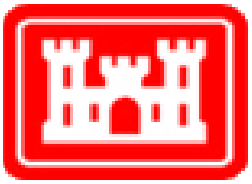
2015 WATER QUALITY MONITORING BLUE MARSH RESERVOIR LEESPORT, PENNSYLVANIA



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

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2015 Water Quality Monitoring
Blue Marsh Reservoir
Leesport, Pennsylvania

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1.0 INTRODUCTION

1.1 PURPOSE OF THE MONITORING PROGRAM

The U.S. Army Corps of Engineers (USACE) manages Blue Marsh Reservoir located in east-central Pennsylvania on the Tulpehocken Creek, which is within the Delaware River Basin. Blue Marsh Reservoir provides flood control and a dependable water supply to downstream communities west of Reading, PA. Additionally, the reservoir provides important habitat for fish, waterfowl, and other wildlife, and recreational opportunities through fishing, boating, and swimming. Due to the broad range of uses and demands that Blue Marsh Reservoir serves, the USACE monitors water quality, and other aspects related to ecological health, primarily to ensure public health safety. Results from water quality monitoring are compared to state water quality standards and used to diagnose other problems that commonly affect reservoir health such as low dissolved oxygen, nutrient enrichment and toxic loadings. This report summarizes the results of water quality monitoring at Blue Marsh Reservoir in 2015.

1.2 DESCRIPTION OF BLUE MARSH RESERVOIR

Blue Marsh Reservoir was designed to provide flood control, a water supply, and enhanced water quality to downstream communities along Tulpehocken Creek. Located about six miles northwest of Reading, Pennsylvania near Route 183, the reservoir dams a drainage area of 175 square miles. The dam, completed in 1979, can impound up to 42.3 billion gallons of water. The primary surface water inputs into Blue Marsh Reservoir other than Tulpehocken Creek include Wolf, Northkill, and Little Northkill Creek from the northwest; Spring Creek from the west; and Licking Creek from the northeast. The reservoir is approximately 6 miles long and is 52 feet deep immediately above the dam near Lower Heidelberg.

1.3 ELEMENTS OF THE STUDY

The USACE, Philadelphia District, has been monitoring the water quality of Blue Marsh Reservoir since 1979. Over this time, the yearly monitoring designs have evolved to address new concerns such as health of public drinking water and contamination of reservoir bottom sediments. The 2015 monitoring program follows that in most recent years and includes the following major elements:

- Monthly water quality and bacteria monitoring of reservoir and upstream sources to evaluate compliance with Pennsylvania state water quality standards and to evaluate the health of the reservoir ecosystem starting on 02 June and ending on 03 September 2015;
- Monthly profile samples for temperature, dissolved oxygen, chlorophyll, pH, turbidity, and conductivity at all stations in the reservoir and watershed; and
- Twice weekly coliform bacteria monitoring at three beach stations - to ensure public health and safety at the Blue Marsh Reservoir swimming beach area.

2.0 METHODS

2.1 PHYSICAL STRATIFICATION MONITORING

Physical stratification monitoring of the water column was conducted monthly at Blue Marsh Reservoir from June to September 2015 (Table 2-1). Stratification parameters included temperature, dissolved oxygen (DO), pH, Chlorophyll a, turbidity, and conductivity. Monitoring was conducted at ten fixed stations located throughout the reservoir watershed (Fig. 2-1). Six stations were located within the reservoir body (BM-2, BM-6, BM-7, BM-8, BM-9, and BM-10) for which water quality was measured from surface to bottom at 5-ft depth intervals. Three stations (BM-1S, BM-5S, and BM-11S) were monitored for surface water quality only. All water quality parameters were measured with a calibrated YSI 6600 V2-4 water quality meter. For this report, all of the stratification monitoring results, when applicable, were summarized and compared to water quality standards enacted by the Pennsylvania Department of Environmental Protection (PADEP – Chapter 93 Water Quality Standards).

2.2 WATER COLUMN CHEMISTRY MONITORING

Water column chemistry monitoring was conducted five times at Blue Marsh Reservoir during the 2015 sampling season (Table 2-1). Water samples were collected at 9 fixed stations in the reservoir watershed (Fig. 2-1). Surface water samples were collected at stations downstream of the reservoir (BM-1S), and upstream of the reservoir on Tulpehocken Creek (BM-5S) and Northkill Creek (BM-11S). Surface, middle, and bottom water samples were collected at the 6 stations within the reservoir (BM-2, BM-6, BM-7, BM-8, BM-9, and BM-10). Surface water samples were collected by opening sample containers approximately one foot below the surface of the water. Middle and bottom water samples were collected with a Van Dorn design horizontal water bottle sampler.

Water samples from all depths were analyzed for ammonia, nitrite, nitrate, total Kjeldahl nitrogen (TKN), total phosphorus, ortho-phosphate, soluble phosphorus, total dissolved solids (TDS), total suspended solids (TSS), biochemical oxygen demand (BOD), alkalinity, and total organic carbon. Table 2-2 summarizes the laboratory methods detection limits, state water quality standards, and sample holding times for each water quality parameter monitored.

Table 2-1. Water quality monitoring schedule of Blue Marsh Reservoir during 2015. Monitoring was conducted at 9 fixed stations located throughout the reservoir watershed.

Date of Sample Collection	Physical Stratification Monitoring (all stations)	Water Column Chemistry Monitoring (all stations)	Trophic State Assessment (BM—6)	Coliform Bacteria Monitoring (all stations)	Drinking Water Monitoring *
02 June	X	X	X	X	
29 June	X	X	X	X	
21 July	X	X	X	X	
11 August	X	X	X	X	
03 September	X	X	X	X	

*Drinking water samples are collected quarterly by personnel at each reservoir. This data is not included.

2.3 TROPHIC STATE DETERMINATION

The trophic state of Blue Marsh Reservoir was determined by methods outlined by Carlson (1977). In general, this method calculated trophic state indices (TSIs) independently for measures of total phosphorus, chlorophyll *a*, and secchi disk depth. Surface water measures of total phosphorus and chlorophyll *a* from chemistry monitoring were averaged in the calculation of monthly TSIs (Table 2-1). Secchi disk depth was measured at station BM-6. Trophic state determinations were made using criteria defined by Carlson and EPA (1983).

2.4 RESERVOIR COLIFORM BACTERIA MONITORING

Monitoring for coliform bacteria contaminants was conducted monthly at Blue Marsh Reservoir. Water samples were analyzed for total and fecal coliforms. Surface water samples were tested at all stations. Table 2-3 presents the test methods, detection limits, PADEP water quality standards, and sample holding times for the bacteria parameters monitored at Blue Marsh Reservoir in 2015. The bacteria analytical method was based on a membrane filtration technique. All of the samples were analyzed within their respective maximum allowable hold times.

Table 2-2. Water quality test methods, detection limits, state regulatory criteria, and sample holding times for water quality parameters monitored at Blue Marsh Reservoir in 2015

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

(1) Chlorophyll *a* samples were recorded using a YSI 6600 with a chlorophyll sensor.
(2) Laboratory Methods Reference:
MCAWW- "Methods for Chemical Analysis of Water and Wastes", EPA-600/4-79-020, March 1983 and subsequent revisions.
SM-20- "Standard Methods for the Examination of Water and Wastewater", 22nd Edition, 2012.
SW846- "Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods", 3rd. Edition, November 1986 and updates.
(3)Samples were not analyzed for Total Carbon and Total Inorganic Carbon in 2015
NA- Not sampled or analyzed by lab

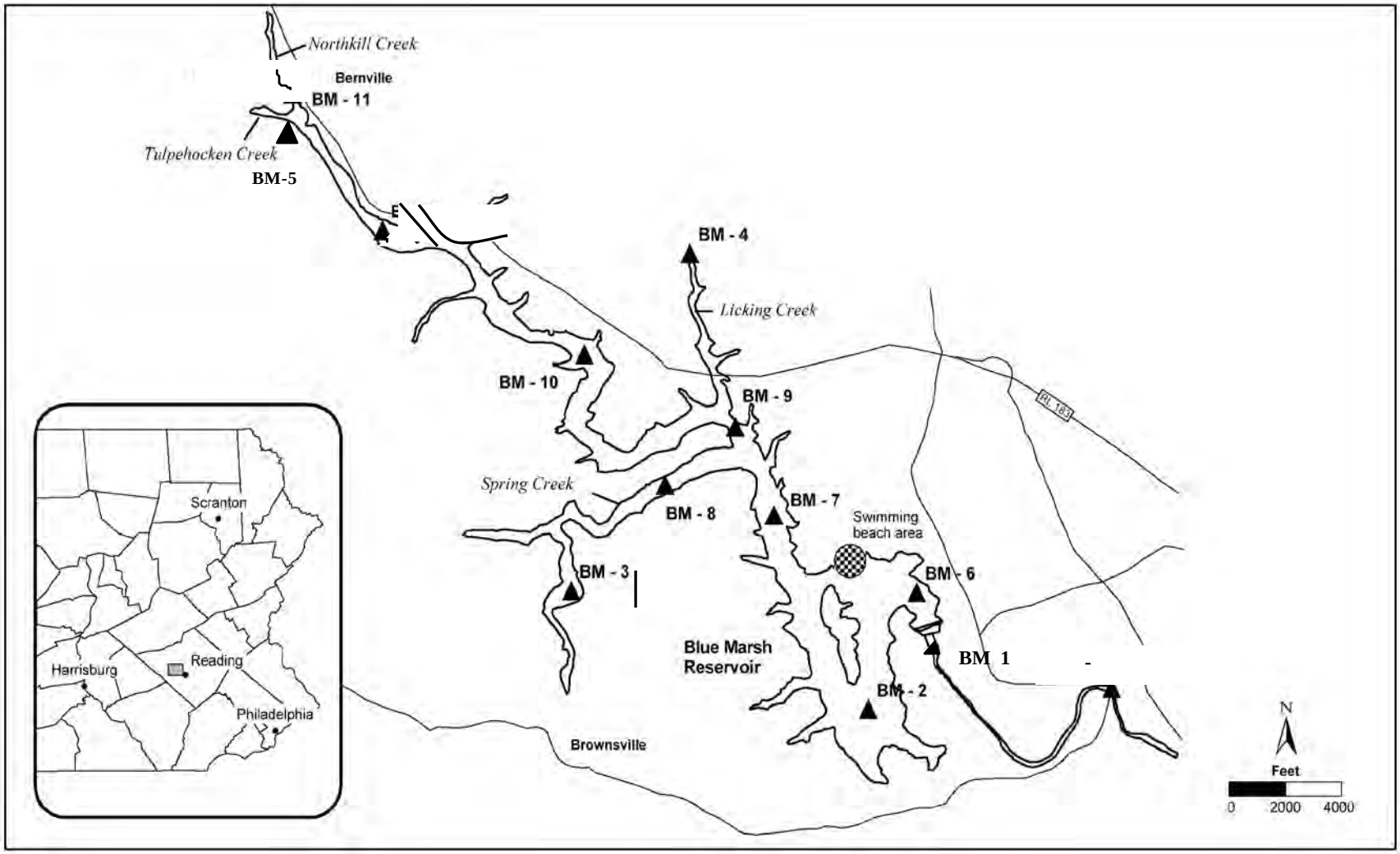

Figure 2-1. Blue Marsh Reservoir and the location of the 9 fixed stations monitored for water quality during 2015

Table 2-3. Water quality test methods, detection limits, PADEP water quality standards, and sample holding times for bacteria parameters monitored at Blue Marsh Reservoir in 2015.

Parameter	Total Coliform/E-Coli	Fecal Coliform
Test method	SM 9223B	SM9222D
Minimum Detection limit	1 clns/100-mls	2 clns/100-mls
PADEP water quality standard	-	Geometric mean < 200 clns/100-mls
PA Department of Health	-	Geometric mean < 200 clns/100-mls. No sample > 1000 clns/100-mls
Maximum allowable holding time	30 hours	30 hours
Achieved holding time	< 30 hours	< 30 hours

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

2.5 SWIMMING BEACH MONITORING

Additional coliform bacteria monitoring was conducted twice weekly near the public swimming beach at the Dry Brooks day use area (Table 2-4). Three stations (SB-1, SB-2, and SB-3) were monitored in the swimming beach area for total coliform, fecal coliform, and Escherichia coli (Figure 2-2). The coliform bacteria samples were collected and analyzed by the same methods used for monthly coliform bacteria sampling. The bacteria monitoring for Blue Marsh Swimming Beach followed a 4-step program of conditional monitoring. Each step or “condition” of monitoring responded to incremental increases of coliform contamination, and therefore reflected the risk to public health at the swimming beach area.

Table 2-4. Sampling dates for coliform bacteria monitoring at the Blue Marsh Reservoir swimming beach during 2015			
Week 1	11 and 14 May	**Week 10**	13 and 16 July
Week 2	18 and 21 May	**Week 11**	20 and 23 July
Week 3	26 and 28 May	**Week 12**	27 and 30 July
Week 4	01 and 04 June	**Week 13**	03 and 06 August
Week 5	08 and 11 June	**Week 14**	10 and 13 August
Week 6	15 and 18 June	**Week 15**	17 and 20 August
Week 7	22 and 25 June	**Week 16**	24 and 27 August
Week 8	29 June and 02 July	**Week 17**	31 August and 03 September
Week 9	06 and 09 July		

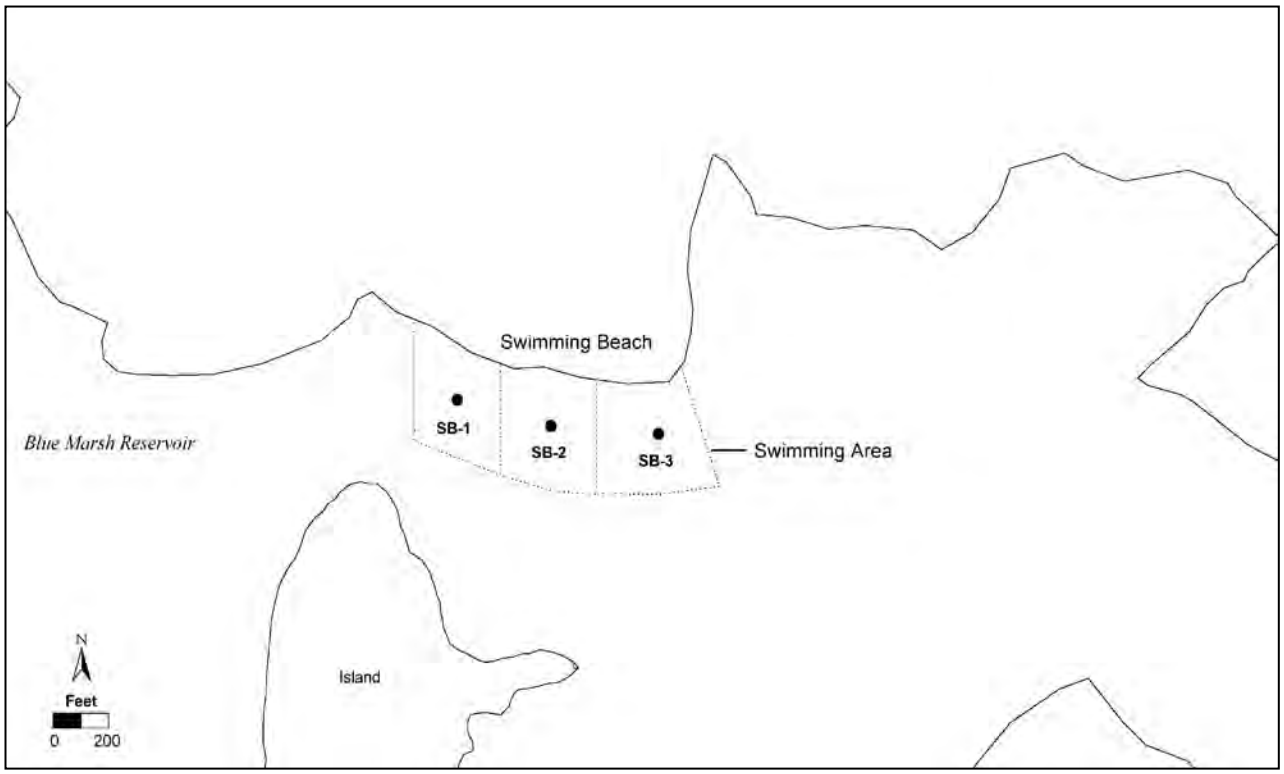

Figure 2-2. Swimming beach bacteriological monitoring stations at Blue Marsh Reservoir in 2015

3.0 RESULTS AND DISCUSSION

3.1 STRATIFICATION MONITORING

The following sections summarize the results of water quality monitoring for physical and chemical parameters: temperature, dissolved oxygen, and pH. Seasonal and spatial patterns of surface water quality measured throughout the reservoir watershed, and seasonal and depth related patterns of the stratified water column based on measures from the deepest portion of the reservoir (station BM-6 or the "Tower") are described. It is appropriate to focus discussion on tributary source waters influencing reservoir water quality and lake stratification at station BM-6 as water quality problems related to depth are generally most severe in deep water habitats. Corps personnel collected the physical/chemical water quality data discussed herein over the monitoring period from June to September 2015, the most productive time of the year for the reservoir. All of the parameters were measured with a calibrated YSI 6600 V2-4 water quality meter and are presented in Appendix A.

3.1.1 Temperature

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

Surface water temperature seasonal patterns upstream of the reservoir at stations BM-5S and BM-11S closely resembled each other throughout the sampling season (Fig. 3-1). Maximum temperatures of 21.88°C and 22.71°C were recorded at station BM-5S and BM-11S respectably in July. The maximum surface water temperature downstream of the reservoir at station BM-1S was 22.02°C in August with a minimum of 17.56°C in early June. Downstream temperatures are influenced through selective withdrawals at the Blue Marsh Dam. Annually the Corps performs selective withdrawal releases in an attempt to maintain temperatures downstream in the Tulpehocken Creek of less than 20°C in support of the trout fishery. The ability to meet this objective is dependent on meteorological conditions and other physical and operational limitations. The temperature objective was routinely exceeded in 2015 from late July through September.

Blue Marsh Reservoir was stratified with respect to temperature during 2015. The stratification pattern was most apparent at station BM-6 or the "Tower" station located in the deepest part of the reservoir (Fig. 3-2). Temperature stratification was evident in early June sampling with temperatures from surface (22.37°C) to bottom (9.77°C) differing by 12.60°C. The deeper and cooler temperature (<20°C) water was available for selective withdrawal to meet downstream temperature objectives through late July. Stratification peaked in late-July and a noticeable shift to deeper warmer water temperatures was evident into August and

September. An erosion of the epilimnion was seen in September as the lake began the process of de-stratifying.

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.

Surface waters upstream of the reservoir at tributary stations BM-5S and BM-11S had similar seasonal DO patterns throughout the sampling season (Fig. 3-3). The maximum DO concentration of 9.83 mg/L was recorded in late June at station BM-11S. The maximum surface water DO concentration downstream of the dam at station BM-1S was 8.98 mg/L recorded in early June with a minimum of 7.67 recorded in August.

Seasonal stratification and chemical and biological processes at Blue Marsh Reservoir dramatically influenced the distribution of DO in the water column during 2015 (Fig. 3-4). In early June, the influence of stratification was apparent at station BM-6, as DO concentrations decreased from 9.34 mg/L near the surface to 0.48 mg/L near the lake bottom. Historically, the lower oxygen levels deeper in the lake progressively move up the water column to within approximately 15-feet of the surface in mid- to late August. In most years the surface waters remain oxygenated as a result of surface algal productivity and water surface wind mixing. In 2015, this pattern was recorded in late June and continued into September. In late June, dissolved oxygen concentrations decreased from 10.23 mg/L at the surface to 9.76 mg/L at a depth of 10 feet and from 10 feet to the lake bottom ranged from 0.21 to 0.33 mg/L. Similar conditions persisted in the lake water column the remainder of the sampling season. These conditions can be detrimental to water quality and aquatic life. Nonetheless, dissolved oxygen concentrations in the upper water column of Blue Marsh Reservoir were in compliance with PADEP water quality standards during the 2015 sampling season. The Pennsylvania water quality standard for DO is a minimum concentration of 5 mg/L within the epilimnion of stratified lakes.

The health of aquatic ecosystems can be impaired by low DO concentrations in the water column. 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. In early June through September of 2015, the lower water column of Blue Marsh was severely affected by hypoxia (Fig. 3-4). Hypoxic water occupied two thirds of the water column in some of these months. Hypoxia in the lower water column is a symptom of eutrophication. Nutrients in the water column feed explosive algal growth at the surface photic zone. Dead and decaying algae

sink to lower levels of the water column and during the process of decay; oxygen is removed from the water.

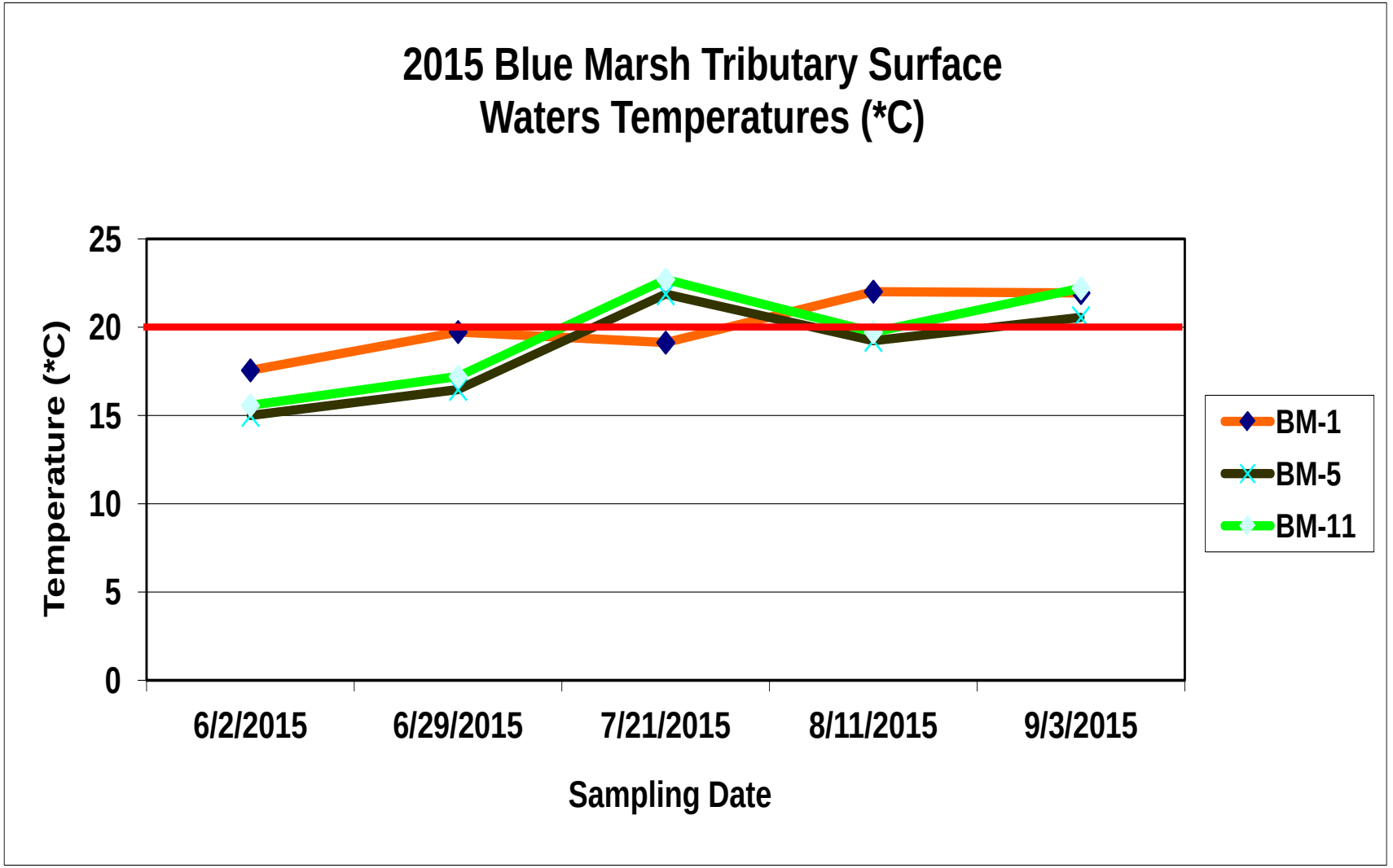

Figure 3-1. Tributary and downstream surface water temperatures (°C) measured at Blue Marsh Reservoir in 2015. Station BM-1S is located downstream of the reservoir. See Appendix A for summary of plotted values.

Figure 3-2. Temperature stratification and release portal elevations at station BM-6 of Blue Marsh Reservoir in 2015. See Appendix A for summary of plotted values.

3.1.3 pH

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

Measures of pH in the surface waters at Blue Marsh Reservoirs upstream and downstream sampling stations followed a similar pattern during 2015 (Fig. 3-5). Downstream release station (BM-1S) routinely had slightly lower pH values than upstream stations throughout the sampling season. In the months sampled, no pH measures violated the PADEP water quality standard maximum or minimum pH level of 9.0 and 6.0, respectably. For the entire monitoring period and at all tributary stations, pH ranged from 7.62 to 8.35.

The pH profile in the water column of Blue Marsh Reservoir was consistent with a stratified lake during 2015 (Fig. 3-6). Throughout the monitoring period the upper 10-15 feet of the water column had consistently higher pH measures than the deeper waters. During most months, pH at the surface to a depth of 15 feet ranged between 7.28 and 9.03. In contrast, measures of pH in the lower water column (>15 feet deep) were consistently lower during the monitoring period and ranged between 6.80 and 7.90. The higher pH in surface waters (euphotic zone) of the reservoir is most likely a result of excessive algal blooms. As a function of increased productivity during photosynthesis, algae remove CO_2 from the water column. Dissolved CO_2 is slightly acidic; its reduction in the water column manifests an increase in pH. In early June through September of 2015, one surface water sample at Blue Marsh Reservoir station BM-6 violated the PADEP pH 9.0 standard. No other samples violated the state standard during the sampling season.

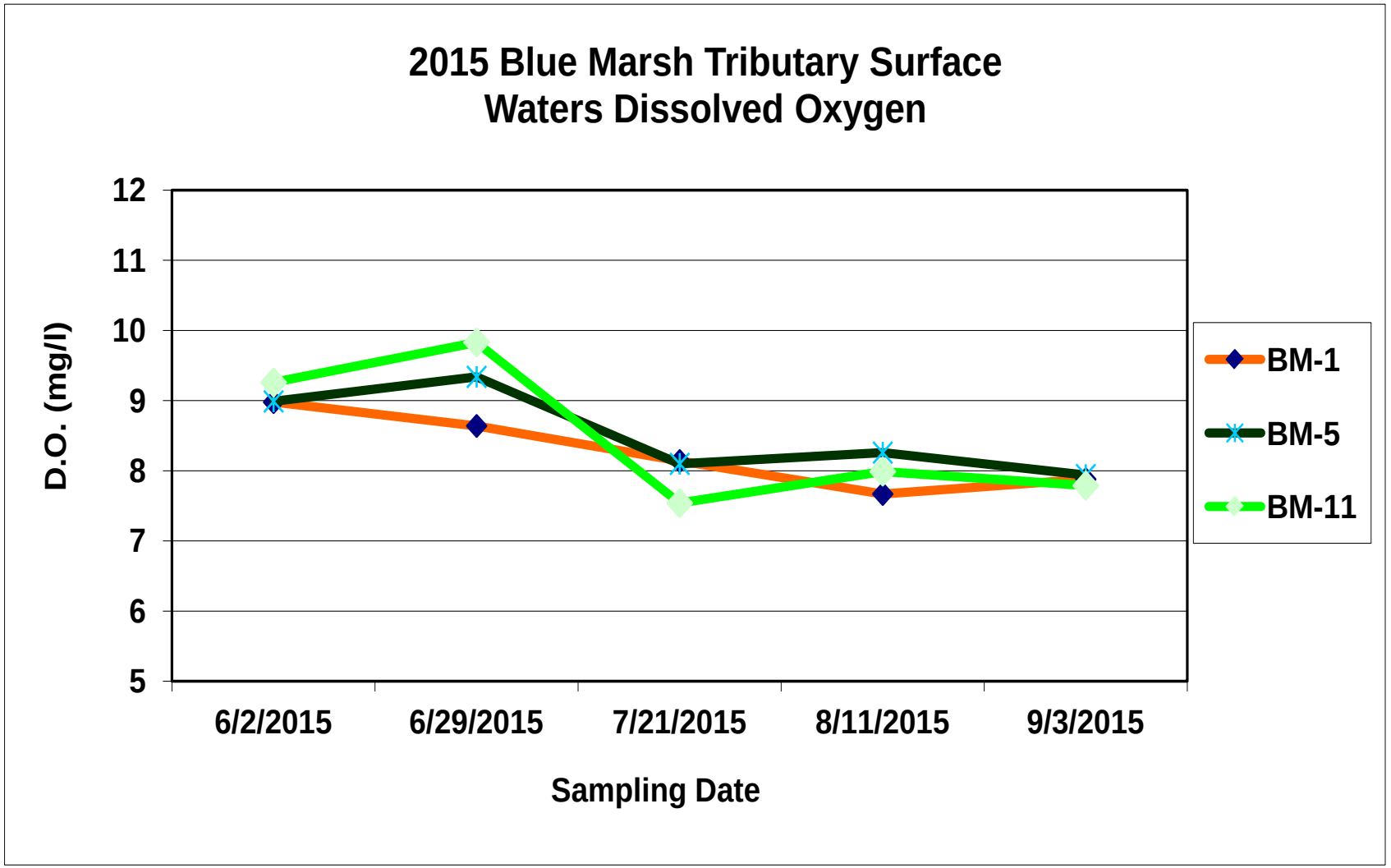

Figure 3-3. Tributary and outflow surface water dissolved oxygen concentrations measured at Blue Marsh Reservoir in 2015. (The PADEP water quality standard for DO is a minimum concentration of 5 mg/L.) See Appendix A for summary of plotted values.

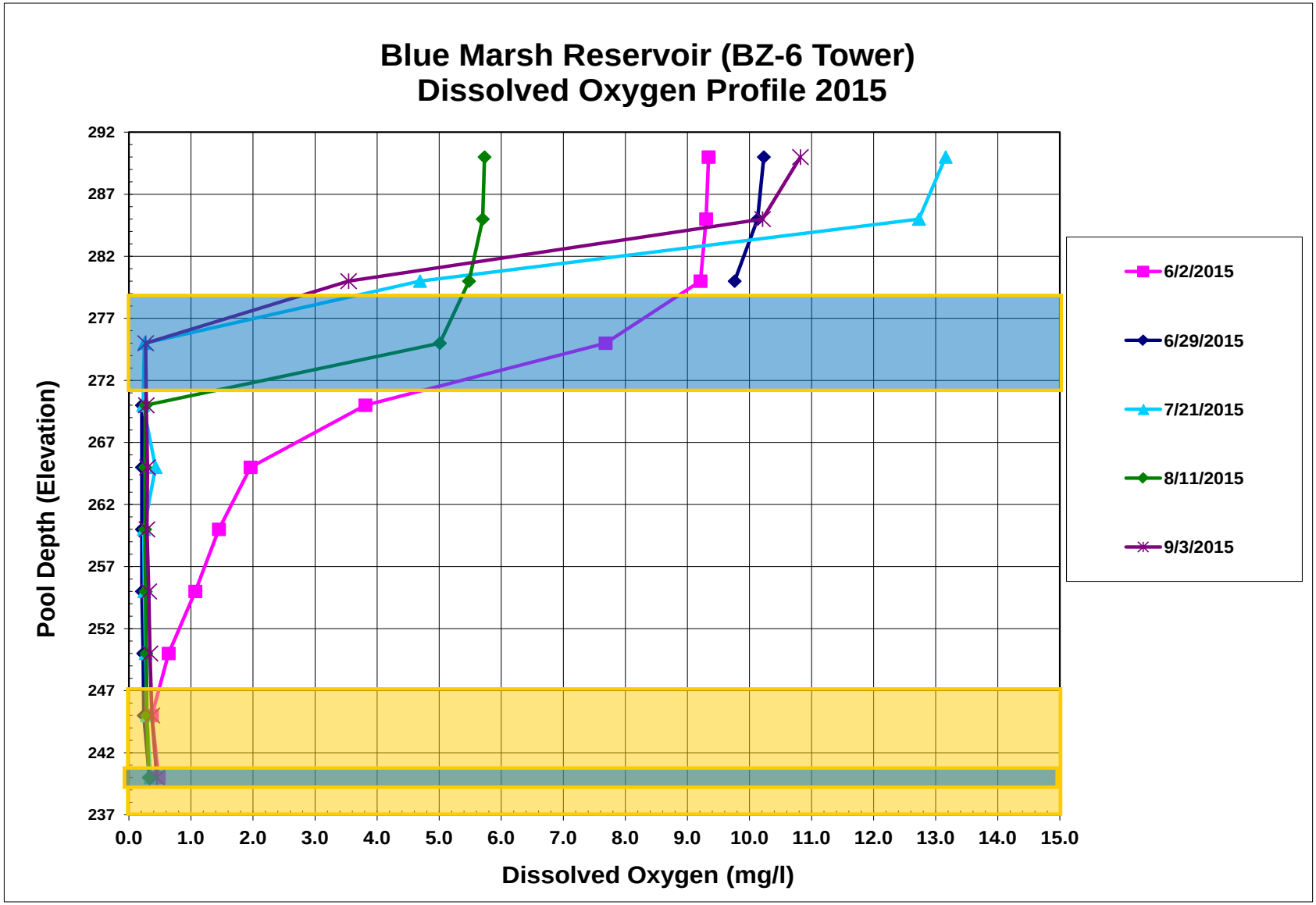

Figure 3-4. Release portal elevations and dissolved oxygen stratification at station BM-6 of Blue Marsh Reservoir in 2015. (PADEP water quality standard for DO is a minimum concentration of 5 mg/L.) See Appendix A for summary of plotted values.

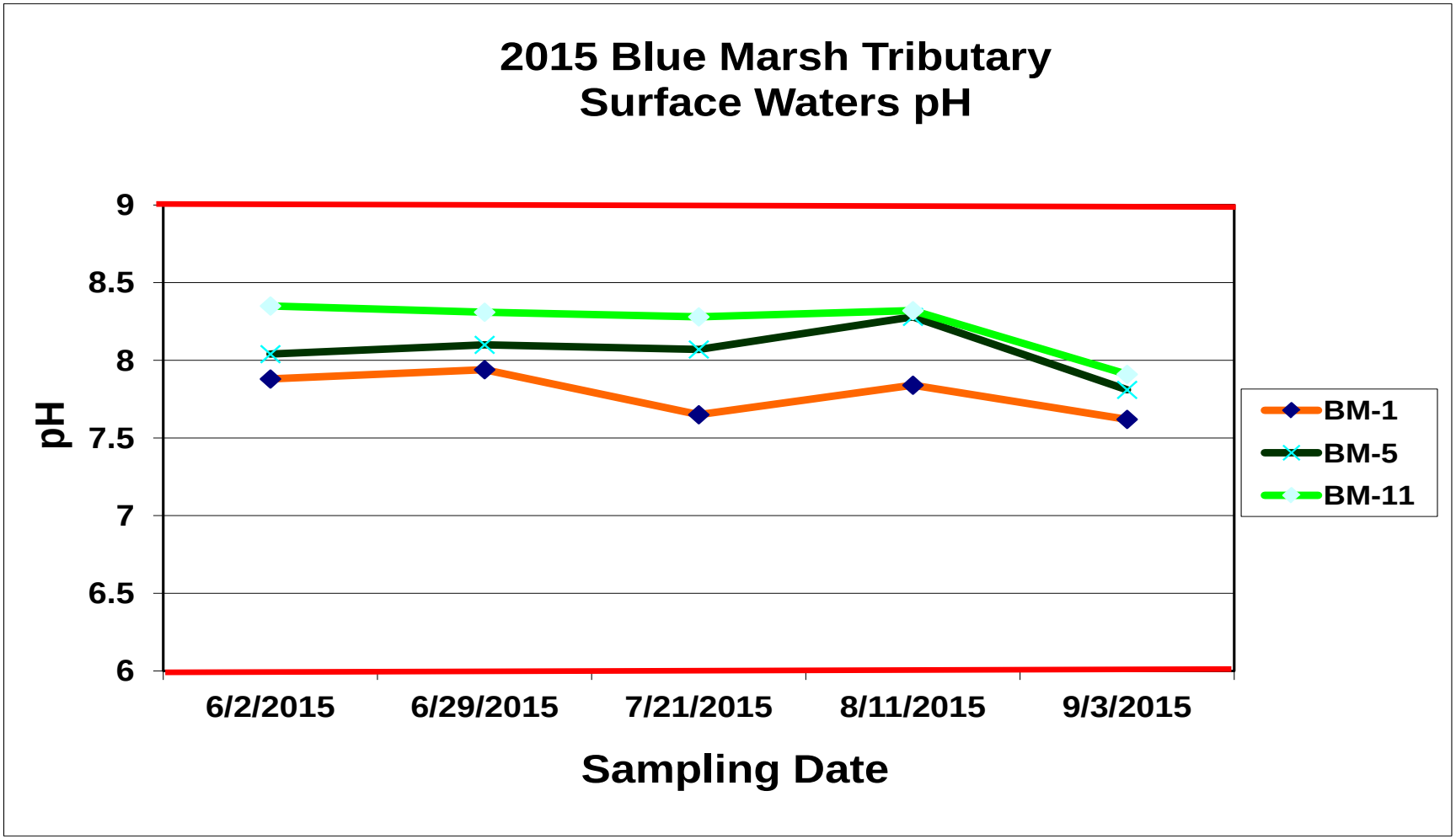

Figure 3-5. Tributary and outflow surface water pH measured at Blue Marsh Reservoir in 2015. (The PADEP water quality standard for pH is a range from 6 to 9.) See Appendix A for summary of plotted values.

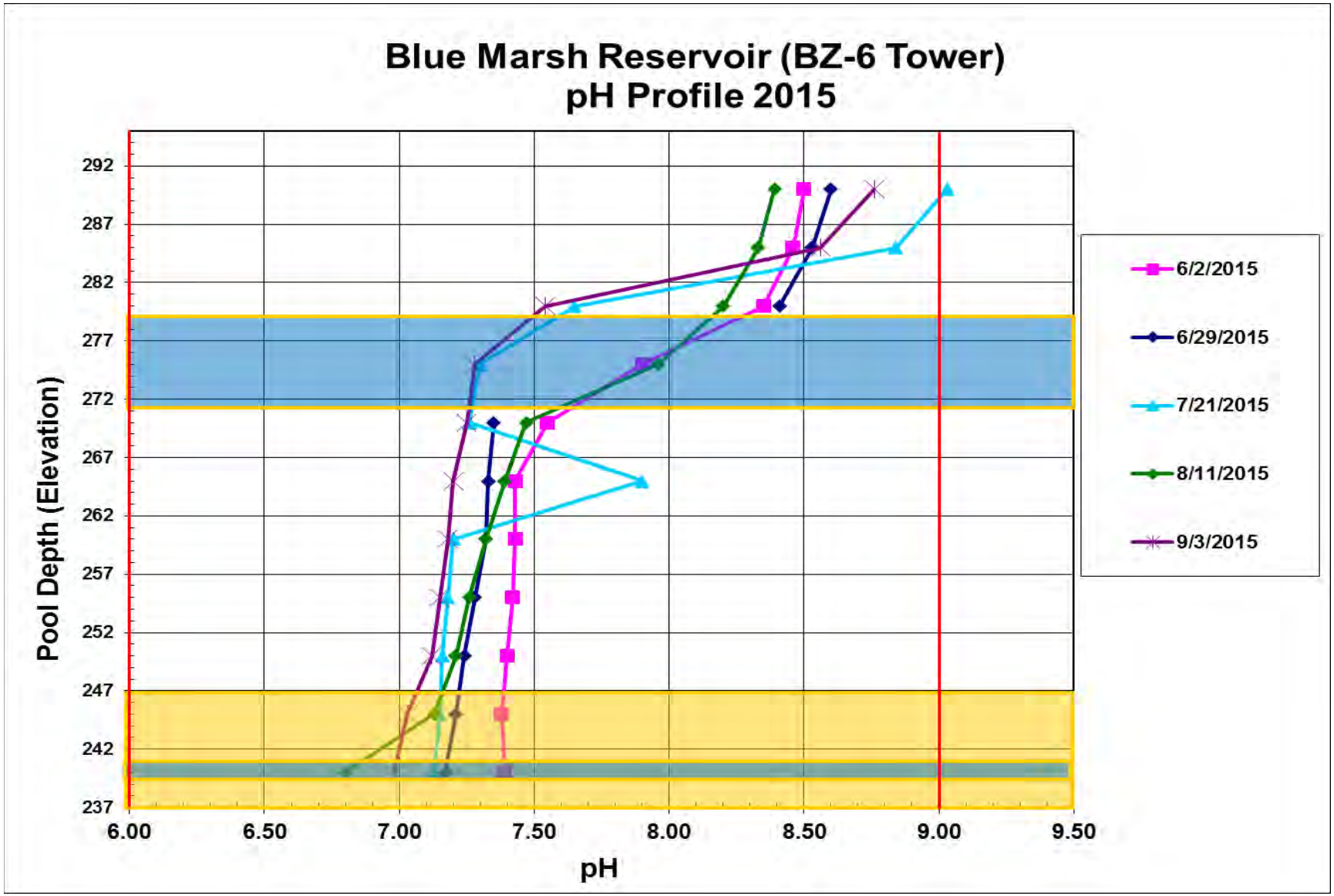

Figure 3-6. Release portal elevations and stratification of pH at station BM-6 of Blue Marsh Reservoir in 2015. (The PADEP water quality standard for pH is a range from 6 to 9.) See Appendix A for summary of plotted values.

3.2 WATER COLUMN CHEMISTRY MONITORING

The following sections describe temporal, spatial, and depth patterns for the water quality parameters measured in surface, middle, and bottom waters of Blue Marsh Reservoir during 2015 (Table 3-1).

3.2.1 Ammonia

Total Ammonia (NH3) is a measure of the most reduced inorganic form of nitrogen in water and includes dissolved ammonia and the ammonium ion. Ammonia is a small component of the nitrogen cycle but as an essential plant nutrient, it contributes to the trophic status of a water body. 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.

In general, ammonia remained relatively low in the waters of Blue Marsh Reservoir with upstream tributary and lake surface samples less than or slightly greater than the reporting limit (0.05 mg/L). Algal uptake in the surface waters may account for the low concentrations at these stations. Higher concentrations were seen in the middle and deep water samples at the deeper lake stations (Table 3-1). The maximum value recorded during the sampling season of 0.92 mg/L was measured in the lake bottom waters at station BM-9B on 21 July. Concentrations of ammonia measured at Blue Marsh Reservoir were in compliance with PADEP water quality standards during all of the 2015 sampling season. The state water quality standard for ammonia is dependent on temperature and pH (Table 3-2).

Table 3-2. PADEP ammonia nitrogen criteria (Pennsylvania Code, Title 25, Chapter 93, 1996). Specific ammonia (mg/l) criteria dependent on temperature and pH.

