21:21	HRG
RESIDUES								
Solids, Total Dissolved	51	mg/l	5	1	SM 2540C	08/23	13:10	TMH
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	08/23	13:10	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	9	mg/l	1	1	SM 2320 B	08/26	13:35	AEH

COMMENTS

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

Distribution of Reports:
Gregory Wacik - USACE (Beltzville Dam)

Reviewed and Approved by:

Richard Wheeler

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

Attention: David Wertz
Reported To: Tetra Tech (Beltzville Dam)
1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Date of Report: 08/30/16
Lab ID: 3157-16-0023490

Date Collected: 08/17/16 08:30
Collected By: Client

Sample Desc: WA-7 Deep

Date Received: 08/17/16 16:15

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	0.01	mg/l	.01	1	SM 4500P-E	08/17	16:50	AEH
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	08/19	14:10	AEH
Phosphorus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	08/19	14:55	AEH
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	08/18	03:32	JCL
Nitrogen, Nitrate	0.08	mg/l	.05	1	EPA 353.2	08/18	16:40	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	08/18	15:05	JCL
Nitrogen, Total Kjeldahl	0.47	mg/l	.25	1	EPA 351.2	08/22	17:57	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	08/18	14:05	EMW
Total Organic Carbon	6.6	mg/l	1	1	SM5310 C	08/18	21:33	HRG
RESIDUES								
Solids, Total Dissolved	75	mg/l	5	1	SM 2540C	08/23	13:10	TMH
Solids, Total Suspended	5	mg/l	3	1	SM 2540D	08/23	13:10	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	11	mg/l	1	1	SM 2320 B	08/26	13:35	AEH

COMMENTS

01 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2S04 to pH <2 after the sample was received at the laboratory.

Distribution of Reports:
Gregory Wacik - USACE (Beltzville Dam)

Reviewed and Approved by:

Richard Wheeler

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M. J. REIDER ASSOCIATES, INC.

Chain of Custody

Account: 3156 Work Order: 006224 Project Leader: rxw No: 276888
Work Order Description: Walter Resevior

Customer: David Wertz

Address: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Phone: 703-387-5516 Ext:

Samplers: WACIK

Remarks: _____

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

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

==========

23478 Sample No: 1 Desc: WA-1 Surface

nh3-n, tkn, alk, tds, tss, po4-p, toc,
M
no2-n, no3-n, d-po4-p, o-po4, bod,
AH BW
fc, tc,
TNTC

Matrix: o Date: 8/17/16
Time: 0910

A - 1 X Pt nh3 p w/ H2SO4(pH<2);
B - 1 X 8oz Alk p w/ Cool to 6 C;
C - 1 X 2xambervoa g w/ H3PO4/zero headspace;
D - 1 X L bod p w/ Cool to 6 C;
E - 1 X Pt no3no2 p w/ Cool to 6 C;
F - 1 X 250mlMicro p w/ Sterile/Na2S2O3;

23479 Sample No: 2 Desc: WA-2 Surface

nh3-n, tkn, alk, tds, tss, po4-p, toc,
M
no2-n, no3-n, d-po4-p, o-po4, bod,
AH BW
fc, tc,
TNTC

Matrix: o Date: 8/17/16
Time: 0735

A - 1 X Pt nh3 p w/ H2SO4(pH<2);
B - 1 X 8oz Alk p w/ Cool to 6 C;
C - 1 X 2xambervoa g w/ H3PO4/zero headspace;
D - 1 X L bod p w/ Cool to 6 C;
E - 1 X Pt no3no2 p w/ Cool to 6 C;
F - 1 X 250mlMicro p w/ Sterile/Na2S2O3;

23480 Sample No: 3 Desc: WA-2 Mid-Depth

nh3-n, tkn, alk, tds, tss, po4-p, toc,
M
no2-n, no3-n, d-po4-p, o-po4, bod,
AH BW

Matrix: o Date: 8/17/16
Time: 0735

A - 1 X Pt nh3 p w/ H2SO4(pH<2);
B - 1 X 8oz Alk p w/ Cool to 6 C;
C - 1 X 2xambervoa g w/ H3PO4/zero headspace;
D - 1 X L bod p w/ Cool to 6 C;
E - 1 X Pt no3no2 p w/ Cool to 6 C;

Relinquished by: _____ Received by: _____ Received for laboratory by: _____

Date: 8/17/16 Time: 245 Date: 8-17-16 Time: 1615

Sample entered by: _____

Chain of Custody

Account: 3156 Work Order: 006224 Project Leader: rxw No: 276888
Work Order Description: Walter Resevior

Customer: David Wertz

Address: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Phone: 703-387-5516 Ext:

Samplers: WACiK

Remarks: _____

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

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

==========

23481 Sample No: 4 Desc: WA-2 Deep

nh3-n, tkn, alk, tds, tss, po4-p, toc,

no2-n, no3-n, d-po4-p, o-po4, bod,

Matrix: o Date: 8/17/16
Time: 0735

A - 1 X Pt nh3 p w/ H2SO4(pH<2);
B - 1 X 8oz Alk p w/ Cool to 6 C;
C - 1 X 2xambervoa g w/ H3PO4/zero headspace;
D - 1 X L bod p w/ Cool to 6 C;
E - 1 X Pt no3no2 p w/ Cool to 6 C;

23482 Sample No: 5 Desc: WA-3 Surface

nh3-n, tkn, alk, tds, tss, po4-p, toc,

no2-n, no3-n, d-po4-p, o-po4, bod,

fc, tc,

Matrix: o Date: 8/17/16
Time: 0920

A - 1 X Pt nh3 p w/ H2SO4(pH<2);
B - 1 X 8oz Alk p w/ Cool to 6 C;
C - 1 X 2xambervoa g w/ H3PO4/zero headspace;
D - 1 X L bod p w/ Cool to 6 C;
E - 1 X Pt no3no2 p w/ Cool to 6 C;
F - 1 X 250mlMicro p w/ Sterile/Na2S2O3;

