2017

MARK TWAIN LAKE

WATER QUALITY

REPORT

U.S. ARMY CORPS OF ENGINEERS, ST. LOUIS DISTRICT
ENVIRONMENTAL QUALITY SECTION – WATER QUALITY

Table of Contents

Water Quality Report-Mark Twain Lake

Section and Page No.

List of Figures & Tables

Appendix

Executive Summary

The purpose of this report is to provide an annual analysis of the water quality in the lake for the past year. Mark Twain Lake is located in northeastern Missouri in the Salt River Basin on the Salt River. Clarence Cannon Dam and the Reregulation Dam are located in Ralls County at Salt River miles 63.0 and 53.5, respectively. The purpose of this project was to provide flood control, hydroelectric power generation, water supply, fish and wildlife conservation, recreation and water quality enhancement. The Mark Twain watershed comprises 2,318 square miles, with an additional 29 square miles draining into the Reregulation Pool. Major tributaries are the North Fork, Middle Fork, Elk Fork, and South Fork. The watershed consists of a gently rolling plain in the upstream portion and hillier in the downstream reaches. High rock bluffs border the stream and lake at various locations. Hickory and oak forests are scattered among crop and grazing lands.

Water quality sampling in 2017 revealed minor issues at Mark Twain Lake. The lake is a medium depth reservoir nestled in the Salt River Basin. The lake tends to stratify during the summer months. All sampling sites met the appropriate state standards during 2017 except the following: Atrazine, iron, manganese total suspended solids, phosphorus, pH, and dissolved oxygen. Phosphorous levels have exceeded the state standard on a routine basis. Generally the tail water levels are lower than the incoming tributary flows, which indicates that the lake is sinking the phosphorous. This is also occurring with nitrogen. The project area has little pollution potentials at present time, no major form of degradation to the lake or streams is apparent. Constant water quality monitoring will continue to check future degradation of the watershed.

WATER QUALITY MONITORING PROGRAM

1.1 GENERAL OVERVIEW

This report summarizes water quality activities of the St. Louis District for Fiscal Year 2017 in accordance with ER 1110-2-8154 Water Quality & Environmental management for Corps Civil Works Projects and ETL 1110-2-362 Environmental Engineering Initiatives for Water Management. According to the U.S. Environmental Protection Agency (USEPA) poor lakeshore habitat is the biggest problem in our nation's lakes, followed by nutrients. Shoreline vegetation provides shelter for aquatic wildlife, reduces sediment and nutrient movement. The biology of a lake is characterized by the diversity if it's organisms. The number and kinds of plant and animal species present is a direct measure of a lake's well-being. Water quality at Mark Twain Lake is directly assessed using stream and river data from 10 site locations.

Water quality monitoring remains one of the Sections major responsibilities. The objective is to maintain a reasonable environmental monitoring program for the Mississippi River and the 5 lakes under the St. Louis District's control. The District's reservoirs consist of Mark Twain and Wappapello Lakes in Missouri, and Shelbyville, Carlyle and Rend Lakes in Illinois. Water quality sampling is conducted within the lakes and their tributaries to establish trend analysis and to maintain water quality at or above state and federal regulations.

The main objective is to provide technical expertise of an environmental nature to all Corps elements requesting assistance in accordance with ER 1110-2-8154. This would include updating the water quality management priorities for the district's projects to ensure water quality meets the state and federal regulations, for protection of human health and the environment, and for the safety and economic welfare of those at Corps projects. Ongoing goals include ensuring that downstream water quality meets all state and federal regulations, is suitable for aquatic and human life; and to continue to evaluate trend analysis in relation to baseline conditions at all projects.

Water quality data is provided to the Missouri Department of Natural Resources (MDNR) to be used as a screening mechanism for the Missouri Water Quality Report which is required every two years by the Clean Water Act Sections 303(d) and 305(b). MDNR does not routinely monitor Mark Twain Lake. However, the Lakes of Missouri Volunteer Program (LMVP) in cooperation with the University of Missouri-Columbia has been taking samples at 3 sites since 1989. The LMVP only analyze for Nutrients and Chlorophyll. In 2016, the LMVP took eight samples at 3 locations at the lake. The LMVP did not sample in 2017. See appendix D for 2016 data.

The National Water Quality Inventory Report to Congress (305(b) report) is the primary vehicle for informing Congress and the public about general water quality conditions in the United States. This document characterizes our water quality, identifies widespread water quality problems of national significance, and describes various programs implemented to restore and protect our waters.

Under Section 303(d) of the 1972 Clean Water Act, states, territories and authorized tribes are required to develop a list of water quality limited segments. These waters on the list do not meet water quality standards, even after point sources of pollution have installed the minimum required levels of pollution control technology. The law requires that these jurisdictions establish priority rankings for water on the lists and develop action plans, called as Total Maximum Daily Loads (TMDL), to improve water quality.

The 2016 water quality report compiled by the Missouri Department of Natural Resources has listed the Salt River below the Cannon Dam and Mark Twain Lake as impaired. The Salt River is impaired by low Dissolved Oxygen and Mercury. Mark Twain Lake is impaired by Mercury. Mark Twain Lake is also listed as eutrophic. Continued monitoring of the lake and its tributaries is vital in assisting the future assessment of the lake for these and other possible impairments. The water quality monitoring program represents the single metric that encompasses the overall health of the watershed as it is a direct measure of how well the environmental stewardship programs are working.

1.2 INTRODUCTION

Mark Twain Lake is located in northeast Missouri. The land surrounding the lake is used predominately for agriculture. The main agricultural contaminants inputs into the watershed include pesticides and fertilizers. Also a concern is the high sediment loading into the lake and the colloidal characteristic of the sediments as well as low dissolved oxygen levels related to turbine generation. The lake is also susceptible to fish kills due to algal decay in the lake arms. As algae decays it uses up oxygen which reduces the amount of oxygen available to aquatic organisms.

The operating purposes for Mark Twain Lake are fish/wildlife, hydroelectric power, flood control, recreation, navigation and water supply. The water quality management program for the lake includes monitoring of baseline parameters, ecological trends and investigation of problem areas to keep the lake within state and federal standards.

Water quality monitoring was conducted during 2017 to assure safe conditions for human recreation, wildlife and aquatic life as maintained and managed within the lake system. The 2017 water quality monitoring program was funded to conduct four sampling events. The sampling sites include the following: Site 1 (MTL-1) Spillway, Site 5 (MTL-5) South Fork at Hwy D, Site 8 (MTL-8) Elk Fork at Hwy 15, Site 9 (MTL-9) Middle Fork at Hwy 15, Site 11 (MTL-11) North Fork at Hwy 36, Site 12 (MTL-12) below re-regulation dam, Site 22 (MTL-22) old river channel 1mile up lake from dam, Site 33 (MTL-33) Lick Creek at Hwy J, Site 66 (MTL-66) South Fork at Hwy 107 bridge, and Site 77 (MTL-77) North Fork at Hwy 107 bridge. During the sampling event one site was selected for quality control duplication and denoted as MTL-15. In June MTL-8 was replaced by MTL-13. MTL-13 provides a safer and easier access point. The locations of the ten sampling sites are depicted on the lake map in Figure 1.

As mentioned above, LMVP collects samples at Mark Twain Lake. In 2016 year they conducted 8 sampling events at 3 sites. No sampling was conducted in 2017. Their data is in Appendix D. We have also included data from the United Water Services Clarence Cannon WTP in Appendix E and state park beach data in Appendix F.

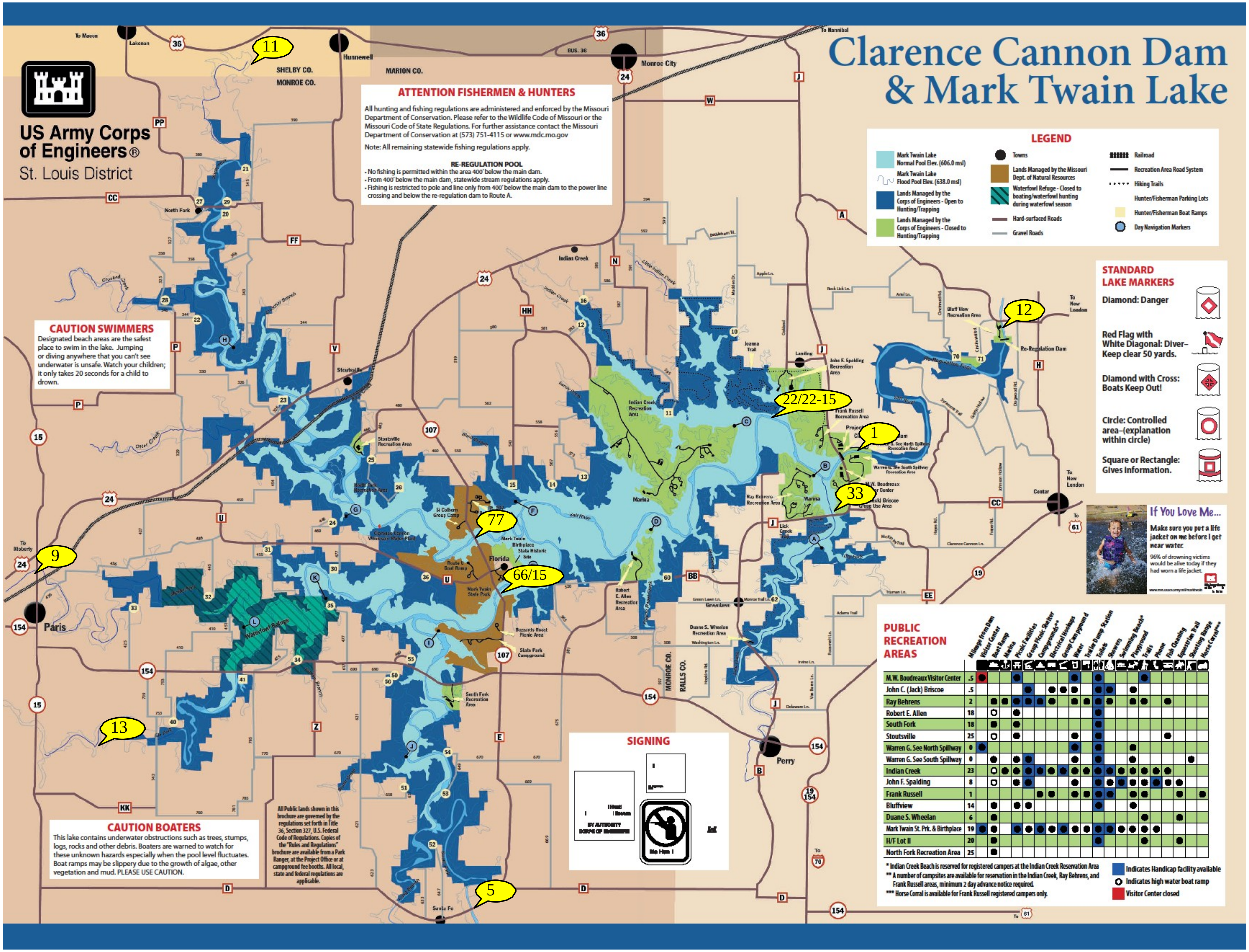


Figure 1
Sample Locations

2.1 WATER QUALITY ASSESSMENT CRITERIA

2.2 Water Quality

The water quality assessment criteria, which have been generally accepted criteria for sustaining adequate aquatic plant and animal growth were based upon the State of Missouri regulatory limits for certain contaminants. The samplings and analysis which were conducted at the Mark Twain Lake sites reflect the minimal set of parameters needed to analyze the current status of water quality for the Mark Twain Lake system.

The following parameters were analyzed in the Fiscal Year 2017 sampling at Mark Twain Lake: Total Organic Carbon (TOC), iron, manganese, ammonia-nitrogen, nitrate-nitrogen, orthophosphate, total phosphate, Total Suspended Solids (TSS), Total Volatile Suspended Solids (TVSS), escherichia coliform (E. coli), pH, temperature, dissolved oxygen, specific conductance, oxidation-reduction potential (ORP), chlorophyll, pheophytin-a, atrazine and alachlor.

The Missouri Department of Natural Resources, Code of State Regulations, Division 20, Chapter 7 classifies water quality criteria based on designated usage. These standards are used to determine the aquatic water quality of the lake. Table 2.1 provides a listing of the regulatory limits where a limit has been established for the parameters analyzed.

TABLE 2.1
State of Missouri
Water Quality Standards

PARAMETER	LIMIT
Temperature	20.5°C - 33°C (68°F - 90°F)
Ammonia Nitrogen	< 15 mg/L
Nitrate Nitrogen	10 mg/L
Iron	1.0 mg/L (Aquatic Life)
Manganese	0.05 mg/L (Drinking Water & GW)
Phosphorous as Phosphate	0.05 mg/L
E. Coli	Missouri standard is 235 E. coli per 100ml for single sample or 126 for geometric mean
pH	Range: 6.5 to 9.0
DO	> 5.0 mg/L
Atrazine	3ug/L[1], 82ug/L[2], 9ug/L[3]
Alachlor	2ug/L[1]
Conductivity	1,700 *u*S/cm≈TDS of 1,000 mg/L
Total Suspended Solids (TSS)	116mg/L (streams); ≥12mg/L Lakes
Chlorpyrifos	10ug/L[1]
Cyanazine	370ug/L[2]; 30ug/L[3]
Metolachlor	1.7mg/L[2]
Metribuzin	200ug/L[1] 91ug/L HRL
Pendmethalin (PROWL)	70ug/L HBSL, 20ug/L[1]
Simazine	4.0ug/L[1]

Trifluralin	26ug/L[2]; 1.1ug/L[3]

[1] Drinking Water
[2] Acute
[3] Chronic
Health Based Sreening Level (HBSL)
Health Reference Level (HRL)

Nitrogen is an essential component of proteins, genetic material, chlorophyll, and other key organic molecules. All organisms require nitrogen in order to survive. Nitrogen exists in several forms. These forms include gaseous nitrogen (N_2), nitrites (NO_2), nitrate (NO_3), ammonia nitrogen (NH_3-N), and ammonium (NH_4). Ammonia can be toxic to fish and other aquatic organisms at certain levels. Unlike ammonia, ammonium (NH4) is not toxic to aquatic organisms and is readily available for uptake by plankton and macrophytes. Nitrogen levels have increased as human activities have accelerated the rate of fixed nitrogen being put into circulation. High nitrogen levels can cause eutrophication. Eutrophication increases biomass of phytoplankton, decreases water transparency, and causes oxygen depletion. Ammonia nitrogen is monitored so that the effects on fish spawning, hatching, growth rate and pathologic changes in gills, liver and kidney tissue can be related to the detected levels of ammonia nitrogen. Nitrate-nitrogen degrades to nitrite or produces ammonia which has a detrimental effect on aquatic life and, therefore, has been monitored to assure levels are below the regulatory "safe" limit.

Phosphate has been analyzed as phosphorus and has been monitored due to the potential for uptake by nuisance algae. Levels of phosphate can indicate the potential for rapid growth of algae (algae bloom), which can cause serious oxygen depletion during the algae decay process. Phosphorous is typically the limiting nutrient in a water body. Therefore, addition of phosphorous to the ecosystem stimulates the growth of plants and algae. Phosphorous is delivered to lakes and streams by way of storm water runoff from agricultural fields, residential property, and construction sites. Other sources of phosphorous are anaerobic decomposition of organic matter, leaking sewer systems, waterfowl, and point source pollution. The general standard for phosphorous in lake water is 0.05mg/L. Dissolved phosphorous also called ortho-phosphorous is generally found in much smaller concentrations than total phosphorous and is readily available for uptake. For this reason dissolved phosphorous concentrations are variable and difficult to use as an indicator of nutrient availability.

The metals manganese and iron are nutrients for both plants and animals. Living organisms require trace amounts of metals. However, excessive amounts can be harmful to the organism. Heavy metals exist in surface waters in three forms, colloidal, particulate, and dissolved. Water chemistry determines the rate of adsorption and desorption of metals to and from sediment. Metals are desorbed from the sediment if the water experiences increases in salinity, decreases in redox potential, or decreases in pH. Metals in surface waters can be from natural or human sources. Currently human sources contribute more metals than natural sources. Metals levels in surface water may pose a health risk to humans and the environment.

Photosynthetic activity can be hindered by the levels of total suspended solids. Total suspended solids concentrations, which cause the photosynthetic activity to be reduced by more than 10% from the seasonably established norm, can have a detrimental effect on aquatic life. Soil particles, organic material, and other debris comprise suspended solids in the water column. Secchi disk measurements are inverse to suspended solid measurements. As total suspended solids (TSS) increases, the secchi disk depth or water transparency decreases. Total suspended solids can be an important indicator of the type and degree of turbidity. TSS measurements represent a combination volatile suspended solids (VSS), that consist of organic material and nonvolatile suspended solids (NVSS) which is comprised of inorganic mineral particles in the water. In order to more accurately determine the types and amounts of suspended solids, volatile suspended solids (VSS) are analyzed. VSS concentration represents the organic portion of the total suspended solids. Organic material often includes plankton and additional plant and animal debris that are present in water. Total volatile solids indicate the presence of organics in suspension; and therefore, show additional demand levels of oxygen. The state standard for TSS is 116 mg/L for streams and 12 mg/L for lakes. Missouri does not currently have a standard for TVSS. However, IEPA literature suggests that NVSS above 15mg/L could highly impair recreational lake use. A NVSS of 3 to 7mg/L might cause slight impairment.

Chlorophyll and pheophytin *a* are monitored to provide indicators of algae growth and, therefore, potential oxygen depletion activity. Chlorophyll is measured in lakes to estimate the type and amount of algal productivity in the water column. Chlorophyll a is present in green algae, blue-green algae, and in diatoms. Chlorophyll a is often used to indicate the degree of eutrophication. Chlorophyll b and c are used to estimate the extent of algal diversity and productivity. Chlorophyll b is common in green algae and is used as an auxiliary pigment for photosynthesis. Chlorophyll c is most common in diatom species and serves as an auxiliary pigment. Algal productivity and diversity can be determined by the concentrations of the individual pigments. For example high concentrations of chlorophyll a and b would indicate that green algae is abundant. High concentrations of chlorophyll a would indicate abundance of blue-green algae and concentrations of chlorophyll a and c would indicate diatoms are the dominant species. Chlorophyll production is currently being connected with hypoxia.

Fecal coliform bacteria is monitored for the protection of human health as it relates to full body contact of recreational waters. People can be exposed to disease-causing organisms, such as bacteria, viruses and protozoa in beach and recreational waters mainly through accidental ingestion of contaminated water or through skin contact. These organisms, called pathogens, usually come from the feces of humans and other warm-blooded animals. If taken into the body, pathogens can cause various illnesses and on rare occasions, even death. Waterborne illnesses include diseases resulting from bacteria infection such as cholera, salmonellosis, and gastroenteritis, viral infections such as hepatitis, gastroenteritis, and intestinal diseases, and protozoan infections such as ameobic dysentery and giardiasis. The most commonly monitored recreational water indicator organisms are fecal coliform, Escherichia coli, (E. coli) and enterococci. Fecal coliform are bacteria that live in the intestinal tracts of warm-blooded animals. The Missouri standard for fecal coliform is less than 200 colonies per 100ml of sample water calculated as a geometric mean. Fecal coliform was originally recommended in 1968 by the Federal Water Pollution Control Administration (predecessor to EPA) as an effective water quality indicator organism for recreational waters. Recent studies indicate that fecal coliform show less correlation to illness than other indicator organisms such as E. coli and enterococci. The Environmental Protection Agency (EPA) currently recommends E. coli or enterococci as an indicator organism for fresh waters. Since 2009 the St. Louis District has been using E. coli as the standard indicator.

Atrazine and Alachlor herbicides are commonly used agricultural chemicals which can be readily transported by rainfall runoff. Both compounds are suspected of causing cancer; and therefore, were monitored for the protection of human and aquatic health. Organic compounds include many pesticides. A pesticide can be any substance that is intended to prevent, destroy, repel, or mitigate any pest. This includes insecticides, herbicides, fungicides, fumigants, algaecides and other substances. Herbicides which are pesticides used to kill vegetation are the most widely used and sampled. Ten of the most frequently used herbicides detected in water are Atrazine, Metolachlor, Alachlor, 2,4-D, Trifluralin, Glyphosate, Dicamba, Cyanazine, Simazine, and 2,4,5-T. Two of the most widely used pesticides are Atrazine and Alachlor. Atrazine is a preemergence or postemergence herbicide use to control broadleaf weeds and annual grasses. Atrazine is most commonly detected in ground and surface water due to its wide use, and its ability to persist in soil and move in water. Alachlor is a Restricted Use Pesticide (RUP) due to the potential to contaminate groundwater. The drinking water standard for Atrazine is 0.003mg/L and 0.002 mg/L for Alachlor.

Temperature, dissolved oxygen and pH are monitored for the protection of aquatic life. Temperature is important because it controls several aspects of water quality. Colder water hold more dissolved oxygen which is required by aquatic organisms. Plants grow more rapidly and use more oxygen in warmer water. Decomposition of organic matter which uses oxygen is accelerated in warmer water. Temperature can also determine the availability of toxic compounds such as ammonia. Since aquatic organisms are cold blooded, water temperature regulates their metabolism and ability to survive. The number and kinds of organisms that are found in streams or lakes is directly related to temperature. Certain organisms require a specific temperature range, such as trout, which require water temperatures below $20^{o}C$. Most aquatic organisms require a minimum concentration of dissolved oxygen to survive. In spring, surface waters of the lake mix with the water below through wind and thermal action. This mixing diminishes as the upper layer of water becomes warmer and less dense. Solar insulation during the summer months stratifies the lake into three zones. The upper warmer water zone is called the epilimnion and the lower cooler water zone is called the hypolimnion. The epilimnion and the hypolimnion zones are divided by a transition zone known as the metalimnion. The thermocline located within the metalimnion exhibits a rapid change in water temperature. During the summer months the hypolimnion may become anaerobic. In this anaerobic zone, chemical reduction of iron and manganese, or the production of methane and sulfides can occur. Iron rapidly oxidizes in aerobic environments, but manganese oxidizes slowly and can remain in the reduced state for long distances down stream even in aerobic environments. The degree of acidity of water is measured by a logarithmetic scale ranging from 0 to 14 and is known as the pH scale. A reading of 7 indicates neutrality and readings below seven are acidic and above are alkaline. Most Missouri lakes range from 6 to 9 on the pH scale. The buffering capacity of water is the ability to neutralize acid better known as alkalinity. A high alkalinity concentration indicates an increased ability to neutralize pH and resist changes; whereas a low alkalinity concentration indicates that a water body is vulnerable to changes in pH.

Conductivity is a measure of water's ability to conduct an electrical current. The ability to carry a current is often driven by the dissolved materials present in a water column. These materials can include dissolved ions and other materials in the water and thus are directly proportional to the concentration of total dissolved solids (TDS) present in the water column. Typically TDS concentrations represent 50-60% of the conductivity measurements. Conductivity is also affected by water temperature. The warmer the water, the higher the conductivity. Conductivity in streams and rivers is affected by the geology of the area. Streams running through granite areas tend to have lower conductivity due to granite being composed of inert material, materials that do not ionize or dissolve into ionic compounds in water. On the other hand streams that run through areas of limestone or clay soils tend to have higher conductivity readings because of the presence of materials that ionize. Conductivity is useful as a general measure of water quality. A stream tends to have a relatively constant range of conductivity that once establish can be used as a baseline. Significant changes, either high or low, might indicate a source of pollution has been introduced into the water. The pollution source could be a treatment plant, which raises the conductivity; or an oil spill, which would lower the conductivity.

Redox or Oxidation-Reduction Potential (ORP) is a measure of a water system's capacity to either release or gain electrons. Oxidation involves an exchange of electrons between 2 atoms. The atom that loses an electron is oxidized and the one that gains an electron is reduced. ORP sensors measure the electrochemical potential between the solution and a reference electrode. Readings are expressed in millivolts. Positive readings indicate increased oxidizing potential and negative readings increased reduction. The ORP probe is essentially a millivolt meter, measuring the voltage across 2 electrodes with the water in between. ORP values are used much like pH values to determine water quality. While pH readings characterize the state of a system relative to the receiving or donating hydrogen ions (base or acid), ORP readings characterize the relative state of losing or gaining electrons. The conversion of ammonia (NH_3) requires an oxidating environment to convert it into nitrites (NO_2) and nitrates (NO_3). Ammonia levels as low as 0.002mg/L can be harmful to fish. Generally ORP readings above 400mV are harmful to aquatic life. However, ORP is a non-specific measurement, which is a reflection of a combination of effects of all the dissolved materials in the water. Therefore, the measurement of ORP in relatively clean water has only limited utility unless a predominant redox-active material is known to be present.

Water clarity is intuitively used by the public to judge water quality. Secchi depth has been used for many years as a limnological characterization tool for characterizing water clarity. Secchi depth is a measure of light penetration into a waterbody and is a function of the absorption and scattering of light in the water. There are three characteristics of water which affect the penetration of light: (1) color of water, (2) amount of phytoplankton in the water column, and (3) amount of inorganic material in the water column. Secchi depth integrates the combined impacts of all three of these factors. Water transparency was measured using a Secchi disk. Secchi disk readings were taken at all lake sites.

2.3 Sediment

In accordance with EM-1110-2-1201, sediment samples should be taken to monitor and assess potential impacts to aquatic and human health. To assess ecological risk, sample values were compared against toxicity information published in the National Oceanic Atmospheric Administrations (NOAA) Screening Quick Reference Tables (SQRT) or similar references for ecological receptors in freshwater sediment. Without standards or other widely applicable numerical tools, NOAA scientists found it difficult to estimate the possible toxicological significance of chemical concentrations in sediment. Therefore, numerical sediment quality guidelines (SQG's) were developed as informal, interpretive tools. The SQGs were not promulgated as regulatory standards, but rather as informal, non-regulatory guidelines for interpreting chemical data from analyses of sediments. For potential ecological risk from inorganic contaminants, seven metals are typically of "most concern" with regards to fish and wildlife: Arsenic, Copper, Cadmium, Selenium, Mercury, Lead, and Zinc. Avian species are thought to be particularly sensitive to arsenic, and is also considered a carcinogenic, mutagenic, and teratogenic contaminant in a variety of species in elevated doses over time. Avian species are also known to be particularly sensitive to lead in the environment with effects ranging from mortality, reduced growth and reproductive output, behavior changes, blood chemistry alterations, and lesions of major organs. Finally, the embryo stages in fish and avian species are known to be the most sensitive to selenium affecting reproductive success.

For potential human health risk, there are no known values in Missouri for sediments. While not a direct correlation, sample results are compared against Missouri Risk Based Corrective Action (MRBCA) lowest default target levels for all soil types and exposure pathways for soils.

3.1 <u>SUMMARY OF MONITORING RESULTS</u>

3.2 Water Quality Summary

The monitoring program for Mark Twain Lake during Fiscal Year 2017 revealed good water quality when compared to limits established by the MDNR for general use, secondary contact, and indigenous aquatic life. Agricultural nutrient runoffs were primary concerns for the lake's water quality. Better land management practices, erosion control and buffering zones are methods used to reduce such contaminants from entering the lake. The St. Louis District personnel are available to work with lake personnel, area communities, and other agencies in the implementation of educational programs and planning to bring about the use of better management techniques to improve the lake's water quality.

E. coli were sampled at the marinas to ensure that the marina areas are not being contaminated by boats with restroom facilities. Bacteria levels for both marinas were well below the Missouri standard of 235. We currently do not take enough samples in a month to calculate a geometric mean, so we mainly look at a high reading of 235/100ml of sample to trigger additional investigations. E. coli beach sample results for the Corps beaches were received from the project office, and data for the state beach was received from MDNR were incorporated into this report. Beach samples were taken weekly during the recreation season. No Corps beach samples were above the Missouri standard for beaches. The state park beach did exceed the 235 limit on May 22, and July 5. On both those sampling dates, the MDNR collector noted rainy conditions. The state uses a weekly geometric mean to determine beach status. In accordance with state law, the Missouri Department of Natural Resources will post signs notifying visitors that swimming is not recommended if the geometric mean of the weekly water quality sample results exceeds the equivalent of 190 E. coli colonies per 100 milliliters of water (190 mpn/100 ml). The state reserves the right to close a beach in the event of a documented health risk including things such as but not limited to wastewater bypass, extremely high sampling values, spills of hazardous chemicals, or localized outbreaks of an infectious disease.

Total iron and total manganese are sampled above the dam near the bottom of the channel (MTL-22-15), below the re-regulation dam (MTL-12), and in the spillway area (MTL-1). As was previously stated living organisms require trace amounts of metals, however excessive amounts can be harmful to the organism. Iron cycling is a function of oxidation-reduction processes. Iron oxidizes relatively rapidly (minutes to hours); therefore any iron released through the spillway will normally be oxidized in a short period of time. Iron did exceeded the state standard at MTL-12 on May 3. Manganese oxidizes slower and can persist in the reduced state long distances downstream even in aerobic environments. Manganese levels exceeded the state standard at MTL-1 on September 7 and at MTL-12 on every sampling date. Missouri's standard for manganese is for drinking water and groundwater. Missouri does not have a manganese standard for aquatic life.

Nitrogen and phosphates are sampled at all sites. All sites exceeded the total phosphorous 0.05 mg/l standard at least once during the sampling period. Phosphorous levels at the lake sites were higher in May. Conversely, the highest phosphorus levels recorded in the tributaries occurred in July. Phosphorus and nitrogen levels are lower in the tail waters than in the incoming tributary flows. Because phosphorous in water is not considered directly toxic to humans and animals no drinking water standards have been established for phosphorous. However, phosphorous can cause health threats through the stimulation of toxic algal blooms and the resulting oxygen depletion. Nitrates can pose a threat to human and animal health. Nitrate in water is toxic at high levels and has been linked to toxic effects of livestock and to blue baby disease (methemoglobinemia) in infants. The Maximum Contaminant Level (MCL) for nitrate-N in drinking water is 10mg/L to protect babies 3 to 6 months of age. The Missouri Water Quality Standard for ammonia nitrogen (NH_3-N) is 15mg/L. The state standard of 10 mg/L for nitrate nitrogen and 15 mg/L for ammonia nitrogen were not exceeded for the 2017 sampling year. The increased levels of phosphate in combination with nitrogen and other lake conditions, such as temperature, pH and stagnant lake conditions, can lead to increased algae growth. Eutrophication is currently the most widespread water quality problem in the U.S. and many other countries. Restoration of eutrophic waters requires the reduction of nonpoint inputs of phosphorous and nitrogen. The resulting detrimental effects of algae toxins and oxygen depletion could result in health problems for fish and other aquatic species as well as land animals utilizing the water supply.

Chlorophyll *a* was sampled at 4 sites, MTL-22, MTL-33, MTL-66 and MTL-77. MTL-15 is a duplicate sample of MTL-66. Chlorophyll *a* is a green pigment found in plants. Missouri does not currently have a standard for chlorophyll. Chlorophyll *a* concentrations are an indicator of phytoplankton abundance and biomass. They can be an effective measure of trophic status, and used as a measure of water quality. High levels often indicate poor water quality and low levels suggest good conditions. However, elevated levels are not necessarily bad. It is the long term persistence of elevated levels that is the problem. It is natural for chlorophyll *a* levels to fluctuate over time. Chlorophyll *a* tends to be higher after storm events and during the summer months when water temperatures and light levels are elevated. Chlorophyll can reduce the clarity of the water and the amount of oxygen available to other organisms. Chlorophyll concentrations and cyanobacteria cell counts serve as proxies for the actual presence of algal toxins. Exposure to cyanobacteria or their toxins may produce allergic reactions such as skin rashes, eye irritations, respiratory symptoms, and in some cases more severe health effects. Microcystin is currently believed to be the most common cyanotoxin in lakes. EPA's current guidance as of December 2016 for recreational Ambient Water Quality Criteria (AWQC) for Cyanotoxins is 4ug/L for microcystins and 8ug/L for Cylindrospermopsin. Mark Twain Lake was in the low to moderate risk of exposure category for chlorophyll. The data indicates a normal increase in chlorophyll levels during the warmer summer months.

Seventy percent of the Mark Twain Lake watershed is used for agriculture and 50% of this is used for cropland. Atrazine and Alachlor are pesticides that were sampled at all sites. These chemicals are herbicides used to control weed growth. The state standard of 3.0 ug/L for atrazine was exceeded on May 3 at MTL-9 and MTL-11. All other sites were below the state standard on this date and all were below the state standards for the other sampling events. Storm water runoff as a result of over 4 inches of precipitation in the week prior to May 3, likely contributed to the higher levels on this date. These substances can enter water bodies as a result of drift during spraying, surface runoff, and leaching through soil. Cyanizine, Metolachlor, Trifluralin and Simazine are also analyzed as part of the pesticide screening. No samples exceeded the state standards. In order to eliminate pesticide contamination of waters it is important for the public to be educated and institute best management practices when using these chemicals.

Total Suspended Solids (TSS) and Total Volatile Suspended Solids (TVSS) samples are collected at all sites. Solids can affect water quality by increasing temperature through the absorption of sunlight by the particles in the water, which also affects the clarity of the water. This can then affect the amount of oxygen in the water. Total Suspended Solids in the tributaries exceeded the standard of 116 mg/L (streams) at MTL-11 and MTL-9 on May 3. On May 4, the lake sites MTL-66 and MTL-77 exceeded the state standard of 12 mg/L (lakes). These spikes/exceedances in the tributaries and lake were likely due to the large amount of rain received in the preceding week.

Total Organic Carbon (TOC) is collected at all sites. TOC is an indicator of the organic character of water. The larger the carbon or organic content, the more oxygen is consumed. TOC tends to be higher in the summer months which may be a result of decaying plant material starting to decay after summer growth. TOC was fairly consistent within the lake ranging from 4.6 to 7.8 mg/L and in the tributaries from 4.4 to 13.0 mg/L. Missouri does not currently have a standard for TOC.

Temperature and dissolved oxygen levels were taken at all sites. Measurements were taken at 1 meter intervals at the lake sites. During the summer months the lake stratifies and a boundary is formed between the upper warmer water and the lower cooler water. This transition area is known as the thermocline, the area where the temperature drops significantly. Oxygen levels can also change drastically as a function of depth. This area where the oxygen level significantly drops is called the oxycline. The depth of the thermocline and oxycline can have an effect on the aquatic organisms. Occasionally the thermocline and oxycline are at or near the same depth. There were no exceedances for temperature and dissolved oxygen during the scheduled sampling events. The DO graphs for the sondes at the tailwater and re-reg dam are located in appendix C. There were multiple low DO events in the re-regulation pool near the Clarence Cannon Dam and one reported fish kill in 2017. A scheduled maintenance outage occurred during the month of June. After the first few days of no water flow into the re-regulation pool, high temperatures, and low precipitation approximately 1,900 fish were killed. Dissolved oxygen levels were below 4 mg/L during this event. Tainter gates were cracked open to allow higher oxygenated water into the pool a plan was implemented to allow some water into the pool as needed during the outage. The scheduled outage lasted until late June and during this time the DO dipped below 5 mg/L regularly, but no more fish kills were reported.

pH is taken at all sites and at 1 meter intervals at lake sites. There were multiple readings observed above and below the state standard range of 6.5 to 9. Sites 5, 11, and 13 were below a pH of 6.5 on May 3. Sites 1, 5 12, 13, and 33 were greater than a pH of 9.0 on July 12. Low variances in pH were likely caused by the heavy precipitation which lead up to and included the May 3rd sampling event. The high pH readings taken on July 12 might be attributed to very high air and water temperatures and algal activity.

Conductivity and redox are taken at all sites and at 1 meter intervals at lake sites. Recommended standard for conductivity is 1,700*u*S/cm. No sites exceeded this standard. Missouri does not currently have a standard for redox.

Seechi disk readings at sites 22 (above dam) and 33 (Lick Creek Arm near Hwy J) indicate that these sites tend to have better water clarity than the rest of the lake. This would seem to be reasonable since these sites are located closer to the dam which allows solids time to settle out of the water column as they travel down the lake.

3.3 Sediment Summary

Sediment sampling was not conducted in 2017. Sediment sampling is normally conducted every 5 years if funding is available and was last completed in 2007.

4.0 PLANNED 2018 STUDIES

The Mark Twain Lake water quality monitoring will continue in Fiscal Year 2018 with 4 sampling events. The greater number of sampling events there are, the better the ability to evaluate water quality trends, to better defend project operations (lake levels, releases, maintenance projects, construction projects, etc.), to better confirm that we meet state water quality standards, and to better confirm that human health and safety are adequately protected. As with any record keeping or data analysis, the greater the sample size, the more reliable the findings. The sampling events are planned to be conducted between February and September in 2018. Mark Twain Lake provides drinking water to many communities and is a high usage recreational lake. The monitoring of water quality is imperative to assure the water quality is within acceptable limits for the designated usage.

The sampling sites include the following: Site 1 (MTL-1) Spillway, Site 5 (MTL-5) South Fork at Hwy D, Site 13 (MTL-13) Elk Fork at 715, Site 9 (MTL-9) Middle Fork at Hwy 15, Site 11 (MTL-11) North Fork at Hwy 36, Site 12 (MTL-12) below re-regulation dam, Site 22 (MTL-22) old river channel 1mile up lake from dam, Site 33 (MTL-33) Lick Creek at Hwy J, Site 66 (MTL-66) South Fork at Hwy 107 bridge, and Site 77 (MTL-77) North Fork at Hwy 107 bridge. This combination of sites effectively represents the incoming contaminants and their effects on the lake.

A remote sensor was installed several years ago in the spillway to allow the project as well as water quality personnel to remotely monitor temperature and oxygen readings to avoid fish kills. During low flow, water is discharged through the after bay. This water is low in oxygen and can create a low oxygen area below the dam. The sensor allows the project to track oxygen levels below the dam and make appropriate adjustments to avoid a possible fish kill. Normally allowing water to spill through the tainter gates will alleviate low oxygen levels below the dam. In 2009 a remote sensor was installed in the re-reg pool near the re-reg dam to monitor the lower portion of the re-reg pool. This location on the re-reg dam is not situated in ideally constructed pipe. In the spring of 2018 EC-EQ plans to install a new platform on the upstream side of the re-reg dam. This setup will include high flow pipes and is intended to support two water quality instruments – one at shallow depth, and the other at a deeper depth. Water quality personnel will continue to maintain and monitor these probes. A water quality monitoring station was installed in 2016, and was fully operational in 2017. This pontoon was moored just upstream of the main dam in the lake. It will be installed again in 2018 and record the dissolved oxygen and temperature profile of the water column daily as well as anytime as needed. This will allow staff to identify the depth of the stratification layer and the depth at which the oxygen decreases as well as better understand the relationships between the lake levels, low dissolved oxygen depth, temperature control weir, and downstream (Re Regulation Pool) water quality during low flow conditions and power generation.

In mid-September of 2017 a concentrated animal feeding operation (CAFO) reportedly released animal waste into Turkey Creek – a tributary leading into the Elk Fork tributary to MTL (just upstream of site MTL-13). This was confirmed by the state of Missouri via a sunshine request. Some negative effects were observed by the state of Missouri during the investigation in Turkey Creek. Water quality staff did not observe any negative impacts downstream on October 10. Water quality staff will check this area during the already scheduled sampling events to ensure any future releases are observed and reported.

Sediment sampling will be conducted in the 2018 sampling season. One sampling event will occur for the year at all the Lake sites. The following parameters will be analyzed for: total phosphate, nitrate nitrogen, total kjeldahl nitrogen, total organic carbon, pesticides, and metals (arsenic, barium, boron, cadmium, chromium, copper, iron, lead, manganese, mercury, nickel, selenium, silver, and zinc).