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

Table 3-1. Summary of surface, middle, and bottom water quality monitoring data for Blue Marsh Reservoir in 2015													
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
BM-01S	6/2/2015	109	<2	<.05	0.14	<.05	3.73	0.02	100	0.64	2.1	0.02	<3
	6/29/2015	118	2	<.05	<.05	0.08	3.45	0.08	209	0.59	2.4	0.1	<3
	7/21/2015	117	3	<.05	0.2	0.2	3.53	<.01	211	0.69	2.6	0.01	<3
	8/11/2015	120	<2	<.05	0.45	0.12	2.48	0.04	225	0.99	2	0.05	<3
	9/3/2015	110	3	<.05	0.51	0.17	2.11	<.01	209	1.28	2.6	0.1	3
	Mean	114.80	2.40	0.05	0.27	0.12	3.06	0.03	190.80	0.84	2.34	0.06	3.00
	Stdev	4.97	0.55	0.00	0.20	0.06	0.72	0.03	51.20	0.29	0.28	0.04	0.00
	Max	120.00	3.00	0.05	0.51	0.20	3.73	0.08	225.00	1.28	2.60	0.10	3.00
	Min	109.00	2.00	0.05	0.05	0.05	2.11	0.01	100.00	0.59	2.00	0.01	3.00
	No. of Det.	5.00	3.00	0.00	4.00	4.00	5.00	3.00	5.00	5.00	5.00	5.00	1.00
BM-02S	6/2/2015	99	<2	<.05	<0.05	<.05	3.82	0.02	135	0.65	2.2	0.06	<3
	6/29/2015	75	3	<.05	<0.05	<.05	3.31	0.02	172	0.83	2.8	0.04	5
	7/21/2015	74	3	<.05	<.05	<.05	2.66	0.02	159	0.89	2.8	0.03	<3
	8/11/2015	80	2	<.05	<.05	0.13	2.25	<.01	170	0.78	2.3	<.01	<3
	9/3/2015	72	3	<.05	<.05	0.13	1.56	<.01	158	0.75	2.6	0.01	<3
	Mean	80.00	2.60	0.05	0.05	0.08	2.72	0.02	158.80	0.78	2.54	0.03	3.40
	Stdev	11.02	0.55	0.00	0.00	0.04	0.88	0.01	14.72	0.09	0.28	0.02	0.89
	Max	99.00	3.00	0.05	0.05	0.13	3.82	0.02	172.00	0.89	2.80	0.06	5.00
	Min	72.00	2.00	0.05	0.05	0.05	1.56	0.01	135.00	0.65	2.20	0.01	3.00
	No. of Det.	5.00	4.00	0.00	0.00	2.00	5.00	3.00	5.00	5.00	5.00	4.00	1.00

Table 3-1 continued. Summary of surface, middle, and bottom water quality monitoring data for Blue Marsh Reservoir in 2015

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
BM-02M	6/2/2015	125	<2	<.05	0.11	<.05	4.06	<.01	212	0.61	2	<.01	<3
	6/29/2015	132	4	<.05	0.25	0.13	3.27	0.01	237	0.68	2.4	0.02	3
	7/21/2015	99	2	<.05	<.05	0.2	4.22	<.01	231	0.43	2	<.01	<3
	8/11/2015	55	4	<.05	<.05	0.06	1.83	<.01	166	1.18	1.4	0.06	9
	9/3/2015	83	5	<.05	0.11	0.32	1.83	0.01	181	0.72	2.9	0.02	<3
	Mean	98.80	3.40	0.05	0.11	0.15	3.04	0.01	205.40	0.72	2.14	0.02	4.20
	Stdev	31.45	1.34	0.00	0.08	0.11	1.16	0.00	31.00	0.28	0.55	0.02	2.68
	Max	132.00	5.00	0.05	0.25	0.32	4.22	0.01	237.00	1.18	2.90	0.06	9.00
	Min	55.00	2.00	0.05	0.05	0.05	1.83	0.01	166.00	0.43	1.40	0.01	3.00
	No. of Det.	5.00	4.00	0.00	3.00	4.00	5.00	2.00	5.00	5.00	5.00	3.00	2.00
BM-02B	6/2/2015	116	<2	<.05	0.32	0.06	2.84	0.13	190	0.72	1.8	0.13	3
	6/29/2015	133	<2	<.05	0.09	0.14	4.13	0.01	242	0.51	2.5	0.01	<3
	7/21/2015	110	3	<.05	0.24	0.26	3.54	0.02	216	0.74	2.2	0.02	3
	8/11/2015	121	3	<.05	0.08	<.05	3.46	0.08	224	1.24	2.4	0.15	68
	9/3/2015	120	6	<.05	0.45	0.16	2.43	<.01	209	1.18	2.4	0.09	28
	Mean	120.00	3.20	0.05	0.24	0.13	3.28	0.05	216.20	0.88	2.26	0.08	21.00
	Stdev	8.46	1.64	0.00	0.16	0.09	0.66	0.05	19.14	0.32	0.28	0.06	28.42
	Max	133.00	6.00	0.05	0.45	0.26	4.13	0.13	242.00	1.24	2.50	0.15	68.00
	Min	110.00	2.00	0.05	0.08	0.05	2.43	0.01	190.00	0.51	1.80	0.01	3.00
	No. of Det.	5.00	3.00	0.00	5.00	4.00	5.00	4.00	5.00	5.00	5.00	5.00	4.00

Table 3-1 continued. Summary of surface, middle, and bottom water quality monitoring data for Blue Marsh Reservoir in 2015

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
BM-05S	6/2/2015	165	<2	0.12	0.08	0.05	7.01	0.16	308	0.73	3	0.2	25
	6/29/2015	167	<2	0.07	<.05	<.05	7.05	0.08	324	0.37	2.1	0.08	6
	7/21/2015	186	<2	<.05	<.05	<.05	7.52	<.01	340	0.71	1.3	0.05	8
	8/11/2015	179	<2	<.05	<.05	<.05	6.63	0.05	332	0.43	1.8	0.07	14
	9/3/2015	93	<2	<.05	<.05	<.05	3.77	<.01	195	0.34	1.8	0.04	<3
	Mean	158.00	2.00	0.07	0.06	0.05	6.40	0.06	299.80	0.52	2.00	0.09	11.20
	Stdev	37.35	0.00	0.03	0.01	0.00	1.50	0.06	59.77	0.19	0.63	0.06	8.70
	Max	186.00	2.00	0.12	0.08	0.05	7.52	0.16	340.00	0.73	3.00	0.20	25.00
	Min	93.00	2.00	0.05	0.05	0.05	3.77	0.01	195.00	0.34	1.30	0.04	3.00
	No. of Det.	5.00	0.00	2.00	1.00	1.00	5.00	3.00	5.00	5.00	5.00	5.00	4.00
BM-06S	6/2/2015	87	<2	<.05	<.05	<.05	3.88	<.01	176	0.63	2.1	0.03	<3
	6/29/2015	84	3	<.05	<.05	<.05	3.37	<.01	190	0.62	2.6	0.04	4
	7/21/2015	68	3	<.05	<.05	<.05	2.68	<.01	168	0.68	2.7	0.02	5
	8/11/2015	79	2	<.05	<.05	0.09	2.13	<.01	177	0.86	1.5	<.01	4
	9/3/2015	69	3	<.05	<.05	0.14	1.6	<.01	169	0.68	2.4	<.01	<3
	Mean	77.40	2.60	0.05	0.05	0.08	2.73	0.01	176.00	0.69	2.26	0.02	3.80
	Stdev	8.62	0.55	0.00	0.00	0.04	0.92	0.00	8.80	0.10	0.48	0.01	0.84
	Max	87.00	3.00	0.05	0.05	0.14	3.88	0.01	190.00	0.86	2.70	0.04	5.00
	Min	68.00	2.00	0.05	0.05	0.05	1.60	0.01	168.00	0.62	1.50	0.01	3.00
	No. of Det.	5.00	4.00	0.00	0.00	2.00	5.00	0.00	5.00	5.00	5.00	3.00	3.00

Table 3-1 continued. Summary of surface, middle, and bottom water quality monitoring data for Blue Marsh Reservoir in 2015

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
BM-06M	6/2/2015	122	<2	<.05	0.15	<.05	4.03	<.01	219	0.64	2	<.01	<3
	6/29/2015	126	<2	<.05	0.1	0.17	3.75	0.01	244	0.55	2.4	0.01	<3
	7/21/2015	106	3	<.05	<0.05	0.14	3.67	0.08	205	0.64	2.4	0.1	<3
	8/11/2015	110	<2	<.05	0.21	0.08	2.5	0.03	212	0.73	2.4	0.03	<3
	9/3/2015	106	6	<.05	0.37	0.31	1.64	<.01	210	1.1	2.7	0.04	<3
	Mean	114.00	3.00	0.05	0.18	0.15	3.12	0.03	218.00	0.73	2.38	0.04	3.00
	Stdev	9.38	1.73	0.00	0.12	0.10	1.01	0.03	15.38	0.22	0.25	0.04	0.00
	Max	126.00	6.00	0.05	0.37	0.31	4.03	0.08	244.00	1.10	2.70	0.10	3.00
	Min	106.00	2.00	0.05	0.05	0.05	1.64	0.01	205.00	0.55	2.00	0.01	3.00
	No. of Det.	5.00	2.00	0.00	4.00	4.00	5.00	3.00	5.00	5.00	5.00	4.00	0.00
BM-06B	6/2/2015	132	<2	<.05	0.55	0.08	2.48	0.03	211	0.96	2	0.03	<3
	6/29/2015	132	4	0.07	0.22	0.2	3.25	0.08	252	0.92	2.5	0.09	<3
	7/21/2015	118	7	<.05	0.65	0.23	2.84	<.01	217	1.32	2.4	0.09	37
	8/11/2015	144	4	<.05	0.88	0.11	1.86	0.03	244	1.44	2.3	0.03	<3
	9/3/2015	115	14	<.05	0.81	0.1	1.94	0.07	230	1.75	2.5	0.09	9
	Mean	128.20	6.20	0.05	0.62	0.14	2.47	0.04	230.80	1.28	2.34	0.07	11.00
	Stdev	11.80	4.71	0.01	0.26	0.07	0.59	0.03	17.37	0.35	0.21	0.03	14.76
	Max	144.00	14.00	0.07	0.88	0.23	3.25	0.08	252.00	1.75	2.50	0.09	37.00
	Min	115.00	2.00	0.05	0.22	0.08	1.86	0.01	211.00	0.92	2.00	0.03	3.00
	No. of Det.	5.00	4.00	1.00	5.00	5.00	5.00	4.00	5.00	5.00	5.00	5.00	2.00

Table 3-1 continued. Summary of surface, middle, and bottom water quality monitoring data for Blue Marsh Reservoir in 2015

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
BM-07S	6/2/2015	102	<2	<.05	0.1	<.05	3.84	<.01	200	0.68	2.3	0.05	<3
	6/29/2015	86	4	<.05	<.05	<.05	3.26	0.03	193	0.82	2.9	0.05	5
	7/21/2015	62	4	<.05	<.05	<.05	2.62	0.01	168	0.95	2.7	0.04	9
	8/11/2015	69	3	<.05	<.05	0.11	2.03	0.04	171	0.98	2.7	0.04	6
	9/3/2015	77	3	<.05	<.05	0.12	1.59	<.01	180	0.71	2.5	<.01	4
	Mean	79.20	3.20	0.05	0.06	0.08	2.67	0.02	182.40	0.83	2.62	0.04	5.40
	Stdev	15.58	0.84	0.00	0.02	0.04	0.91	0.01	13.83	0.14	0.23	0.02	2.30
	Max	102.00	4.00	0.05	0.10	0.12	3.84	0.04	200.00	0.98	2.90	0.05	9.00
	Min	62.00	2.00	0.05	0.05	0.05	1.59	0.01	168.00	0.68	2.30	0.01	3.00
	No. of Det.	5.00	4.00	0.00	1.00	2.00	5.00	3.00	5.00	5.00	5.00	4.00	4.00
BM-07M	6/2/2015	160	<2	<.05	0.17	<.05	4.3	0.04	239	0.73	2.2	0.09	<3
	6/29/2015	121	<2	<.05	0.08	<.05	4.48	<.01	218	0.52	2.7	<.01	<3
	7/21/2015	118	5	<.05	0.14	0.12	4.14	<.01	250	0.66	2.1	0.04	4
	8/11/2015	76	3	<.05	<.05	0.14	2.15	0.01	186	0.93	2.7	0.01	7
	9/3/2015	79	2	<.05	<.05	0.12	2.11	<.01	190	0.76	2.4	0.07	<3
	Mean	110.80	2.80	0.05	0.10	0.10	3.44	0.02	216.60	0.72	2.42	0.04	4.00
	Stdev	34.64	1.30	0.00	0.05	0.04	1.20	0.01	28.56	0.15	0.28	0.04	1.73
	Max	160.00	5.00	0.05	0.17	0.14	4.48	0.04	250.00	0.93	2.70	0.09	7.00
	Min	76.00	2.00	0.05	0.05	0.05	2.11	0.01	186.00	0.52	2.10	0.01	3.00
	No. of Det.	5.00	3.00	0.00	3.00	3.00	5.00	2.00	5.00	5.00	5.00	4.00	2.00

Table 3-1 continued. Summary of surface, middle, and bottom water quality monitoring data for Blue Marsh Reservoir in 2015

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
BM-07B	6/2/2015	116	<2	<.05	0.24	<.05	3.22	0.12	185	0.86	2.1	0.12	51
	6/29/2015	107	<2	<.05	0.11	<.05	4.41	<.01	242	0.6	2.2	0.06	21
	7/21/2015	104	3	<.05	0.17	0.09	3.38	<.01	222	1.14	2.2	0.11	49
	8/11/2015	126	<2	<.05	0.5	0.12	2.81	<.01	242	1.23	2.4	0.06	7
	9/3/2015	110	4	<.05	0.08	0.34	2.74	0.02	222	0.87	2.3	0.05	25
	Mean	112.60	2.60	0.05	0.22	0.13	3.31	0.03	222.60	0.94	2.24	0.08	30.60
	Stdev	8.71	0.89	0.00	0.17	0.12	0.67	0.05	23.28	0.25	0.11	0.03	18.94
	Max	126.00	4.00	0.05	0.50	0.34	4.41	0.12	242.00	1.23	2.40	0.12	51.00
	Min	104.00	2.00	0.05	0.08	0.05	2.74	0.01	185.00	0.60	2.10	0.05	7.00
	No. of Det.	5.00	2.00	0.00	5.00	3.00	5.00	2.00	5.00	5.00	5.00	5.00	5.00
BM-08S	6/2/2015	95	<2	<.05	0.14	<.05	3.62	0.03	208	0.72	2.4	0.04	<3
	6/29/2015	70	4	<.05	<0.05	<.05	3.14	<.01	198	0.68	2.8	0.04	3
	7/21/2015	57	4	<.05	<.05	<.05	2.52	<.01	158	1.01	3.1	0.02	7
	8/11/2015	65	4	<.05	<.05	0.07	1.8	<.01	160	1.1	2.7	0.04	7
	9/3/2015	80	3	<.05	<.05	0.11	1.59	<.01	177	0.81	2.8	<.01	<3
	Mean	73.40	3.40	0.05	0.07	0.07	2.53	0.01	180.20	0.86	2.76	0.03	4.60
	Stdev	14.67	0.89	0.00	0.04	0.03	0.86	0.01	22.37	0.18	0.25	0.01	2.19
	Max	95.00	4.00	0.05	0.14	0.11	3.62	0.03	208.00	1.10	3.10	0.04	7.00
	Min	57.00	2.00	0.05	0.05	0.05	1.59	0.01	158.00	0.68	2.40	0.01	3.00
	No. of Det.	5.00	4.00	0.00	1.00	2.00	5.00	1.00	5.00	5.00	5.00	4.00	3.00

Table 3-1 continued. Summary of surface, middle, and bottom water quality monitoring data for Blue Marsh Reservoir in 2015

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
BM-08M	6/2/2015	103	3	<.05	0.12	<.05	3.63	0.05	203	0.83	2.4	0.09	<3
	6/29/2015	101	<2	<.05	0.08	<.05	4.01	0.04	250	0.63	2.4	0.05	<3
	7/21/2015	68	4	<.05	0.05	<.05	2.71	<.01	181	1.06	2.4	0.08	5
	8/11/2015	63	3	<.05	<.05	0.09	1.9	0.01	171	1.03	2.6	0.02	6
	9/3/2015	85	3	<.05	<.05	0.09	1.9	<.01	186	0.87	2.4	0.03	4
	Mean	84.00	3.00	0.05	0.07	0.07	2.83	0.02	198.20	0.88	2.44	0.05	4.20
	Stdev	18.36	0.71	0.00	0.03	0.02	0.97	0.02	31.19	0.17	0.09	0.03	1.30
	Max	103.00	4.00	0.05	0.12	0.09	4.01	0.05	250.00	1.06	2.60	0.09	6.00
	Min	63.00	2.00	0.05	0.05	0.05	1.90	0.01	171.00	0.63	2.40	0.02	3.00
	No. of Det.	5.00	4.00	0.00	3.00	2.00	5.00	3.00	5.00	5.00	5.00	5.00	3.00
BM-08B	6/2/2015	115	<2	<.05	0.25	0.06	3.64	<.01	245	0.79	2.1	<.01	10
	6/29/2015	90	2	0.06	0.08	<.05	3.3	0.08	240	0.73	2.9	0.1	29
	7/21/2015	109	<2	<.05	0.24	0.07	3.41	<.01	226	0.92	2.2	0.03	10
	8/11/2015	54	3	<.05	<.05	0.08	1.86	<.01	175	1.06	2.6	0.04	5
	9/3/2015	100	4	<.05	0.3	0.09	1.93	<.01	210	1.79	2.4	0.03	243
	Mean	93.60	2.60	0.05	0.18	0.07	2.83	0.02	219.20	1.06	2.44	0.04	59.40
	Stdev	24.07	0.89	0.00	0.11	0.02	0.86	0.03	28.21	0.43	0.32	0.03	103.05
	Max	115.00	4.00	0.06	0.30	0.09	3.64	0.08	245.00	1.79	2.90	0.10	243.00
	Min	54.00	2.00	0.05	0.05	0.05	1.86	0.01	175.00	0.73	2.10	0.01	5.00
	No. of Det.	5.00	3.00	1.00	4.00	4.00	5.00	1.00	5.00	5.00	5.00	4.00	5.00

Table 3-1 continued. Summary of surface, middle, and bottom water quality monitoring data for Blue Marsh Reservoir in 2015

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
BM-09S	6/2/2015	112	<2	<.05	0.12	<.05	3.9	<.01	227	0.75	2.2	0.03	<3
	6/29/2015	74	4	<.05	<.05	<.05	3.29	<.01	208	0.75	2.6	0.1	<3
	7/21/2015	56	3	<.05	<.05	<.05	2.54	<.01	174	0.96	5.5	0.01	7
	8/11/2015	62	4	<.05	<.05	0.08	1.97	<.01	170	1.02	3	0.03	5
	9/3/2015	73	3	<.05	<.05	0.11	1.6	0.03	182	0.75	2.6	0.04	<3
	Mean	75.40	3.20	0.05	0.06	0.07	2.66	0.01	192.20	0.85	3.18	0.04	4.20
	Stdev	21.81	0.84	0.00	0.03	0.03	0.94	0.01	24.44	0.13	1.33	0.03	1.79
	Max	112.00	4.00	0.05	0.12	0.11	3.90	0.03	227.00	1.02	5.50	0.10	7.00
	Min	56.00	2.00	0.05	0.05	0.05	1.60	0.01	170.00	0.75	2.20	0.01	3.00
	No. of Det.	5.00	4.00	0.00	1.00	2.00	5.00	1.00	5.00	5.00	5.00	5.00	2.00
BM-09M	6/2/2015	117	4	<.05	0.17	0.05	3.99	0.04	236	0.92	2.5	0.15	5
	6/29/2015	108	3	<.05	0.05	<.05	4	0.02	239	0.68	2.5	0.03	3
	7/21/2015	110	<2	<.05	0.13	<.05	3.96	<.01	215	0.77	2.2	0.03	6
	8/11/2015	65	3	<.05	<.05	0.09	1.99	0.04	164	0.98	2.8	0.05	7
	9/3/2015	79	3	<.05	<.05	0.11	1.78	<.01	173	0.81	2.4	0.12	<3
	Mean	95.80	3.00	0.05	0.09	0.07	3.14	0.02	205.40	0.83	2.48	0.08	4.80
	Stdev	22.53	0.71	0.00	0.06	0.03	1.15	0.02	35.08	0.12	0.22	0.06	1.79
	Max	117.00	4.00	0.05	0.17	0.11	4.00	0.04	239.00	0.98	2.80	0.15	7.00
	Min	65.00	2.00	0.05	0.05	0.05	1.78	0.01	164.00	0.68	2.20	0.03	3.00
	No. of Det.	5.00	4.00	0.00	3.00	3.00	5.00	3.00	5.00	5.00	5.00	5.00	4.00

Table 3-1 continued. Summary of surface, middle, and bottom water quality monitoring data for Blue Marsh Reservoir in 2015

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
BM-09B	6/2/2015	120	<2	<.05	0.3	<.05	2.57	0.06	230	0.81	1.9	0.09	23
	6/29/2015	105	2	0.1	0.06	<.05	3.93	0.06	253	0.76	4	0.12	32
	7/21/2015	135	4	<.05	0.92	0.1	2.69	0.06	249	2.11	2.4	0.19	57
	8/11/2015	108	2	<.05	0.26	0.1	2.97	<.01	230	1.11	2.8	0.06	13
	9/3/2015	142	4	<.05	0.42	0.07	2.96	0.01	274	1.51	2.2	0.14	33
	Mean	122.00	2.80	0.06	0.39	0.07	3.02	0.04	247.20	1.26	2.66	0.12	31.60
	Stdev	16.26	1.10	0.02	0.32	0.03	0.54	0.03	18.35	0.56	0.82	0.05	16.33
	Max	142.00	4.00	0.10	0.92	0.10	3.93	0.06	274.00	2.11	4.00	0.19	57.00
	Min	105.00	2.00	0.05	0.06	0.05	2.57	0.01	230.00	0.76	1.90	0.06	13.00
	No. of Det.	5.00	4.00	1.00	5.00	3.00	5.00	4.00	5.00	5.00	5.00	5.00	5.00
BM-10S	6/2/2015	127	<2	<.05	0.1	0.05	3.9	<.01	232	0.91	2.5	0.13	8
	6/29/2015	72	4	<.05	<.05	<.05	3.15	<.01	213	0.9	2.8	0.03	5
	7/21/2015	57	5	<.05	<.05	<.05	2.44	<.01	163	1.09	3	0.08	9
	8/11/2015	63	4	0.05	<.05	0.06	1.8	<.01	172	1.17	2.9	0.05	8
	9/3/2015	79	3	<.05	<.05	0.1	1.56	<.01	200	1.01	2.7	0.06	<3
	Mean	79.60	3.60	0.05	0.06	0.06	2.57	0.01	196.00	1.02	2.78	0.07	6.60
	Stdev	27.80	1.14	0.00	0.02	0.02	0.97	0.00	28.57	0.12	0.19	0.04	2.51
	Max	127.00	5.00	0.05	0.10	0.10	3.90	0.01	232.00	1.17	3.00	0.13	9.00
	Min	57.00	2.00	0.05	0.05	0.05	1.56	0.01	163.00	0.90	2.50	0.03	3.00
	No. of Det.	5.00	4.00	1.00	1.00	3.00	5.00	0.00	5.00	5.00	5.00	5.00	4.00

Table 3-1 continued. Summary of surface, middle, and bottom water quality monitoring data for Blue Marsh Reservoir in 2015

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
BM-10M	6/2/2015	116	3	<.05	0.09	0.05	3.89	0.1	207	0.84	2.6	0.1	5
	6/29/2015	79	3	<.05	<.05	<.05	3.37	<.01	213	0.8	2.9	0.07	7
	7/21/2015	151	2	<.05	0.15	<.05	4.88	0.02	272	0.96	2	0.14	28
	8/11/2015	55	4	<.05	<.05	0.06	1.83	<.01	166	1.18	1.4	0.06	9
	9/3/2015	93	4	<.05	<.05	0.08	2.51	0.03	220	0.87	2.2	0.09	6
	Mean	98.80	3.20	0.05	0.08	0.06	3.30	0.03	215.60	0.93	2.22	0.09	11.00
	Stdev	36.62	0.84	0.00	0.04	0.01	1.19	0.04	37.89	0.15	0.58	0.03	9.62
	Max	151.00	4.00	0.05	0.15	0.08	4.88	0.10	272.00	1.18	2.90	0.14	28.00
	Min	55.00	2.00	0.05	0.05	0.05	1.83	0.01	166.00	0.80	1.40	0.06	5.00
	No. of Det.	5.00	5.00	0.00	2.00	3.00	5.00	3.00	5.00	5.00	5.00	5.00	5.00
BM-10B	6/2/2015	82	<2	0.16	0.25	0.07	3.81	0.26	223	1.63	6.2	0.51	108
	6/29/2015	105	2	0.09	<.05	<.05	4.29	0.11	249	0.78	4.1	0.15	48
	7/21/2015	136	<2	<.05	0.25	<.05	5.32	<.01	298	1.09	1.9	0.16	61
	8/11/2015	121	3	<.05	0.08	<.05	3.46	0.08	224	1.24	2.4	0.15	68
	9/3/2015	125	3	<.05	<.05	<.05	4.27	<.01	282	1.55	2	0.3	116
	Mean	113.80	2.40	0.08	0.14	0.05	4.23	0.09	255.20	1.26	3.32	0.25	80.20
	Stdev	20.97	0.55	0.05	0.10	0.01	0.70	0.10	33.91	0.35	1.84	0.16	30.04
	Max	136.00	3.00	0.16	0.25	0.07	5.32	0.26	298.00	1.63	6.20	0.51	116.00
	Min	82.00	2.00	0.05	0.05	0.05	3.46	0.01	223.00	0.78	1.90	0.15	48.00
	No. of Det.	5.00	3.00	2.00	3.00	1.00	5.00	3.00	5.00	5.00	5.00	5.00	5.00

Table 3-1 continued. Summary of surface, middle, and bottom water quality monitoring data for Blue Marsh Reservoir in 2015

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
BM-11S	6/2/2015	42	<2	0.07	0.05	<.05	1.85	0.12	94	1.04	3.9	0.31	74
	6/29/2015	32	<2	0.1	<.05	<.05	3.39	0.12	138	0.62	2.9	0.14	113
	7/21/2015	101	<2	<.05	<.05	<.05	4.59	0.1	231	0.61	2.1	0.49	29
	8/11/2015	47	<2	<.05	<.05	<.05	2.18	0.05	145	0.55	2.8	0.05	4
	9/3/2015	117	2	<.05	<.05	<.05	3.32	<.01	255	0.87	2.3	0.08	12
	Mean	67.80	2.00	0.06	0.05	0.05	3.07	0.08	172.60	0.74	2.80	0.21	46.40
	Stdev	38.41	0.00	0.02	0.00	0.00	1.09	0.05	67.71	0.21	0.70	0.18	46.05
	Max	117.00	2.00	0.10	0.05	0.05	4.59	0.12	255.00	1.04	3.90	0.49	113.00
	Min	32.00	2.00	0.05	0.05	0.05	1.85	0.01	94.00	0.55	2.10	0.05	4.00
	No. of Det.	5.00	1.00	2.00	1.00	0.00	5.00	4.00	5.00	5.00	5.00	5.00	5.00

3.2.2 Nitrite and Nitrate

Nitrite (NO2) is a measure of a form of nitrogen that occurs as an intermediate in the nitrogen cycle. It is unstable and can rapidly be oxidized to nitrate or reduced to nitrogen gas. Nitrite is a source of nutrients for plants and can be toxic to aquatic life in relatively low concentrations. Nitrite concentrations were low at Blue Marsh Reservoir during 2015 (Table 3-1). Concentrations ranged from less than the reporting limit of 0.05 mg/L to 0.34 mg/L during the sampling season.

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 concentrations were similar across stations in Blue Marsh Reservoir in 2015 except for the consistently higher concentrations measured at upstream tributary station BM-5S (Table 3-1). Concentrations at all sampling locations and depths averaged 3.17 mg/L and ranged from 1.56 to 7.52 mg/L. Throughout the sampling period, concentrations at surface tributary station BM-5S averaged 6.40 mg/L with a maximum concentration of 7.52 mg/L in July and a minimum measure of 3.77 mg/L in September. It appears that the elevated nitrate concentrations at BM-5S are originating from somewhere in the Tulpehocken Creek watershed.

Concentrations of nitrate and nitrite measured at Blue Marsh Reservoir were in compliance with PADEP water quality standards during 2015. The state water quality standard for nitrogen from nitrite and nitrate sources is a summed concentration of not more than 10 mg/L. Summed concentrations at all stations were less than the State standard. The highest nitrogen summed concentration of 7.57 mg/L occurred in the surface waters at station BM-5S on 21 July.

3.2.3 Total Kjeldahl Nitrogen

Total Kjeldahl nitrogen (TKN) is a measure of organic nitrogen that is inclusive of ammonia. Organic nitrogen is not immediately available for biological activity and is therefore not available for plant growth until decomposition to inorganic form occurs. In general, TKN remained low but variable throughout the water column of Blue Marsh Reservoir in 2015 (Table 3-1). Concentrations measured at all stations and depths of the reservoir and tributaries ranged from 0.34 mg/L to 2.11 mg/L. Higher readings were typically seen in the deeper waters of the reservoir.

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. Total phosphorus in the watershed and lake body of Blue Marsh Reservoir was frequently measured at concentrations well above this standard during 2015 (Table 3-1). Bottom waters within the lake routinely had the highest measured concentrations. This may be a direct result of phosphorus release from bottom sediments during anoxic conditions experienced at Blue Marsh annually. In 2015, only 14 of the 105 samples measured for total phosphorus at Blue Marsh Reservoir, including its tributaries, were less than the EPA guideline. The single sample values for all stations and depths ranged from 0.51 mg/L to <0.01 mg/L. Agriculture and other land use found in the watershed contribute to the historic and current elevated total phosphorus level in Blue Marsh reservoir.

3.2.5 Total Dissolved Phosphorus

Total dissolved phosphorus (DISS P) in the water column of Blue Marsh Reservoir was consistently low during 2015. Nine out of the 105 samples collected during the sampling season were greater than the laboratory reporting limit of 0.05 mg/L (Table 3-1). The single sample values for all stations and depths ranged from 0.16 mg/L to <0.05 mg/L. Most stations showed their highest readings during the June sampling period.

3.2.6 Dissolved Phosphate

Orthophosphate (PO4) is a measure of the inorganic oxidized form of soluble phosphorus. This form of phosphorus is the most readily available for uptake during photosynthesis. In freshwater environments, dissolved phosphate is usually a limiting nutrient and is readily taken up by freshwater plants and algae. Dissolved phosphate in the surface waters of Blue Marsh Reservoir were low during 2015 (Table 3-1) with the majority of higher sample results occurring in the deeper waters of the reservoir and at upstream tributaries. Algal uptake during photosynthesis likely contributed to lower concentrations. The single sample values for all stations and depths ranged from 0.26 mg/L to <0.01 mg/L (laboratory reporting limit).

3.2.7 Total Dissolved Solids

Total dissolved solids (TDS) are a measure of the amount of non-filterable dissolved material in the water. Dissolved salts such as sulfate, magnesium, chloride, and sodium contribute to elevated levels. Total dissolved solids (TDS) in the water column of Blue Marsh Reservoir at all stations and depths ranged from 340 mg/L to 94 mg/L in 2015 (Table 3-1). Upstream tributary station BM-5S had the highest single sample concentration of 340 mg/L on 21 July and the highest sampling station seasonal average of 300 mg/L. The state water quality standard for TDS is a maximum concentration of 500 mg/L. Concentrations of total dissolved solids measured at Blue Marsh Reservoir did not exceed the PADEP water quality standard during 2015.

3.2.8 Total Suspended Solids

Total suspended solids (TSS) are a measure of the amount of filterable particulate matter that is suspended within the water column. High concentrations increase the turbidity of the water and can hinder photosynthetic activity, result in damage to fish gills, and cause impairment to spawning habitat (smothering). Total suspended solids in the waters of Blue Marsh Reservoir were generally low during the 2015 sampling period (Table 3-1). Sample results at all stations and depths ranged from 243 mg/L to <3 mg/L (laboratory reporting limit). The maximum and consistently higher TSS readings were taken in the bottom water samples at reservoir deep water sampling locations. Uncharacteristically high single sample readings from bottom water samples can be attributed to sample collection error. On occasion, bottom sediments are re-suspended during the sample collection process and are inadvertently included in the sample. All elevated sample results occurred at bottom water sampling stations and likely associated with sediment disturbance. The Pennsylvania Department of Environmental Protection (PADEP) has not issued a water quality standard for TSS.

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.

BOD in the water column of Blue Marsh Reservoir, for the most part, was relatively low during the 2015 sampling period (Table 3-1) with many concentrations less than the laboratory reporting limit of 2.0 mg/L primarily in the early Summer time period. The BOD at all monitoring stations and depths ranged from <2.0 mg/L to 14.0 mg/L for the sampling period. Seven of the 105 samples collected were ≥5.0 mg/L with the remaining 98 samples within the <2 mg/L to 4.0 mg/L range. Based on the comprehensive BOD results from 2015, it is inferred that upstream tributaries of the reservoir remained very clean with little biodegradeable waste throughout the sampling season. It is also inferred that Blue Marsh Reservoir range from very clean with little biodegradable wastes in Spring and transition to moderately clean waters with some biodegradable wastes in Summer and Fall. The Pennsylvania Department of Environmental Protection (PADEP) does not issue a water quality standard for BOD.

3.2.10 Alkalinity

Alkalinity 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.

Throughout the monitoring period in 2015, concentrations at all stations and depths for Blue Marsh Reservoir ranged from 32 mg/L $CaCO_3$ to 186 mg/L $CaCO_3$ (Table 3-1). Upstream tributary station BM-5S maintained the highest seasonal mean concentration of 158 mg/L $CaCO_3$. Whereas, upstream tributary station BM-11S maintained the lowest seasonal mean concentration of 67.80 mg/L $CaCO_3$. Concentrations of alkalinity measured at Blue Marsh Reservoir were in compliance with PADEP water quality standards for all samples collected during 2015.

3.2.11 Total Organic Carbon

Total organic carbon (TOC) is a measurement of the amount of dissolved and particulate carbon that is bound in organic compounds. TOC can be derived from decaying vegetation, bacterial growth, and metabolic activities of living organisms. The bulk of organic carbon in water is composed of humic substances and partly degraded animal and plant materials. Other sources of TOC can include agricultural chemicals such as herbicides and insecticides and also wastewater treatment plants. The amount of carbon in a freshwater stream is an indicator of the organic character of a water body. High organic content can increase the growth of microorganisms which contribute to the depletion of oxygen. Total organic carbon concentrations in the water column and tributaries of Blue Marsh Reservoir were low during 2015 (Table 3-1). Concentrations of TOC at all stations and depths ranged from 1.3 mg/L to 6.2 mg/L with an average concentration of 2.51 mg/L.

3.2.12 Chlorophyll *a*

Chlorophyll a is the measure of the plant chlorophyll “a” primary pigment which helps plants get energy from light. It is found in most plants, algae, and cyanobacteria. Chlorophyll a measures increase in relation to algal densities in a water body. Chlorophyll *a* is used as a measure of algal biomass. In 2015, the average concentration during the monitoring period for lake surface waters (<15 feet) at lake station BM-6 was 10.47 ug/L. (Appendix A). For all reservoir sampling stations, a maximum concentration of 31.9 ug/L was measured in the surface waters at lake station BM-7 in late June and the minimum concentration of 0.9 ug/L was measured at the upstream surface water station BM-5S in late June.

3.3 TROPHIC STATE DETERMINATION

Carlson’s (1977) trophic state index (TSI) is a method of quantitatively expressing the magnitude of eutrophication for a lake. The trophic state analysis calculates separate indices for eutrophication based on measures of total phosphorus, chlorophyll *a*, and secchi disk 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: oligotrophic (TSI <40), mesotrophic (TSI >40), and eutrophic (TSI >50).

During 2015, TSI's calculated for measures of secchi disk depth classified Blue Marsh Reservoir as eutrophic in early June (50.38), late June (54.16), July (55.68), August (57.99) and September (56.78) (Fig. 3-7). TSI's calculated for measures of total phosphorus classified Blue Marsh Reservoir as eutrophic in early June (53.20) and late June (57.34), mesotrophic in July (47.35), and oligotrophic in August (37.35) and September (37.35). TSI's calculated for measures of chlorophyll *a* classified Blue Marsh Reservoir as mesotrophic in early June (47.96), and eutrophic in late June (58.41), July (54.45), August (52.76) and September (54.41). Carlson (1977) warned against averaging TSI values estimated for different parameters, and instead suggested giving priority to chlorophyll *a* in the summer and to phosphorus in the spring, fall, and winter. With this in mind, the trophic state of the reservoir based on TSI's was eutrophic in all months sampled but approaching mesotrophic conditions in to September.

The EPA (1983) also provides criteria for defining the trophic conditions of lakes of the North Temperate Zone based on concentrations of total phosphorus, chlorophyll *a*, and secchi depth (Table 3-3). Based on these ranges of classification, Blue Marsh Reservoir was eutrophic throughout most of the 2015 monitoring period and transitioning to a mestrophic condition into the fall season.

Table 3-3. EPA trophic classification criteria and average monthly measures for Blue Marsh Reservoir in 2015

Water Quality Variable	Oligo-trophic	Meso-trophic	Eutrophic	02 June	29 June	21 July	11 August	03 September
Total phos. (ppb)	<10	10-20	>20	30	40	20	<10	<10
Chlorophyll (ppb)	<4	4-10	>10	5.87	17.03	11.97	9.57	11.33
Secchi depth (m)	>4	2-4	<2	1.95	1.5	1.35	1.15	1.25

3.4 RESERVOIR COLIFORM BACTERIA MONITORING

Two forms of coliform bacteria contamination were monitored in the tributary and lake surface waters at Blue Marsh Reservoir during 2015 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 contamination of Blue Marsh Reservoir was relatively high at most stations during the 2015 monitoring period and exceed the sample detection limit of 2400 colonies/100-ml on 19 occasions throughout the sampling season. In all months sampled, upstream tributary stations BM-5S and BM-11S exceeded the detection limit. Total coliform values for all stations ranged from 140 colonies/100-ml to greater than the detection limit of 2400 colonies/100-ml. Bacteria in natural waters are common and their presence in the sample is not necessarily a

human health concern. No State or federal standards exist for total coliform for water contact recreation.

The PADEP standard for fecal coliform bacteria during the swimming season (from 1 May to 30 September) is a geometric mean not greater than 200 colonies/100-ml calculated for not less than five fecal coliform samples collected over a consecutive thirty day period. Given that our regular monitoring was completed on one day as grab samples, single sample results were then compared to the Pennsylvania Department of Health single sample standard of <1000 colonies/100-ml. Fecal coliform contamination in surface waters of Blue Marsh Reservoir during 2015 ranged from less than the 2 clns/100-ml detection limit to a high of 14,000 clns/100-ml. Elevated bacteria readings were most often seen in upstream tributary surface waters to include stations BM-11S and BM-5S. The fecal coliform samples collected at Blue Marsh Reservoir did exceed the State single sample standard in 2015 on 7 occasions. The elevated counts at station BM-5S, BM-11S, and BM-10S correlate with rainstorm and runoff events in the watershed during the sampling period. Water contact recreation, such as water skiing, is permitted at Blue Marsh Reservoir. The Corps recreational swimming beach is monitored and managed separately from the monthly routine water quality sampling (see Section 3.5).

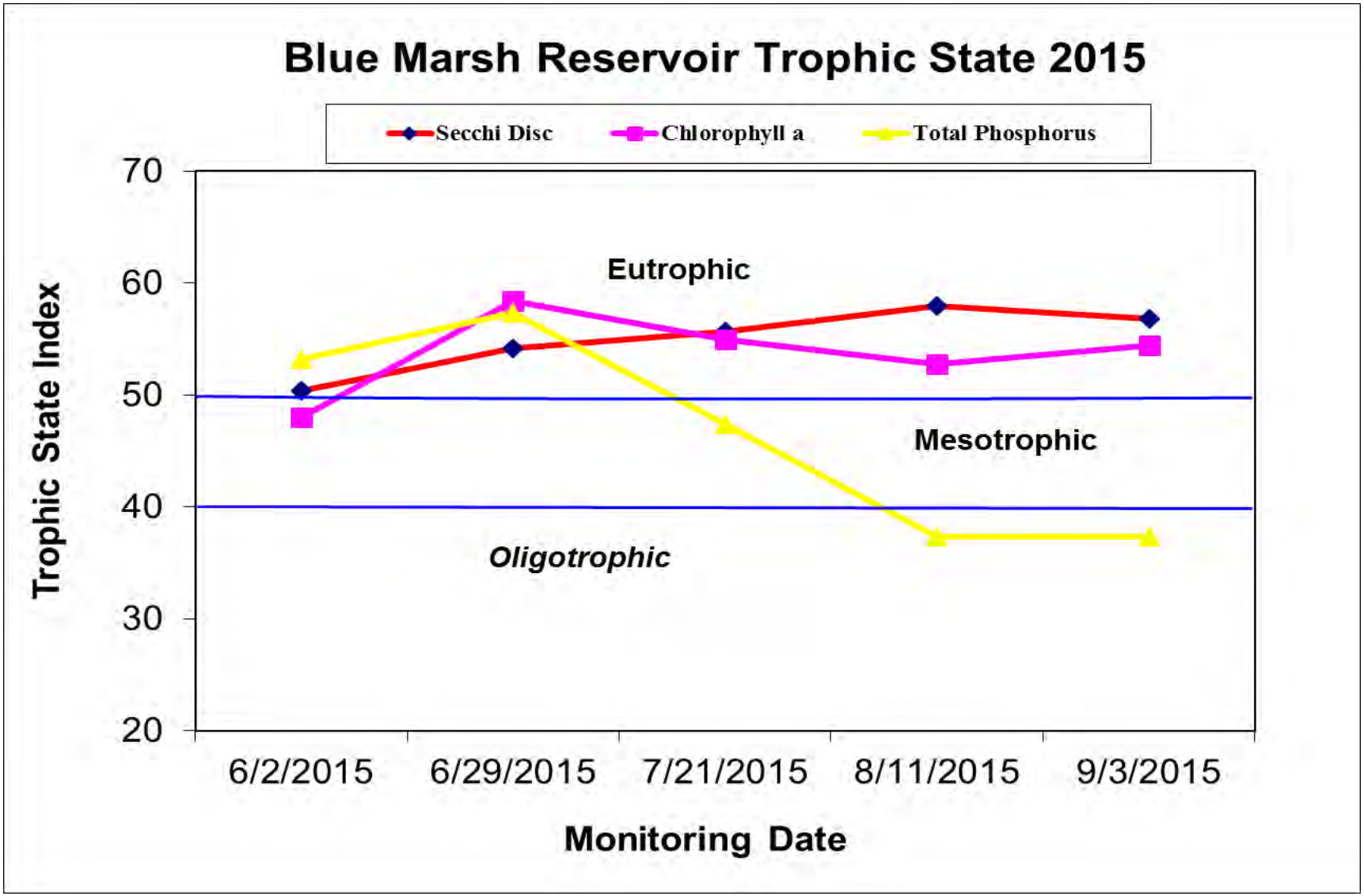

Figure 3-7. Trophic state indices calculated from secchi disk depth and concentrations of total phosphorus and chlorophyll *a* at Blue Marsh Reservoir in 2015

Table 3-4. Bacteria counts (colonies/100 ml) at Blue Marsh Reservoir during 2015. Shaded values exceed the Pennsylvania Department of Health water quality standard for bathing beach of 1,000 fecal coliform colonies/100-ml. NS = Not Sampled in 2015

STATION	DATE	Total Coliform		Fecal Coliform (FC)		Escherichia coli	
BM-1S	6/2/2015		1200		10		NS
	6/29/2015	>	2400		21		NS
	7/21/2015	>	2400		3		NS
	8/11/2015	>	2400		10		NS
	9/3/2015	>	2400		34		NS
BM-2S	6/2/2015		140		3		NS
	6/29/2015		610		2		NS
	7/21/2015		1700	<	2		NS
	8/11/2015		2400		20		NS
	9/3/2015		180	<	2		NS
BM-5S	6/2/2015	>	2400		14000		NS
	6/29/2015	>	2400		1900		NS
	7/21/2015	>	2400		430		NS
	8/11/2015	>	2400		4500		NS
	9/3/2015	>	2400		270		NS
BM-6S	6/2/2015		730		34		NS
	6/29/2015		1100		6		NS
	7/21/2015		1000	<	2		NS
	8/11/2015	>	2400		62		NS
	9/3/2015		870		5		NS
BM-7S	6/2/2015		410		10		NS
	6/29/2015		390		6		NS
	7/21/2015		1300	<	2		NS
	8/11/2015		1700		6		NS
	9/3/2015		1000	<	2		NS
BM-8S	6/2/2015	>	2400		930		NS
	6/29/2015		550		2		NS
	7/21/2015		2000	<	2		NS
	8/11/2015	>	2400		5		NS
	9/3/2015		550	<	2		NS
BM-9S	6/2/2015		730		50		NS
	6/29/2015		520		5		NS
	7/21/2015		2400		2		NS
	8/11/2015		1700		10		NS
	9/3/2015		1300	<	2		NS
BM-10	6/2/2015	>	2400		12000		NS
	6/29/2015		520		20		NS
	7/21/2015		2000	<	2		NS
	8/11/2015		2000		10		NS
	9/3/2015		1200		2		NS
BM-11	6/2/2015	>	2400		8400		NS
	6/29/2015	>	2400		980		NS
	7/21/2015	>	2400		1100		NS
	8/11/2015	>	2400		2100		NS
	9/3/2015	>	2400		120		NS

3.5 WEEKLY SWIMMING BEACH BACTERIA MONITORING

Weekly coliform bacteria monitoring was conducted at the public swimming beach of the Dry Brooks Day Use Area of Blue Marsh Reservoir to gauge compliance with Pennsylvania Department of Health bathing beach water quality standards to ensure public safety in this water contact recreation area. The bathing beach contamination standard, like the PADEP swimming season water quality standard, is based on a geometric mean of less than 200 colonies/100-ml for five samples collected over not more than a 30 consecutive day period, but also stipulates that no single sample should exceed 1,000 fecal coliform colonies/100-ml. Samples for coliform analysis were collected twice weekly from 3 fixed stations on each date in the regulated swimming area. During 2015, fecal coliform contamination at the swimming beach area of Blue Marsh Reservoir never exceeded the State single sample or geometric mean fecal criteria (Table 3-5).

Escherichia coli (E. coli) was monitored at the swimming beach to better understand bacteria trends. E. coli is the most reliable indicator of fecal bacterial contamination of surface waters in the United States according to water quality standards set by the EPA (2000). The EPA recommendation for recreational water quality standard for E. coli is based on two criteria: a geometric mean of 126 organisms/ 100 ml (geometric mean) threshold and 235 organisms/ 100 ml (single water sample) threshold. Escherichia coli measures never exceeded the EPA single sample or geometric mean standard at the Blue Marsh Reservoir swimming beach area in 2015.

Table 3-5. Single sample Maximum counts and 5-day running fecal coliform geometric means at the three swimming beach stations of Blue Marsh Reservoir in 2015. Shaded values indicate results were not in compliance with PA Dep. of Health water quality standards for bathing beaches: maximum count greater than 1,000 colonies/100-ml; 5-day geometric mean greater than 200 colonies/100-ml.