23483 Sample No: 6 Desc: WA-4 Surface

nh3-n, tkn, alk, tds, tss, po4-p, toc,

no2-n, no3-n, d-po4-p, o-po4, bod,

fc, tc,

Matrix: o Date: 8/17/16
Time: 0935

A - 1 X Pt nh3 p w/ H2SO4(pH<2);
B - 1 X 8oz Alk p w/ Cool to 6 C;
C - 1 X 2xambervoa g w/ H3PO4/zero headspace;
D - 1 X L bod p w/ Cool to 6 C;
E - 1 X Pt no3no2 p w/ Cool to 6 C;
F - 1 X 250mlMicro p w/ Sterile/Na2S2O3;

Relinquished by: _____ Received by: _____ Received for laboratory by: _____

Date: 8/17/16 Time: 245 Date: 8-17-16 Time: 1615

Sample entered by: _____

Chain of Custody

Account: 3156 Work Order: 006224 Project Leader: rxw No: 276888
Work Order Description: Walter Resevior

Customer: David Wertz

Address: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Phone: 703-387-5516 Ext:

Samplers: WACiK

Remarks: _____

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

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

==========

23484 Sample No: 7 Desc: WA-5 Surface

nh3-n, tkn, alk, tds, tss, po4-p, toc,

no2-n, no3-n, d-po4-p, o-po4, bod

fc, tc,

Matrix: o Date: 8/17/16
Time: 0955

A - 1 X Pt nh3 p w/ H2SO4(pH<2);
B - 1 X 8oz Alk p w/ Cool to 6 C;
C - 1 X 2xambervoa g w/ H3PO4/zero headspace;
D - 1 X L bod p w/ Cool to 6 C;
E - 1 X Pt no3no2 p w/ Cool to 6 C;
F - 1 X 250mlMicro p w/ Sterile/Na2S2O3;

23485 Sample No: 8 Desc: WA-6 Surface

nh3-n, tkn, alk, tds, tss, po4-p, toc,

no2-n, no3-n, d-po4-p, o-po4, bod

fc, tc,

Matrix: o Date: 8/17/16
Time: 0810

A - 1 X Pt nh3 p w/ H2SO4(pH<2);
B - 1 X 8oz Alk p w/ Cool to 6 C;
C - 1 X 2xambervoa g w/ H3PO4/zero headspace;
D - 1 X L bod p w/ Cool to 6 C;
E - 1 X Pt no3no2 p w/ Cool to 6 C;
F - 1 X 250mlMicro p w/ Sterile/Na2S2O3;

23486 Sample No: 9 Desc: WA-6 Mid-Depth

nh3-n, tkn, alk, tds, tss, po4-p, toc,

no2-n, no3-n, d-po4-p, o-po4, bod

Matrix: o Date: 8/17/16
Time: 0810

A - 1 X Pt nh3 p w/ H2SO4(pH<2);
B - 1 X 8oz Alk p w/ Cool to 6 C;
C - 1 X 2xambervoa g w/ H3PO4/zero headspace;
D - 1 X L bod p w/ Cool to 6 C;
E - 1 X Pt no3no2 p w/ Cool to 6 C;

Relinquished by: _____ Received by: _____ Received for laboratory by: _____

Date: 8/17/16 Time: 2:45 Date: 8-17-16 Time: 1615

Sample entered by: _____

Chain of Custody

Account: 3156 Work Order: 006224 Project Leader: rxw No: 276888
Work Order Description: Walter Resevior

Customer: David Wertz

Address: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Phone: 703-387-5516 Ext:

Samplers: WACiK

Remarks: _____

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

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

==========

23487 Sample No: 10 Desc: WA-6 Deep

nh3-n, tkn, alk, tds, tss, po4-p, toc,

no2-n, no3-n, d-po4-p, o-po4, bod

Matrix: o Date: 8/17/16
Time: 0810

A - 1 X Pt nh3 p w/ H2SO4(pH<2);
B - 1 X 8oz Alk p w/ Cool to 6 C;
C - 1 X 2xambervoa g w/ H3PO4/zero headspace;
D - 1 X L bod p w/ Cool to 6 C;
E - 1 X Pt no3no2 p w/ Cool to 6 C;

23488 Sample No: 11 Desc: WA-7 Surface

nh3-n, tkn, alk, tds, tss, po4-p, toc,

no2-n, no3-n, d-po4-p, o-po4, bod

fc, tc

Matrix: o Date: 8/17/16
Time: 0830

A - 1 X Pt nh3 p w/ H2SO4(pH<2);
B - 1 X 8oz Alk p w/ Cool to 6 C;
C - 1 X 2xambervoa g w/ H3PO4/zero headspace;
D - 1 X L bod p w/ Cool to 6 C;
E - 1 X Pt no3no2 p w/ Cool to 6 C;
F - 1 X 250mlMicro p w/ Sterile/Na2S2O3;

23489 Sample No: 12 Desc: WA-7 Mid-Depth

nh3-n, tkn, alk, tds, tss, po4-p, toc,

no2-n, no3-n, d-po4-p, o-po4, bod

Matrix: o Date: 8/17/16
Time: 0836

A - 1 X Pt nh3 p w/ H2SO4(pH<2);
B - 1 X 8oz Alk p w/ Cool to 6 C;
C - 1 X 2xambervoa g w/ H3PO4/zero headspace;
D - 1 X L bod p w/ Cool to 6 C;
E - 1 X Pt no3no2 p w/ Cool to 6 C;

Relinquished by: _____ Received by: _____ Received for laboratory by: _____

Date: 8/17/16 Time: 2:45 Date: 8-17-16 Time: 1615

Sample entered by: _____

Chain of Custody

Account: 3156 Work Order: 006224 Project Leader: rxw No: 276888
Work Order Description: Walter Resevior