APPENDIX A

DATA

LAB DATA

Site #	Collection Date	Parameter	Flag	Reported Result	MDL	PQL	Units
MTL-1	3/9/2017	Alachlor	<	0.20	0.20	0.20	UG/L
	5/3/2017	Alachlor	<	0.22	0.22	0.22	UG/L
	7/12/2017	Alachlor	<	0.20	0.20	0.20	UG/L
	9/7/2017	Alachlor	<	0.200	0.200	0.200	UG/L
MTL-11	3/9/2017	Alachlor	<	0.22	0.22	0.22	UG/L
	5/3/2017	Alachlor	<	0.20	0.20	0.20	UG/L
	7/12/2017	Alachlor	<	0.20	0.20	0.20	UG/L
	9/7/2017	Alachlor	<	0.200	0.200	0.200	UG/L
MTL-12	3/9/2017	Alachlor	<	0.22	0.22	0.22	UG/L
	5/3/2017	Alachlor	<	0.20	0.20	0.20	UG/L
	7/12/2017	Alachlor	<	0.20	0.20	0.20	UG/L
	9/7/2017	Alachlor	<	0.222	0.222	0.222	UG/L
MTL-13	3/9/2017	Alachlor	<	0.20	0.20	0.20	UG/L
	5/3/2017	Alachlor	<	0.20	0.20	0.20	UG/L
	7/12/2017	Alachlor	<	0.20	0.20	0.20	UG/L
	9/7/2017	Alachlor	<	0.200	0.200	0.200	UG/L
MTL-15-0	3/9/2017	Alachlor	<	0.22	0.22	0.22	UG/L
	5/4/2017	Alachlor	<	0.20	0.20	0.20	UG/L
	7/12/2017	Alachlor	<	0.20	0.20	0.20	UG/L
	9/7/2017	Alachlor	<	0.200	0.200	0.200	UG/L
MTL-22-0	3/9/2017	Alachlor	<	0.20	0.20	0.20	UG/L
	5/4/2017	Alachlor	<	0.22	0.22	0.22	UG/L
	7/12/2017	Alachlor	<	0.20	0.20	0.20	UG/L
	9/7/2017	Alachlor	<	0.200	0.200	0.200	UG/L
MTL-33-0	3/9/2017	Alachlor	<	0.20	0.20	0.20	UG/L
	7/12/2017	Alachlor	<	0.20	0.20	0.20	UG/L
	9/7/2017	Alachlor	<	0.200	0.200	0.200	UG/L
MTL-5	3/9/2017	Alachlor	<	0.20	0.20	0.20	UG/L
	5/3/2017	Alachlor	<	0.20	0.20	0.20	UG/L
	7/12/2017	Alachlor	<	0.20	0.20	0.20	UG/L
	9/7/2017	Alachlor	<	0.200	0.200	0.200	UG/L
MTL-66-0	3/9/2017	Alachlor	<	0.20	0.20	0.20	UG/L
	5/4/2017	Alachlor	<	0.20	0.20	0.20	UG/L

	7/12/2017	Alachlor	<	0.20	0.20	0.20	UG/L
	9/7/2017	Alachlor	<	0.200	0.200	0.200	UG/L
MTL-77-0	3/9/2017	Alachlor	<	0.22	0.22	0.22	UG/L
	5/4/2017	Alachlor	<	0.22	0.22	0.22	UG/L
	7/12/2017	Alachlor	<	0.20	0.20	0.20	UG/L
	9/7/2017	Alachlor	<	0.222	0.222	0.222	UG/L
MTL-9	3/9/2017	Alachlor	<	0.22	0.22	0.22	UG/L
	5/3/2017	Alachlor	<	0.20	0.20	0.20	UG/L
	7/12/2017	Alachlor	<	0.22	0.22	0.22	UG/L
	9/7/2017	Alachlor	<	0.200	0.200	0.200	UG/L
MTL-1	3/9/2017	Ammonia Nitrogen		0.053	0.030	0.030	MG/L
	5/3/2017	Ammonia Nitrogen		0.31	0.020	0.030	MG/L
	7/12/2017	Ammonia Nitrogen		0.057	0.020	0.030	MG/L
	9/7/2017	Ammonia Nitrogen		0.0482	0.0200	0.030 0	MG/L
MTL-11	3/9/2017	Ammonia Nitrogen		0.046	0.030	0.030	MG/L
	5/3/2017	Ammonia Nitrogen		0.22	0.020	0.030	MG/L
	7/12/2017	Ammonia Nitrogen		0.034	0.020	0.030	MG/L
	9/7/2017	Ammonia Nitrogen	<	0.0200	0.0200	0.030 0	MG/L
MTL-12	3/9/2017	Ammonia Nitrogen		0.040	0.030	0.030	MG/L
	5/3/2017	Ammonia Nitrogen		0.14	0.020	0.030	MG/L
	7/12/2017	Ammonia Nitrogen		0.10	0.020	0.030	MG/L
	9/7/2017	Ammonia Nitrogen		0.0581	0.0200	0.030 0	MG/L
MTL-13	3/9/2017	Ammonia Nitrogen		0.051	0.030	0.030	MG/L
	5/3/2017	Ammonia Nitrogen		0.22	0.020	0.030	MG/L
	7/12/2017	Ammonia Nitrogen		0.042	0.020	0.030	MG/L
	9/7/2017	Ammonia Nitrogen		0.0510	0.0200	0.030 0	MG/L
MTL-15-0	3/9/2017	Ammonia Nitrogen		0.056	0.030	0.030	MG/L
	5/4/2017	Ammonia Nitrogen		0.17	0.020	0.030	MG/L
	7/12/2017	Ammonia Nitrogen		0.035	0.020	0.030	MG/L
	9/7/2017	Ammonia Nitrogen		0.0831	0.0200	0.030 0	MG/L
MTL-22-0	3/9/2017	Ammonia Nitrogen	<	0.030	0.030	0.030	MG/L
	5/4/2017	Ammonia Nitrogen		0.039	0.020	0.030	MG/L
	7/12/2017	Ammonia Nitrogen		0.038	0.020	0.030	MG/L
	9/7/2017	Ammonia Nitrogen	<	0.0200	0.0200	0.030 0	MG/L
MTL-22-15	3/9/2017	Ammonia Nitrogen		0.034	0.030	0.030	MG/L

	5/4/2017	Ammonia Nitrogen		0.049	0.020	0.030	MG/L
	7/12/2017	Ammonia Nitrogen		0.054	0.020	0.030	MG/L
	9/7/2017	Ammonia Nitrogen	<	0.0200	0.0200	0.030 0	MG/L
MTL-33-0	3/9/2017	Ammonia Nitrogen	<	0.030	0.030	0.030	MG/L
	5/4/2017	Ammonia Nitrogen		0.12	0.020	0.030	MG/L
	7/12/2017	Ammonia Nitrogen	J	0.022	0.020	0.030	MG/L
	9/7/2017	Ammonia Nitrogen	J	0.0275	0.0200	0.030 0	MG/L
MTL-5	3/9/2017	Ammonia Nitrogen		0.066	0.030	0.030	MG/L
	5/3/2017	Ammonia Nitrogen		0.27	0.020	0.030	MG/L
	7/12/2017	Ammonia Nitrogen	<	0.020	0.020	0.030	MG/L
	9/7/2017	Ammonia Nitrogen		0.0781	0.0200	0.030 0	MG/L
MTL-66-0	3/9/2017	Ammonia Nitrogen	<	0.030	0.030	0.030	MG/L
	5/4/2017	Ammonia Nitrogen		0.23	0.020	0.030	MG/L
	7/12/2017	Ammonia Nitrogen	J	0.025	0.020	0.030	MG/L
	9/7/2017	Ammonia Nitrogen		0.0708	0.0200	0.030 0	MG/L
MTL-77-0	3/9/2017	Ammonia Nitrogen		0.037	0.030	0.030	MG/L
	5/4/2017	Ammonia Nitrogen		0.12	0.020	0.030	MG/L
	7/12/2017	Ammonia Nitrogen		0.072	0.020	0.030	MG/L
	9/7/2017	Ammonia Nitrogen	<	0.0200	0.0200	0.030 0	MG/L
MTL-9	3/9/2017	Ammonia Nitrogen		0.045	0.030	0.030	MG/L
	5/3/2017	Ammonia Nitrogen		0.18	0.020	0.030	MG/L
	7/12/2017	Ammonia Nitrogen		0.078	0.020	0.030	MG/L
	9/7/2017	Ammonia Nitrogen	J	0.0249	0.0200	0.030 0	MG/L
MTL-1	3/9/2017	Atrazine	<	0.20	0.20	0.20	UG/L
MTL-1	5/3/2017	Atrazine		1.2	0.22	0.22	UG/L
MTL-1	7/12/2017	Atrazine		0.58	0.20	0.20	UG/L
MTL-1	9/7/2017	Atrazine		0.910	0.200	0.200	UG/L
MTL-11	3/9/2017	Atrazine	<	0.22	0.22	0.22	UG/L
MTL-11	5/3/2017	Atrazine		16.6	0.80	0.80	UG/L
MTL-11	7/12/2017	Atrazine		0.50	0.20	0.20	UG/L
MTL-11	9/7/2017	Atrazine	<	0.200	0.200	0.200	UG/L
MTL-12	3/9/2017	Atrazine	<	0.22	0.22	0.22	UG/L
MTL-12	5/3/2017	Atrazine		2.0	0.20	0.20	UG/L
MTL-12	7/12/2017	Atrazine		0.61	0.20	0.20	UG/L
MTL-12	9/7/2017	Atrazine		0.689	0.222	0.222	UG/L

MTL-13	3/9/2017	Atrazine	<	0.20	0.20	0.20	UG/L
MTL-13	5/3/2017	Atrazine		10.8	0.40	0.40	UG/L
MTL-13	7/12/2017	Atrazine		1.2	0.20	0.20	UG/L
MTL-13	9/7/2017	Atrazine	<	0.200	0.200	0.200	UG/L
MTL-15-0	3/9/2017	Atrazine	<	0.22	0.22	0.22	UG/L
MTL-15-0	5/4/2017	Atrazine		8.8	0.20	0.20	UG/L
MTL-15-0	7/12/2017	Atrazine		0.88	0.20	0.20	UG/L
MTL-15-0	9/7/2017	Atrazine		0.970	0.200	0.200	UG/L
MTL-22-0	3/9/2017	Atrazine	<	0.20	0.20	0.20	UG/L
MTL-22-0	5/4/2017	Atrazine		0.23	0.22	0.22	UG/L
MTL-22-0	7/12/2017	Atrazine		0.46	0.20	0.20	UG/L
MTL-22-0	9/7/2017	Atrazine		0.930	0.200	0.200	UG/L
MTL-33-0	3/9/2017	Atrazine	<	0.20	0.20	0.20	UG/L
MTL-33-0	7/12/2017	Atrazine		0.69	0.20	0.20	UG/L
MTL-33-0	9/7/2017	Atrazine		0.870	0.200	0.200	UG/L
MTL-5	3/9/2017	Atrazine	<	0.20	0.20	0.20	UG/L
MTL-5	5/3/2017	Atrazine		12.4	0.40	0.40	UG/L
MTL-5	7/12/2017	Atrazine		0.69	0.20	0.20	UG/L
MTL-5	9/7/2017	Atrazine	<	0.200	0.200	0.200	UG/L
MTL-66-0	3/9/2017	Atrazine	<	0.20	0.20	0.20	UG/L
MTL-66-0	5/4/2017	Atrazine		8.2	0.20	0.20	UG/L
MTL-66-0	7/12/2017	Atrazine		0.66	0.20	0.20	UG/L
MTL-66-0	9/7/2017	Atrazine		0.890	0.200	0.200	UG/L
MTL-77-0	3/9/2017	Atrazine	<	0.22	0.22	0.22	UG/L
MTL-77-0	5/4/2017	Atrazine		5.3	0.22	0.22	UG/L
MTL-77-0	7/12/2017	Atrazine		0.70	0.20	0.20	UG/L
MTL-77-0	9/7/2017	Atrazine		0.878	0.222	0.222	UG/L
MTL-9	3/9/2017	Atrazine	<	0.22	0.22	0.22	UG/L
MTL-9	5/3/2017	Atrazine		17.6	0.80	0.80	UG/L
MTL-9	7/12/2017	Atrazine		0.92	0.22	0.22	UG/L
MTL-9	9/7/2017	Atrazine	<	0.200	0.200	0.200	UG/L
MTL-15-0	3/9/2017	Chlorophyll a		9.5	2.0	2.0	MG/CU.M.
	5/4/2017	Chlorophyll a		2.1	2.0	2.0	MG/CU.M.
	7/12/2017	Chlorophyll a		23.1	1.0	1.0	MG/CU.M.
	9/7/2017	Chlorophyll a		12.7	1.00	1.00	MG/CU.M.
MTL-22-0	3/9/2017	Chlorophyll a		4.3	2.0	2.0	MG/CU.M.

	5/4/2017	Chlorophyll a		3.3	2.0	2.0	MG/CU.M.
	7/12/2017	Chlorophyll a		21.4	1.0	1.0	MG/CU.M.
	9/7/2017	Chlorophyll a		21.7	1.00	1.00	MG/CU.M.
MTL-33-0	3/9/2017	Chlorophyll a		3.5	2.0	2.0	MG/CU.M.
	5/4/2017	Chlorophyll a		4.0	2.0	2.0	MG/CU.M.
	7/12/2017	Chlorophyll a		20.9	1.0	1.0	MG/CU.M.
	9/7/2017	Chlorophyll a		21.2	1.00	1.00	MG/CU.M.
MTL-66-0	3/9/2017	Chlorophyll a		8.8	2.0	2.0	MG/CU.M.
	5/4/2017	Chlorophyll a		2.1	2.0	2.0	MG/CU.M.
	7/12/2017	Chlorophyll a		20.9	1.0	1.0	MG/CU.M.
	9/7/2017	Chlorophyll a		14.4	1.00	1.00	MG/CU.M.
MTL-77-0	3/9/2017	Chlorophyll a		7.5	2.0	2.0	MG/CU.M.
	5/4/2017	Chlorophyll a	<	2.0	2.0	2.0	MG/CU.M.
	7/12/2017	Chlorophyll a		19.2	1.0	1.0	MG/CU.M.
	9/7/2017	Chlorophyll a		20.0	1.00	1.00	MG/CU.M.
MTL-1	3/9/2017	Chlorpyrifos	<	0.20	0.20	0.20	UG/L
MTL-1	5/3/2017	Chlorpyrifos	<	0.22	0.22	0.22	UG/L
MTL-1	7/12/2017	Chlorpyrifos	<	0.20	0.20	0.20	UG/L
MTL-1	9/7/2017	Chlorpyrifos	<	0.200	0.200	0.200	UG/L
MTL-11	3/9/2017	Chlorpyrifos	<	0.22	0.22	0.22	UG/L
MTL-11	5/3/2017	Chlorpyrifos	<	0.20	0.20	0.20	UG/L
MTL-11	7/12/2017	Chlorpyrifos	<	0.20	0.20	0.20	UG/L
MTL-11	9/7/2017	Chlorpyrifos	<	0.200	0.200	0.200	UG/L
MTL-12	3/9/2017	Chlorpyrifos	<	0.22	0.22	0.22	UG/L
MTL-12	5/3/2017	Chlorpyrifos	<	0.20	0.20	0.20	UG/L
MTL-12	7/12/2017	Chlorpyrifos	<	0.20	0.20	0.20	UG/L

MTL-12	9/7/2017	Chlorpyrifos	<	0.222	0.222	0.222	UG/L
MTL-13	3/9/2017	Chlorpyrifos	<	0.20	0.20	0.20	UG/L
MTL-13	5/3/2017	Chlorpyrifos	<	0.20	0.20	0.20	UG/L
MTL-13	7/12/2017	Chlorpyrifos	<	0.20	0.20	0.20	UG/L
MTL-13	9/7/2017	Chlorpyrifos	<	0.200	0.200	0.200	UG/L
MTL-15-0	3/9/2017	Chlorpyrifos	<	0.22	0.22	0.22	UG/L
MTL-15-0	5/4/2017	Chlorpyrifos	<	0.20	0.20	0.20	UG/L
MTL-15-0	7/12/2017	Chlorpyrifos	<	0.20	0.20	0.20	UG/L
MTL-15-0	9/7/2017	Chlorpyrifos	<	0.200	0.200	0.200	UG/L
MTL-22-0	3/9/2017	Chlorpyrifos	<	0.20	0.20	0.20	UG/L
MTL-22-0	5/4/2017	Chlorpyrifos	<	0.22	0.22	0.22	UG/L
MTL-22-0	7/12/2017	Chlorpyrifos	<	0.20	0.20	0.20	UG/L
MTL-22-0	9/7/2017	Chlorpyrifos	<	0.200	0.200	0.200	UG/L
MTL-33-0	3/9/2017	Chlorpyrifos	<	0.20	0.20	0.20	UG/L
MTL-33-0	7/12/2017	Chlorpyrifos	<	0.20	0.20	0.20	UG/L
MTL-33-0	9/7/2017	Chlorpyrifos	<	0.200	0.200	0.200	UG/L
MTL-5	3/9/2017	Chlorpyrifos	<	0.20	0.20	0.20	UG/L
MTL-5	5/3/2017	Chlorpyrifos	<	0.20	0.20	0.20	UG/L
MTL-5	7/12/2017	Chlorpyrifos	<	0.20	0.20	0.20	UG/L
MTL-5	9/7/2017	Chlorpyrifos	<	0.200	0.200	0.200	UG/L
MTL-66-0	3/9/2017	Chlorpyrifos	<	0.20	0.20	0.20	UG/L
MTL-66-0	5/4/2017	Chlorpyrifos	<	0.20	0.20	0.20	UG/L
MTL-66-0	7/12/2017	Chlorpyrifos	<	0.20	0.20	0.20	UG/L
MTL-66-0	9/7/2017	Chlorpyrifos	<	0.200	0.200	0.200	UG/L
MTL-77-0	3/9/2017	Chlorpyrifos	<	0.22	0.22	0.22	UG/L
MTL-77-0	5/4/2017	Chlorpyrifos	<	0.22	0.22	0.22	UG/L
MTL-77-0	7/12/2017	Chlorpyrifos	<	0.20	0.20	0.20	UG/L
MTL-77-0	9/7/2017	Chlorpyrifos	<	0.222	0.222	0.222	UG/L
MTL-9	3/9/2017	Chlorpyrifos	<	0.22	0.22	0.22	UG/L
MTL-9	5/3/2017	Chlorpyrifos	<	0.20	0.20	0.20	UG/L
MTL-9	7/12/2017	Chlorpyrifos	<	0.22	0.22	0.22	UG/L
MTL-9	9/7/2017	Chlorpyrifos	<	0.200	0.200	0.200	UG/L
MTL-1	3/9/2017	Cyanazine	<	0.20	0.20	0.20	UG/L
MTL-1	5/3/2017	Cyanazine	<	0.22	0.22	0.22	UG/L
MTL-1	7/12/2017	Cyanazine	<	0.20	0.20	0.20	UG/L
MTL-1	9/7/2017	Cyanazine	<	0.200	0.200	0.200	UG/L
MTL-11	3/9/2017	Cyanazine	<	0.22	0.22	0.22	UG/L
MTL-11	5/3/2017	Cyanazine	<	0.20	0.20	0.20	UG/L
MTL-11	7/12/2017	Cyanazine	<	0.20	0.20	0.20	UG/L
MTL-11	9/7/2017	Cyanazine	<	0.200	0.200	0.200	UG/L

MTL-12	3/9/2017	Cyanazine	<	0.22	0.22	0.22	UG/L
MTL-12	5/3/2017	Cyanazine	<	0.20	0.20	0.20	UG/L
MTL-12	7/12/2017	Cyanazine	<	0.20	0.20	0.20	UG/L
MTL-12	9/7/2017	Cyanazine	<	0.222	0.222	0.222	UG/L
MTL-13	3/9/2017	Cyanazine	<	0.20	0.20	0.20	UG/L
MTL-13	5/3/2017	Cyanazine	<	0.20	0.20	0.20	UG/L
MTL-13	7/12/2017	Cyanazine	<	0.20	0.20	0.20	UG/L
MTL-13	9/7/2017	Cyanazine	<	0.200	0.200	0.200	UG/L
MTL-15-0	3/9/2017	Cyanazine	<	0.22	0.22	0.22	UG/L
MTL-15-0	5/4/2017	Cyanazine	<	0.20	0.20	0.20	UG/L
MTL-15-0	7/12/2017	Cyanazine	<	0.20	0.20	0.20	UG/L
MTL-15-0	9/7/2017	Cyanazine	<	0.200	0.200	0.200	UG/L
MTL-22-0	3/9/2017	Cyanazine	<	0.20	0.20	0.20	UG/L
MTL-22-0	5/4/2017	Cyanazine	<	0.22	0.22	0.22	UG/L
MTL-22-0	7/12/2017	Cyanazine	<	0.20	0.20	0.20	UG/L
MTL-22-0	9/7/2017	Cyanazine	<	0.200	0.200	0.200	UG/L
MTL-33-0	3/9/2017	Cyanazine	<	0.20	0.20	0.20	UG/L
MTL-33-0	7/12/2017	Cyanazine	<	0.20	0.20	0.20	UG/L
MTL-33-0	9/7/2017	Cyanazine	<	0.200	0.200	0.200	UG/L
MTL-5	3/9/2017	Cyanazine	<	0.20	0.20	0.20	UG/L
MTL-5	5/3/2017	Cyanazine	<	0.20	0.20	0.20	UG/L
MTL-5	7/12/2017	Cyanazine	<	0.20	0.20	0.20	UG/L
MTL-5	9/7/2017	Cyanazine	<	0.200	0.200	0.200	UG/L
MTL-66-0	3/9/2017	Cyanazine	<	0.20	0.20	0.20	UG/L
MTL-66-0	5/4/2017	Cyanazine	<	0.20	0.20	0.20	UG/L
MTL-66-0	7/12/2017	Cyanazine	<	0.20	0.20	0.20	UG/L
MTL-66-0	9/7/2017	Cyanazine	<	0.200	0.200	0.200	UG/L
MTL-77-0	3/9/2017	Cyanazine	<	0.22	0.22	0.22	UG/L
MTL-77-0	5/4/2017	Cyanazine	<	0.22	0.22	0.22	UG/L
MTL-77-0	7/12/2017	Cyanazine	<	0.20	0.20	0.20	UG/L
MTL-77-0	9/7/2017	Cyanazine	<	0.222	0.222	0.222	UG/L
MTL-9	3/9/2017	Cyanazine	<	0.22	0.22	0.22	UG/L
MTL-9	5/3/2017	Cyanazine	<	0.20	0.20	0.20	UG/L
MTL-9	7/12/2017	Cyanazine	<	0.22	0.22	0.22	UG/L
MTL-9	9/7/2017	Cyanazine	<	0.200	0.200	0.200	UG/L
BJ MARINA	5/4/2017	E. Coliform		150	1.0	1.0	COL/100 ML
BJ MARINA	7/13/2017	E. Coliform		1.0	1.0	1.0	COL/100 ML
BJ MARINA	9/7/2017	E. Coliform		2.00	1.00	1.00	COL/100 ML

IC MARINA	5/4/2017	E. Coliform		100	1.0	1.0	COL/100 ML
IC MARINA	7/13/2017	E. Coliform		12.0	1.0	1.0	COL/100 ML
IC MARINA	9/7/2017	E. Coliform		5.00	1.00	1.00	COL/100 ML
MTL-1	3/9/2017	Iron		0.72	0.050	0.10	MG/L
	5/3/2017	Iron		0.66	0.050	0.10	MG/L
	7/12/2017	Iron		0.33	0.040	0.050	MG/L
	9/7/2017	Iron		0.304	0.0400	0.0500	MG/L
MTL-12	3/9/2017	Iron		0.80	0.050	0.10	MG/L
	5/3/2017	Iron		2.3	0.050	0.10	MG/L
	7/12/2017	Iron		0.50	0.040	0.050	MG/L
	9/7/2017	Iron		0.384	0.0400	0.0500	MG/L
MTL-22-15	3/9/2017	Iron		0.77	0.050	0.10	MG/L
	5/4/2017	Iron		0.87	0.050	0.10	MG/L
	7/12/2017	Iron		0.15	0.040	0.050	MG/L
	9/7/2017	Iron		0.129	0.0400	0.0500	MG/L
MTL-1	3/9/2017	Manganese		0.049	0.0050	0.010	MG/L
	5/3/2017	Manganese		0.027	0.0050	0.010	MG/L
	7/12/2017	Manganese		0.040	0.0040	0.0050	MG/L
	9/7/2017	Manganese		0.0894	0.00400	0.00500	MG/L
MTL-12	3/9/2017	Manganese		0.073	0.0050	0.010	MG/L
	5/3/2017	Manganese		0.11	0.0050	0.010	MG/L
	7/12/2017	Manganese		0.056	0.0040	0.0050	MG/L
	9/7/2017	Manganese		0.119	0.00400	0.00500	MG/L
MTL-22-15	3/9/2017	Manganese		0.049	0.0050	0.010	MG/L
	5/4/2017	Manganese		0.028	0.0050	0.010	MG/L
	7/12/2017	Manganese		0.010	0.0040	0.0050	MG/L
	9/7/2017	Manganese		0.0359	0.00400	0.00500	MG/L
MTL-1	3/9/2017	Metolachlor		0.35	0.20	0.20	UG/L
MTL-1	5/3/2017	Metolachlor		0.22	0.22	0.22	UG/L

MTL-1	7/12/2017	Metolachlor		3.0	0.20	0.20	UG/L
MTL-1	9/7/2017	Metolachlor		1.94	0.200	0.200	UG/L
MTL-11	3/9/2017	Metolachlor	<	0.22	0.22	0.22	UG/L
MTL-11	5/3/2017	Metolachlor		3.5	0.20	0.20	UG/L
MTL-11	7/12/2017	Metolachlor		1.1	0.20	0.20	UG/L
MTL-11	9/7/2017	Metolachlor	<	0.200	0.200	0.200	UG/L
MTL-12	3/9/2017	Metolachlor		0.37	0.22	0.22	UG/L
MTL-12	5/3/2017	Metolachlor	<	0.20	0.20	0.20	UG/L
MTL-12	7/12/2017	Metolachlor		3.1	0.20	0.20	UG/L
MTL-12	9/7/2017	Metolachlor		1.57	0.222	0.222	UG/L
MTL-13	3/9/2017	Metolachlor	<	0.20	0.20	0.20	UG/L
MTL-13	5/3/2017	Metolachlor		0.86	0.20	0.20	UG/L
MTL-13	7/12/2017	Metolachlor		2.0	0.20	0.20	UG/L
MTL-13	9/7/2017	Metolachlor	<	0.200	0.200	0.200	UG/L
MTL-15-0	3/9/2017	Metolachlor		0.22	0.22	0.22	UG/L
MTL-15-0	5/4/2017	Metolachlor		1.6	0.20	0.20	UG/L
MTL-15-0	7/12/2017	Metolachlor		3.1	0.20	0.20	UG/L
MTL-15-0	9/7/2017	Metolachlor		1.68	0.200	0.200	UG/L
MTL-22-0	3/9/2017	Metolachlor		0.37	0.20	0.20	UG/L
MTL-22-0	5/4/2017	Metolachlor	<	0.22	0.22	0.22	UG/L
MTL-22-0	7/12/2017	Metolachlor		2.6	0.20	0.20	UG/L
MTL-22-0	9/7/2017	Metolachlor		1.96	0.200	0.200	UG/L
MTL-33-0	3/9/2017	Metolachlor		0.35	0.20	0.20	UG/L
MTL-33-0	7/12/2017	Metolachlor		3.0	0.20	0.20	UG/L
MTL-33-0	9/7/2017	Metolachlor		1.83	0.200	0.200	UG/L
MTL-5	3/9/2017	Metolachlor	<	0.20	0.20	0.20	UG/L
MTL-5	5/3/2017	Metolachlor		3.2	0.20	0.20	UG/L
MTL-5	7/12/2017	Metolachlor		1.4	0.20	0.20	UG/L
MTL-5	9/7/2017	Metolachlor	<	0.200	0.200	0.200	UG/L
MTL-66-0	3/9/2017	Metolachlor		0.22	0.20	0.20	UG/L
MTL-66-0	5/4/2017	Metolachlor		1.4	0.20	0.20	UG/L
MTL-66-0	7/12/2017	Metolachlor		2.5	0.20	0.20	UG/L
MTL-66-0	9/7/2017	Metolachlor		1.57	0.200	0.200	UG/L
MTL-77-0	3/9/2017	Metolachlor		0.26	0.22	0.22	UG/L
MTL-77-0	5/4/2017	Metolachlor		0.97	0.22	0.22	UG/L
MTL-77-0	7/12/2017	Metolachlor		3.2	0.20	0.20	UG/L
MTL-77-0	9/7/2017	Metolachlor		1.68	0.222	0.222	UG/L
MTL-9	3/9/2017	Metolachlor	<	0.22	0.22	0.22	UG/L
MTL-9	5/3/2017	Metolachlor		4.6	0.20	0.20	UG/L
MTL-9	7/12/2017	Metolachlor		0.97	0.22	0.22	UG/L

MTL-9	9/7/2017	Metolachlor	<	0.200	0.200	0.200	UG/L
MTL-1	3/9/2017	Metribuzin	<	0.20	0.20	0.20	UG/L
MTL-1	5/3/2017	Metribuzin	<	0.22	0.22	0.22	UG/L
MTL-1	7/12/2017	Metribuzin	<	0.20	0.20	0.20	UG/L
MTL-1	9/7/2017	Metribuzin	<	0.200	0.200	0.200	UG/L
MTL-11	3/9/2017	Metribuzin	<	0.22	0.22	0.22	UG/L
MTL-11	5/3/2017	Metribuzin		0.44	0.20	0.20	UG/L
MTL-11	7/12/2017	Metribuzin	<	0.20	0.20	0.20	UG/L
MTL-11	9/7/2017	Metribuzin	<	0.200	0.200	0.200	UG/L
MTL-12	3/9/2017	Metribuzin	<	0.22	0.22	0.22	UG/L
MTL-12	5/3/2017	Metribuzin	<	0.20	0.20	0.20	UG/L
MTL-12	7/12/2017	Metribuzin		0.20	0.20	0.20	UG/L
MTL-12	9/7/2017	Metribuzin	<	0.222	0.222	0.222	UG/L
MTL-13	3/9/2017	Metribuzin	<	0.20	0.20	0.20	UG/L
MTL-13	5/3/2017	Metribuzin	<	0.20	0.20	0.20	UG/L
MTL-13	7/12/2017	Metribuzin	<	0.20	0.20	0.20	UG/L
MTL-13	9/7/2017	Metribuzin	<	0.200	0.200	0.200	UG/L
MTL-15-0	3/9/2017	Metribuzin	<	0.22	0.22	0.22	UG/L
MTL-15-0	5/4/2017	Metribuzin		0.25	0.20	0.20	UG/L
MTL-15-0	7/12/2017	Metribuzin	<	0.20	0.20	0.20	UG/L
MTL-15-0	9/7/2017	Metribuzin	<	0.200	0.200	0.200	UG/L
MTL-22-0	3/9/2017	Metribuzin	<	0.20	0.20	0.20	UG/L
MTL-22-0	5/4/2017	Metribuzin	<	0.22	0.22	0.22	UG/L
MTL-22-0	7/12/2017	Metribuzin	<	0.20	0.20	0.20	UG/L
MTL-22-0	9/7/2017	Metribuzin	<	0.200	0.200	0.200	UG/L
MTL-33-0	3/9/2017	Metribuzin	<	0.20	0.20	0.20	UG/L
MTL-33-0	7/12/2017	Metribuzin	<	0.20	0.20	0.20	UG/L
MTL-33-0	9/7/2017	Metribuzin	<	0.200	0.200	0.200	UG/L
MTL-5	3/9/2017	Metribuzin	<	0.20	0.20	0.20	UG/L
MTL-5	5/3/2017	Metribuzin		0.42	0.20	0.20	UG/L
MTL-5	7/12/2017	Metribuzin	<	0.20	0.20	0.20	UG/L
MTL-5	9/7/2017	Metribuzin	<	0.200	0.200	0.200	UG/L
MTL-66-0	3/9/2017	Metribuzin	<	0.20	0.20	0.20	UG/L
MTL-66-0	5/4/2017	Metribuzin		0.23	0.20	0.20	UG/L
MTL-66-0	7/12/2017	Metribuzin	<	0.20	0.20	0.20	UG/L
MTL-66-0	9/7/2017	Metribuzin	<	0.200	0.200	0.200	UG/L
MTL-77-0	3/9/2017	Metribuzin	<	0.22	0.22	0.22	UG/L
MTL-77-0	5/4/2017	Metribuzin	<	0.22	0.22	0.22	UG/L
MTL-77-0	7/12/2017	Metribuzin		0.20	0.20	0.20	UG/L
MTL-77-0	9/7/2017	Metribuzin	<	0.222	0.222	0.222	UG/L

MTL-9	3/9/2017	Metribuzin	<	0.22	0.22	0.22	UG/L
MTL-9	5/3/2017	Metribuzin		0.73	0.20	0.20	UG/L
MTL-9	7/12/2017	Metribuzin	<	0.22	0.22	0.22	UG/L
MTL-9	9/7/2017	Metribuzin	<	0.200	0.200	0.200	UG/L
MTL-1	3/9/2017	Nitrate as Nitrogen		0.55	0.040	0.040	MG/L
	5/3/2017	Nitrate as Nitrogen		0.80	0.038	0.040	MG/L
	7/12/2017	Nitrate as Nitrogen		0.92	0.019	0.020	MG/L
	9/7/2017	Nitrate as Nitrogen	<	0.0190	0.0190	0.020 0	MG/L
MTL-11	3/9/2017	Nitrate as Nitrogen		0.23	0.040	0.040	MG/L
	5/3/2017	Nitrate as Nitrogen		2.3	0.038	0.040	MG/L
	7/12/2017	Nitrate as Nitrogen	<	0.019	0.019	0.020	MG/L
	9/7/2017	Nitrate as Nitrogen	<	0.0190	0.0190	0.020 0	MG/L
MTL-12	3/9/2017	Nitrate as Nitrogen		0.37	0.040	0.040	MG/L
	5/3/2017	Nitrate as Nitrogen		0.92	0.038	0.040	MG/L
	7/12/2017	Nitrate as Nitrogen		0.91	0.019	0.020	MG/L
	9/7/2017	Nitrate as Nitrogen	<	0.0190	0.0190	0.020 0	MG/L
MTL-13	3/9/2017	Nitrate as Nitrogen		0.090	0.040	0.040	MG/L
	5/3/2017	Nitrate as Nitrogen		2.6	0.038	0.040	MG/L
	7/12/2017	Nitrate as Nitrogen		0.097	0.019	0.020	MG/L
	9/7/2017	Nitrate as Nitrogen	<	0.0190	0.0190	0.020 0	MG/L
MTL-15-0	3/9/2017	Nitrate as Nitrogen		0.80	0.040	0.040	MG/L
	5/4/2017	Nitrate as Nitrogen		2.0	0.038	0.040	MG/L
	7/12/2017	Nitrate as Nitrogen		0.60	0.019	0.020	MG/L
	9/7/2017	Nitrate as Nitrogen	<	0.0190	0.0190	0.020 0	MG/L
MTL-22-0	3/9/2017	Nitrate as Nitrogen		0.54	0.040	0.040	MG/L
	5/4/2017	Nitrate as Nitrogen		1.4	0.038	0.040	MG/L
	7/12/2017	Nitrate as Nitrogen		0.82	0.019	0.020	MG/L
	9/7/2017	Nitrate as Nitrogen	<	0.0190	0.0190	0.020 0	MG/L
MTL-22-15	3/9/2017	Nitrate as Nitrogen		0.57	0.040	0.040	MG/L
	5/4/2017	Nitrate as Nitrogen		1.4	0.038	0.040	MG/L
	7/12/2017	Nitrate as Nitrogen		0.84	0.019	0.020	MG/L
	9/7/2017	Nitrate as Nitrogen	<	0.0190	0.0190	0.020 0	MG/L
MTL-33-0	3/9/2017	Nitrate as Nitrogen		0.56	0.040	0.040	MG/L
	5/4/2017	Nitrate as Nitrogen		1.2	0.038	0.040	MG/L

	7/12/2017	Nitrate as Nitrogen		0.78	0.019	0.020	MG/L
	9/7/2017	Nitrate as Nitrogen	<	0.0190	0.0190	0.020 0	MG/L
MTL-5	3/9/2017	Nitrate as Nitrogen		0.080	0.040	0.040	MG/L
	5/3/2017	Nitrate as Nitrogen		0.25	0.038	0.040	MG/L
	7/12/2017	Nitrate as Nitrogen		0.23	0.019	0.020	MG/L
	9/7/2017	Nitrate as Nitrogen	<	0.0190	0.0190	0.020 0	MG/L
MTL-66-0	3/9/2017	Nitrate as Nitrogen		0.81	0.040	0.040	MG/L
	5/4/2017	Nitrate as Nitrogen		2.0	0.038	0.040	MG/L
	7/12/2017	Nitrate as Nitrogen		0.64	0.019	0.020	MG/L
	9/7/2017	Nitrate as Nitrogen	<	0.0190	0.0190	0.020 0	MG/L
MTL-77-0	3/9/2017	Nitrate as Nitrogen		0.80	0.040	0.040	MG/L
	5/4/2017	Nitrate as Nitrogen		2.2	0.038	0.040	MG/L
	7/12/2017	Nitrate as Nitrogen		0.80	0.019	0.020	MG/L
	9/7/2017	Nitrate as Nitrogen	<	0.0190	0.0190	0.020 0	MG/L
MTL-9	3/9/2017	Nitrate as Nitrogen		0.064	0.040	0.040	MG/L
	5/3/2017	Nitrate as Nitrogen		2.2	0.038	0.040	MG/L
	7/12/2017	Nitrate as Nitrogen		0.020	0.019	0.020	MG/L
	9/7/2017	Nitrate as Nitrogen	<	0.0190	0.0190	0.020 0	MG/L
MTL-1	3/9/2017	Pendimethalin	<	0.20	0.20	0.20	UG/L
MTL-1	5/3/2017	Pendimethalin	<	0.22	0.22	0.22	UG/L
MTL-1	7/12/2017	Pendimethalin	<	0.20	0.20	0.20	UG/L
MTL-1	9/7/2017	Pendimethalin	<	0.200	0.200	0.200	UG/L
MTL-11	3/9/2017	Pendimethalin	<	0.22	0.22	0.22	UG/L
MTL-11	5/3/2017	Pendimethalin	<	0.20	0.20	0.20	UG/L
MTL-11	7/12/2017	Pendimethalin	<	0.20	0.20	0.20	UG/L
MTL-11	9/7/2017	Pendimethalin	<	0.200	0.200	0.200	UG/L
MTL-12	3/9/2017	Pendimethalin	<	0.22	0.22	0.22	UG/L
MTL-12	5/3/2017	Pendimethalin	<	0.20	0.20	0.20	UG/L
MTL-12	7/12/2017	Pendimethalin	<	0.20	0.20	0.20	UG/L
MTL-12	9/7/2017	Pendimethalin	<	0.222	0.222	0.222	UG/L
MTL-13	3/9/2017	Pendimethalin	<	0.20	0.20	0.20	UG/L
MTL-13	5/3/2017	Pendimethalin	<	0.20	0.20	0.20	UG/L
MTL-13	7/12/2017	Pendimethalin	<	0.20	0.20	0.20	UG/L
MTL-13	9/7/2017	Pendimethalin	<	0.200	0.200	0.200	UG/L
MTL-15-0	3/9/2017	Pendimethalin	<	0.22	0.22	0.22	UG/L
MTL-15-0	5/4/2017	Pendimethalin	<	0.20	0.20	0.20	UG/L

MTL-15-0	7/12/2017	Pendimethalin	<	0.20	0.20	0.20	UG/L
MTL-15-0	9/7/2017	Pendimethalin	<	0.200	0.200	0.200	UG/L
MTL-22-0	3/9/2017	Pendimethalin	<	0.20	0.20	0.20	UG/L
MTL-22-0	5/4/2017	Pendimethalin	<	0.22	0.22	0.22	UG/L
MTL-22-0	7/12/2017	Pendimethalin	<	0.20	0.20	0.20	UG/L
MTL-22-0	9/7/2017	Pendimethalin	<	0.200	0.200	0.200	UG/L
MTL-33-0	3/9/2017	Pendimethalin	<	0.20	0.20	0.20	UG/L
MTL-33-0	7/12/2017	Pendimethalin	<	0.20	0.20	0.20	UG/L
MTL-33-0	9/7/2017	Pendimethalin	<	0.200	0.200	0.200	UG/L
MTL-5	3/9/2017	Pendimethalin	<	0.20	0.20	0.20	UG/L
MTL-5	5/3/2017	Pendimethalin	<	0.20	0.20	0.20	UG/L
MTL-5	7/12/2017	Pendimethalin	<	0.20	0.20	0.20	UG/L
MTL-5	9/7/2017	Pendimethalin	<	0.200	0.200	0.200	UG/L
MTL-66-0	3/9/2017	Pendimethalin	<	0.20	0.20	0.20	UG/L
MTL-66-0	5/4/2017	Pendimethalin	<	0.20	0.20	0.20	UG/L
MTL-66-0	7/12/2017	Pendimethalin	<	0.20	0.20	0.20	UG/L
MTL-66-0	9/7/2017	Pendimethalin	<	0.200	0.200	0.200	UG/L
MTL-77-0	3/9/2017	Pendimethalin	<	0.22	0.22	0.22	UG/L
MTL-77-0	5/4/2017	Pendimethalin	<	0.22	0.22	0.22	UG/L
MTL-77-0	7/12/2017	Pendimethalin	<	0.20	0.20	0.20	UG/L
MTL-77-0	9/7/2017	Pendimethalin	<	0.222	0.222	0.222	UG/L
MTL-9	3/9/2017	Pendimethalin	<	0.22	0.22	0.22	UG/L
MTL-9	5/3/2017	Pendimethalin	<	0.20	0.20	0.20	UG/L
MTL-9	7/12/2017	Pendimethalin	<	0.22	0.22	0.22	UG/L
MTL-9	9/7/2017	Pendimethalin	<	0.200	0.200	0.200	UG/L
MTL-15-0	3/9/2017	Pheophytin a	<	2.0	2.0	2.0	MG/CU.M.
MTL-22-0	3/9/2017	Pheophytin a	<	2.0	2.0	2.0	MG/CU.M.
MTL-33-0	3/9/2017	Pheophytin a	<	2.0	2.0	2.0	MG/CU.M.
MTL-66-0	3/9/2017	Pheophytin a	<	2.0	2.0	2.0	MG/CU.M.
MTL-77-0	3/9/2017	Pheophytin a	<	2.0	2.0	2.0	MG/CU.M.
MTL-15-0	5/4/2017	Pheophytin-a	<	2.0	2.0	2.0	MG/CU.M.
MTL-15-0	7/12/2017	Pheophytin-a		4.4	1.0	1.0	MG/CU.M.
MTL-15-0	9/7/2017	Pheophytin-a		3.90	1.00	1.00	MG/CU.M.