Week	Date	Single Maximum Count	5-Day Geometric Means		
			sb1	sb2	sb3
Week 1	11-May	6.00	-	-	-
	14-May	2.00	-	-	-
Week 2	18-May	8.00	-	-	-
	21-May	2.00	-	-	-
Week 3	26-May	15.00	3.49	3.95	4.13
	28-May	48.00	4.20	7.46	3.59
Week 4	01-June	450.00	12.39	16.91	8.01
	04-June	5.00	10.32	15.39	8.01
Week 5	08-June	6.00	10.32	15.39	8.01
	11-June	15.00	9.79	12.81	10.82
Week 6	15-June	40.00	13.05	11.16	18.17
	18-June	3.00	4.79	4.92	8.15
Week 7	22-June	6.00	5.19	5.10	6.79
	25-June	8.00	5.63	6.36	7.19
Week 8	29-June	13.00	5.74	6.73	6.99
	02-July	15.00	3.89	4.92	5.74
Week 9	06-July	18.00	5.57	5.91	6.23
	09-July	3.00	5.57	4.74	6.23
Week 10	13-July	16.00	7.78	4.13	4.72
	16-July	24.00	9.09	4.74	4.92
Week 11	20-July	140.00	10.07	9.24	5.40
	23-July	18.00	10.07	9.24	4.98
Week 12	27-July	18.00	15.14	11.09	7.73
	30-July	2.00	9.99	10.23	7.73
Week 13	03-August	11.00	7.57	9.49	6.13
	06-August	39.00	11.41	5.05	4.92
Week 14	10-August	10.00	8.83	4.21	6.79
	13-August	20.00	8.59	5.09	5.45
Week 15	17-August	20.00	12.49	8.07	8.15
	20-August	13.00	14.58	6.90	8.15
Week 16	24-August	16.00	12.20	8.05	7.70
	27-August	56.00	19.78	11.32	7.84
Week 17	31-August	24.00	19.37	12.80	9.98
	03-September	26.00	22.25	12.53	9.98

Table 3-6. Maximum counts and 5-day e-coli running geometric means of the three swimming beach stations of Blue Marsh Reservoir in 2015. Shaded values indicate results were not in compliance with PA Dep. of Health water quality standards for E-coli levels at bathing beaches: maximum single count greater than 235 colonies/100-ml; 5-day geometric mean greater than 126 colonies/100-ml.

Week	Date	Single Maximum Count	5-Day Geometric Means		
			sb1	sb2	sb3
Week 1	11-May	3.00	-	-	-
	14-May	2.00	-	-	-
Week 2	18-May	7.00	-	-	-
	21-May	2.00	-	-	-
Week 3	26-May	10.00	2.27	2.61	2.54
	28-May	60.00	3.95	5.91	3.00
Week 4	01-June	140.00	10.61	12.92	7.16
	04-June	3.00	8.52	11.91	6.05
Week 5	08-June	7.00	8.52	11.91	8.92
	11-June	10.00	7.09	8.63	10.25
Week 6	15-June	12.00	5.83	6.26	11.01
	18-June	3.00	2.17	3.10	5.30
Week 7	22-June	3.00	2.35	2.70	4.26
	25-June	1.00	2.35	2.35	2.89
Week 8	29-June	8.00	2.55	3.10	2.61
	02-July	8.00	2.05	2.86	2.49
Week 9	06-July	3.00	2.35	2.86	2.70
	09-July	4.00	2.17	3.29	3.57
Week 10	13-July	10.00	3.44	4.70	5.10
	16-July	10.00	2.99	4.92	4.92
Week 11	20-July	91.00	3.95	8.00	6.27
	23-July	10.00	5.45	6.42	6.65
Week 12	27-July	17.00	6.54	8.25	8.88
	30-July	2.00	4.74	5.77	6.20
Week 13	03-August	5.00	4.74	5.02	4.50
	06-August	54.00	6.95	2.54	3.52
Week 14	10-August	5.00	4.38	2.54	3.69
	13-August	7.00	4.69	2.37	2.76
Week 15	17-August	11.00	6.47	3.39	4.46
	20-August	4.00	6.85	2.83	4.46
Week 16	24-August	16.00	5.37	3.44	4.06
	27-August	45.00	11.51	5.45	4.66
Week 17	31-August	23.00	10.76	7.39	6.43
	03-September	18.00	12.10	8.76	6.75

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APPENDIX A

STRATIFICATION DATA TABLES

2015 Blue Marsh Stratification/Profile

Station	Date	Time	Depth	Temp	DO	DO	pH	pHmV	ORP	Turbidity	Chloro.	SpCond
	M/D/Y	hh:mm:ss	ft	C	%	mg/L		mV	mV	NTU	ug/L	mS/cm
BM-1	6/2/2015	13:51:38	0.5	17.56	94.1	8.98	7.88	-86.4	194.6	36.6	5.3	0.404
	6/29/2015	12:20:45	0.5	19.73	94.6	8.64	7.94	-90.1	88.8	41.7	7.1	0.344
	7/21/2015	13:39:18	0.5	19.13	88.1	8.14	7.65	-73.4	70.6	38.4	3.2	0.331
	8/11/2015	12:58:32	0.5	22.02	87.8	7.67	7.84	-84.5	23.8	41.7	1.4	0.356
	9/3/2015	12:56:33	0.5	21.94	90.1	7.88	7.62	-71.7	114.6	43.1	3	0.398
BM-2	6/2/2015	10:55:05	0.5	22.66	105.2	9.07	8.56	-126.9	101	36.4	6.3	0.374
		10:54:14	5.0	22.67	104.3	9	8.51	-123.6	98.2	37.1	6.3	0.375
		10:53:36	10.0	22.72	102.6	8.84	8.42	-118.7	95.7	37.2	5.9	0.374
		10:52:30	15.0	20.61	78.4	7.04	7.94	-89.8	99.8	37.6	5.6	0.407
		10:51:28	20.0	18.3	37.5	3.53	7.7	-75.8	101.1	38.1	7.9	0.428
		10:50:24	25.0	15.24	13.8	1.39	7.64	-72.1	99.1	38.5	10.5	0.435
		10:49:23	30.0	13.04	11.9	1.25	7.69	-74.5	94.4	37.4	7.3	0.412
		10:47:58	35.0	11.35	5.5	0.6	7.72	-76	86.1	37.6	4	0.412
		10:47:06	40.0	10.62	6	0.66	7.76	-78.5	81.4	44.2	2.7	0.414
BM-2	6/29/2015	9:20:50	0.5	23.25	122.4	10.44	8.7	-134.8	50.3	37.8	17.5	0.284
		9:20:06	5	23.25	121.4	10.36	8.68	-133.6	46.9	37.7	21.1	0.284
		9:18:17	10	23.23	114.1	9.74	8.54	-125.9	38	38.1	23.4	0.284
		9:17:35	15	23.22	90.7	7.75	8.35	-114.7	33.4	38.3	21.8	0.284
		9:16:58	20	21.81	9.1	0.8	7.65	-73.7	50.1	36.6	13.6	0.352
		9:14:33	25	20.1	9.6	0.87	7.7	-76.2	32.9	37.2	4.9	0.382
		9:08:35	30	19	2.7	0.25	7.46	-62.2	12.3	41.2	5.1	0.377
		9:07:44	35	17.66	2.6	0.25	7.45	-61.7	20.5	38	3.4	0.378
		9:06:27	40	16.75	2.7	0.26	7.47	-62.4	21.9	38.8	3.4	0.38
		9:04:37	45	14.42	3	0.3	7.5	-63.9	13	39.3	3.4	0.377
BM-2	7/21/2015	10:14:30	0.5	28.66	170.8	13.21	9.14	-163.2	50.1	39.9	12.6	0.255
		10:13:22	5	28.56	164.6	12.75	8.99	-153.9	49.9	40.3	14.1	0.255
		10:11:34	10	25.32	59.4	4.88	7.76	-80.5	74.3	40.5	9.6	0.293
		10:09:40	15	23.53	9.6	0.81	7.51	-65.3	79.5	38.4	6.7	0.330
		10:08:25	20	21.63	4.2	0.37	7.46	-62.6	80	36.9	4.8	0.350
		10:07:34	25	20.98	6.6	0.59	7.47	-62.7	78.2	36.4	3.8	0.355
		10:06:29	30	20.39	4.3	0.38	7.49	-63.9	74	36.5	3.9	0.346
		10:04:53	35	19.51	3	0.28	7.52	-65.7	64.6	36.8	3	0.340
		10:03:19	40	18.95	3.4	0.32	7.55	-67.5	50.2	38.2	3.1	0.347
BM-2	8/11/2015	10:00:14	0.5	25.03	59.1	4.88	8.09	-99.9	13.9	40	9.4	0.280
		9:59:26	5	25	55.7	4.6	8	-94.4	9	39.8	9.2	0.282
		9:58:29	10	24.84	41.6	3.44	7.81	-83.2	4.8	39.4	5.7	0.290
		9:57:21	15	24.33	13.6	1.14	7.63	-72.8	-3.2	35.9	2.8	0.320
		9:55:52	20	23.54	3	0.25	7.54	-67.5	-15.1	36.2	3.4	0.339
		9:54:17	25	23.17	5	0.43	7.5	-64.6	-3.9	36.8	2.1	0.346
		9:53:36	30	22.68	3	0.26	7.5	-64.6	-9.1	36.3	2.2	0.338
		9:51:47	35	21.86	3	0.26	7.42	-59.9	-8.6	36.7	4.2	0.357
		9:50:16	40	20.96	3.3	0.3	7.36	-56.4	-23.2	40	1.5	0.353
		9:48:12	45	20.6	3.5	0.32	7.23	-48.8	-45.4	-5.9	3.8	0.366

2015 Blue Marsh Stratification/Profile

Station	Date	Time	Depth	Temp	DO	DO	pH	pHmV	ORP	Turbidity	Chloro.	SpCond
	M/D/Y	hh:mm:ss	ft	C	%	mg/L		mV	mV	NTU	ug/L	mS/cm
		10:03:58	0.5	27.4	141.8	11.21	8.87	-146.5	60.2	39.4	4.5	0.294
		10:02:43	5	27.1	139.7	11.11	8.7	-136.3	57.3	40	11.8	0.294
BM-2		10:01:02	10	25.14	42.4	3.49	7.7	-76.6	75.5	39.2	12	0.314
	9/3/2015	9:57:37	15	24.12	16.6	1.39	7.48	-63.8	71.4	38.3	5.4	0.326
		9:54:58	20	23.33	3.3	0.28	7.44	-61.5	66.5	38.7	5.4	0.327
		9:53:40	25	22.76	3.3	0.28	7.45	-62.1	67.2	39.6	4.8	0.320
		9:52:01	30	22.25	3.5	0.3	7.48	-63.6	67.6	40.8	4.3	0.341
		9:50:20	35	21.93	3.7	0.33	7.51	-65.4	68.7	40.6	4.4	0.383
		9:47:12	40	21.58	5	0.44	7.63	-72.4	41.8	42.5	4.8	0.396
BM-4												
	6/2/2015	13:19:16	0.5	15	89.3	8.99	8.04	-94.7	167	60.7	4.9	0.541
	6/29/2015	11:51:53	0.5	16.47	95.7	9.34	8.1	-98.5	125.9	47	0.9	0.478
BM-5	7/21/2015	13:02:17	0.5	21.88	92.5	8.1	8.07	-97.8	125.8	42.7	1.6	0.521
	8/11/2015	12:27:58	0.5	19.24	89.6	8.26	8.28	-109.5	65.9	55.3	2	0.480
	9/3/2015	12:30:06	0.5	20.56	88.5	7.94	7.81	-82.5	139.6	46.1	1.6	0.568
		9:45:29	0.5	22.37	107.7	9.34	8.5	-123.2	155	36.6	5.8	0.378
BM-6		9:44:50	5	22.41	107.3	9.3	8.46	-120.6	154.2	36.9	5.9	0.378
		9:43:52	10	22.39	106.2	9.21	8.35	-114.3	153.2	37.1	5.9	0.379
		9:41:50	15	20.74	85.8	7.68	7.9	-88	157.8	37.7	5.9	0.405
Secchi		9:39:47	20	17.91	40.2	3.81	7.55	-67.2	162.7	37.8	5.9	0.423
	6/2/2015	9:37:53	25	15.56	19.7	1.96	7.43	-60.1	163.9	38.2	9.2	0.423
1.95 m		9:36:17	30	13.09	13.8	1.45	7.43	-59.9	163	37.4	6.7	0.407
		9:35:13	35	11.65	9.8	1.07	7.42	-59.1	162.7	36.8	4.8	0.409
		9:32:23	40	10.95	5.8	0.64	7.4	-58.1	158.3	36.5	3.7	0.411
		9:30:12	45	10.05	3.3	0.37	7.38	-57.1	153.9	36	3.1	0.414
		9:28:19	50	9.77	4.2	0.48	7.39	-57.7	153.1	36	2.9	0.417
		8:47:48	0.5	23.31	120.1	10.23	8.6	-129.3	50.2	38.2	14.6	0.278
		8:46:41	5	23.37	119	10.13	8.53	-125.3	43.2	38.7	17.8	0.288
		8:45:39	10	23.34	114.6	9.76	8.41	-117.9	35.5	38.8	18.7	0.288
BM-6												
		8:43:42	20	21.15	2.3	0.21	7.35	-56.2	25.1	36.7	5.5	0.376
		8:42:08	25	20.29	2.4	0.21	7.33	-55	23.9	36.8	4.9	0.375
Secchi	6/29/2015	8:40:54	30	18.23	2.2	0.21	7.32	-53.9	32.4	36.4	3.5	0.371
		8:39:29	35	16.77	2.2	0.21	7.28	-51.7	43.3	36.4	2.4	0.375
1.50 m		8:37:41	40	16.2	2.3	0.23	7.24	-49.2	59.6	36.3	2.8	0.376
		8:35:30	45	14.18	2.3	0.24	7.21	-47.8	81	37.1	2	0.372
		8:32:13	50	12.81	3.1	0.33	7.17	-45.3	102.1	42.4	2.8	0.375

2015 Blue Marsh Stratification/Profile

Station	Date	Time	Depth	Temp	DO	DO	pH	pHmV	ORP	Turbidity	Chloro.	SpCond
	M/D/Y	hh:mm:ss	ft	C	%	mg/L		mV	mV	NTU	ug/L	mS/cm
		9:44:43	0.5	28.87	170.8	13.16	9.03	-156.6	42.6	40.3	12.2	0.254
		9:43:45	5	28.68	164.7	12.73	8.84	-145.2	41.4	40.3	12.5	0.255
		9:42:10	10	25.39	57.2	4.69	7.65	-73.9	61.2	40.8	11.2	0.294
BM-6		9:39:21	15	23.5	3	0.25	7.3	-53.4	57	39.5	8.6	0.329
		9:38:19	20	22.47	2.7	0.23	7.26	-50.6	54.3	38	7.4	0.340
Secchi	7/21/2015	9:48:59	25	21.24	4.8	0.43	7.9	-87.8	92.7	35.7	5	0.339
		9:36:33	30	20.34	2.7	0.24	7.2	-47.1	52.5	36.9	3.8	0.335
1.35 m		9:34:52	35	19.14	2.7	0.25	7.18	-45.9	49.8	36.8	3.6	0.331
		9:32:31	40	18.76	2.9	0.27	7.16	-44.8	51.4	37	3.3	0.340
		9:31:28	45	18.51	3.1	0.29	7.15	-44.2	41.3	37.5	3.3	0.341
		9:29:31	50	17.81	3.7	0.35	7.13	-42.9	35	40.9	4.6	0.349
		9:26:17	0.5	25.3	69.7	5.73	8.39	-117.6	18.4	40.6	10.3	0.269
		9:24:57	5	25.32	69.4	5.7	8.33	-113.7	11.6	40.9	9.2	0.268
BM-6		9:23:50	10	25.29	66.7	5.48	8.2	-106.3	3.8	40.8	9.2	0.268
		9:22:43	15	25.22	60.9	5.01	7.96	-92.2	-5.8	41	7.9	0.268
Secchi		9:20:44	20	23.78	3.2	0.27	7.47	-63	-17.8	36.8	4	0.338
	8/11/2015	9:19:40	25	22.97	3	0.26	7.39	-58.6	-17.4	36.9	1.6	0.345
1.15 M		9:18:45	30	21.59	3	0.26	7.32	-54.1	-19.6	37.1	0.3	0.358
		9:17:43	35	21.05	3	0.27	7.26	-51	-26.3	37.2	0.8	0.362
		9:16:44	40	20.8	3.1	0.28	7.21	-47.9	-37.8	38.6	3.3	0.362
		9:15:31	45	20.36	3.2	0.29	7.13	-43.3	-53.8	41.5	-0.7	0.365
		9:13:15	50	20.25	3.5	0.32	6.8	-24.2	-103.7	-2.3	-1.7	0.386
BM-6		9:31:24	0.5	27.18	136.3	10.82	8.76	-139.7	87.2	39.6	7.3	0.282
		9:29:20	5	26.99	128.2	10.21	8.56	-127.7	86.2	39.8	11.6	0.283
		9:26:48	10	25.32	43.1	3.54	7.54	-67.6	102.6	40	15.1	0.299
		9:24:48	15	24.18	3.2	0.27	7.28	-52.2	105.8	39.3	9.3	0.311
Secchi	9/3/2015	9:23:47	20	23.56	3.3	0.28	7.25	-50.1	104.8	39.2	5.3	0.323
		9:22:53	25	22.81	3.5	0.3	7.2	-47.5	109.9	39.1	3.7	0.334
1.25 m		9:21:41	30	22.27	3.3	0.29	7.18	-46.1	110.3	40.4	4.3	0.316
		9:19:53	35	22	3.7	0.32	7.15	-44.5	107.5	40.7	3.7	0.331
		9:18:40	40	21.71	3.9	0.34	7.12	-42.4	103.2	41.8	3.5	0.358
		9:16:48	45	21.23	4.2	0.37	7.03	-37.5	96.4	45.5	5	0.368
		9:15:31	50	20.79	5	0.45	6.98	-34.6	108.9	75.5	7.8	0.375
		12:36:34	0.5	22.72	108.1	9.31	8.46	-120.6	108.3	36.7	7.1	0.396
		12:36:03	5.0	22.73	107.5	9.26	8.43	-118.9	106.6	36.7	7.6	0.396
BM-7		12:35:22	10.0	22.72	106.2	9.15	8.36	-114.8	104.3	36.7	7.7	0.396
	6/2/2015	12:33:17	15.0	21.24	44.1	3.91	7.71	-77	110.4	52.3	8.7	0.469
		12:32:13	20.0	18.51	39.2	3.67	7.7	-76.1	107.3	38.6	9.9	0.463
		12:30:05	25.0	14.97	9.5	0.96	7.62	-71	100.5	40.2	6.7	0.449
		12:28:56	30.0	12.8	5.2	0.55	7.68	-73.8	93.4	39.8	5.3	0.422
		12:28:01	35.0	11.55	5.7	0.62	7.73	-76.7	90.5	52.7	5.1	0.421

2015 Blue Marsh Stratification/Profile

Station	Date	Time	Depth	Temp	DO	DO	pH	pHmV	ORP	Turbidity	Chloro.	SpCond
	M/D/Y	hh:mm:ss	ft	C	%	mg/L		mV	mV	NTU	ug/L	mS/cm
BM-7	6/29/2015	9:47:01	0.5	23.72	142.3	12.03	8.89	-146	113.6	37.8	16.7	0.276
		9:46:12	5	23.58	141.4	11.99	8.86	-144.6	112.6	38.4	31.9	0.276
		9:44:46	10	23.44	137.4	11.68	8.76	-138.6	112.3	38.5	31.1	0.276
		9:42:46	15	22.46	31.4	2.72	7.67	-74.9	137.3	36.5	15.1	0.336
		9:41:44	20	21.17	20.7	1.84	7.65	-73.3	139.7	35.7	7.1	0.364
		9:39:04	25	20.46	48.2	4.34	7.78	-81.1	136.4	39	7.2	0.366
		9:37:30	30	19.21	57.3	5.29	7.88	-86.6	134.2	49.9	9.1	0.345
		9:36:16	32	18.96	55.5	5.15	7.95	-90.4	132.3	84.2	9.4	0.344
BM-7	7/21/2015	10:39:02	0.5	28.4	179.8	13.96	9.3	-172.1	89.9	40.3	15.5	0.256
		10:37:31	5	28.2	174.4	13.59	9.18	-165.4	93	40.8	17	0.257
		10:34:36	10	25.52	81.8	6.69	8.02	-95.5	126.9	39.8	11.6	0.288
		10:33:13	15	23.55	48.9	4.15	7.77	-80.9	136.8	38	6.7	0.316
		10:32:05	20	21.85	18.5	1.62	7.68	-75.1	142.1	36.8	4.9	0.362
		10:31:07	25	21.26	17.5	1.55	7.7	-76.5	141.5	37.7	4.7	0.368
		10:29:30	30	20.55	4.4	0.39	7.75	-79.3	141.6	42.4	4.4	0.370
BM-7	8/11/2015	10:28:08	0.5	25.29	98.9	8.13	8.79	-141	30.5	42.3	11.3	0.253
		10:26:34	5	25.27	93	7.64	8.68	-134.5	24.8	42.4	11.4	0.255
		10:25:09	10	25.26	90.5	7.44	8.58	-128.3	17.1	42.4	12.7	0.256
		10:24:09	15	25.24	87.4	7.19	8.43	-120	10.1	42.2	10.8	0.256
		10:23:01	20	24.85	68.1	5.64	7.94	-90.9	8.3	41.8	7.9	0.277
		10:21:39	25	22.77	13.4	1.15	7.54	-67.2	10.3	44.7	5.2	0.359
		10:19:05	30	22.24	4.1	0.36	7.51	-65.6	-16.2	87.2	5.8	0.349
BM-7	9/3/2015	10:24:50	0.5	26.9	141.9	11.32	8.83	-143.8	80	40.1	9.4	0.296
		10:23:55	5	26.55	133	10.68	8.68	-135.1	81.5	40.4	13.3	0.297
		10:22:49	10	25.11	72.2	5.95	8.04	-96.7	98.1	40	10	0.310
		10:21:25	15	24.15	52.8	4.43	7.79	-82.2	102.8	38.9	5.5	0.324
		10:20:03	20	23.42	28.5	2.43	7.7	-76.3	106	38.9	3.5	0.339
		10:18:11	25	22.9	12.3	1.06	7.7	-76.7	104.1	38.9	3.5	0.353
		10:16:20	30	22.55	19.3	1.67	7.83	-84	97.2	46.1	4.3	0.372
BM-8	6/2/2015	12:11:53	0.5	22.77	94.1	8.1	8.32	-112.7	121.8	38.9	6	0.388
		12:10:49	5.0	22.78	93.7	8.07	8.29	-110.8	119.4	39.2	6.5	0.389
		12:09:48	10.0	22.77	92.3	7.95	8.22	-106.6	116.3	39.3	6.1	0.389
		12:07:19	15.0	20.92	41.3	3.68	7.73	-78.2	121.9	48.4	9.7	0.400
		12:06:23	20.0	19.12	20	1.84	7.71	-76.8	121.4	45.7	6.2	0.437
		12:04:40	23.0	16.93	12.4	1.2	7.76	-79.3	119.5	68.6	6.2	0.458
BM-8	6/29/2015	11:05:20	0.5	23.6	150.4	12.74	8.98	-151.6	91.6	38	15.8	0.274
		11:04:30	5	23.48	147.2	12.51	8.92	-147.7	86.7	38.4	26.3	0.274
		11:03:27	10	23.17	122.3	10.45	8.59	-128.4	81.4	38.5	31.6	0.274
		11:02:39	15	21.47	50.1	4.42	7.82	-83.6	99.2	38.3	11.9	0.338
		11:01:10	20	20.42	44	3.97	7.9	-87.9	84.3	40.8	9.8	0.325

2015 Blue Marsh Stratification/Profile

Station	Date	Time	Depth	Temp	DO	DO	pH	pHmV	ORP	Turbidity	Chloro.	SpCond
	M/D/Y	hh:mm:ss	ft	C	%	mg/L		mV	mV	NTU	ug/L	mS/cm
BM-8	7/21/2015	11:56:17	0.5	28.88	210.8	16.24	9.4	-178.7	96.5	40.5	20	0.250
		11:55:02	5	28.19	182.2	14.2	9.14	-162.5	103.7	43.1	24.5	0.256
		11:53:34	10	25.53	116.3	9.51	8.45	-121.3	121.8	40.9	12.3	0.275
		11:52:22	15	23.91	66.1	5.57	7.98	-93.3	137	38.1	7	0.306
		11:50:47	20	22.09	15.1	1.32	7.91	-88.4	140	37	4.7	0.350
		11:49:48	22	21.8	21	1.85	7.98	-92.7	136.2	37.3	4.4	0.358
BM-8	8/11/2015	11:40:21	0.5	26.05	135.5	10.98	9.19	-165	38.6	43.3	12.3	0.240
		11:39:22	5	25.57	118.7	9.7	9.05	-156.5	36.8	43.3	12.1	0.242
		11:37:47	10	25.5	106.7	8.73	8.9	-147.5	29.1	42.4	10.8	0.244
		11:36:34	15	25.36	93.5	7.67	8.7	-135.7	22.3	41.6	11	0.252
		11:34:56	20	24.85	84.9	7.03	8.32	-113.4	8.5	45.2	8.3	0.276
		11:33:35	22	23.78	46.4	3.92	8.12	-101.1	3.7	74.5	12.3	0.298
BM-8	9/3/2015	11:38:15	0.5	27.51	154.3	12.18	8.98	-153	104.5	40.2	6.4	0.294
		11:37:13	5	26.71	140.8	11.27	8.84	-144.3	108.4	41.3	16.9	0.296
		11:36:05	10	25.29	95	7.81	8.33	-114	122.1	40.7	10.4	0.316
		11:34:47	15	24.31	58.9	4.93	7.9	-88.3	133.5	43.1	6.3	0.345
		11:33:19	20	23.4	19.5	1.66	7.82	-83.6	136.7	42.8	3.8	0.350
		11:31:50	22	23.31	14.4	1.23	7.91	-89.1	131	45.7	3.6	0.350
BM-9	6/2/2015											
		11:51:53	0.5	22.77	96.4	8.29	8.2	-105.8	92.6	38.3	8.4	0.408
		11:51:06	5	22.79	93.9	8.08	8.13	-101.4	89.4	38.4	9	0.408
		11:50:30	10	22.77	85.7	7.38	8	-94	86.3	39.2	8.8	0.408
		11:49:46	15	21.07	47.9	4.26	7.72	-77.2	91.7	55.7	10	0.443
		11:48:39	20	19.33	39.4	3.63	7.66	-73.8	85.6	46.8	5.7	0.473
		11:47:08	25	14.76	6.9	0.7	7.58	-68.7	76.2	42.8	6.7	0.450
		11:45:53	30	12.66	3	0.32	7.61	-70.2	69	46.3	4.9	0.427
		11:43:17	32	11.7	3.8	0.42	7.68	-73.8	58.8	51.1	4.3	0.421
BM-9	6/29/2015											
		10:50:35	0.5	23.72	150.6	12.74	8.95	-149.9	149.6	37.7	15.5	0.275
		10:49:50	5	23.56	149.5	12.68	8.92	-148.2	150.8	38	27.4	0.273
		10:48:52	10	23.38	132.4	11.27	8.7	-135	156.1	38.1	29.5	0.279
		10:47:35	15	22.58	46	3.97	7.86	-85.6	179.6	36.3	13.9	0.330
		10:46:08	20	20.77	74.1	6.63	7.91	-88.3	180.6	39.2	7.7	0.366
		10:44:40	25	19.53	92.9	8.52	8.1	-99.3	176.4	46.5	12.2	0.315
		10:42:30	30	17.68	79.2	7.54	7.94	-89.6	181.7	67.7	9.9	0.305
		10:38:36	32	17.68	78.8	7.5	8.07	-96.9	174	71	10.7	0.305
BM-9	7/21/2015	11:38:58	0.5	28.88	195.8	15.09	9.37	-176.6	66.1	39.5	13.6	0.251
		11:37:02	5	28.39	173.1	13.45	9.07	-158.4	65.9	40.8	17.5	0.254
		11:35:53	10	25.7	94.4	7.69	8.16	-104	84.2	40.1	11.3	0.279
		11:34:23	15	23.76	83.5	7.05	7.97	-92.4	87.2	38.5	7.8	0.305
		11:32:41	20	22.35	58	5.03	7.85	-85.1	83	38.4	5.8	0.345
		11:31:32	25	21.46	48.6	4.29	7.81	-82.8	75.2	39	5.7	0.367
		11:30:07	30	20.42	4.8	0.43	7.77	-80.2	59.1	44	5.8	0.383
		11:29:09	32	20.12	5.6	0.51	7.82	-83	45.9	45.5	5.5	0.387

2015 Blue Marsh Stratification/Profile

Station	Date	Time	Depth	Temp	DO	DO	pH	pHmV	ORP	Turbidity	Chloro.	SpCond
	M/D/Y	hh:mm:ss	ft	C	%	mg/L		mV	mV	NTU	ug/L	mS/cm
BM-9	8/11/2015	11:21:06	0.5	25.73	117.3	9.56	8.99	-152.7	45.2	42.7	9.9	0.247
		11:20:17	5	25.43	108.1	8.86	8.9	-147.4	43.9	42.7	14	0.248
		11:19:21	10	25.37	101.2	8.3	8.82	-142.5	41.5	42.5	12.3	0.249
		11:18:17	15	25.36	99.4	8.15	8.75	-138.5	35.4	42.5	14.3	0.250
		11:17:11	20	25.28	92.5	7.6	8.53	-125.9	29.5	42.6	9.9	0.254
		11:16:13	25	23.92	63.6	5.36	8.05	-97.3	39.2	47	7.5	0.321
		11:14:33	30	23.1	51.2	4.38	8.05	-96.9	19.7	56.5	10.9	0.363
BM-9	9/3/2015	10:46:29	0.5	27.09	142.6	11.34	8.9	-148.2	93.2	39.9	10	0.297
		10:45:20	5	26.57	134.2	10.77	8.78	-141.1	95.8	40.7	13.4	0.298
		10:43:48	10	25.27	78.9	6.49	8.1	-100.2	112.3	40.4	11.3	0.307
		10:42:19	15	24.35	60.3	5.04	7.91	-89.2	118.4	39.1	5.9	0.324
		10:40:46	20	23.34	51	4.34	7.81	-83.3	120.7	39.6	3.9	0.356
		10:38:43	25	22.9	29.6	2.54	7.75	-79.5	120.1	46.4	3.8	0.377
		10:36:50	30	22.57	12.5	1.08	7.79	-81.9	114.9	59.3	5.3	0.417
BM-10	6/2/2015	11:22:39	0.5	22.78	90.7	7.81	8.27	-109.7	153.2	48.4	11.5	0.424
		11:21:17	5	22.9	90.3	7.75	8.23	-107.6	153.8	50	11.7	0.425
		11:20:08	10	22.71	87.8	7.57	8.17	-104.1	154.2	55.6	12.1	0.421
		11:19:07	15	21.85	83.2	7.29	8.08	-98.6	157.2	79.6	13.3	0.405
		11:17:17	20	19.69	64.1	5.86	8	-93.5	167.1	169.3	14.5	0.359
BM-10	6/29/2015	10:17:53	0.5	23.42	167.6	14.26	9.17	-162.3	136.2	39.5	23	0.263
		10:16:08	5	23.3	162.4	13.85	9.07	-156.8	139.7	39.7	27.7	0.263
		10:14:54	10	21.94	138.5	12.11	8.76	-138.3	150	40.4	18.7	0.279
		10:13:23	15	17.82	92.4	8.78	8.04	-95.4	170.3	55	9.1	0.312
		10:11:49	20	17.45	87.4	8.36	8	-93.1	168.4	69.8	8.4	0.318
		10:10:43	21	17.43	88.2	8.44	8.09	-98.2	164.3	73.6	8.1	0.318
BM-10	7/21/2015	11:07:38	0.5	28.79	221.2	17.07	9.49	-183.8	93.5	41.7	24.3	0.245
		11:06:22	5	27.36	215.1	17.02	9.22	-167	101.3	42.2	16.3	0.251
		11:04:44	10	25.67	144.8	11.81	8.46	-121.4	119.3	43.3	10.1	0.316
		11:02:24	15	24.86	108.3	8.96	8.11	-100.9	122.3	53.1	8.8	0.382
		11:00:31	20	23.66	77.7	6.57	8	-94.1	117.9	82.4	6.1	0.439
BM-10	8/11/2015	10:56:36	0.5	25.45	135.4	11.09	9.19	-164.8	58.5	44.8	13.6	0.235
		10:55:22	5	25.33	128	10.51	9.12	-160.1	59.1	45.8	13	0.236
		10:54:41	10	25.19	130.1	10.7	9.1	-159.4	58.1	46.2	12.6	0.237
		10:52:27	15	24.42	119.6	9.98	8.88	-145.8	58.7	49.4	10.8	0.251
		10:51:19	20	22.31	86.3	7.49	8.28	-110.2	75	113.7	10.5	0.348
BM-10	9/3/2015	11:12:52	0.5	26.75	162.9	13.03	9.05	-156.6	102.9	42.3	12.2	0.293
		11:11:25	5	26.21	145.2	11.73	8.94	-149.9	105.9	42.6	12.5	0.293
		11:07:47	10	25.12	116.2	9.57	8.38	-116.9	119.6	45.2	10.4	0.338
		11:06:17	15	24.52	111.2	9.26	8.22	-107.2	122.5	49.1	10.9	0.365
		11:05:00	20	22.73	76.2	6.56	7.98	-92.7	130.1	119.5	9.6	0.448

2015 Blue Marsh Stratification/Profile

Station	Date	Time	Depth	Temp	DO	DO	pH	pHmV	ORP	Turbidity	Chloro.	SpCond
	M/D/Y	hh:mm:ss	ft	C	%	mg/L		mV	mV	NTU	ug/L	mS/cm
BM-11	6/2/2015	13:22:12	0.5	15.58	93	9.26	8.35	-112.7	166.3	57.4	5.5	0.253
	6/29/2015	11:55:10	0.5	17.21	102.1	9.83	8.31	-110.4	156.4	52.7	2.8	0.162
	7/21/2015	12:58:28	0.5	22.71	87.5	7.54	8.28	-110.5	103.4	44.1	1.3	0.310
	8/11/2015	12:31:40	0.5	19.72	87.5	7.99	8.32	-111.6	90.7	52	2.4	0.290
	9/3/2015	12:33:33	0.5	22.21	89.6	7.79	7.91	-88.7	174.5	62	3.1	0.428

APPENDIX B

BEACH BACTERIA SAMPLING DATA TABLES

BLUE MARSH RESERVOIR SWIMMING BEACH MONITORING PROGRAM RESULTS
Fecal/e-coli Coliform 2015

		FECAL COLIFORM				E-COLI			
DAY	DATE	SB1	SB2	SB3	Arith. AVG.&LOG	SB1	SB2	SB3	Ave./LOG
Mon.	11-May	2.00	2.00	6.00	3.33	1.00	1.00	3.00	1.67
Thur.	14-May	2.00	2.00	2.00	2.00	1.00	2.00	1.00	1.33
Mon.	18-May	5.00	8.00	5.00	6.00	6.00	3.00	7.00	5.33
Thur.	21-May	2.00	2.00	2.00	2.00	1.00	2.00	1.00	1.33
Tues.	26-May	13.00	15.00	10.00	12.67	10.00	10.00	5.00	8.33
5 smpl. Log Value		0.54	0.60	0.62	0.60	0.36	0.42	0.40	0.42
5 smpl. Geo. Mean		3.49	3.95	4.13	3.99	2.27	2.61	2.54	2.65
Thur.	28-May	5.00	48.00	3.00	18.67	16.00	60.00	7.00	27.67
5 smpl. Log Value		0.62	0.87	0.56	0.75	0.60	0.77	0.48	0.67
5 smpl. Geo. Mean		4.20	7.46	3.59	5.63	3.95	5.91	3.00	4.66
Mon.	1-Jun	450.00	120.00	110.00	226.67	140.00	100.00	77.00	105.67
5 smpl. Log Value		1.09	1.23	0.90	1.16	1.03	1.11	0.86	1.05
5 smpl. Geo. Mean		12.39	16.91	8.01	14.51	10.61	12.92	7.16	11.16
Thur.	4-Jun	2.00	5.00	5.00	4.00	2.00	2.00	3.00	2.33
5 smpl. Log Value		1.01	1.19	0.90	1.13	0.93	1.08	0.78	0.98
5 smpl. Geo. Mean		10.32	15.39	8.01	13.38	8.52	11.91	6.05	9.46
Mon.	8-Jun	2.00	2.00	6.00	3.33	1.00	2.00	7.00	3.33
5 smpl. Log Value		1.01	1.19	1.00	1.17	0.93	1.08	0.95	1.06
5 smpl. Geo. Mean		10.32	15.39	9.98	14.82	8.52	11.91	8.92	11.36
Thur.	11-Jun	10.00	6.00	15.00	10.33	4.00	2.00	10.00	5.33
5 smpl. Log Value		0.99	1.11	1.03	1.15	0.85	0.94	1.01	1.02
5 smpl. Geo. Mean		9.79	12.81	10.82	14.23	7.09	8.63	10.25	10.39
Mon.	15-Jun	21.00	24.00	40.00	28.33	6.00	12.00	10.00	9.33
5 smpl. Log Value		1.12	1.05	1.26	1.19	0.77	0.80	1.04	0.92
5 smpl. Geo. Mean		13.05	11.16	18.17	15.47	5.83	6.26	11.01	8.36
Thur.	18-Jun	3.00	2.00	2.00	2.33	1.00	3.00	2.00	2.00

5 smpl. Log Value		0.68	0.69	0.91	0.79	0.34	0.49	0.72	0.58
5 smpl. Geo. Mean		4.79	4.92	8.15	6.19	2.17	3.10	5.30	3.78
Mon.	22-Jun	3.00	6.00	2.00	3.67	3.00	1.00	1.00	1.67
5 smpl. Log Value		0.72	0.71	0.83	0.78	0.37	0.43	0.63	0.55
5 smpl. Geo. Mean		5.19	5.10	6.79	6.09	2.35	2.70	4.26	3.54
Thur.	25-Jun	3.00	6.00	8.00	5.67	1.00	1.00	1.00	1.00
5 smpl. Log Value		0.75	0.80	0.86	0.83	0.37	0.37	0.46	0.44
5 smpl. Geo. Mean		5.63	6.36	7.19	6.77	2.35	2.35	2.89	2.78
Mon.	29-Jun	11.00	8.00	13.00	10.67	6.00	8.00	6.00	6.67
5 smpl. Log Value		0.76	0.83	0.84	0.83	0.41	0.49	0.42	0.46
5 smpl. Geo. Mean		5.74	6.73	6.99	6.81	2.55	3.10	2.61	2.91
Thur.	2-Jul	3.00	5.00	15.00	7.67	2.00	8.00	8.00	6.00
5 smpl. Log Value		0.59	0.69	0.76	0.72	0.31	0.46	0.40	0.42
5 smpl. Geo. Mean		3.89	4.92	5.74	5.24	2.05	2.86	2.49	2.66
Mon.	6-Jul	18.00	5.00	3.00	8.67	2.00	3.00	3.00	2.67
5 smpl. Log Value		0.75	0.77	0.79	0.83	0.37	0.46	0.43	0.45
5 smpl. Geo. Mean		5.57	5.91	6.23	6.82	2.35	2.86	2.70	2.82
Thur.	9-Jul	3.00	2.00	2.00	2.33	2.00	2.00	4.00	2.67
5 smpl. Log Value		0.75	0.68	0.79	0.79	0.34	0.52	0.55	0.49
5 smpl. Geo. Mean		5.57	4.74	6.23	6.23	2.17	3.29	3.57	3.10
Mon.	13-Jul	16.00	3.00	2.00	7.00	10.00	6.00	6.00	7.33
5 smpl. Log Value		0.89	0.62	0.67	0.81	0.54	0.67	0.71	0.66
5 smpl. Geo. Mean		7.78	4.13	4.72	6.50	3.44	4.70	5.10	4.61
Thur.	16-Jul	24.00	16.00	16.00	18.67	3.00	10.00	5.00	6.00
5 smpl. Log Value		0.96	0.68	0.69	0.86	0.48	0.69	0.69	0.65
5 smpl. Geo. Mean		9.09	4.74	4.92	7.27	2.99	4.92	4.92	4.52
Mon.	20-Jul	5.00	140.00	24.00	56.33	8.00	91.00	27.00	42.00
5 smpl. Log Value		1.00	0.97	0.73	1.03	0.60	0.90	0.80	0.82
5 smpl. Geo. Mean		10.07	9.24	5.40	10.83	3.95	8.00	6.27	6.66
Thur.	23-Jul	18.00	5.00	2.00	8.33	10.00	1.00	4.00	5.00
5 smpl. Log Value		1.00	0.97	0.70	1.03	0.74	0.81	0.82	0.88
5 smpl. Geo. Mean		10.07	9.24	4.98	10.74	5.45	6.42	6.65	7.56
Mon.	27-Jul	23.00	5.00	18.00	15.33	5.00	7.00	17.00	9.67
5 smpl. Log Value		1.18	1.05	0.89	1.19	0.82	0.92	0.95	0.99

BLUE MARSH BEACH BACTERIA DATA

5 smpl. Geo. Mean		15.14	11.09	7.73	15.66	6.54	8.25	8.88	9.78
Thur.	30-Jul	2.00	2.00	2.00	2.00	2.00	1.00	1.00	1.33
5 smpl. Log Value		1.00	1.01	0.89	1.09	0.68	0.76	0.79	0.84
5 smpl. Geo. Mean		9.99	10.23	7.73	12.19	4.74	5.77	6.20	6.95
Mon.	3-Aug	6.00	11.00	5.00	7.33	3.00	5.00	1.00	3.00
5 smpl. Log Value		0.88	0.98	0.79	1.00	0.68	0.70	0.65	0.78
5 smpl. Geo. Mean		7.57	9.49	6.13	10.11	4.74	5.02	4.50	6.05
Thur.	6-Aug	39.00	6.00	8.00	17.67	54.00	3.00	8.00	21.67
5 smpl. Log Value		1.06	0.70	0.69	0.90	0.84	0.40	0.55	0.72
5 smpl. Geo. Mean		11.41	5.05	4.92	8.02	6.95	2.54	3.52	5.30
Mon.	10-Aug	5.00	2.00	10.00	5.67	1.00	1.00	5.00	2.33
5 smpl. Log Value		0.95	0.62	0.83	0.87	0.64	0.40	0.57	0.66
5 smpl. Geo. Mean		8.83	4.21	6.79	7.42	4.38	2.54	3.69	4.55
Thur.	13-Aug	20.00	13.00	6.00	13.00	7.00	5.00	4.00	5.33
5 smpl. Log Value		0.93	0.71	0.74	0.86	0.67	0.38	0.44	0.61
5 smpl. Geo. Mean		8.59	5.09	5.45	7.18	4.69	2.37	2.76	4.04
Mon.	17-Aug	13.00	20.00	15.00	16.00	10.00	6.00	11.00	9.00
5 smpl. Log Value		1.10	0.91	0.91	1.04	0.81	0.53	0.65	0.77
5 smpl. Geo. Mean		12.49	8.07	8.15	10.88	6.47	3.39	4.46	5.92
Thur.	20-Aug	13.00	5.00	5.00	7.67	4.00	2.00	1.00	2.33
5 smpl. Log Value		1.16	0.84	0.91	1.04	0.84	0.45	0.65	0.75
5 smpl. Geo. Mean		14.58	6.90	8.15	10.98	6.85	2.83	4.46	5.63
Mon.	24-Aug	16.00	13.00	6.00	11.67	16.00	8.00	5.00	9.67
5 smpl. Log Value		1.09	0.91	0.89	1.00	0.73	0.54	0.61	0.68
5 smpl. Geo. Mean		12.20	8.05	7.70	10.11	5.37	3.44	4.06	4.79
Thur.	27-Aug	56.00	11.00	11.00	26.00	45.00	10.00	10.00	21.67
5 smpl. Log Value		1.30	1.05	0.89	1.14	1.06	0.74	0.67	0.87
5 smpl. Geo. Mean		19.78	11.32	7.84	13.71	11.51	5.45	4.66	7.48
Mon.	31-Aug	18.00	24.00	20.00	20.67	5.00	23.00	20.00	16.00
5 smpl. Log Value		1.29	1.11	1.00	1.18	1.03	0.87	0.81	0.97
5 smpl. Geo. Mean		19.37	12.80	9.98	15.04	10.76	7.39	6.43	9.32
Thur.	3-Sep	26.00	18.00	15.00	19.67	18.00	14.00	14.00	15.33
5 smpl. Log Value		1.35	1.10	1.00	1.20	1.08	0.94	0.83	1.02
5 smpl. Geo. Mean		22.25	12.53	9.98	15.67	12.10	8.76	6.75	10.37

BLUE MARSH BEACH BACTERIA DATA

APPENDIX C

LABORATORY CUSTODY SHEETS

M.J. Reider Associates, Inc.
ENVIRONMENTAL TESTING LABORATORY
U.S. EPA/PA DEP #06-00003
107 ANGELICA STREET □ READING, PA 19611 □ WWW.MJREIDER.COM (610) 374-5129 FAX (610) 374-7234

Sold To: Accounts Payable
Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

INVOICE NO. 325257
Date 06/15/15

Acct. No. 03156
P.O. No. 1115743
Receipt No. 0
C of C No. 257587
Contact Richard Wheeler

Sample Description			Price
15	0020135	BM-1 Surface	254.00
15	0020136	BM-2 Surface	254.00
15	0020137	BM-2 Mid-Depth	194.00
15	0020138	BM-2 Deep	194.00
15	0020139	BM-5 Surface	254.00
15	0020140	BM-6 Surface	254.00
15	0020141	BM-6 Mid-Depth	194.00
15	0020142	BM-6 Deep	194.00
15	0020143	BM-7 Surface	254.00
15	0020144	BM-7 Mid-Depth	194.00
15	0020145	BM-7 Deep	194.00
15	0020146	BM-8 Surface	254.00
15	0020147	BM-8 Mid-Depth	194.00
15	0020148	BM-8 Deep	194.00
15	0020149	BM-9 Surface	254.00
15	0020150	BM-9 Mid-Depth	194.00
15	0020151	BM-9 Deep	194.00
15	0020152	BM-10 Surface	254.00
15	0020153	BM-10 Mid-Depth	194.00
15	0020154	BM-10 Deep	194.00
15	0020155	BM-11 Surface	254.00

1.5% PER MONTH SURCHARGE WILL BE APPLIED TO INVOICES NOT PAID IN 30 DAYS

Remit To:

M. J. REIDER ASSOCIATES, INC.
107 Angelica St.
Reading, PA 19611

PLEASE RETURN THIS PORTION WITH YOUR PAYMENT

INVOICE NO.$ 325257
Date 06/15/2015
Acct. No. 3156
Amount Due $ 4614.00

M.J. Reider Associates, Inc.
ENVIRONMENTAL TESTING LABORATORY
U.S. EPA/PA DEP #06-00003
107 ANGELICA STREET □ READING, PA 19611 □ WWW.MJREIDER.COM (610) 374-5129 FAX (610) 374-7234

Sold To: Accounts Payable
Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

INVOICE NO. 325257
Date 06/15/15

Acct. No. 03156
P.O. No. 1115743
Receipt No. 0
C of C No. 257587
Contact Richard Wheeler

Sample Description	Price
Analytical	4,614.00

Due Date: 07/15/2015

TOTAL AMOUNT DUE: $4,614.00

1.5% PER MONTH SURCHARGE WILL BE APPLIED TO INVOICES NOT PAID IN 30 DAYS

Remit To:

M. J. REIDER ASSOCIATES, INC.
107 Angelica St.
Reading, PA 19611

PLEASE RETURN THIS PORTION WITH YOUR PAYMENT

INVOICE NO.$ 325257
Date 06/15/2015
Acct. No. 3156
Amount Due $ 4614.00

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

Attention: David Wertz
Reported To: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 06/15/15
Lab ID: 3156-15-0020135

Date Collected: 06/02/15 14:15
Collected By: Client

Sample Desc: BM-1 Surface

Date Received: 06/02/15 15:15

PWSID: 3060912

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Fecal Coliform	10	/100ml	2	1	SM 9222D	06/02	15:50	PLW
Total Coliform	1200	mpn/100ml	1	1	SM 9223B	06/03	13:25	TNS
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	0.02	mg/l	.01	1	SM 4500P-E	06/03	08:00	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	06/03	12:30	HRG
Phosphorus as P, Total	0.02	mg/l	.01	1	SM 4500P-E	06/03	12:45	HRG
NITROGENS								
Nitrogen, Ammonia	0.14	mg/l	.05	1	D6919-03	06/02	19:25	JCL
Nitrogen, Nitrate	3.73	mg/l	.05	1	EPA 353.2	06/03	15:15	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	06/03	13:32	JCL
Nitrogen, Total Kjeldahl	0.64	mg/l	.25	1	EPA 351.2	06/04	13:14	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	06/02	16:30	EMW
Total Organic Carbon	2.1	mg/l	1	1	SM5310 C	06/03	13:09	ALD
RESIDUES								
Solids, Total Dissolved	100	mg/l	5	1	SM 2540C	06/04	13:15	TMH
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	06/04	13:15	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	109	mg/l	1	1	SM 2320 B	06/05	13:30	HRG

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

Reviewed and Approved by:

Richard Wheeler

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

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

Attention: David Wertz
Reported To: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 06/15/15
Lab ID: 3156-15-0020135

Date Collected: 06/02/15 14:15
Collected By: Client

Sample Desc: BM-1 Surface

Date Received: 06/02/15 15:15

PWSID: 3060912

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

COMMENTS

01 The total coliform sample was placed in the incubator on 06/02/15 at 18:25.

02 The Ortho-phosphate was filtered after it was received at the laboratory.

03 The sample was filtered/preserved after it was received at the laboratory for dissolved po4-p.

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

Reviewed and Approved by:

Richard Wheeler

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M.J. Reider Associates, Inc.