Customer: David Wertz

Address: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Phone: 703-387-5516 Ext:

Samplers: WAC1 K

Remarks: _____

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

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

==========

Sample No: 13 Desc: WA-7 Deep Matrix: o Date: 8/17/16
Time: 0830

23490

nh3-n, tkn, alk, tds, tss, po4-p, toc,
AH
no2-n, no3-n, d-po4-p, o-po4, bod
AH BW

A - 1 X Pt nh3 p w/ H2SO4(pH<2);
B - 1 X 8oz Alk p w/ Cool to 6 C;
C - 1 X 2xambervoa g w/ H3PO4/zero headspace;
D - 1 X L bod p w/ Cool to 6 C;
E - 1 X Pt no3no2 p w/ Cool to 6 C;

Relinquished by: _____ Received by: _____ Received for laboratory by: _____

Date: 8/17/16 Time: 2:45 Date: 8-17-16 Time: 1615

Sample entered by: _____

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

Attention: David Wertz
Reported To: Tetra Tech (Beltzville Dam)
1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Date of Report: 09/26/16
Lab ID: 3157-16-0028547

Date Collected: 09/13/16 10:07
Collected By: Client

Sample Desc: WA-1 Surface

Date Received: 09/13/16 18:00

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Fecal Coliform	5	/100ml	2	1	SM 9222D	09/13	18:30	TNS
Total Coliform	980	mpn/100ml	1	1	SM 9223B	09/14	12:30	PLW
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	09/14	12:05	AEH
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	09/19	15:00	AEH
Phosphorus as P, Total	0.04	mg/l	.01	1	SM 4500P-E	09/19	15:20	AEH
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	09/14	02:48	JCL
Nitrogen, Nitrate	0.06	mg/l	.05	1	EPA 353.2	09/14	16:46	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	09/14	14:55	JCL
Nitrogen, Total Kjeldahl	0.40	mg/l	.25	1	EPA 351.2	09/15	17:51	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	09/14	13:10	EMW
Total Organic Carbon	3.7	mg/l	1	1	SM5310 C	09/15	12:41	ALD
RESIDUES								
Solids, Total Dissolved	57	mg/l	5	1	SM 2540C	09/16	12:10	TMH
Solids, Total Suspended	11	mg/l	3	1	SM 2540D	09/16	12:10	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	11	mg/l	1	1	SM 2320 B	09/14	12:30	AEH

Distribution of Reports:
Gregory Wacik - USACE (Beltzville Dam)

Reviewed and Approved by:

Richard Wheeler

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PHONE: 610-374-5129 • FAX: 610-374-7234 • **www.mjreider.com**

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

Attention: David Wertz
Reported To: Tetra Tech (Beltzville Dam)
1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Date of Report: 09/26/16
Lab ID: 3157-16-0028547

Date Collected: 09/13/16 10:07
Collected By: Client

Sample Desc: WA-1 Surface

Date Received: 09/13/16 18:00

PWSID: 3130843

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

COMMENTS

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

02 The total colifrom sample was placed in the incubator on 09/13/2016 at 18:20.

Distribution of Reports:
Gregory Wacik - USACE (Beltzville Dam)

Reviewed and Approved by:

Richard Wheeler

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

Attention: David Wertz
Reported To: Tetra Tech (Beltzville Dam)
1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Date of Report: 09/26/16
Lab ID: 3157-16-0028548

Date Collected: 09/13/16 07:52
Collected By: Client

Sample Desc: WA-2 Surface

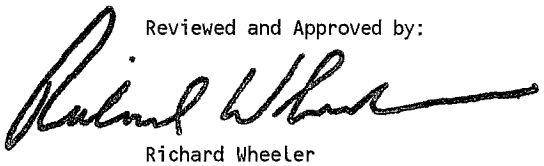
Date Received: 09/13/16 18:00

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Fecal Coliform	<2	/100ml	2	1	SM 9222D	09/13	18:30	TNS
Total Coliform	250	mpn/100ml	1	1	SM 9223B	09/14	12:30	PLW
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	09/14	12:05	AEH
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	09/19	15:00	AEH
Phosphorus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	09/19	15:20	AEH
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	09/14	03:03	JCL
Nitrogen, Nitrate	0.05	mg/l	.05	1	EPA 353.2	09/14	16:47	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	09/14	14:58	JCL
Nitrogen, Total Kjeldahl	0.31	mg/l	.25	1	EPA 351.2	09/15	17:52	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	09/14	13:10	EMW
Total Organic Carbon	4.4	mg/l	1	1	SM5310 C	09/15	15:31	ALD
RESIDUES								
Solids, Total Dissolved	65	mg/l	5	1	SM 2540C	09/16	12:10	TMH
Solids, Total Suspended	3	mg/l	3	1	SM 2540D	09/16	12:10	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	9	mg/l	1	1	SM 2320 B	09/14	12:30	AEH

Distribution of Reports:
Gregory Wacik - USACE (Beltzville Dam)

Reviewed and Approved by:



Richard Wheeler

THE NELAC INSTITUTE

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

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

Attention: David Wertz
Reported To: Tetra Tech (Beltzville Dam)
1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Date of Report: 09/26/16
Lab ID: 3157-16-0028548

Date Collected: 09/13/16 07:52
Collected By: Client

Sample Desc: WA-2 Surface

Date Received: 09/13/16 18:00

PWSID: 3130843

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

COMMENTS

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

02 The total colifrom sample was placed in the incubator on 09/13/2016 at 18:20.

Distribution of Reports:
Gregory Wacik - USACE (Beltzville Dam)

Reviewed and Approved by:

Richard Wheeler

THE NELAC INSTITUTE

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

Attention: David Wertz
Reported To: Tetra Tech (Beltzville Dam)
1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Date of Report: 09/26/16
Lab ID: 3157-16-0028549