MTL-22-0	5/4/2017	Pheophytin-a	<	2.0	2.0	2.0	MG/C U.M.
MTL-22-0	7/12/2017	Pheophytin-a		3.2	1.0	1.0	MG/C U.M.
MTL-22-0	9/7/2017	Pheophytin-a		2.10	1.00	1.00	MG/C U.M.
MTL-33-0	5/4/2017	Pheophytin-a	<	2.0	2.0	2.0	MG/C U.M.
MTL-33-0	7/12/2017	Pheophytin-a		3.6	1.0	1.0	MG/C U.M.
MTL-33-0	9/7/2017	Pheophytin-a		1.50	1.00	1.00	MG/C U.M.
MTL-66-0	5/4/2017	Pheophytin-a	<	2.0	2.0	2.0	MG/C U.M.
MTL-66-0	7/12/2017	Pheophytin-a		3.3	1.0	1.0	MG/C U.M.
MTL-66-0	9/7/2017	Pheophytin-a		4.30	1.00	1.00	MG/C U.M.
MTL-77-0	5/4/2017	Pheophytin-a	<	2.0	2.0	2.0	MG/C U.M.
MTL-77-0	7/12/2017	Pheophytin-a		3.2	1.0	1.0	MG/C U.M.
MTL-77-0	9/7/2017	Pheophytin-a		2.10	1.00	1.00	MG/C U.M.
MTL-1	3/9/2017	Phosphorus		0.067	0.010	0.010	MG/L
	5/3/2017	Phosphorus		0.050	0.0080	0.010	MG/L
	7/12/2017	Phosphorus		0.082	0.0080	0.010	MG/L
	9/7/2017	Phosphorus		0.0651	0.00800	0.010 0	MG/L
MTL-11	3/9/2017	Phosphorus		0.12	0.010	0.010	MG/L
	5/3/2017	Phosphorus		0.19	0.0080	0.010	MG/L
	7/12/2017	Phosphorus		0.16	0.0080	0.010	MG/L
	9/7/2017	Phosphorus		0.220	0.00800	0.010 0	MG/L
MTL-12	3/9/2017	Phosphorus		0.062	0.010	0.010	MG/L
	5/3/2017	Phosphorus		0.12	0.0080	0.010	MG/L
	7/12/2017	Phosphorus		0.14	0.0080	0.010	MG/L
	9/7/2017	Phosphorus		0.0737	0.00800	0.010 0	MG/L
MTL-13	3/9/2017	Phosphorus		0.028	0.010	0.010	MG/L
	5/3/2017	Phosphorus		0.14	0.0080	0.010	MG/L

	7/12/2017	Phosphorus		0.090	0.0080	0.010	MG/L
	9/7/2017	Phosphorus		0.0393	0.00800	0.010 0	MG/L
MTL-15-0	3/9/2017	Phosphorus		0.093	0.010	0.010	MG/L
	5/4/2017	Phosphorus		0.13	0.0080	0.010	MG/L
	7/12/2017	Phosphorus		0.13	0.0080	0.010	MG/L
	9/7/2017	Phosphorus		0.0479	0.00800	0.010 0	MG/L
MTL-22-0	3/9/2017	Phosphorus		0.067	0.010	0.010	MG/L
	5/4/2017	Phosphorus		0.058	0.0080	0.010	MG/L
	7/12/2017	Phosphorus		0.10	0.0080	0.010	MG/L
	9/7/2017	Phosphorus		0.0350	0.00800	0.010 0	MG/L
MTL-22-15	3/9/2017	Phosphorus		0.067	0.010	0.010	MG/L
	5/4/2017	Phosphorus		0.067	0.0080	0.010	MG/L
	7/12/2017	Phosphorus		0.065	0.0080	0.010	MG/L
	9/7/2017	Phosphorus		0.0350	0.00800	0.010 0	MG/L
MTL-33-0	3/9/2017	Phosphorus		0.058	0.010	0.010	MG/L
	5/4/2017	Phosphorus		0.062	0.0080	0.010	MG/L
	7/12/2017	Phosphorus		0.073	0.0080	0.010	MG/L
	9/7/2017	Phosphorus		0.0350	0.00800	0.010 0	MG/L
MTL-5	3/9/2017	Phosphorus		0.088	0.010	0.010	MG/L
	5/3/2017	Phosphorus		0.17	0.0080	0.010	MG/L
	7/12/2017	Phosphorus		0.29	0.0080	0.010	MG/L
	9/7/2017	Phosphorus		0.134	0.00800	0.010 0	MG/L
MTL-66-0	3/9/2017	Phosphorus		0.088	0.010	0.010	MG/L
	5/4/2017	Phosphorus		0.15	0.0080	0.010	MG/L
	7/12/2017	Phosphorus		0.12	0.0080	0.010	MG/L
	9/7/2017	Phosphorus		0.0479	0.00800	0.010 0	MG/L
MTL-77-0	3/9/2017	Phosphorus		0.12	0.010	0.010	MG/L
	5/4/2017	Phosphorus		0.13	0.0080	0.010	MG/L
	7/12/2017	Phosphorus		0.086	0.0080	0.010	MG/L
	9/7/2017	Phosphorus		0.0479	0.00800	0.010 0	MG/L
MTL-9	3/9/2017	Phosphorus		0.062	0.010	0.010	MG/L
	5/3/2017	Phosphorus		0.15	0.0080	0.010	MG/L
	7/12/2017	Phosphorus		0.13	0.0080	0.010	MG/L

	9/7/2017	Phosphorus		0.0909	0.00800	0.0100	MG/L
MTL-1	3/9/2017	Phosphorus, -ortho		0.025	0.010	0.010	MG/L
MTL-1	5/3/2017	Phosphorus, -ortho		0.036	0.0080	0.010	MG/L
MTL-1	7/12/2017	Phosphorus, -ortho	<	0.0080	0.0080	0.010	MG/L
MTL-1	9/7/2017	Phosphorus, -ortho	<	0.00800	0.00800	0.0100	MG/L
MTL-11	3/9/2017	Phosphorus, -ortho	<	0.010	0.010	0.010	MG/L
MTL-11	5/3/2017	Phosphorus, -ortho		0.17	0.0080	0.010	MG/L
MTL-11	7/12/2017	Phosphorus, -ortho		0.027	0.0080	0.010	MG/L
MTL-11	9/7/2017	Phosphorus, -ortho		0.0149	0.00800	0.0100	MG/L
MTL-12	3/9/2017	Phosphorus, -ortho	<	0.010	0.010	0.010	MG/L
MTL-12	5/3/2017	Phosphorus, -ortho		0.10	0.0080	0.010	MG/L
MTL-12	7/12/2017	Phosphorus, -ortho	<	0.0080	0.0080	0.010	MG/L
MTL-12	9/7/2017	Phosphorus, -ortho		0.0174	0.00800	0.0100	MG/L
MTL-13	3/9/2017	Phosphorus, -ortho	<	0.010	0.010	0.010	MG/L
MTL-13	5/3/2017	Phosphorus, -ortho		0.12	0.0080	0.010	MG/L
MTL-13	7/12/2017	Phosphorus, -ortho		0.032	0.0080	0.010	MG/L
MTL-13	9/7/2017	Phosphorus, -ortho	J	0.00980	0.00800	0.0100	MG/L
MTL-15-0	3/9/2017	Phosphorus, -ortho		0.022	0.010	0.010	MG/L
MTL-15-0	5/4/2017	Phosphorus, -ortho		0.11	0.0080	0.010	MG/L
MTL-15-0	7/12/2017	Phosphorus, -ortho		0.011	0.0080	0.010	MG/L
MTL-15-0	9/7/2017	Phosphorus, -ortho	<	0.00800	0.00800	0.0100	MG/L
MTL-22-0	3/9/2017	Phosphorus, -ortho		0.022	0.010	0.010	MG/L
MTL-22-0	5/4/2017	Phosphorus, -ortho		0.044	0.0080	0.010	MG/L
MTL-22-0	7/12/2017	Phosphorus, -ortho	J	0.0086	0.0080	0.010	MG/L
MTL-22-0	9/7/2017	Phosphorus, -ortho	<	0.00800	0.00800	0.0100	MG/L
MTL-22-15	3/9/2017	Phosphorus, -ortho		0.022	0.010	0.010	MG/L
MTL-22-15	5/4/2017	Phosphorus, -ortho		0.052	0.0080	0.010	MG/L
MTL-22-15	7/12/2017	Phosphorus, -ortho	J	0.0086	0.0080	0.010	MG/L
MTL-22-15	9/7/2017	Phosphorus, -ortho	<	0.00800	0.00800	0.0100	MG/L
MTL-33-0	3/9/2017	Phosphorus, -ortho		0.022	0.010	0.010	MG/L
MTL-33-0	5/4/2017	Phosphorus, -ortho		0.047	0.0080	0.010	MG/L
MTL-33-0	7/12/2017	Phosphorus, -ortho	<	0.0080	0.0080	0.010	MG/L
MTL-33-0	9/7/2017	Phosphorus, -ortho	<	0.00800	0.00800	0.010	MG/L

						0	
MTL-5	3/9/2017	Phosphorus, -ortho	<	0.010	0.010	0.010	MG/L
MTL-5	5/3/2017	Phosphorus, -ortho		0.15	0.0080	0.010	MG/L
MTL-5	7/12/2017	Phosphorus, -ortho		0.12	0.0080	0.010	MG/L
MTL-5	9/7/2017	Phosphorus, -ortho		0.0866	0.00800	0.010 0	MG/L
MTL-66-0	3/9/2017	Phosphorus, -ortho		0.017	0.010	0.010	MG/L
MTL-66-0	5/4/2017	Phosphorus, -ortho		0.13	0.0080	0.010	MG/L
MTL-66-0	7/12/2017	Phosphorus, -ortho		0.011	0.0080	0.010	MG/L
MTL-66-0	9/7/2017	Phosphorus, -ortho	J	0.00980	0.00800	0.010 0	MG/L
MTL-77-0	3/9/2017	Phosphorus, -ortho		0.017	0.010	0.010	MG/L
MTL-77-0	5/4/2017	Phosphorus, -ortho		0.12	0.0080	0.010	MG/L
MTL-77-0	7/12/2017	Phosphorus, -ortho	<	0.0080	0.0080	0.010	MG/L
MTL-77-0	9/7/2017	Phosphorus, -ortho	<	0.00800	0.00800	0.010 0	MG/L
MTL-9	3/9/2017	Phosphorus, -ortho	<	0.010	0.010	0.010	MG/L
MTL-9	5/3/2017	Phosphorus, -ortho		0.13	0.0080	0.010	MG/L
MTL-9	7/12/2017	Phosphorus, -ortho		0.022	0.0080	0.010	MG/L
MTL-9	9/7/2017	Phosphorus, -ortho		0.0226	0.00800	0.010 0	MG/L
MTL-1	3/9/2017	Solids, Total Suspended		4.0	1.1	1.1	MG/L
	5/3/2017	Solids, Total Suspended		8.9	1.3	1.3	MG/L
	7/12/2017	Solids, Total Suspended		6.6	2.0	2.0	MG/L
	9/7/2017	Solids, Total Suspended		8.33	1.67	1.67	MG/L
MTL-11	3/9/2017	Solids, Total Suspended		15.6	2.2	2.2	MG/L
	5/3/2017	Solids, Total Suspended		445	16.7	16.7	MG/L
	7/12/2017	Solids, Total Suspended		19.7	2.9	2.9	MG/L
	9/7/2017	Solids, Total Suspended		29.0	3.33	3.33	MG/L
MTL-12	3/9/2017	Solids, Total Suspended		10.1	1.3	1.3	MG/L
	5/3/2017	Solids, Total Suspended		34.4	2.9	2.9	MG/L
	7/12/2017	Solids, Total Suspended		15.4	2.0	2.0	MG/L
	9/7/2017	Solids, Total Suspended		12.4	2.00	2.00	MG/L
MTL-13	3/9/2017	Solids, Total Suspended		1.6	1.1	1.1	MG/L
	5/3/2017	Solids, Total Suspended		84.0	5.0	5.0	MG/L
	7/12/2017	Solids, Total Suspended		9.6	1.3	1.3	MG/L
	9/7/2017	Solids, Total Suspended		2.60	1.00	1.00	MG/L
MTL-15-0	3/9/2017	Solids, Total Suspended		8.1	1.3	1.3	MG/L
	5/4/2017	Solids, Total Suspended		59.5	5.0	5.0	MG/L
	7/12/2017	Solids, Total Suspended		8.2	2.0	2.0	MG/L
	9/7/2017	Solids, Total Suspended		4.00	1.25	1.25	MG/L

MTL-22-0	3/9/2017	Solids, Total Suspended		6.0	1.0	1.0	MG/L
	5/4/2017	Solids, Total Suspended		3.9	1.0	1.0	MG/L
	7/12/2017	Solids, Total Suspended		4.3	1.3	1.3	MG/L
	9/7/2017	Solids, Total Suspended		3.58	1.05	1.05	MG/L
MTL-22-15	3/9/2017	Solids, Total Suspended		4.8	1.1	1.1	MG/L
	5/4/2017	Solids, Total Suspended		4.5	1.0	1.0	MG/L
	7/12/2017	Solids, Total Suspended		4.4	1.3	1.3	MG/L
	9/7/2017	Solids, Total Suspended		3.67	1.11	1.11	MG/L
MTL-33-0	3/9/2017	Solids, Total Suspended		4.3	1.0	1.0	MG/L
	5/4/2017	Solids, Total Suspended		6.1	1.0	1.0	MG/L
	7/12/2017	Solids, Total Suspended		4.8	1.3	1.3	MG/L
	9/7/2017	Solids, Total Suspended		3.58	1.05	1.05	MG/L
MTL-5	3/9/2017	Solids, Total Suspended		6.8	2.0	2.0	MG/L
	5/3/2017	Solids, Total Suspended		89.2	7.7	7.7	MG/L
	7/12/2017	Solids, Total Suspended		20.5	2.5	2.5	MG/L
	9/7/2017	Solids, Total Suspended		2.50	1.00	1.00	MG/L
MTL-66-0	3/9/2017	Solids, Total Suspended		8.5	1.3	1.3	MG/L
	5/4/2017	Solids, Total Suspended		51.0	5.0	5.0	MG/L
	7/12/2017	Solids, Total Suspended		7.6	2.0	2.0	MG/L
	9/7/2017	Solids, Total Suspended		3.78	1.11	1.11	MG/L
MTL-77-0	3/9/2017	Solids, Total Suspended		8.8	1.3	1.3	MG/L
	5/4/2017	Solids, Total Suspended		26.3	2.9	2.9	MG/L
	7/12/2017	Solids, Total Suspended		5.7	1.3	1.3	MG/L
	9/7/2017	Solids, Total Suspended		4.87	1.25	1.25	MG/L
MTL-9	3/9/2017	Solids, Total Suspended		5.6	2.0	2.0	MG/L
	5/3/2017	Solids, Total Suspended		145	6.7	6.7	MG/L
	7/12/2017	Solids, Total Suspended		13.8	2.0	2.0	MG/L
	9/7/2017	Solids, Total Suspended		7.80	1.00	1.00	MG/L
MTL-1	3/9/2017	Solids, Volatile Suspended	<	1.1	1.1	1.1	MG/L
	5/3/2017	Solids, Volatile Suspended		2.0	1.3	1.3	MG/L
	7/12/2017	Solids, Volatile Suspended		2.8	2.0	2.0	MG/L
	9/7/2017	Solids, Volatile Suspended		3.17	1.67	1.67	MG/L
MTL-11	3/9/2017	Solids, Volatile Suspended		3.8	2.2	2.2	MG/L
	5/3/2017	Solids, Volatile Suspended		25.0	16.7	16.7	MG/L
	7/12/2017	Solids, Volatile Suspended		4.3	2.9	2.9	MG/L
	9/7/2017	Solids, Volatile Suspended		7.33	3.33	3.33	MG/L
MTL-12	3/9/2017	Solids, Volatile Suspended	<	1.3	1.3	1.3	MG/L
	5/3/2017	Solids, Volatile Suspended		3.8	2.9	2.9	MG/L
	7/12/2017	Solids, Volatile Suspended		3.2	2.0	2.0	MG/L
	9/7/2017	Solids, Volatile Suspended		3.80	2.00	2.00	MG/L

MTL-13	3/9/2017	Solids, Volatile Suspended	<	1.1	1.1	1.1	MG/L
	5/3/2017	Solids, Volatile Suspended		8.5	5.0	5.0	MG/L
	7/12/2017	Solids, Volatile Suspended		1.5	1.3	1.3	MG/L
	9/7/2017	Solids, Volatile Suspended	<	1.00	1.00	1.00	MG/L
MTL-15-0	3/9/2017	Solids, Volatile Suspended	<	1.3	1.3	1.3	MG/L
	5/4/2017	Solids, Volatile Suspended		5.5	5.0	5.0	MG/L
	7/12/2017	Solids, Volatile Suspended		2.6	2.0	2.0	MG/L
	9/7/2017	Solids, Volatile Suspended		2.12	1.25	1.25	MG/L
MTL-22-0	3/9/2017	Solids, Volatile Suspended	<	1.0	1.0	1.0	MG/L
	5/4/2017	Solids, Volatile Suspended	<	1.0	1.0	1.0	MG/L
	7/12/2017	Solids, Volatile Suspended		2.1	1.3	1.3	MG/L
	9/7/2017	Solids, Volatile Suspended		2.74	1.05	1.05	MG/L
MTL-22-15	3/9/2017	Solids, Volatile Suspended	<	1.1	1.1	1.1	MG/L
	5/4/2017	Solids, Volatile Suspended		1.1	1.0	1.0	MG/L
	7/12/2017	Solids, Volatile Suspended		2.5	1.3	1.3	MG/L
	9/7/2017	Solids, Volatile Suspended		2.33	1.11	1.11	MG/L
MTL-33-0	3/9/2017	Solids, Volatile Suspended	<	1.0	1.0	1.0	MG/L
	5/4/2017	Solids, Volatile Suspended	<	1.0	1.0	1.0	MG/L
	7/12/2017	Solids, Volatile Suspended		2.9	1.3	1.3	MG/L
	9/7/2017	Solids, Volatile Suspended		2.84	1.05	1.05	MG/L
MTL-5	3/9/2017	Solids, Volatile Suspended		4.0	2.0	2.0	MG/L
	5/3/2017	Solids, Volatile Suspended		10.8	7.7	7.7	MG/L
	7/12/2017	Solids, Volatile Suspended		3.8	2.5	2.5	MG/L
	9/7/2017	Solids, Volatile Suspended	<	1.00	1.00	1.00	MG/L
MTL-66-0	3/9/2017	Solids, Volatile Suspended	<	1.3	1.3	1.3	MG/L
	5/4/2017	Solids, Volatile Suspended		5.0	5.0	5.0	MG/L
	7/12/2017	Solids, Volatile Suspended		2.4	2.0	2.0	MG/L
	9/7/2017	Solids, Volatile Suspended		2.11	1.11	1.11	MG/L
MTL-77-0	3/9/2017	Solids, Volatile Suspended	<	1.3	1.3	1.3	MG/L
	5/4/2017	Solids, Volatile Suspended		3.1	2.9	2.9	MG/L
	7/12/2017	Solids, Volatile Suspended		2.0	1.3	1.3	MG/L
	9/7/2017	Solids, Volatile Suspended		2.88	1.25	1.25	MG/L
MTL-9	3/9/2017	Solids, Volatile Suspended	<	2.0	2.0	2.0	MG/L
	5/3/2017	Solids, Volatile Suspended		13.3	6.7	6.7	MG/L
	7/12/2017	Solids, Volatile Suspended		3.2	2.0	2.0	MG/L
	9/7/2017	Solids, Volatile Suspended		1.60	1.00	1.00	MG/L
MTL-1	3/9/2017	Total Organic Carbon		4.4	1.0	1.0	MG/L
	5/3/2017	Total Organic Carbon		6.4	1.0	1.0	MG/L
	7/12/2017	Total Organic Carbon		7.0	1.0	1.0	MG/L
	9/7/2017	Total Organic Carbon		5.70	1.00	1.00	MG/L

MTL-11	3/9/2017	Total Organic Carbon		5.6	1.0	1.0	MG/L
	5/3/2017	Total Organic Carbon		8.7	1.0	1.0	MG/L
	7/12/2017	Total Organic Carbon		6.0	1.0	1.0	MG/L
	9/7/2017	Total Organic Carbon		5.30	1.00	1.00	MG/L
MTL-12	3/9/2017	Total Organic Carbon		4.6	1.0	1.0	MG/L
	5/3/2017	Total Organic Carbon		7.0	1.0	1.0	MG/L
	7/12/2017	Total Organic Carbon		13.0	1.0	1.0	MG/L
	9/7/2017	Total Organic Carbon		5.30	1.00	1.00	MG/L
MTL-13	3/9/2017	Total Organic Carbon		6.0	1.0	1.0	MG/L
	5/3/2017	Total Organic Carbon		7.5	1.0	1.0	MG/L
	7/12/2017	Total Organic Carbon		6.0	1.0	1.0	MG/L
	9/7/2017	Total Organic Carbon		5.50	1.00	1.00	MG/L
MTL-15-0	3/9/2017	Total Organic Carbon		5.1	1.0	1.0	MG/L
	5/4/2017	Total Organic Carbon		7.8	1.0	1.0	MG/L
	7/12/2017	Total Organic Carbon		6.2	1.0	1.0	MG/L
	9/7/2017	Total Organic Carbon		5.60	1.00	1.00	MG/L
MTL-22-0	3/9/2017	Total Organic Carbon		4.7	1.0	1.0	MG/L
	5/4/2017	Total Organic Carbon		6.2	1.0	1.0	MG/L
	7/12/2017	Total Organic Carbon		6.9	1.0	1.0	MG/L
	9/7/2017	Total Organic Carbon		5.60	1.00	1.00	MG/L
MTL-22-15	3/9/2017	Total Organic Carbon		4.6	1.0	1.0	MG/L
	5/4/2017	Total Organic Carbon		6.7	1.0	1.0	MG/L
	7/12/2017	Total Organic Carbon		7.0	1.0	1.0	MG/L
	9/7/2017	Total Organic Carbon		5.60	1.00	1.00	MG/L
MTL-33-0	3/9/2017	Total Organic Carbon		4.8	1.0	1.0	MG/L
	5/4/2017	Total Organic Carbon		6.0	1.0	1.0	MG/L
	7/12/2017	Total Organic Carbon		6.8	1.0	1.0	MG/L
	9/7/2017	Total Organic Carbon		5.70	1.00	1.00	MG/L
MTL-5	3/9/2017	Total Organic Carbon		9.0	1.0	1.0	MG/L
	5/3/2017	Total Organic Carbon		7.9	1.0	1.0	MG/L
	7/12/2017	Total Organic Carbon		6.5	1.0	1.0	MG/L
	9/7/2017	Total Organic Carbon		5.30	1.00	1.00	MG/L
MTL-66-0	3/9/2017	Total Organic Carbon		5.1	1.0	1.0	MG/L
	5/4/2017	Total Organic Carbon		7.4	1.0	1.0	MG/L
	7/12/2017	Total Organic Carbon		6.3	1.0	1.0	MG/L
	9/7/2017	Total Organic Carbon		5.50	1.00	1.00	MG/L
MTL-77-0	3/9/2017	Total Organic Carbon		5.2	1.0	1.0	MG/L
	5/4/2017	Total Organic Carbon		7.2	1.0	1.0	MG/L
	7/12/2017	Total Organic Carbon		6.7	1.0	1.0	MG/L
	9/7/2017	Total Organic Carbon		5.50	1.00	1.00	MG/L

MTL-9	3/9/2017	Total Organic Carbon		5.6	1.0	1.0	MG/L
	5/3/2017	Total Organic Carbon		9.1	1.0	1.0	MG/L
	7/12/2017	Total Organic Carbon		6.9	1.0	1.0	MG/L
	9/7/2017	Total Organic Carbon		6.20	1.00	1.00	MG/L
MTL-1	3/9/2017	Trifluralin	<	0.20	0.20	0.20	UG/L
MTL-1	5/3/2017	Trifluralin	<	0.22	0.22	0.22	UG/L
MTL-1	7/12/2017	Trifluralin	<	0.20	0.20	0.20	UG/L
MTL-1	9/7/2017	Trifluralin	<	0.200	0.200	0.200	UG/L
MTL-11	3/9/2017	Trifluralin	<	0.22	0.22	0.22	UG/L
MTL-11	5/3/2017	Trifluralin	<	0.20	0.20	0.20	UG/L
MTL-11	7/12/2017	Trifluralin	<	0.20	0.20	0.20	UG/L
MTL-11	9/7/2017	Trifluralin	<	0.200	0.200	0.200	UG/L
MTL-12	3/9/2017	Trifluralin	<	0.22	0.22	0.22	UG/L
MTL-12	5/3/2017	Trifluralin	<	0.20	0.20	0.20	UG/L
MTL-12	7/12/2017	Trifluralin	<	0.20	0.20	0.20	UG/L
MTL-12	9/7/2017	Trifluralin	<	0.222	0.222	0.222	UG/L
MTL-13	3/9/2017	Trifluralin	<	0.20	0.20	0.20	UG/L
MTL-13	5/3/2017	Trifluralin	<	0.20	0.20	0.20	UG/L
MTL-13	7/12/2017	Trifluralin	<	0.20	0.20	0.20	UG/L
MTL-13	9/7/2017	Trifluralin	<	0.200	0.200	0.200	UG/L
MTL-15-0	3/9/2017	Trifluralin	<	0.22	0.22	0.22	UG/L
MTL-15-0	5/4/2017	Trifluralin	<	0.20	0.20	0.20	UG/L
MTL-15-0	7/12/2017	Trifluralin	<	0.20	0.20	0.20	UG/L
MTL-15-0	9/7/2017	Trifluralin	<	0.200	0.200	0.200	UG/L
MTL-22-0	3/9/2017	Trifluralin	<	0.20	0.20	0.20	UG/L
MTL-22-0	5/4/2017	Trifluralin	<	0.22	0.22	0.22	UG/L
MTL-22-0	7/12/2017	Trifluralin	<	0.20	0.20	0.20	UG/L
MTL-22-0	9/7/2017	Trifluralin	<	0.200	0.200	0.200	UG/L
MTL-33-0	3/9/2017	Trifluralin	<	0.20	0.20	0.20	UG/L
MTL-33-0	7/12/2017	Trifluralin	<	0.20	0.20	0.20	UG/L
MTL-33-0	9/7/2017	Trifluralin	<	0.200	0.200	0.200	UG/L
MTL-5	3/9/2017	Trifluralin	<	0.20	0.20	0.20	UG/L
MTL-5	5/3/2017	Trifluralin	<	0.20	0.20	0.20	UG/L
MTL-5	7/12/2017	Trifluralin	<	0.20	0.20	0.20	UG/L
MTL-5	9/7/2017	Trifluralin	<	0.200	0.200	0.200	UG/L
MTL-66-0	3/9/2017	Trifluralin	<	0.20	0.20	0.20	UG/L
MTL-66-0	5/4/2017	Trifluralin	<	0.20	0.20	0.20	UG/L
MTL-66-0	7/12/2017	Trifluralin	<	0.20	0.20	0.20	UG/L
MTL-66-0	9/7/2017	Trifluralin	<	0.200	0.200	0.200	UG/L
MTL-77-0	3/9/2017	Trifluralin	<	0.22	0.22	0.22	UG/L

MTL-77-0	5/4/2017	Trifluralin	<	0.22	0.22	0.22	UG/L
MTL-77-0	7/12/2017	Trifluralin	<	0.20	0.20	0.20	UG/L
MTL-77-0	9/7/2017	Trifluralin	<	0.222	0.222	0.222	UG/L
MTL-9	3/9/2017	Trifluralin	<	0.22	0.22	0.22	UG/L
MTL-9	5/3/2017	Trifluralin	<	0.20	0.20	0.20	UG/L
MTL-9	7/12/2017	Trifluralin	<	0.22	0.22	0.22	UG/L
MTL-9	9/7/2017	Trifluralin	<	0.200	0.200	0.200	UG/L

U Analyte was not detected. J Estimated value between Method Detection Limit (MDL) and Practical Quantitation Limit (PQL)

FIELD DATA

Site	Date	Depth	Water Temp (oC)	Redox (mv)	Cond (uS)	DO %	DO mg/l	pH	Time	Secchi (in)
MTL-1	3/9/2017	0.7	7.10	301	175	111	13.1	7.77	1027	
	5/3/2017	0.5	13.12	436	223.7	96	10.09	6.85	1445	
	7/12/2017	1.1	27.25	361	174.2	86.2	6.75	9.16	1455	
	9/7/2017	1.3	22.30	119.3	182.7	91.7	7.97	8.17	1015	
MTL-11	3/9/2017	0.4	11.50	165	528	110	11.8	7.58	1205	
	5/3/2017	0.7	12.40	433	186.6	80	8.54	5.91	1325	
	7/12/2017	0.4	31.16	351	253	132.6	9.83	8.48	1720	
	9/7/2017	0.3	19.80	113.8	254.6	89.2	8.15	7.70	1325	
MTL-12	3/9/2017	0.5	10.80	269	182	130.8	14.3	8.23	1043	
	5/3/2017	0.2	13.67	420	205.6	110.5	11.46	6.54	1400	
	7/12/2017	0.2	27.10	379	175.4	100.1	7.96	9.11	1810	
	9/7/2017	0.5	22.20	118.3	189.1	93.3	8.13	7.88	950	
MTL-13	3/9/2017	0.4	11.50	188	616	125	13.4	8.20	1310	
	5/3/2017	0.7	12.43	448	240.5	88.5	9.44	6.31	1130	
	7/12/2017	0.4	32.64	356	292.1	159.6	11.46	9.37	1615	
	9/7/2017	0.3	19.40	94.7	412.4	121.2	11.14	8.41	1215	
MTL-22	3/9/2017	1.4	7.27	360	176.2	108.8	12.8	7.84	1130	23
MTL-22		2.8	7.30	363	176.2	109.2	12.8	7.84	1130	
MTL-22		3.8	6.98	365	176.2	107.7	12.9	7.83	1130	
MTL-22		4.7	6.76	367	176.4	107.6	12.8	7.82	1130	
MTL-22		5.8	6.70	368	176.4	107.8	12.8	7.82	1130	
MTL-22		6.8	6.68	369	176.4	106.8	12.8	7.81	1130	
MTL-22		7.7	6.67	370	176.4	107.7	12.8	7.82	1130	

MTL-22		8.9	6.66	371	176.4	106.9	12.7	7.83	1130	
MTL-22		9.7	6.60	371	176.5	107.1	12.76	7.82	1130	
MTL-22		10.6	6.46	372	176.6	106.2	12.73	7.81	1130	
MTL-22		11.6	6.41	373	176.6	106.2	12.8	7.79	1130	
MTL-22		12.6	6.39	374	176.6	106.5	12.8	7.79	1130	
MTL-22		2.8	7.30	363	176.2	109.2	12.8	7.84	1130	
MTL-22		3.8	6.98	365	176.2	107.7	12.9	7.83	1130	

Site	Date	Depth	Water Temp (oC)	Redox (mv)	Cond (uS)	DO %	DO mg/l	pH	Time	Secchi(in)
MTL-22		4.7	6.76	367	176.4	107.6	12.8	7.82	1130	
MTL-22		5.8	6.70	368	176.4	107.8	12.8	7.82	1130	
MTL-22		6.8	6.68	369	176.4	106.8	12.8	7.81	1130	
MTL-22		7.7	6.67	370	176.4	107.7	12.8	7.82	1130	
MTL-22		8.9	6.66	371	176.4	106.9	12.7	7.83	1130	
MTL-22		9.7	6.60	371	176.5	107.1	12.76	7.82	1130	
MTL-22		10.6	6.46	372	176.6	106.2	12.73	7.81	1130	
MTL-22		11.6	6.41	373	176.6	106.2	12.8	7.79	1130	
MTL-22		12.6	6.39	374	176.6	106.5	12.8	7.79	1130	
MTL-22	5/4/2017	0.3	13.81	478	227	87	8.94	7.46	1300	30
MTL-22		1.0	13.60	482	227	84	8.78	7.34	1300	
MTL-22		1.9	13.52	483	228	83	8.71	7.31	1300	
MTL-22		3.0	13.48	484	227	83	8.69	7.22	1300	
MTL-22		4.0	13.36	484	226	82	8.57	7.24	1300	
MTL-22		5.0	13.29	486	227	80.2	8.38	7.20	1300	
MTL-22		6.0	13.16	487	229	79.2	8.22	7.16	1300	
MTL-22		7.2	13.00	489	229	77.1	8	7.13	1300	
MTL-22		9.1	12.70	490	224	75	7.95	7.00	1300	
MTL-22	7/12/2017	0.0	28.19	360	172	100	7.66	8.98	1147	34
MTL-22		1.0	28.16	358	171	99.7	7.67	8.93	1147	
MTL-22		2.0	28.16	361	172	99.6	7.67	8.93	1147	
MTL-22		3.0	28.15	362	171	99.4	7.64	8.93	1147	
MTL-22		4.0	28.14	363	172	99	7.61	8.93	1147	
MTL-22		5.0	28.13	365	172	98.7	7.61	8.92	1147	
MTL-22		6.0	28.12	367	172	98.8	7.61	8.92	1147	
MTL-22		7.0	28.09	368	171	50.11	3.5	8.00	1147	

MTL-22		8.0	20.82	409	171	0	0	7.27	1147	
MTL-22	9/7/2017	1.0	23.30	106.5	178.4	96.7	8.24	8.41	1230	48
MTL-22		2.0	23.30	105.8	178.4	95.3	8.13	8.38	1230	
MTL-22		2.9	23.10	107.2	178.8	87.3	7.47	8.13	1230	
MTL-22		3.0	23.10	110.2	178.7	87.4	7.48	8.15	1230	
MTL-22		5.0	23.00	113.4	179	80.3	7.14	8.01	1230	
MTL-22		6.0	23.00	114.5	179	82.4	7.07	7.99	1230	
MTL-22		7.0	22.90	118	179.3	77.6	6.66	7.85	1230	

Site	Date	Depth	Water Temp (oC)	Redox (mv)	Cond (uS)	DO %	DO mg/l	pH	Time	Secchi(in)
MTL-22		8.0	20.90	130.5	184.8	16.3	1.45	7.24	1230	
MTL-22		9.0	15.90	135.1	197.7	4.9	0.49	6.94	1230	
MTL-22		10.1	14.00	139.9	197.1	2.3	0.24	6.76	1230	
MTL-33	3/9/2017	1.0	7.63	335	180.6	108.7	12.72	7.61	1100	25
MTL-33		2.1	6.86	347	180.4	107.1	12.86	7.68	1100	
MTL-33		4.2	6.66	351	180.5	107.1	12.71	7.70	1100	
MTL-33		5.1	6.65	354	180	105.8	12.5	7.70	1100	
MTL-33		5.9	6.64	355	180	105.5	12.6	7.70	1100	
MTL-33		7.1	6.60	356	180	105	12.6	7.70	1100	
MTL-33		8.1	6.60	357	180	105	12.6	7.70	1100	
MTL-33		8.9	6.50	358	180	104	12.5	7.70	1100	
MTL-33		9.8	6.49	359	179	105	12.6	7.70	1100	
MTL-33		10.3	6.47	360	179	104	12.6	7.70	1100	
MTL-33		11.3	6.43	360	179	104	12.5	7.70	1100	
MTL-33		12.0	6.40	361	180	103	12.4	7.70	1100	
MTL-33	5/4/2017	0.7	13.67	471	220	83.8	8.7	7.10	1225	24
MTL-33		1.2	13.66	471	220	84.1	8.72	7.10	1225	
MTL-33		2.3	13.62	471	219.5	83.6	8.7	7.10	1225	
MTL-33		3.3	13.62	471	219	83.9	8.72	7.09	1225	
MTL-33		4.5	13.64	470	219.8	84	8.72	7.07	1225	
MTL-33		6.2	13.61	470	219.2	84	8.72	7.08	1225	
MTL-33	7/12/2017	0.3	28.69	333	175.6	108.2	8.23	9.39	1155	28
MTL-33		1.0	28.50	336	175.5	106.7	8.18	9.36	1155	
MTL-33		2.0	28.25	340	176.3	101	7.8	9.27	1155	
MTL-33		3.0	28.14	345	176.8	95	7.31	9.18	1155	

MTL-33		4.0	27.82	353	177	83.2	6.44	8.96	1155	
MTL-33		5.0	27.32	376	176.5	48	3.75	8.04	1155	
MTL-33		6.0	25.30	394	177	26.4	2.51	7.76	1155	
MTL-33		7.0	24.10	404	179.9	0	0	7.45	1155	
MTL-33		8.0	20.62	385	177.7	0	0	7.32	1155	
MTL-33	9/7/2017	0.0	24.00	111	182.6	98	8.24	8.35	1300	45
MTL-33		1.0	23.80	112.3	182.5	95.1	8.03	8.33	1300	
MTL-33		2.0	23.50	116.3	182.5	92.1	7.81	8.27	1300	
MTL-33		3.0	23.40	119.5	182.5	85.3	7.26	8.08	1300	

Site	Date	Depth	Water Temp (oC)	Redox (mv)	Cond (uS)	DO %	DO mg/l	pH	Time	Secchi(in)
MTL-33		4.0	23.40	122.3	182.5	85.7	7.3	8.09	1300	
MTL-33		5.0	23.30	126.3	182.6	83.5	7.11	8.02	1300	
MTL-33		6.0	23.30	128.2	182.6	84.2	7.18	8.04	1300	
MTL-33		7.0	23.20	130.9	182.6	78.7	6.72	7.88	1300	
MTL-33		8.0	21.50	141.3	185.3	39	3.44	7.34	1300	
MTL-33		9.0	14.90	152.6	200.2	3.4	0.35	6.89	1300	
MTL-5	3/9/2017	0.43	12	96	710	160	16.5	7.65	1341	
	5/3/2017	0.6	13.08	439	193.2	80.5	8.47	6.11	1040	
	7/12/2017	0.2	32.66	354	217	164	11.67	9.50	1530	
	9/7/2017	0.3	18.80	75.5	283.6	117.3	10.92	8.43	1130	
MTL-66	3/9/2017	3.6	7.91	379	227	107.2	12.49	7.96	1100	25
MTL-66		4.8	7.73	381	228	106	12.38	7.96	1100	
MTL-66		5.8	7.60	383	220.4	105.6	12.35	7.93	1100	
MTL-66		6.6	7.53	383	216.7	105.4	12.33	7.91	1100	
MTL-66		7.7	7.45	384	213.9	104.6	12.4	7.90	1100	
MTL-66		8.8	7.40	385	212.4	104.9	12.4	7.87	1100	
MTL-66		10.0	7.36	385	211.3	104.5	12.38	7.88	1100	
MTL-66		10.8	7.32	386	212.2	102.3	12	7.82	1100	
MTL-66		2.7	8.19	374	222	108.7	12.62	7.89	1100	
MTL-66	5/4/2017	4.0	13.00	471	198	76.4	8.04	7.13	1330	5
MTL-66		6.0	12.80	474	191	75.7	8.01	7.09	1330	
MTL-66		8.2	12.80	475	197	75.7	7.99	7.02	1330	