Attention: David Wertz
Reported To: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 06/15/15
Lab ID: 3156-15-0020136

Date Collected: 06/02/15 10:30
Collected By: Client

Sample Desc: BM-2 Surface

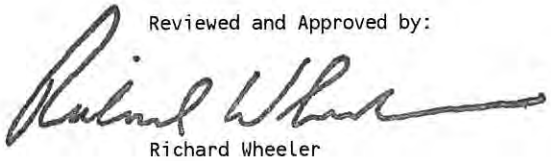
Date Received: 06/02/15 15:15

PWSID: 3060912

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Fecal Coliform	3	/100ml	2	1	SM 9222D	06/02	15:50	PLW
Total Coliform	140	mpn/100ml	1	1	SM 9223B	06/03	13:25	TNS
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	0.02	mg/l	.01	1	SM 4500P-E	06/03	08:00	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	06/03	12:30	HRG
Phosphorus as P, Total	0.06	mg/l	.01	1	SM 4500P-E	06/03	12:50	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	06/02	19:40	JCL
Nitrogen, Nitrate	3.82	mg/l	.05	1	EPA 353.2	06/03	15:16	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	06/03	13:35	JCL
Nitrogen, Total Kjeldahl	0.65	mg/l	.25	1	EPA 351.2	06/04	13:17	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	06/02	16:30	EMW
Total Organic Carbon	2.2	mg/l	1	1	SM5310 C	06/03	13:44	ALD
RESIDUES								
Solids, Total Dissolved	135	mg/l	5	1	SM 2540C	06/04	13:15	TMH
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	06/04	13:15	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	99	mg/l	1	1	SM 2320 B	06/05	13:30	HRG

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

Reviewed and Approved by:



Richard Wheeler

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

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

Attention: David Wertz
Reported To: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 06/15/15
Lab ID: 3156-15-0020136

Date Collected: 06/02/15 10:30
Collected By: Client

Sample Desc: BM-2 Surface

Date Received: 06/02/15 15:15

PWSID: 3060912

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

COMMENTS

01 The total coliform sample was placed in the incubator on 06/02/15 at 18:25.

02 The Ortho-phosphate was filtered after it was received at the laboratory.

03 The sample was filtered/preserved after it was received at the laboratory for dissolved po4-p.

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

Reviewed and Approved by:

Richard Wheeler

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M.J. Reider Associates, Inc.

Attention: David Wertz
Reported To: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 06/15/15
Lab ID: 3156-15-0020137

Date Collected: 06/02/15 10:30
Collected By: Client

Sample Desc: BM-2 Mid-Depth

Date Received: 06/02/15 15:15

PWSID: 3060912

	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	06/03	08:05	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	06/03	12:30	HRG
Phosphorus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	06/03	12:50	HRG
NITROGENS								
Nitrogen, Ammonia	0.11	mg/l	.05	1	D6919-03	06/02	19:54	JCL
Nitrogen, Nitrate	4.06	mg/l	.05	1	EPA 353.2	06/03	15:17	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	06/03	13:36	JCL
Nitrogen, Total Kjeldahl	0.61	mg/l	.25	1	EPA 351.2	06/04	13:18	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	06/02	16:30	EMW
Total Organic Carbon	2.0	mg/l	1	1	SM5310 C	06/03	14:33	ALD
RESIDUES								
Solids, Total Dissolved	212	mg/l	5	1	SM 2540C	06/04	13:15	TMH
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	06/04	13:15	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	125	mg/l	1	1	SM 2320 B	06/05	13:30	HRG

COMMENTS

01 The Ortho-phosphate was filtered after it was received at the laboratory.

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

Reviewed and Approved by:

Richard Wheeler

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Attention: David Wertz
Reported To: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 06/15/15
Lab ID: 3156-15-0020137

Date Collected: 06/02/15 10:30
Collected By: Client

Sample Desc: BM-2 Mid-Depth

Date Received: 06/02/15 15:15

PWSID: 3060912

		Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
02	The sample was filtered/preserved after it was received at the laboratory for dissolved po4-p.								

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

Reviewed and Approved by:

Richard Wheeler

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

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

Attention: David Wertz
Reported To: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 06/15/15
Lab ID: 3156-15-0020138

Date Collected: 06/02/15 10:30
Collected By: Client

Sample Desc: BM-2 Deep

Date Received: 06/02/15 15:15

PWSID: 3060912

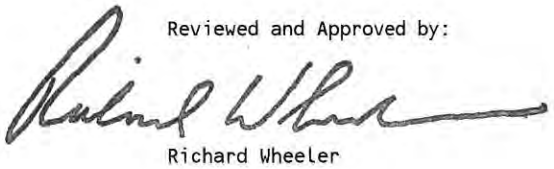
	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	0.13	mg/l	.01	1	SM 4500P-E	06/03	08:05	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	06/03	12:35	HRG
Phosphorus as P, Total	0.13	mg/l	.01	1	SM 4500P-E	06/03	12:50	HRG
NITROGENS								
Nitrogen, Ammonia	0.32	mg/l	.05	1	D6919-03	06/02	20:09	JCL
Nitrogen, Nitrate	2.84	mg/l	.05	1	EPA 353.2	06/03	15:18	JCL
Nitrogen, Nitrite	0.06	mg/l	.05	1	EPA 353.2	06/03	13:37	JCL
Nitrogen, Total Kjeldahl	0.72	mg/l	.25	1	EPA 351.2	06/04	13:19	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	06/02	16:30	EMW
Total Organic Carbon	1.8	mg/l	1	1	SM5310 C	06/03	14:50	ALD
RESIDUES								
Solids, Total Dissolved	190	mg/l	5	1	SM 2540C	06/04	13:15	TMH
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	06/04	13:15	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	116	mg/l	1	1	SM 2320 B	06/05	13:45	HRG

COMMENTS

01 The Ortho-phosphate was filtered after it was received at the laboratory.

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

Reviewed and Approved by:



Richard Wheeler

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

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

Attention: David Wertz
Reported To: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 06/15/15
Lab ID: 3156-15-0020138

Date Collected: 06/02/15 10:30
Collected By: Client

Sample Desc: BM-2 Deep

Date Received: 06/02/15 15:15

PWSID: 3060912

		Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
02	The sample was filtered/preserved after it was received at the laboratory for dissolved po4-p.								

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

Reviewed and Approved by:

Richard Wheeler

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

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

Attention: David Wertz
Reported To: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 06/15/15
Lab ID: 3156-15-0020139

Date Collected: 06/02/15 13:40
Collected By: Client

Sample Desc: BM-5 Surface

Date Received: 06/02/15 15:15

PWSID: 3060912

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Fecal Coliform	14000	/100ml	2	1	SM 9222D	06/02	15:50	PLW
Total Coliform	>2400	mpn/100ml	1	1	SM 9223B	06/03	13:25	TNS
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	0.16	mg/l	.01	1	SM 4500P-E	06/03	08:05	HRG
Phosphorus as P, Dissolved	0.12	mg/l	.05	1	SM 4500P-E	06/03	12:35	HRG
Phosphorus as P, Total	0.20	mg/l	.01	1	SM 4500P-E	06/03	12:50	HRG
NITROGENS								
Nitrogen, Ammonia	0.08	mg/l	.05	1	D6919-03	06/02	20:24	JCL
Nitrogen, Nitrate	7.01	mg/l	.05	1	EPA 353.2	06/03	15:46	JCL
Nitrogen, Nitrite	0.05	mg/l	.05	1	EPA 353.2	06/03	13:38	JCL
Nitrogen, Total Kjeldahl	0.73	mg/l	.25	1	EPA 351.2	06/04	13:20	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	06/02	16:30	EMW
Total Organic Carbon	3.0	mg/l	1	1	SM5310 C	06/03	15:09	ALD
RESIDUES								
Solids, Total Dissolved	308	mg/l	5	1	SM 2540C	06/04	13:15	TMH
Solids, Total Suspended	25	mg/l	3	1	SM 2540D	06/04	13:15	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	165	mg/l	1	1	SM 2320 B	06/05	13:45	HRG

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

Reviewed and Approved by:

Richard Wheeler

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Date of Report: 06/15/15
Lab ID: 3156-15-0020139

Date Collected: 06/02/15 13:40
Collected By: Client

Sample Desc: BM-5 Surface

Date Received: 06/02/15 15:15

PWSID: 3060912

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

COMMENTS

01 The total coliform sample was placed in the incubator on 06/02/15 at 18:25.

02 The Ortho-phosphate was filtered after it was received at the laboratory.

03 The sample was filtered/preserved after it was received at the laboratory for dissolved po4-p.

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

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Reported To: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 06/15/15
Lab ID: 3156-15-0020140

Date Collected: 06/02/15 09:30
Collected By: Client

Sample Desc: BM-6 Surface

Date Received: 06/02/15 15:15

PWSID: 3060912

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Fecal Coliform	34	/100ml	2	1	SM 9222D	06/02	15:50	PLW
Total Coliform	730	mpn/100ml	1	1	SM 9223B	06/03	13:25	TNS
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	06/03	08:05	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	06/03	12:35	HRG
Phosphorus as P, Total	0.03	mg/l	.01	1	SM 4500P-E	06/03	12:50	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	06/02	20:38	JCL
Nitrogen, Nitrate	3.88	mg/l	.05	1	EPA 353.2	06/03	15:21	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	06/03	13:39	JCL
Nitrogen, Total Kjeldahl	0.63	mg/l	.25	1	EPA 351.2	06/04	13:21	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	06/02	16:30	EMW
Total Organic Carbon	2.1	mg/l	1	1	SM5310 C	06/03	16:14	ALD
RESIDUES								
Solids, Total Dissolved	176	mg/l	5	1	SM 2540C	06/04	13:15	TMH
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	06/04	13:15	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	87	mg/l	1	1	SM 2320 B	06/05	13:45	HRG

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Date Collected: 06/02/15 09:30
Collected By: Client

Sample Desc: BM-6 Surface

Date Received: 06/02/15 15:15

PWSID: 3060912

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

COMMENTS

01 The TOC duplicates were greater than 20%.

02 The Ortho-phosphate was filtered after it was received at the laboratory.

03 The sample was filtered/preserved after it was received at the laboratory for dissolved po4-p.

04 The total coliform sample was placed in the incubator on 06/02/15 at 18:25.

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1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 06/15/15
Lab ID: 3156-15-0020141

Date Collected: 06/02/15 09:30
Collected By: Client

Sample Desc: BM-6 Mid-Depth

Date Received: 06/02/15 15:15

PWSID: 3060912

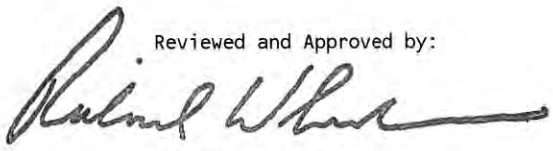
	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	06/03	08:05	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	06/03	12:35	HRG
Phosphorus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	06/03	12:50	HRG
NITROGENS								
Nitrogen, Ammonia	0.15	mg/l	.05	1	D6919-03	06/02	20:53	JCL
Nitrogen, Nitrate	4.03	mg/l	.05	1	EPA 353.2	06/03	15:22	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	06/03	13:40	JCL
Nitrogen, Total Kjeldahl	0.64	mg/l	.25	1	EPA 351.2	06/04	13:22	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	06/02	16:30	EMW
Total Organic Carbon	2.0	mg/l	1	1	SM5310 C	06/03	16:50	ALD
RESIDUES								
Solids, Total Dissolved	219	mg/l	5	1	SM 2540C	06/04	13:15	TMH
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	06/04	13:15	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	122	mg/l	1	1	SM 2320 B	06/05	14:00	HRG

COMMENTS

01 The sample was filtered/preserved after it was received at the laboratory for dissolved po4-p.

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

Reviewed and Approved by:



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Date of Report: 06/15/15
Lab ID: 3156-15-0020141

Date Collected: 06/02/15 09:30
Collected By: Client

Sample Desc: BM-6 Mid-Depth

Date Received: 06/02/15 15:15

PWSID: 3060912

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

02 The Ortho-phosphate was filtered after it was received at the laboratory.

Distribution of Reports:
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Reported To: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 06/15/15
Lab ID: 3156-15-0020142

Date Collected: 06/02/15 09:30
Collected By: Client

Sample Desc: BM-6 Deep

Date Received: 06/02/15 15:15

PWSID: 3060912

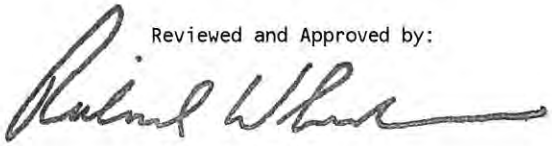
	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	0.03	mg/l	.01	1	SM 4500P-E	06/03	08:05	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	06/03	12:35	HRG
Phosphorus as P, Total	0.03	mg/l	.01	1	SM 4500P-E	06/03	12:50	HRG
NITROGENS								
Nitrogen, Ammonia	0.55	mg/l	.05	1	D6919-03	06/02	21:07	JCL
Nitrogen, Nitrate	2.48	mg/l	.05	1	EPA 353.2	06/03	15:23	JCL
Nitrogen, Nitrite	0.08	mg/l	.05	1	EPA 353.2	06/03	13:40	JCL
Nitrogen, Total Kjeldahl	0.96	mg/l	.25	1	EPA 351.2	06/04	13:23	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	06/02	16:30	EMW
Total Organic Carbon	2.0	mg/l	1	1	SM5310 C	06/03	17:42	ALD
RESIDUES								
Solids, Total Dissolved	211	mg/l	5	1	SM 2540C	06/04	13:15	TMH
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	06/04	13:15	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	132	mg/l	1	1	SM 2320 B	06/05	14:00	HRG

COMMENTS

01 The Ortho-phosphate was filtered after it was received at the laboratory.

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

Reviewed and Approved by:



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Date of Report: 06/15/15
Lab ID: 3156-15-0020142

Date Collected: 06/02/15 09:30
Collected By: Client

Sample Desc: BM-6 Deep

Date Received: 06/02/15 15:15

PWSID: 3060912

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

02 The sample was filtered/preserved after it was received at the laboratory for dissolved po4-p.

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

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Date of Report: 06/15/15
Lab ID: 3156-15-0020143

Date Collected: 06/02/15 12:45
Collected By: Client

Sample Desc: BM-7 Surface

Date Received: 06/02/15 15:15

PWSID: 3060912

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Fecal Coliform	10	/100ml	2	1	SM 9222D	06/02	15:50	PLW
Total Coliform	410	mpn/100ml	1	1	SM 9223B	06/03	13:25	TNS
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	06/03	08:10	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	06/03	12:35	HRG
Phosphorus as P, Total	0.05	mg/l	.01	1	SM 4500P-E	06/03	12:50	HRG
NITROGENS								
Nitrogen, Ammonia	0.10	mg/l	.05	1	D6919-03	06/02	21:22	JCL
Nitrogen, Nitrate	3.84	mg/l	.05	1	EPA 353.2	06/03	15:26	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	06/03	13:43	JCL
Nitrogen, Total Kjeldahl	0.68	mg/l	.25	1	EPA 351.2	06/04	13:25	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	06/02	16:30	EMW
Total Organic Carbon	2.3	mg/l	1	1	SM5310 C	06/03	18:00	ALD
RESIDUES								
Solids, Total Dissolved	200	mg/l	5	1	SM 2540C	06/04	13:15	TMH
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	06/04	13:15	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	102	mg/l	1	1	SM 2320 B	06/05	14:00	HRG

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Date Collected: 06/02/15 12:45
Collected By: Client

Sample Desc: BM-7 Surface

Date Received: 06/02/15 15:15

PWSID: 3060912

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

COMMENTS

01 The Ortho-phosphate was filtered after it was received at the laboratory.

02 The sample was filtered/preserved after it was received at the laboratory for dissolved po4-p.

03 The total coliform sample was placed in the incubator on 06/02/15 at 18:25.

Distribution of Reports:
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1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 06/15/15
Lab ID: 3156-15-0020144

Date Collected: 06/02/15 12:45
Collected By: Client

Sample Desc: BM-7 Mid-Depth

Date Received: 06/02/15 15:15

PWSID: 3060912

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	0.04	mg/l	.01	1	SM 4500P-E	06/03	08:10	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	06/03	12:35	HRG
Phosphorus as P, Total	0.09	mg/l	.01	1	SM 4500P-E	06/03	12:50	HRG
NITROGENS								
Nitrogen, Ammonia	0.17	mg/l	.05	1	D6919-03	06/02	21:37	JCL
Nitrogen, Nitrate	4.30	mg/l	.05	1	EPA 353.2	06/03	15:27	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	06/03	13:44	JCL
Nitrogen, Total Kjeldahl	0.73	mg/l	.25	1	EPA 351.2	06/04	13:26	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	06/02	16:30	EMW
Total Organic Carbon	2.2	mg/l	1	1	SM5310 C	06/03	18:18	ALD
RESIDUES								
Solids, Total Dissolved	239	mg/l	5	1	SM 2540C	06/04	13:15	TMH
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	06/04	13:15	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	160	mg/l	1	1	SM 2320 B	06/05	14:15	HRG

COMMENTS

01 The Ortho-phosphate was filtered after it was received at the laboratory.

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Date Collected: 06/02/15 12:45
Collected By: Client

Sample Desc: BM-7 Mid-Depth

Date Received: 06/02/15 15:15

PWSID: 3060912

		Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
02	The sample was filtered/preserved after it was received at the laboratory for dissolved po4-p.								

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Date of Report: 06/15/15
Lab ID: 3156-15-0020145

Date Collected: 06/02/15 12:45
Collected By: Client

Sample Desc: BM-7 Deep

Date Received: 06/02/15 15:15

PWSID: 3060912

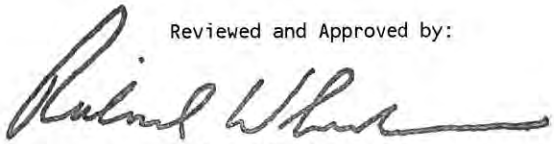
	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	0.12	mg/l	.01	1	SM 4500P-E	06/03	08:10	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	06/03	12:40	HRG
Phosphorus as P, Total	0.12	mg/l	.01	1	SM 4500P-E	06/03	12:55	HRG
NITROGENS								
Nitrogen, Ammonia	0.24	mg/l	.05	1	D6919-03	06/02	22:20	JCL
Nitrogen, Nitrate	3.22	mg/l	.05	1	EPA 353.2	06/03	15:28	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	06/03	13:45	JCL
Nitrogen, Total Kjeldahl	0.86	mg/l	.25	1	EPA 351.2	06/04	13:27	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	06/02	16:30	EMW
Total Organic Carbon	2.1	mg/l	1	1	SM5310 C	06/03	18:50	ALD
RESIDUES								
Solids, Total Dissolved	185	mg/l	5	1	SM 2540C	06/04	13:40	TMH
Solids, Total Suspended	51	mg/l	3	1	SM 2540D	06/04	13:15	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	116	mg/l	1	1	SM 2320 B	06/05	14:30	HRG

COMMENTS

01 The Ortho-phosphate was filtered after it was received at the laboratory.

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

Reviewed and Approved by:



Richard Wheeler

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1320 North Courthouse Rd., Ste.600
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Date of Report: 06/15/15
Lab ID: 3156-15-0020145

Date Collected: 06/02/15 12:45
Collected By: Client

Sample Desc: BM-7 Deep

Date Received: 06/02/15 15:15

PWSID: 3060912

		Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
02	The sample was filtered/preserved after it was received at the laboratory for dissolved po4-p.								

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

Reviewed and Approved by:

Richard Wheeler

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

CERTIFICATE OF ANALYSIS

M.J. Reider Associates, Inc.

Attention: David Wertz
Reported To: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 06/15/15
Lab ID: 3156-15-0020146

Date Collected: 06/02/15 12:30
Collected By: Client

Sample Desc: BM-8 Surface

Date Received: 06/02/15 15:15

PWSID: 3060912

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Fecal Coliform	930	/100ml	2	1	SM 9222D	06/02	15:50	PLW
Total Coliform	>2400	mpn/100ml	1	1	SM 9223B	06/03	13:25	TNS
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	0.03	mg/l	.01	1	SM 4500P-E	06/03	08:10	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	06/03	12:40	HRG
Phosphorus as P, Total	0.04	mg/l	.01	1	SM 4500P-E	06/03	12:55	HRG
NITROGENS								
Nitrogen, Ammonia	0.14	mg/l	.05	1	D6919-03	06/02	22:35	JCL
Nitrogen, Nitrate	3.62	mg/l	.05	1	EPA 353.2	06/03	15:29	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	06/03	13:48	JCL
Nitrogen, Total Kjeldahl	0.72	mg/l	.25	1	EPA 351.2	06/04	13:30	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	06/02	16:30	EMW
Total Organic Carbon	2.4	mg/l	1	1	SM5310 C	06/03	19:08	ALD
RESIDUES								
Solids, Total Dissolved	208	mg/l	5	1	SM 2540C	06/04	13:40	TMH
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	06/04	13:45	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	95	mg/l	1	1	SM 2320 B	06/05	14:30	HRG

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

Reviewed and Approved by:

Richard Wheeler

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Date of Report: 06/15/15
Lab ID: 3156-15-0020146

Date Collected: 06/02/15 12:30
Collected By: Client

Sample Desc: BM-8 Surface

Date Received: 06/02/15 15:15

PWSID: 3060912

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

COMMENTS

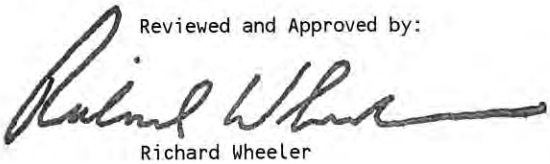
01 The Ortho-phosphate was filtered after it was received at the laboratory.

02 The sample was filtered/preserved after it was received at the laboratory for dissolved po4-p.

03 The total coliform sample was placed in the incubator on 06/02/15 at 18:25.

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

Reviewed and Approved by:



Richard Wheeler

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M.J. Reider Associates, Inc.

Attention: David Wertz
Reported To: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 06/15/15
Lab ID: 3156-15-0020147

Date Collected: 06/02/15 12:30
Collected By: Client

Sample Desc: BM-8 Mid-Depth

Date Received: 06/02/15 15:15

PWSID: 3060912

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	0.05	mg/l	.01	1	SM 4500P-E	06/03	08:10	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	06/03	12:40	HRG
Phosphorus as P, Total	0.09	mg/l	.01	1	SM 4500P-E	06/03	12:55	HRG
NITROGENS								
Nitrogen, Ammonia	0.12	mg/l	.05	1	D6919-03	06/02	22:50	JCL
Nitrogen, Nitrate	3.63	mg/l	.05	1	EPA 353.2	06/03	15:32	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	06/03	13:49	JCL
Nitrogen, Total Kjeldahl	0.83	mg/l	.25	1	EPA 351.2	06/04	13:31	JCL
OTHER								
Biochemical Oxygen Demand	3	mg/l	2	1	SM 5210B	06/02	16:30	EMW
Total Organic Carbon	2.4	mg/l	1	1	SM5310 C	06/03	19:26	ALD
RESIDUES								
Solids, Total Dissolved	203	mg/l	5	1	SM 2540C	06/04	13:40	TMH
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	06/04	13:45	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	103	mg/l	1	1	SM 2320 B	06/05	14:30	HRG

COMMENTS

01 The Ortho-phosphate was filtered after it was received at the laboratory.

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

Reviewed and Approved by:

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Date of Report: 06/15/15
Lab ID: 3156-15-0020147

Date Collected: 06/02/15 12:30
Collected By: Client

Sample Desc: BM-8 Mid-Depth

Date Received: 06/02/15 15:15

PWSID: 3060912

		Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
02	The sample was filtered/preserved after it was received at the laboratory for dissolved po4-p.								

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

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Attention: David Wertz
Reported To: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 06/15/15
Lab ID: 3156-15-0020148

Date Collected: 06/02/15 12:30
Collected By: Client

Sample Desc: BM-8 Deep

Date Received: 06/02/15 15:15

PWSID: 3060912

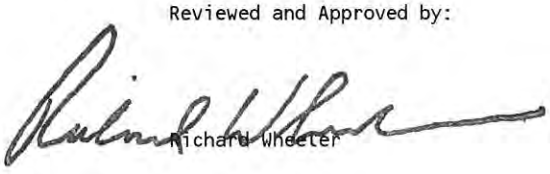
	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	06/03	08:10	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	06/03	12:40	HRG
Phosphorus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	06/03	12:55	HRG
NITROGENS								
Nitrogen, Ammonia	0.25	mg/l	.05	1	D6919-03	06/02	23:04	JCL
Nitrogen, Nitrate	3.64	mg/l	.05	1	EPA 353.2	06/03	15:33	JCL
Nitrogen, Nitrite	0.06	mg/l	.05	1	EPA 353.2	06/03	13:50	JCL
Nitrogen, Total Kjeldahl	0.79	mg/l	.25	1	EPA 351.2	06/04	13:32	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	06/02	16:30	EMW
Total Organic Carbon	2.1	mg/l	1	1	SM5310 C	06/03	19:43	ALD
RESIDUES								
Solids, Total Dissolved	245	mg/l	5	1	SM 2540C	06/04	13:40	TMH
Solids, Total Suspended	10	mg/l	3	1	SM 2540D	06/04	13:45	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	115	mg/l	1	1	SM 2320 B	06/05	14:30	HRG

COMMENTS

01 The Ortho-phosphate was filtered after it was received at the laboratory.

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

Reviewed and Approved by:



Richard Wheeler

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1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 06/15/15
Lab ID: 3156-15-0020148

Date Collected: 06/02/15 12:30
Collected By: Client

Sample Desc: BM-8 Deep

Date Received: 06/02/15 15:15

PWSID: 3060912

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

02 The sample was filtered/preserved after it was received at the laboratory for dissolved po4-p.

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

Reviewed and Approved by:

Richard Wheeler

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Reported To: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 06/15/15
Lab ID: 3156-15-0020149

Date Collected: 06/02/15 12:00
Collected By: Client

Sample Desc: BM-9 Surface

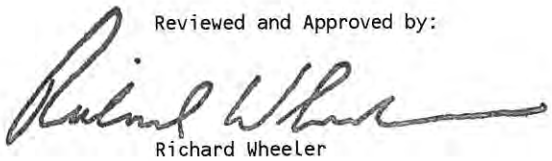
Date Received: 06/02/15 15:15

PWSID: 3060912

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Fecal Coliform	50	/100ml	2	1	SM 9222D	06/02	15:50	PLW
Total Coliform	730	mpn/100ml	1	1	SM 9223B	06/03	13:25	TNS
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	06/03	08:10	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	06/03	12:40	HRG
Phosphorus as P, Total	0.03	mg/l	.01	1	SM 4500P-E	06/03	12:55	HRG
NITROGENS								
Nitrogen, Ammonia	0.12	mg/l	.05	1	D6919-03	06/02	23:19	JCL
Nitrogen, Nitrate	3.90	mg/l	.05	1	EPA 353.2	06/03	15:34	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	06/03	13:51	JCL
Nitrogen, Total Kjeldahl	0.75	mg/l	.25	1	EPA 351.2	06/04	13:33	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	06/02	16:30	EMW
Total Organic Carbon	2.2	mg/l	1	1	SM5310 C	06/03	20:01	ALD
RESIDUES								
Solids, Total Dissolved	227	mg/l	5	1	SM 2540C	06/04	13:40	TMH
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	06/04	13:45	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	112	mg/l	1	1	SM 2320 B	06/05	14:45	HRG

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

Reviewed and Approved by:



Richard Wheeler

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Attention: David Wertz
Reported To: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 06/15/15
Lab ID: 3156-15-0020149

Date Collected: 06/02/15 12:00
Collected By: Client

Sample Desc: BM-9 Surface

Date Received: 06/02/15 15:15

PWSID: 3060912

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

COMMENTS

01 The Ortho-phosphate was filtered after it was received at the laboratory.

02 The sample was filtered/preserved after it was received at the laboratory for dissolved po4-p.

03 The total coliform sample was placed in the incubator on 06/02/15 at 18:25.

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

Reviewed and Approved by:

Richard Wheeler

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M.J. Reider Associates, Inc.

Attention: David Wertz
Reported To: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 06/15/15
Lab ID: 3156-15-0020150

Date Collected: 06/02/15 12:00
Collected By: Client

Sample Desc: BM-9 Mid-Depth

Date Received: 06/02/15 15:15

PWSID: 3060912

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	0.04	mg/l	.01	1	SM 4500P-E	06/03	08:10	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	06/03	12:40	HRG
Phosphorus as P, Total	0.15	mg/l	.01	1	SM 4500P-E	06/03	12:55	HRG
NITROGENS								
Nitrogen, Ammonia	0.17	mg/l	.05	1	D6919-03	06/02	23:33	JCL
Nitrogen, Nitrate	3.99	mg/l	.05	1	EPA 353.2	06/03	15:35	JCL
Nitrogen, Nitrite	0.05	mg/l	.05	1	EPA 353.2	06/03	13:51	JCL
Nitrogen, Total Kjeldahl	0.92	mg/l	.25	1	EPA 351.2	06/04	13:34	JCL
OTHER								
Biochemical Oxygen Demand	4	mg/l	2	1	SM 5210B	06/02	16:30	EMW
Total Organic Carbon	2.5	mg/l	1	1	SM5310 C	06/03	21:07	ALD
RESIDUES								
Solids, Total Dissolved	236	mg/l	5	1	SM 2540C	06/04	13:40	TMH
Solids, Total Suspended	5	mg/l	3	1	SM 2540D	06/04	13:45	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	117	mg/l	1	1	SM 2320 B	06/05	14:45	HRG

COMMENTS

01 The Ortho-phosphate was filtered after it was received at the laboratory.

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

Reviewed and Approved by:

Richard Wheeler

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Date of Report: 06/15/15
Lab ID: 3156-15-0020150
Date Collected: 06/02/15 12:00
Collected By: Client

Sample Desc: BM-9 Mid-Depth

Date Received: 06/02/15 15:15

PWSID: 3060912

		Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
02	The sample was filtered/preserved after it was received at the laboratory for dissolved po4-p.								

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

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Reported To: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 06/15/15
Lab ID: 3156-15-0020151

Date Collected: 06/02/15 12:00
Collected By: Client

Sample Desc: BM-9 Deep

Date Received: 06/02/15 15:15

PWSID: 3060912

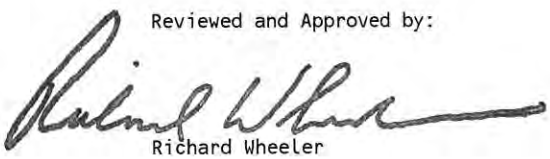
	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	0.06	mg/l	.01	1	SM 4500P-E	06/03	08:10	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	06/03	12:40	HRG
Phosphorus as P, Total	0.09	mg/l	.01	1	SM 4500P-E	06/03	13:00	HRG
NITROGENS								
Nitrogen, Ammonia	0.30	mg/l	.05	1	D6919-03	06/02	23:48	JCL
Nitrogen, Nitrate	2.57	mg/l	.05	1	EPA 353.2	06/03	15:38	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	06/03	13:55	JCL
Nitrogen, Total Kjeldahl	0.81	mg/l	.25	1	EPA 351.2	06/04	13:37	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	06/02	16:30	EMW
Total Organic Carbon	1.9	mg/l	1	1	SM5310 C	06/03	21:42	ALD
RESIDUES								
Solids, Total Dissolved	230	mg/l	5	1	SM 2540C	06/04	13:40	TMH
Solids, Total Suspended	23	mg/l	3	1	SM 2540D	06/04	13:45	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	120	mg/l	1	1	SM 2320 B	06/05	14:45	HRG

COMMENTS

01 The Ortho-phosphate was filtered after it was received at the laboratory.

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

Reviewed and Approved by:



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Arlington VA 22201-0000

Date of Report: 06/15/15
Lab ID: 3156-15-0020151

Date Collected: 06/02/15 12:00
Collected By: Client

Sample Desc: BM-9 Deep

Date Received: 06/02/15 15:15

PWSID: 3060912

		Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
02	The sample was filtered/preserved after it was received at the laboratory for dissolved po4-p.								

Distribution of Reports:
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Reported To: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 06/15/15
Lab ID: 3156-15-0020152

Date Collected: 06/02/15 11:30
Collected By: Client

Sample Desc: BM-10 Surface

Date Received: 06/02/15 15:15

PWSID: 3060912

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Fecal Coliform	12000	/100ml	2	1	SM 9222D	06/02	15:50	PLW
Total Coliform	>2400	mpn/100ml	1	1	SM 9223B	06/03	13:25	TNS
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	06/03	08:10	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	06/03	12:40	HRG
Phosphorus as P, Total	0.13	mg/l	.01	1	SM 4500P-E	06/03	13:00	HRG
NITROGENS								
Nitrogen, Ammonia	0.10	mg/l	.05	1	D6919-03	06/03	00:03	JCL
Nitrogen, Nitrate	3.90	mg/l	.05	1	EPA 353.2	06/03	15:39	JCL
Nitrogen, Nitrite	0.05	mg/l	.05	1	EPA 353.2	06/03	13:56	JCL
Nitrogen, Total Kjeldahl	0.91	mg/l	.25	1	EPA 351.2	06/04	13:37	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	06/02	16:30	EMW
Total Organic Carbon	2.5	mg/l	1	1	SM5310 C	06/03	22:34	ALD
RESIDUES								
Solids, Total Dissolved	232	mg/l	5	1	SM 2540C	06/04	13:40	TMH
Solids, Total Suspended	8	mg/l	3	1	SM 2540D	06/04	13:45	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	127	mg/l	1	1	SM 2320 B	06/05	15:00	HRG

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

Reviewed and Approved by:

Richard Wheeler

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

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

Attention: David Wertz
Reported To: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 06/15/15
Lab ID: 3156-15-0020152

Date Collected: 06/02/15 11:30
Collected By: Client

Sample Desc: BM-10 Surface

Date Received: 06/02/15 15:15

PWSID: 3060912

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

COMMENTS

01 The Ortho-phosphate was filtered after it was received at the laboratory.

02 The sample was filtered/preserved after it was received at the laboratory for dissolved po4-p.

03 The total coliform sample was placed in the incubator on 06/02/15 at 18:25.

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

Reviewed and Approved by:

Richard Wheeler

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1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 06/15/15
Lab ID: 3156-15-0020153
Date Collected: 06/02/15 11:30
Collected By: Client

Sample Desc: BM-10 Mid-Depth

Date Received: 06/02/15 15:15

PWSID: 3060912

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	0.10	mg/l	.01	1	SM 4500P-E	06/03	08:15	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	06/03	12:40	HRG
Phosphorus as P, Total	0.10	mg/l	.01	1	SM 4500P-E	06/03	13:00	HRG
NITROGENS								
Nitrogen, Ammonia	0.09	mg/l	.05	1	D6919-03	06/03	00:17	JCL
Nitrogen, Nitrate	3.89	mg/l	.05	1	EPA 353.2	06/03	15:40	JCL
Nitrogen, Nitrite	0.05	mg/l	.05	1	EPA 353.2	06/03	13:57	JCL
Nitrogen, Total Kjeldahl	0.84	mg/l	.25	1	EPA 351.2	06/04	13:38	JCL
OTHER								
Biochemical Oxygen Demand	3	mg/l	2	1	SM 5210B	06/02	16:30	EMW
Total Organic Carbon	2.6	mg/l	1	1	SM5310 C	06/03	22:53	ALD
RESIDUES								
Solids, Total Dissolved	207	mg/l	5	1	SM 2540C	06/04	13:40	TMH
Solids, Total Suspended	5	mg/l	3	1	SM 2540D	06/04	13:45	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	116	mg/l	1	1	SM 2320 B	06/05	15:00	HRG

COMMENTS

01 The Ortho-phosphate was filtered after it was received at the laboratory.

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

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Date of Report: 06/15/15
Lab ID: 3156-15-0020153

Date Collected: 06/02/15 11:30
Collected By: Client

Sample Desc: BM-10 Mid-Depth

Date Received: 06/02/15 15:15

PWSID: 3060912

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

02 The sample was filtered/preserved after it was received at the laboratory for dissolved po4-p.

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

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Richard Wheeler

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Attention: David Wertz
Reported To: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 06/15/15
Lab ID: 3156-15-0020154

Date Collected: 06/02/15 11:30
Collected By: Client

Sample Desc: BM-10 Deep

Date Received: 06/02/15 15:15

PWSID: 3060912

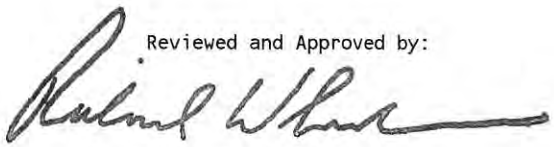
	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	0.26	mg/l	.01	1	SM 4500P-E	06/03	08:15	HRG
Phosphorus as P, Dissolved	0.16	mg/l	.05	1	SM 4500P-E	06/03	12:45	HRG
Phosphorus as P, Total	0.51	mg/l	.01	1	SM 4500P-E	06/03	13:00	HRG
NITROGENS								
Nitrogen, Ammonia	0.25	mg/l	.05	1	D6919-03	06/03	00:32	JCL
Nitrogen, Nitrate	3.81	mg/l	.05	1	EPA 353.2	06/03	15:40	JCL
Nitrogen, Nitrite	0.07	mg/l	.05	1	EPA 353.2	06/03	13:58	JCL
Nitrogen, Total Kjeldahl	1.63	mg/l	.25	1	EPA 351.2	06/04	13:39	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	06/02	16:30	EMW
Total Organic Carbon	6.2	mg/l	1	1	SM5310 C	06/03	23:13	ALD
RESIDUES								
Solids, Total Dissolved	223	mg/l	5	1	SM 2540C	06/04	13:40	TMH
Solids, Total Suspended	108	mg/l	3	1	SM 2540D	06/04	13:45	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	82	mg/l	1	1	SM 2320 B	06/05	15:00	HRG

COMMENTS

01 The sample was filtered/preserved after it was received at the laboratory for dissolved po4-p.

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

Reviewed and Approved by:



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Date of Report: 06/15/15
Lab ID: 3156-15-0020154

Date Collected: 06/02/15 11:30
Collected By: Client

Sample Desc: BM-10 Deep

Date Received: 06/02/15 15:15

PWSID: 3060912

		Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
02	The Ortho-phosphate was filtered after it was received at the laboratory.								

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

Reviewed and Approved by:

Richard Wheeler

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1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 06/15/15
Lab ID: 3156-15-0020155

Date Collected: 06/02/15 13:50
Collected By: Client

Sample Desc: BM-11 Surface

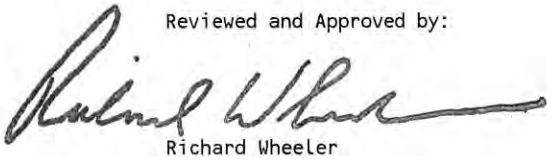
Date Received: 06/02/15 15:15

PWSID: 3060912

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Fecal Coliform	8400	/100ml	2	1	SM 9222D	06/02	15:50	PLW
Total Coliform	>2400	mpn/100ml	1	1	SM 9223B	06/03	13:25	TNS
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	0.12	mg/l	.01	1	SM 4500P-E	06/03	08:15	HRG
Phosphorus as P, Dissolved	0.07	mg/l	.05	1	SM 4500P-E	06/08	12:15	HRG
Phosphorus as P, Total	0.31	mg/l	.01	1	SM 4500P-E	06/05	12:00	HRG
NITROGENS								
Nitrogen, Ammonia	0.05	mg/l	.05	1	D6919-03	06/03	01:30	JCL
Nitrogen, Nitrate	1.85	mg/l	.05	1	EPA 353.2	06/03	15:43	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	06/03	14:01	JCL
Nitrogen, Total Kjeldahl	1.04	mg/l	.25	1	EPA 351.2	06/04	13:42	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	06/02	16:30	EMW
Total Organic Carbon	3.9	mg/l	1	1	SM5310 C	06/04	19:34	ALD
RESIDUES								
Solids, Total Dissolved	94	mg/l	5	1	SM 2540C	06/04	14:00	TMH
Solids, Total Suspended	74	mg/l	3	1	SM 2540D	06/04	13:45	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	42	mg/l	1	1	SM 2320 B	06/05	15:15	HRG

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

Reviewed and Approved by:



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Arlington VA 22201-0000

Date of Report: 06/15/15
Lab ID: 3156-15-0020155

Date Collected: 06/02/15 13:50
Collected By: Client

Sample Desc: BM-11 Surface

Date Received: 06/02/15 15:15

PWSID: 3060912

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

COMMENTS

01 The sample was filtered/preserved after it was received at the laboratory for dissolved po4-p.

02 The Ortho-phosphate was filtered after it was received at the laboratory.

03 The total coliform sample was placed in the incubator on 06/02/15 at 18:25.

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

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THE NELAC INSTITUTE

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M. J. REIDER ASSOCIATES, INC.