Date Collected: 09/13/16 07:52
Collected By: Client

Sample Desc: WA-2 Mid-Depth

Date Received: 09/13/16 18:00

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	09/14	12:05	AEH
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	09/19	15:00	AEH
Phosphorus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	09/19	15:20	AEH
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	09/14	03:17	JCL
Nitrogen, Nitrate	0.05	mg/l	.05	1	EPA 353.2	09/14	16:50	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	09/14	14:59	JCL
Nitrogen, Total Kjeldahl	0.34	mg/l	.25	1	EPA 351.2	09/15	17:53	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	09/14	13:10	EMW
Total Organic Carbon	3.8	mg/l	1	1	SM5310 C	09/15	15:55	ALD
RESIDUES								
Solids, Total Dissolved	79	mg/l	5	1	SM 2540C	09/16	12:10	TMH
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	09/16	12:10	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	10	mg/l	1	1	SM 2320 B	09/14	13:50	AEH

COMMENTS

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

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1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Date of Report: 09/26/16
Lab ID: 3157-16-0028550

Date Collected: 09/13/16 07:52
Collected By: Client

Sample Desc: WA-2 Deep

Date Received: 09/13/16 18:00

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	09/14	12:05	AEH
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	09/19	15:00	AEH
Phosphorus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	09/19	15:25	AEH
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	09/14	03:32	JCL
Nitrogen, Nitrate	0.09	mg/l	.05	1	EPA 353.2	09/14	16:51	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	09/14	15:00	JCL
Nitrogen, Total Kjeldahl	0.41	mg/l	.25	1	EPA 351.2	09/15	17:56	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	09/14	13:10	EMW
Total Organic Carbon	3.6	mg/l	1	1	SM5310 C	09/15	16:31	ALD
RESIDUES								
Solids, Total Dissolved	76	mg/l	5	1	SM 2540C	09/16	12:10	TMH
Solids, Total Suspended	14	mg/l	3	1	SM 2540D	09/16	12:10	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	11	mg/l	1	1	SM 2320 B	09/14	13:50	AEH

COMMENTS

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

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1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Date of Report: 09/26/16
Lab ID: 3157-16-0028551

Date Collected: 09/13/16 10:35
Collected By: Client

Sample Desc: WA-3 Surface

Date Received: 09/13/16 18:00

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Fecal Coliform	11	/100ml	2	1	SM 9222D	09/13	18:30	TNS
Total Coliform	>2400	mpn/100ml	1	1	SM 9223B	09/14	12:30	PLW
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	09/14	12:05	AEH
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	09/19	15:05	AEH
Phosphorus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	09/19	15:25	AEH
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	09/14	03:46	JCL
Nitrogen, Nitrate	0.12	mg/l	.05	1	EPA 353.2	09/14	16:52	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	09/14	15:01	JCL
Nitrogen, Total Kjeldahl	0.28	mg/l	.25	1	EPA 351.2	09/15	17:57	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	09/14	13:10	EMW
Total Organic Carbon	3.9	mg/l	1	1	SM5310 C	09/15	16:43	ALD
RESIDUES								
Solids, Total Dissolved	95	mg/l	5	1	SM 2540C	09/16	12:10	TMH
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	09/16	12:10	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	12	mg/l	1	1	SM 2320 B	09/14	13:50	AEH

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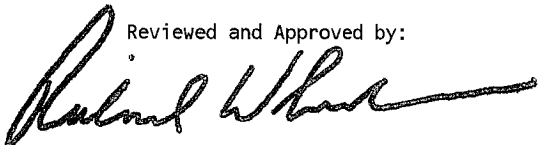

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Reported To: Tetra Tech (Beltzville Dam)
1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Date of Report: 09/26/16
Lab ID: 3157-16-0028551

Date Collected: 09/13/16 10:35
Collected By: Client

Sample Desc: WA-3 Surface

Date Received: 09/13/16 18:00

PWSID: 3130843

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

COMMENTS

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

02 The total colifrom sample was placed in the incubator on 09/13/2016 at 18:20.

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Reviewed and Approved by:

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Attention: David Wertz
Reported To: Tetra Tech (Beltzville Dam)
1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Date of Report: 09/26/16
Lab ID: 3157-16-0028552

Date Collected: 09/13/16 10:47
Collected By: Client

Sample Desc: WA-4 Surface

Date Received: 09/13/16 18:00

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Fecal Coliform	28	/100ml	2	1	SM 9222D	09/13	18:30	TNS
Total Coliform	2400	mpn/100ml	1	1	SM 9223B	09/14	12:30	PLW
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	09/14	12:05	AEH
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	09/19	15:05	AEH
Phosphorus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	09/19	15:25	AEH
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	09/14	04:01	JCL
Nitrogen, Nitrate	<.05	mg/l	.05	1	EPA 353.2	09/14	16:53	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	09/14	15:02	JCL
Nitrogen, Total Kjeldahl	0.29	mg/l	.25	1	EPA 351.2	09/15	17:58	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	09/14	13:10	EMW
Total Organic Carbon	2.7	mg/l	1	1	SM5310 C	09/15	16:55	ALD
RESIDUES								
Solids, Total Dissolved	84	mg/l	5	1	SM 2540C	09/16	12:10	TMH
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	09/16	12:10	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	14	mg/l	1	1	SM 2320 B	09/14	13:50	AEH

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Arlington VA 22201

Date of Report: 09/26/16
Lab ID: 3157-16-0028552

Date Collected: 09/13/16 10:47
Collected By: Client

Sample Desc: WA-4 Surface

Date Received: 09/13/16 18:00

PWSID: 3130843

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

COMMENTS

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

02 The total colifrom sample was placed in the incubator on 09/13/2016 at 18:20.

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Attention: David Wertz
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1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Date of Report: 09/26/16
Lab ID: 3157-16-0028553