MTL-66		0.7	13.08	459	199	79	8.2	7.20	1330	
MTL-66		2.8	13.00	468	197.8	76.9	8.07	7.17	1330	
MTL-66	7/12/2017	4.0	24.98	410	159	46.7	4.29	7.69	1100	16
MTL-66		5.0	23.90	418	159	11.7	0.9	7.60	1100	
MTL-66		0.0	27.32	391	153.1	83.5	6.52	7.93	1100	
MTL-66		1.0	27.28	391	153.2	81.7	6.39	7.92	1100	
MTL-66		2.0	27.10	394	154.8	76.1	5.96	7.76	1100	
MTL-66		3.0	26.40	401	156.2	61.5	5.12	7.69	1100	
MTL-66	9/7/2017	1.0	23.40	176.2	179.7	76	6.47	7.77	1155	42
MTL-66		2.0	23.20	173.4	179.6	72.4	6.18	7.69	1155	
MTL-66		4.0	23.10	175.3	179.9	62.9	5.38	7.55	1155	
MTL-66		5.0	23.10	177.3	179.9	61.4	5.35	7.51	1155	
MTL-66		6.0	23.00	188.1	179.9	61.4	5.26	7.25	1155	
MTL-66		7.0	22.40	194	180.1	35.9	3.12	7.06	1155	
MTL-66		8.0	18.00	-16.2	183.4	4	0.38	6.90	1155	
MTL-66		8.0	18.30	-25.9	214.9	3.2	0.3	6.90	1155	
MTL-66		9.0	14.60	-58.2	213.5	1.4	0.15	6.92	1155	
MTL-66		10.0	13.50	-73.4	229.6	1	0.1	6.97	1155	
MTL-77	3/9/2017	2.3	7.93	370	208.6	110.1	12.86	7.90	1230	12
MTL-77		3.2	7.57	373	210.4	108.2	12.72	7.98	1230	
MTL-77		4.3	7.53	375	209.1	107.6	12.68	7.96	1230	
MTL-77		5.3	7.47	376	206.1	107.1	12.59	7.96	1230	
MTL-77		6.2	7.37	376	205.4	107.2	12.59	7.93	1230	
MTL-77		7.2	7.26	377	202.4	107	12.59	7.92	1230	
MTL-77		8.2	7.16	377	199.2	106.7	12.59	7.91	1230	
MTL-77		9.1	7.10	378	197.7	107.4	12.58	7.89	1230	
MTL-77		10.2	6.99	378	196.1	106.3	12.59	7.85	1230	
MTL-77		11.6	6.94	378	195.1	104.3	12.51	7.87	1230	
MTL-77	5/4/2017	0.8	13.40	485	226	77	8	7.28	1400	6
MTL-77		2.5	13.30	486	225	76.8	8.03	7.22	1400	
MTL-77		4.5	13.30	487	226	77	8.05	7.18	1400	
MTL-77		6.4	13.33	488	225	77.2	8.09	7.15	1400	
MTL-77		8.4	13.33	488	225.6	77.7	8.11	7.10	1400	

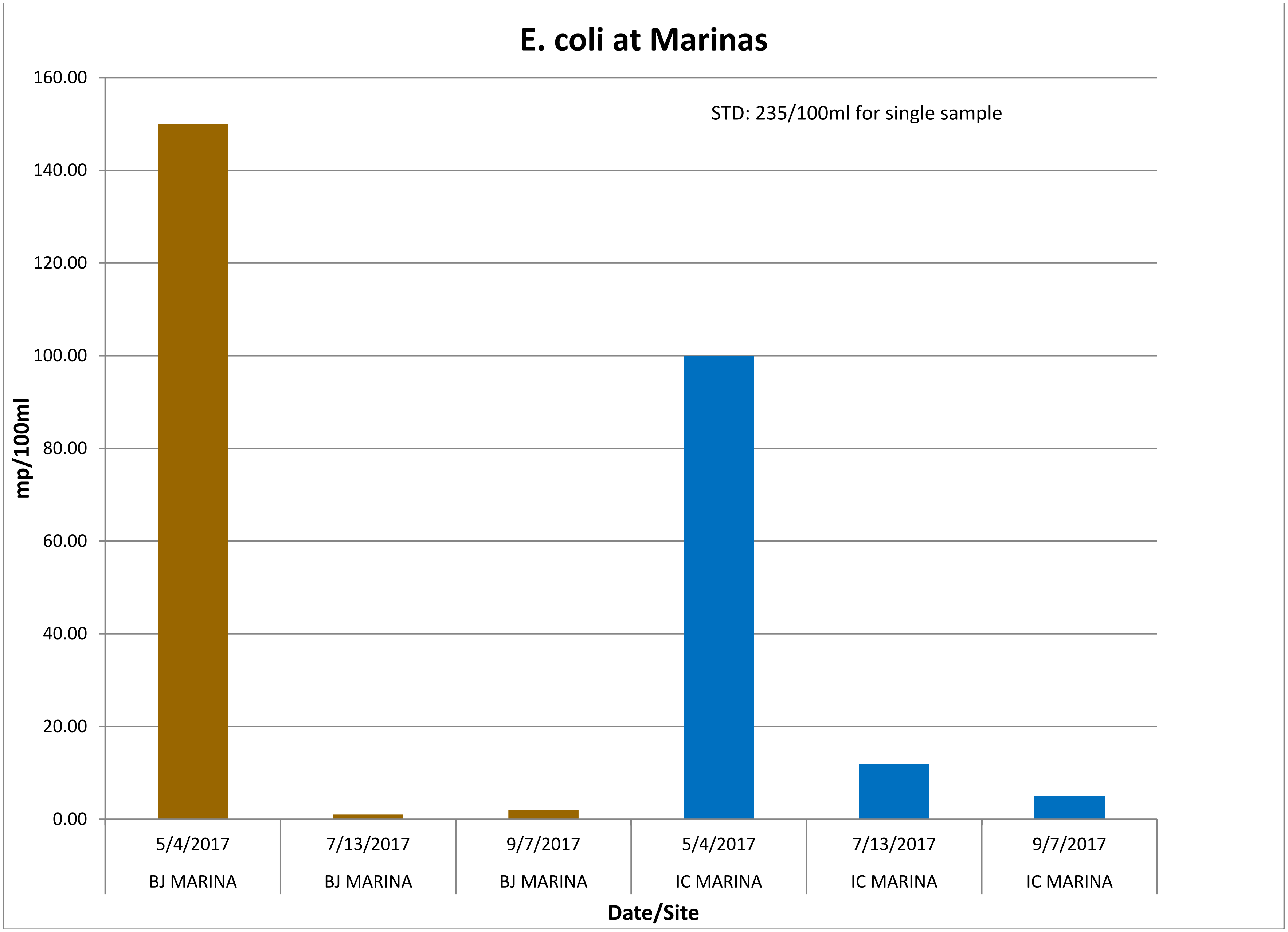
MTL-77	7/12/2017	0.5	27.17	488	180.4	85.2	6.73	7.84	1045	21
MTL-77		1.0	27.10	486	180.7	84.1	6.64	7.80	1045	
MTL-77		2.0	27.08	483	180.6	82.9	6.55	7.75	1045	
MTL-77		3.0	26.93	484	180.4	79	6.25	7.68	1045	
MTL-77		4.0	26.68	478	180.7	69.5	5.45	7.51	1045	
MTL-77		5.0	24.54	487	178	16	1.34	7.11	1045	
MTL-77		6.0	22.42	490	156	0	0	7.06	1045	
MTL-77	9/7/2017	0.0	22.90	196	178.1	87.1	7.48	7.91	1130	43
MTL-77		1.0	22.60	201.2	179.1	83.1	7.17	7.81	1130	
MTL-77		2.0	22.50	207.2	180.4	73.8	6.39	7.61	1130	
MTL-77		3.0	22.50	208.3	180.5	71.8	6.22	7.57	1130	
MTL-77		3.0	22.50	206.9	180.4	72.2	6.25	7.63	1130	
MTL-77		4.0	22.50	205.6	180.5	71.6	6.2	7.66	1130	
MTL-77		5.0	22.50	206.5	180.7	70.6	6.11	7.64	1130	
MTL-77		6.0	22.40	206.9	181.1	69.7	6.04	7.63	1130	MTL-77
MTL-77		7.0	21.80	209.2	179.8	49.3	4.32	7.43	1130	MTL-77
MTL-77		8.0	18.80	211.1	193.1	13	1.21	7.20	1130	MTL-77
MTL-77		8.0	17.60	181.7	198.4	4.3	0.41	7.10	1130	MTL-77
MTL-77		9.0	15.20	92.7	209.8	1.7	0.17	7.04	1130	MTL-77
MTL-9	3/9/2017	0.4	11.00	203	625	113	12.2	7.80	1240	MTL-9
	5/3/2017	1.3	12.15	446	147.3	76.2	8.17	5.79	1215	
	7/12/2017	0.2	31.69	379	252	144	10.75	8.92	1640	
	9/7/2017	0.3	19.40	108	569	81.3	7.47	7.97	1240	

Marina E. Coli Data

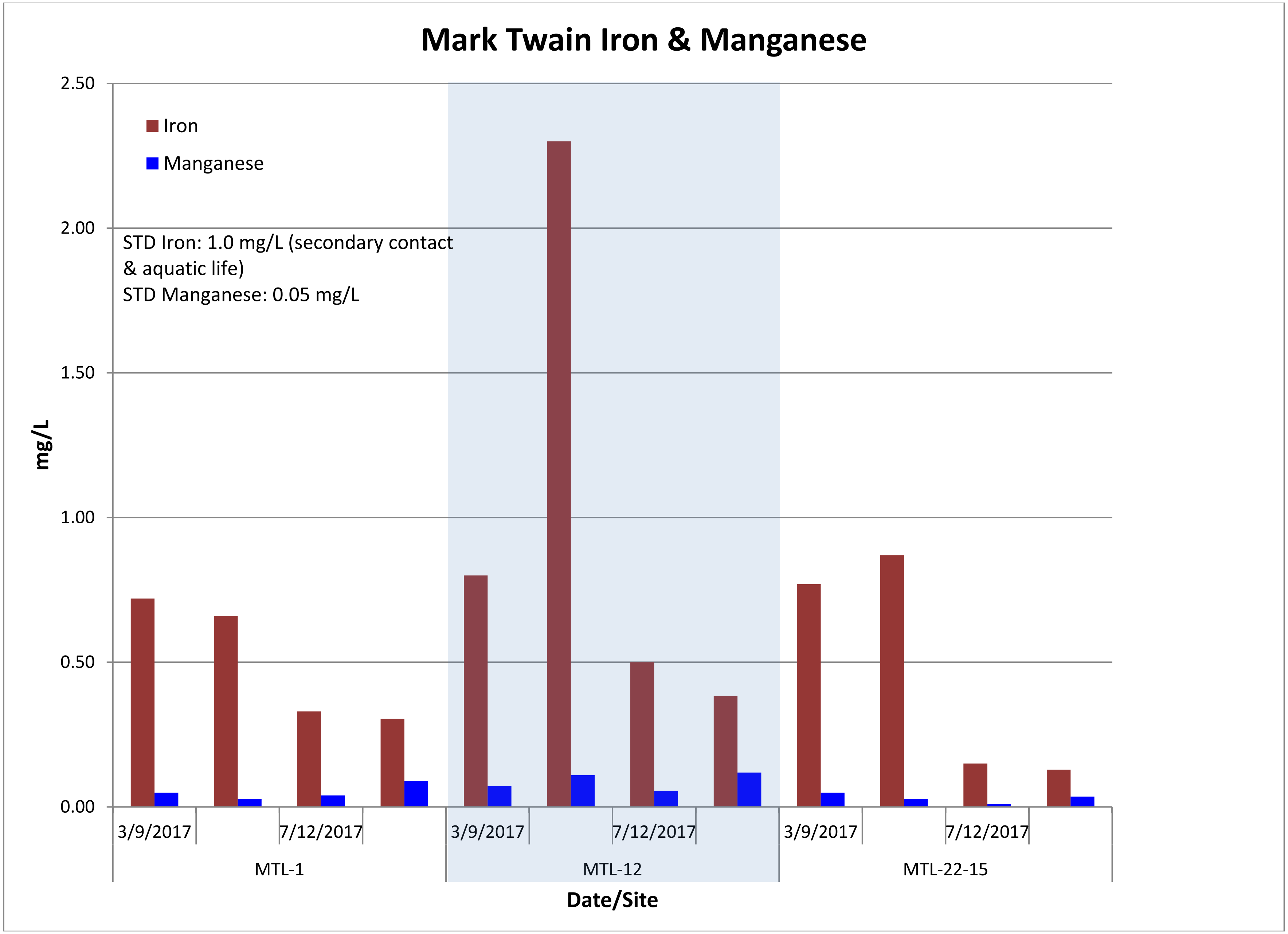
Site	Date Collected	Result	Qualifier	Unit
BJ MARINA	5/4/2017	150.00		COL/100 ML
BJ MARINA	7/13/2017	1.00		COL/100 ML
BJ MARINA	9/7/2017	2.00		COL/100 ML
IC MARINA	5/4/2017	100.00		COL/100 ML
IC MARINA	7/13/2017	12.00		COL/100 ML
IC MARINA	9/7/2017	5.00		COL/100 ML

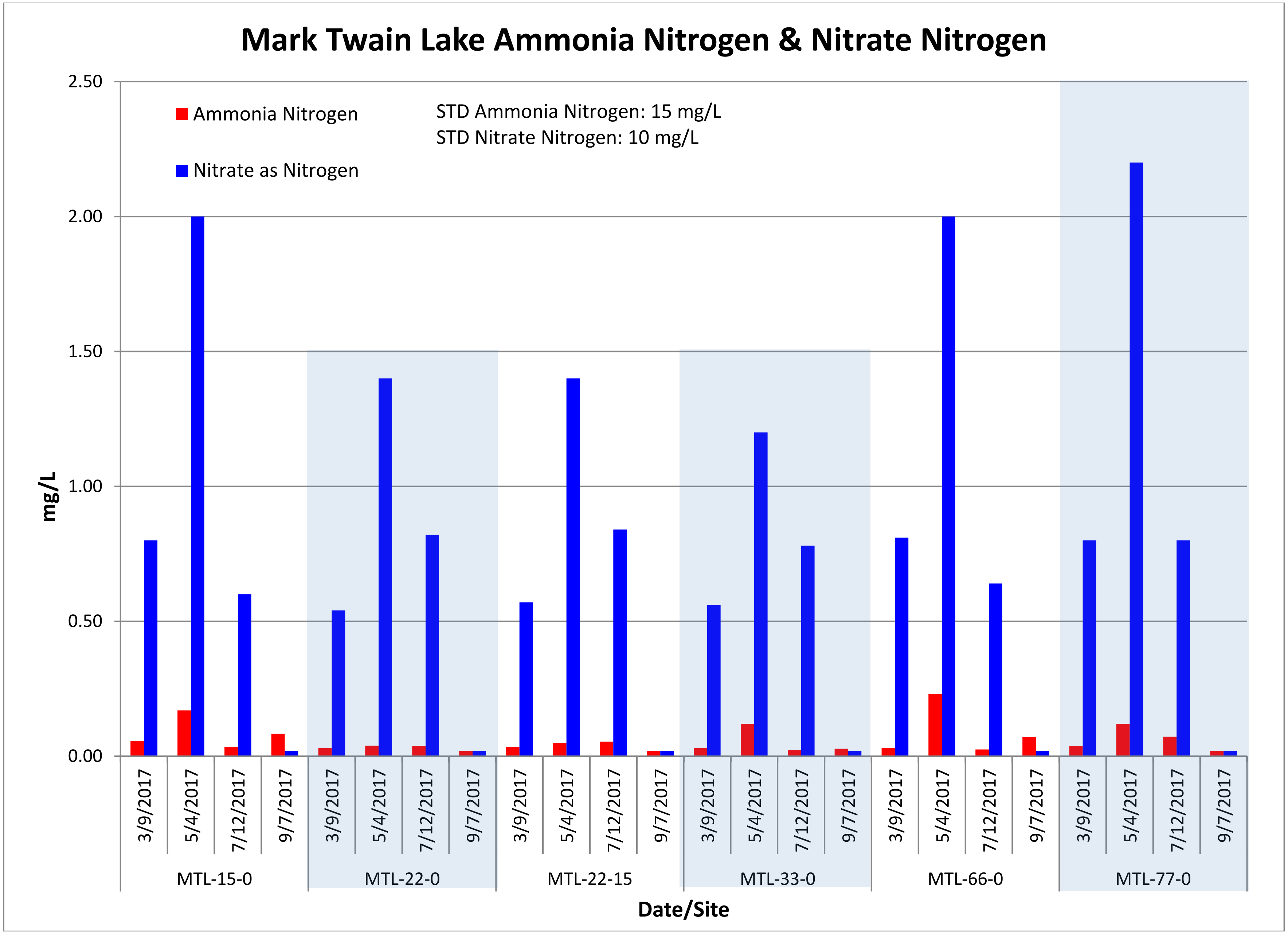
APPENDIX B

LAB DATA
GRAPHS

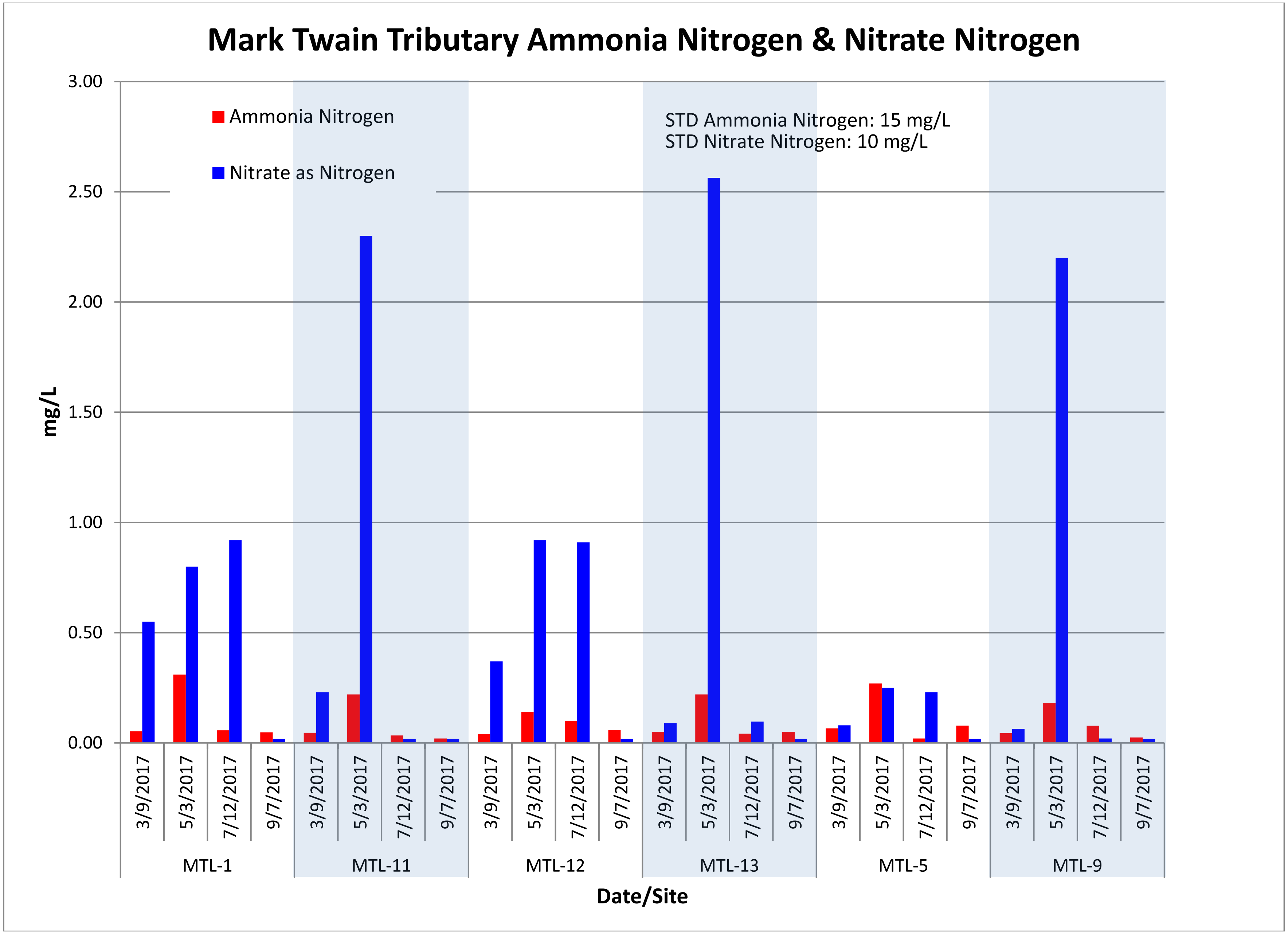


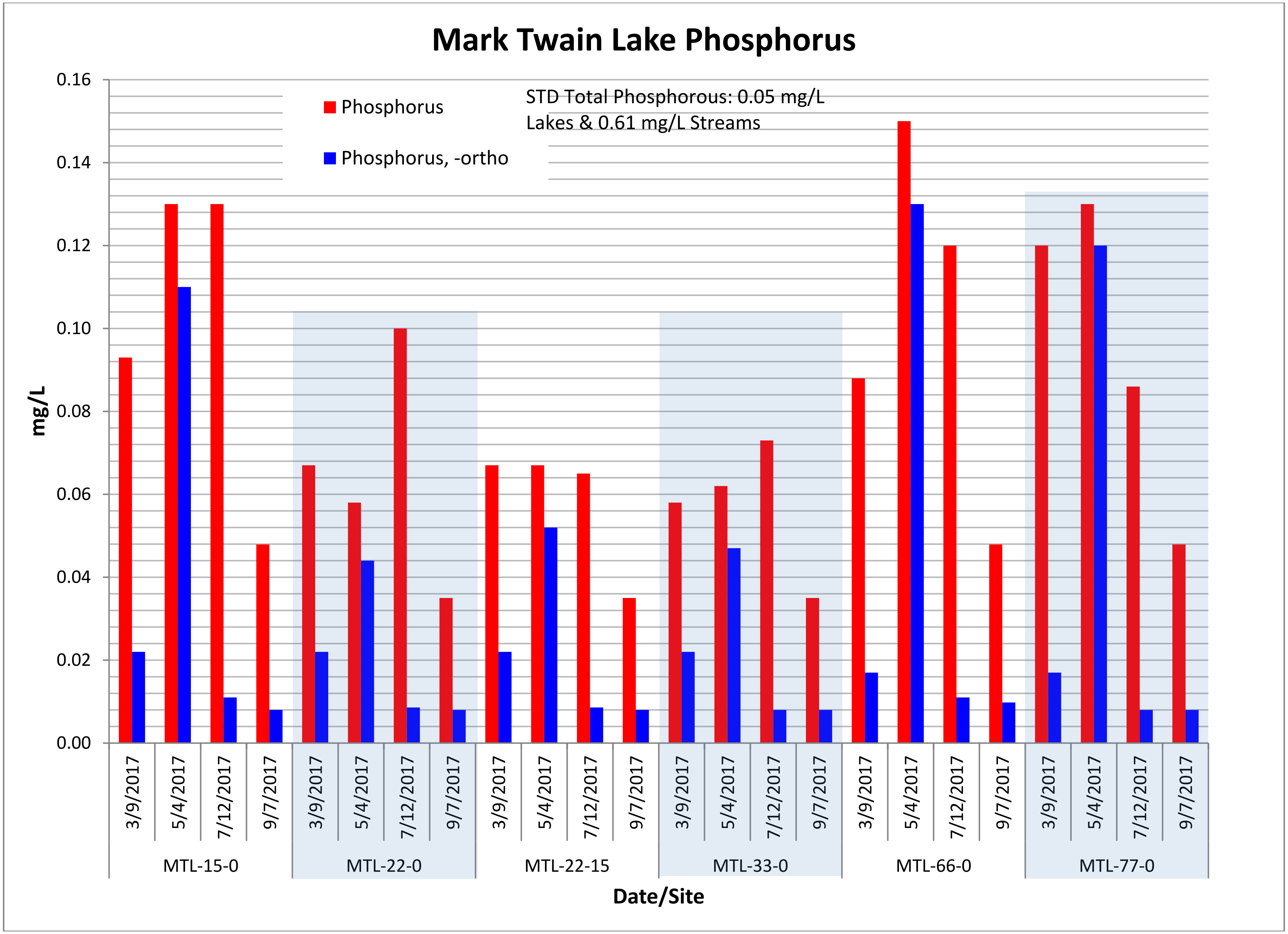
E. coli at Marinas
160.00
140.00
120.00
100.00
80.00
60.00
40.00
20.00
0.00
mp/100ml
STD: 235/100ml for single sample
5/4/2017
BJ MARINA
7/13/2017
BJ MARINA
9/7/2017
BJ MARINA
5/4/2017
IC MARINA
7/13/2017
IC MARINA
9/7/2017
IC MARINA
Date/Site

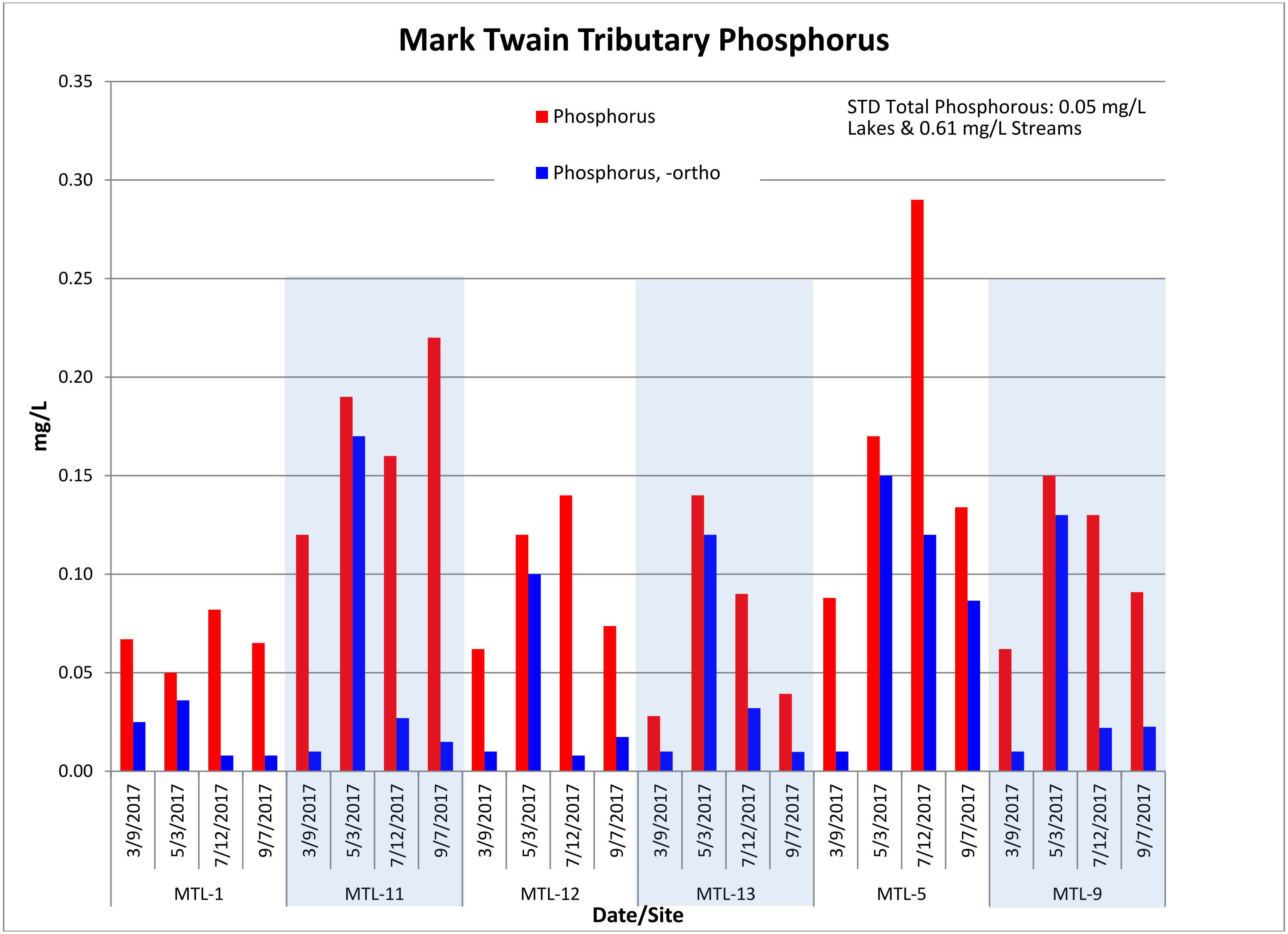

Mark Twain Iron & Manganese
2.50
2.00
1.50
1.00
0.50
0.00
Iron
Manganese
STD Iron: 1.0 mg/L (secondary contact & aquatic life)
STD Manganese: 0.05 mg/L
mg/L
3/9/2017
7/12/2017
3/9/2017
7/12/2017
3/9/2017
7/12/2017
MTL-1
MTL-12
MTL-22-15
Date/Site



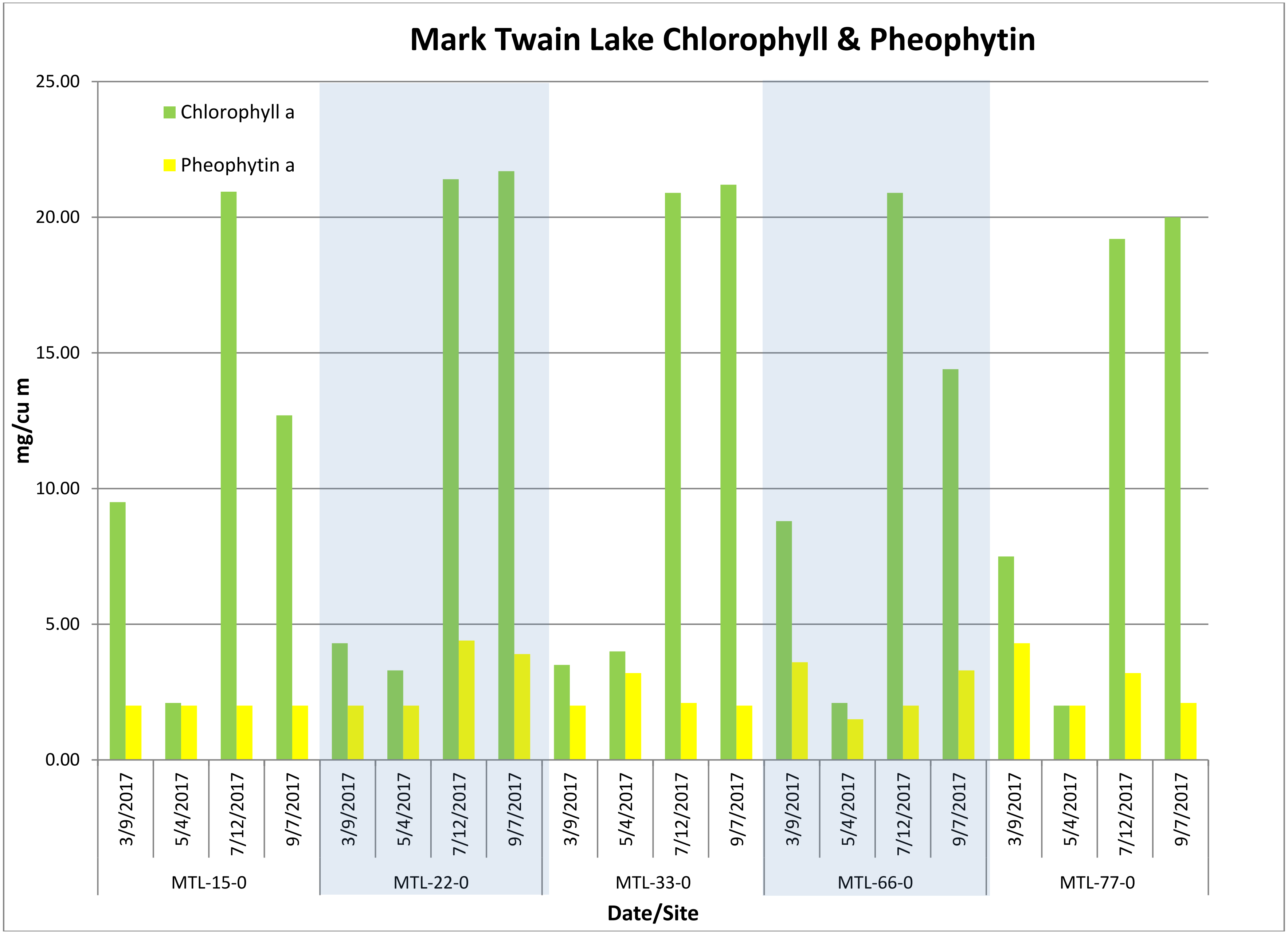
Mark Twain Lake Ammonia Nitrogen & Nitrate Nitrogen
Ammonia Nitrogen
Nitrate as Nitrogen
STD Ammonia Nitrogen: 15 mg/L
STD Nitrate Nitrogen: 10 mg/L
mg/L
2.50
2.00
1.50
1.00
0.50
0.00
3/9/2017
5/4/2017
7/12/2017
9/7/2017
MTL-15-0
MTL-22-0
MTL-22-15
MTL-33-0
MTL-66-0
MTL-77-0
Date/Site


Mark Twain Tributary Ammonia Nitrogen & Nitrate Nitrogen
Ammonia Nitrogen
Nitrate as Nitrogen
STD Ammonia Nitrogen: 15 mg/L
STD Nitrate Nitrogen: 10 mg/L
mg/L
3.00
2.50
2.00
1.50
1.00
0.50
0.00
3/9/2017
5/3/2017
7/12/2017
9/7/2017
MTL-1
MTL-11
MTL-12
MTL-13
MTL-5
MTL-9
Date/Site

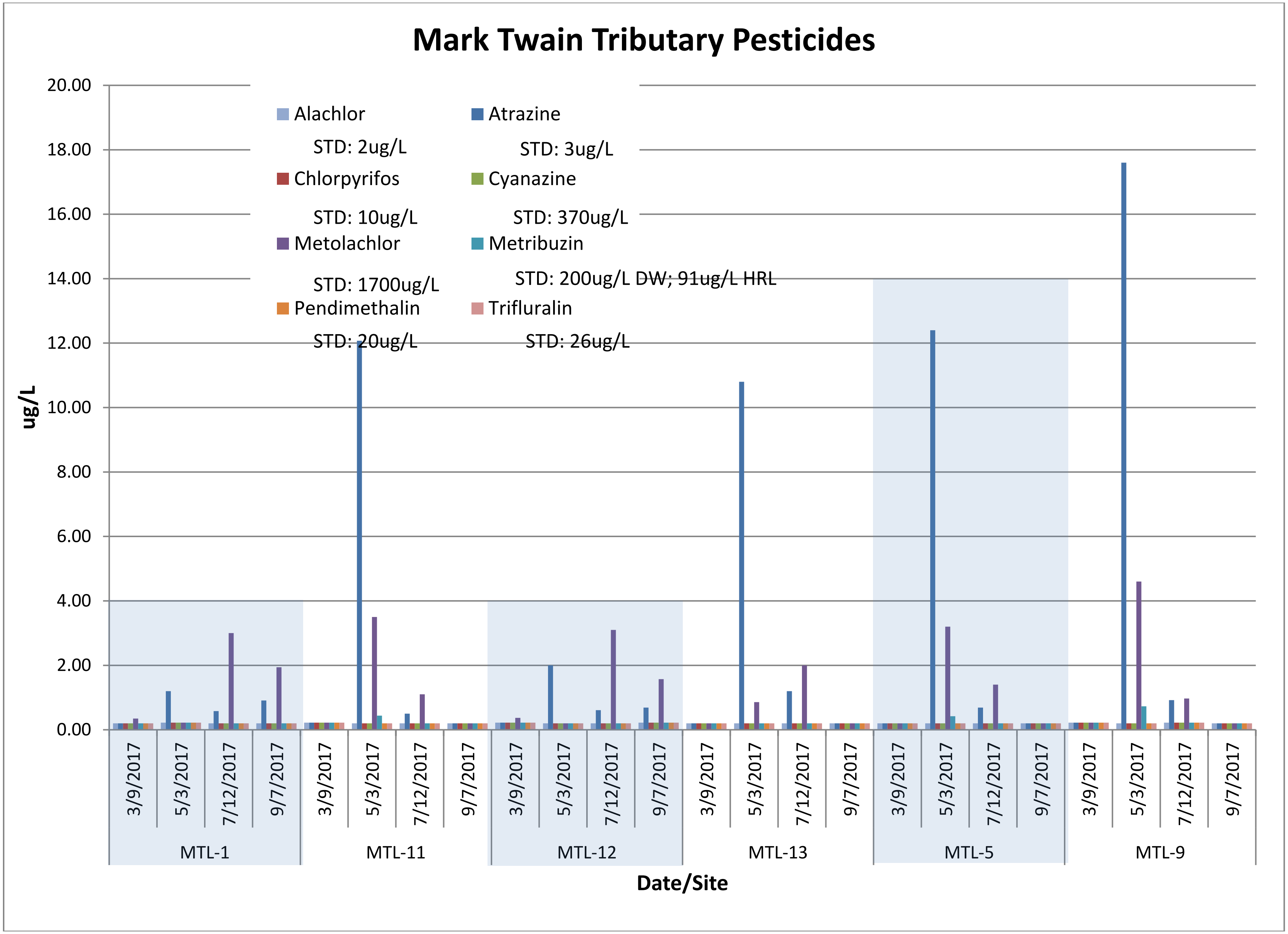

Mark Twain Lake Phosphorus
STD Total Phosphorous: 0.05 mg/L Lakes & 0.61 mg/L Streams
Phosphorus
Phosphorus, -ortho
mg/L
0.16
0.14
0.12
0.10
0.08
0.06
0.04
0.02
0.00
3/9/2017
5/4/2017
7/12/2017
9/7/2017
MTL-15-0
MTL-22-0
MTL-22-15
MTL-33-0
MTL-66-0
MTL-77-0
Date/Site