Chain of Custody

Account: 3156 Work Order: 006223 Project Leader: rxw No: 257587
Work Order Description: Seasonal Monthly Blue Marsh Resevoir

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

==========

20135 Sample No: 1 Desc: BM-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: 6/2/15
Time: 1415

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;

20136 Sample No: 2 Desc: BM-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: 6/2/15
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;

20137 Sample No: 3 Desc: BM-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: 6/2/15
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;

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

Date: 6/2/15 Time: 1430 Date: 6-2-15 Time: 1515

Sample entered by: WTL

Chain of Custody

Account: 3156 Work Order: 006223 Project Leader: rxw No: 257587
Work Order Description: Seasonal Monthly Blue Marsh Resevoir

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

==========

20138 Sample No: 4 Desc: BM-2 Deep

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

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

Matrix: o Date: 6/2/15 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;

20139 Sample No: 5 Desc: BM-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: 6/2/15 Time: 1340

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;

20140 Sample No: 6 Desc: BM-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: 6/2/15 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;

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

Date: 6/2/15 Time: 1430 Date: 6-2-15 Time: 1515

Sample entered by: WTL

Chain of Custody

Account: 3156 Work Order: 006223 Project Leader: rxw No: 257587
Work Order Description: Seasonal Monthly Blue Marsh Resevoir

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

==========

20141 Sample No: 7 Desc: BM-6 Mid-Depth

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

no2-n, no3-n, d-po4-p, o-po4, bod,
H6 B

Matrix: o Date: 6/2/15
Time: 0930
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;

20142 Sample No: 8 Desc: BM-6 Deep

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

no2-n, no3-n, d-po4-p, o-po4, bod,
H6 B

Matrix: o Date: 6/2/15
Time: 0930
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;

20143 Sample No: 9 Desc: BM-7 Surface

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

no2-n, no3-n, d-po4-p, o-po4, bod,
H6 B

fc, tc,
TNTC

Matrix: o Date: 6/2/15
Time: 1245
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: 6/2/15 Time: 1430 Date: 6-2-15 Time: 1515

Sample entered by: WTZ

Chain of Custody

Account: 3156 Work Order: 006223 Project Leader: rxw No: 257587
Work Order Description: Seasonal Monthly Blue Marsh Resevoir

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

==========

20144

Sample No: 10 Desc: BM-7 Mid-Depth

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

no2-n, no3-n, d-po4-p, o-po4, bod,
a nc H6 B

Matrix: o Date: 6/2/15
Time: 1245

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;

20145

Sample No: 11 Desc: BM-7 Deep

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

nc nc
no2-n, no3-n, d-po4-p, o-po4, bod,
H6 B

Matrix: o Date: 6/2/15
Time: 1245

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;

20146

Sample No: 12 Desc: BM-8 Surface

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

nc nc
no2-n, no3-n, d-po4-p, o-po4, bod,
H6 B
fc, tc,
TNTC

Matrix: o Date: 6/2/15
Time: 1230

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: 6/2/15 Time: 1430 Date: 6-2-15 Time: 1515

Sample entered by: NWL

Chain of Custody

Account: 3156 Work Order: 006223 Project Leader: rxw No: 257587
Work Order Description: Seasonal Monthly Blue Marsh Resevoir

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

==========

20147 Sample No: 13 Desc: BM-8 Mid-Depth

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

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

Matrix: o Date: 6/2/15
Time: ~~1230~~

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;

20148 Sample No: 14 Desc: BM-8 Deep

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

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

Matrix: o Date: 6/2/15
Time: 1230

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;

20149 Sample No: 15 Desc: BM-9 Surface

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

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

fc, tc,
TNTC

Matrix: o Date: 6/2/15
Time: ~~1200~~

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: ByHand Received for laboratory by: ByHand

Date: 6/2/15 Time: 1430 Date: 6-2-15 Time: 1515

Sample entered by: MTZ

Chain of Custody

Account: 3156 Work Order: 006223 Project Leader: rxw No: 257587
Work Order Description: Seasonal Monthly Blue Marsh Resevoir

Customer: David Wertz

Remarks: _____

Address: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

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

Phone: 703-387-5516 Ext:

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

Samplers: WACIK

Approved By: BSW

==========

20150 Sample No: 16 Desc: BM-9 Mid-Depth

Matrix: o Date: 6/2/15
Time: 1200

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

20151 Sample No: 17 Desc: BM-9 Deep

Matrix: o Date: 6/2/15
Time: 1200

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

20152 Sample No: 18 Desc: BM-10 Surface

Matrix: o Date: 6/2/15
Time: 1130

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

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: By Wert Received for laboratory by: By Wert

Date: 6/2/15 Time: 1430 Date: 6-2-15 Time: 1515

Sample entered by: NTC

Chain of Custody

Account: 3156 Work Order: 006223 Project Leader: rxw No: 257587
Work Order Description: Seasonal Monthly Blue Marsh Resevoir

Customer: David Wertz

Address: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Remarks: _____

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

Phone: 703-387-5516 Ext:

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

Samplers: WACiK

Approved By: BSW

==========

20153 Sample No: 19 Desc: BM-10 Mid-Depth

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

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

Matrix: o Date: 6/2/15 Time: 1130

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;

20154 Sample No: 20 Desc: BM-10 Deep

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

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

Matrix: o Date: 6/2/15 Time: 1130

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;

20155 Sample No: 21 Desc: BM-11 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: 6/2/15 Time: 1350

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: 6/2/15 Time: 1430 Date: 6-2-15 Time: 1515

Sample entered by: _____

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

Attention: David Wertz
Reported To: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 07/13/15
Lab ID: 3156-15-0022967

Date Collected: 06/29/15 12:40
Collected By: Client

Sample Desc: BM-1 Surface

Date Received: 06/29/15 14:00

PWSID: 3060912

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Fecal Coliform	21	/100ml	2	1	SM 9222D	06/29	14:50	PLW
Total Coliform	>2400	mpn/100ml	1	1	SM 9223B	06/30	11:25	RES
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	0.08	mg/l	.01	1	SM 4500P-E	06/29	15:40	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	06/30	12:15	HRG
Phosphorus as P, Total	0.10	mg/l	.01	1	SM 4500P-E	06/30	12:30	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	06/30	00:10	JCL
Nitrogen, Nitrate	3.45	mg/l	.05	1	EPA 353.2	06/30	14:46	JCL
Nitrogen, Nitrite	0.08	mg/l	.05	1	EPA 353.2	06/30	13:14	JCL
Nitrogen, Total Kjeldahl	0.59	mg/l	.25	1	EPA 351.2	07/01	13:01	ALD
OTHER								
Biochemical Oxygen Demand	2	mg/l	2	1	SM 5210B	06/29	16:05	EMW
Total Organic Carbon	2.4	mg/l	1	1	SM5310 C	06/30	14:32	ALD
RESIDUES								
Solids, Total Dissolved	209	mg/l	5	1	SM 2540C	06/30	13:15	TMH
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	06/30	13:15	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	118	mg/l	1	1	SM 2320 B	07/02	10:30	HRG

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

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 (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 07/13/15
Lab ID: 3156-15-0022967

Date Collected: 06/29/15 12:40
Collected By: Client

Sample Desc: BM-1 Surface

Date Received: 06/29/15 14:00

PWSID: 3060912

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

COMMENTS

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

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 06/29/15 at 17:00.

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

Reviewed and Approved by:

Richard Wheeler

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Attention: David Wertz
Reported To: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 07/13/15
Lab ID: 3156-15-0022968

Date Collected: 06/29/15 09:25
Collected By: Client

Sample Desc: BM-2 Surface

Date Received: 06/29/15 14:00

PWSID: 3060912

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Fecal Coliform	2	/100ml	2	1	SM 9222D	06/29	14:50	PLW
Total Coliform	610	mpn/100ml	1	1	SM 9223B	06/30	11:25	RES
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	0.02	mg/l	.01	1	SM 4500P-E	06/29	15:40	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	06/30	12:15	HRG
Phosphorus as P, Total	0.04	mg/l	.01	1	SM 4500P-E	06/30	12:30	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	06/30	00:25	JCL
Nitrogen, Nitrate	3.31	mg/l	.05	1	EPA 353.2	06/30	14:47	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	06/30	13:17	JCL
Nitrogen, Total Kjeldahl	0.83	mg/l	.25	1	EPA 351.2	07/01	13:06	JCL
OTHER								
Biochemical Oxygen Demand	3	mg/l	2	1	SM 5210B	06/29	16:05	EMW
Total Organic Carbon	2.8	mg/l	1	1	SM5310 C	06/30	14:47	ALD
RESIDUES								
Solids, Total Dissolved	172	mg/l	5	1	SM 2540C	06/30	13:15	TMH
Solids, Total Suspended	5	mg/l	3	1	SM 2540D	06/30	13:15	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	75	mg/l	1	1	SM 2320 B	07/02	10:30	HRG

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

Reviewed and Approved by:

Richard Wheeler

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Date of Report: 07/13/15
Lab ID: 3156-15-0022968

Date Collected: 06/29/15 09:25
Collected By: Client

Sample Desc: BM-2 Surface

Date Received: 06/29/15 14:00

PWSID: 3060912

	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 06/29/15 at 17:00.

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

Reviewed and Approved by:

Richard Wheeler

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Attention: David Wertz
Reported To: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 07/13/15
Lab ID: 3156-15-0022969

Date Collected: 06/29/15 09:25
Collected By: Client

Sample Desc: BM-2 Mid-Depth

Date Received: 06/29/15 14:00

PWSID: 3060912

	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	06/29	15:45	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	06/30	12:15	HRG
Phosphorus as P, Total	0.02	mg/l	.01	1	SM 4500P-E	06/30	12:35	HRG
NITROGENS								
Nitrogen, Ammonia	0.25	mg/l	.05	1	D6919-03	06/30	00:39	JCL
Nitrogen, Nitrate	3.27	mg/l	.05	1	EPA 353.2	06/30	14:48	JCL
Nitrogen, Nitrite	0.13	mg/l	.05	1	EPA 353.2	06/30	13:18	JCL
Nitrogen, Total Kjeldahl	0.68	mg/l	.25	1	EPA 351.2	07/01	13:07	JCL
OTHER								
Biochemical Oxygen Demand	4	mg/l	2	1	SM 5210B	06/29	16:05	EMW
Total Organic Carbon	2.4	mg/l	1	1	SM5310 C	06/30	15:03	ALD
RESIDUES								
Solids, Total Dissolved	237	mg/l	5	1	SM 2540C	06/30	13:15	TMH
Solids, Total Suspended	3	mg/l	3	1	SM 2540D	06/30	13:15	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	132	mg/l	1	1	SM 2320 B	07/02	10:30	HRG

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 (Blue Marsh Reservoir)

Reviewed and Approved by:

Richard Wheeler

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Attention: David Wertz
Reported To: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 07/13/15
Lab ID: 3156-15-0022970

Date Collected: 06/29/15 09:25
Collected By: Client

Sample Desc: BM-2 Deep

Date Received: 06/29/15 14:00

PWSID: 3060912

	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	06/29	15:45	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	06/30	12:20	HRG
Phosphorus as P, Total	0.01	mg/l	.01	1	SM 4500P-E	06/30	12:35	HRG
NITROGENS								
Nitrogen, Ammonia	0.09	mg/l	.05	1	D6919-03	06/30	00:54	JCL
Nitrogen, Nitrate	4.13	mg/l	.05	1	EPA 353.2	06/30	14:49	JCL
Nitrogen, Nitrite	0.14	mg/l	.05	1	EPA 353.2	06/30	13:19	JCL
Nitrogen, Total Kjeldahl	0.51	mg/l	.25	1	EPA 351.2	07/01	13:08	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	06/29	16:05	EMW
Total Organic Carbon	2.5	mg/l	1	1	SM5310 C	06/30	15:18	ALD
RESIDUES								
Solids, Total Dissolved	242	mg/l	5	1	SM 2540C	06/30	13:15	TMH
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	06/30	13:15	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	133	mg/l	1	1	SM 2320 B	07/02	10:45	HRG

COMMENTS

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

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

Reviewed and Approved by:

Richard Wheeler

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Attention: David Wertz
Reported To: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 07/13/15
Lab ID: 3156-15-0022971
Date Collected: 06/29/15 12:15
Collected By: Client

Sample Desc: BM-5 Surface

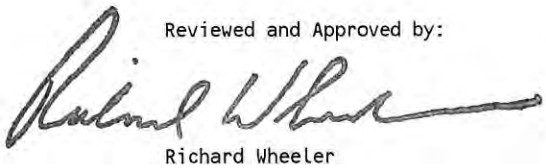
Date Received: 06/29/15 14:00

PWSID: 3060912

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Fecal Coliform	1900	/100ml	2	1	SM 9222D	06/29	14:50	PLW
Total Coliform	>2400	mpn/100ml	1	1	SM 9223B	06/30	11:25	RES
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	0.08	mg/l	.01	1	SM 4500P-E	06/29	15:45	HRG
Phosphorus as P, Dissolved	0.07	mg/l	.05	1	SM 4500P-E	06/30	12:20	HRG
Phosphorus as P, Total	0.08	mg/l	.01	1	SM 4500P-E	06/30	12:35	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	06/30	01:09	JCL
Nitrogen, Nitrate	7.05	mg/l	.1	2	EPA 353.2	06/30	15:17	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	06/30	13:19	JCL
Nitrogen, Total Kjeldahl	0.37	mg/l	.25	1	EPA 351.2	07/01	13:09	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	06/29	16:05	EMW
Total Organic Carbon	2.1	mg/l	1	1	SM5310 C	06/30	15:48	ALD
RESIDUES								
Solids, Total Dissolved	324	mg/l	5	1	SM 2540C	06/30	13:15	TMH
Solids, Total Suspended	6	mg/l	3	1	SM 2540D	06/30	13:15	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	167	mg/l	1	1	SM 2320 B	07/02	10:45	HRG

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

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 (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 07/13/15
Lab ID: 3156-15-0022971

Date Collected: 06/29/15 12:15
Collected By: Client

Sample Desc: BM-5 Surface

Date Received: 06/29/15 14:00

PWSID: 3060912

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

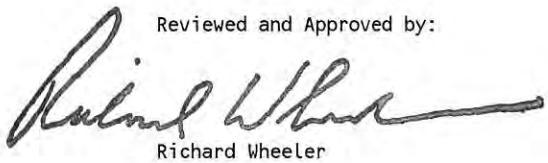
COMMENTS

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 06/29/15 at 17:00.

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

Reviewed and Approved by:



Richard Wheeler

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M.J. Reider Associates, Inc.

Attention: David Wertz
Reported To: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 07/13/15
Lab ID: 3156-15-0022972
Date Collected: 06/29/15 08:45
Collected By: Client

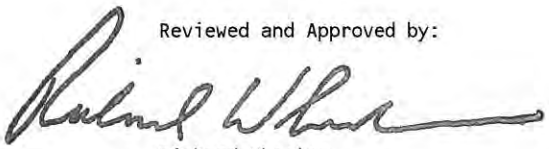
Sample Desc: BM-6 Surface
Date Received: 06/29/15 14:00

PWSID: 3060912

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Fecal Coliform	6	/100ml	2	1	SM 9222D	06/29	14:50	PLW
Total Coliform	1100	mpn/100ml	1	1	SM 9223B	06/30	11:25	RES
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	06/29	15:45	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	06/30	12:20	HRG
Phosphorus as P, Total	0.04	mg/l	.01	1	SM 4500P-E	06/30	12:35	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	06/30	02:07	JCL
Nitrogen, Nitrate	3.37	mg/l	.05	1	EPA 353.2	06/30	14:52	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	06/30	13:20	JCL
Nitrogen, Total Kjeldahl	0.62	mg/l	.25	1	EPA 351.2	07/01	13:09	JCL
OTHER								
Biochemical Oxygen Demand	3	mg/l	2	1	SM 5210B	06/29	16:05	EMW
Total Organic Carbon	2.6	mg/l	1	1	SM5310 C	06/30	16:50	ALD
RESIDUES								
Solids, Total Dissolved	190	mg/l	5	1	SM 2540C	06/30	13:15	TMH
Solids, Total Suspended	4	mg/l	3	1	SM 2540D	06/30	13:15	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	84	mg/l	1	1	SM 2320 B	07/02	10:45	HRG

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

Reviewed and Approved by:



Richard Wheeler

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M.J. Reider Associates, Inc.

Attention: David Wertz
Reported To: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 07/13/15
Lab ID: 3156-15-0022972

Date Collected: 06/29/15 08:45
Collected By: Client

Sample Desc: BM-6 Surface

Date Received: 06/29/15 14:00

PWSID: 3060912

	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 06/29/15 at 17:00.

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

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 (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 07/13/15
Lab ID: 3156-15-0022973

Date Collected: 06/29/15 08:45
Collected By: Client

Sample Desc: BM-6 Mid-Depth

Date Received: 06/29/15 14:00

PWSID: 3060912

	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	06/29	15:45	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	06/30	12:20	HRG
Phosphorus as P, Total	0.01	mg/l	.01	1	SM 4500P-E	06/30	12:35	HRG
NITROGENS								
Nitrogen, Ammonia	0.10	mg/l	.05	1	D6919-03	06/30	02:07	JCL
Nitrogen, Nitrate	3.75	mg/l	.05	1	EPA 353.2	06/30	14:53	JCL
Nitrogen, Nitrite	0.17	mg/l	.05	1	EPA 353.2	06/30	13:21	JCL
Nitrogen, Total Kjeldahl	0.55	mg/l	.25	1	EPA 351.2	07/01	13:10	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	06/29	16:05	EMW
Total Organic Carbon	2.4	mg/l	1	1	SM5310 C	06/30	17:06	ALD
RESIDUES								
Solids, Total Dissolved	244	mg/l	5	1	SM 2540C	06/30	13:15	TMH
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	06/30	13:15	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	126	mg/l	1	1	SM 2320 B	07/02	10:45	HRG

COMMENTS

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

Distribution of Reports:
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Reported To: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 07/13/15
Lab ID: 3156-15-0022974

Date Collected: 06/29/15 08:45
Collected By: Client

Sample Desc: BM-6 Deep

Date Received: 06/29/15 14:00

PWSID: 3060912

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	0.08	mg/l	.01	1	SM 4500P-E	06/29	15:45	HRG
Phosphorus as P, Dissolved	0.07	mg/l	.05	1	SM 4500P-E	06/30	12:20	HRG
Phosphorus as P, Total	0.09	mg/l	.01	1	SM 4500P-E	06/30	12:40	HRG
NITROGENS								
Nitrogen, Ammonia	0.22	mg/l	.05	1	D6919-03	06/30	02:36	JCL
Nitrogen, Nitrate	3.25	mg/l	.05	1	EPA 353.2	06/30	14:54	JCL
Nitrogen, Nitrite	0.20	mg/l	.05	1	EPA 353.2	06/30	13:22	JCL
Nitrogen, Total Kjeldahl	0.92	mg/l	.25	1	EPA 351.2	07/01	13:11	JCL
OTHER								
Biochemical Oxygen Demand	4	mg/l	2	1	SM 5210B	06/29	16:05	EMW
Total Organic Carbon	2.5	mg/l	1	1	SM5310 C	06/30	17:21	ALD
RESIDUES								
Solids, Total Dissolved	252	mg/l	5	1	SM 2540C	06/30	13:15	TMH
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	06/30	13:15	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	132	mg/l	1	1	SM 2320 B	07/02	11:00	HRG

COMMENTS

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

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1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 07/13/15
Lab ID: 3156-15-0022975

Date Collected: 06/29/15 10:00
Collected By: Client

Sample Desc: BM-7 Surface

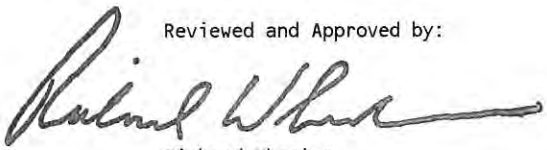
Date Received: 06/29/15 14:00

PWSID: 3060912

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Fecal Coliform	6	/100ml	2	1	SM 9222D	06/29	15:20	PLW
Total Coliform	390	mpn/100ml	1	1	SM 9223B	06/30	11:25	RES
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	0.03	mg/l	.01	1	SM 4500P-E	06/29	15:45	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	06/30	12:20	HRG
Phosphorus as P, Total	0.05	mg/l	.01	1	SM 4500P-E	06/30	12:40	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	06/30	02:51	JCL
Nitrogen, Nitrate	3.26	mg/l	.05	1	EPA 353.2	06/30	14:57	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	06/30	13:25	JCL
Nitrogen, Total Kjeldahl	0.82	mg/l	.25	1	EPA 351.2	07/01	13:14	JCL
OTHER								
Biochemical Oxygen Demand	4	mg/l	2	1	SM 5210B	06/29	16:05	EMW
Total Organic Carbon	2.9	mg/l	1	1	SM5310 C	06/30	17:37	ALD
RESIDUES								
Solids, Total Dissolved	193	mg/l	5	1	SM 2540C	06/30	13:15	TMH
Solids, Total Suspended	5	mg/l	3	1	SM 2540D	06/30	13:15	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	86	mg/l	1	1	SM 2320 B	07/02	11:00	HRG

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

Reviewed and Approved by:



Richard Wheeler

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Reported To: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 07/13/15
Lab ID: 3156-15-0022975

Date Collected: 06/29/15 10:00
Collected By: Client

Sample Desc: BM-7 Surface

Date Received: 06/29/15 14:00

PWSID: 3060912

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

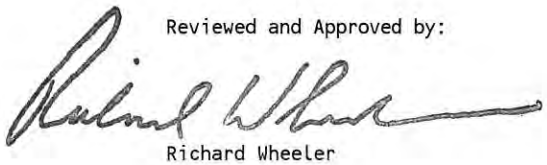
COMMENTS

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 06/29/15 at 17:00.

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

Reviewed and Approved by:



Richard Wheeler

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1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 07/13/15
Lab ID: 3156-15-0022976

Date Collected: 06/29/15 10:00
Collected By: Client

Sample Desc: BM-7 Mid-Depth

Date Received: 06/29/15 14:00

PWSID: 3060912

	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	06/29	15:50	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	06/30	12:20	HRG
Phosphorus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	06/30	12:40	HRG
NITROGENS								
Nitrogen, Ammonia	0.08	mg/l	.05	1	D6919-03	06/30	03:35	JCL
Nitrogen, Nitrate	4.48	mg/l	.05	1	EPA 353.2	06/30	14:58	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	06/30	13:26	JCL
Nitrogen, Total Kjeldahl	0.52	mg/l	.25	1	EPA 351.2	07/01	13:15	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	06/29	16:05	EMW
Total Organic Carbon	2.7	mg/l	1	1	SM5310 C	06/30	17:53	ALD
RESIDUES								
Solids, Total Dissolved	218	mg/l	5	1	SM 2540C	06/30	13:15	TMH
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	06/30	13:40	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	121	mg/l	1	1	SM 2320 B	07/02	11:00	HRG

COMMENTS

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

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Date of Report: 07/13/15
Lab ID: 3156-15-0022977

Date Collected: 06/29/15 10:00
Collected By: Client

Sample Desc: BM-7 Deep

Date Received: 06/29/15 14:00

PWSID: 3060912

	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	06/29	15:50	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	06/30	12:25	HRG
Phosphorus as P, Total	0.06	mg/l	.01	1	SM 4500P-E	06/30	12:40	HRG
NITROGENS								
Nitrogen, Ammonia	0.11	mg/l	.05	1	D6919-03	06/30	03:49	JCL
Nitrogen, Nitrate	4.41	mg/l	.05	1	EPA 353.2	06/30	14:59	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	06/30	13:27	JCL
Nitrogen, Total Kjeldahl	0.60	mg/l	.25	1	EPA 351.2	07/01	13:16	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	06/29	16:05	EMW
Total Organic Carbon	2.2	mg/l	1	1	SM5310 C	06/30	19:07	ALD
RESIDUES								
Solids, Total Dissolved	242	mg/l	5	1	SM 2540C	06/30	13:40	TMH
Solids, Total Suspended	21	mg/l	3	1	SM 2540D	06/30	13:40	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	107	mg/l	1	1	SM 2320 B	07/02	11:00	HRG

COMMENTS

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

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Reported To: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 07/13/15
Lab ID: 3156-15-0022978
Date Collected: 06/29/15 11:25
Collected By: Client

Sample Desc: BM-8 Surface

Date Received: 06/29/15 14:00

PWSID: 3060912

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Fecal Coliform	2	/100ml	2	1	SM 9222D	06/29	15:20	PLW
Total Coliform	550	mpn/100ml	1	1	SM 9223B	06/30	11:25	RES
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	06/29	15:50	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	06/30	12:25	HRG
Phosphorus as P, Total	0.04	mg/l	.01	1	SM 4500P-E	06/30	12:45	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	06/30	04:04	JCL
Nitrogen, Nitrate	3.14	mg/l	.05	1	EPA 353.2	06/30	15:00	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	06/30	13:30	JCL
Nitrogen, Total Kjeldahl	0.68	mg/l	.25	1	EPA 351.2	07/01	13:19	JCL
OTHER								
Biochemical Oxygen Demand	4	mg/l	2	1	SM 5210B	06/29	16:05	EMW
Total Organic Carbon	2.8	mg/l	1	1	SM5310 C	06/30	19:52	ALD
RESIDUES								
Solids, Total Dissolved	198	mg/l	5	1	SM 2540C	06/30	13:40	TMH
Solids, Total Suspended	3	mg/l	3	1	SM 2540D	06/30	13:40	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	70	mg/l	1	1	SM 2320 B	07/02	11:15	HRG

Distribution of Reports:
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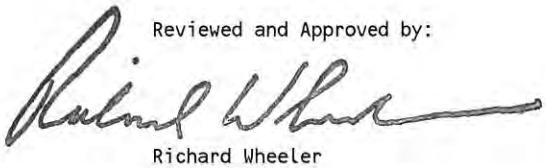

Richard Wheeler

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1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 07/13/15
Lab ID: 3156-15-0022978

Date Collected: 06/29/15 11:25
Collected By: Client

Sample Desc: BM-8 Surface

Date Received: 06/29/15 14:00

PWSID: 3060912

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

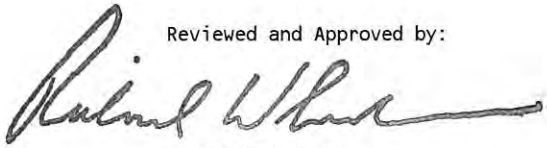
COMMENTS

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 06/29/15 at 17:00.

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

Reviewed and Approved by:



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1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 07/13/15
Lab ID: 3156-15-0022979

Date Collected: 06/29/15 11:25
Collected By: Client

Sample Desc: BM-8 Mid-Depth

Date Received: 06/29/15 14:00

PWSID: 3060912

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	0.04	mg/l	.01	1	SM 4500P-E	06/29	15:50	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	06/30	12:25	HRG
Phosphorus as P, Total	0.05	mg/l	.01	1	SM 4500P-E	06/30	12:45	HRG
NITROGENS								
Nitrogen, Ammonia	0.08	mg/l	.05	1	D6919-03	06/30	04:18	JCL
Nitrogen, Nitrate	4.01	mg/l	.05	1	EPA 353.2	06/30	15:03	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	06/30	13:31	JCL
Nitrogen, Total Kjeldahl	0.63	mg/l	.25	1	EPA 351.2	07/01	13:20	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	06/29	16:05	EMW
Total Organic Carbon	2.4	mg/l	1	1	SM5310 C	06/30	20:39	ALD
RESIDUES								
Solids, Total Dissolved	250	mg/l	5	1	SM 2540C	06/30	13:40	TMH
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	06/30	13:40	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	101	mg/l	1	1	SM 2320 B	07/02	11:15	HRG

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:
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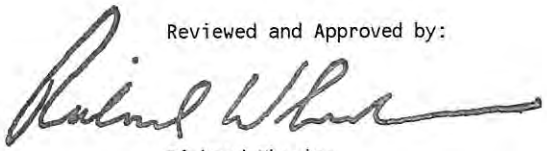

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1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 07/13/15
Lab ID: 3156-15-0022980

Date Collected: 06/29/15 11:25
Collected By: Client

Sample Desc: BM-8 Deep

Date Received: 06/29/15 14:00

PWSID: 3060912

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	0.08	mg/l	.01	1	SM 4500P-E	06/29	15:50	HRG
Phosphorus as P, Dissolved	0.06	mg/l	.05	1	SM 4500P-E	06/30	12:25	HRG
Phosphorus as P, Total	0.10	mg/l	.01	1	SM 4500P-E	06/30	12:45	HRG
NITROGENS								
Nitrogen, Ammonia	0.08	mg/l	.05	1	D6919-03	06/30	04:33	JCL
Nitrogen, Nitrate	3.30	mg/l	.05	1	EPA 353.2	06/30	15:04	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	06/30	13:32	JCL
Nitrogen, Total Kjeldahl	0.73	mg/l	.25	1	EPA 351.2	07/01	13:21	JCL
OTHER								
Biochemical Oxygen Demand	2	mg/l	2	1	SM 5210B	06/29	16:05	EMW
Total Organic Carbon	2.9	mg/l	1	1	SM5310 C	06/30	20:55	ALD
RESIDUES								
Solids, Total Dissolved	240	mg/l	5	1	SM 2540C	06/30	13:40	TMH
Solids, Total Suspended	29	mg/l	3	1	SM 2540D	06/30	13:40	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	90	mg/l	1	1	SM 2320 B	07/02	11:15	HRG

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 (Blue Marsh Reservoir)

Reviewed and Approved by:

Richard Wheeler

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1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 07/13/15
Lab ID: 3156-15-0022980

Date Collected: 06/29/15 11:25
Collected By: Client

Sample Desc: BM-8 Deep

Date Received: 06/29/15 14:00

PWSID: 3060912

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

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

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 (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 07/13/15
Lab ID: 3156-15-0022981

Date Collected: 06/29/15 11:00
Collected By: Client

Sample Desc: BM-9 Surface

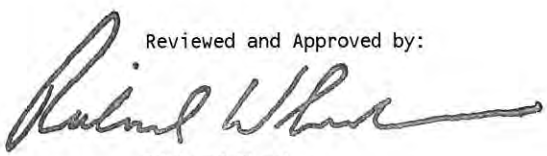
Date Received: 06/29/15 14:00

PWSID: 3060912

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Fecal Coliform	5	/100ml	2	1	SM 9222D	06/29	15:20	PLW
Total Coliform	520	mpn/100ml	1	1	SM 9223B	06/30	11:25	RES
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	06/29	15:55	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	06/30	12:25	HRG
Phosphorus as P, Total	0.10	mg/l	.01	1	SM 4500P-E	06/30	12:45	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	06/30	04:48	JCL
Nitrogen, Nitrate	3.29	mg/l	.05	1	EPA 353.2	06/30	15:05	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	06/30	13:33	JCL
Nitrogen, Total Kjeldahl	0.75	mg/l	.25	1	EPA 351.2	07/01	13:22	JCL
OTHER								
Biochemical Oxygen Demand	4	mg/l	2	1	SM 5210B	06/29	16:05	EMW
Total Organic Carbon	2.6	mg/l	1	1	SM5310 C	06/30	21:24	ALD
RESIDUES								
Solids, Total Dissolved	208	mg/l	5	1	SM 2540C	06/30	13:40	TMH
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	06/30	13:40	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	74	mg/l	1	1	SM 2320 B	07/02	09:30	HRG

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

Reviewed and Approved by:



Richard Wheeler

ENVIRONMENTAL TESTING LABORATORY 107 ANGELICA STREET, READING, PA 19611
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Attention: David Wertz
Reported To: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 07/13/15
Lab ID: 3156-15-0022981
Date Collected: 06/29/15 11:00
Collected By: Client

Sample Desc: BM-9 Surface

Date Received: 06/29/15 14:00

PWSID: 3060912

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

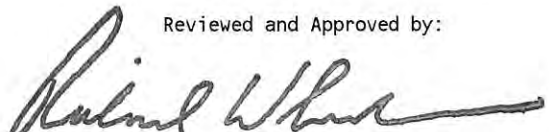
COMMENTS

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 06/29/15 at 17:00.

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

Reviewed and Approved by:



Richard Wheeler

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Attention: David Wertz
Reported To: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 07/13/15
Lab ID: 3156-15-0022982

Date Collected: 06/29/15 11:00
Collected By: Client

Sample Desc: BM-9 Mid-Depth

Date Received: 06/29/15 14:00

PWSID: 3060912

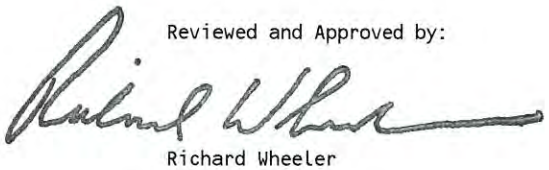
	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	0.02	mg/l	.01	1	SM 4500P-E	06/29	15:55	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	06/30	12:25	HRG
Phosphorus as P, Total	0.03	mg/l	.01	1	SM 4500P-E	06/30	12:45	HRG
NITROGENS								
Nitrogen, Ammonia	0.05	mg/l	.05	1	D6919-03	06/30	05:02	JCL
Nitrogen, Nitrate	4.00	mg/l	.05	1	EPA 353.2	06/30	15:06	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	06/30	13:34	JCL
Nitrogen, Total Kjeldahl	0.68	mg/l	.25	1	EPA 351.2	07/01	13:23	JCL
OTHER								
Biochemical Oxygen Demand	3	mg/l	2	1	SM 5210B	06/29	16:05	EMW
Total Organic Carbon	2.5	mg/l	1	1	SM5310 C	06/30	21:39	ALD
RESIDUES								
Solids, Total Dissolved	239	mg/l	5	1	SM 2540C	06/30	13:40	TMH
Solids, Total Suspended	3	mg/l	3	1	SM 2540D	06/30	13:40	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	108	mg/l	1	1	SM 2320 B	07/02	11:30	HRG

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 (Blue Marsh Reservoir)

Reviewed and Approved by:



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Arlington VA 22201-0000

Date of Report: 07/13/15
Lab ID: 3156-15-0022982

Date Collected: 06/29/15 11:00
Collected By: Client

Sample Desc: BM-9 Mid-Depth

Date Received: 06/29/15 14:00

PWSID: 3060912

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

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

Reviewed and Approved by:

Richard Wheeler

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Reported To: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 07/13/15
Lab ID: 3156-15-0022983

Date Collected: 06/29/15 11:00
Collected By: Client

Sample Desc: BM-9 Deep

Date Received: 06/29/15 14:00

PWSID: 3060912

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	0.06	mg/l	.01	1	SM 4500P-E	06/29	15:55	HRG
Phosphorus as P, Dissolved	0.10	mg/l	.05	1	SM 4500P-E	06/30	12:25	HRG
Phosphorus as P, Total	0.12	mg/l	.01	1	SM 4500P-E	06/30	12:45	HRG
NITROGENS								
Nitrogen, Ammonia	0.06	mg/l	.05	1	D6919-03	06/30	05:17	JCL
Nitrogen, Nitrate	3.93	mg/l	.05	1	EPA 353.2	06/30	15:09	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	06/30	13:37	JCL
Nitrogen, Total Kjeldahl	0.76	mg/l	.25	1	EPA 351.2	07/01	13:26	JCL
OTHER								
Biochemical Oxygen Demand	2	mg/l	2	1	SM 5210B	06/29	16:05	EMW
Total Organic Carbon	4.0	mg/l	1	1	SM5310 C	06/30	21:56	ALD
RESIDUES								
Solids, Total Dissolved	253	mg/l	5	1	SM 2540C	06/30	13:40	TMH
Solids, Total Suspended	32	mg/l	3	1	SM 2540D	06/30	13:40	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	105	mg/l	1	1	SM 2320 B	07/02	12:15	HRG

COMMENTS

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

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

Reviewed and Approved by:

Richard Wheeler

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Date of Report: 07/13/15
Lab ID: 3156-15-0022983

Date Collected: 06/29/15 11:00
Collected By: Client

Sample Desc: BM-9 Deep

Date Received: 06/29/15 14:00

PWSID: 3060912

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

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

Reviewed and Approved by:

Richard Wheeler

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1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 07/13/15
Lab ID: 3156-15-0022984

Date Collected: 06/29/15 10:30
Collected By: Client

Sample Desc: BM-10 Surface

Date Received: 06/29/15 14:00

PWSID: 3060912

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Fecal Coliform	20	/100ml	2	1	SM 9222D	06/29	15:20	PLW
Total Coliform	520	mpn/100ml	1	1	SM 9223B	06/30	11:25	RES
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	06/29	15:55	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	06/30	12:25	HRG
Phosphorus as P, Total	0.03	mg/l	.01	1	SM 4500P-E	06/30	12:45	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	06/30	12:15	JCL
Nitrogen, Nitrate	3.15	mg/l	.05	1	EPA 353.2	06/30	15:09	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	06/30	13:38	JCL
Nitrogen, Total Kjeldahl	0.90	mg/l	.25	1	EPA 351.2	07/01	13:27	JCL
OTHER								
Biochemical Oxygen Demand	4	mg/l	2	1	SM 5210B	06/29	16:05	EMW
Total Organic Carbon	2.8	mg/l	1	1	SM5310 C	06/30	22:26	ALD
RESIDUES								
Solids, Total Dissolved	213	mg/l	5	1	SM 2540C	06/30	13:40	TMH
Solids, Total Suspended	5	mg/l	3	1	SM 2540D	06/30	13:40	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	72	mg/l	1	1	SM 2320 B	07/02	12:15	HRG

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

Reviewed and Approved by:

Richard Wheeler

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1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 07/13/15
Lab ID: 3156-15-0022984

Date Collected: 06/29/15 10:30
Collected By: Client

Sample Desc: BM-10 Surface

Date Received: 06/29/15 14:00

PWSID: 3060912

	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 06/29/15 at 17:00.

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

Reviewed and Approved by:

Richard Wheeler

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Reported To: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 07/13/15
Lab ID: 3156-15-0022985
Date Collected: 06/29/15 10:30
Collected By: Client

Sample Desc: BM-10 Mid-Depth

Date Received: 06/29/15 14:00

PWSID: 3060912

	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	06/29	15:55	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	06/30	12:25	HRG
Phosphorus as P, Total	0.07	mg/l	.01	1	SM 4500P-E	06/30	12:50	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	06/30	12:30	JCL
Nitrogen, Nitrate	3.37	mg/l	.05	1	EPA 353.2	06/30	15:10	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	06/30	13:39	JCL
Nitrogen, Total Kjeldahl	0.80	mg/l	.25	1	EPA 351.2	07/01	13:28	JCL
OTHER								
Biochemical Oxygen Demand	3	mg/l	2	1	SM 5210B	06/29	16:05	EMW
Total Organic Carbon	2.9	mg/l	1	1	SM5310 C	06/30	22:41	ALD
RESIDUES								
Solids, Total Dissolved	213	mg/l	5	1	SM 2540C	06/30	13:40	TMH
Solids, Total Suspended	7	mg/l	3	1	SM 2540D	06/30	13:40	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	79	mg/l	1	1	SM 2320 B	07/02	12:15	HRG

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 (Blue Marsh Reservoir)

Reviewed and Approved by:

Richard Wheeler

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Arlington VA 22201-0000

Date of Report: 07/13/15
Lab ID: 3156-15-0022985

Date Collected: 06/29/15 10:30
Collected By: Client

Sample Desc: BM-10 Mid-Depth

Date Received: 06/29/15 14:00

PWSID: 3060912

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

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

Reviewed and Approved by:

Richard Wheeler

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Reported To: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 07/13/15
Lab ID: 3156-15-0022986

Date Collected: 06/29/15 10:30
Collected By: Client

Sample Desc: BM-10 Deep

Date Received: 06/29/15 14:00

PWSID: 3060912

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	0.11	mg/l	.01	1	SM 4500P-E	06/29	15:55	HRG
Phosphorus as P, Dissolved	0.09	mg/l	.05	1	SM 4500P-E	06/30	12:25	HRG
Phosphorus as P, Total	0.15	mg/l	.01	1	SM 4500P-E	06/30	12:50	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	06/30	12:45	JCL
Nitrogen, Nitrate	4.29	mg/l	.05	1	EPA 353.2	06/30	15:11	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	06/30	13:39	JCL
Nitrogen, Total Kjeldahl	0.78	mg/l	.25	1	EPA 351.2	07/01	13:29	JCL
OTHER								
Biochemical Oxygen Demand	2	mg/l	2	1	SM 5210B	06/29	16:05	EMW
Total Organic Carbon	4.1	mg/l	1	1	SM5310 C	06/30	22:58	ALD
RESIDUES								
Solids, Total Dissolved	249	mg/l	5	1	SM 2540C	06/30	13:40	TMH
Solids, Total Suspended	48	mg/l	3	1	SM 2540D	06/30	13:40	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	105	mg/l	1	1	SM 2320 B	07/02	12:15	HRG

COMMENTS

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

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

Reviewed and Approved by:

Richard Wheeler

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Date of Report: 07/13/15
Lab ID: 3156-15-0022986

Date Collected: 06/29/15 10:30
Collected By: Client

Sample Desc: BM-10 Deep

Date Received: 06/29/15 14:00

PWSID: 3060912

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

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

Reviewed and Approved by:

Richard Wheeler

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1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 07/13/15
Lab ID: 3156-15-0022987

Date Collected: 06/29/15 12:25
Collected By: Client

Sample Desc: BM-11 Surface

Date Received: 06/29/15 14:00

PWSID: 3060912

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Fecal Coliform	980	/100ml	2	1	SM 9222D	06/29	15:20	PLW
Total Coliform	>2400	mpn/100ml	1	1	SM 9223B	06/30	11:25	RES
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	0.12	mg/l	.01	1	SM 4500P-E	06/29	16:05	HRG
Phosphorus as P, Dissolved	0.10	mg/l	.05	1	SM 4500P-E	07/06	12:35	HRG
Phosphorus as P, Total	0.14	mg/l	.01	1	SM 4500P-E	07/02	12:00	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	06/30	12:59	JCL
Nitrogen, Nitrate	3.39	mg/l	.05	1	EPA 353.2	06/30	15:14	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	06/30	13:42	JCL
Nitrogen, Total Kjeldahl	0.62	mg/l	.25	1	EPA 351.2	07/01	13:31	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	06/29	16:05	EMW
Total Organic Carbon	2.9	mg/l	1	1	SM5310 C	07/01	00:13	ALD
RESIDUES								
Solids, Total Dissolved	138	mg/l	5	1	SM 2540C	06/30	14:00	TMH
Solids, Total Suspended	113	mg/l	3	1	SM 2540D	06/30	14:00	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	32	mg/l	1	1	SM 2320 B	07/02	12:30	HRG

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

Reviewed and Approved by:

Richard Wheeler

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Reported To: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 07/13/15
Lab ID: 3156-15-0022987

Date Collected: 06/29/15 12:25
Collected By: Client

Sample Desc: BM-11 Surface

Date Received: 06/29/15 14:00

PWSID: 3060912

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

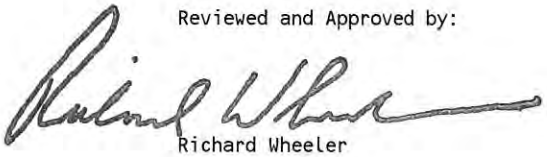
COMMENTS

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 06/29/15 at 17:00.