Date Collected: 09/13/16 11:07
Collected By: Client

Sample Desc: WA-5 Surface

Date Received: 09/13/16 18:00

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Fecal Coliform	20	/100ml	2	1	SM 9222D	09/13	18:30	TNS
Total Coliform	2400	mpn/100ml	1	1	SM 9223B	09/14	12:30	PLW
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	09/14	12:05	AEH
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	09/19	15:05	AEH
Phosphorus as P, Total	0.05	mg/l	.01	1	SM 4500P-E	09/19	15:25	AEH
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	09/14	04:16	JCL
Nitrogen, Nitrate	0.05	mg/l	.05	1	EPA 353.2	09/14	16:54	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	09/14	15:02	JCL
Nitrogen, Total Kjeldahl	<.25	mg/l	.25	1	EPA 351.2	09/15	17:59	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	09/14	13:10	EMW
Total Organic Carbon	3.1	mg/l	1	1	SM5310 C	09/15	17:07	ALD
RESIDUES								
Solids, Total Dissolved	68	mg/l	5	1	SM 2540C	09/16	12:10	TMH
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	09/16	12:10	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	6	mg/l	1	1	SM 2320 B	09/14	13:50	AEH

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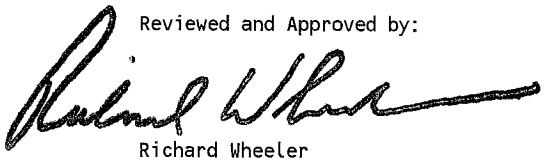

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Arlington VA 22201

Date of Report: 09/26/16
Lab ID: 3157-16-0028553

Date Collected: 09/13/16 11:07
Collected By: Client

Sample Desc: WA-5 Surface

Date Received: 09/13/16 18:00

PWSID: 3130843

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

COMMENTS

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

02 The total colifrom sample was placed in the incubator on 09/13/2016 at 18:20.

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Arlington VA 22201

Date of Report: 09/26/16
Lab ID: 3157-16-0028554

Date Collected: 09/13/16 08:30
Collected By: Client

Sample Desc: WA-6 Surface

Date Received: 09/13/16 18:00

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Fecal Coliform	2	/100ml	2	1	SM 9222D	09/13	18:30	TNS
Total Coliform	280	mpn/100ml	1	1	SM 9223B	09/14	12:30	PLW
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	09/14	12:05	AEH
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	09/19	15:05	AEH
Phosphorus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	09/19	15:25	AEH
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	09/14	04:30	JCL
Nitrogen, Nitrate	0.05	mg/l	.05	1	EPA 353.2	09/14	16:54	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	09/14	15:03	JCL
Nitrogen, Total Kjeldahl	0.60	mg/l	.25	1	EPA 351.2	09/15	18:00	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	09/14	13:10	EMW
Total Organic Carbon	3.7	mg/l	1	1	SM5310 C	09/15	18:07	ALD
RESIDUES								
Solids, Total Dissolved	72	mg/l	5	1	SM 2540C	09/16	12:10	TMH
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	09/16	12:10	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	10	mg/l	1	1	SM 2320 B	09/14	13:50	AEH

Distribution of Reports:
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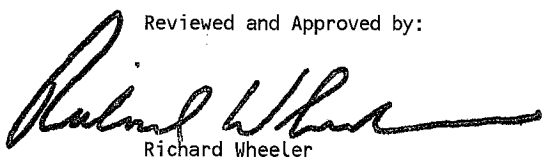
Reviewed and Approved by:



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Date of Report: 09/26/16
Lab ID: 3157-16-0028554

Date Collected: 09/13/16 08:30
Collected By: Client

Sample Desc: WA-6 Surface

Date Received: 09/13/16 18:00

PWSID: 3130843

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

COMMENTS

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

02 The total colifrom sample was placed in the incubator on 09/13/2016 at 18:20.

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1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Date of Report: 09/26/16
Lab ID: 3157-16-0028555

Date Collected: 09/13/16 08:30
Collected By: Client

Sample Desc: WA-6 Mid-Depth

Date Received: 09/13/16 18:00

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	09/14	12:05	AEH
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	09/19	15:05	AEH
Phosphorus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	09/19	15:25	AEH
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	09/14	04:45	JCL
Nitrogen, Nitrate	0.05	mg/l	.05	1	EPA 353.2	09/14	16:57	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	09/14	15:06	JCL
Nitrogen, Total Kjeldahl	0.27	mg/l	.25	1	EPA 351.2	09/21	15:02	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	09/14	13:10	EMW
Total Organic Carbon	3.8	mg/l	1	1	SM5310 C	09/15	18:31	ALD
RESIDUES								
Solids, Total Dissolved	77	mg/l	5	1	SM 2540C	09/16	12:10	TMH
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	09/16	12:10	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	10	mg/l	1	1	SM 2320 B	09/14	13:50	AEH

COMMENTS

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

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Richard Wheeler

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Attention: David Wertz
Reported To: Tetra Tech (Beltzville Dam)
1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Date of Report: 09/26/16
Lab ID: 3157-16-0028556

Date Collected: 09/13/16 08:30
Collected By: Client

Sample Desc: WA-6 Deep

Date Received: 09/13/16 18:00

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	09/14	12:05	AEH
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	09/19	15:05	AEH
Phosphorus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	09/19	15:25	AEH
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	09/14	04:59	JCL
Nitrogen, Nitrate	0.05	mg/l	.05	1	EPA 353.2	09/14	16:58	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	09/14	15:07	JCL
Nitrogen, Total Kjeldahl	0.39	mg/l	.25	1	EPA 351.2	09/21	15:05	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	09/14	13:10	EMW
Total Organic Carbon	3.7	mg/l	1	1	SM5310 C	09/15	19:06	ALD
RESIDUES								
Solids, Total Dissolved	86	mg/l	5	1	SM 2540C	09/16	12:10	TMH
Solids, Total Suspended	28	mg/l	3	1	SM 2540D	09/16	12:10	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	11	mg/l	1	1	SM 2320 B	09/14	13:50	AEH