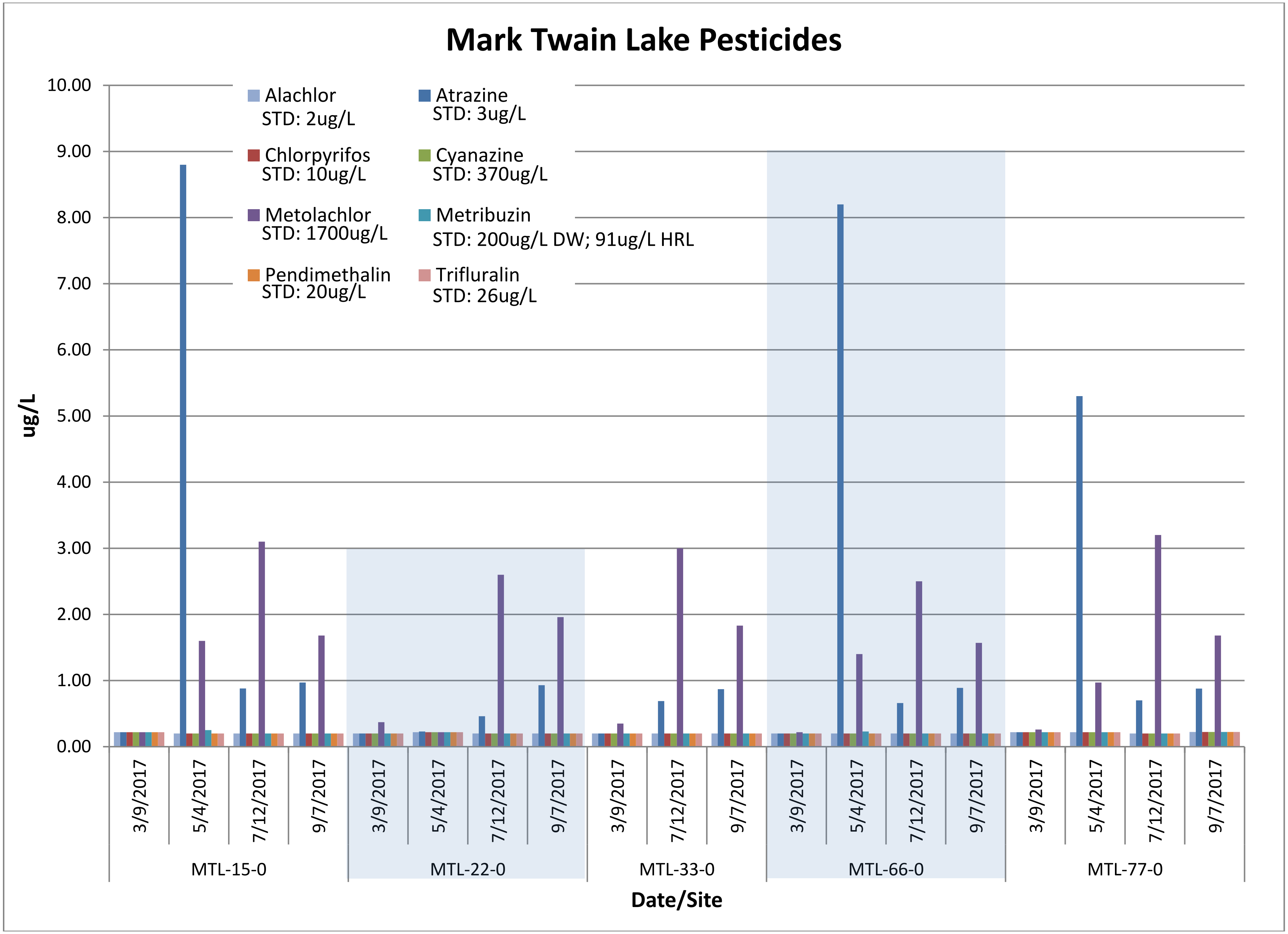
Mark Twain Tributary Phosphorus
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
mg/L
Phosphorus
Phosphorus, -ortho
STD Total Phosphorous: 0.05 mg/L Lakes & 0.61 mg/L Streams
3/9/2017
5/3/2017
7/12/2017
9/7/2017
MTL-1
MTL-11
MTL-12
MTL-13
MTL-5
MTL-9
Date/Site

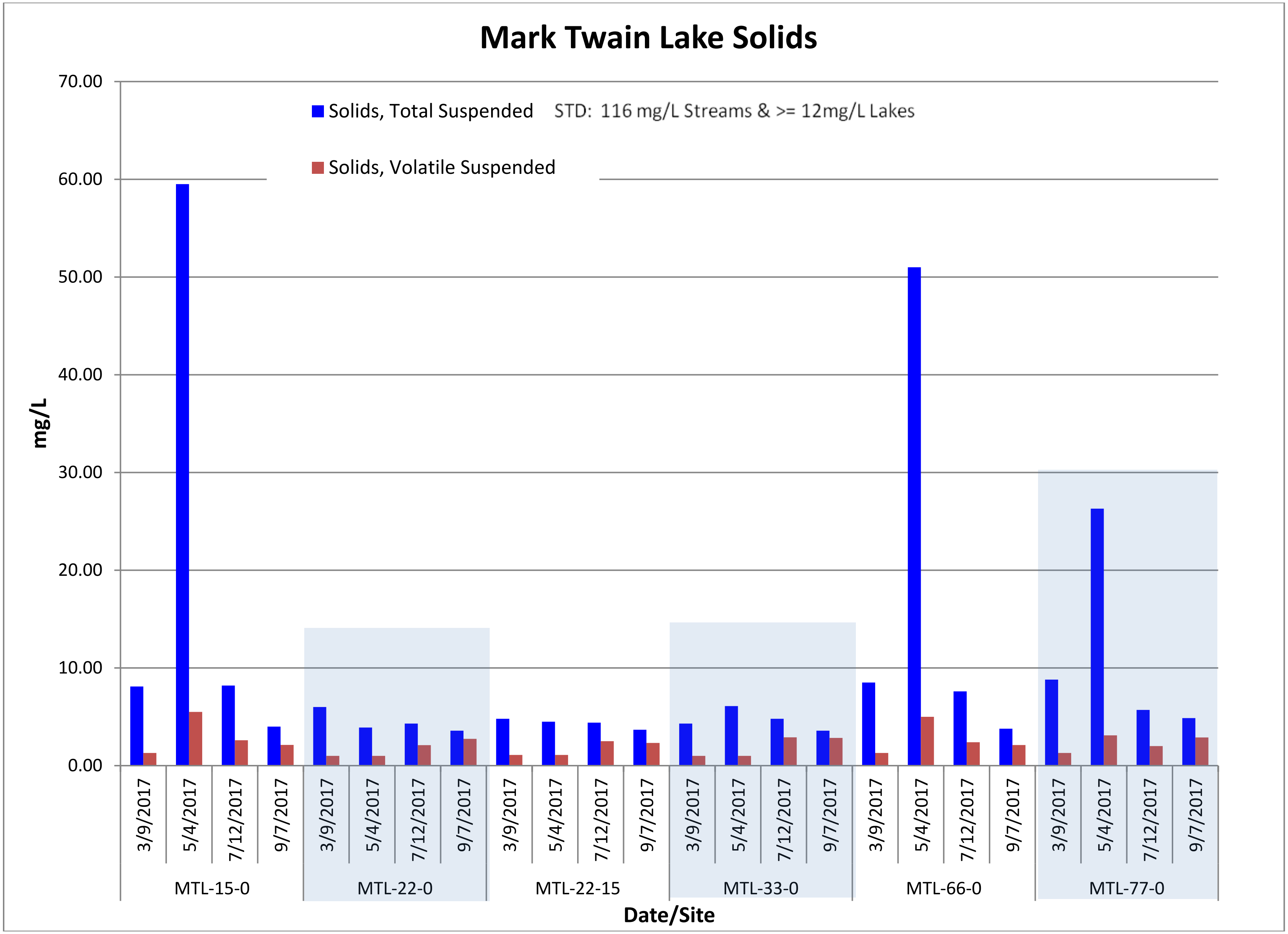


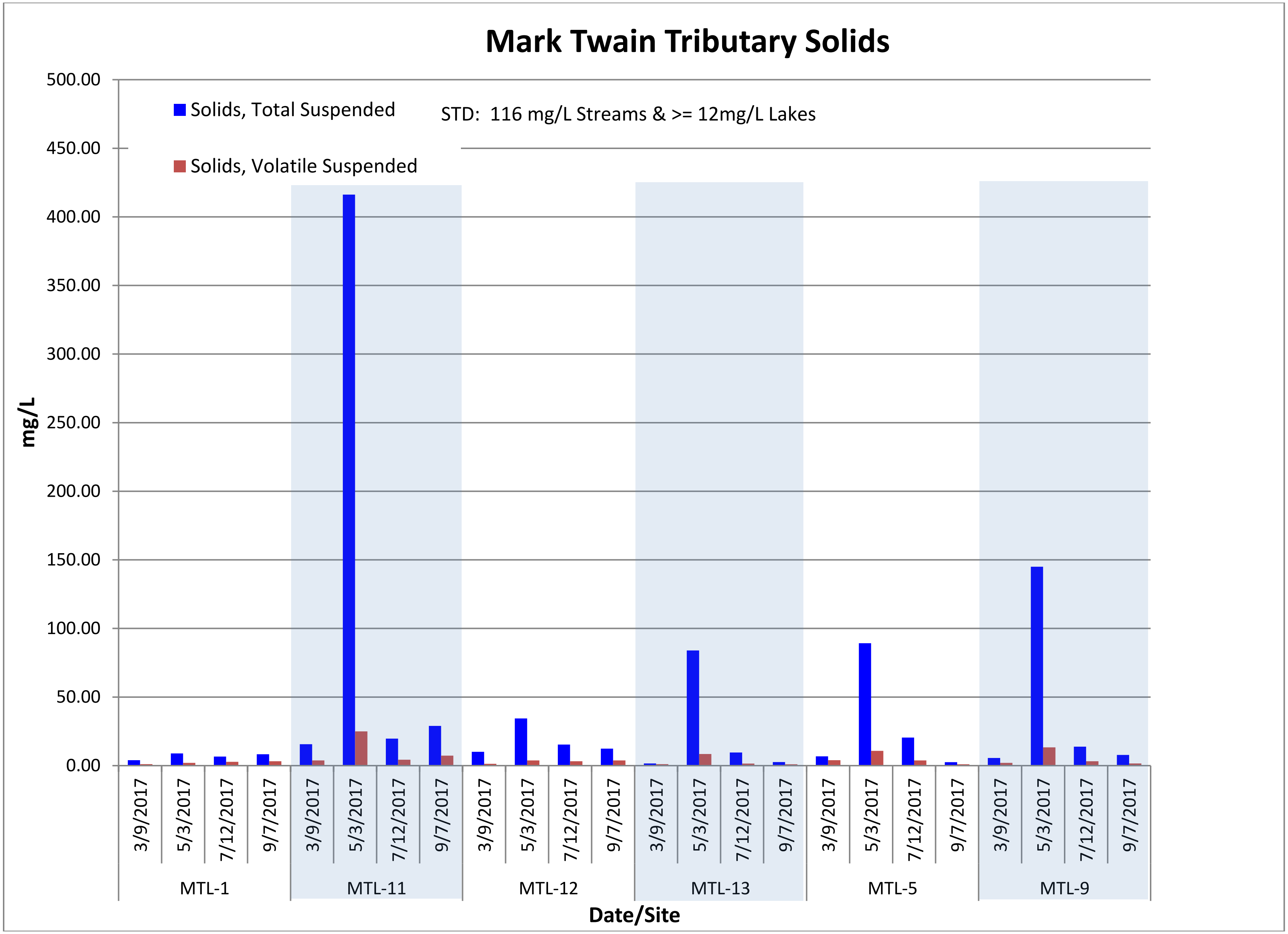
Mark Twain Lake Chlorophyll & Pheophytin
Chlorophyll a
Pheophytin a
mg/cu m
25.00
20.00
15.00
10.00
5.00
0.00
3/9/2017
5/4/2017
7/12/2017
9/7/2017
MTL-15-0
MTL-22-0
MTL-33-0
MTL-66-0
MTL-77-0
Date/Site

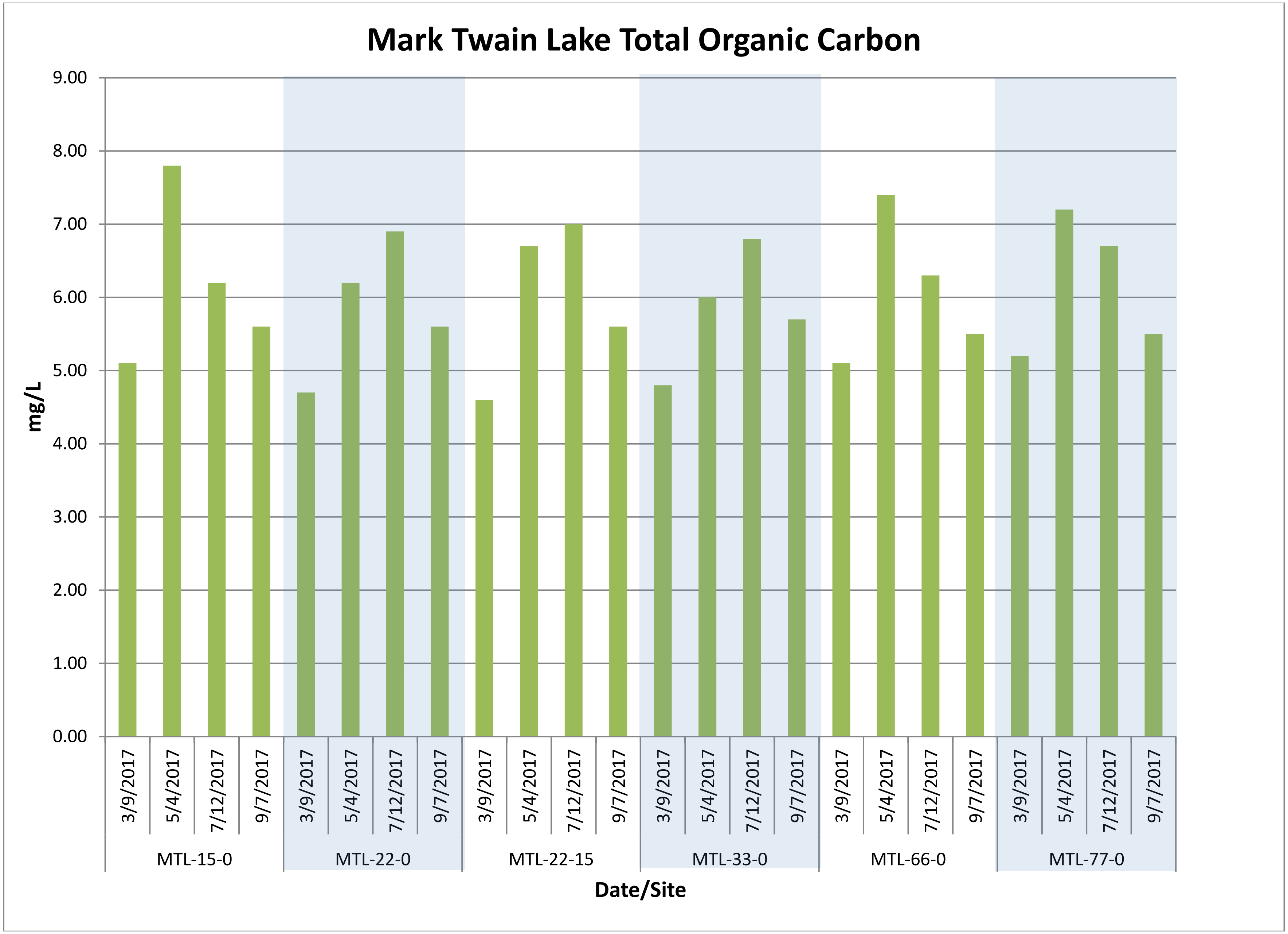


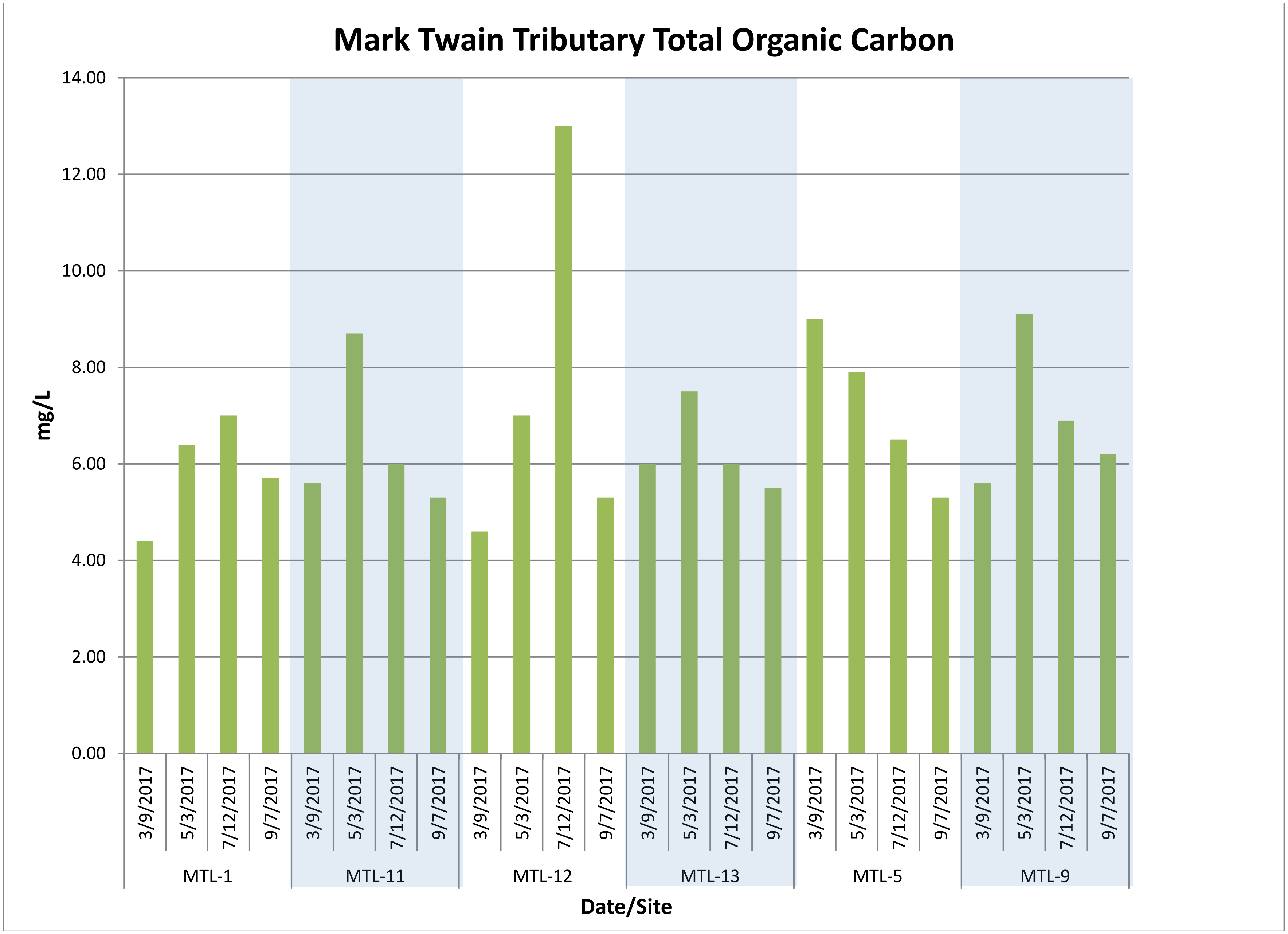
Mark Twain Tributary Pesticides
20.00
18.00
16.00
14.00
12.00
10.00
8.00
6.00
4.00
2.00
0.00
ug/L
Alachlor STD: 2ug/L
Atrazine STD: 3ug/L
Chlorpyrifos STD: 10ug/L
Cyanazine STD: 370ug/L
Metolachlor STD: 1700ug/L
Metribuzin STD: 200ug/L DW; 91ug/L HRL
Pendimethalin STD: 20ug/L
Trifluralin STD: 26ug/L
3/9/2017
5/3/2017
7/12/2017
9/7/2017
MTL-1
MTL-11
MTL-12
MTL-13
MTL-5
MTL-9
Date/Site


Mark Twain Lake Pesticides
10.00
9.00
8.00
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
ug/L
Alachlor
STD: 2ug/L
Atrazine
STD: 3ug/L
Chlorpyrifos
STD: 10ug/L
Cyanazine
STD: 370ug/L
Metolachlor
STD: 1700ug/L
Metribuzin
STD: 200ug/L DW; 91ug/L HRL
Pendimethalin
STD: 20ug/L
Trifluralin
STD: 26ug/L
3/9/2017
5/4/2017
7/12/2017
9/7/2017
MTL-15-0
3/9/2017
5/4/2017
7/12/2017
9/7/2017
MTL-22-0
3/9/2017
7/12/2017
9/7/2017
MTL-33-0
3/9/2017
5/4/2017
7/12/2017
9/7/2017
MTL-66-0
3/9/2017
5/4/2017
7/12/2017
9/7/2017
MTL-77-0
Date/Site


Mark Twain Lake Solids
Solids, Total Suspended
STD: 116 mg/L Streams & >= 12mg/L Lakes
Solids, Volatile Suspended
mg/L
70.00
60.00
50.00
40.00
30.00
20.00
10.00
0.00
3/9/2017
5/4/2017
7/12/2017
9/7/2017
MTL-15-0
MTL-22-0
MTL-22-15
MTL-33-0
MTL-66-0
MTL-77-0
Date/Site

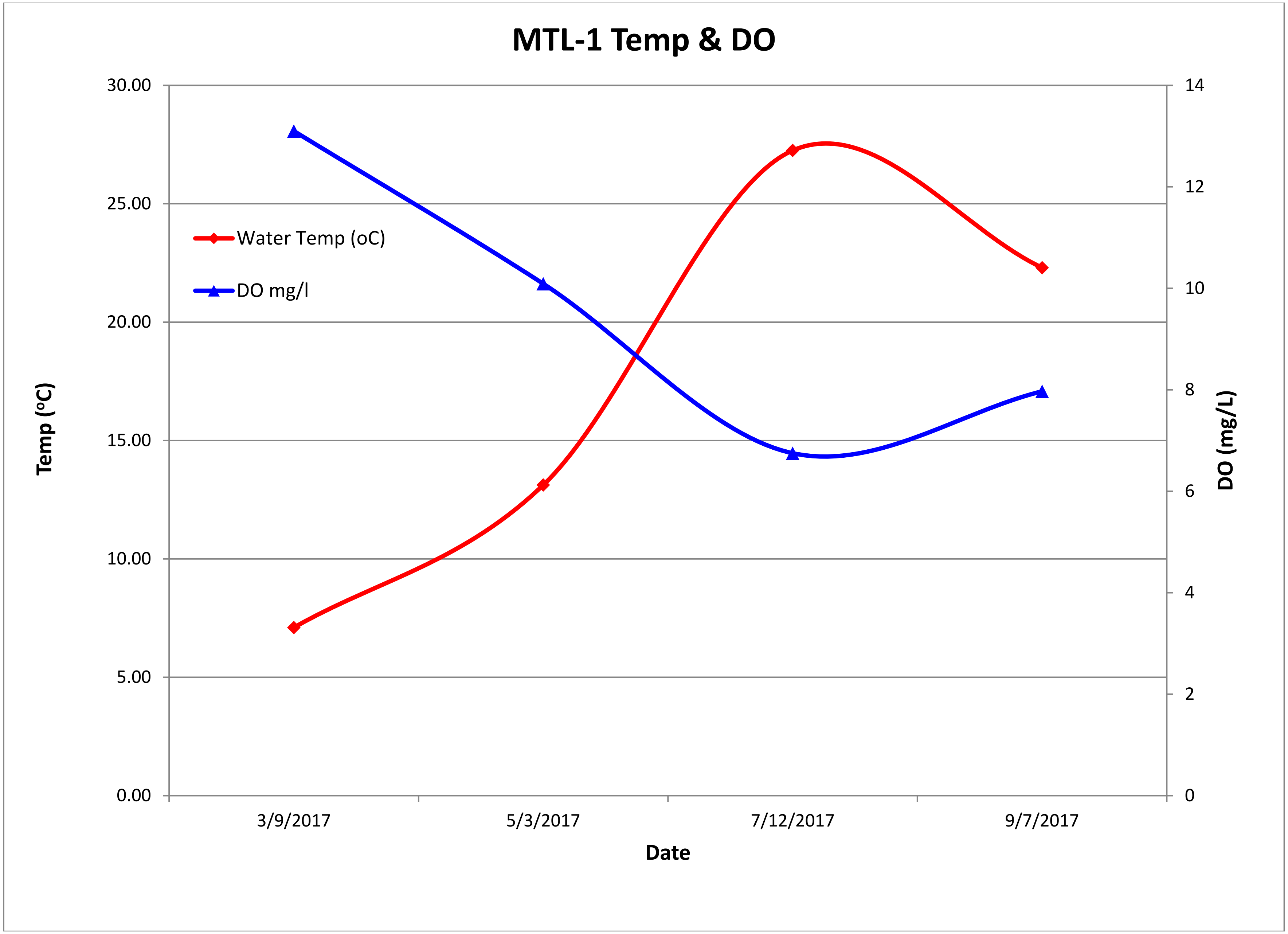

Mark Twain Tributary Solids
Solids, Total Suspended
Solids, Volatile Suspended
STD: 116 mg/L Streams & >= 12mg/L Lakes
mg/L
500.00
450.00
400.00
350.00
300.00
250.00
200.00
150.00
100.00
50.00
0.00
3/9/2017
5/3/2017
7/12/2017
9/7/2017
MTL-1
MTL-11
MTL-12
MTL-13
MTL-5
MTL-9
Date/Site

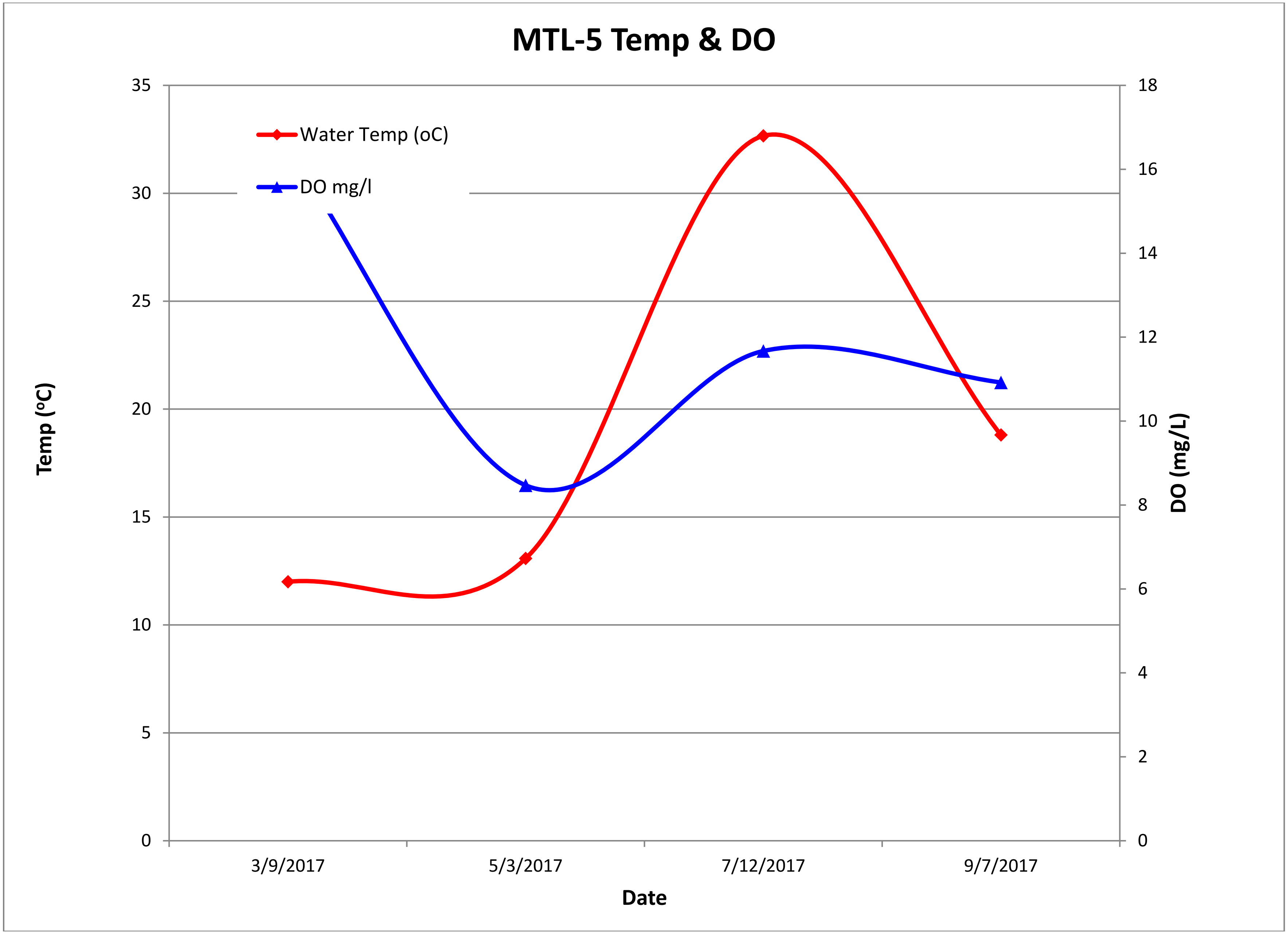

Mark Twain Lake Total Organic Carbon
mg/L
9.00
8.00
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
3/9/2017
5/4/2017
7/12/2017
9/7/2017
MTL-15-0
MTL-22-0
MTL-22-15
MTL-33-0
MTL-66-0
MTL-77-0
Date/Site


Mark Twain Tributary Total Organic Carbon
14.00
12.00
10.00
8.00
6.00
4.00
2.00
0.00
mg/L
3/9/2017
5/3/2017
7/12/2017
9/7/2017
MTL-1
MTL-11
MTL-12
MTL-13
MTL-5
MTL-9
Date/Site

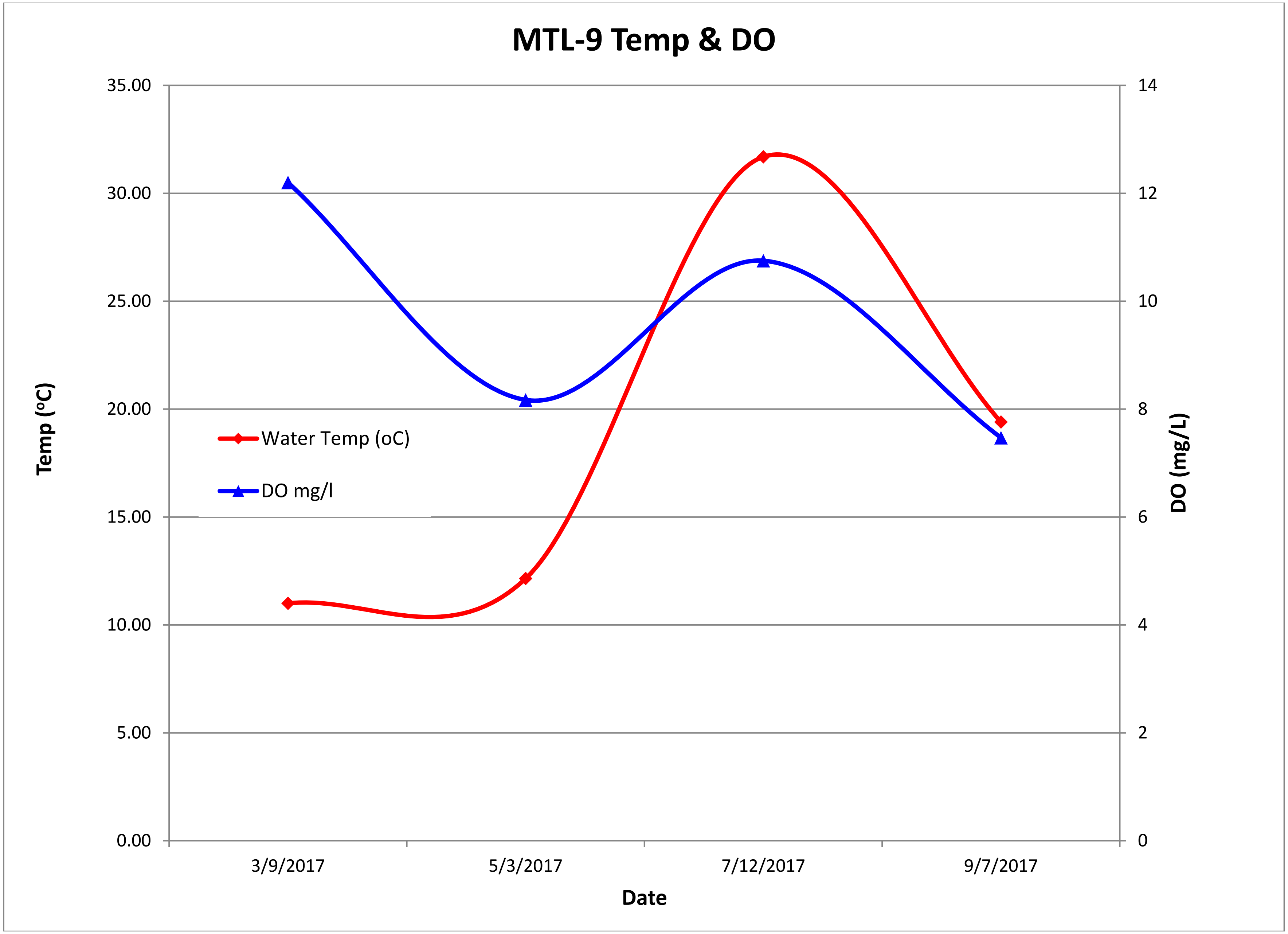
APPENDIX C

FIELD DATA
GRAPHS

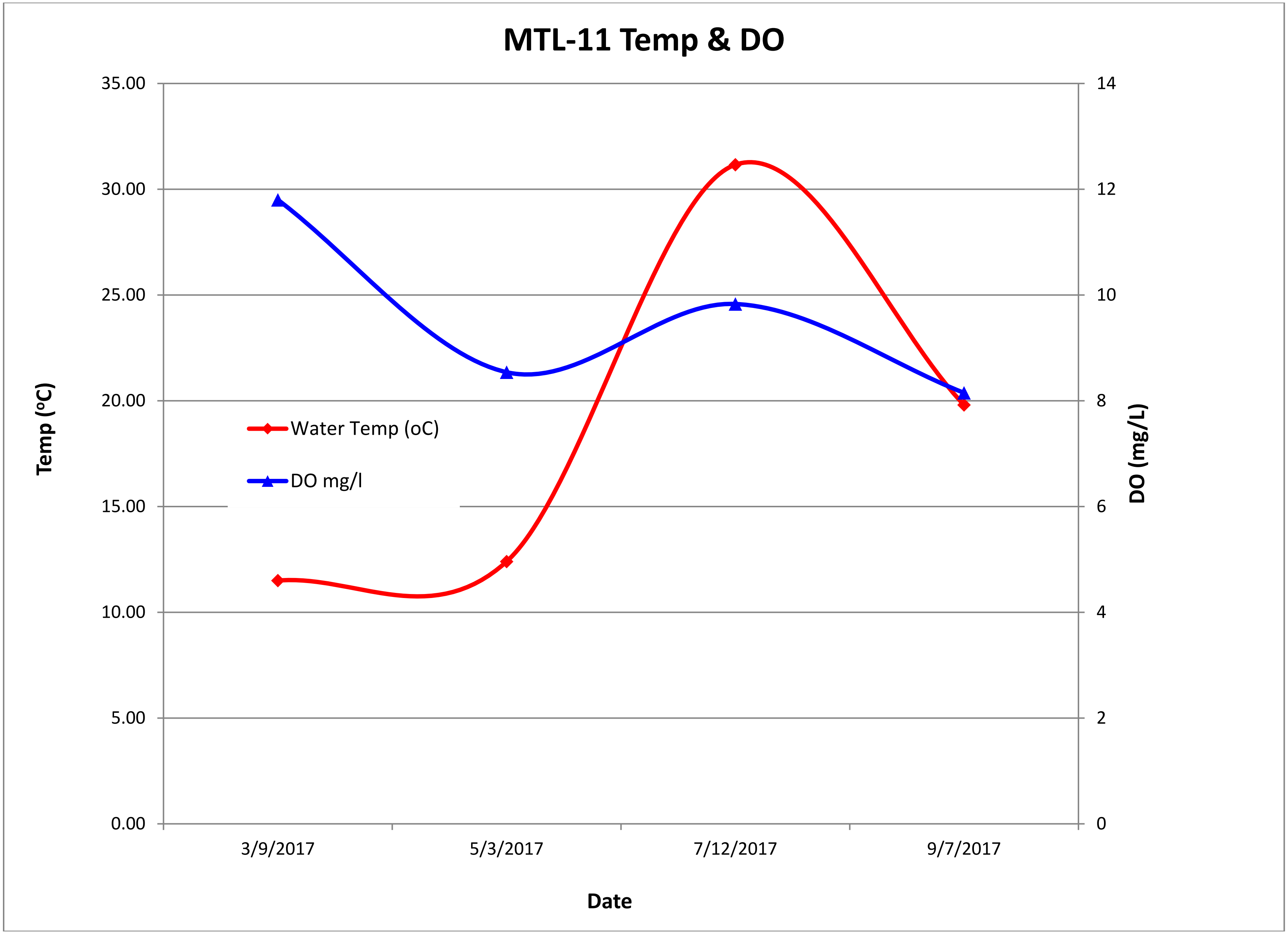

MTL-1 Temp & DO
30.00
25.00
20.00
15.00
10.00
5.00
0.00
14
12
10
8
6
4
2
0
Water Temp (oC)
DO mg/l
Temp (oC)
DO (mg/L)
3/9/2017
5/3/2017
7/12/2017
9/7/2017
Date