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

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 (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 07/13/15
Lab ID: 3156-15-0031226

Date Collected: 07/09/15 08:15
Collected By: jbs

Sample Desc: SB-1

Date Received: 07/09/15 08:40

PWSID: 3060912

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Escherichia coli	2	mpn/100ml	1	1	SM 9223B	07/10	11:30	PLW
Fecal Coliform	3	/100ml	2	1	SM 9222D	07/09	12:20	TNS
Total Coliform Bacteria	1000	mpn/100ml	1	1	SM 9223B	07/10	10:50	PLW

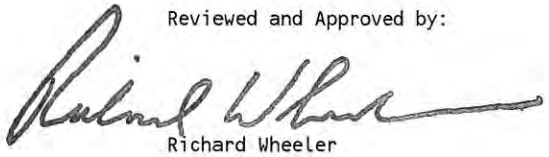
COMMENTS

01 Duplicate analysis of this sample for fecal coliform was outside the acceptable limit of 20%RPD.

02 The total coliform sample was placed in the incubator on 07/09/15 at 11:20.

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

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**

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

Attention: David Wertz
Reported To: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 07/13/15
Lab ID: 3156-15-0031227

Date Collected: 07/09/15 08:20
Collected By: jbs

Sample Desc: SB-2

Date Received: 07/09/15 08:40

PWSID: 3060912

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Escherichia coli	2	mpn/100ml	1	1	SM 9223B	07/10	11:30	PLW
Fecal Coliform	2	/100ml	2	1	SM 9222D	07/09	12:20	TNS
Total Coliform Bacteria	460	mpn/100ml	1	1	SM 9223B	07/10	10:50	PLW

COMMENTS

01 The total coliform sample was placed in the incubator on 07/09/15 at 11:20.

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

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 (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 07/13/15
Lab ID: 3156-15-0031228

Date Collected: 07/09/15 08:05
Collected By: jbs

Sample Desc: SB-3

Date Received: 07/09/15 08:40

PWSID: 3060912

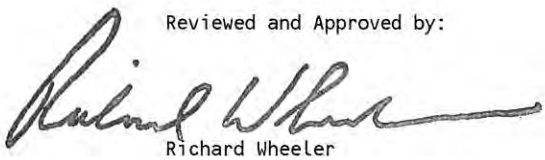
	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Escherichia coli	4	mpn/100ml	1	1	SM 9223B	07/10	10:50	PLW
Fecal Coliform	2	/100ml	2	1	SM 9222D	07/09	12:20	TNS
Total Coliform Bacteria	550	mpn/100ml	1	1	SM 9223B	07/10	10:50	PLW

COMMENTS

01 The total coliform sample was placed in the incubator on 07/09/15 at 11:20.

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

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**

M. J. REIDER ASSOCIATES, INC.

Chain of Custody

Account: 3156 Work Order: 006223 Project Leader: rxw No: 258468
Work Order Description: Seasonal Monthly Blue Marsh Resevoir

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

==========

22967 Sample No: 1 Desc: BM-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: 6/29/15
Time: 1240

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;

22968 Sample No: 2 Desc: BM-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: 6/29/15
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;

22969 Sample No: 3 Desc: BM-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: 6/29/15
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;

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

Date: 6/29/15 Time: 1300 Date: 6-29-15 Time: 1400

Sample entered by: MTZ

Chain of Custody

Account: 3156 Work Order: 006223 Project Leader: rxw No: 258468
Work Order Description: Seasonal Monthly Blue Marsh Resevoir

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

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22970

Sample No: 4 Desc: BM-2 Deep

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

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

22971

Sample No: 5 Desc: BM-5 Surface

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

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

fc, tc,

22972

Sample No: 6 Desc: BM-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: 6/29/15
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;

Matrix: o Date: 6/29/15
Time: 1215
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;

Matrix: o Date: 6/29/15
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 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: 6/29/15 Time: 1300 Date: 6-29-15 Time: 1400

Sample entered by: MTZ

Chain of Custody

Account: 3156 Work Order: 006223 Project Leader: rxw No: 258468
Work Order Description: Seasonal Monthly Blue Marsh Resevoir

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

==========

22973

Sample No: 7 Desc: BM-6 Mid-Depth

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

22974

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

Matrix: o Date: 6/29/15
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 headspace;
D - 1 X L bod p w/ Cool to 6 C;
E - 1 X Pt no3no2 p w/ Cool to 6 C;

Sample No: 8 Desc: BM-6 Deep

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

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

Matrix: o Date: 6/29/15
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 headspace;
D - 1 X L bod p w/ Cool to 6 C;
E - 1 X Pt no3no2 p w/ Cool to 6 C;

22975

Sample No: 9 Desc: BM-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: 6/29/15
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: 6/29/15 Time: 1300 Date: 6.29.15 Time: 1400

Sample entered by: MTL

Chain of Custody

Account: 3156 Work Order: 006223 Project Leader: rxw No: 258468
Work Order Description: Seasonal Monthly Blue Marsh Resevoir

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

==========

22976

Sample No: 10 Desc: BM-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: 6/29/15
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;

22977

Sample No: 11 Desc: BM-7 Deep

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

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

Matrix: o Date: 6/29/15
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;

22978

Sample No: 12 Desc: BM-8 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: 6/29/15
Time: 1125

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: 6/29/15 Time: 1300 Date: 6-29-15 Time: 1400

Sample entered by: _____

Chain of Custody

Account: 3156 Work Order: 006223 Project Leader: rxw No: 258468
Work Order Description: Seasonal Monthly Blue Marsh Resevoir

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

==========

22979

Sample No: 13 Desc: BM-8 Mid-Depth

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

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

Matrix: o Date: 6/29/15
Time: 1125

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;

22980

Sample No: 14 Desc: BM-8 Deep

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

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

Matrix: o Date: 6/29/15
Time: 1125

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;

22981

Sample No: 15 Desc: BM-9 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: 6/29/15
Time: 1100

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: 6/29/15 Time: 1300 Date: 6-29-15 Time: 1400

Sample entered by: MTZ

Chain of Custody

Account: 3156 Work Order: 006223 Project Leader: rxw No: 258468
Work Order Description: Seasonal Monthly Blue Marsh Resevoir

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

==========

22982

Sample No: 16 Desc: BM-9 Mid-Depth

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

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

Matrix: o Date: 6/29/15 Time: 1100

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;

22983

Sample No: 17 Desc: BM-9 Deep

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

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

Matrix: o Date: 6/29/15 Time: 1100

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;

22984

Sample No: 18 Desc: BM-10 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: 6/29/15 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;

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

Date: 6/29/15 Time: 1300 Date: 6-29-15 Time: 1430

Sample entered by: _____

Chain of Custody

Account: 3156 Work Order: 006223 Project Leader: rxw No: 258468
Work Order Description: Seasonal Monthly Blue Marsh Resevoir

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

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22985

Sample No: 19 Desc: BM-10 Mid-Depth

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

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

Matrix: o Date: 6/29/15
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;

22986

Sample No: 20 Desc: BM-10 Deep

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

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

Matrix: o Date: 6/29/15
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;

22987

Sample No: 21 Desc: BM-11 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: 6/29/15
Time: 1225

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: 6/29/15 Time: 1300 Date: 6-29-15 Time: 1400

Sample entered by: _____

Chain of Custody

Account: 3156 Work Order: 006222 Project Leader: rxw No: 261099
Work Order Description: Beaches 1, 2, 3

Customer: David Wertz

Address: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Phone: 703-387-5516 Ext:

Remarks: _____

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

Laboratory Receipt Temp: 13 Deg C. If Temp Unacceptable, On Ice? Y N
Approved By: JBS

Samplers: JBS

==========

31226 Sample No: 1 Desc: SB-1 Matrix: o Date: 7-9-15
Time: 0815
fc, ec, tcb, TDS A - 1 X 125ml bact p w/ Sterile/Na2S2O3;

31227 Sample No: 2 Desc: SB-2 Matrix: o Date: 7-9-15
Time: 0820
fc, ec, tcb, TDS A - 1 X 125ml bact p w/ Sterile/Na2S2O3;

31228 Sample No: 3 Desc: SB-3 Matrix: o Date: 7-9-15
Time: 0805
fc, ec, tcb, TDS A - 1 X 125ml bact p w/ Sterile/Na2S2O3;

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

Date: 7-9-15 Time: 0820 Date: 7-9-15 Time: 0840

Sample entered by: _____

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

Attention: David Wertz
Reported To: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 07/29/15
Lab ID: 3156-15-0028743

Date Collected: 07/21/15 13:30
Collected By: Client

Sample Desc: BM-1 Surface

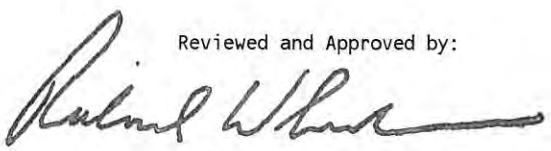
Date Received: 07/21/15 14:10

PWSID: 3060912

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Fecal Coliform	3	/100ml	2	1	SM 9222D	07/21	15:30	TNS
Total Coliform	>2400	mpn/100ml	1	1	SM 9223B	07/22	10:30	PLW
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	07/22	17:35	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	07/28	10:55	HRG
Phosphorus as P, Total	0.01	mg/l	.01	1	SM 4500P-E	07/27	13:45	HRG
NITROGENS								
Nitrogen, Ammonia	0.20	mg/l	.05	1	D6919-03	07/21	15:20	JCL
Nitrogen, Nitrate	3.53	mg/l	.05	1	EPA 353.2	07/22	15:09	JCL
Nitrogen, Nitrite	0.20	mg/l	.05	1	EPA 353.2	07/22	13:29	JCL
Nitrogen, Total Kjeldahl	0.69	mg/l	.25	1	EPA 351.2	07/22	17:30	JCL
OTHER								
Biochemical Oxygen Demand	3	mg/l	2	1	SM 5210B	07/21	15:30	EMW
Total Organic Carbon	2.6	mg/l	1	1	SM5310 C	07/22	12:40	ALD
RESIDUES								
Solids, Total Dissolved	211	mg/l	5	1	SM 2540C	07/24	13:30	TMH
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	07/24	13:30	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	117	mg/l	1	1	SM 2320 B	07/22	13:30	HRG

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

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 (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 07/29/15
Lab ID: 3156-15-0028743

Date Collected: 07/21/15 13:30
Collected By: Client

Sample Desc: BM-1 Surface

Date Received: 07/21/15 14:10

PWSID: 3060912

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

COMMENTS

01 The total coliform sample was placed in the incubator on 07/21/15 at 16:00.

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.

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

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

Reviewed and Approved by:

Richard Wheeler

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M.J. Reider Associates, Inc.

Attention: David Wertz
Reported To: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 07/29/15
Lab ID: 3156-15-0028744

Date Collected: 07/21/15 09:30
Collected By: Client

Sample Desc: BM-2 Surface

Date Received: 07/21/15 14:10

PWSID: 3060912

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Fecal Coliform	<2	/100ml	2	1	SM 9222D	07/21	15:30	TNS
Total Coliform	1700	mpn/100ml	1	1	SM 9223B	07/22	10:30	PLW
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	0.02	mg/l	.01	1	SM 4500P-E	07/22	17:35	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	07/28	10:55	HRG
Phosphorus as P, Total	0.03	mg/l	.01	1	SM 4500P-E	07/27	13:45	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	07/21	15:04	JCL
Nitrogen, Nitrate	2.66	mg/l	.05	1	EPA 353.2	07/22	15:10	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	07/22	13:32	JCL
Nitrogen, Total Kjeldahl	0.89	mg/l	.25	1	EPA 351.2	07/22	17:33	JCL
OTHER								
Biochemical Oxygen Demand	3	mg/l	2	1	SM 5210B	07/21	15:30	EMW
Total Organic Carbon	2.8	mg/l	1	1	SM5310 C	07/22	12:55	ALD
RESIDUES								
Solids, Total Dissolved	159	mg/l	5	1	SM 2540C	07/24	13:30	TMH
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	07/24	13:30	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	74	mg/l	1	1	SM 2320 B	07/22	10:45	HRG

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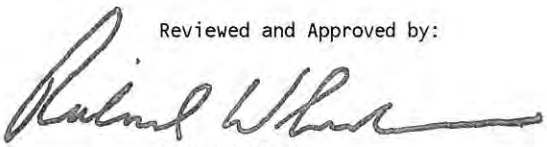
Gregory Wacik - USACE (Blue Marsh Reservoir)

Reviewed and Approved by:



Richard Wheeler

THE NELAC INSTITUTE

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M.J. Reider Associates, Inc.

Attention: David Wertz
Reported To: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 07/29/15
Lab ID: 3156-15-0028744

Date Collected: 07/21/15 09:30
Collected By: Client

Sample Desc: BM-2 Surface

Date Received: 07/21/15 14:10

PWSID: 3060912

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

COMMENTS

01 The total coliform sample was placed in the incubator on 07/21/15 at 16:00.

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 (Blue Marsh Reservoir)

Reviewed and Approved by:

Richard Wheeler

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Attention: David Wertz
Reported To: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 07/29/15
Lab ID: 3156-15-0028745

Date Collected: 07/21/15 09:50
Collected By: Client

Sample Desc: BM-2 Mid-Depth

Date Received: 07/21/15 14:10

PWSID: 3060912

	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	07/22	17:35	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	07/28	10:55	HRG
Phosphorus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	07/27	13:45	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	07/21	16:19	JCL
Nitrogen, Nitrate	4.22	mg/l	.05	1	EPA 353.2	07/22	15:13	JCL
Nitrogen, Nitrite	0.20	mg/l	.05	1	EPA 353.2	07/22	13:33	JCL
Nitrogen, Total Kjeldahl	0.43	mg/l	.25	1	EPA 351.2	07/22	17:34	JCL
OTHER								
Biochemical Oxygen Demand	2	mg/l	2	1	SM 5210B	07/21	15:30	EMW
Total Organic Carbon	2.0	mg/l	1	1	SM5310 C	07/22	13:11	ALD
RESIDUES								
Solids, Total Dissolved	231	mg/l	5	1	SM 2540C	07/24	13:30	TMH
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	07/24	13:30	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	99	mg/l	1	1	SM 2320 B	07/22	10:45	HRG

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.

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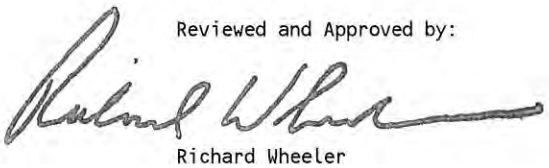
Gregory Wacik - USACE (Blue Marsh Reservoir)

Reviewed and Approved by:



Richard Wheeler

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Attention: David Wertz
Reported To: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 07/29/15
Lab ID: 3156-15-0028745

Date Collected: 07/21/15 09:50
Collected By: Client

Sample Desc: BM-2 Mid-Depth

Date Received: 07/21/15 14:10

PWSID: 3060912

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

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

Reviewed and Approved by:

Richard Wheeler

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Attention: David Wertz
Reported To: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 07/29/15
Lab ID: 3156-15-0028746
Date Collected: 07/21/15 09:30
Collected By: Client

Sample Desc: BM-2 Deep

Date Received: 07/21/15 14:10

PWSID: 3060912

	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	07/22	17:40	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	07/28	11:00	HRG
Phosphorus as P, Total	0.02	mg/l	.01	1	SM 4500P-E	07/27	13:45	HRG
NITROGENS								
Nitrogen, Ammonia	0.24	mg/l	.05	1	D6919-03	07/21	16:34	JCL
Nitrogen, Nitrate	3.54	mg/l	.05	1	EPA 353.2	07/22	15:13	JCL
Nitrogen, Nitrite	0.26	mg/l	.05	1	EPA 353.2	07/22	13:34	JCL
Nitrogen, Total Kjeldahl	0.74	mg/l	.25	1	EPA 351.2	07/22	17:45	JCL
OTHER								
Biochemical Oxygen Demand	3	mg/l	2	1	SM 5210B	07/21	15:30	EMW
Total Organic Carbon	2.2	mg/l	1	1	SM5310 C	07/22	13:26	ALD
RESIDUES								
Solids, Total Dissolved	216	mg/l	5	1	SM 2540C	07/24	13:30	TMH
Solids, Total Suspended	3	mg/l	3	1	SM 2540D	07/24	13:30	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	110	mg/l	1	1	SM 2320 B	07/22	11:00	HRG

COMMENTS

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

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

Reviewed and Approved by:

Richard Wheeler

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Reported To: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 07/29/15
Lab ID: 3156-15-0028747

Date Collected: 07/21/15 12:45
Collected By: Client

Sample Desc: BM-5 Surface

Date Received: 07/21/15 14:10

PWSID: 3060912

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Fecal Coliform	430	/100ml	2	1	SM 9222D	07/21	15:30	TNS
Total Coliform	>2400	mpn/100ml	1	1	SM 9223B	07/22	10:30	PLW
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	07/22	17:40	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	07/28	11:00	HRG
Phosphorus as P, Total	0.05	mg/l	.01	1	SM 4500P-E	07/27	13:50	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	07/21	16:48	JCL
Nitrogen, Nitrate	7.52	mg/l	.1	2	EPA 353.2	07/22	15:40	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	07/22	13:35	JCL
Nitrogen, Total Kjeldahl	0.71	mg/l	.25	1	EPA 351.2	07/22	17:36	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	07/21	15:30	EMW
Total Organic Carbon	1.3	mg/l	1	1	SM5310 C	07/22	13:41	ALD
RESIDUES								
Solids, Total Dissolved	340	mg/l	5	1	SM 2540C	07/24	13:30	TMH
Solids, Total Suspended	8	mg/l	3	1	SM 2540D	07/24	13:30	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	186	mg/l	1	1	SM 2320 B	07/22	11:00	HRG

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

Reviewed and Approved by:

Richard Wheeler

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Arlington VA 22201-0000

Date of Report: 07/29/15
Lab ID: 3156-15-0028747

Date Collected: 07/21/15 12:45
Collected By: Client

Sample Desc: BM-5 Surface

Date Received: 07/21/15 14:10

PWSID: 3060912

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

COMMENTS

01 The total coliform sample was placed in the incubator on 07/21/15 at 16:00.

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 (Blue Marsh Reservoir)

Reviewed and Approved by:

Richard Wheeler

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Attention: David Wertz
Reported To: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 07/29/15
Lab ID: 3156-15-0028748

Date Collected: 07/21/15 09:10
Collected By: Client

Sample Desc: BM-6 Surface

Date Received: 07/21/15 14:10

PWSID: 3060912

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Fecal Coliform	<2	/100ml	2	1	SM 9222D	07/21	16:00	TNS
Total Coliform	1000	mpn/100ml	1	1	SM 9223B	07/22	10:30	PLW
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	07/22	17:40	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	07/28	11:00	HRG
Phosphorus as P, Total	0.02	mg/l	.01	1	SM 4500P-E	07/27	13:50	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	07/21	17:03	JCL
Nitrogen, Nitrate	2.68	mg/l	.05	1	EPA 353.2	07/22	15:15	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	07/22	13:36	JCL
Nitrogen, Total Kjeldahl	0.68	mg/l	.25	1	EPA 351.2	07/22	17:37	JCL
OTHER								
Biochemical Oxygen Demand	3	mg/l	2	1	SM 5210B	07/21	15:30	EMW
Total Organic Carbon	2.7	mg/l	1	1	SM5310 C	07/22	13:57	ALD
RESIDUES								
Solids, Total Dissolved	168	mg/l	5	1	SM 2540C	07/24	13:30	TMH
Solids, Total Suspended	5	mg/l	3	1	SM 2540D	07/24	13:30	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	68	mg/l	1	1	SM 2320 B	07/22	11:15	HRG

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

Reviewed and Approved by:

Richard Wheeler

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1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 07/29/15
Lab ID: 3156-15-0028748

Date Collected: 07/21/15 09:10
Collected By: Client

Sample Desc: BM-6 Surface

Date Received: 07/21/15 14:10

PWSID: 3060912

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

COMMENTS

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

02 The total coliform sample was placed in the incubator on 07/21/15 at 16:00.

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

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

Reviewed and Approved by:

Richard Wheeler

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Reported To: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 07/29/15
Lab ID: 3156-15-0028749
Date Collected: 07/21/15 09:10
Collected By: Client

Sample Desc: BM-6 Mid-Depth

Date Received: 07/21/15 14:10

PWSID: 3060912

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	0.08	mg/l	.01	1	SM 4500P-E	07/22	17:40	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	07/28	11:00	HRG
Phosphorus as P, Total	0.10	mg/l	.01	1	SM 4500P-E	07/27	13:50	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	07/21	17:17	JCL
Nitrogen, Nitrate	3.67	mg/l	.05	1	EPA 353.2	07/22	15:16	JCL
Nitrogen, Nitrite	0.14	mg/l	.05	1	EPA 353.2	07/22	13:37	JCL
Nitrogen, Total Kjeldahl	0.64	mg/l	.25	1	EPA 351.2	07/22	17:37	JCL
OTHER								
Biochemical Oxygen Demand	3	mg/l	2	1	SM 5210B	07/21	15:30	EMW
Total Organic Carbon	2.4	mg/l	1	1	SM5310 C	07/22	13:14	ALD
RESIDUES								
Solids, Total Dissolved	205	mg/l	5	1	SM 2540C	07/24	13:30	TMH
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	07/24	13:30	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	106	mg/l	1	1	SM 2320 B	07/22	11:15	HRG

COMMENTS

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

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

Reviewed and Approved by:

Richard Wheeler

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Arlington VA 22201-0000

Date of Report: 07/29/15
Lab ID: 3156-15-0028749

Date Collected: 07/21/15 09:10
Collected By: Client

Sample Desc: BM-6 Mid-Depth

Date Received: 07/21/15 14:10

PWSID: 3060912

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

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

Reviewed and Approved by:

Richard Wheeler

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Attention: David Wertz
Reported To: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 07/29/15
Lab ID: 3156-15-0028750

Date Collected: 07/21/15 09:10
Collected By: Client

Sample Desc: BM-6 Deep

Date Received: 07/21/15 14:10

PWSID: 3060912

	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	07/22	17:40	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	07/28	11:00	HRG
Phosphorus as P, Total	0.09	mg/l	.01	1	SM 4500P-E	07/27	13:50	HRG
NITROGENS								
Nitrogen, Ammonia	0.65	mg/l	.05	1	D6919-03	07/21	17:32	JCL
Nitrogen, Nitrate	2.84	mg/l	.05	1	EPA 353.2	07/22	15:17	JCL
Nitrogen, Nitrite	0.23	mg/l	.05	1	EPA 353.2	07/22	13:38	JCL
Nitrogen, Total Kjeldahl	1.32	mg/l	.25	1	EPA 351.2	07/22	17:38	JCL
OTHER								
Biochemical Oxygen Demand	7	mg/l	2	1	SM 5210B	07/21	15:30	EMW
Total Organic Carbon	2.4	mg/l	1	1	SM5310 C	07/22	14:44	ALD
RESIDUES								
Solids, Total Dissolved	217	mg/l	5	1	SM 2540C	07/24	13:30	TMH
Solids, Total Suspended	37	mg/l	3	1	SM 2540D	07/24	13:30	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	118	mg/l	1	1	SM 2320 B	07/22	11:15	HRG

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 (Blue Marsh Reservoir)

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 (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 07/29/15
Lab ID: 3156-15-0028751

Date Collected: 07/21/15 10:20
Collected By: Client

Sample Desc: BM-7 Surface

Date Received: 07/21/15 14:10

PWSID: 3060912

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Fecal Coliform	<2	/100ml	2	1	SM 9222D	07/21	16:00	TNS
Total Coliform	1300	mpn/100ml	1	1	SM 9223B	07/22	10:30	PLW
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	0.01	mg/l	.01	1	SM 4500P-E	07/22	17:40	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	07/28	11:00	HRG
Phosphorus as P, Total	0.04	mg/l	.01	1	SM 4500P-E	07/27	13:50	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	07/21	17:47	JCL
Nitrogen, Nitrate	2.62	mg/l	.05	1	EPA 353.2	07/22	15:20	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	07/22	13:41	JCL
Nitrogen, Total Kjeldahl	0.95	mg/l	.25	1	EPA 351.2	07/22	17:41	JCL
OTHER								
Biochemical Oxygen Demand	4	mg/l	2	1	SM 5210B	07/21	15:30	EMW
Total Organic Carbon	2.7	mg/l	1	1	SM5310 C	07/22	15:00	ALD
RESIDUES								
Solids, Total Dissolved	168	mg/l	5	1	SM 2540C	07/24	13:30	TMH
Solids, Total Suspended	9	mg/l	3	1	SM 2540D	07/24	13:30	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	62	mg/l	1	1	SM 2320 B	07/22	12:00	HRG

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

Reviewed and Approved by:

Richard Wheeler

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Date of Report: 07/29/15
Lab ID: 3156-15-0028751

Date Collected: 07/21/15 10:20
Collected By: Client

Sample Desc: BM-7 Surface

Date Received: 07/21/15 14:10

PWSID: 3060912

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

COMMENTS

01 The total coliform sample was placed in the incubator on 07/21/15 at 16:00.

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 (Blue Marsh Reservoir)

Reviewed and Approved by:

Richard Wheeler

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Attention: David Wertz
Reported To: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 07/29/15
Lab ID: 3156-15-0028752

Date Collected: 07/21/15 10:20
Collected By: Client

Sample Desc: BM-7 Mid-Depth

Date Received: 07/21/15 14:10

PWSID: 3060912

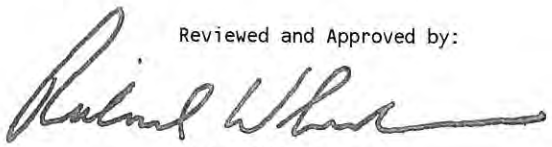
	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	07/22	17:40	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	07/28	11:05	HRG
Phosphorus as P, Total	0.04	mg/l	.01	1	SM 4500P-E	07/27	13:50	HRG
NITROGENS								
Nitrogen, Ammonia	0.14	mg/l	.05	1	D6919-03	07/21	18:01	JCL
Nitrogen, Nitrate	4.14	mg/l	.05	1	EPA 353.2	07/22	15:21	JCL
Nitrogen, Nitrite	0.12	mg/l	.05	1	EPA 353.2	07/22	13:41	JCL
Nitrogen, Total Kjeldahl	0.66	mg/l	.25	1	EPA 351.2	07/22	17:42	JCL
OTHER								
Biochemical Oxygen Demand	5	mg/l	2	1	SM 5210B	07/21	15:30	EMW
Total Organic Carbon	2.1	mg/l	1	1	SM5310 C	07/22	15:15	ALD
RESIDUES								
Solids, Total Dissolved	250	mg/l	5	1	SM 2540C	07/24	13:30	TMH
Solids, Total Suspended	4	mg/l	3	1	SM 2540D	07/24	13:30	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	118	mg/l	1	1	SM 2320 B	07/22	12:15	HRG

COMMENTS

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

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

Reviewed and Approved by:



Richard Wheeler

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M.J. Reider Associates, Inc.

Attention: David Wertz
Reported To: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 07/29/15
Lab ID: 3156-15-0028753

Date Collected: 07/21/15 10:20
Collected By: Client

Sample Desc: BM-7 Deep

Date Received: 07/21/15 14:10

PWSID: 3060912

	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	07/22	17:45	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	07/28	11:05	HRG
Phosphorus as P, Total	0.11	mg/l	.01	1	SM 4500P-E	07/27	13:50	HRG
NITROGENS								
Nitrogen, Ammonia	0.17	mg/l	.05	1	D6919-03	07/21	18:16	JCL
Nitrogen, Nitrate	3.38	mg/l	.05	1	EPA 353.2	07/22	15:22	JCL
Nitrogen, Nitrite	0.09	mg/l	.05	1	EPA 353.2	07/22	13:42	JCL
Nitrogen, Total Kjeldahl	1.14	mg/l	.25	1	EPA 351.2	07/22	17:43	JCL
OTHER								
Biochemical Oxygen Demand	3	mg/l	2	1	SM 5210B	07/21	15:30	EMW
Total Organic Carbon	2.2	mg/l	1	1	SM5310 C	07/22	16:33	ALD
RESIDUES								
Solids, Total Dissolved	222	mg/l	5	1	SM 2540C	07/24	14:00	TMH
Solids, Total Suspended	49	mg/l	3	1	SM 2540D	07/24	14:00	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	104	mg/l	1	1	SM 2320 B	07/22	12:15	HRG

COMMENTS

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

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

Reviewed and Approved by:

Richard Wheeler

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Reported To: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 07/29/15
Lab ID: 3156-15-0028753

Date Collected: 07/21/15 10:20
Collected By: Client

Sample Desc: BM-7 Deep

Date Received: 07/21/15 14:10

PWSID: 3060912

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

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

Reviewed and Approved by:

Richard Wheeler

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M.J. Reider Associates, Inc.

Attention: David Wertz
Reported To: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 07/29/15
Lab ID: 3156-15-0028754

Date Collected: 07/21/15 11:30
Collected By: Client

Sample Desc: BM-8 Surface

Date Received: 07/21/15 14:10

PWSID: 3060912

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Fecal Coliform	<2	/100ml	2	1	SM 9222D	07/21	16:00	TNS
Total Coliform	2000	mpn/100ml	1	1	SM 9223B	07/22	10:30	PLW
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	07/22	17:45	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	07/28	11:05	HRG
Phosphorus as P, Total	0.02	mg/l	.01	1	SM 4500P-E	07/27	13:55	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	07/21	18:30	JCL
Nitrogen, Nitrate	2.52	mg/l	.05	1	EPA 353.2	07/22	15:23	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	07/22	13:45	JCL
Nitrogen, Total Kjeldahl	1.01	mg/l	.25	1	EPA 351.2	07/22	17:44	JCL
OTHER								
Biochemical Oxygen Demand	4	mg/l	2	1	SM 5210B	07/21	15:30	EMW
Total Organic Carbon	3.1	mg/l	1	1	SM5310 C	07/22	16:49	ALD
RESIDUES								
Solids, Total Dissolved	158	mg/l	5	1	SM 2540C	07/24	14:00	TMH
Solids, Total Suspended	7	mg/l	3	1	SM 2540D	07/24	14:00	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	57	mg/l	1	1	SM 2320 B	07/22	12:30	HRG

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

Reviewed and Approved by:

Richard Wheeler

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Attention: David Wertz
Reported To: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 07/29/15
Lab ID: 3156-15-0028754

Date Collected: 07/21/15 11:30
Collected By: Client

Sample Desc: BM-8 Surface

Date Received: 07/21/15 14:10

PWSID: 3060912

	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 07/21/15 at 16:00.

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

Reviewed and Approved by:

Richard Wheeler

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M.J. Reider Associates, Inc.

Attention: David Wertz
Reported To: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 07/29/15
Lab ID: 3156-15-0028755
Date Collected: 07/21/15 11:30
Collected By: Client

Sample Desc: BM-8 Mid-Depth

Date Received: 07/21/15 14:10

PWSID: 3060912

	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	07/22	17:45	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	07/28	11:10	HRG
Phosphorus as P, Total	0.08	mg/l	.01	1	SM 4500P-E	07/27	13:55	HRG
NITROGENS								
Nitrogen, Ammonia	0.05	mg/l	.05	1	D6919-03	07/21	18:52	JCL
Nitrogen, Nitrate	2.71	mg/l	.05	1	EPA 353.2	07/22	15:26	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	07/22	13:46	JCL
Nitrogen, Total Kjeldahl	1.06	mg/l	.25	1	EPA 351.2	07/22	17:47	JCL
OTHER								
Biochemical Oxygen Demand	4	mg/l	2	1	SM 5210B	07/21	15:30	EMW
Total Organic Carbon	2.4	mg/l	1	1	SM5310 C	07/22	17:05	ALD
RESIDUES								
Solids, Total Dissolved	181	mg/l	5	1	SM 2540C	07/24	14:00	TMH
Solids, Total Suspended	5	mg/l	3	1	SM 2540D	07/24	14:00	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	68	mg/l	1	1	SM 2320 B	07/22	12:30	HRG

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 (Blue Marsh Reservoir)

Reviewed and Approved by:

Richard Wheeler

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M.J. Reider Associates, Inc.

Attention: David Wertz
Reported To: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 07/29/15
Lab ID: 3156-15-0028756

Date Collected: 07/21/15 11:30
Collected By: Client

Sample Desc: BM-8 Deep

Date Received: 07/21/15 14:10

PWSID: 3060912

	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	07/22	17:50	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	07/28	11:10	HRG
Phosphorus as P, Total	0.03	mg/l	.01	1	SM 4500P-E	07/27	13:55	HRG
NITROGENS								
Nitrogen, Ammonia	0.24	mg/l	.05	1	D6919-03	07/21	19:50	JCL
Nitrogen, Nitrate	3.41	mg/l	.05	1	EPA 353.2	07/22	15:27	JCL
Nitrogen, Nitrite	0.07	mg/l	.05	1	EPA 353.2	07/22	13:47	JCL
Nitrogen, Total Kjeldahl	0.92	mg/l	.25	1	EPA 351.2	07/22	17:48	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	07/21	15:30	EMW
Total Organic Carbon	2.2	mg/l	1	1	SM5310 C	07/22	17:20	ALD
RESIDUES								
Solids, Total Dissolved	226	mg/l	5	1	SM 2540C	07/24	14:00	TMH
Solids, Total Suspended	10	mg/l	3	1	SM 2540D	07/24	14:00	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	109	mg/l	1	1	SM 2320 B	07/22	12:30	HRG

COMMENTS

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

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

Reviewed and Approved by:

Richard Wheeler

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Attention: David Wertz
Reported To: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 07/29/15
Lab ID: 3156-15-0028757

Date Collected: 07/21/15 11:10
Collected By: Client

Sample Desc: BM-9 Surface

Date Received: 07/21/15 14:10

PWSID: 3060912

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Fecal Coliform	2	/100ml	2	1	SM 9222D	07/21	16:00	TNS
Total Coliform	2400	mpn/100ml	1	1	SM 9223B	07/22	10:30	PLW
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	07/22	17:50	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	07/28	11:10	HRG
Phosphorus as P, Total	0.01	mg/l	.01	1	SM 4500P-E	07/27	13:55	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	07/21	20:05	JCL
Nitrogen, Nitrate	2.54	mg/l	.05	1	EPA 353.2	07/22	15:28	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	07/22	13:48	JCL
Nitrogen, Total Kjeldahl	0.96	mg/l	.25	1	EPA 351.2	07/22	17:49	JCL
OTHER								
Biochemical Oxygen Demand	3	mg/l	2	1	SM 5210B	07/21	15:30	EMW
Total Organic Carbon	5.5	mg/l	1	1	SM5310 C	07/22	17:36	ALD
RESIDUES								
Solids, Total Dissolved	174	mg/l	5	1	SM 2540C	07/24	14:00	TMH
Solids, Total Suspended	7	mg/l	3	1	SM 2540D	07/24	14:00	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	56	mg/l	1	1	SM 2320 B	07/22	12:30	HRG

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

Reviewed and Approved by:

Richard Wheeler

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Attention: David Wertz
Reported To: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 07/29/15
Lab ID: 3156-15-0028757

Date Collected: 07/21/15 11:10
Collected By: Client

Sample Desc: BM-9 Surface

Date Received: 07/21/15 14:10

PWSID: 3060912

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

COMMENTS

01 This sample was not collected in the appropriate container for microbiology analysis. The customer was contacted and they authorized the analysis.

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 07/21/15 at 16:00.

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

Reviewed and Approved by:

Richard Wheeler

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Attention: David Wertz
Reported To: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 07/29/15
Lab ID: 3156-15-0028758

Date Collected: 07/21/15 11:10
Collected By: Client

Sample Desc: BM-9 Mid-Depth

Date Received: 07/21/15 14:10

PWSID: 3060912

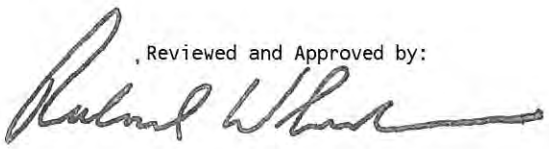
	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	07/22	17:50	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	07/28	11:10	HRG
Phosphorus as P, Total	0.03	mg/l	.01	1	SM 4500P-E	07/27	13:55	HRG
NITROGENS								
Nitrogen, Ammonia	0.13	mg/l	.05	1	D6919-03	07/21	20:19	JCL
Nitrogen, Nitrate	3.96	mg/l	.05	1	EPA 353.2	07/22	15:29	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	07/22	13:49	JCL
Nitrogen, Total Kjeldahl	0.77	mg/l	.25	1	EPA 351.2	07/22	17:49	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	07/21	15:30	EMW
Total Organic Carbon	2.2	mg/l	1	1	SM5310 C	07/22	17:52	ALD
RESIDUES								
Solids, Total Dissolved	215	mg/l	5	1	SM 2540C	07/24	14:00	TMH
Solids, Total Suspended	6	mg/l	3	1	SM 2540D	07/24	14:00	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	110	mg/l	1	1	SM 2320 B	07/22	12:45	HRG

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 (Blue Marsh Reservoir)

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 (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 07/29/15
Lab ID: 3156-15-0028759

Date Collected: 07/21/15 10:45
Collected By: Client

Sample Desc: BM-9 Deep

Date Received: 07/21/15 14:10

PWSID: 3060912

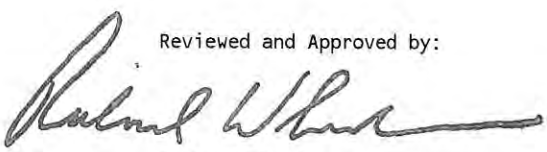
	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	0.06	mg/l	.01	1	SM 4500P-E	07/22	17:55	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	07/28	11:10	HRG
Phosphorus as P, Total	0.19	mg/l	.01	1	SM 4500P-E	07/27	13:55	HRG
NITROGENS								
Nitrogen, Ammonia	0.92	mg/l	.05	1	D6919-03	07/21	20:34	JCL
Nitrogen, Nitrate	2.69	mg/l	.05	1	EPA 353.2	07/22	15:32	JCL
Nitrogen, Nitrite	0.10	mg/l	.05	1	EPA 353.2	07/22	13:52	JCL
Nitrogen, Total Kjeldahl	2.11	mg/l	.25	1	EPA 351.2	07/22	17:52	JCL
OTHER								
Biochemical Oxygen Demand	4	mg/l	2	1	SM 5210B	07/21	15:30	EMW
Total Organic Carbon	2.4	mg/l	1	1	SM5310 C	07/22	18:08	ALD
RESIDUES								
Solids, Total Dissolved	249	mg/l	5	1	SM 2540C	07/24	14:00	TMH
Solids, Total Suspended	57	mg/l	3	1	SM 2540D	07/24	14:00	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	135	mg/l	1	1	SM 2320 B	07/22	12:45	HRG

COMMENTS

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

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

Reviewed and Approved by:



Richard Wheeler

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M.J. Reider Associates, Inc.

Attention: David Wertz
Reported To: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 07/29/15
Lab ID: 3156-15-0028760

Date Collected: 07/21/15 10:45
Collected By: Client

Sample Desc: BM-10 Surface

Date Received: 07/21/15 14:10

PWSID: 3060912

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Fecal Coliform	<2	/100ml	2	1	SM 9222D	07/21	16:00	TNS
Total Coliform	2000	mpn/100ml	1	1	SM 9223B	07/22	10:30	PLW
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	07/22	17:55	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	07/28	11:10	HRG
Phosphorus as P, Total	0.08	mg/l	.01	1	SM 4500P-E	07/27	13:53	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	07/21	20:49	JCL
Nitrogen, Nitrate	2.44	mg/l	.05	1	EPA 353.2	07/22	15:33	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	07/22	13:53	JCL
Nitrogen, Total Kjeldahl	1.09	mg/l	.25	1	EPA 351.2	07/22	17:53	JCL
OTHER								
Biochemical Oxygen Demand	5	mg/l	2	1	SM 5210B	07/21	15:30	EMW
Total Organic Carbon	3.0	mg/l	1	1	SM5310 C	07/22	18:23	ALD
RESIDUES								
Solids, Total Dissolved	163	mg/l	5	1	SM 2540C	07/24	14:00	TMH
Solids, Total Suspended	9	mg/l	3	1	SM 2540D	07/24	14:00	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	57	mg/l	1	1	SM 2320 B	07/22	12:45	HRG

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

Reviewed and Approved by:

Richard Wheeler

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1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 07/29/15
Lab ID: 3156-15-0028760

Date Collected: 07/21/15 10:45
Collected By: Client

Sample Desc: BM-10 Surface

Date Received: 07/21/15 14:10

PWSID: 3060912

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

COMMENTS

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

02 The total coliform sample was placed in the incubator on 07/21/15 at 16:00.

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

Reviewed and Approved by:

Richard Wheeler

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Attention: David Wertz
Reported To: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 07/29/15
Lab ID: 3156-15-0028761

Date Collected: 07/21/15 10:45
Collected By: Client

Sample Desc: BM-10 Mid-Depth

Date Received: 07/21/15 14:10

PWSID: 3060912

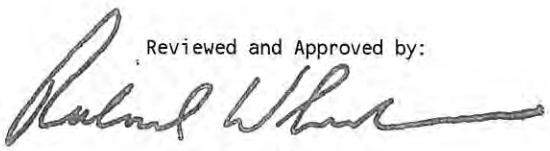
	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	0.02	mg/l	.01	1	SM 4500P-E	07/22	17:55	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	07/28	11:10	HRG
Phosphorus as P, Total	0.14	mg/l	.01	1	SM 4500P-E	07/27	14:00	HRG
NITROGENS								
Nitrogen, Ammonia	0.15	mg/l	.05	1	D6919-03	07/21	21:03	JCL
Nitrogen, Nitrate	4.88	mg/l	.05	1	EPA 353.2	07/22	15:33	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	07/22	13:54	JCL
Nitrogen, Total Kjeldahl	0.96	mg/l	.25	1	EPA 351.2	07/22	17:54	JCL
OTHER								
Biochemical Oxygen Demand	2	mg/l	2	1	SM 5210B	07/21	15:30	EMW
Total Organic Carbon	2.0	mg/l	1	1	SM5310 C	07/22	18:39	ALD
RESIDUES								
Solids, Total Dissolved	272	mg/l	5	1	SM 2540C	07/24	14:00	TMH
Solids, Total Suspended	28	mg/l	3	1	SM 2540D	07/24	14:00	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	151	mg/l	1	1	SM 2320 B	07/22	13:00	HRG

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 (Blue Marsh Reservoir)

Reviewed and Approved by:



Richard Wheeler

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M.J. Reider Associates, Inc.