COMMENTS

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

Distribution of Reports:
Gregory Wacik - USACE (Beltzville Dam)

Reviewed and Approved by:

Richard Wheeler

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

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

Attention: David Wertz
Reported To: Tetra Tech (Beltzville Dam)
1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Date of Report: 09/26/16
Lab ID: 3157-16-0028557

Date Collected: 09/13/16 09:02
Collected By: Client

Sample Desc: WA-7 Surface

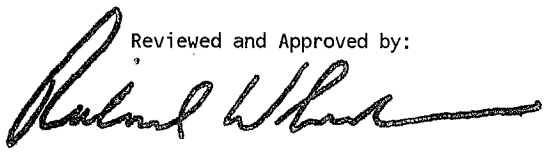
Date Received: 09/13/16 18:00

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Fecal Coliform	<2	/100ml	2	1	SM 9222D	09/13	18:30	TNS
Total Coliform	330	mpn/100ml	1	1	SM 9223B	09/14	12:30	PLW
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	09/14	12:05	AEH
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	09/19	15:05	AEH
Phosphorus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	09/19	15:25	AEH
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	09/14	11:45	JCL
Nitrogen, Nitrate	0.05	mg/l	.05	1	EPA 353.2	09/14	16:59	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	09/14	15:08	JCL
Nitrogen, Total Kjeldahl	0.33	mg/l	.25	1	EPA 351.2	09/21	15:06	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	09/14	13:10	EMW
Total Organic Carbon	3.8	mg/l	1	1	SM5310 C	09/15	19:18	ALD
RESIDUES								
Solids, Total Dissolved	79	mg/l	5	1	SM 2540C	09/16	12:30	TMH
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	09/16	12:30	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	10	mg/l	1	1	SM 2320 B	09/14	13:50	AEH

Distribution of Reports:
Gregory Wacik - USACE (Beltzville Dam)

Reviewed and Approved by:



Richard Wheeler

THE NELAC INSTITUTE

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

Attention: David Wertz
Reported To: Tetra Tech (Beltzville Dam)
1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Date of Report: 09/26/16
Lab ID: 3157-16-0028557

Date Collected: 09/13/16 09:02
Collected By: Client

Sample Desc: WA-7 Surface

Date Received: 09/13/16 18:00

PWSID: 3130843

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

COMMENTS

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

02 The total colifrom sample was placed in the incubator on 09/13/2016 at 18:20.

Distribution of Reports:
Gregory Wacik - USACE (Beltzville Dam)

Reviewed and Approved by:

Richard Wheeler

THE NELAC INSTITUTE

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QUALITY ETHICS SERVICES ACIL Seal of Excellence

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

Attention: David Wertz
Reported To: Tetra Tech (Beltzville Dam)
1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Date of Report: 09/26/16
Lab ID: 3157-16-0028558

Date Collected: 09/13/16 09:02
Collected By: Client

Sample Desc: WA-7 Mid-Depth

Date Received: 09/13/16 18:00

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	09/14	12:05	AEH
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	09/19	15:10	AEH
Phosphorus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	09/19	15:30	AEH
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	09/14	12:00	JCL
Nitrogen, Nitrate	<.05	mg/l	.05	1	EPA 353.2	09/14	17:02	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	09/14	15:11	JCL
Nitrogen, Total Kjeldahl	0.32	mg/l	.25	1	EPA 351.2	09/21	15:07	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	09/14	13:10	EMW
Total Organic Carbon	3.7	mg/l	1	1	SM5310 C	09/15	19:30	ALD
RESIDUES								
Solids, Total Dissolved	69	mg/l	5	1	SM 2540C	09/16	12:30	TMH
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	09/16	12:30	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	10	mg/l	1	1	SM 2320 B	09/14	13:50	AEH

COMMENTS

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

Distribution of Reports:
Gregory Wacik - USACE (Beltzville Dam)

Reviewed and Approved by:

Richard Wheeler

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

Attention: David Wertz
Reported To: Tetra Tech (Beltzville Dam)
1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Date of Report: 09/26/16
Lab ID: 3157-16-0028559

Date Collected: 09/13/16 09:02
Collected By: Client

Sample Desc: WA-7 Deep

Date Received: 09/13/16 18:00

PWSID: 3130843

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	09/14	12:15	AEH
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	09/19	15:10	AEH
Phosphorus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	09/19	15:30	AEH
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	09/14	12:14	JCL
Nitrogen, Nitrate	0.07	mg/l	.05	1	EPA 353.2	09/14	17:03	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	09/14	15:12	JCL
Nitrogen, Total Kjeldahl	0.35	mg/l	.25	1	EPA 351.2	09/21	15:08	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	09/14	13:10	EMW
Total Organic Carbon	3.5	mg/l	1	1	SM5310 C	09/15	19:42	ALD
RESIDUES								
Solids, Total Dissolved	84	mg/l	5	1	SM 2540C	09/16	12:30	TMH
Solids, Total Suspended	48	mg/l	3	1	SM 2540D	09/16	12:30	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	12	mg/l	1	1	SM 2320 B	09/14	13:50	AEH

COMMENTS

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

Distribution of Reports:
Gregory Wacik - USACE (Beltzville Dam)

Reviewed and Approved by:
Richard Wheeler

ENVIRONMENTAL TESTING LABORATORY 107 ANGELICA STREET, READING, PA 19611
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rxw
08/08/16 8:25:15 AM

M. J. REIDER ASSOCIATES, INC.

COFC.PRT
Page: 1

Chain of Custody

Account: 3157 Work Order: 006224 Project Leader: rxw No: 278488
Work Order Description: Walter Resevior

Customer: David Wertz

Address: Tetra Tech (Beltzville Dam)
1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Remarks: _____

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

Phone: 703-387-5516 Ext:

Samplers: WACiK

Laboratory Receipt Temp: 12 Deg C. If Temp Unacceptable, On Ice? (Y) N
Approved By: BSW

==========

28547 Sample No: 1 Desc: WA-1 Surface

nh3-n, tkn, alk, tds, tss, po4-p, toc,

no2-n, no3-n, d-po4-p, o-po4, bod

fc, tc,

Matrix: o Date: 9/13/16
Time: 1007

A - 1 X Pt nh3 p w/ H2SO4(pH<2);
B - 1 X 8oz Alk p w/ Cool to 6 C;
C - 1 X 2xambervoa g w/ H3PO4/zero headspace;
D - 1 X L bod p w/ Cool to 6 C;
E - 1 X Pt no3no2 p w/ Cool to 6 C;
F - 1 X 250mlMicro p w/ Sterile/Na2S2O3;

28548 Sample No: 2 Desc: WA-2 Surface

nh3-n, tkn, alk, tds, tss, po4-p, toc,

no2-n, no3-n, d-po4-p, o-po4, bod

fc, tc,

Matrix: o Date: 9/13/16
Time: 752

A - 1 X Pt nh3 p w/ H2SO4(pH<2);
B - 1 X 8oz Alk p w/ Cool to 6 C;
C - 1 X 2xambervoa g w/ H3PO4/zero headspace;
D - 1 X L bod p w/ Cool to 6 C;
E - 1 X Pt no3no2 p w/ Cool to 6 C;
F - 1 X 250mlMicro p w/ Sterile/Na2S2O3;

28549 Sample No: 3 Desc: WA-2 Mid-Depth

nh3-n, tkn, alk, tds, tss, po4-p, toc,

no2-n, no3-n, d-po4-p, o-po4, bod

Matrix: o Date: 9/13/16
Time: 752

A - 1 X Pt nh3 p w/ H2SO4(pH<2);
B - 1 X 8oz Alk p w/ Cool to 6 C;
C - 1 X 2xambervoa g w/ H3PO4/zero headspace;
D - 1 X L bod p w/ Cool to 6 C;
E - 1 X Pt no3no2 p w/ Cool to 6 C;

Relinquished by: _____ Received by: _____ Received for laboratory by: _____

Date: 9/13/16 Time: 420 Date: 9-13-16 Time: 1800

Sample entered by: PSM

M. J. REIDER ASSOCIATES, INC.

Chain of Custody

Account: 3157 Work Order: 006224 Project Leader: rxw No: 278488
Work Order Description: Walter Resevior

Customer: David Wertz

Address: Tetra Tech (Beltzville Dam)
1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Remarks: _____

Phone: 703-387-5516 Ext:

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

Samplers: WACK

Laboratory Receipt Temp: 12 Deg C. If Temp Unacceptable, On Ice? (Y) N
Approved By: BSW

==========

28550 Sample No: 4 Desc: WA-2 Deep

nh3-n, tkn, alk, tds, tss, po4-p, toc,

no2-n, no3-n, d-po4-p, o-po4, bod

Matrix: o Date: 9/13/16
Time: 752

A - 1 X Pt nh3 p w/ H2SO4(pH<2);
B - 1 X 8oz Alk p w/ Cool to 6 C;
C - 1 X 2xambervoa g w/ H3PO4/zero headspace;
D - 1 X L bod p w/ Cool to 6 C;
E - 1 X Pt no3no2 p w/ Cool to 6 C;

28551 Sample No: 5 Desc: WA-3 Surface

nh3-n, tkn, alk, tds, tss, po4-p, toc,

no2-n, no3-n, d-po4-p, o-po4, bod

fc, tc, TNS

Matrix: o Date: 9/13/16
Time: 1035

A - 1 X Pt nh3 p w/ H2SO4(pH<2);
B - 1 X 8oz Alk p w/ Cool to 6 C;
C - 1 X 2xambervoa g w/ H3PO4/zero headspace;
D - 1 X L bod p w/ Cool to 6 C;
E - 1 X Pt no3no2 p w/ Cool to 6 C;
F - 1 X 250mlMicro p w/ Sterile/Na2S2O3;

RES 8/8/16
~~28551~~
28552 Sample No: 6 Desc: WA-4 Surface

nh3-n, tkn, alk, tds, tss, po4-p, toc,

no2-n, no3-n, d-po4-p, o-po4, bod

fc, tc, TNS

Matrix: o Date: 9/13/16
Time: 1047

A - 1 X Pt nh3 p w/ H2SO4(pH<2);
B - 1 X 8oz Alk p w/ Cool to 6 C;
C - 1 X 2xambervoa g w/ H3PO4/zero headspace;
D - 1 X L bod p w/ Cool to 6 C;
E - 1 X Pt no3no2 p w/ Cool to 6 C;
F - 1 X 250mlMicro p w/ Sterile/Na2S2O3;

Relinquished by: _____ Received by: _____ Received for laboratory by: _____

Date: 9/15/16 Time: 420 Date: 9-13-16 Time: 1800

Sample entered by: DSM

Chain of Custody

Account: 3157 Work Order: 006224 Project Leader: rxw No: 278488
Work Order Description: Walter Resevior

Customer: David Wertz

Address: Tetra Tech (Beltzville Dam)
1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Phone: 703-387-5516 Ext:

Samplers: WAGK

Remarks: _____

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

Laboratory Receipt Temp: 12 Deg C. If Temp Unacceptable, On Ice? (Y) N
Approved By: BSW

==========

~~28552~~ 28553
RES 8/8/16

Sample No: 7 Desc: WA-5 Surface

nh3-n, tkn, alk, tds, tss, po4-p, toc,

no2-n, no3-n, d-po4-p, o-po4, bod,

fc, tc,

Matrix: o Date: 9/13/16
Time: 1107

A - 1 X Pt nh3 p w/ H2SO4(pH<2);
B - 1 X 8oz Alk p w/ Cool to 6 C;
C - 1 X 2xambervoa g w/ H3PO4/zero headspace;
D - 1 X L bod p w/ Cool to 6 C;
E - 1 X Pt no3no2 p w/ Cool to 6 C;
F - 1 X 250mlMicro p w/ Sterile/Na2S2O3;