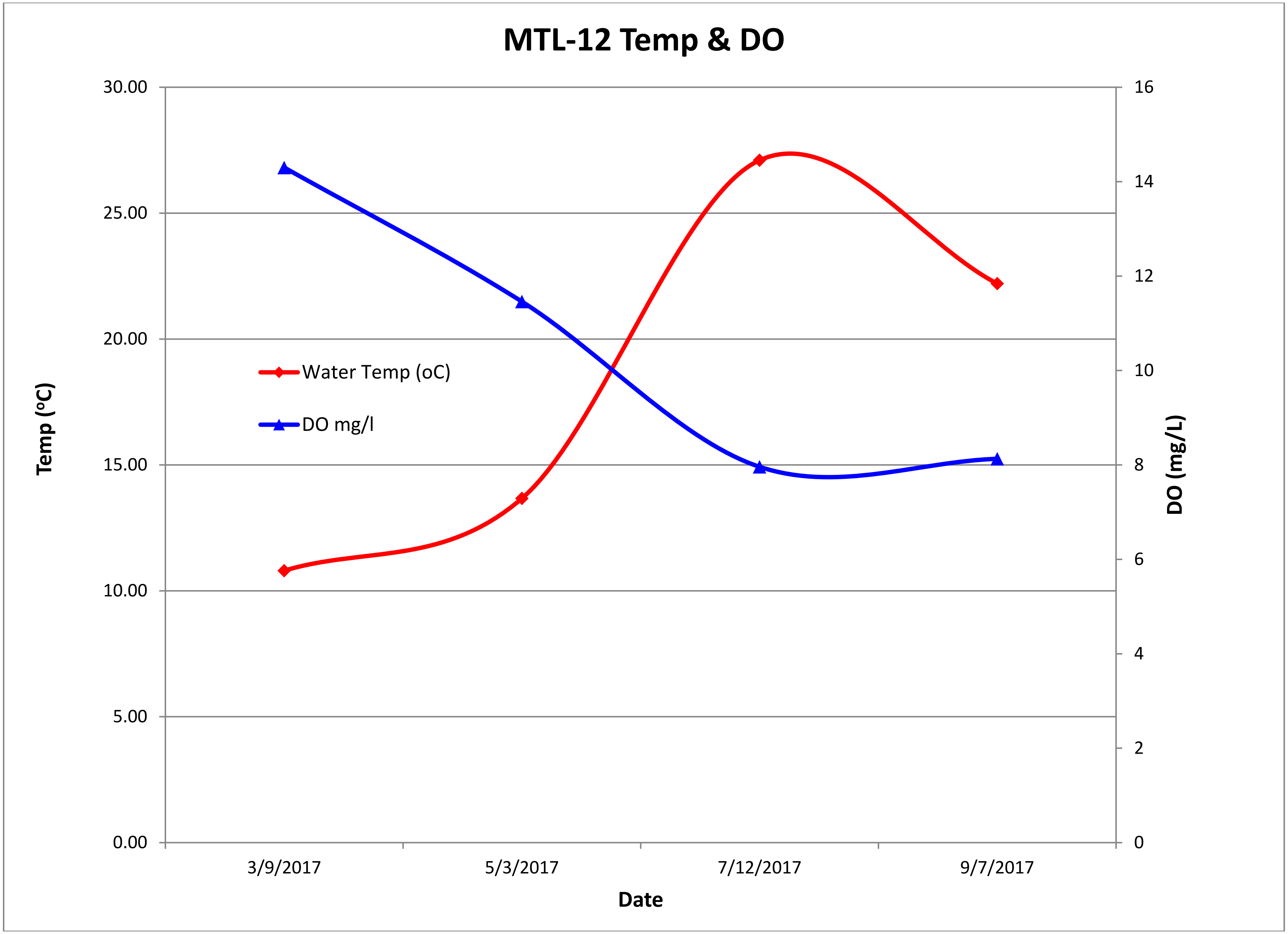


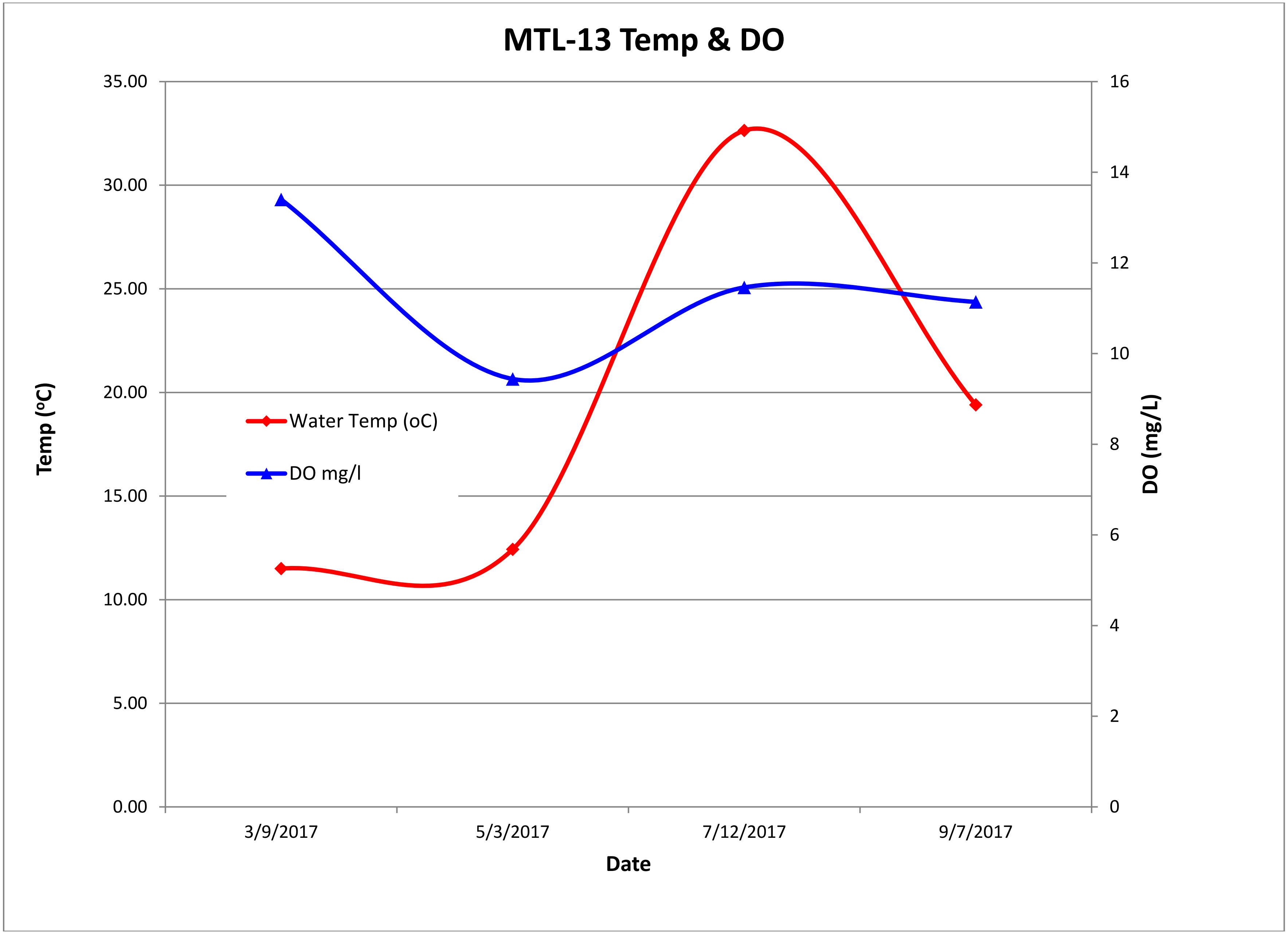
MTL-5 Temp & DO
Water Temp (oC)
DO mg/l
35
30
25
20
15
10
5
0
18
16
14
12
10
8
6
4
2
0
Temp (oC)
DO (mg/L)
3/9/2017
5/3/2017
7/12/2017
9/7/2017
Date

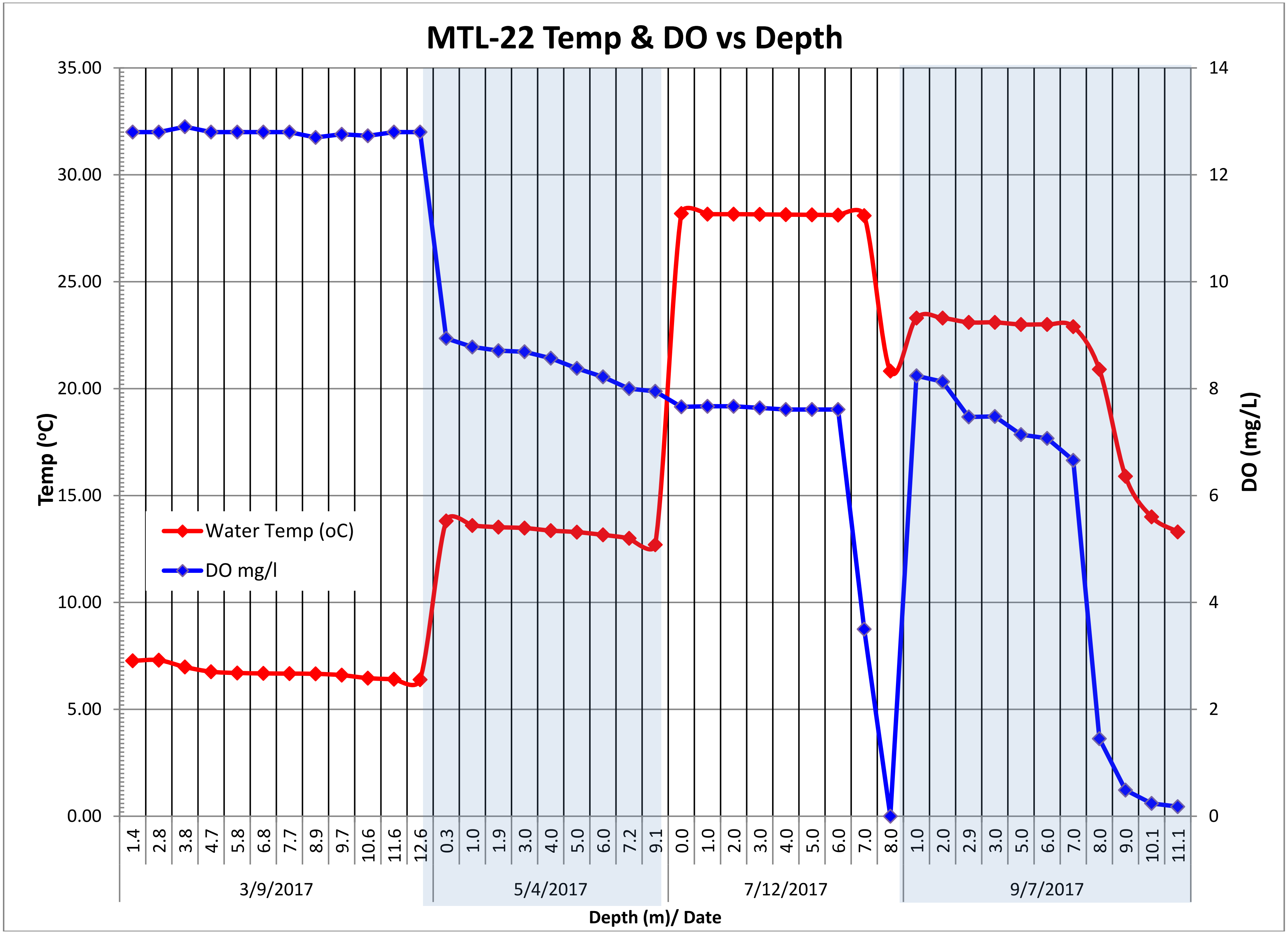


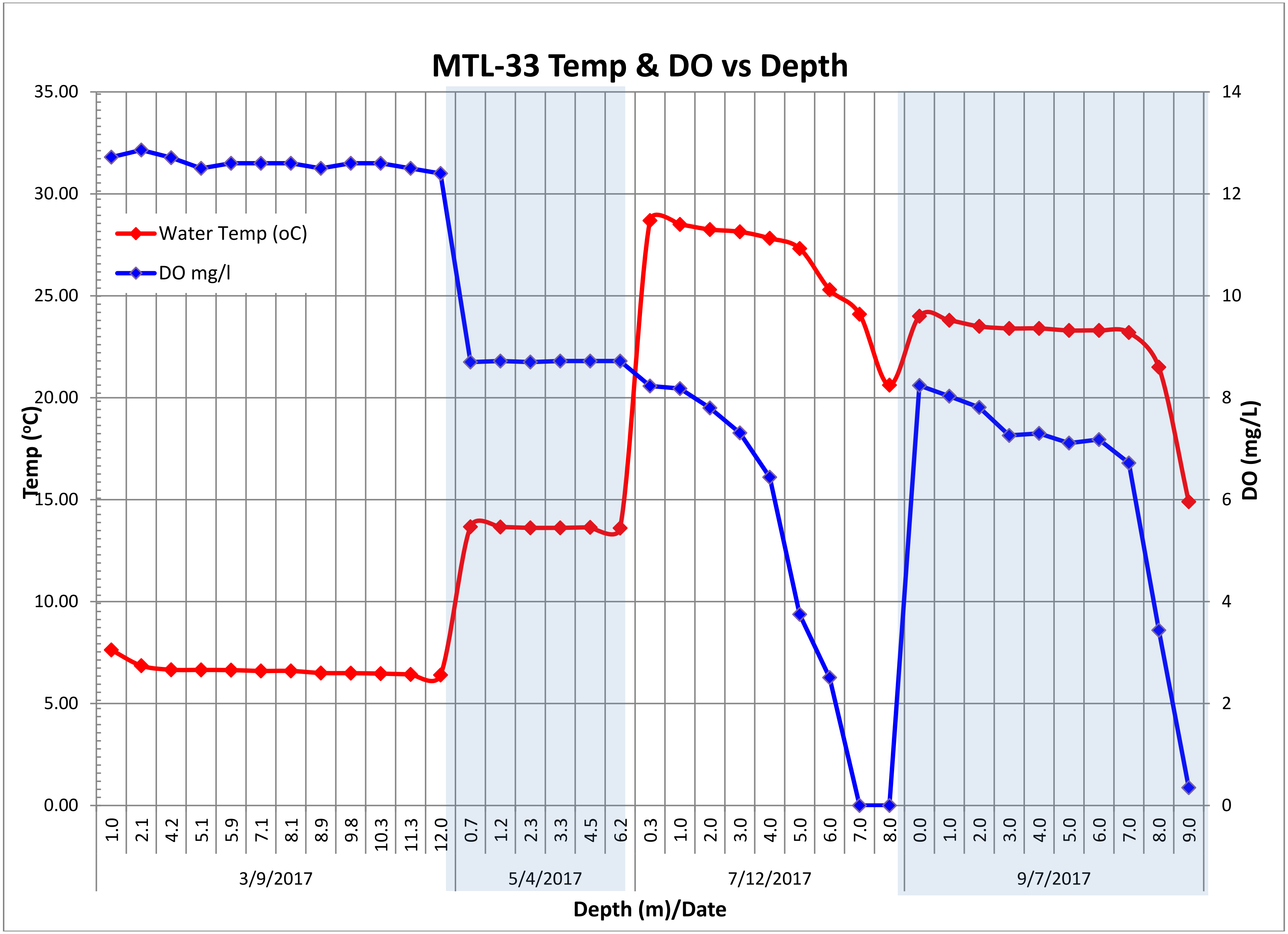
MTL-9 Temp & DO
35.00
30.00
25.00
20.00
15.00
10.00
5.00
0.00
14
12
10
8
6
4
2
0
Temp (ºC)
DO (mg/L)
Water Temp (oC)
DO mg/l
3/9/2017
5/3/2017
7/12/2017
9/7/2017
Date

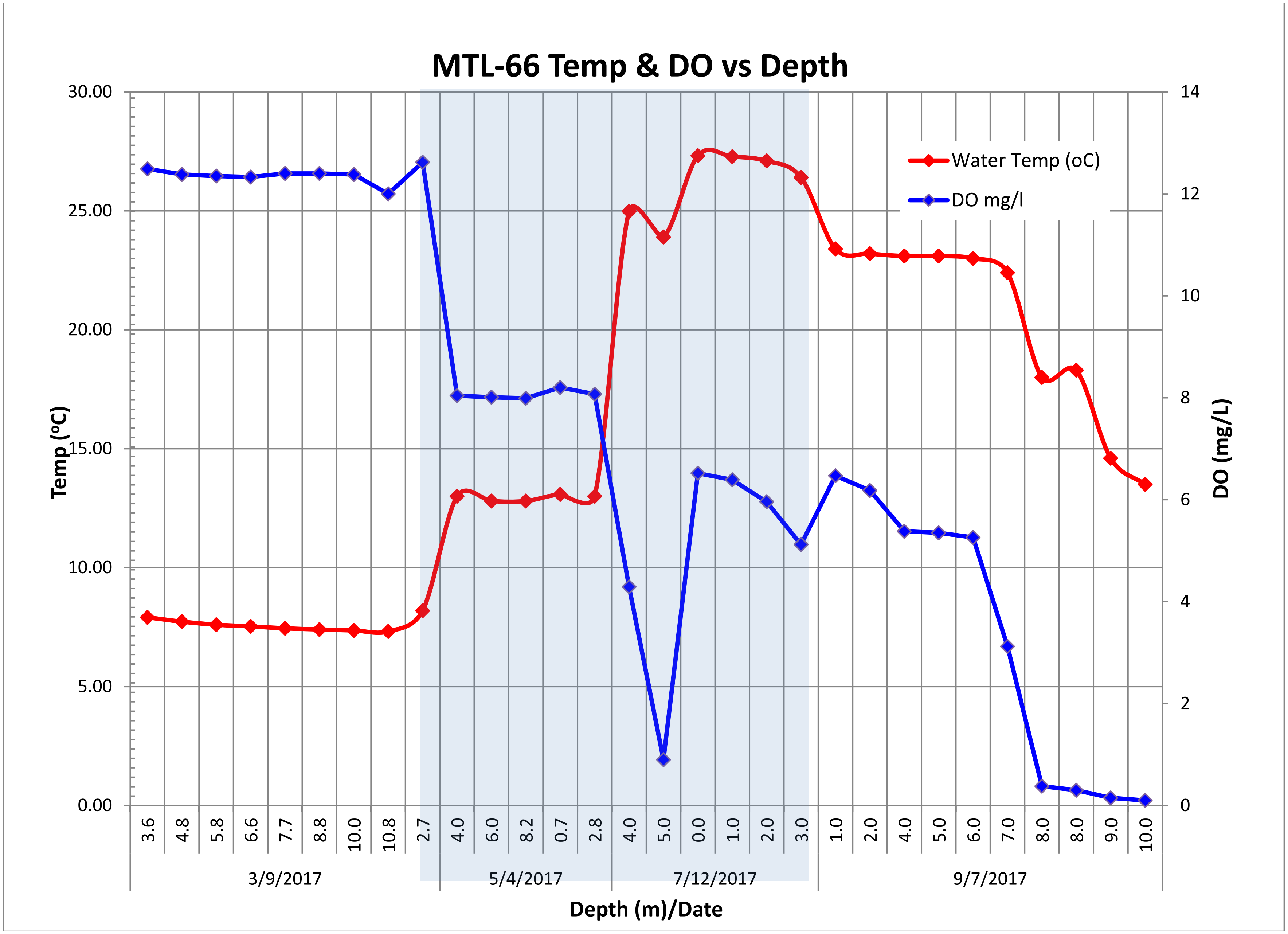

MTL-11 Temp & DO
35.00
30.00
25.00
20.00
15.00
10.00
5.00
0.00
14
12
10
8
6
4
2
0
Temp (ºC)
DO (mg/L)
Water Temp (oC)
DO mg/l
3/9/2017
5/3/2017
7/12/2017
9/7/2017
Date


MTL-12 Temp & DO
30.00
25.00
20.00
15.00
10.00
5.00
0.00
16
14
12
10
8
6
4
2
0
Temp (°C)
DO (mg/L)
Water Temp (oC)
DO mg/l
3/9/2017
5/3/2017
7/12/2017
9/7/2017
Date

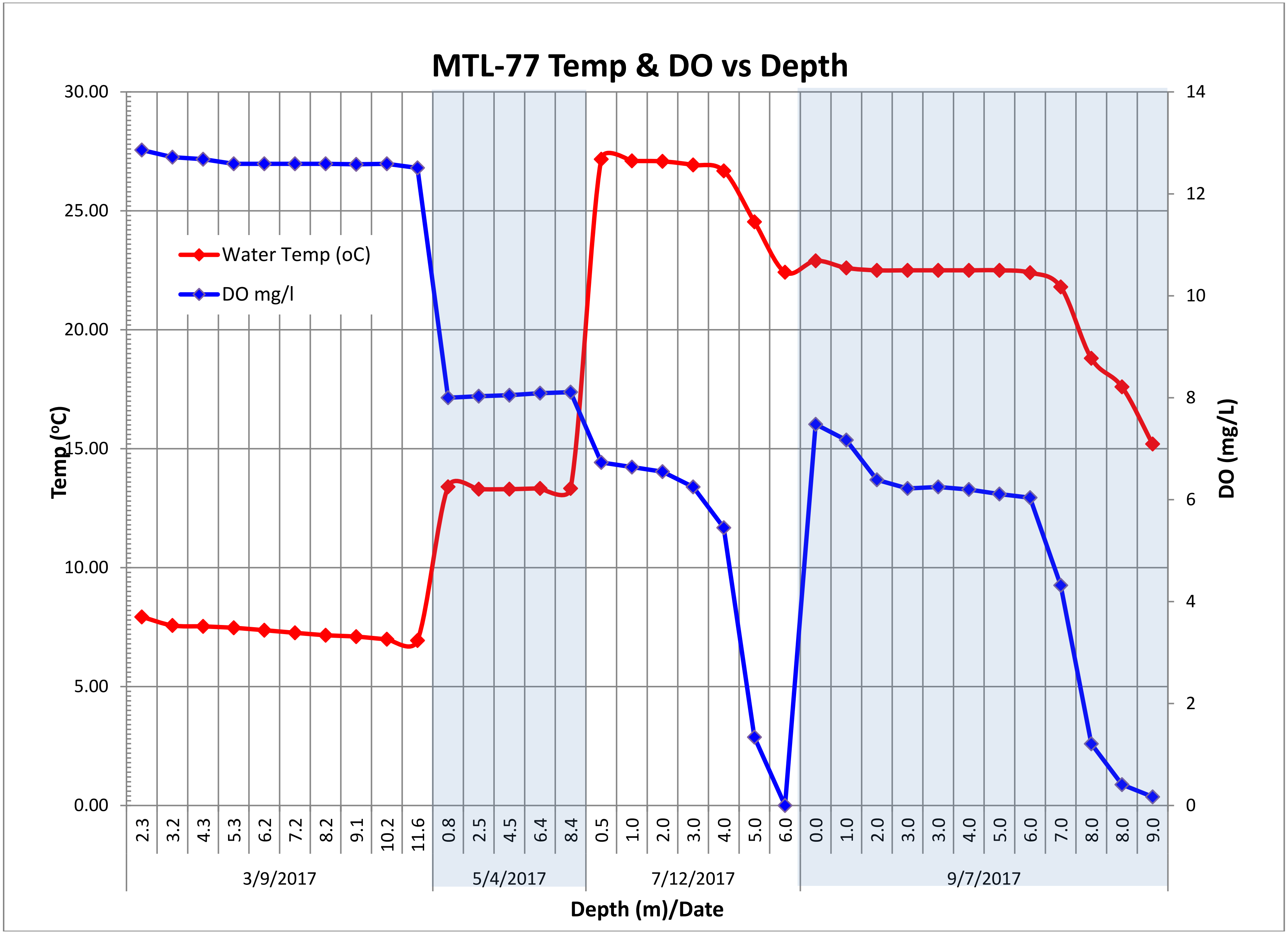

MTL-13 Temp & DO
35.00
30.00
25.00
20.00
15.00
10.00
5.00
0.00
Temp (ºC)
16
14
12
10
8
6
4
2
0
DO (mg/L)
Water Temp (oC)
DO mg/l
3/9/2017
5/3/2017
7/12/2017
9/7/2017
Date


MTL-22 Temp & DO vs Depth
Temp (oC)
DO (mg/L)
Water Temp (oC)
DO mg/l
35.00
30.00
25.00
20.00
15.00
10.00
5.00
0.00
14
12
10
8
6
4
2
0
1.4
2.8
3.8
4.7
5.8
6.8
7.7
8.9
9.7
10.6
11.6
12.6
0.3
1.0
1.9
3.0
4.0
5.0
6.0
7.2
9.1
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
1.0
2.0
2.9
3.0
5.0
6.0
7.0
8.0
9.0
10.1
11.1
3/9/2017
5/4/2017
7/12/2017
9/7/2017
Depth (m)/ Date

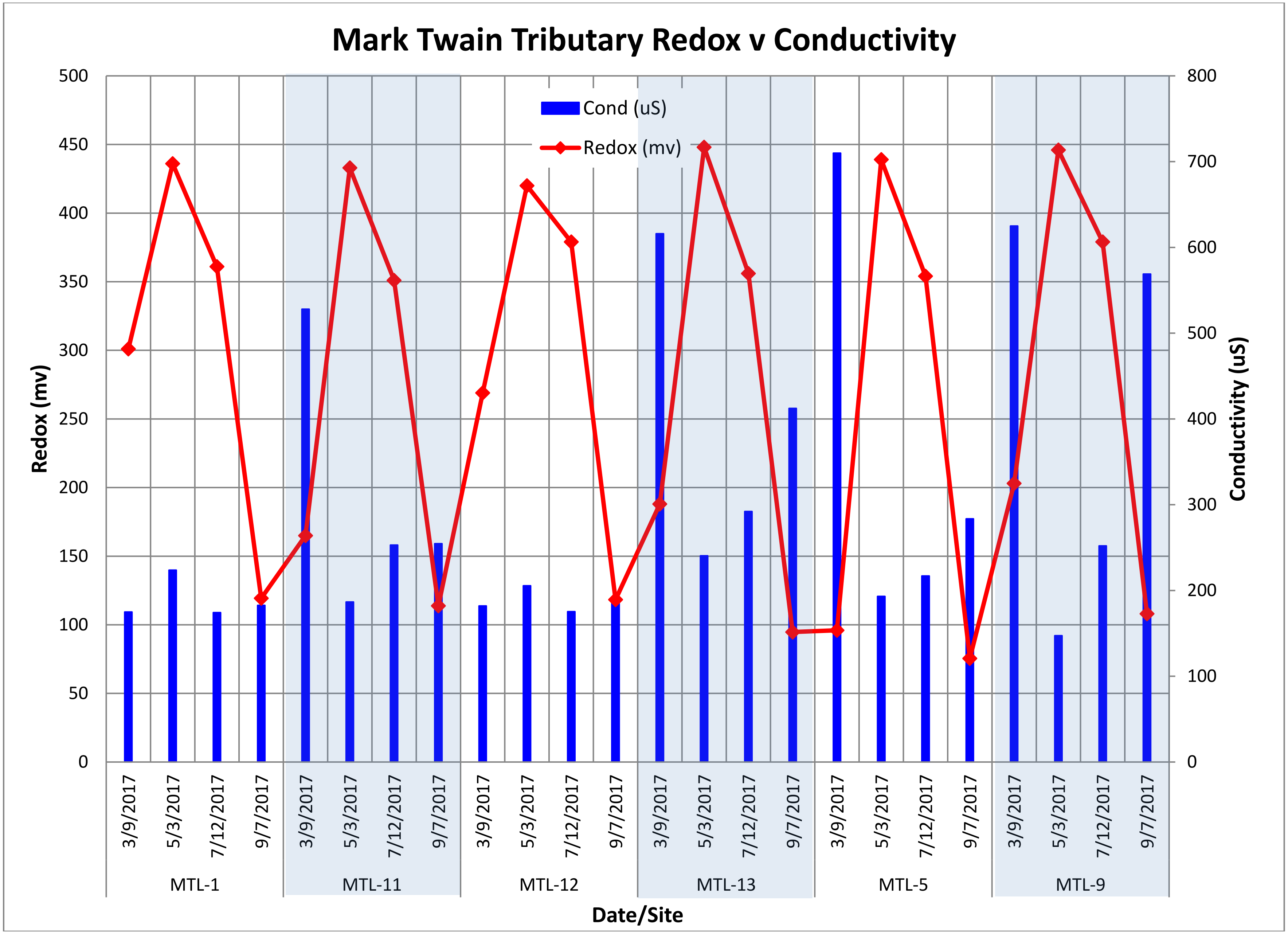

MTL-33 Temp & DO vs Depth
35.00
30.00
25.00
20.00
15.00
10.00
5.00
0.00
14
12
10
8
6
4
2
0
Water Temp (oC)
DO mg/l
Temp (ºC)
DO (mg/L)
1.0
2.1
4.2
5.1
5.9
7.1
8.1
8.9
9.8
10.3
11.3
12.0
0.7
1.2
2.3
3.3
4.5
6.2
0.3
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
9.0
3/9/2017
5/4/2017
7/12/2017
9/7/2017
Depth (m)/Date



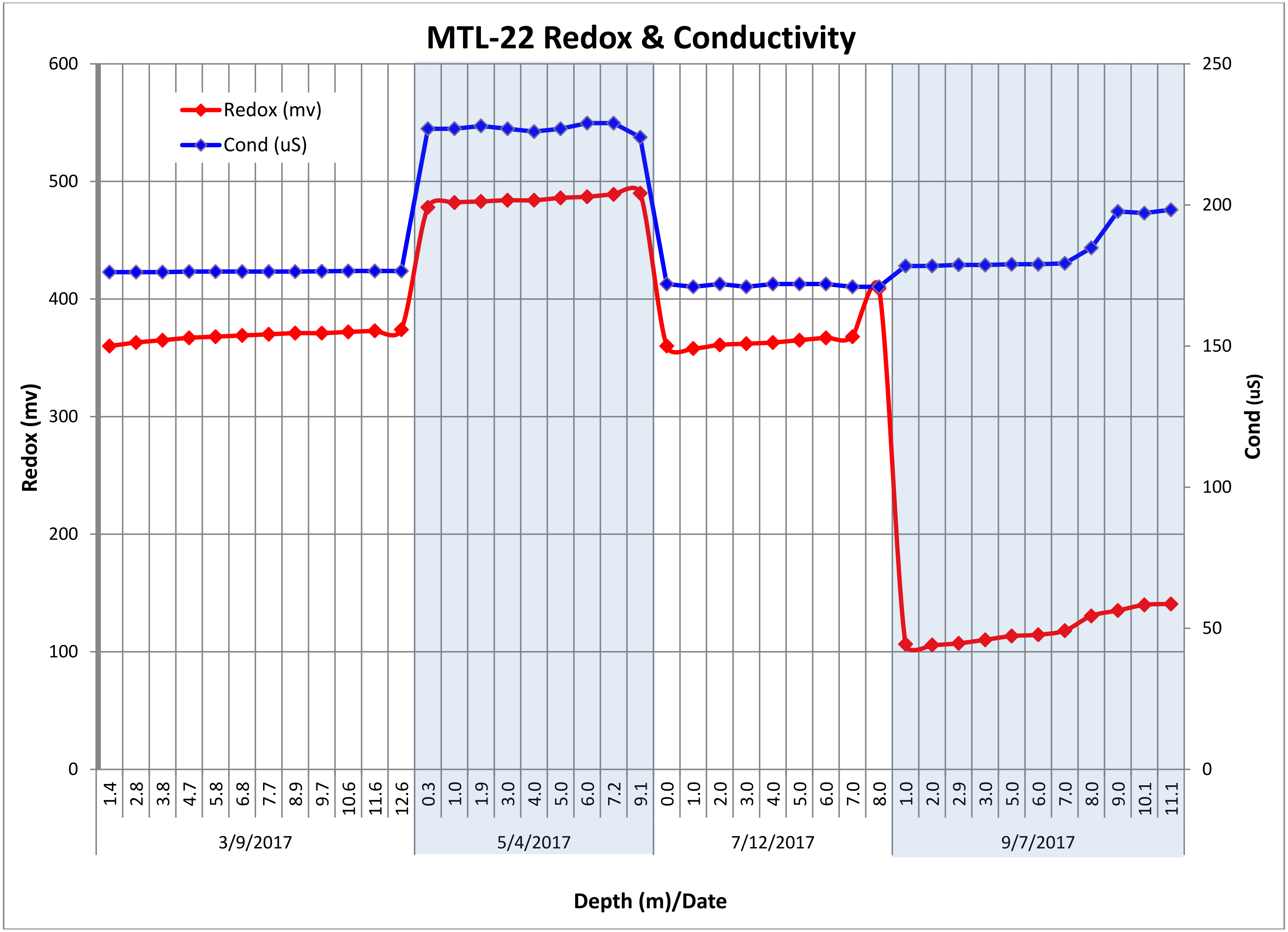
MTL-66 Temp & DO vs Depth
Water Temp (oC)
DO mg/l
Temp (ºC)
DO (mg/L)
30.00
25.00
20.00
15.00
10.00
5.00
0.00
14
12
10
8
6
4
2
0
3.6
4.8
5.8
6.6
7.7
8.8
10.0
10.8
2.7
4.0
6.0
8.2
0.7
2.8
4.0
5.0
0.0
1.0
2.0
3.0
1.0
2.0
4.0
5.0
6.0
7.0
8.0
8.0
9.0
10.0
3/9/2017
5/4/2017
7/12/2017
9/7/2017
Depth (m)/Date



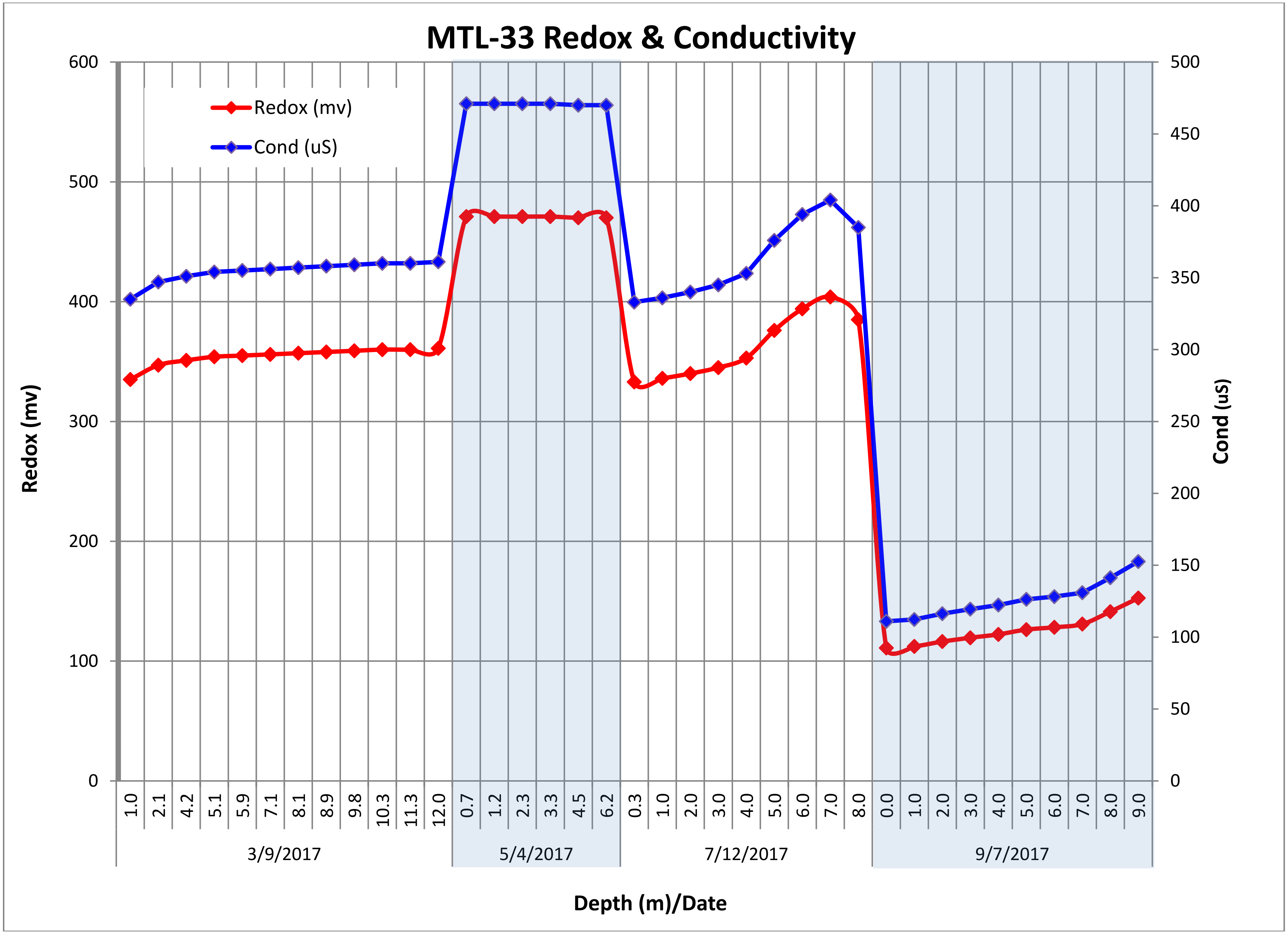
MTL-77 Temp & DO vs Depth
Water Temp (oC)
DO mg/l
Temp (ºC)
DO (mg/L)
30.00
25.00
20.00
15.00
10.00
5.00
0.00
14
12
10
8
6
4
2
0
2.3 3.2 4.3 5.3 6.2 7.2 8.2 9.1 10.2 11.6
0.8 2.5 4.5 6.4 8.4
0.5 1.0 2.0 3.0 4.0 5.0 6.0
0.0 1.0 2.0 3.0 3.0 4.0 5.0 6.0 7.0 8.0 8.0 9.0
3/9/2017
5/4/2017
7/12/2017
9/7/2017
Depth (m)/Date



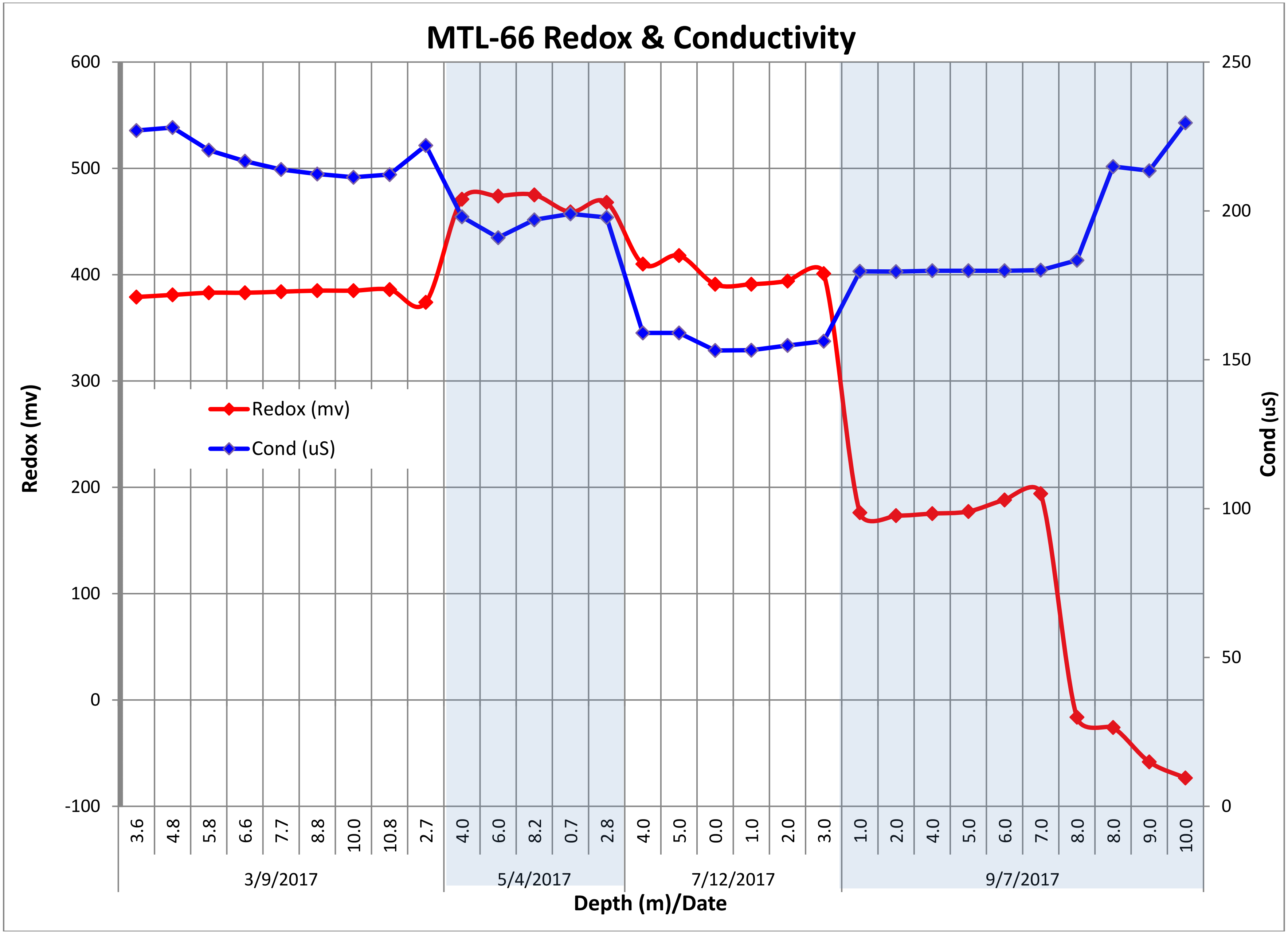
Mark Twain Tributary Redox v Conductivity
Cond (uS)
Redox (mv)
Redox (mv)
Conductivity (uS)
0
50
100
150
200
250
300
350
400
450
500
0
100
200
300
400
500
600
700
800
3/9/2017
5/3/2017
7/12/2017
9/7/2017
MTL-1
MTL-11
MTL-12
MTL-13
MTL-5
MTL-9
Date/Site