Attention: David Wertz
Reported To: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 07/29/15
Lab ID: 3156-15-0028762

Date Collected: 07/21/15 10:45
Collected By: Client

Sample Desc: BM-10 Deep

Date Received: 07/21/15 14:10

PWSID: 3060912

	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	07/22	18:00	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	07/28	11:15	HRG
Phosphorus as P, Total	0.16	mg/l	.01	1	SM 4500P-E	07/27	14:00	HRG
NITROGENS								
Nitrogen, Ammonia	0.25	mg/l	.05	1	D6919-03	07/21	21:18	JCL
Nitrogen, Nitrate	5.32	mg/l	.05	1	EPA 353.2	07/22	15:34	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	07/22	13:55	JCL
Nitrogen, Total Kjeldahl	1.09	mg/l	.25	1	EPA 351.2	07/22	17:55	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	07/21	15:30	EMW
Total Organic Carbon	1.9	mg/l	1	1	SM5310 C	07/22	19:09	ALD
RESIDUES								
Solids, Total Dissolved	298	mg/l	5	1	SM 2540C	07/24	14:00	TMH
Solids, Total Suspended	61	mg/l	3	1	SM 2540D	07/24	14:00	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	136	mg/l	1	1	SM 2320 B	07/22	13:00	HRG

COMMENTS

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

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

Reviewed and Approved by:

Richard Wheeler

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Reported To: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 07/29/15
Lab ID: 3156-15-0028763

Date Collected: 07/21/15 12:45
Collected By: Client

Sample Desc: BM-11 Surface

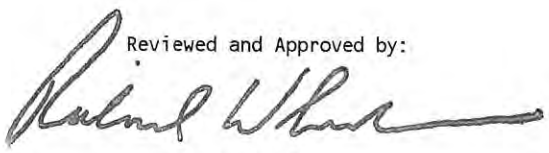
Date Received: 07/21/15 14:10

PWSID: 3060912

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Fecal Coliform	1100	/100ml	2	1	SM 9222D	07/21	16:00	TNS
Total Coliform	>2400	mpn/100ml	1	1	SM 9223B	07/22	10:30	PLW
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	0.10	mg/l	.01	1	SM 4500P-E	07/22	18:00	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	07/28	11:15	HRG
Phosphorus as P, Total	0.49	mg/l	.01	1	SM 4500P-E	07/27	14:00	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	07/21	21:32	JCL
Nitrogen, Nitrate	4.59	mg/l	.05	1	EPA 353.2	07/22	15:37	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	07/22	13:58	JCL
Nitrogen, Total Kjeldahl	0.61	mg/l	.25	1	EPA 351.2	07/22	17:58	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	07/21	15:30	EMW
Total Organic Carbon	2.1	mg/l	1	1	SM5310 C	07/22	20:40	ALD
RESIDUES								
Solids, Total Dissolved	231	mg/l	5	1	SM 2540C	07/24	14:30	TMH
Solids, Total Suspended	29	mg/l	3	1	SM 2540D	07/24	14:00	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	101	mg/l	1	1	SM 2320 B	07/22	13:15	HRG

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

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 (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 07/29/15
Lab ID: 3156-15-0028763

Date Collected: 07/21/15 12:45
Collected By: Client

Sample Desc: BM-11 Surface

Date Received: 07/21/15 14:10

PWSID: 3060912

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

COMMENTS

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

02 The total coliform sample was placed in the incubator on 07/21/15 at 16:00.

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

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

M. J. REIDER ASSOCIATES, INC.

Chain of Custody

Account: 3156 Work Order: 006223 Project Leader: rxw No: 260278
Work Order Description: Seasonal Monthly Blue Marsh Resevoir

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: 28757-F Filled From BOD Bottle per RXW Conversation with customer. BSW-7-21-15

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

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

==========

28743 Sample No: 1 Desc: BM-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: 7/21/15 Time: 130
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;

28744 Sample No: 2 Desc: BM-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: 7/21/15 Time: 0930
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;

28745 Sample No: 3 Desc: BM-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: 7/21/15 Time: 0950
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: 7/21/15 Time: 130 Date: 7-21-15 Time: 1410

Sample entered by: MTZ

Chain of Custody

Account: 3156 Work Order: 006223 Project Leader: rxw No: 260278
Work Order Description: Seasonal Monthly Blue Marsh Resevoir

Customer: David Wertz

Address: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

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: BSW

Samplers: WACiK

==========

28746 Sample No: 4 Desc: BM-2 Deep

Matrix: o Date: 7/21/15
Time: 0930

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

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;

28747 Sample No: 5 Desc: BM-5 Surface

Matrix: o Date: 7/21/15
Time: 1245

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

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;

28748 Sample No: 6 Desc: BM-6 Surface

Matrix: o Date: 7/21/15
Time: 0910

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

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: 7/21/15 Time: 130 Date: 7-21-15 Time: 1410

Sample entered by: _____

M. J. REIDER ASSOCIATES, INC.

Chain of Custody

Account: 3156 Work Order: 006223 Project Leader: rxw No: 260278
Work Order Description: Seasonal Monthly Blue Marsh Resevoir

Customer: David Wertz

Address: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Remarks: _____

Phone: 703-387-5516 Ext:

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

Samplers: WACIK

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

==========

28749

Sample No: 7 Desc: BM-6 Mid-Depth

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

Matrix: o Date: 7/21/15 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;

28750

Sample No: 8 Desc: BM-6 Deep

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

Matrix: o Date: 7/21/15 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;

28751

Sample No: 9 Desc: BM-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: 7/21/15 Time: 1020

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: 7/21/15 Time: 1310 Date: 7-21-15 Time: 1410

Sample entered by: _____

Chain of Custody

Account: 3156 Work Order: 006223 Project Leader: rxw No: 260278
Work Order Description: Seasonal Monthly Blue Marsh Resevoir

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

==========

28752

Sample No: 10 Desc: BM-7 Mid-Depth

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

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

28753

Sample No: 11 Desc: BM-7 Deep

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

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

28754

Sample No: 12 Desc: BM-8 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: 7/21/15
Time: 1020

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;

Matrix: o Date: 7/21/15
Time: 1020

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;

Matrix: o Date: 7/21/15
Time: 1130

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: 7/21/15 Time: 130 Date: 7-21-15 Time: 1410

Sample entered by: MTL

M. J. REIDER ASSOCIATES, INC.

Chain of Custody

Account: 3156 Work Order: 006223 Project Leader: rxw No: 260278
Work Order Description: Seasonal Monthly Blue Marsh Resevoir

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

==========

28755

Sample No: 13 Desc: BM-8 Mid-Depth

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

Matrix: o Date: 7/21/15
Time: 1130

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;

28756

Sample No: 14 Desc: BM-8 Deep

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

Matrix: o Date: 7/21/15
Time: 1130

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;

28757

Sample No: 15 Desc: BM-9 Surface

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

Matrix: o Date: 7/21/15
Time: 1110

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: 7/21/15 Time: 130 Date: 7-21-15 Time: 1410

Sample entered by: MTL

jbs
06/24/15 4:28:04 PM

M. J. REIDER ASSOCIATES, INC.

Chain of Custody

Account: 3156 Work Order: 006223 Project Leader: rxw No: 260278
Work Order Description: Seasonal Monthly Blue Marsh Resevoir

Customer: David Wertz

Address: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Remarks: _____

Phone: 703-387-5516 Ext:

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

Samplers: WACiK

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

28758

Sample No: 16 Desc: BM-9 Mid-Depth

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

Matrix: o Date: 7/21/15
Time: 1110
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;

28759

Sample No: 17 Desc: BM-9 Deep

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

Matrix: o Date: 7/21/15
Time: 1110
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;

28760

Sample No: 18 Desc: BM-10 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: 7/21/15
Time: 1045
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: 7/21/15 Time: 130 Date: 7-21-15 Time: 1410

Sample entered by: MTR

Chain of Custody

Account: 3156 Work Order: 006223 Project Leader: rxw No: 260278
Work Order Description: Seasonal Monthly Blue Marsh Resevoir

Customer: David Wertz

Address: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Remarks: _____

Phone: 703-387-5516 Ext:

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

Samplers: WACIK

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

28761

Sample No: 19 Desc: BM-10 Mid-Depth

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

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

Matrix: o Date: 7/21/15
Time: 1045

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;

28762

Sample No: 20 Desc: BM-10 Deep

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

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

Matrix: o Date: 7/21/15
Time: 1045

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;

28763

Sample No: 21 Desc: BM-11 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: 7/21/15
Time: 1245

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: 7/21/15 Time: 130 Date: 7-21-15 Time: 1410

Sample entered by: MTL

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

Attention: David Wertz
Reported To: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 08/28/15
Lab ID: 3156-15-0032763

Date Collected: 08/11/15 12:45
Collected By: Client

Sample Desc: BM-1 Surface

Date Received: 08/11/15 14:00

PWSID: 3060912

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Fecal Coliform	10	/100ml	2	1	SM 9222D	08/11	15:35	TNS
Total Coliform	>2400	mpn/100ml	1	1	SM 9223B	08/12	10:45	PLW
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	0.04	mg/l	.01	1	SM 4500P-E	08/12	15:20	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	08/18	13:20	HRG
Phosphorus as P, Total	0.05	mg/l	.01	1	SM 4500P-E	08/13	12:50	HRG
NITROGENS								
Nitrogen, Ammonia	0.45	mg/l	.05	1	D6919-03	08/11	15:24	JCL
Nitrogen, Nitrate	2.48	mg/l	.05	1	EPA 353.2	08/12	13:11	JCL
Nitrogen, Nitrite	0.12	mg/l	.05	1	EPA 353.2	08/12	11:46	JCL
Nitrogen, Total Kjeldahl	0.99	mg/l	.25	1	EPA 351.2	08/20	13:30	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	08/11	15:50	EMW
Total Organic Carbon	2.0	mg/l	1	1	SM5310 C	08/12	23:33	ALD
RESIDUES								
Solids, Total Dissolved	225	mg/l	5	1	SM 2540C	08/13	13:10	TMH
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	08/13	13:10	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	120	mg/l	1	1	SM 2320 B	08/12	10:15	HRG

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

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 (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 08/28/15
Lab ID: 3156-15-0032763

Date Collected: 08/11/15 12:45
Collected By: Client

Sample Desc: BM-1 Surface

Date Received: 08/11/15 14:00

PWSID: 3060912

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 placed in the incubator on 08/11/15 at 15:45

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

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**

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

Attention: David Wertz
Reported To: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 08/28/15
Lab ID: 3156-15-0032764

Date Collected: 08/11/15 09:32
Collected By: Client

Sample Desc: BM-2 Surface

Date Received: 08/11/15 14:00

PWSID: 3060912

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Fecal Coliform	20	/100ml	2	1	SM 9222D	08/11	15:35	TNS
Total Coliform	>2400	mpn/100ml	1	1	SM 9223B	08/12	10:45	PLW
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	08/12	15:20	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	08/18	13:20	HRG
Phosphorus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	08/13	12:50	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	08/11	15:39	JCL
Nitrogen, Nitrate	2.25	mg/l	.05	1	EPA 353.2	08/12	13:12	JCL
Nitrogen, Nitrite	0.13	mg/l	.05	1	EPA 353.2	08/12	11:49	JCL
Nitrogen, Total Kjeldahl	0.78	mg/l	.25	1	EPA 351.2	08/20	13:33	JCL
OTHER								
Biochemical Oxygen Demand	2	mg/l	2	1	SM 5210B	08/11	15:50	EMW
Total Organic Carbon	2.3	mg/l	1	1	SM5310 C	08/12	23:48	ALD
RESIDUES								
Solids, Total Dissolved	170	mg/l	5	1	SM 2540C	08/13	13:10	TMH
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	08/13	13:10	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	80	mg/l	1	1	SM 2320 B	08/12	10:15	HRG

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

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 (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 08/28/15
Lab ID: 3156-15-0032764

Date Collected: 08/11/15 09:32
Collected By: Client

Sample Desc: BM-2 Surface

Date Received: 08/11/15 14:00

PWSID: 3060912

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 placed in the incubator on 08/11/15 at 15:45

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

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

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 (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 08/28/15
Lab ID: 3156-15-0032765

Date Collected: 08/11/15 09:32
Collected By: Client

Sample Desc: BM-2 Mid-Depth

Date Received: 08/11/15 14:00

PWSID: 3060912

	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	08/12	15:20	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	08/18	13:25	HRG
Phosphorus as P, Total	0.02	mg/l	.01	1	SM 4500P-E	08/13	12:50	HRG
NITROGENS								
Nitrogen, Ammonia	0.23	mg/l	.05	1	D6919-03	08/11	15:54	JCL
Nitrogen, Nitrate	2.78	mg/l	.05	1	EPA 353.2	08/12	13:15	JCL
Nitrogen, Nitrite	0.15	mg/l	.05	1	EPA 353.2	08/12	11:50	JCL
Nitrogen, Total Kjeldahl	0.64	mg/l	.25	1	EPA 351.2	08/20	13:34	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	08/11	15:50	EMW
Total Organic Carbon	2.0	mg/l	1	1	SM5310 C	08/13	00:04	ALD
RESIDUES								
Solids, Total Dissolved	216	mg/l	5	1	SM 2540C	08/13	13:10	TMH
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	08/13	13:10	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	94	mg/l	1	1	SM 2320 B	08/12	10:15	HRG

COMMENTS

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

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

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 (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 08/28/15
Lab ID: 3156-15-0032766

Date Collected: 08/11/15 09:32
Collected By: Client

Sample Desc: BM-2 Deep

Date Received: 08/11/15 14:00

PWSID: 3060912

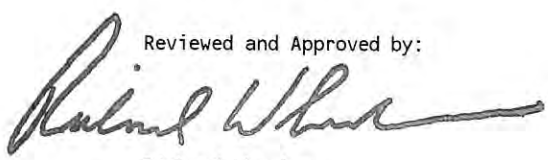
	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	08/12	15:20	HRG
Phosphorus as P, Dissolved	0.08	mg/l	.05	1	SM 4500P-E	08/18	13:25	HRG
Phosphorus as P, Total	0.18	mg/l	.01	1	SM 4500P-E	08/13	12:50	HRG
NITROGENS								
Nitrogen, Ammonia	0.94	mg/l	.05	1	D6919-03	08/11	16:08	JCL
Nitrogen, Nitrate	1.83	mg/l	.05	1	EPA 353.2	08/12	13:16	JCL
Nitrogen, Nitrite	0.09	mg/l	.05	1	EPA 353.2	08/12	11:51	JCL
Nitrogen, Total Kjeldahl	2.16	mg/l	.25	1	EPA 351.2	08/20	13:35	JCL
OTHER								
Biochemical Oxygen Demand	5	mg/l	2	1	SM 5210B	08/11	15:50	EMW
Total Organic Carbon	2.6	mg/l	1	1	SM5310 C	08/13	00:21	ALD
RESIDUES								
Solids, Total Dissolved	225	mg/l	5	1	SM 2540C	08/13	13:10	TMH
Solids, Total Suspended	24	mg/l	3	1	SM 2540D	08/13	13:10	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	142	mg/l	1	1	SM 2320 B	08/12	10:30	HRG

COMMENTS

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

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

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 (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 08/28/15
Lab ID: 3156-15-0032767

Date Collected: 08/11/15 12:17
Collected By: Client

Sample Desc: BM-5 Surface

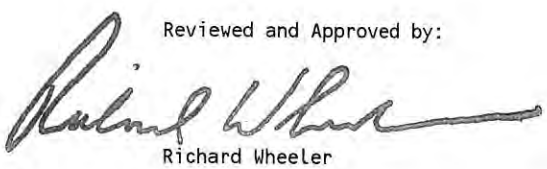
Date Received: 08/11/15 14:00

PWSID: 3060912

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Fecal Coliform	4500	/100ml	2	1	SM 9222D	08/11	15:35	TNS
Total Coliform	>2400	mpn/100ml	1	1	SM 9223B	08/12	10:45	PLW
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	0.05	mg/l	.01	1	SM 4500P-E	08/12	15:20	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	08/18	13:25	HRG
Phosphorus as P, Total	0.07	mg/l	.01	1	SM 4500P-E	08/13	12:50	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	08/11	16:23	JCL
Nitrogen, Nitrate	6.63	mg/l	.1	2	EPA 353.2	08/12	13:45	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	08/12	11:52	JCL
Nitrogen, Total Kjeldahl	0.43	mg/l	.25	1	EPA 351.2	08/20	13:36	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	08/11	15:50	EMW
Total Organic Carbon	1.8	mg/l	1	1	SM5310 C	08/13	00:36	ALD
RESIDUES								
Solids, Total Dissolved	332	mg/l	5	1	SM 2540C	08/13	13:10	TMH
Solids, Total Suspended	14	mg/l	3	1	SM 2540D	08/13	13:10	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	179	mg/l	1	1	SM 2320 B	08/12	10:30	HRG

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

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 (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 08/28/15
Lab ID: 3156-15-0032767

Date Collected: 08/11/15 12:17
Collected By: Client

Sample Desc: BM-5 Surface

Date Received: 08/11/15 14:00

PWSID: 3060912

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

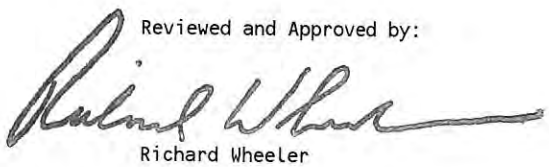
COMMENTS

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 placed in the incubator on 08/11/15 at 15:45

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

Reviewed and Approved by:



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Attention: David Wertz
Reported To: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 08/28/15
Lab ID: 3156-15-0032768

Date Collected: 08/11/15 08:55
Collected By: Client

Sample Desc: BM-6 Surface

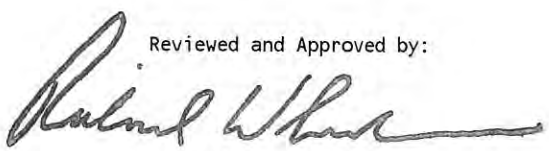
Date Received: 08/11/15 14:00

PWSID: 3060912

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Fecal Coliform	62	/100ml	2	1	SM 9222D	08/11	15:35	TNS
Total Coliform	>2400	mpn/100ml	1	1	SM 9223B	08/12	10:45	PLW
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	08/12	15:20	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	08/18	13:25	HRG
Phosphorus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	08/13	12:55	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	08/11	16:37	JCL
Nitrogen, Nitrate	2.13	mg/l	.05	1	EPA 353.2	08/12	13:18	JCL
Nitrogen, Nitrite	0.09	mg/l	.05	1	EPA 353.2	08/12	11:53	JCL
Nitrogen, Total Kjeldahl	0.86	mg/l	.25	1	EPA 351.2	08/20	13:37	JCL
OTHER								
Biochemical Oxygen Demand	2	mg/l	2	1	SM 5210B	08/11	15:50	EMW
Total Organic Carbon	1.5	mg/l	1	1	SM5310 C	08/13	10:10	ALD
RESIDUES								
Solids, Total Dissolved	177	mg/l	5	1	SM 2540C	08/13	13:10	TMH
Solids, Total Suspended	4	mg/l	3	1	SM 2540D	08/13	13:10	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	79	mg/l	1	1	SM 2320 B	08/12	10:45	HRG

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

Reviewed and Approved by:



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Reported To: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 08/28/15
Lab ID: 3156-15-0032768

Date Collected: 08/11/15 08:55
Collected By: Client

Sample Desc: BM-6 Surface

Date Received: 08/11/15 14:00

PWSID: 3060912

	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 placed in the incubator on 08/11/15 at 15:45

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

Distribution of Reports:
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Reviewed and Approved by:

Richard Wheeler

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Reported To: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 08/28/15
Lab ID: 3156-15-0032769

Date Collected: 08/11/15 08:55
Collected By: Client

Sample Desc: BM-6 Mid-Depth

Date Received: 08/11/15 14:00

PWSID: 3060912

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	0.03	mg/l	.01	1	SM 4500P-E	08/12	15:20	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	08/18	13:25	HRG
Phosphorus as P, Total	0.03	mg/l	.01	1	SM 4500P-E	08/13	12:55	HRG
NITROGENS								
Nitrogen, Ammonia	0.21	mg/l	.05	1	D6919-03	08/11	16:52	JCL
Nitrogen, Nitrate	2.50	mg/l	.05	1	EPA 353.2	08/12	13:19	JCL
Nitrogen, Nitrite	0.08	mg/l	.05	1	EPA 353.2	08/12	11:54	JCL
Nitrogen, Total Kjeldahl	0.73	mg/l	.25	1	EPA 351.2	08/20	13:38	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	08/11	15:50	EMW
Total Organic Carbon	2.4	mg/l	1	1	SM5310 C	08/13	10:57	ALD
RESIDUES								
Solids, Total Dissolved	212	mg/l	5	1	SM 2540C	08/13	13:10	TMH
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	08/13	13:10	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	110	mg/l	1	1	SM 2320 B	08/12	10:45	HRG

COMMENTS

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

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

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Attention: David Wertz
Reported To: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 08/28/15
Lab ID: 3156-15-0032770

Date Collected: 08/11/15 08:55
Collected By: Client

Sample Desc: BM-6 Deep

Date Received: 08/11/15 14:00

PWSID: 3060912

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	0.03	mg/l	.01	1	SM 4500P-E	08/12	15:25	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	08/18	13:30	HRG
Phosphorus as P, Total	0.03	mg/l	.01	1	SM 4500P-E	08/13	12:55	HRG
NITROGENS								
Nitrogen, Ammonia	0.88	mg/l	.05	1	D6919-03	08/11	17:07	JCL
Nitrogen, Nitrate	1.86	mg/l	.05	1	EPA 353.2	08/12	13:20	JCL
Nitrogen, Nitrite	0.11	mg/l	.05	1	EPA 353.2	08/12	11:55	JCL
Nitrogen, Total Kjeldahl	1.44	mg/l	.25	1	EPA 351.2	08/20	13:38	JCL
OTHER								
Biochemical Oxygen Demand	4	mg/l	2	1	SM 5210B	08/11	15:50	EMW
Total Organic Carbon	2.3	mg/l	1	1	SM5310 C	08/13	11:44	ALD
RESIDUES								
Solids, Total Dissolved	244	mg/l	5	1	SM 2540C	08/13	13:10	TMH
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	08/13	13:10	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	144	mg/l	1	1	SM 2320 B	08/12	11:00	HRG

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.

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Attention: David Wertz
Reported To: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 08/28/15
Lab ID: 3156-15-0032771

Date Collected: 08/11/15 10:04
Collected By: Client

Sample Desc: BM-7 Surface

Date Received: 08/11/15 14:00

PWSID: 3060912

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Fecal Coliform	6	/100ml	2	1	SM 9222D	08/11	15:35	TNS
Total Coliform	1700	mpn/100ml	1	1	SM 9223B	08/12	10:45	PLW
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	0.04	mg/l	.01	1	SM 4500P-E	08/12	15:25	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	08/18	13:30	HRG
Phosphorus as P, Total	0.04	mg/l	.01	1	SM 4500P-E	08/13	12:55	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	08/11	17:21	JCL
Nitrogen, Nitrate	2.03	mg/l	.05	1	EPA 353.2	08/12	13:23	JCL
Nitrogen, Nitrite	0.11	mg/l	.05	1	EPA 353.2	08/12	11:58	JCL
Nitrogen, Total Kjeldahl	0.98	mg/l	.25	1	EPA 351.2	08/20	13:41	JCL
OTHER								
Biochemical Oxygen Demand	3	mg/l	2	1	SM 5210B	08/11	15:50	EMW
Total Organic Carbon	2.7	mg/l	1	1	SM5310 C	08/13	12:00	ALD
RESIDUES								
Solids, Total Dissolved	171	mg/l	5	1	SM 2540C	08/13	13:10	TMH
Solids, Total Suspended	6	mg/l	3	1	SM 2540D	08/13	13:10	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	69	mg/l	1	1	SM 2320 B	08/12	11:00	HRG

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

Reviewed and Approved by:

Richard Wheeler

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Arlington VA 22201-0000

Date of Report: 08/28/15
Lab ID: 3156-15-0032771

Date Collected: 08/11/15 10:04
Collected By: Client

Sample Desc: BM-7 Surface

Date Received: 08/11/15 14:00

PWSID: 3060912

	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 placed in the incubator on 08/11/15 at 15:45

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

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Reported To: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 08/28/15
Lab ID: 3156-15-0032772

Date Collected: 08/11/15 10:04
Collected By: Client

Sample Desc: BM-7 Mid-Depth

Date Received: 08/11/15 14:00

PWSID: 3060912

	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	08/12	15:25	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	08/18	13:30	HRG
Phosphorus as P, Total	0.01	mg/l	.01	1	SM 4500P-E	08/13	12:55	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	08/11	17:36	JCL
Nitrogen, Nitrate	2.15	mg/l	.05	1	EPA 353.2	08/12	13:24	JCL
Nitrogen, Nitrite	0.14	mg/l	.05	1	EPA 353.2	08/12	11:59	JCL
Nitrogen, Total Kjeldahl	0.93	mg/l	.25	1	EPA 351.2	08/20	13:42	JCL
OTHER								
Biochemical Oxygen Demand	3	mg/l	2	1	SM 5210B	08/11	15:50	EMW
Total Organic Carbon	2.7	mg/l	1	1	SM5310 C	08/13	12:16	ALD
RESIDUES								
Solids, Total Dissolved	186	mg/l	5	1	SM 2540C	08/13	13:10	TMH
Solids, Total Suspended	7	mg/l	3	1	SM 2540D	08/13	13:10	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	76	mg/l	1	1	SM 2320 B	08/12	11:00	HRG

COMMENTS

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

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

Reviewed and Approved by:

Richard Wheeler

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Attention: David Wertz
Reported To: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 08/28/15
Lab ID: 3156-15-0032773

Date Collected: 08/11/15 10:04
Collected By: Client

Sample Desc: BM-7 Deep

Date Received: 08/11/15 14:00

PWSID: 3060912

	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	08/12	15:25	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	08/18	13:30	HRG
Phosphorus as P, Total	0.06	mg/l	.01	1	SM 4500P-E	08/13	12:55	HRG
NITROGENS								
Nitrogen, Ammonia	0.50	mg/l	.05	1	D6919-03	08/11	17:50	JCL
Nitrogen, Nitrate	2.81	mg/l	.05	1	EPA 353.2	08/12	13:24	JCL
Nitrogen, Nitrite	0.12	mg/l	.05	1	EPA 353.2	08/12	12:00	JCL
Nitrogen, Total Kjeldahl	1.23	mg/l	.25	1	EPA 351.2	08/20	13:43	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	08/11	15:50	EMW
Total Organic Carbon	2.4	mg/l	1	1	SM5310 C	08/13	23:32	ALD
RESIDUES								
Solids, Total Dissolved	242	mg/l	5	1	SM 2540C	08/13	13:40	TMH
Solids, Total Suspended	7	mg/l	3	1	SM 2540D	08/13	13:40	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	126	mg/l	1	1	SM 2320 B	08/12	11:30	HRG

COMMENTS

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

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

Reviewed and Approved by:

Richard Wheeler

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Reported To: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 08/28/15
Lab ID: 3156-15-0032774

Date Collected: 08/11/15 11:23
Collected By: Client

Sample Desc: BM-8 Surface

Date Received: 08/11/15 14:00

PWSID: 3060912

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Fecal Coliform	5	/100ml	2	1	SM 9222D	08/11	16:05	TNS
Total Coliform	>2400	mpn/100ml	1	1	SM 9223B	08/12	10:45	PLW
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	08/12	15:30	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	08/18	13:30	HRG
Phosphorus as P, Total	0.04	mg/l	.01	1	SM 4500P-E	08/13	13:00	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	08/11	18:05	JCL
Nitrogen, Nitrate	1.80	mg/l	.05	1	EPA 353.2	08/12	13:25	JCL
Nitrogen, Nitrite	0.07	mg/l	.05	1	EPA 353.2	08/12	12:03	JCL
Nitrogen, Total Kjeldahl	1.10	mg/l	.25	1	EPA 351.2	08/20	13:44	JCL
OTHER								
Biochemical Oxygen Demand	4	mg/l	2	1	SM 5210B	08/11	15:50	EMW
Total Organic Carbon	2.7	mg/l	1	1	SM5310 C	08/13	12:48	ALD
RESIDUES								
Solids, Total Dissolved	160	mg/l	5	1	SM 2540C	08/13	13:40	TMH
Solids, Total Suspended	7	mg/l	3	1	SM 2540D	08/13	13:40	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	65	mg/l	1	1	SM 2320 B	08/12	11:30	HRG

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

Reviewed and Approved by:

Richard Wheeler

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Arlington VA 22201-0000

Date of Report: 08/28/15
Lab ID: 3156-15-0032774

Date Collected: 08/11/15 11:23
Collected By: Client

Sample Desc: BM-8 Surface

Date Received: 08/11/15 14:00

PWSID: 3060912

	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 placed in the incubator on 08/11/15 at 15:45

Distribution of Reports:
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Reviewed and Approved by:

Richard Wheeler

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Reported To: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 08/28/15
Lab ID: 3156-15-0032775

Date Collected: 08/11/15 11:23
Collected By: Client

Sample Desc: BM-8 Mid-Depth

Date Received: 08/11/15 14:00

PWSID: 3060912

	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	08/12	15:30	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	08/18	13:30	HRG
Phosphorus as P, Total	0.02	mg/l	.01	1	SM 4500P-E	08/13	13:00	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	08/11	18:20	JCL
Nitrogen, Nitrate	1.90	mg/l	.05	1	EPA 353.2	08/12	13:28	JCL
Nitrogen, Nitrite	0.09	mg/l	.05	1	EPA 353.2	08/12	12:04	JCL
Nitrogen, Total Kjeldahl	1.03	mg/l	.25	1	EPA 351.2	08/20	13:45	JCL
OTHER								
Biochemical Oxygen Demand	3	mg/l	2	1	SM 5210B	08/11	15:50	EMW
Total Organic Carbon	2.6	mg/l	1	1	SM5310 C	08/13	13:03	ALD
RESIDUES								
Solids, Total Dissolved	171	mg/l	5	1	SM 2540C	08/13	13:40	TMH
Solids, Total Suspended	6	mg/l	3	1	SM 2540D	08/13	13:40	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	63	mg/l	1	1	SM 2320 B	08/12	11:45	HRG

COMMENTS

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

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

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 (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 08/28/15
Lab ID: 3156-15-0032776

Date Collected: 08/11/15 11:23
Collected By: Client

Sample Desc: BM-8 Deep

Date Received: 08/11/15 14:00

PWSID: 3060912

	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	08/12	15:30	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	08/18	13:30	HRG
Phosphorus as P, Total	0.04	mg/l	.01	1	SM 4500P-E	08/13	13:00	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	08/11	19:18	JCL
Nitrogen, Nitrate	1.86	mg/l	.05	1	EPA 353.2	08/12	13:29	JCL
Nitrogen, Nitrite	0.08	mg/l	.05	1	EPA 353.2	08/12	12:05	JCL
Nitrogen, Total Kjeldahl	1.06	mg/l	.25	1	EPA 351.2	08/20	13:48	JCL
OTHER								
Biochemical Oxygen Demand	3	mg/l	2	1	SM 5210B	08/11	15:50	EMW
Total Organic Carbon	2.6	mg/l	1	1	SM5310 C	08/13	13:19	ALD
RESIDUES								
Solids, Total Dissolved	175	mg/l	5	1	SM 2540C	08/13	13:40	TMH
Solids, Total Suspended	5	mg/l	3	1	SM 2540D	08/13	13:40	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	54	mg/l	1	1	SM 2320 B	08/12	11:45	HRG

COMMENTS

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

Distribution of Reports:
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Reported To: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 08/28/15
Lab ID: 3156-15-0032777

Date Collected: 08/11/15 11:00
Collected By: Client

Sample Desc: BM-9 Surface

Date Received: 08/11/15 14:00

PWSID: 3060912

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Fecal Coliform	10	/100ml	2	1	SM 9222D	08/11	16:05	TNS
Total Coliform	1700	mpn/100ml	1	1	SM 9223B	08/12	10:45	PLW
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	08/12	15:30	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	08/18	13:35	HRG
Phosphorus as P, Total	0.03	mg/l	.01	1	SM 4500P-E	08/13	13:00	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	08/11	19:33	JCL
Nitrogen, Nitrate	1.97	mg/l	.05	1	EPA 353.2	08/12	13:30	JCL
Nitrogen, Nitrite	0.08	mg/l	.05	1	EPA 353.2	08/12	12:06	JCL
Nitrogen, Total Kjeldahl	1.02	mg/l	.25	1	EPA 351.2	08/20	13:49	JCL
OTHER								
Biochemical Oxygen Demand	4	mg/l	2	1	SM 5210B	08/11	15:50	EMW
Total Organic Carbon	3.0	mg/l	1	1	SM5310 C	08/13	13:35	ALD
RESIDUES								
Solids, Total Dissolved	170	mg/l	5	1	SM 2540C	08/13	13:40	TMH
Solids, Total Suspended	5	mg/l	3	1	SM 2540D	08/13	13:40	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	62	mg/l	1	1	SM 2320 B	08/12	12:00	HRG

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Date of Report: 08/28/15
Lab ID: 3156-15-0032777

Date Collected: 08/11/15 11:00
Collected By: Client

Sample Desc: BM-9 Surface

Date Received: 08/11/15 14:00

PWSID: 3060912

	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 placed in the incubator on 08/11/15 at 15:45

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

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Reported To: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 08/28/15
Lab ID: 3156-15-0032778

Date Collected: 08/11/15 11:00
Collected By: Client

Sample Desc: BM-9 Mid-Depth

Date Received: 08/11/15 14:00

PWSID: 3060912

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	0.04	mg/l	.01	1	SM 4500P-E	08/12	15:30	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	08/18	13:35	HRG
Phosphorus as P, Total	0.05	mg/l	.01	1	SM 4500P-E	08/13	13:00	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	08/11	19:47	JCL
Nitrogen, Nitrate	1.99	mg/l	.05	1	EPA 353.2	08/12	13:31	JCL
Nitrogen, Nitrite	0.09	mg/l	.05	1	EPA 353.2	08/12	12:06	JCL
Nitrogen, Total Kjeldahl	0.98	mg/l	.25	1	EPA 351.2	08/20	13:50	JCL
OTHER								
Biochemical Oxygen Demand	3	mg/l	2	1	SM 5210B	08/11	15:50	EMW
Total Organic Carbon	2.8	mg/l	1	1	SM5310 C	08/13	14:51	ALD
RESIDUES								
Solids, Total Dissolved	164	mg/l	5	1	SM 2540C	08/13	13:40	TMH
Solids, Total Suspended	7	mg/l	3	1	SM 2540D	08/13	13:40	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	65	mg/l	1	1	SM 2320 B	08/12	12:00	HRG

COMMENTS

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

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

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1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 08/28/15
Lab ID: 3156-15-0032779

Date Collected: 08/11/15 10:00
Collected By: Client

Sample Desc: BM-9 Deep

Date Received: 08/11/15 14:00

PWSID: 3060912

	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	08/12	15:30	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	08/18	13:35	HRG
Phosphorus as P, Total	0.06	mg/l	.01	1	SM 4500P-E	08/13	13:05	HRG
NITROGENS								
Nitrogen, Ammonia	0.26	mg/l	.05	1	D6919-03	08/11	20:02	JCL
Nitrogen, Nitrate	2.97	mg/l	.05	1	EPA 353.2	08/12	13:34	JCL
Nitrogen, Nitrite	0.10	mg/l	.05	1	EPA 353.2	08/12	12:09	JCL
Nitrogen, Total Kjeldahl	1.11	mg/l	.25	1	EPA 351.2	08/20	13:52	JCL
OTHER								
Biochemical Oxygen Demand	2	mg/l	2	1	SM 5210B	08/11	15:50	EMW
Total Organic Carbon	2.8	mg/l	1	1	SM5310 C	08/13	15:30	ALD
RESIDUES								
Solids, Total Dissolved	230	mg/l	5	1	SM 2540C	08/13	13:40	TMH
Solids, Total Suspended	13	mg/l	3	1	SM 2540D	08/13	13:40	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	108	mg/l	1	1	SM 2320 B	08/12	12:45	HRG

COMMENTS

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

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Richard Wheeler

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Date of Report: 08/28/15
Lab ID: 3156-15-0032779

Date Collected: 08/11/15 10:00
Collected By: Client

Sample Desc: BM-9 Deep

Date Received: 08/11/15 14:00

PWSID: 3060912

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

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Reported To: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 08/28/15
Lab ID: 3156-15-0032780

Date Collected: 08/11/15 10:35
Collected By: Client

Sample Desc: BM-10 Surface

Date Received: 08/11/15 14:00

PWSID: 3060912

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Fecal Coliform	10	/100ml	2	1	SM 9222D	08/11	16:05	TNS
Total Coliform	2000	mpn/100ml	1	1	SM 9223B	08/12	10:45	PLW
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	08/12	15:30	HRG
Phosphorus as P, Dissolved	0.05	mg/l	.05	1	SM 4500P-E	08/18	13:35	HRG
Phosphorus as P, Total	0.05	mg/l	.01	1	SM 4500P-E	08/13	13:05	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	08/11	20:16	JCL
Nitrogen, Nitrate	1.80	mg/l	.05	1	EPA 353.2	08/12	13:35	JCL
Nitrogen, Nitrite	0.06	mg/l	.05	1	EPA 353.2	08/12	12:10	JCL
Nitrogen, Total Kjeldahl	1.17	mg/l	.25	1	EPA 351.2	08/20	13:53	JCL
OTHER								
Biochemical Oxygen Demand	4	mg/l	2	1	SM 5210B	08/11	15:50	EMW
Total Organic Carbon	2.9	mg/l	1	1	SM5310 C	08/13	16:23	ALD
RESIDUES								
Solids, Total Dissolved	172	mg/l	5	1	SM 2540C	08/13	13:40	TMH
Solids, Total Suspended	8	mg/l	3	1	SM 2540D	08/13	13:40	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	63	mg/l	1	1	SM 2320 B	08/12	12:45	HRG

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

Reviewed and Approved by:

Richard Wheeler

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Date of Report: 08/28/15
Lab ID: 3156-15-0032780

Date Collected: 08/11/15 10:35
Collected By: Client

Sample Desc: BM-10 Surface

Date Received: 08/11/15 14:00

PWSID: 3060912

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 placed in the incubator on 08/11/15 at 15:45

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

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Reported To: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 08/28/15
Lab ID: 3156-15-0032781

Date Collected: 08/11/15 10:35
Collected By: Client

Sample Desc: BM-10 Mid-Depth

Date Received: 08/11/15 14:00

PWSID: 3060912

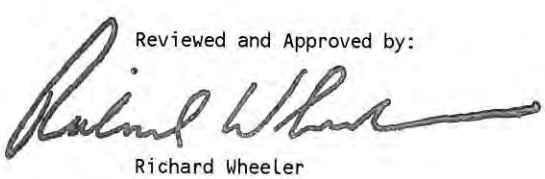
	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	08/12	15:30	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	08/18	13:35	HRG
Phosphorus as P, Total	0.06	mg/l	.01	1	SM 4500P-E	08/13	13:05	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	08/11	20:31	JCL
Nitrogen, Nitrate	1.83	mg/l	.05	1	EPA 353.2	08/12	13:36	JCL
Nitrogen, Nitrite	0.06	mg/l	.05	1	EPA 353.2	08/12	12:11	JCL
Nitrogen, Total Kjeldahl	1.18	mg/l	.25	1	EPA 351.2	08/20	13:54	JCL
OTHER								
Biochemical Oxygen Demand	4	mg/l	2	1	SM 5210B	08/11	15:50	EMW
Total Organic Carbon	1.4	mg/l	1	1	SM5310 C	08/13	16:40	ALD
RESIDUES								
Solids, Total Dissolved	166	mg/l	5	1	SM 2540C	08/13	13:40	TMH
Solids, Total Suspended	9	mg/l	3	1	SM 2540D	08/13	13:40	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	55	mg/l	1	1	SM 2320 B	08/12	12:45	HRG

COMMENTS

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

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

Reviewed and Approved by:



Richard Wheeler

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Reported To: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 08/28/15
Lab ID: 3156-15-0032782

Date Collected: 08/11/15 10:35
Collected By: Client

Sample Desc: BM-10 Deep

Date Received: 08/11/15 14:00

PWSID: 3060912

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	0.08	mg/l	.01	1	SM 4500P-E	08/12	15:35	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	08/18	13:35	HRG
Phosphorus as P, Total	0.15	mg/l	.01	1	SM 4500P-E	08/13	13:05	HRG
NITROGENS								
Nitrogen, Ammonia	0.08	mg/l	.05	1	D6919-03	08/11	20:46	JCL
Nitrogen, Nitrate	3.46	mg/l	.05	1	EPA 353.2	08/12	13:37	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	08/12	12:12	JCL
Nitrogen, Total Kjeldahl	1.24	mg/l	.25	1	EPA 351.2	08/13	12:47	JCL
OTHER								
Biochemical Oxygen Demand	3	mg/l	2	1	SM 5210B	08/11	15:50	EMW
Total Organic Carbon	2.4	mg/l	1	1	SM5310 C	08/13	16:59	ALD
RESIDUES								
Solids, Total Dissolved	224	mg/l	5	1	SM 2540C	08/13	13:40	TMH
Solids, Total Suspended	68	mg/l	3	1	SM 2540D	08/13	13:40	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	121	mg/l	1	1	SM 2320 B	08/12	13:00	HRG

COMMENTS

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

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

Reviewed and Approved by:

Richard Wheeler

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Reported To: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 08/28/15
Lab ID: 3156-15-0032783

Date Collected: 08/11/15 12:17
Collected By: Client

Sample Desc: BM-11 Surface

Date Received: 08/11/15 14:00

PWSID: 3060912

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Fecal Coliform	2100	/100ml	2	1	SM 9222D	08/11	16:05	TNS
Total Coliform	>2400	mpn/100ml	1	1	SM 9223B	08/12	10:45	PLW
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	0.05	mg/l	.01	1	SM 4500P-E	08/12	15:45	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	08/18	13:40	HRG
Phosphorus as P, Total	0.05	mg/l	.01	1	SM 4500P-E	08/13	13:10	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	08/11	21:29	JCL
Nitrogen, Nitrate	2.18	mg/l	.05	1	EPA 353.2	08/12	13:40	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	08/12	12:15	JCL
Nitrogen, Total Kjeldahl	0.55	mg/l	.25	1	EPA 351.2	08/13	12:48	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	08/11	15:50	EMW
Total Organic Carbon	2.8	mg/l	1	1	SM5310 C	08/13	17:19	ALD
RESIDUES								
Solids, Total Dissolved	145	mg/l	5	1	SM 2540C	08/13	14:10	TMH
Solids, Total Suspended	4	mg/l	3	1	SM 2540D	08/13	13:40	TMH
TITRATIONS								
Alkalinity, Total to pH 4.5	47	mg/l	1	1	SM 2320 B	08/12	13:00	HRG

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

Reviewed and Approved by:

Richard Wheeler

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1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 08/28/15
Lab ID: 3156-15-0032783

Date Collected: 08/11/15 12:17
Collected By: Client

Sample Desc: BM-11 Surface

Date Received: 08/11/15 14:00

PWSID: 3060912

	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 placed in the incubator on 08/11/15 at 15:45

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

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**

M. J. REIDER ASSOCIATES, INC.

Chain of Custody

Account: 3156 Work Order: 006223 Project Leader: rxw No: 261502
Work Order Description: Seasonal Monthly Blue Marsh Resevoir

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: 24 Deg C. If Temp Unacceptable, On Ice? Y N
Approved By: RAC

==========

32763

Sample No: 1 Desc: BM-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: 8/11/15
Time: 1245

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;

32764

Sample No: 2 Desc: BM-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: 8/11/15
Time: 932

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;

32765

Sample No: 3 Desc: BM-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: 8/11/15
Time: 932

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: Rafael Quijada
Rafael Quijada

Date: 8/11/15 Time: 1:00
1340

Date: 8/11/15 Time: 1400

Sample entered by: MM

Chain of Custody

Account: 3156 Work Order: 006223 Project Leader: rxw No: 261502
Work Order Description: Seasonal Monthly Blue Marsh Resevoir

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: 24 Deg C. If Temp Unacceptable, On Ice? (Y) N
Approved By: RACe

32766 Sample No: 4 Desc: BM-2 Deep

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

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

Matrix: o Date: 8/11/15
Time: 0932

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;

32767 Sample No: 5 Desc: BM-5 Surface

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

no2-n, no3-n, d-po4-p, o-po4, bod,
fc, tc, ph

Matrix: o Date: 8/11/15
Time: 1217

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;

32768 Sample No: 6 Desc: BM-6 Surface

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

no2-n, no3-n, d-po4-p, o-po4, bod,
fc, tc, ph

Matrix: o Date: 8/11/15
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;
F - 1 X 250mlMicro p w/ Sterile/Na2S2O3;

Relinquished by: _____ Received by: _____ Received for laboratory by: Rafael Quijada
Rafael Quijada

Date: 8/11/15 Time: 1:00
1340

Date: 8/11/15 Time: 1400

Sample entered by: MTL

Chain of Custody

Account: 3156 Work Order: 006223 Project Leader: rxw No: 261502
Work Order Description: Seasonal Monthly Blue Marsh Resevoir

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: 24 Deg C. If Temp Unacceptable, On Ice? (Y) N
Approved By: RAQ

32769 Sample No: 7 Desc: BM-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: 8/11/15
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;

32770 Sample No: 8 Desc: BM-6 Deep

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

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

Matrix: o Date: 8/11/15
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;

32771 Sample No: 9 Desc: BM-7 Surface

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

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

fc, tc, pH

Matrix: o Date: 8/11/15
Time: 1004

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: _____
Rafael Quijada

Date: 8/11/15 Time: 1:00 1340 Date: 8/11/15 Time: 1400

Sample entered by: WTL

Chain of Custody

Account: 3156 Work Order: 006223 Project Leader: rxw No: 261502
Work Order Description: Seasonal Monthly Blue Marsh Resevoir

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: 24 Deg C, If Temp Unacceptable, On Ice? (Y) N
Approved By: RAC

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32772

Sample No: 10 Desc: BM-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: 8/11/15
Time: 1004

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;

32773

Sample No: 11 Desc: BM-7 Deep

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

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

Matrix: o Date: 8/11/15
Time: 1004

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;

32774

Sample No: 12 Desc: BM-8 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: 8/11/15
Time: 1123

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: Rafael Quijada

Date: 8/11/15 Time: 1:00 1340

Date: 8/11/15 Time: 1400

RAC 8/11/15

Sample entered by: MTR

M. J. REIDER ASSOCIATES, INC.

Chain of Custody

Account: 3156 Work Order: 006223 Project Leader: rxw No: 261502
Work Order Description: Seasonal Monthly Blue Marsh Resevoir

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: 24 Deg C. If Temp Unacceptable, On Ice? Y N
Approved By: RACE

32775 Sample No: 13 Desc: BM-8 Mid-Depth

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

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

Matrix: o Date: 8/11/15 Time: 1123
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;

32776 Sample No: 14 Desc: BM-8 Deep

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

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

Matrix: o Date: 8/11/15 Time: 1123
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;

32777 Sample No: 15 Desc: BM-9 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: 8/11/15 Time: 1100
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: Rafael Quijada

Date: 8/11/15 Time: 1:00 1340 Date: 8/11/15 Time: 1400

Sample entered by: MM2

M. J. REIDER ASSOCIATES, INC.

Chain of Custody

Account: 3156 Work Order: 006223 Project Leader: rxw No: 261502
Work Order Description: Seasonal Monthly Blue Marsh Resevoir

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

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32778 Sample No: 16 Desc: BM-9 Mid-Depth

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

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

Matrix: o Date: 8/11/15 Time: 1100

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;

32779 Sample No: 17 Desc: BM-9 Deep

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

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

Matrix: o Date: 8/11/15 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;

32780 Sample No: 18 Desc: BM-10 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: 8/11/15 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;

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

Date: 8/11/15 Time: 1500 1340 Date: 8/11/15 Time: 1400

Sample entered by: MT2

Chain of Custody

Account: 3156 Work Order: 006223 Project Leader: rxw No: 261502
Work Order Description: Seasonal Monthly Blue Marsh Resevoir

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: 24 Deg C, If Temp Unacceptable, On Ice? (Y) N
Approved By: RAQ

==========

327781 Sample No: 19 Desc: BM-10 Mid-Depth

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

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

Matrix: o Date: 8/11/15
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;

327782 Sample No: 20 Desc: BM-10 Deep

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

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

Matrix: o Date: 8/11/15
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;

327783 Sample No: 21 Desc: BM-11 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: 8/11/15
Time: 1217

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: _____
Rafael Quijada

Date: 8/11/15 Time: 1:00 1340 Date: 8/11/15 Time: 1400

Sample entered by: _____

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

Attention: David Wertz
Reported To: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 09/11/15
Lab ID: 3156-15-0036136

Date Collected: 09/03/15 12:45
Collected By: Client

Sample Desc: BM-1 Surface

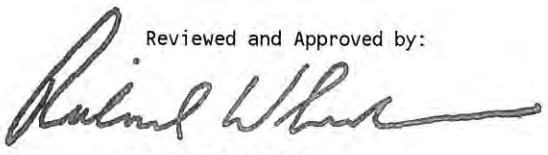
Date Received: 09/03/15 13:30

PWSID: 3060912

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Fecal Coliform	34	/100ml	2	1	SM 9222D	09/03	15:30	TNS
Total Coliform	>2400	mpn/100ml	1	1	SM 9223B	09/04	11:35	PLW
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	09/03	15:35	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	09/04	13:45	HRG
Phosphorus as P, Total	0.10	mg/l	.01	1	SM 4500P-E	09/04	13:00	HRG
NITROGENS								
Nitrogen, Ammonia	0.51	mg/l	.05	1	D6919-03	09/04	11:36	JCL
Nitrogen, Nitrate	2.11	mg/l	.05	1	EPA 353.2	09/04	13:04	JCL
Nitrogen, Nitrite	0.17	mg/l	.05	1	EPA 353.2	09/04	11:05	JCL
Nitrogen, Total Kjeldahl	1.28	mg/l	.25	1	EPA 351.2	09/09	10:59	JCL
OTHER								
Biochemical Oxygen Demand	3	mg/l	2	1	SM 5210B	09/03	15:45	EMW
Total Organic Carbon	2.6	mg/l	1	1	SM5310 C	09/09	11:09	ALD
RESIDUES								
Solids, Total Dissolved	209	mg/l	5	1	SM 2540C	09/09	09:35	TMH
Solids, Total Suspended	3	mg/l	3	1	SM 2540D	09/06	15:18	ALD
TITRATIONS								
Alkalinity, Total to pH 4.5	110	mg/l	1	1	SM 2320 B	09/08	12:15	HRG

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

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**

Attention: David Wertz
Reported To: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 09/11/15
Lab ID: 3156-15-0036136

Date Collected: 09/03/15 12:45
Collected By: Client

Sample Desc: BM-1 Surface

Date Received: 09/03/15 13:30

PWSID: 3060912

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 09/03/15 at 16:50.