~~28553~~ 28554
8/8/16
RES

Sample No: 8 Desc: WA-6 Surface

nh3-n, tkn, alk, tds, tss, po4-p, toc,

no2-n, no3-n, d-po4-p, o-po4, bod,

fc, tc,

Matrix: o Date: 9/13/16
Time: 830

A - 1 X Pt nh3 p w/ H2SO4(pH<2);
B - 1 X 8oz Alk p w/ Cool to 6 C;
C - 1 X 2xambervoa g w/ H3PO4/zero headspace;
D - 1 X L bod p w/ Cool to 6 C;
E - 1 X Pt no3no2 p w/ Cool to 6 C;
F - 1 X 250mlMicro p w/ Sterile/Na2S2O3;

~~28554~~ 28555
9/8/16
RES

Sample No: 9 Desc: WA-6 Mid-Depth

nh3-n, tkn, alk, tds, tss, po4-p, toc,

no2-n, no3-n, d-po4-p, o-po4, bod,

Matrix: o Date: 9/13/16
Time: 830

A - 1 X Pt nh3 p w/ H2SO4(pH<2);
B - 1 X 8oz Alk p w/ Cool to 6 C;
C - 1 X 2xambervoa g w/ H3PO4/zero headspace;
D - 1 X L bod p w/ Cool to 6 C;
E - 1 X Pt no3no2 p w/ Cool to 6 C;

Relinquished by: _____ Received by: _____ Received for laboratory by: _____

Date: 9/13/16 Time: 426 Date: 9-13-16 Time: 1800

Sample entered by: DSM

M. J. REIDER ASSOCIATES, INC.

Chain of Custody

Account: 3157 Work Order: 006224 Project Leader: rxw No: 278488
Work Order Description: Walter Resevior

Customer: David Wertz

Address: Tetra Tech (Beltzville Dam)
1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Phone: 703-387-5516 Ext:

Samplers: WACK

Remarks: _____

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

Laboratory Receipt Temp: 12 Deg C. If Temp Unacceptable, On Ice? (Y) N
Approved By: BSW

==========

~~28555~~ Sample No: 10 Desc: WA-6 Deep
28556
RES 8/8/16
nh3-n, tkn, alk, tds, tss, po4-p, toc,
no2-n, no3-n, d-po4-p, o-po4, bod BW

Matrix: o Date: ~~7/13/16~~
Time: ~~8 30~~
A - 1 X Pt nh3 p w/ H2SO4(pH<2);
B - 1 X 8oz Alk p w/ Cool to 6 C;
C - 1 X 2xambervoa g w/ H3PO4/zero headspace;
D - 1 X L bod p w/ Cool to 6 C;
E - 1 X Pt no3no2 p w/ Cool to 6 C;

~~28556~~ Sample No: 11 Desc: WA-7 Surface
28557
RES 8/8/16
nh3-n, tkn, alk, tds, tss, po4-p, toc,
no2-n, no3-n, d-po4-p, o-po4, bod BW
fc, tc NS

Matrix: o Date: 9/15/16
Time: 902
A - 1 X Pt nh3 p w/ H2SO4(pH<2);
B - 1 X 8oz Alk p w/ Cool to 6 C;
C - 1 X 2xambervoa g w/ H3PO4/zero headspace;
D - 1 X L bod p w/ Cool to 6 C;
E - 1 X Pt no3no2 p w/ Cool to 6 C;
F - 1 X 250mlMicro p w/ Sterile/Na2S2O3;

~~28557~~ Sample No: 12 Desc: WA-7 Mid-Depth
28558
RES 8/8/16
nh3-n, tkn, alk, tds, tss, po4-p, toc,
no2-n, no3-n, d-po4-p, o-po4, bod BW

Matrix: o Date: 9/15/16
Time: 902
A - 1 X Pt nh3 p w/ H2SO4(pH<2);
B - 1 X 8oz Alk p w/ Cool to 6 C;
C - 1 X 2xambervoa g w/ H3PO4/zero headspace;
D - 1 X L bod p w/ Cool to 6 C;
E - 1 X Pt no3no2 p w/ Cool to 6 C;

Relinquished by: _____ Received by: _____ Received for laboratory by: _____

Date: 7/13/16 Time: 420 Date: 9-13-16 Time: 1800

Sample entered by: DSR

M. J. REIDER ASSOCIATES, INC.

Chain of Custody

Account: 3157 Work Order: 006224 Project Leader: rxw No: 278488
Work Order Description: Walter Resevior

Customer: David Wertz

Address: Tetra Tech (Beltzville Dam)
1320 North Courthouse Rd., Ste. 600
Arlington VA 22201

Phone: 703-387-5516 Ext:

Samplers: WADK

Remarks: _____

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

Laboratory Receipt Temp: 12 Deg C. If Temp Unacceptable, On Ice? (Y) N
Approved By: BSW

==========

28559

Sample No: 13 Desc: WA-7 Deep

Matrix: o Date: 9/13/16
Time: 902

nh3-n, tkn, alk, tds, tss, po4-p, toc,
m
no2-n, no3-n, d-po4-p, o-po4, bod
BW

A - 1 X Pt nh3 p w/ H2SO4(pH<2);
B - 1 X 8oz Alk p w/ Cool to 6 C;
C - 1 X 2xambervoa g w/ H3PO4/zero headspace;
D - 1 X L bod p w/ Cool to 6 C;
E - 1 X Pt no3no2 p w/ Cool to 6 C;

Relinquished by: _____ Received by: _____ Received for laboratory by: _____

Date: 9/13/16 Time: 426 Date: 9-13-16 Time: 1800

Sample entered by: PSM