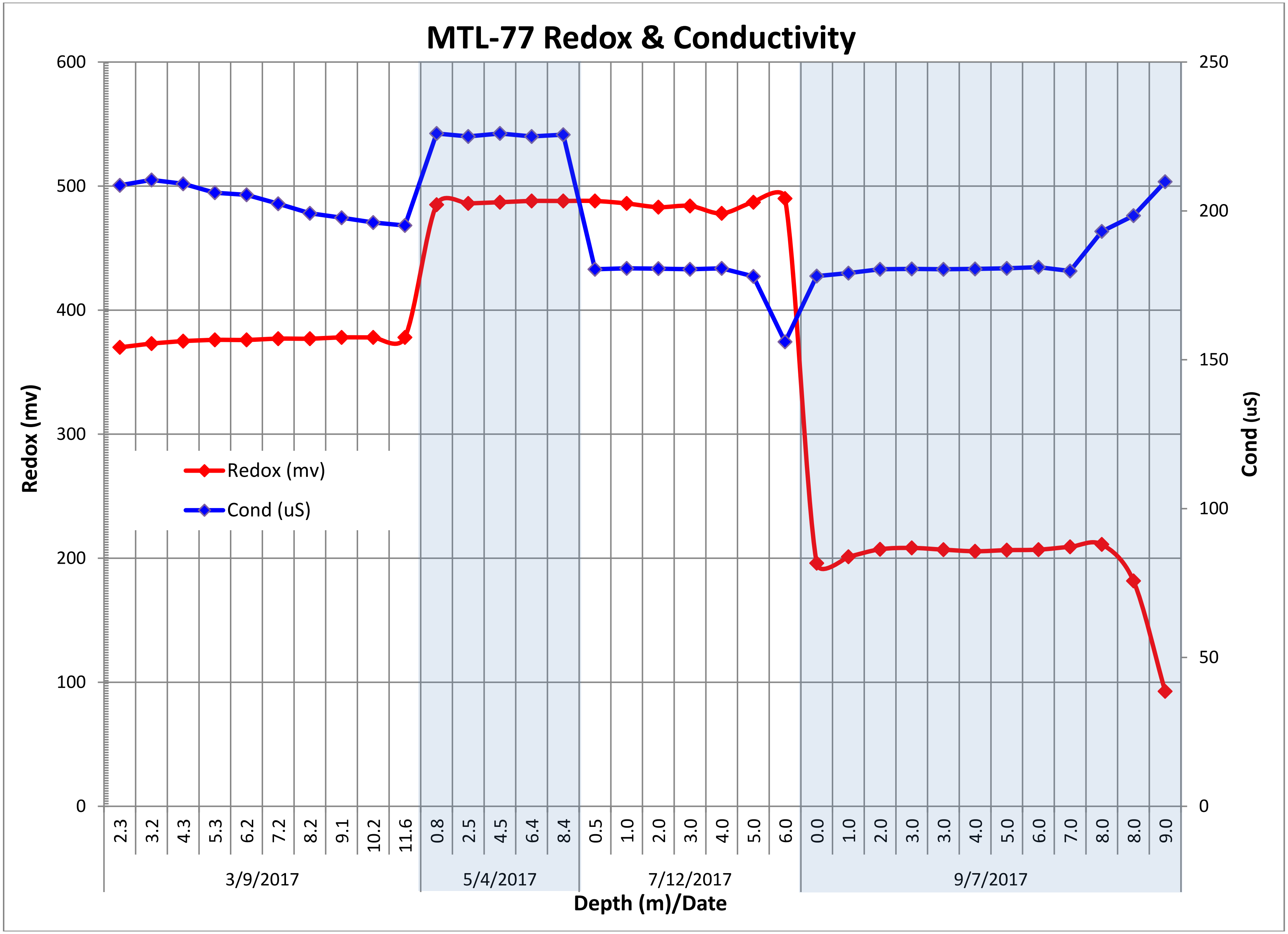


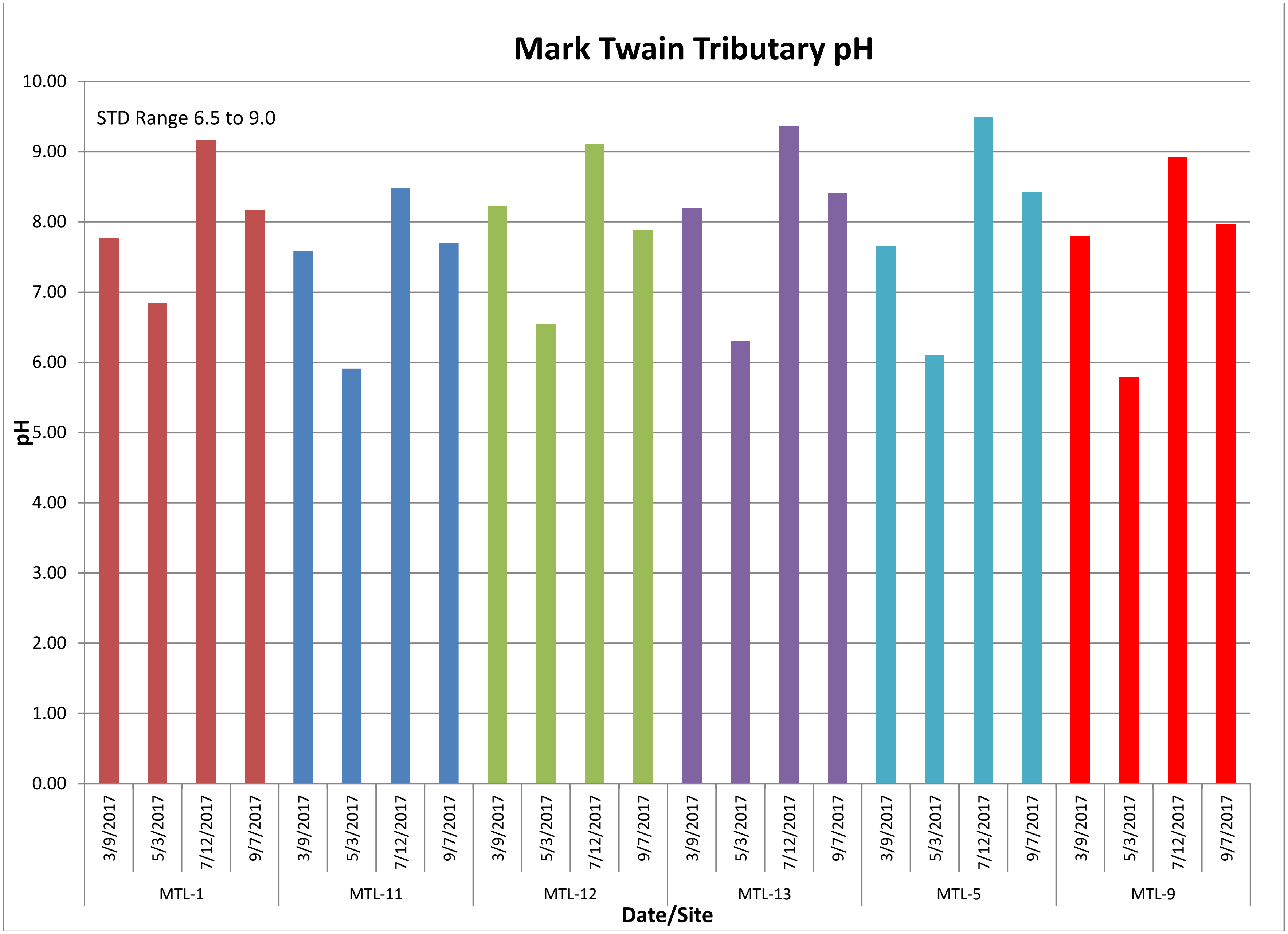
MTL-22 Redox & Conductivity
Redox (mv)
Cond (uS)
600
500
400
300
200
100
0
250
200
150
100
50
0
Redox (mv)
Cond (us)
1.4 2.8 3.8 4.7 5.8 6.8 7.7 8.9 9.7 10.6 11.6 12.6
0.3 1.0 1.9 3.0 4.0 5.0 6.0 7.2 9.1
0.0 1.0 2.0 3.0 4.0 5.0 6.0 7.0 8.0
1.0 2.0 2.9 3.0 5.0 6.0 7.0 8.0 9.0 10.1 11.1
3/9/2017
5/4/2017
7/12/2017
9/7/2017
Depth (m)/Date

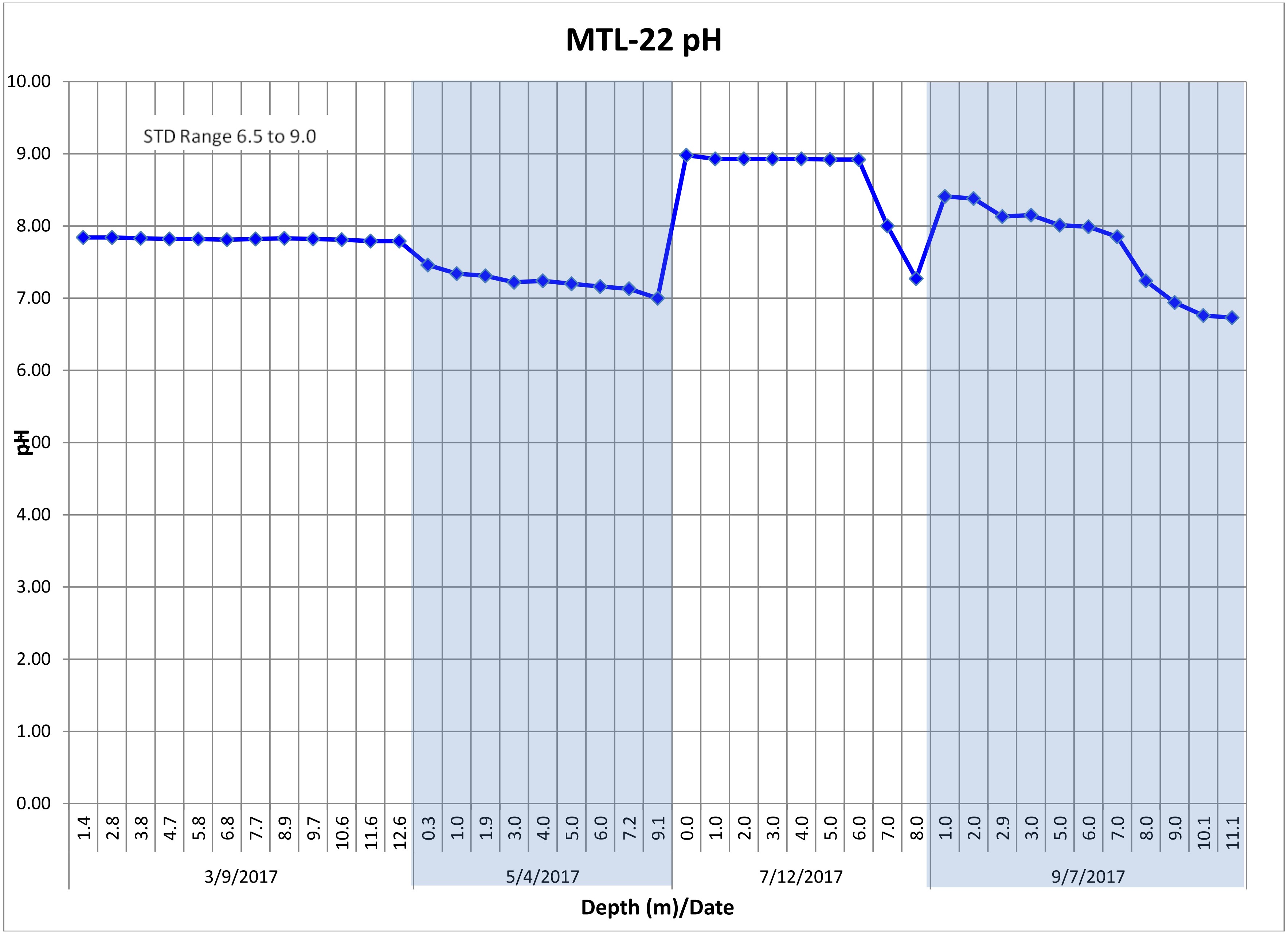


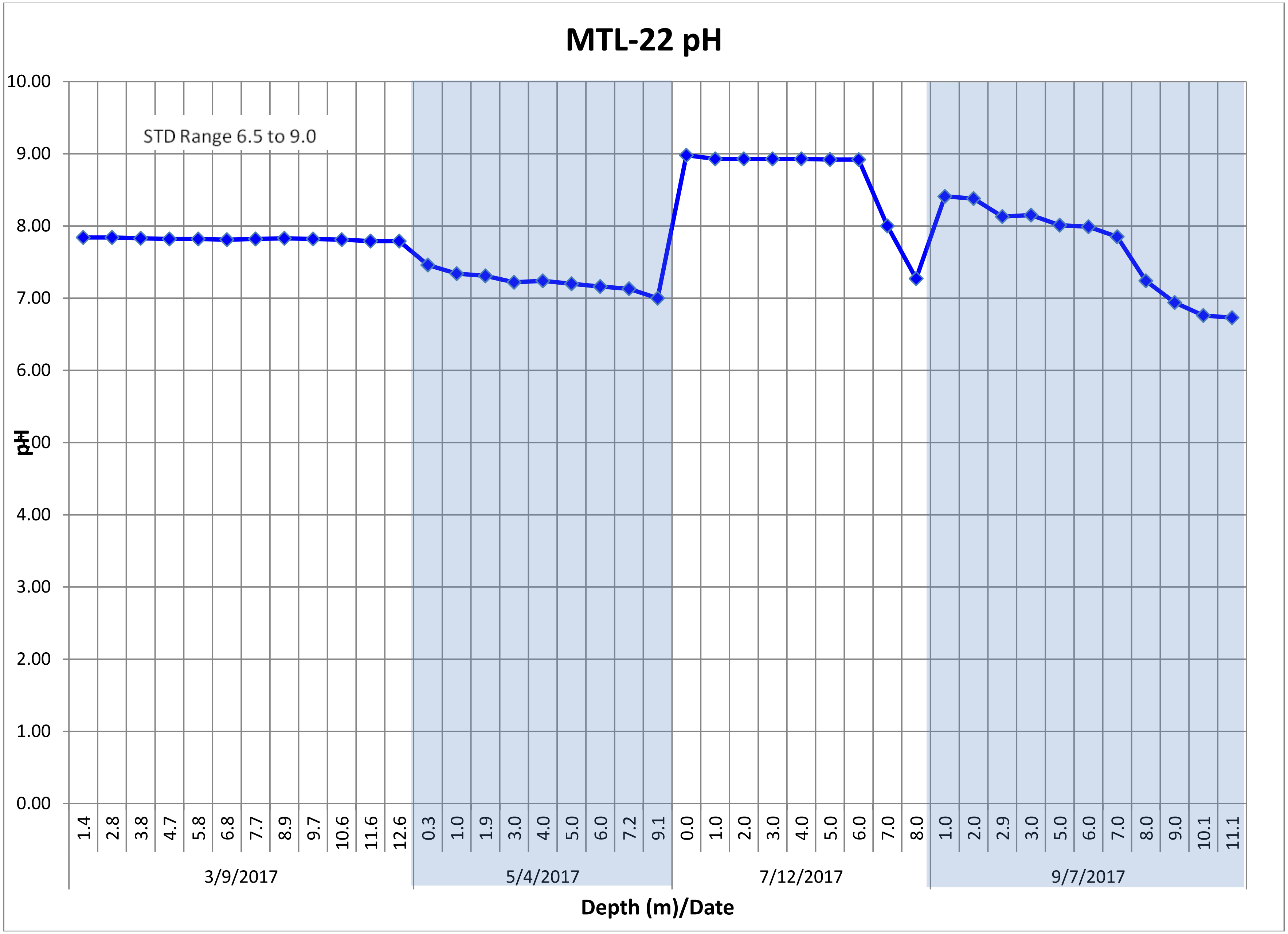
MTL-33 Redox & Conductivity
Redox (mv)
Cond (uS)
600
500
400
300
200
100
0
500
450
400
350
300
250
200
150
100
50
0
1.0
2.1
4.2
5.1
5.9
7.1
8.1
8.9
9.8
10.3
11.3
12.0
0.7
1.2
2.3
3.3
4.5
6.2
0.3
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
9.0
3/9/2017
5/4/2017
7/12/2017
9/7/2017
Depth (m)/Date


MTL-66 Redox & Conductivity
Redox (mv)
Cond (us)
Redox (mv)
Cond (uS)
600
500
400
300
200
100
0
-100
250
200
150
100
50
0
3.6
4.8
5.8
6.6
7.7
8.8
10.0
10.8
2.7
4.0
6.0
8.2
0.7
2.8
4.0
5.0
0.0
1.0
2.0
3.0
1.0
2.0
4.0
5.0
6.0
7.0
8.0
8.0
9.0
10.0
3/9/2017
5/4/2017
7/12/2017
9/7/2017
Depth (m)/Date

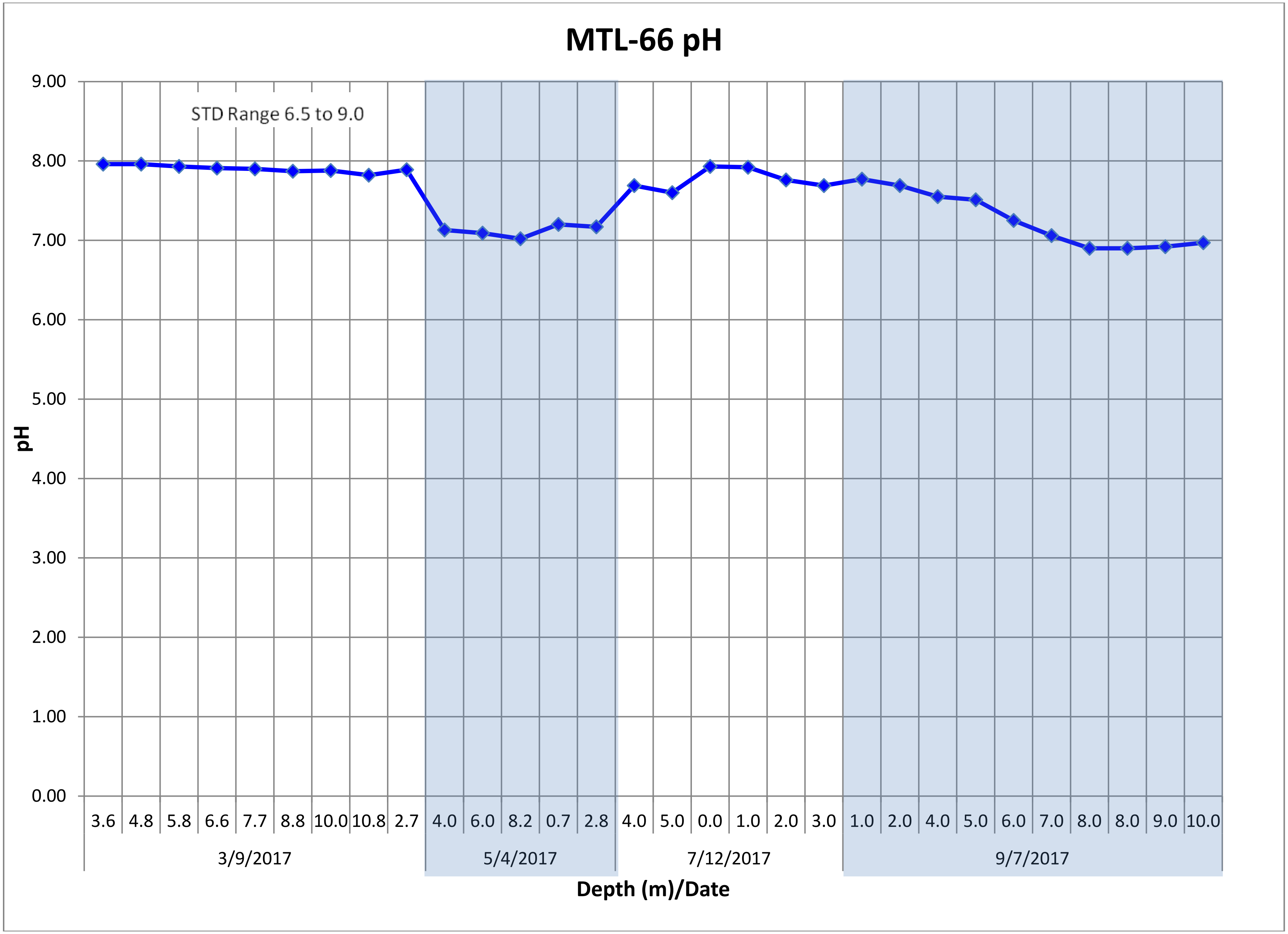

MTL-77 Redox & Conductivity
Redox (mv)
Cond (uS)
Redox (mv)
Cond (uS)
600
500
400
300
200
100
0
250
200
150
100
50
0
2.3
3.2
4.3
5.3
6.2
7.2
8.2
9.1
10.2
11.6
0.8
2.5
4.5
6.4
8.4
0.5
1.0
2.0
3.0
4.0
5.0
6.0
0.0
1.0
2.0
3.0
3.0
4.0
5.0
6.0
7.0
8.0
8.0
9.0
3/9/2017
5/4/2017
7/12/2017
9/7/2017
Depth (m)/Date

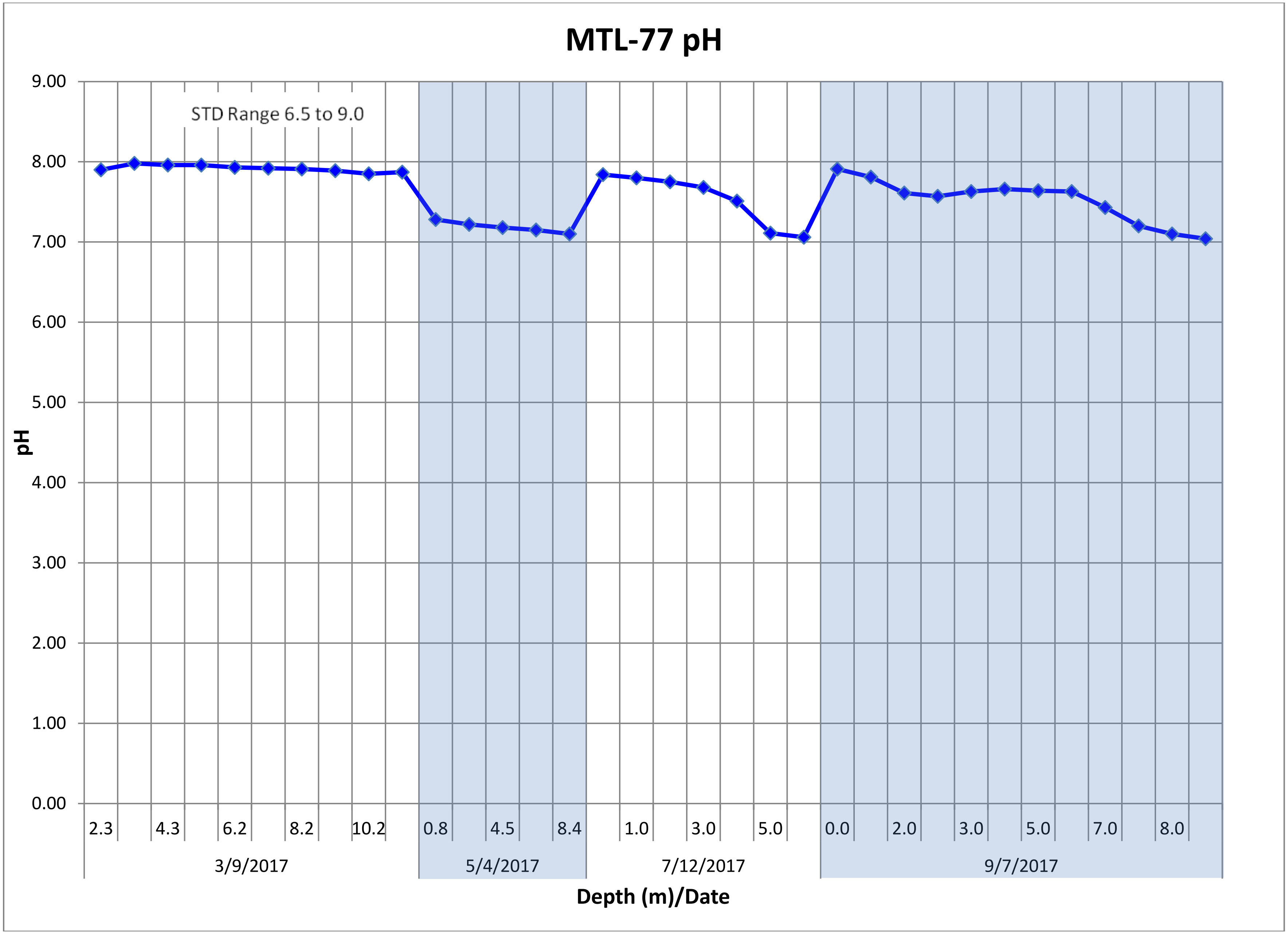

Mark Twain Tributary pH
STD Range 6.5 to 9.0
pH
10.00
9.00
8.00
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
3/9/2017
5/3/2017
7/12/2017
9/7/2017
MTL-1
MTL-11
MTL-12
MTL-13
MTL-5
MTL-9
Date/Site


MTL-22 pH
STD Range 6.5 to 9.0
pH
10.00
9.00
8.00
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
1.4
2.8
3.8
4.7
5.8
6.8
7.7
8.9
9.7
10.6
11.6
12.6
0.3
1.0
1.9
3.0
4.0
5.0
6.0
7.2
9.1
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
1.0
2.0
2.9
3.0
5.0
6.0
7.0
8.0
9.0
10.1
11.1
3/9/2017
5/4/2017
7/12/2017
9/7/2017
Depth (m)/Date

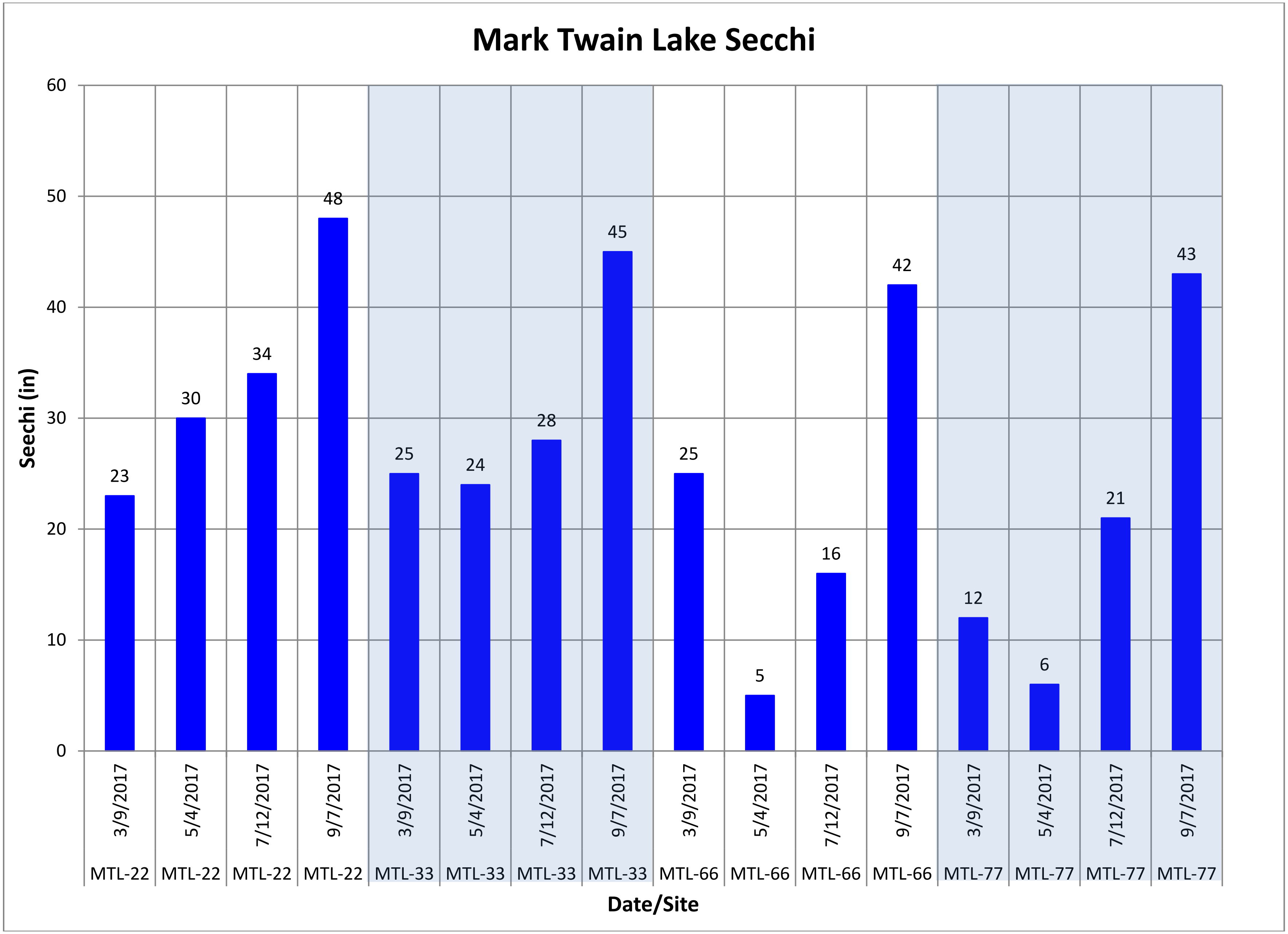


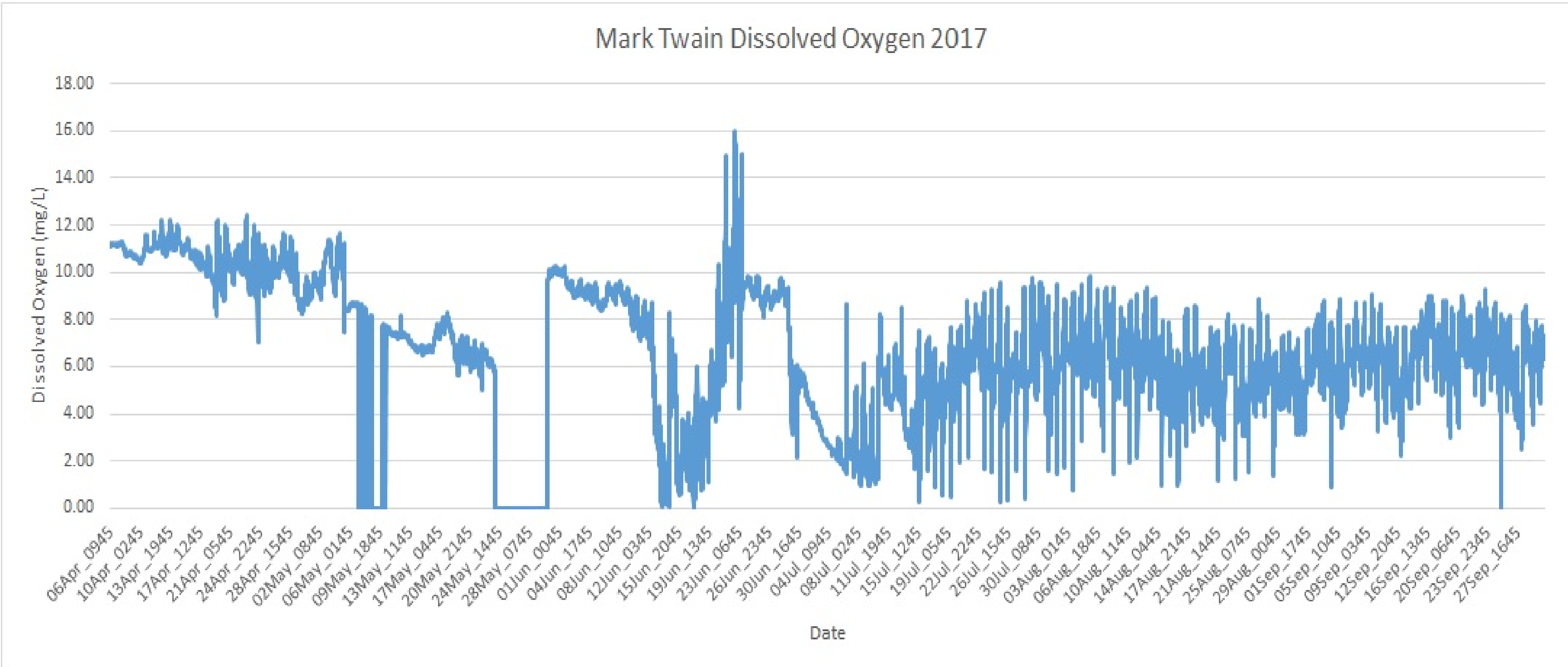
MTL-22 pH
STD Range 6.5 to 9.0
10.00
9.00
8.00
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
pH
1.4 2.8 3.8 4.7 5.8 6.8 7.7 8.9 9.7 10.6 11.6 12.6
0.3 1.0 1.9 3.0 4.0 5.0 6.0 7.2 9.1
0.0 1.0 2.0 3.0 4.0 5.0 6.0 7.0 8.0
1.0 2.0 2.9 3.0 5.0 6.0 7.0 8.0 9.0 10.1 11.1
3/9/2017
5/4/2017
7/12/2017
9/7/2017
Depth (m)/Date


MTL-66 pH
STD Range 6.5 to 9.0
9.00
8.00
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
pH
3.6 4.8 5.8 6.6 7.7 8.8 10.0 10.8 2.7 4.0 6.0 8.2 0.7 2.8 4.0 5.0 0.0 1.0 2.0 3.0 1.0 2.0 4.0 5.0 6.0 7.0 8.0 8.0 9.0 10.0
3/9/2017
5/4/2017
7/12/2017
9/7/2017
Depth (m)/Date



MTL-77 pH
9.00
8.00
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
pH
STD Range 6.5 to 9.0
2.3
4.3
6.2
8.2
10.2
0.8
4.5
8.4
1.0
3.0
5.0
0.0
2.0
3.0
5.0
7.0
8.0
3/9/2017
5/4/2017
7/12/2017
9/7/2017
Depth (m)/Date


Mark Twain Lake Secchi
Seechi (in)
60
50
40
30
20
10
0
23
30
34
48
25
24
28
45
25
5
16
42
12
6
21
43
3/9/2017
5/4/2017
7/12/2017
9/7/2017
3/9/2017
5/4/2017
7/12/2017
9/7/2017
3/9/2017
5/4/2017
7/12/2017
9/7/2017
3/9/2017
5/4/2017
7/12/2017
9/7/2017
MTL-22
MTL-22
MTL-22
MTL-22
MTL-33
MTL-33
MTL-33
MTL-33
MTL-66
MTL-66
MTL-66
MTL-66
MTL-77
MTL-77
MTL-77
MTL-77
Date/Site



Main Dam Spillway D.O.

APPENDIX D

Lakes of Missouri Volunteer Program (LMVP) Data

2016 Lakes of Missouri Volunteer Program (LMVP) Data

Site	Date	Temp F	Secchi INCHES	TP ug/L	TN ug/L	TCHLa ug/L	CHLa ug/L	PHEO ug/L	ISS mg/L	OSS mg/L	TSS mg/L	Depth	Comments	Latitude	Longitude
1	4/30/2016	58	16	125	1830	4	3.5	1.3	7	1.6	8.6	58		39.524	-91.6478
1	5/21/2016	66	20	127	1800	3.2	3	0.5	5.3	1.5	6.8	75	Sunny, pt cloudy. Light winds. We sampled sites in a diff. order than usual.	39.524	-91.6478
1	6/11/2016	81	41	42	1580	13.6	11.1	7.2	5.2	4	9.2	68		39.524	-91.6478
1	7/4/2016	73	36	36	1500	21.6	19.4	6.2	3.4	3.6	7	66	Cloudy, Air 73F. Light misty rain	39.524	-91.6478
1	7/23/2016	83	48	27	1400	17.3	14.8	6.9	1.6	4	5.6	60	Pt cloudy, light winds	39.524	-91.6478
1	8/13/2016	84	50	36	860	40.8	35.6	15.1	1.6	6.4	8	83	Pt cloudy, mostly sunny. WInds from W/NW at 10mph.	39.524	-91.6478
1	9/2/2016	75	46	36	650	21.8	18.7	9.2	1	3.4	4.4	69	Sunny, 77F, W wind at 8mph	39.524	-91.6478
1	9/24/2016	80	51	27	660	21.5	18.7	7.9	0.6	4	4.6	83	86F air, Sunny, pt cloudy. Light winds S-SW 4-8mph	39.524	-91.6478
2	4/30/2016	58	14	159	1840	7.3	6.3	2.8	8.5	1.8	10.3	39		39.5395	-91.6972
2	5/21/2016	69	18	126	1820	4.7	4.4	0.7	4.1	1.4	5.5	61	Overcast	39.5395	-91.6972
2	6/11/2016	80	36	29	1430	13.4	11.5	5.5	5.7	2.9	8.6	74		39.5395	-91.6972
2	7/4/2016	73	40	27	1330	22.4	19.7	7.7	3.2	3.3	6.5	65		39.5395	-91.6972
2	7/23/2016	84	49	23	1090	16.9	14.7	6.4	2.3	3.7	6	64		39.5395	-91.6972
2	8/13/2016	85	46	23	770	32.5	28.5	11.8	1.4	5.9	7.3	65		39.5395	-91.6972
2	9/2/2016	76	39	33	670	25.1	21.2	11.3	2.2	4.3	6.5	48	"Silo"	39.5395	-91.6972
2	9/24/2016	80	47	19	620	16	14	5.7	1.1	3.5	4.6	62		39.5395	-91.6972
5	4/30/2016	58	16	148	1830	4.7	4	1.8	7.2	2.3	9.5	27	Light rain, overcast day	39.5066	-91.7679
5	5/21/2016	67	20	125	1790	6.2	5.6	1.7	4.5	2.2	6.7	30	Overcast	39.5066	-91.7679

Site	Date	Temp F	Secchi INCHES	TP ug/L	TN ug/L	TCHLa ug/L	CHLa ug/L	PHEO ug/L	ISS mg/L	OSS mg/L	TSS mg/L	Depth	Comments	Latitude	Longitude
5	6/11/2016	79	31	38	1610	18.4	15.6	8.3	5.8	3.7	9.5	57		39.5066	-91.7679
5	7/4/2016	73	36	34	1510	14.2	13.8	1	3.5	3	6.5	45		39.5066	-91.7679
5	7/23/2016	85	45	30	1250	18.4	16.2	6.4	2	3.6	5.6	53		39.5066	-91.7679
5	8/13/2016	85	42	41	830	45	39.3	16.5	2	6.7	8.7	40		39.5066	-91.7679
5	9/2/2016	75	36	46	690	29.5	25.3	12.4	2.2	4.8	7	52	"Hurricane gulch"	39.5066	-91.7679
5	9/24/2016	81	53	26	550	17.5	15.3	6.2	0.3	4.2	4.5	36		39.5066	-91.7679

Site 1 - near dam

Site 2 - Indian Creek

Site 5 - Confluence of North Fork & South Fork

Parameter	Abreviation	Unit of Measure
Water Clarity (using Secchi disk)	Secchi	Inches (“)
Total Phosphorus	TP	Micrograms per liter (ug/L) or parts per billion (ppb)
Total Nitrogen	TN	Micrograms per liter (ug/L) or parts per billion (ppb)
Chlorophyll A	TCHLA	Micrograms per liter (ug/L) or parts per billion (ppb) (uncorrected for pheophytin)
Chlorophyll A	CHLA	ug/L (pheophytin corrected)
Pheophytin	Pheo	ug/L
Inorganic Suspended Sediments	ISS	Milligrams per liter (mg/L), or parts per million (ppm)
Organic Suspended Solids	OSS	mg/L
Total Suspended Sediments	TSS	Milligrams per liter (mg/L), or parts per million (ppm)

Full report for all lakes in the LMVP can be found at http://www.lmvp.org/lakes.htm.