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

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

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 (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 09/11/15
Lab ID: 3156-15-0036137

Date Collected: 09/03/15 09:40
Collected By: Client

Sample Desc: BM-2 Surface

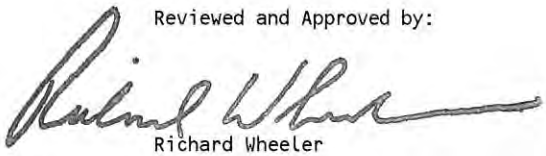
Date Received: 09/03/15 13:30

PWSID: 3060912

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Fecal Coliform	<2	/100ml	2	1	SM 9222D	09/03	15:30	TNS
Total Coliform	180	mpn/100ml	1	1	SM 9223B	09/04	11:35	PLW
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	09/03	15:40	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	09/04	13:45	HRG
Phosphorus as P, Total	0.01	mg/l	.01	1	SM 4500P-E	09/04	13:00	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	09/04	11:51	JCL
Nitrogen, Nitrate	1.56	mg/l	.05	1	EPA 353.2	09/04	13:05	JCL
Nitrogen, Nitrite	0.13	mg/l	.05	1	EPA 353.2	09/04	11:08	JCL
Nitrogen, Total Kjeldahl	0.75	mg/l	.25	1	EPA 351.2	09/09	11:02	JCL
OTHER								
Biochemical Oxygen Demand	3	mg/l	2	1	SM 5210B	09/03	15:45	EMW
Total Organic Carbon	2.6	mg/l	1	1	SM5310 C	09/09	11:24	ALD
RESIDUES								
Solids, Total Dissolved	158	mg/l	5	1	SM 2540C	09/09	09:35	TMH
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	09/06	15:18	ALD
TITRATIONS								
Alkalinity, Total to pH 4.5	72	mg/l	1	1	SM 2320 B	09/08	12:15	HRG

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

Reviewed and Approved by:



Richard Wheeler

THE NELAC INSTITUTE

ENVIRONMENTAL TESTING LABORATORY 107 ANGELICA STREET, READING, PA 19611
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Attention: David Wertz
Reported To: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 09/11/15
Lab ID: 3156-15-0036137

Date Collected: 09/03/15 09:40
Collected By: Client

Sample Desc: BM-2 Surface

Date Received: 09/03/15 13:30

PWSID: 3060912

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

COMMENTS

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

02 The total coliform sample was placed in the incubator on 09/03/15 at 16:50.

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

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 (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 09/11/15
Lab ID: 3156-15-0036138

Date Collected: 09/03/15 09:40
Collected By: Client

Sample Desc: BM-2 Mid-Depth

Date Received: 09/03/15 13:30

PWSID: 3060912

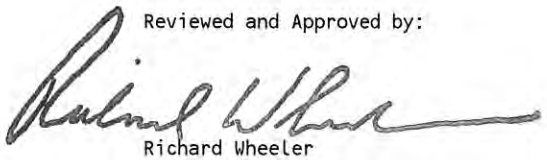
	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	0.01	mg/l	.01	1	SM 4500P-E	09/03	15:40	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	09/04	13:45	HRG
Phosphorus as P, Total	0.02	mg/l	.01	1	SM 4500P-E	09/04	13:00	HRG
NITROGENS								
Nitrogen, Ammonia	0.11	mg/l	.05	1	D6919-03	09/04	12:05	JCL
Nitrogen, Nitrate	1.83	mg/l	.05	1	EPA 353.2	09/04	13:08	JCL
Nitrogen, Nitrite	0.32	mg/l	.05	1	EPA 353.2	09/04	11:09	JCL
Nitrogen, Total Kjeldahl	0.72	mg/l	.25	1	EPA 351.2	09/09	11:03	JCL
OTHER								
Biochemical Oxygen Demand	5	mg/l	2	1	SM 5210B	09/03	15:45	EMW
Total Organic Carbon	2.9	mg/l	1	1	SM5310 C	09/09	11:41	ALD
RESIDUES								
Solids, Total Dissolved	181	mg/l	5	1	SM 2540C	09/09	09:35	TMH
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	09/06	15:18	ALD
TITRATIONS								
Alkalinity, Total to pH 4.5	83	mg/l	1	1	SM 2320 B	09/08	12:30	HRG

COMMENTS

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

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

Reviewed and Approved by:



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Attention: David Wertz
Reported To: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 09/11/15
Lab ID: 3156-15-0036139

Date Collected: 09/03/15 09:40
Collected By: Client

Sample Desc: BM-2 Deep

Date Received: 09/03/15 13:30

PWSID: 3060912

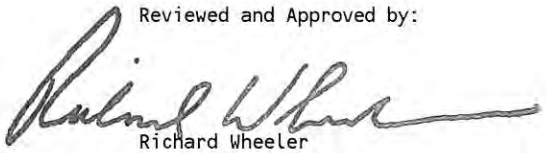
	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	09/03	15:40	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	09/04	13:45	HRG
Phosphorus as P, Total	0.09	mg/l	.01	1	SM 4500P-E	09/04	13:00	HRG
NITROGENS								
Nitrogen, Ammonia	0.45	mg/l	.05	1	D6919-03	09/04	12:20	JCL
Nitrogen, Nitrate	2.43	mg/l	.05	1	EPA 353.2	09/04	13:09	JCL
Nitrogen, Nitrite	0.16	mg/l	.05	1	EPA 353.2	09/04	11:10	JCL
Nitrogen, Total Kjeldahl	1.18	mg/l	.25	1	EPA 351.2	09/09	11:04	JCL
OTHER								
Biochemical Oxygen Demand	6	mg/l	2	1	SM 5210B	09/03	15:45	EMW
Total Organic Carbon	2.4	mg/l	1	1	SM5310 C	09/09	12:13	ALD
RESIDUES								
Solids, Total Dissolved	209	mg/l	5	1	SM 2540C	09/09	09:35	TMH
Solids, Total Suspended	28	mg/l	3	1	SM 2540D	09/07	16:50	ALD
TITRATIONS								
Alkalinity, Total to pH 4.5	120	mg/l	1	1	SM 2320 B	09/08	12:45	HRG

COMMENTS

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

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

Reviewed and Approved by:



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Reported To: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 09/11/15
Lab ID: 3156-15-0036140

Date Collected: 09/03/15 12:20
Collected By: Client

Sample Desc: BM-5 Surface

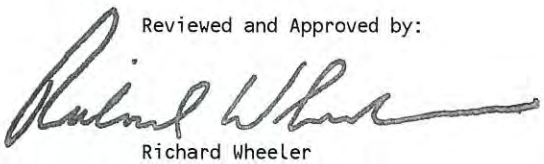
Date Received: 09/03/15 13:30

PWSID: 3060912

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Fecal Coliform	270	/100ml	2	1	SM 9222D	09/03	15:30	TNS
Total Coliform	>2400	mpn/100ml	1	1	SM 9223B	09/04	11:35	PLW
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	09/03	15:40	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	09/04	13:45	HRG
Phosphorus as P, Total	0.04	mg/l	.01	1	SM 4500P-E	09/04	13:00	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	09/04	12:35	JCL
Nitrogen, Nitrate	3.77	mg/l	.05	1	EPA 353.2	09/04	13:10	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	09/04	11:11	JCL
Nitrogen, Total Kjeldahl	0.34	mg/l	.25	1	EPA 351.2	09/09	11:05	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	09/03	15:45	EMW
Total Organic Carbon	1.8	mg/l	1	1	SM5310 C	09/09	12:28	ALD
RESIDUES								
Solids, Total Dissolved	195	mg/l	5	1	SM 2540C	09/09	09:35	TMH
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	09/07	16:50	ALD
TITRATIONS								
Alkalinity, Total to pH 4.5	93	mg/l	1	1	SM 2320 B	09/08	12:45	HRG

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

Reviewed and Approved by:



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Attention: David Wertz
Reported To: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 09/11/15
Lab ID: 3156-15-0036140

Date Collected: 09/03/15 12:20
Collected By: Client

Sample Desc: BM-5 Surface

Date Received: 09/03/15 13:30

PWSID: 3060912

	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 09/03/15 at 16:50.

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

Reviewed and Approved by:

Richard Wheeler

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Reported To: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 09/11/15
Lab ID: 3156-15-0036141

Date Collected: 09/03/15 09:15
Collected By: Client

Sample Desc: BM-6 Surface

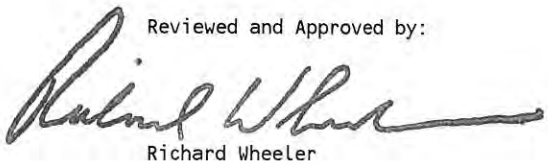
Date Received: 09/03/15 13:30

PWSID: 3060912

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Fecal Coliform	5	/100ml	2	1	SM 9222D	09/03	15:30	TNS
Total Coliform	870	mpn/100ml	1	1	SM 9223B	09/04	11:35	PLW
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	09/03	15:40	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	09/04	13:45	HRG
Phosphorus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	09/04	13:00	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	09/04	12:49	JCL
Nitrogen, Nitrate	1.60	mg/l	.05	1	EPA 353.2	09/04	13:11	JCL
Nitrogen, Nitrite	0.14	mg/l	.05	1	EPA 353.2	09/04	11:12	JCL
Nitrogen, Total Kjeldahl	0.68	mg/l	.25	1	EPA 351.2	09/09	11:06	JCL
OTHER								
Biochemical Oxygen Demand	3	mg/l	2	1	SM 5210B	09/03	15:45	EMW
Total Organic Carbon	2.4	mg/l	1	1	SM5310 C	09/09	12:44	ALD
RESIDUES								
Solids, Total Dissolved	169	mg/l	5	1	SM 2540C	09/09	09:35	TMH
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	09/07	16:50	ALD
TITRATIONS								
Alkalinity, Total to pH 4.5	69	mg/l	1	1	SM 2320 B	09/08	13:00	HRG

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

Reviewed and Approved by:



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Attention: David Wertz
Reported To: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 09/11/15
Lab ID: 3156-15-0036141

Date Collected: 09/03/15 09:15
Collected By: Client

Sample Desc: BM-6 Surface

Date Received: 09/03/15 13:30

PWSID: 3060912

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

COMMENTS

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

02 The total coliform sample was placed in the incubator on 09/03/15 at 16:50.

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

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 (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 09/11/15
Lab ID: 3156-15-0036142

Date Collected: 09/03/15 09:15
Collected By: Client

Sample Desc: BM-6 Mid-Depth

Date Received: 09/03/15 13:30

PWSID: 3060912

	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	09/03	15:40	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	09/04	13:45	HRG
Phosphorus as P, Total	0.04	mg/l	.01	1	SM 4500P-E	09/04	13:05	HRG
NITROGENS								
Nitrogen, Ammonia	0.37	mg/l	.05	1	D6919-03	09/04	13:04	JCL
Nitrogen, Nitrate	1.64	mg/l	.05	1	EPA 353.2	09/04	13:11	JCL
Nitrogen, Nitrite	0.31	mg/l	.05	1	EPA 353.2	09/04	11:13	JCL
Nitrogen, Total Kjeldahl	1.10	mg/l	.25	1	EPA 351.2	09/09	11:07	JCL
OTHER								
Biochemical Oxygen Demand	6	mg/l	2	1	SM 5210B	09/03	15:45	EMW
Total Organic Carbon	2.7	mg/l	1	1	SM5310 C	09/09	13:37	ALD
RESIDUES								
Solids, Total Dissolved	210	mg/l	5	1	SM 2540C	09/09	09:35	TMH
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	09/07	16:50	ALD
TITRATIONS								
Alkalinity, Total to pH 4.5	106	mg/l	1	1	SM 2320 B	09/08	13:00	HRG

COMMENTS

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

Distribution of Reports:
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1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 09/15/15
Lab ID: 3156-15-0036143

Date Collected: 09/03/15 09:00
Collected By: CLIENT

Sample Desc: BM-6 Deep

Date Received: 09/03/15 13:30

PWSID: 3060912

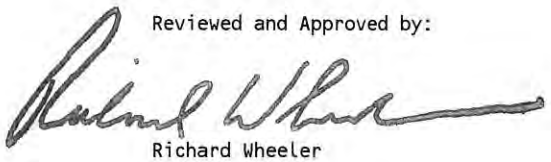
	Result	Unit	Rep. Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	0.07	mg/l	.01	1	SM 4500P-E	09/03	15:40	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	09/04	13:45	HRG
Phosphorus as P, Total	0.09	mg/l	.01	1	SM 4500P-E	09/04	13:05	HRG
NITROGENS								
Nitrogen, Ammonia	0.81	mg/l	.05	1	D6919-03	09/04	13:18	JCL
Nitrogen, Nitrate	1.94	mg/l	.05	1	EPA 353.2	09/04	13:12	JCL
Nitrogen, Nitrite	0.10	mg/l	.05	1	EPA 353.2	09/04	11:13	JCL
Nitrogen, Total Kjeldahl	1.75	mg/l	.25	1	EPA 351.2	09/09	11:08	JCL
OTHER								
Biochemical Oxygen Demand	14	mg/l	2	1	SM 5210B	09/08	13:40	EMW
Total Organic Carbon	2.5	mg/l	1	1	SM5310 C	09/09	13:52	ALD
RESIDUES								
Solids, Total Dissolved	230	mg/l	5	1	SM 2540C	09/09	09:35	TMH
Solids, Total Suspended	9	mg/l	3	1	SM 2540D	09/07	16:50	ALD
TITRATIONS								
Alkalinity, Total to pH 4.5	115	mg/l	1	1	SM 2320 B	09/08	13:15	HRG

COMMENTS

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

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

Reviewed and Approved by:



Richard Wheeler

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1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 09/15/15
Lab ID: 3156-15-0036143

Date Collected: 09/03/15 09:00
Collected By: CLIENT

Sample Desc: BM-6 Deep

Date Received: 09/03/15 13:30

PWSID: 3060912

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

02 BOD was reanalyzed after the recommended holding time had elapsed. Original dilutions were not appropriate for this sample. Values should be considered an estimate.

Distribution of Reports:
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1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 09/11/15
Lab ID: 3156-15-0036144

Date Collected: 09/03/15 10:05
Collected By: Client

Sample Desc: BM-7 Surface

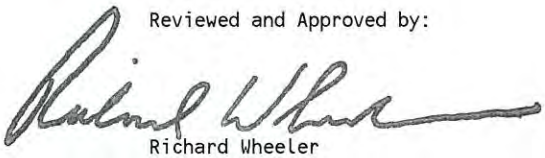
Date Received: 09/03/15 13:30

PWSID: 3060912

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Fecal Coliform	<2	/100ml	2	1	SM 9222D	09/03	16:00	TNS
Total Coliform	1000	mpn/100ml	1	1	SM 9223B	09/04	11:35	PLW
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	09/03	15:45	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	09/04	13:50	HRG
Phosphorus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	09/04	13:05	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	09/04	13:33	JCL
Nitrogen, Nitrate	1.59	mg/l	.05	1	EPA 353.2	09/04	13:15	JCL
Nitrogen, Nitrite	0.12	mg/l	.05	1	EPA 353.2	09/04	11:16	JCL
Nitrogen, Total Kjeldahl	0.71	mg/l	.25	1	EPA 351.2	09/09	11:11	JCL
OTHER								
Biochemical Oxygen Demand	3	mg/l	2	1	SM 5210B	09/03	15:45	EMW
Total Organic Carbon	2.5	mg/l	1	1	SM5310 C	09/09	14:22	ALD
RESIDUES								
Solids, Total Dissolved	180	mg/l	5	1	SM 2540C	09/09	09:35	TMH
Solids, Total Suspended	4	mg/l	3	1	SM 2540D	09/07	16:50	ALD
TITRATIONS								
Alkalinity, Total to pH 4.5	77	mg/l	1	1	SM 2320 B	09/08	13:15	HRG

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

Reviewed and Approved by:



Richard Wheeler

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Arlington VA 22201-0000

Date of Report: 09/11/15
Lab ID: 3156-15-0036144

Date Collected: 09/03/15 10:05
Collected By: Client

Sample Desc: BM-7 Surface

Date Received: 09/03/15 13:30

PWSID: 3060912

	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 09/03/15 at 16:50.

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

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 (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 09/11/15
Lab ID: 3156-15-0036145

Date Collected: 09/03/15 10:05
Collected By: Client

Sample Desc: BM-7 Mid-Depth

Date Received: 09/03/15 13:30

PWSID: 3060912

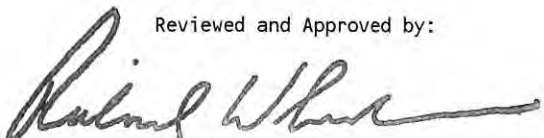
	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	09/03	15:45	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	09/04	13:50	HRG
Phosphorus as P, Total	0.07	mg/l	.01	1	SM 4500P-E	09/04	13:05	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	09/04	13:48	JCL
Nitrogen, Nitrate	2.11	mg/l	.05	1	EPA 353.2	09/04	13:16	JCL
Nitrogen, Nitrite	0.12	mg/l	.05	1	EPA 353.2	09/04	11:17	JCL
Nitrogen, Total Kjeldahl	0.76	mg/l	.25	1	EPA 351.2	09/09	11:12	JCL
OTHER								
Biochemical Oxygen Demand	2	mg/l	2	1	SM 5210B	09/03	15:45	EMW
Total Organic Carbon	2.4	mg/l	1	1	SM5310 C	09/09	14:37	ALD
RESIDUES								
Solids, Total Dissolved	190	mg/l	5	1	SM 2540C	09/09	09:35	TMH
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	09/07	16:50	ALD
TITRATIONS								
Alkalinity, Total to pH 4.5	79	mg/l	1	1	SM 2320 B	09/08	13:30	HRG

COMMENTS

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

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

Reviewed and Approved by:



Richard Wheeler

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Reported To: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 09/11/15
Lab ID: 3156-15-0036145

Date Collected: 09/03/15 10:05
Collected By: Client

Sample Desc: BM-7 Mid-Depth

Date Received: 09/03/15 13:30

PWSID: 3060912

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

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

Reviewed and Approved by:

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Arlington VA 22201-0000

Date of Report: 09/11/15
Lab ID: 3156-15-0036146

Date Collected: 09/03/15 10:05
Collected By: Client

Sample Desc: BM-7 Deep

Date Received: 09/03/15 13:30

PWSID: 3060912

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	0.02	mg/l	.01	1	SM 4500P-E	09/03	15:45	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	09/04	13:50	HRG
Phosphorus as P, Total	0.05	mg/l	.01	1	SM 4500P-E	09/04	13:05	HRG
NITROGENS								
Nitrogen, Ammonia	0.08	mg/l	.05	1	D6919-03	09/04	14:31	JCL
Nitrogen, Nitrate	2.74	mg/l	.05	1	EPA 353.2	09/04	13:17	JCL
Nitrogen, Nitrite	0.34	mg/l	.05	1	EPA 353.2	09/04	11:18	JCL
Nitrogen, Total Kjeldahl	0.87	mg/l	.25	1	EPA 351.2	09/09	11:13	JCL
OTHER								
Biochemical Oxygen Demand	4	mg/l	2	1	SM 5210B	09/03	15:45	EMW
Total Organic Carbon	2.3	mg/l	1	1	SM5310 C	09/09	16:06	ALD
RESIDUES								
Solids, Total Dissolved	222	mg/l	5	1	SM 2540C	09/09	09:55	TMH
Solids, Total Suspended	25	mg/l	3	1	SM 2540D	09/07	16:50	ALD
TITRATIONS								
Alkalinity, Total to pH 4.5	110	mg/l	1	1	SM 2320 B	09/08	13:30	HRG

COMMENTS

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

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

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Reported To: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 09/11/15
Lab ID: 3156-15-0036147

Date Collected: 09/03/15 11:15
Collected By: Client

Sample Desc: BM-8 Surface

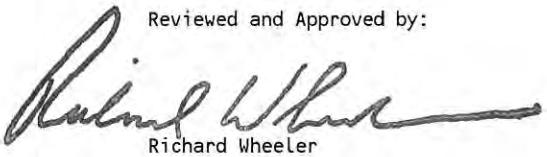
Date Received: 09/03/15 13:30

PWSID: 3060912

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Fecal Coliform	<2	/100ml	2	1	SM 9222D	09/03	16:00	TNS
Total Coliform	550	mpn/100ml	1	1	SM 9223B	09/04	11:35	PLW
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	09/03	15:45	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	09/04	13:50	HRG
Phosphorus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	09/04	13:05	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	09/04	14:46	JCL
Nitrogen, Nitrate	1.59	mg/l	.05	1	EPA 353.2	09/04	13:18	JCL
Nitrogen, Nitrite	0.11	mg/l	.05	1	EPA 353.2	09/04	11:21	JCL
Nitrogen, Total Kjeldahl	0.81	mg/l	.25	1	EPA 351.2	09/09	11:16	JCL
OTHER								
Biochemical Oxygen Demand	3	mg/l	2	1	SM 5210B	09/03	15:45	EMW
Total Organic Carbon	2.8	mg/l	1	1	SM5310 C	09/09	16:22	ALD
RESIDUES								
Solids, Total Dissolved	177	mg/l	5	1	SM 2540C	09/09	09:55	TMH
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	09/07	16:50	ALD
TITRATIONS								
Alkalinity, Total to pH 4.5	80	mg/l	1	1	SM 2320 B	09/08	13:30	HRG

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

Reviewed and Approved by:



Richard Wheeler

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M.J. Reider Associates, Inc.

Attention: David Wertz
Reported To: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 09/11/15
Lab ID: 3156-15-0036147

Date Collected: 09/03/15 11:15
Collected By: Client

Sample Desc: BM-8 Surface

Date Received: 09/03/15 13:30

PWSID: 3060912

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

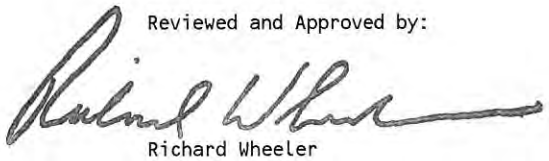
COMMENTS

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

02 The total coliform sample was placed in the incubator on 09/03/15 at 16:50.

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

Reviewed and Approved by:



Richard Wheeler

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Reported To: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 09/11/15
Lab ID: 3156-15-0036148

Date Collected: 09/03/15 11:15
Collected By: Client

Sample Desc: BM-8 Mid-Depth

Date Received: 09/03/15 13:30

PWSID: 3060912

	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	09/03	15:45	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	09/04	13:50	HRG
Phosphorus as P, Total	0.03	mg/l	.01	1	SM 4500P-E	09/04	13:05	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	09/04	18:01	JCL
Nitrogen, Nitrate	1.90	mg/l	.05	1	EPA 353.2	09/04	13:21	JCL
Nitrogen, Nitrite	0.09	mg/l	.05	1	EPA 353.2	09/04	11:22	JCL
Nitrogen, Total Kjeldahl	0.87	mg/l	.25	1	EPA 351.2	09/09	11:17	JCL
OTHER								
Biochemical Oxygen Demand	3	mg/l	2	1	SM 5210B	09/03	15:45	EMW
Total Organic Carbon	2.4	mg/l	1	1	SM5310 C	09/09	16:37	ALD
RESIDUES								
Solids, Total Dissolved	186	mg/l	5	1	SM 2540C	09/09	09:55	TMH
Solids, Total Suspended	4	mg/l	3	1	SM 2540D	09/07	16:50	ALD
TITRATIONS								
Alkalinity, Total to pH 4.5	85	mg/l	1	1	SM 2320 B	09/08	13:45	HRG

COMMENTS

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

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

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1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 09/11/15
Lab ID: 3156-15-0036149

Date Collected: 09/03/15 11:15
Collected By: Client

Sample Desc: BM-8 Deep

Date Received: 09/03/15 13:30

PWSID: 3060912

	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	09/03	15:50	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	09/04	13:50	HRG
Phosphorus as P, Total	0.03	mg/l	.01	1	SM 4500P-E	09/04	13:10	HRG
NITROGENS								
Nitrogen, Ammonia	0.30	mg/l	.05	1	D6919-03	09/04	15:15	JCL
Nitrogen, Nitrate	1.93	mg/l	.05	1	EPA 353.2	09/04	13:22	JCL
Nitrogen, Nitrite	0.09	mg/l	.05	1	EPA 353.2	09/04	11:23	JCL
Nitrogen, Total Kjeldahl	1.79	mg/l	.25	1	EPA 351.2	09/09	11:18	JCL
OTHER								
Biochemical Oxygen Demand	4	mg/l	2	1	SM 5210B	09/03	15:45	EMW
Total Organic Carbon	2.4	mg/l	1	1	SM5310 C	09/09	16:52	ALD
RESIDUES								
Solids, Total Dissolved	210	mg/l	5	1	SM 2540C	09/09	09:55	TMH
Solids, Total Suspended	243	mg/l	3	1	SM 2540D	09/07	16:50	ALD
TITRATIONS								
Alkalinity, Total to pH 4.5	100	mg/l	1	1	SM 2320 B	09/08	13:45	HRG

COMMENTS

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

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Reported To: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 09/11/15
Lab ID: 3156-15-0036150

Date Collected: 09/03/15 10:25
Collected By: Client

Sample Desc: BM-9 Surface

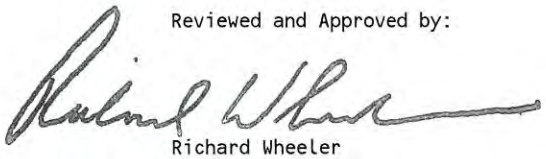
Date Received: 09/03/15 13:30

PWSID: 3060912

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Fecal Coliform	<2	/100ml	2	1	SM 9222D	09/03	16:00	TNS
Total Coliform	1300	mpn/100ml	1	1	SM 9223B	09/04	11:35	PLW
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	0.03	mg/l	.01	1	SM 4500P-E	09/03	15:50	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	09/04	13:50	HRG
Phosphorus as P, Total	0.04	mg/l	.01	1	SM 4500P-E	09/04	13:10	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	09/04	15:30	JCL
Nitrogen, Nitrate	1.60	mg/l	.05	1	EPA 353.2	09/04	13:23	JCL
Nitrogen, Nitrite	0.11	mg/l	.05	1	EPA 353.2	09/04	11:24	JCL
Nitrogen, Total Kjeldahl	0.75	mg/l	.25	1	EPA 351.2	09/09	11:19	JCL
OTHER								
Biochemical Oxygen Demand	3	mg/l	2	1	SM 5210B	09/03	15:45	EMW
Total Organic Carbon	2.6	mg/l	1	1	SM5310 C	09/09	17:08	ALD
RESIDUES								
Solids, Total Dissolved	182	mg/l	5	1	SM 2540C	09/09	09:55	TMH
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	09/07	16:50	ALD
TITRATIONS								
Alkalinity, Total to pH 4.5	73	mg/l	1	1	SM 2320 B	09/08	14:00	HRG

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

Reviewed and Approved by:



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Attention: David Wertz
Reported To: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 09/11/15
Lab ID: 3156-15-0036150

Date Collected: 09/03/15 10:25
Collected By: Client

Sample Desc: BM-9 Surface

Date Received: 09/03/15 13:30

PWSID: 3060912

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

COMMENTS

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

02 The total coliform sample was placed in the incubator on 09/03/15 at 16:50.

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

Reviewed and Approved by:

Richard Wheeler

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1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 09/11/15
Lab ID: 3156-15-0036151

Date Collected: 09/03/15 10:25
Collected By: Client

Sample Desc: BM-9 Mid-Depth

Date Received: 09/03/15 13:30

PWSID: 3060912

	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	09/03	15:50	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	09/04	13:55	HRG
Phosphorus as P, Total	0.12	mg/l	.01	1	SM 4500P-E	09/04	13:10	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	09/04	15:44	JCL
Nitrogen, Nitrate	1.78	mg/l	.05	1	EPA 353.2	09/04	13:24	JCL
Nitrogen, Nitrite	0.11	mg/l	.05	1	EPA 353.2	09/04	11:25	JCL
Nitrogen, Total Kjeldahl	0.81	mg/l	.25	1	EPA 351.2	09/09	11:20	JCL
OTHER								
Biochemical Oxygen Demand	3	mg/l	2	1	SM 5210B	09/03	15:45	EMW
Total Organic Carbon	2.4	mg/l	1	1	SM5310 C	09/09	17:23	ALD
RESIDUES								
Solids, Total Dissolved	173	mg/l	5	1	SM 2540C	09/09	09:55	TMH
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	09/07	16:50	ALD
TITRATIONS								
Alkalinity, Total to pH 4.5	79	mg/l	1	1	SM 2320 B	09/08	14:00	HRG

COMMENTS

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

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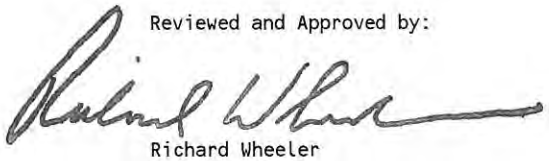
Reviewed and Approved by:



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1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 09/11/15
Lab ID: 3156-15-0036152

Date Collected: 09/03/15 10:25
Collected By: Client

Sample Desc: BM-9 Deep

Date Received: 09/03/15 13:30

PWSID: 3060912

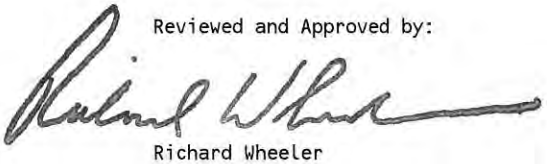
	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	0.01	mg/l	.01	1	SM 4500P-E	09/03	15:50	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	09/04	13:55	HRG
Phosphorus as P, Total	0.14	mg/l	.01	1	SM 4500P-E	09/04	13:10	HRG
NITROGENS								
Nitrogen, Ammonia	0.42	mg/l	.05	1	D6919-03	09/04	15:59	JCL
Nitrogen, Nitrate	2.96	mg/l	.05	1	EPA 353.2	09/04	13:27	JCL
Nitrogen, Nitrite	0.07	mg/l	.05	1	EPA 353.2	09/04	11:28	JCL
Nitrogen, Total Kjeldahl	1.51	mg/l	.25	1	EPA 351.2	09/09	11:22	JCL
OTHER								
Biochemical Oxygen Demand	4	mg/l	2	1	SM 5210B	09/03	15:45	EMW
Total Organic Carbon	2.2	mg/l	1	1	SM5310 C	09/09	17:53	ALD
RESIDUES								
Solids, Total Dissolved	274	mg/l	5	1	SM 2540C	09/09	09:55	TMH
Solids, Total Suspended	33	mg/l	3	1	SM 2540D	09/07	16:50	ALD
TITRATIONS								
Alkalinity, Total to pH 4.5	142	mg/l	1	1	SM 2320 B	09/08	14:00	HRG

COMMENTS

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

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

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**

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

Attention: David Wertz
Reported To: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 09/11/15
Lab ID: 3156-15-0036153

Date Collected: 09/03/15 11:00
Collected By: Client

Sample Desc: BM-10 Surface

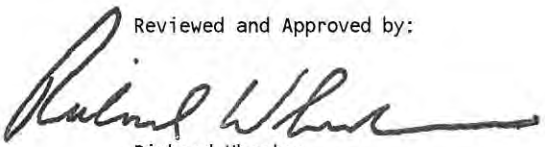
Date Received: 09/03/15 13:30

PWSID: 3060912

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Fecal Coliform	2	/100ml	2	1	SM 9222D	09/03	16:00	TNS
Total Coliform	1200	mpn/100ml	1	1	SM 9223B	09/04	11:35	PLW
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	09/03	15:50	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	09/04	13:55	HRG
Phosphorus as P, Total	0.06	mg/l	.01	1	SM 4500P-E	09/04	13:10	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	09/04	18:14	JCL
Nitrogen, Nitrate	1.56	mg/l	.05	1	EPA 353.2	09/04	13:28	JCL
Nitrogen, Nitrite	0.10	mg/l	.05	1	EPA 353.2	09/04	11:29	JCL
Nitrogen, Total Kjeldahl	1.01	mg/l	.25	1	EPA 351.2	09/09	11:23	JCL
OTHER								
Biochemical Oxygen Demand	3	mg/l	2	1	SM 5210B	09/03	15:45	EMW
Total Organic Carbon	2.7	mg/l	1	1	SM5310 C	09/09	18:08	ALD
RESIDUES								
Solids, Total Dissolved	200	mg/l	5	1	SM 2540C	09/09	09:55	TMH
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	09/07	16:50	ALD
TITRATIONS								
Alkalinity, Total to pH 4.5	79	mg/l	1	1	SM 2320 B	09/08	14:00	HRG

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

Reviewed and Approved by:



Richard Wheeler

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ACIL Seal of Excellence

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

Attention: David Wertz
Reported To: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 09/11/15
Lab ID: 3156-15-0036153

Date Collected: 09/03/15 11:00
Collected By: Client

Sample Desc: BM-10 Surface

Date Received: 09/03/15 13:30

PWSID: 3060912

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

COMMENTS

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

02 The total coliform sample was placed in the incubator on 09/03/15 at 16:50.

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

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 (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 09/11/15
Lab ID: 3156-15-0036154

Date Collected: 09/03/15 11:00
Collected By: Client

Sample Desc: BM-10 Mid-Depth

Date Received: 09/03/15 13:30

PWSID: 3060912

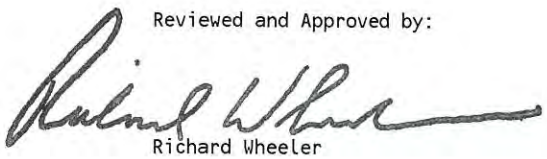
	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	0.03	mg/l	.01	1	SM 4500P-E	09/03	15:55	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	09/04	13:55	HRG
Phosphorus as P, Total	0.09	mg/l	.01	1	SM 4500P-E	09/04	13:15	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	09/04	16:28	JCL
Nitrogen, Nitrate	2.51	mg/l	.05	1	EPA 353.2	09/04	13:29	JCL
Nitrogen, Nitrite	0.08	mg/l	.05	1	EPA 353.2	09/04	11:30	JCL
Nitrogen, Total Kjeldahl	0.87	mg/l	.25	1	EPA 351.2	09/09	11:24	JCL
OTHER								
Biochemical Oxygen Demand	4	mg/l	2	1	SM 5210B	09/03	15:45	EMW
Total Organic Carbon	2.2	mg/l	1	1	SM5310 C	09/09	18:23	ALD
RESIDUES								
Solids, Total Dissolved	220	mg/l	5	1	SM 2540C	09/09	09:55	TMH
Solids, Total Suspended	6	mg/l	3	1	SM 2540D	09/07	16:50	ALD
TITRATIONS								
Alkalinity, Total to pH 4.5	93	mg/l	1	1	SM 2320 B	09/08	14:15	HRG

COMMENTS

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

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

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 (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 09/11/15
Lab ID: 3156-15-0036155

Date Collected: 09/03/15 11:00
Collected By: Client

Sample Desc: BM-10 Deep

Date Received: 09/03/15 13:30

PWSID: 3060912

	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	09/03	15:55	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	09/04	13:55	HRG
Phosphorus as P, Total	0.30	mg/l	.01	1	SM 4500P-E	09/04	13:15	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	09/04	16:43	JCL
Nitrogen, Nitrate	4.27	mg/l	.05	1	EPA 353.2	09/04	13:30	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	09/04	11:31	JCL
Nitrogen, Total Kjeldahl	1.55	mg/l	.25	1	EPA 351.2	09/09	11:25	JCL
OTHER								
Biochemical Oxygen Demand	3	mg/l	2	1	SM 5210B	09/03	15:45	EMW
Total Organic Carbon	2.0	mg/l	1	1	SM5310 C	09/09	19:08	ALD
RESIDUES								
Solids, Total Dissolved	282	mg/l	5	1	SM 2540C	09/09	09:55	TMH
Solids, Total Suspended	116	mg/l	3	1	SM 2540D	09/07	16:50	ALD
TITRATIONS								
Alkalinity, Total to pH 4.5	125	mg/l	1	1	SM 2320 B	09/08	14:15	HRG

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 (Blue Marsh Reservoir)

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 (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 09/11/15
Lab ID: 3156-15-0036156

Date Collected: 09/03/15 12:20
Collected By: Client

Sample Desc: BM-11 Surface

Date Received: 09/03/15 13:30

PWSID: 3060912

	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Fecal Coliform	120	/100ml	2	1	SM 9222D	09/03	16:00	TNS
Total Coliform	>2400	mpn/100ml	1	1	SM 9223B	09/04	11:35	PLW
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	09/03	16:00	HRG
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	09/04	13:20	HRG
Phosphorus as P, Total	0.08	mg/l	.01	1	SM 4500P-E	09/04	13:15	HRG
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	09/04	17:41	JCL
Nitrogen, Nitrate	3.32	mg/l	.05	1	EPA 353.2	09/04	13:32	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	09/04	11:34	JCL
Nitrogen, Total Kjeldahl	0.87	mg/l	.25	1	EPA 351.2	09/09	11:28	JCL
OTHER								
Biochemical Oxygen Demand	2	mg/l	2	1	SM 5210B	09/03	15:45	EMW
Total Organic Carbon	2.3	mg/l	1	1	SM5310 C	09/09	20:38	ALD
RESIDUES								
Solids, Total Dissolved	255	mg/l	5	1	SM 2540C	09/09	10:20	TMH
Solids, Total Suspended	12	mg/l	3	1	SM 2540D	09/07	16:50	ALD
TITRATIONS								
Alkalinity, Total to pH 4.5	117	mg/l	1	1	SM 2320 B	09/08	14:15	HRG

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

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 (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Date of Report: 09/11/15
Lab ID: 3156-15-0036156

Date Collected: 09/03/15 12:20
Collected By: Client

Sample Desc: BM-11 Surface

Date Received: 09/03/15 13:30

PWSID: 3060912

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

COMMENTS

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

02 The total coliform sample was placed in the incubator on 09/03/15 at 16:50.

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

Distribution of Reports:
Gregory Wacik - USACE (Blue Marsh Reservoir)

Reviewed and Approved by:

Richard Wheeler

ENVIRONMENTAL TESTING LABORATORY 107 ANGELICA STREET, READING, PA 19611
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rxw
08/07/15 8:01:08 AM

M. J. REIDER ASSOCIATES, INC.

COFC.PRT
Page: 1

Chain of Custody

Account: 3156 Work Order: 006223 Project Leader: rxw No: 262653
Work Order Description: Seasonal Monthly Blue Marsh Resevoir

Customer: David Wertz

Address: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Remarks: _____

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

Phone: 703-387-5516 Ext:

Laboratory Receipt Temp: 14 Deg C. If Temp Unacceptable, On Ice? (Y) N

Samplers: WACiK

Approved By: APM

==========

36136 Sample No: 1 Desc: BM-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: 9/3/15
Time: 1245

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;

36137 Sample No: 2 Desc: BM-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: 9/3/15
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 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;

36138 Sample No: 3 Desc: BM-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: 9/3/15
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 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: 9/3/15 Time: 1310

APM 9/3/15 1310

Date: 9/3/15 Time: 1330

Sample entered by: MTZ

Chain of Custody

Account: 3156 Work Order: 006223 Project Leader: rxw No: 262653
Work Order Description: Seasonal Monthly Blue Marsh Resevoir

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: 14 Deg C, If Temp Unacceptable, On Ice? Y N
Approved By: APM

==========

36139 Sample No: 4 Desc: BM-2 Deep

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

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

Matrix: o Date: 9/3/15
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 headspace;
D - 1 X L bod p w/ Cool to 6 C;
E - 1 X Pt no3no2 p w/ Cool to 6 C;

36140 Sample No: 5 Desc: BM-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: 9/3/15
Time: 1220

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;

36141 Sample No: 6 Desc: BM-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: 9/3/15
Time: 0915

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: 9/3/15 Time: 1:15 Date: 9/3/15 Time: 1330

APM 9/3/15 1310

Sample entered by: MTL

Chain of Custody

Account: 3156 Work Order: 006223 Project Leader: rxw No: 262653
Work Order Description: Seasonal Monthly Blue Marsh Resevoir

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: 14 Deg C If Temp Unacceptable, On Ice? (Y) N
Approved By: AMM

==========

36142 Sample No: 7 Desc: BM-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: 9/3/15
Time: 915

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;

36143 Sample No: 8 Desc: BM-6 Deep

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

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

Matrix: o Date: 9/3/15
Time: 915

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;

36144 Sample No: 9 Desc: BM-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: 9/3/15
Time: 1005

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: 9/3/15 Time: 115 Date: 9/3/15 Time: 1330

AMM 9/3/15 1310

Sample entered by: MT

Chain of Custody

Account: 3156 Work Order: 006223 Project Leader: rxw No: 262653
Work Order Description: Seasonal Monthly Blue Marsh Resevoir

Customer: David Wertz

Address: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Remarks: _____

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

Phone: 703-387-5516 Ext:

Laboratory Receipt Temp: 14 Deg C. If Temp Unacceptable, On Ice? (Y) N

Samplers: WACiK

Approved By: APM

==========

36145 Sample No: 10 Desc: BM-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: 9/3/15
Time: 1005

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;

36146 Sample No: 11 Desc: BM-7 Deep

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

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

Matrix: o Date: 9/3/15
Time: 1005

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;

36147 Sample No: 12 Desc: BM-8 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: 9/3/15
Time: 1115

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: 9/3/15 Time: 1315 Date: 9/3/15 Time: 1330

9/3/15 APM 1310

Sample entered by: MTZ

Chain of Custody

Account: 3156 Work Order: 006223 Project Leader: rxw No: 262653
Work Order Description: Seasonal Monthly Blue Marsh Resevoir

Customer: David Wertz

Address: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Remarks: _____

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

Phone: 703-387-5516 Ext:

Laboratory Receipt Temp: 14 Deg C. If Temp Unacceptable, On Ice? (Y) N

Samplers: WACiK

Approved By: APM

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36148 Sample No: 13 Desc: BM-8 Mid-Depth

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

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

Matrix: o Date: 9/3/15
Time: 1115

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;

36149 Sample No: 14 Desc: BM-8 Deep

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

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

Matrix: o Date: 9/3/15
Time: 1115

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;

36150 Sample No: 15 Desc: BM-9 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: 9/3/15
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 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: 9/3/15 Time: 1115 Date: 9/3/15 Time: 1330

APM 9/3/15 1310

Sample entered by: _____

M. J. REIDER ASSOCIATES, INC.

Chain of Custody

Account: 3156 Work Order: 006223 Project Leader: rxw No: 262653
Work Order Description: Seasonal Monthly Blue Marsh Resevoir

Customer: David Wertz

Address: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Remarks: _____

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

Phone: 703-387-5516 Ext:

Laboratory Receipt Temp: 14 Deg C. If Temp Unacceptable, On Ice? (Y) N

Samplers: WACiK

Approved By: ARM

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36151 Sample No: 16 Desc: BM-9 Mid-Depth

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

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

Matrix: o Date: 9/3/15
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 headspace;
D - 1 X L bod p w/ Cool to 6 C;
E - 1 X Pt no3no2 p w/ Cool to 6 C;

36152 Sample No: 17 Desc: BM-9 Deep

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

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

Matrix: o Date: 9/3/15
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 headspace;
D - 1 X L bod p w/ Cool to 6 C;
E - 1 X Pt no3no2 p w/ Cool to 6 C;

36153 Sample No: 18 Desc: BM-10 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: 9/3/15
Time: 1100

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: 9/3/15 Time: 1115 Date: 9/3/15 Time: 1330

ARM 9/3/15 1310

Sample entered by: _____

Chain of Custody

Account: 3156 Work Order: 006223 Project Leader: rxw No: 262653
Work Order Description: Seasonal Monthly Blue Marsh Resevoir

Customer: David Wertz

Address: Tetra Tech (Blue Marsh Reservoir)
1320 North Courthouse Rd., Ste.600
Arlington VA 22201-0000

Remarks: _____

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

Phone: 703-387-5516 Ext:

Laboratory Receipt Temp: 14 Deg C If Temp Unacceptable, On Ice? (Y) N
Approved By: APM

Samplers: WACiK

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36154 Sample No: 19 Desc: BM-10 Mid-Depth

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

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

Matrix: o Date: 9/3/15
Time: 1100

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;

36155 Sample No: 20 Desc: BM-10 Deep

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

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

Matrix: o Date: 9/3/15
Time: 1050

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;

36156 Sample No: 21 Desc: BM-11 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: 9/3/15
Time: 1220

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: 9/3/15 Time: 1115 Date: 9-3-15 Time: 1330

APM 9/3/15 ~~1310~~ 1310 APM 9/3/15

Sample entered by: MS