APPENDIX E

United Water Services
Clarence Cannon WTP Data

High Service

January 2017

DATE	Flow (mgd)	pH -	Alkalinity (mg/l)	Turbidity (NTU)	Free Cl2 (mg/l)	Total Cl2 (mg/l)	Hardnes (mg/l)	Iron (mg/l)	Mn (mg/l)	NH_3 (mg/l)	NO_2 (mg/l)	TDS (mg/l)	Color (u)	Temp (°C)	Total Coliform
1	4.26	7.74	102	0.04	0.06	3.66	156	0.003		0.01		262	0.0	7	
2	4.23	7.82	100	0.05	0.04	3.65	156	0.005		0.01		260	0.0	8	A
3	4.10	7.81	101	0.06	0.05	3.63	153	0.013		0.03		257	0.0	8	
4	3.92	7.77	102	0.05	0.06	3.74	156	0.002	0.009	0.02	0.006	263	0.0	8	A
5	3.93	7.75	104	0.04	0.07	3.56	156	0.011		0.01		267	0.0	8	
6	3.99	7.82	102	0.04	0.06	3.52	163	0.005		0.01		221	0.0	5	A
7	4.11	7.77	98	0.06	0.06	3.78	155	0.006		0.01		218	0.0	5	
8	4.37	7.80	101	0.07	0.06	3.69	145	0.004		0.03		220	0.0	7	
9	4.71	7.77	104	0.05	0.07	3.60	160	0.009		0.01		221	0.0	6	A
10	4.00	7.73	102	0.04	0.06	3.50	160	0.003		0.01		221	0.0	7	
11	4.38	7.79	101	0.05	0.05	3.55	153	0.003	0.006	0.01	0.004	222	0.0	7	A
12	4.01	7.73	101	0.06	0.05	3.39	155	0.003		0.02		226	0.0	6	
13	4.28	7.76	101	0.06	0.05	3.51	154	0.008		0.03		225	0.0	7	A
14	4.01	7.88	105	0.04	0.06	3.69	159	0.002		0.03		225	0.0	6	
15	3.61	7.94	106	0.04	0.06	3.63	161	0.006		0.05		225	0.0	7	
16	4.35	7.92	103	0.06	0.05	3.55	155	0.004		0.04		230	0.0	7	A
17	3.76	7.87	100	0.06	0.07	3.61	151	0.007		0.01		222	0.0	7	
18	4.01	7.94	101	0.04	0.06	3.60	162	0.005	0.013	0.03	0.004	221	0.0	7	A
19	3.79	7.92	102	0.04	0.05	3.58	160	0.008		0.05		220	0.0	7	
20	3.74	7.84	103	0.05	0.08	3.67	160	0.007		0.06		221	0.0	8	A
21	4.07	7.82	100	0.06	0.08	3.64	157	0.006		0.07		220	0.0	7	
22	3.66	7.80	100	0.07	0.07	3.60	153	0.005		0.05		220	0.0	7	
23	4.56	7.85	105	0.04	0.06	3.59	159	0.005		0.12		223	0.0	8	A
24	3.98	7.76	104	0.04	0.07	3.45	163	0.004		0.08		226	0.0	8	
25	3.57	7.85	103	0.06	0.05	3.46	160	0.003	0.006	0.06	0.004	230	0.0	7	A
26	3.96	7.88	103	0.06	0.05	3.54	152	0.005		0.05		230	0.0	7	
27	3.83	7.94	106	0.06	0.07	3.10	167	0.005		0.09		233	0.0	7	A
28	4.08	7.84	109	0.04	0.06	3.40	166	0.006		0.09		232	0.0	7	
29	4.02	7.73	107	0.04	0.05	3.38	164	0.003		0.08		231	0.0	7	
30	3.61	7.77	103	0.06	0.05	3.61	161	0.004		0.05		230	0.0	8	A
31	3.85	7.76	105	0.07	0.05	3.50	162	0.006		0.10		231	0.0	7	
AVG	**4.02**	**7.82**	**103**	**0.05**	**0.06**	**3.56**	**158**	**0.005**	**0.009**	**0.04**	**0.005**	**231**	**0.0**	**7**	
TOTA	**124.75**														

HIGH SERVICE
February 2017

DATE	Flow (mgd)	pH -	Alkalinity (mg/l)	Turbidity (NTU)	Free Cl2 (mg/l)	Total Cl2 (mg/l)	Hardnes (mg/l)	Iron (mg/l)	Mn (mg/l)	NH_3 (mg/l)	NO_2 (mg/l)	TDS (mg/l)	Color (u)	Temp (°C)	Total Coliform
1	4.06	7.76	105	0.04	0.06	3.41	166	0.006	0.018	0.12	0.004	233	0.0	7	A
2	3.71	7.75	106	0.04	0.07	3.44	162	0.004		0.03		234	0.0	7	
3	3.26	7.78	107	0.04	0.07	3.49	167	0.002		0.10		233	0.0	7	A
4	4.21	7.78	103	0.07	0.05	3.56	165	0.004		0.11		231	0.0	7	
5	3.97	7.75	105	0.06	0.06	3.44	159	0.003		0.12		229	0.0	7	
6	3.77	7.80	107	0.04	0.07	3.55	167	0.003		0.08		237	0.0	7	A
7	4.16	7.81	108	0.04	0.06	3.62	166	0.006		0.08		237	0.0	7	
8	3.68	7.74	105	0.05	0.09	3.71	164	0.006	0.010	0.06	0.004	236	0.0	7	A
9	3.48	7.72	103	0.06	0.07	3.68	166	0.005		0.05		236	0.0	7	
10	4.32	7.77	104	0.07	0.05	3.55	162	0.006		0.12		234	0.0	7	A
11	3.92	7.87	108	0.04	0.06	3.47	166	0.005		0.09		234	0.0	8	
12	3.88	7.87	108	0.04	0.05	3.51	168	0.005		0.10		233	0.0	7	
13	3.74	7.85	104	0.06	0.05	3.55	158	0.007		0.07		232	0.0	7	A
14	3.82	7.89	105	0.06	0.07	3.69	163	0.007		0.13		232	0.0	7	
15	3.80	7.68	105	0.04	0.06	3.72	162	0.006	0.020	0.04	0.006	229	0.0	8	A
16	3.72	7.73	105	0.04	0.05	3.48	165	0.005		0.13		230	0.0	8	
17	3.67	7.71	106	0.04	0.06	3.48	165	0.005		0.08		231	0.0	8	A
18	3.72	7.80	103	0.06	0.05	3.51	161	0.006		0.09		230	0.0	8	
19	3.95	7.83	105	0.06	0.05	3.54	162	0.006		0.09		230	0.0	8	
20	3.97	7.85	107	0.04	0.06	3.47	161	0.005		0.10		228	0.0	9	A
21	3.88	7.86	105	0.04	0.07	3.40	167	0.007		0.08		230	0.0	9	
22	4.14	7.88	104	0.05	0.06	3.53	161	0.007	0.020	0.08	0.005	232	0.0	10	A
23	3.66	7.79	103	0.06	0.05	3.28	160	0.007		0.08		230	0.0	9	
24	3.73	7.77	104	0.06	0.06	3.13	162	0.006		0.08		230	0.0	9	A
25	3.52	7.79	106	0.04	0.06	3.41	165	0.007		0.14		232	0.0	9	
26	3.84	7.82	107	0.05	0.06	3.43	162	0.003		0.13		233	0.0	10	
27	3.94	7.83	104	0.06	0.06	3.47	157	0.005		0.06		232	0.0	11	A
28	3.54	7.72	102	0.06	0.06	3.63	160	0.005		0.06		231	0.0	11	
AVG	**3.82**	**7.79**	**105**	**0.05**	**0.06**	**3.51**	**163**	**0.005**	**0.017**	**0.09**	**0.005**	**232**	**0.0**	**8**	
TOTA	**107.06**														

HIGH SERVICE
March 2017

DATE	PLANT EFFLUENT Flow (mgd)	pH -	Alkalinity (mg/l)	Turbidity (NTU)	Free Cl2 (mg/l)	Total Cl2 (mg/l)	Hardnes (mg/l)	Iron (mg/l)	Mn (mg/l)	NH_3 (mg/l)	NO_2 (mg/l)	TDS (mg/l)	Color (u)	Temp (°C)	Total Coliform
1	3.73	7.74	104	0.04	0.06	3.46	164	0.005	0.017	0.04	0.006	233	0.0	10	A
2	4.11	7.74	107	0.04	0.06	3.39	164	0.008		0.06		228	0.0	11	
3	3.64	7.74	105	0.04	0.06	3.52	161	0.006		0.05		232	0.0	10	A
4	3.65	7.80	101	0.05	0.06	3.58	161	0.006		0.05		230	20.0	10	
5	3.77	7.79	104	0.06	0.07	3.54	157	0.006		0.08		230	0.0	10	
6	4.09	7.72	106	0.04	0.05	3.42	163	0.008		0.04		229	0.0	11	A
7	3.63	7.66	104	0.04	0.06	3.46	163	0.007		0.03		228	0.0	11	
8	3.86	7.68	100	0.05	0.05	3.52	158	0.005	0.004	0.03	0.002	229	0.0	12	A
9	3.74	7.66	101	0.06	0.06	3.47	157	0.023		0.05		230	0.0	12	
10	3.83	7.84	101	0.05	0.48	3.59	160	0.014		0.03		233	0.0	12	A
11	3.78	7.95	106	0.04	0.06	3.54	164	0.009		0.08		234	0.0	12	
12	3.21	7.86	107	0.04	0.04	3.57	165	0.012		0.07		234	0.0	11	
13	3.72	7.76	101	0.06	0.05	3.44	156	0.009		0.08		232	0.0	11	A
14	4.03	7.68	102	0.06	0.05	3.46	159	0.008		0.11		232	0.0	11	
15	3.64	7.73	103	0.04	0.06	3.65	168	0.009	0.012	0.04		236	0.0	11	A
16	3.84	7.97	107	0.04	0.06	3.60	169	0.010		0.06	0.005	236	0.0	11	
17	3.82	7.97	105	0.04	0.07	3.59	169	0.005		0.06		241	0.0	10	A
18	3.50	8.03	102	0.05	0.05	3.61	170	0.007		0.08		240	0.0	10	
19	4.42	7.96	102	0.06	0.05	3.53	169	0.008		0.07		238	0.0	11	
20	4.18	7.74	104	0.04	0.06	3.67	166	0.011		0.13		241	0.0	12	A
21	3.66	7.76	101	0.04	0.05	3.58	170	0.006		0.04		244	0.0	12	
22	3.94	7.94	102	0.06	0.05	3.59	169	0.006	0.014	0.05	0.000	242	0.0	13	A
23	3.99	7.93	103	0.06	0.05	3.50	167	0.007		0.05		240	0.0	12	
24	3.92	7.99	103	0.06	0.05	3.51	153	0.007		0.09		241	0.0	12	A
25	3.58	7.90	103	0.04	0.06	3.51	170	0.004		0.08		240	0.0	13	
26	3.62	7.79	101	0.05	0.05	3.50	164	0.005		0.10		239	0.0	13	
27	3.65	7.75	99	0.06	0.04	3.52	163	0.006		0.10		239	0.0	13	A
28	3.74	7.78	100	0.06	0.05	3.65	164	0.010		0.09		239	0.0	13	
29	3.48	7.75	101	0.05	0.05	3.49	166	0.005	0.019	0.07	0.006	243	0.0	14	A
30	3.21	7.70	104	0.04	0.07	3.52	172	0.011		0.06		249	0.0	15	
31	3.88	7.69	108	0.05	0.07	3.32	182	0.013		0.06		257	0.0	15	A
AVG	**3.77**	**7.81**	**103**	**0.05**	**0.07**	**3.53**	**165**	**0.008**	**0.013**	**0.06**	**0.004**	**237**	**0.6**	**12**	
TOTA	**116.86**														

HIGH SERVICE															
April 2017															
	PLANT EFFLUENT														
	Flow	pH	Alkalinity	Turbidity	Free Cl2	Total Cl2	Hardness	Iron	Mn	NH_3	NO_2	TDS	Color	Temp	Total
DATE	(mgd)	-	(mg/l)	(NTU)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(u)	(°C)	Coliforms
1	3.63	7.82	112	0.07	0.05	3.25	188	0.008		0.04		258	0.0	12	
2	3.79	7.81	110	0.07	0.06	3.51	184	0.008		0.04		280	0.0	12	
3	3.62	7.69	108	0.04	0.07	3.58	189	0.011		0.01		278	0.0	13	A
4	3.90	7.84	107	0.04	0.05	3.59	191	0.007		0.01		278	0.0	14	
5	3.35	7.92	106	0.06	0.05	3.64	180	0.006	0.009	0.02	0.004	278	0.0	15	A
6	3.74	7.80	102	0.06	0.15	3.47	179	0.007		0.05		278	0.0	14	
7	3.70	7.78	99	0.06	0.04	3.35	178	0.005		0.17		276	0.0	14	A
8	3.84	7.79	100	0.05	0.05	3.36	188	0.004		0.12		274	0.0	15	
9	3.74	7.92	103	0.06	0.05	3.26	187	0.010		0.12		269	0.0	15	
10	4.15	7.94	100	0.06	0.06	3.41	185	0.003		0.12		280	0.0	15	A
11	3.83	7.74	98	0.07	0.05	3.52	179	0.005		0.10		274	0.0	16	
12	4.04	7.75	98	0.06	0.06	3.37	183	0.007	0.024	0.03	0.006	268	0.0	17	A
13	3.84	7.85	99	0.05	0.06	3.35	184	0.006		0.06		269	0.0	17	
14	4.42	7.80	96	0.05	0.06	3.45	187	0.005		0.02		267	0.0	18	A
15	3.93	7.75	91	0.05	0.06	3.45	178	0.006		0.05		261	0.0	20	
16	4.48	7.86	92	0.05	0.05	3.48	175	0.006		0.02		263	0.0	20	
17	3.91	7.88	96	0.04	0.05	3.46	180	0.010		0.03		262	0.0	19	A
18	4.28	7.66	97	0.04	0.06	3.46	177	0.005		0.05		261	0.0	21	
19	3.96	7.76	95	0.05	0.05	3.45	176	0.028	0.020	0.05	0.004	264	0.0	21	A
20	4.42	7.81	97	0.06	0.05	4.03	178	0.006		0.08		280	0.0	20	
21	4.16	7.90	97	0.05	0.04	3.30	178	0.007		0.05		268	0.0	20	A
22	4.41	7.96	96	0.06	0.04	3.34	177	0.005		0.01		258	0.0	20	
23	3.89	7.92	96	0.05	0.05	3.43	174	0.039		0.03		258	0.0	20	
24	4.68	7.79	96	0.06	0.05	3.34	177	0.007		0.04		258	0.0	19	A
25	4.11	7.80	97	0.07	0.04	3.43	176	0.030		0.07		256	0.0	19	
26	4.05	7.74	98	0.05	0.04	3.44	179	0.006	0.013	0.01		256	0.0	19	A
27	3.67	7.87	98	0.04	0.05	3.62	177	0.005		0.02		257	0.0	19	
28	3.72	7.88	99	0.04	0.04	3.65	179	0.005		0.06		259	0.0	19	A
29	3.54	7.92	99	0.06	0.05	3.50	178	0.008		0.06		260	0.0	18	
30	3.49	7.99	97	0.06	0.05	3.54	176	0.006		0.06		260	0.0	18	
AVG	**3.94**	**7.83**	**99**	**0.05**	**0.05**	**3.47**	**181**	**0.009**	**0.017**	**0.05**	**0.005**	**267**	**0.0**	**17**	
TOTA	**118.29**														

HIGH SERVICE															
May 2017															
	PLANT EFFLUENT														
	Flow	pH	Alkalinity	Turbidity	Free Cl2	Total Cl2	Hardness	Iron	Mn	NH_3	NO_2	TDS	Color	Temp	Total
DATE	(mgd)	-	(mg/l)	(NTU)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(u)	(°C)	Coliforms
1	4.11	7.95	99	0.06	0.05	3.42	176	0.004		0.02		254	0.0	18	A
2	4.06	7.81	97	0.05	0.05	3.55	170	0.015		0.02		253	0.0	18	
3	2.94	7.98	90	0.06	0.07	3.75	160	0.007	0.015	0.03	0.004	229	0.0	17	A
4	3.33	7.90	85	0.06	0.05	3.63	161	0.006		0.05		212	0.0	16	
5	4.19	7.85	92	0.05	0.04	3.43	163	0.004		0.04		221	0.0	16	A
6	3.95	7.81	99	0.04	0.05	3.34	164	0.003		0.06		260	0.0	18	
7	3.71	7.79	95	0.05	0.04	3.38	161	0.008		0.05		230	0.0	18	
8	4.33	7.78	97	0.06	0.04	3.31	159	0.006		0.07		230	0.0	16	A
9	4.24	7.83	98	0.05	0.04	3.36	158	0.060		0.06		225	0.0	16	
10	4.48	7.85	98	0.04	0.06	3.48	164	0.006	0.016	0.03	0.005	225	0.0	17	A
11	4.05	7.85	100	0.04	0.05	3.48	159	0.005		0.10		223	0.0	18	
12	3.40	7.73	99	0.04	0.05	3.51	163	0.010		0.10		221	0.0	19	A
13	4.50	7.74	97	0.05	0.07	3.48	154	0.008		0.04		221	0.0	19	
14	4.23	7.81	93	0.06	0.07	3.60	156	0.006		0.04		226	0.0	20	
15	4.72	7.97	102	0.04	0.05	3.60	163	0.007		0.04		228	0.0	19	A
16	4.53	7.86	105	0.05	0.06	3.53	172	0.006		0.04		232	0.0	20	
17	4.59	7.82	100	0.06	0.05	3.55	160	0.005	0.008	0.05	0.004	230	0.0	20	A
18	4.17	7.79	98	0.06	0.05	3.50	161	0.007		0.06		228	0.0	20	
19	4.13	7.81	99	0.05	0.04	3.41	161	0.006		0.06		228	0.0	21	A
20	4.07	7.83	101	0.04	0.05	3.30	166	0.006		0.07		226	0.0	21	
21	3.82	7.79	96	0.04	0.05	3.33	166	0.004		0.06		227	0.0	22	
22	4.15	7.75	97	0.05	0.05	3.36	160	0.005		0.06		226	0.0	21	A
23	3.70	7.85	99	0.05	0.04	3.33	160	0.007		0.06		226	0.0	21	
24	3.19	7.91	100	0.04	0.04	3.34	162	0.005	0.012	0.03	0.005	225	0.0	21	A
25	4.23	7.84	101	0.03	0.04	3.25	167	0.005		0.09		223	0.0	21	
26	4.00	7.81	98	0.04	0.05	3.33	161	0.006		0.04		221	0.0	21	A
27	4.15	7.75	99	0.06	0.04	3.39	160	0.006		0.08		230	0.0	21	
28	3.89	7.82	100	0.05	0.04	3.44	159	0.006		0.08		236	0.0	21	
29	4.55	7.72	102	0.04	0.04	3.41	163	0.006		0.09		223	0.0	22	A
30	4.90	7.85	104	0.03	0.05	3.42	163	0.007		0.08		226	0.0	22	
31	4.40	7.92	101	0.05	0.05	3.46	161	0.004	0.007	0.06	0.004	225	0.0	22	A
AVG	**4.09**	**7.83**	**98**	**0.05**	**0.05**	**3.44**	**162**	**0.008**	**0.012**	**0.05**	**0.004**	**229**	**0.0**	**19**	
TOTA	**126.71**														

HIGH SERVICE
June 2017

	PLANT EFFLUENT														
DATE	Flow (mgd)	pH -	Alkalinity (mg/l)	Turbidity (NTU)	Free Cl2 (mg/l)	Total Cl2 (mg/l)	Hardness (mg/l)	Iron (mg/l)	Mn (mg/l)	NH_3 (mg/l)	NO_2 (mg/l)	TDS (mg/l)	Color (u)	Temp (°C)	Total Coliforms
1	4.51	7.78	101	0.05	0.04	3.48	159	0.006		0.05		226	0.0	22	
2	4.76	7.72	101	0.05	0.05	3.42	160	0.008		0.05		226	0.0	23	A
3	4.44	7.76	105	0.04	0.05	3.23	162	0.007		0.12		222	0.0	23	
4	4.92	7.85	105	0.04	0.05	3.25	167	0.004		0.12		223	0.0	24	
5	4.90	7.75	101	0.05	0.05	3.33	162	0.006		0.06		222	0.0	24	A
6	4.97	7.66	100	0.05	0.05	3.51	159	0.005		0.10		221	0.0	23	
7	4.70	7.85	99	0.04	0.05	3.47	163	0.005	0.015	0.03	0.006	223	0.0	23	A
8	4.82	7.92	100	0.03	0.04	3.34	167	0.006		0.09		227	0.0	23	
9	4.93	7.90	100	0.03	0.05	3.42	166	0.005		0.03		224	0.0	24	A
10	4.77	7.93	100	0.05	0.05	3.58	161	0.006		0.04		225	0.0	23	
11	4.57	7.79	97	0.05	0.05	3.60	159	0.006		0.07		225	0.0	22	
12	5.40	7.83	102	0.04	0.05	3.42	167	0.005		0.10		230	0.0	24	A
13	5.34	7.94	101	0.04	0.04	3.32	166	0.005		0.07		227	0.0	24	
14	4.14	7.77	97	0.06	0.05	3.38	164	0.005	0.009	0.05	0.004	214	0.0	24	A
15	4.30	7.75	99	0.06	0.05	3.36	162	0.006		0.05		212	0.0	24	
16	4.62	7.77	97	0.05	0.05	3.40	160	0.006		0.04		224	0.0	25	A
17	4.41	7.73	102	0.03	0.04	3.26	166	0.007		0.12		229	0.0	25	
18	4.24	7.79	102	0.03	0.04	3.27	171	0.003		0.09		231	0.0	25	
19	4.29	7.79	100	0.05	0.07	3.43	161	0.005		0.07		230	0.0	24	A
20	4.54	7.83	99	0.05	0.05	3.44	163	0.009		0.08		229	0.0	24	
21	4.58	7.94	97	0.04	0.04	3.49	162	0.004	0.009	0.07	0.000	231	0.0	25	A
22	4.67	7.96	97	0.04	0.05	3.38	159	0.005		0.06		229	0.0	26	
23	4.29	7.90	96	0.04	0.05	3.40	161	0.005		0.03		219	0.0	25	A
24	4.75	7.92	93	0.05	0.05	3.52	160	0.005		0.06		227	0.0	24	
25	4.19	7.80	90	0.05	0.04	3.52	156	0.010		0.04		223	0.0	24	
26	4.57	7.86	93	0.03	0.04	3.48	160	0.006		0.05		221	0.0	23	A
27	4.67	7.74	93	0.04	0.05	3.42	170	0.007		0.03		224	0.0	23	
28	4.34	7.92	92	0.06	0.05	3.51	155	0.006	0.012	0.06	0.004	221	0.0	24	A
29	4.28	8.00	91	0.06	0.05	3.38	156	0.006		0.07	0.000	220	0.0	24	
30	4.15	7.99	92	0.06	0.04	3.37	157	0.003		0.10		219	0.0	25	A
AVG	**4.60**	**7.84**	**98**	**0.05**	**0.05**	**3.41**	**162**	**0.005**	**0.011**	**0.06**	**0.003**	**224**	**0.0**	**24**	
TOTA	**138.06**														

HIGH SERVICE
July 2017

	PLANT EFFLUENT														
DATE	Flow (mgd)	pH -	Alkalinity (mg/l)	Turbidity (NTU)	Free Cl2 (mg/l)	Total Cl2 (mg/l)	Hardness (mg/l)	Iron (mg/l)	Mn (mg/l)	NH_3 (mg/l)	NO_2 (mg/l)	TDS (mg/l)	Color (u)	Temp (°C)	Total Coliforms
1	4.36	7.85	94	0.03	0.04	3.22	159	0.005		0.11		216	0.0	25	
2	4.03	7.64	92	0.03	0.04	3.18	152	0.006		0.09		209	0.0	25	
3	4.98	7.80	89	0.06	0.05	3.48	146	0.080		0.06		208	0.0	24	A
4	4.61	7.81	88	0.06	0.05	3.45	142	0.035		0.10		206	0.0	25	
5	4.65	7.84	89	0.04	0.04	3.34	145	0.003	0.011	0.06	0.005	194	0.0	25	A
6	4.07	7.82	89	0.04	0.05	3.28	149	0.005		0.14		197	0.0	26	
7	4.22	7.86	86	0.04	0.05	3.34	143	0.003		0.05		192	0.0	26	A
8	4.48	7.82	88	0.05	0.04	3.46	145	0.005		0.05		200	0.0	24	
9	4.88	7.79	90	0.06	0.04	3.50	145	0.007		0.04		200	0.0	25	
10	4.96	7.90	93	0.05	0.05	3.24	152	0.002		0.08		204	0.0	26	A
11	5.48	7.98	94	0.05	0.05	3.35	152	0.004		0.05		201	0.0	25	
12	4.72	7.93	91	0.06	0.04	3.46	150	0.004	0.002	0.03	0.003	200	0.0	26	A
13	4.69	7.96	93	0.06	0.06	3.47	149	0.005		0.04		206	0.0	26	
14	4.86	7.93	92	0.05	0.05	3.50	149	0.006		0.09		205	0.0	27	A
15	5.01	7.83	94	0.04	0.05	3.31	152	0.002		0.13		206	0.0	27	
16	4.34	7.81	92	0.04	0.05	3.21	152	0.004		0.15		202	0.0	28	
17	5.02	7.87	91	0.06	0.05	3.30	150	0.006		0.12		203	0.0	26	A
18	5.15	7.95	91	0.06	0.04	3.49	152	0.004		0.13		200	0.0	27	
19	5.30	7.86	94	0.05	0.06	3.57	155	0.004	0.010	0.17	0.005	207	0.0	28	A
20	4.52	7.78	92	0.05	0.06	3.47	158	0.005		0.12		209	0.0	29	
21	5.29	7.76	91	0.04	0.05	3.46	159	0.005		0.11		211	0.0	29	A
22	5.17	7.77	90	0.07	0.05	3.53	160	0.006		0.08		210	0.0	28	
23	4.40	7.93	95	0.06	0.04	3.44	158	0.007		0.07		208	0.0	29	
24	5.42	7.84	95	0.04	0.05	3.32	153	0.006		0.12		208	0.0	28	A
25	4.68	7.87	96	0.04	0.04	3.25	160	0.004		0.12		205	0.0	28	
26	4.79	7.82	94	0.06	0.47	3.33	151	0.005	0.002	0.11	0.040	201	0.0	28	A
27	4.18	7.91	92	0.07	0.05	3.42	153	0.006		0.10		201	0.0	28	
28	4.63	7.89	92	0.06	0.05	3.29	147	0.003		0.10		202	0.0	29	A
29	4.14	7.93	93	0.04	0.04	3.25	149	0.007		0.10		202	0.0	28	
30	4.77	7.95	95	0.04	0.04	3.36	152	0.001		0.14		202	0.0	28	
31	4.74	7.89	94	0.05	0.05	3.38	150	0.032		0.08		200	0.0	28	A
AVG	**4.73**	**7.86**	**92**	**0.05**	**0.06**	**3.38**	**151**	**0.009**	**0.006**	**0.09**	**0.013**	**204**	**0.0**	**27**	
TOTA	**146.54**														

HIGH SERVICE															
August 2017															
	PLANT EFFLUENT														
	Flow	**pH**	**Alkalinity**	**Turbidity**	**Free Cl2**	**Total Cl2**	**Hardness**	**Iron**	**Mn**	**NH_3**	**NO_2**	**TDS**	**Color**	**Temp**	**Total**
DATE	**(mgd)**	**-**	**(mg/l)**	**(NTU)**	**(mg/l)**	**(mg/l)**	**(mg/l)**	**(mg/l)**	**(mg/l)**	**(mg/l)**	**(mg/l)**	**(mg/l)**	**(u)**	**(°C)**	**Coliforms**
1	4.99	7.92	94	0.06	0.05	3.34	149	0.001		0.13		204	0.0	28	
2	4.47	7.92	95	0.04	0.05	3.37	152	0.004	0.008	0.11	0.005	203	0.0	28	A
3	4.86	7.60	91	0.04	0.04	3.21	152	0.008		0.10		200	0.0	28	
4	4.34	7.80	93	0.04	0.05	3.22	149	0.002		0.06		201	0.0	28	A
5	4.50	7.90	94	0.05	0.04	3.35	145	0.002		0.03		200	0.0	28	
6	4.14	7.82	97	0.05	0.04	3.30	145	0.003		0.04		202	0.0	28	
7	4.83	7.88	97	0.05	0.05	3.40	147	0.005		0.08		203	0.0	25	A
8	4.35	8.10	95	0.04	0.05	3.61	154	0.002		0.10		210	0.0	25	
9	4.75	8.06	93	0.06	0.05	3.55	143	0.004		0.20		201	0.0	25	A
10	4.41	7.97	94	0.06	0.04	3.48	144	0.004		0.07		208	0.0	24	
11	4.90	7.89	94	0.06	0.05	3.55	143	0.005		0.05		201	0.0	25	A
12	4.37	8.01	94	0.04	0.04	3.44	148	0.008		0.06		197	0.0	27	
13	4.38	7.98	92	0.04	0.05	3.38	145	0.006		0.07		199	0.0	26	
14	4.61	7.72	89	0.06	0.04	3.32	144	0.007		0.05		200	0.0	26	A
15	4.96	7.87	91	0.06	0.05	3.35	144	0.006		0.09		200	0.0	27	
16	4.24	7.84	92	0.04	0.05	3.31	149	0.004	0.014	0.04	0.000	194	0.0	27	A
17	4.57	7.86	94	0.04	0.04	3.25	149	0.002		0.15		205	0.0	27	
18	4.23	7.85	94	0.04	0.05	3.20	153	0.003		0.09		199	0.0	25	A
19	4.68	7.89	94	0.06	0.05	3.33	151	0.004		0.10		198	0.0	26	
20	4.01	7.90	96	0.06	0.05	3.43	147	0.007		0.10		200	0.0	26	
21	4.94	7.91	98	0.04	0.05	3.49	153	0.006		0.12		201	0.0	27	A
22	3.78	7.93	97	0.04	0.05	3.39	157	0.005		0.10		203	0.0	26	
23	4.75	7.97	94	0.05	0.05	3.44	156	0.005	0.002	0.09	0.004	199	0.0	26	A
24	3.84	7.99	95	0.05	0.04	3.48	147	0.006		0.11		200	0.0	26	
25	4.04	7.93	97	0.05	0.05	3.43	151	0.005		0.11		200	0.0	26	A
26	4.19	7.80	99	0.04	0.04	3.29	155	0.004		0.18		203	0.0	25	
27	4.30	7.75	97	0.04	0.04	3.16	151	0.009		0.17		202	0.0	26	
28	4.61	7.78	96	0.06	0.04	3.34	153	0.006		0.10		206	0.0	25	A
29	3.96	7.86	97	0.06	0.04	3.45	153	0.006		0.14		206	0.0	26	
30	3.94	7.88	97	0.04	0.05	3.28	157	0.004	0.001	0.09	0.005	202	0.0	26	A
31	4.21	7.89	97	0.04	0.04	3.23	154	0.004		0.10		205	0.0	26	
AVG	**4.42**	**7.89**	**95**	**0.05**	**0.05**	**3.37**	**150**	**0.004**	**0.006**	**0.10**	**0.004**	**202**	**0.0**	**26**	
TOTA	**137.15**														

HIGH SERVICE
September 2017

	PLANT EFFLUENT														
DATE	Flow (mgd)	pH -	Alkalinity (mg/l)	Turbidity (NTU)	Free Cl2 (mg/l)	Total Cl2 (mg/l)	Hardness (mg/l)	Iron (mg/l)	Mn (mg/l)	NH_3 (mg/l)	NO_2 (mg/l)	TDS (mg/l)	Color (u)	Temp (°C)	Total Coliforms
1	3.92	7.85	98	0.04	0.04	3.33	155	0.006		0.07		206	0.0	25	A
2	4.13	7.84	95	0.05	0.05	3.36	155	0.005		0.11		196	0.0	25	
3	4.21	7.79	94	0.04	0.06	3.41	150	0.006		0.04		193	0.0	26	
4	4.25	7.76	99	0.03	0.05	3.37	150	0.007		0.12		203	0.0	26	A
5	4.38	7.94	99	0.04	0.04	3.38	156	0.004		0.06		206	0.0	25	
6	3.84	7.97	100	0.05	0.05	3.41	155	0.006	0.010	0.09	0.004	201	0.0	25	A
7	4.35	7.89	98	0.05	0.05	3.33	156	0.006		0.11		201	0.0	24	
8	4.30	7.78	101	0.05	0.05	3.25	153	0.007		0.11		207	0.0	25	A
9	3.85	7.73	102	0.04	0.05	3.28	155	0.005		0.12		207	0.0	25	
10	4.54	7.74	102	0.03	0.05	3.28	153	0.006		0.12		208	0.0	24	
11	4.06	7.70	101	0.06	1.37	3.04	150	0.003		0.06		202	0.0	24	A
12	4.60	7.81	99	0.06	3.00	3.67	153	0.004		0.06		204	0.0	24	
13	3.97	7.88	97	0.04	2.95	3.55	160	0.004	0.014	0.05		196	0.0	24	A
14	4.42	7.87	97	0.04	2.81	3.56	150	0.007		0.00		203	0.0	24	
15	3.54	7.76	97	0.04	2.88	3.59	160	0.006		0.00		207	0.0	24	A
16	5.03	7.72	96	0.05	3.03	3.51	159	0.007		0.00		206	0.0	23	
17	4.04	7.69	97	0.07	2.93	3.51	151	0.005		0.00		206	0.0	23	
18	4.02	7.74	98	0.04	2.74	3.48	152	0.004		0.00		200	0.0	25	A
19	4.63	7.86	98	0.04	2.80	3.48	153	0.006		0.00		197	0.0	24	
20	4.50	7.86	97	0.04	2.95	3.52	156	0.005		0.00		198	0.0	25	A
21	4.45	7.71	97	0.06	3.19	3.67	149	0.006	0.001	0.00		198	0.0	24	
22	4.73	7.73	95	0.05	3.00	3.56	151	0.007		0.00		204	0.0	25	A
23	4.76	7.84	95	0.04	2.86	3.53	147	0.006		0.00		213	0.0	26	
24	4.26	7.86	93	0.05	2.88	3.63	149	0.008		0.00		208	0.0	26	
25	4.85	7.80	93	0.06	2.88	3.52	149	0.008		0.00		216	0.0	25	A
26	4.80	7.86	94	0.05	2.82	3.54	147	0.009		0.00		214	0.0	26	
27	4.24	7.81	97	0.04	2.81	3.53	154	0.005	0.012	0.00		206	0.0	25	A
28	4.36	7.81	96	0.05	3.06	3.67	157	0.006		0.00		215	0.0	25	
29	4.82	7.80	94	0.05	2.90	3.49	153	0.006		0.00		214	0.0	24	A
30	4.42	7.77	93	0.05	2.91	3.49	153	0.005		0.00		209	0.0	25	
AVG	**4.34**	**7.81**	**97**	**0.05**	**1.91**	**3.46**	**153**	**0.005**	**0.009**	**0.04**	**0.004**	**205**	**0.0**	**25**	
TOTA	**130.27**														

HIGH SERVICE
October 2017

	PLANT EFFLUENT														
DATE	Flow (mgd)	pH -	Alkalinity (mg/l)	Turbidity (NTU)	Free Cl2 (mg/l)	Total Cl2 (mg/l)	Hardness (mg/l)	Iron (mg/l)	Mn (mg/l)	NH_3 (mg/l)	NO_2 (mg/l)	TDS (mg/l)	Color (u)	Temp (°C)	Total Coliforms
1	4.49	7.71	96	0.05	3.08	3.72	148	0.007		0.00		215	0.0	24	
2	4.84	7.72	98	0.04	2.75	3.57	156	0.003		0.00		220	0.0	24	A
3	4.40	7.71	99	0.04	2.76	3.45	158	0.004		0.00		212	0.0	24	
4	4.11	7.87	101	0.06	3.08	3.56	156	0.004	0.002	0.00	0.004	213	0.0	23	A
5	4.20	7.90	101	0.05	3.04	3.57	158	0.005		0.00		212	0.0	23	
6	3.86	7.87	101	0.04	2.83	3.50	156	0.007		0.00		218	0.0	23	A
7	4.24	7.85	100	0.05	2.77	3.38	153	0.007		0.00		221	0.0	23	
8	3.88	7.87	100	0.06	2.51	3.32	157	0.003		0.00		220	0.0	23	
9	4.20	7.92	101	0.04	2.81	3.43	165	0.005		0.00		223	0.0	23	A
10	3.94	7.88	102	0.05	2.69	3.34	162	0.004		0.00		220	0.0	23	
11	4.14	7.89	99	0.04	2.82	3.40	157	0.003	0.005	0.00	0.002	222	0.0	22	A
12	3.52	7.88	99	0.04	2.82	3.45	156	0.006		0.00		221	0.0	23	
13	4.29	7.82	100	0.04	2.79	3.39	159	0.004		0.00		221	0.0	21	A
14	3.76	7.79	101	0.06	2.79	3.39	159	0.003		0.00		220	0.0	21	
15	4.92	7.78	101	0.06	2.64	3.19	157	0.005		0.00		218	0.0	21	
16	3.53	7.94	102	0.04	1.08	2.43	160	0.009		0.17		225	0.0	21	A
17	4.34	8.21	104	0.04	0.05	3.15	160	0.006		0.07		228	0.0	21	
18	4.43	8.00	104	0.05	0.05	3.51	162	0.006	0.002	0.08	0.005	226	0.0	21	A
19	3.98	7.82	104	0.05	0.05	3.57	164	0.004		0.09		225	0.0	21	
20	3.77	7.89	105	0.05	0.05	3.55	158	0.007		0.11		226	0.0	21	A
21	4.13	7.95	102	0.05	0.05	3.53	158	0.004		0.08		226	0.0	21	
22	3.92	8.16	106	0.05	0.04	3.54	153	0.008		0.10		227	0.0	20	
23	3.29	7.96	104	0.05	0.05	3.47	159	0.007		0.12		226	0.0	20	A
24	5.22	8.01	105	0.05	0.05	3.47	157	0.004		0.10		227	0.0	20	
25	3.97	8.01	106	0.04	0.06	3.39	164	0.006		0.06		228	0.0	19	A
26	4.05	8.08	105	0.03	0.05	3.51	167	0.007		0.06		231	0.0	19	
27	4.18	8.04	105	0.03	0.05	3.61	166	0.005		0.03		234	0.0	18	A
28	3.43	8.07	104	0.05	0.05	3.51	163	0.007		0.05		230	0.0	18	
29	3.99	8.10	105	0.05	0.05	3.58	161	0.005		0.06		202	0.0	17	
30	4.26	8.00	106	0.04	0.04	3.47	163	0.007		0.05		232	0.0	16	A
31	4.00	7.92	102	0.04	0.06	3.46	169	0.005		0.06		232	0.0	16	
AVG	**4.11**	**7.92**	**102**	**0.05**	**1.42**	**3.43**	**159**	**0.005**	**0.003**	**0.04**	**0.004**	**222**	**0.0**	**21**	
TOTA	**127.28**														

HIGH SERVICE															
November 2017															
	PLANT EFFLUENT														
	Flow	pH	Alkalinity	Turbidity	Free Cl2	Total Cl2	Hardness	Iron	Mn	NH_3	NO_2	TDS	Color	Temp	Total
DATE	(mgd)	-	(mg/l)	(NTU)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(u)	(°C)	Coliforms
1	3.53	7.87	101	0.06	0.06	3.72	158	0.005	0.003	0.04	0.002	232	0.0	16	A
2	4.01	7.87	102	0.06	0.05	3.52	158	0.006		0.06		230	0.0	16	
3	4.02	7.90	102	0.04	0.06	3.57	158	0.004		0.04		232	0.0	15	A
4	3.89	7.89	105	0.04	0.06	3.56	162	0.008		0.05		231	0.0	15	
5	4.16	7.91	105	0.04	0.05	3.45	164	0.002		0.04		233	0.0	15	
6	4.01	7.93	104	0.05	0.05	3.50	160	0.006		0.07		230	0.0	15	A
7	3.72	7.97	104	0.05	0.05	3.64	158	0.005		0.07		231	0.0	15	
8	3.95	8.00	102	0.04	0.06	3.52	162	0.004	0.002	0.04	0.002	228	0.0	14	A
9	3.39	7.90	103	0.02	0.07	3.79	155	0.004		0.09		231	0.0	15	
10	3.64	7.85	103	0.04	0.05	3.62	167	0.005		0.08		230	0.0	14	A
11	4.23	7.90	103	0.05	0.06	3.53	161	0.005		0.07		232	0.0	13	
12	4.40	7.91	100	0.05	0.07	3.49	159	0.004		0.04		234	0.0	15	
13	4.13	7.83	102	0.04	0.05	3.54	157	0.006		0.15		230	0.0	13	A
14	3.76	7.85	101	0.04	0.05	3.49	158	0.005		0.09		228	0.0	13	
15	3.62	7.95	100	0.05	0.06	3.65	156	0.004	0.002	0.06	0.005	229	0.0	14	A
16	4.70	8.02	100	0.06	0.06	3.48	153	0.006		0.07		230	0.0	14	
17	3.59	7.95	101	0.06	0.06	3.40	158	0.008		0.05		229	0.0	14	A
18	4.00	7.96	105	0.04	0.05	6.91	160	0.006		0.15		228	0.0	14	
19	3.71	7.96	105	0.04	0.05	3.22	162	0.007		0.16		227	0.0	12	
20	4.25	7.99	103	0.05	0.05	3.23	155	0.008		0.11		226	0.0	12	A
21	3.96	8.00	104	0.04	0.06	3.32	161	0.006		0.14		225	0.0	12	
22	3.98	7.96	102	0.04	0.05	3.35	161	0.004	0.028	0.07	0.006	225	0.0	13	A
23	3.77	7.94	97	0.06	0.04	3.38	156	0.005		0.04		226	0.0	12	
24	4.14	7.92	100	0.05	0.06	3.43	156	0.005		0.15		224	0.0	12	A
25	3.93	7.85	100	0.05	0.05	3.41	155	0.005		0.13		222	0.0	11	
26	3.92	7.84	99	0.06	0.06	3.50	152	0.007		0.14		224	0.0	12	
27	4.04	7.86	104	0.04	0.06	3.37	160	0.008		0.14		219	0.0	12	A
28	3.91	7.89	102	0.04	0.07	3.53	158	0.006		0.18		221	0.0	12	
29	3.08	7.90	98	0.05	0.06	3.67	154	0.006	0.004	0.10	0.002	221	0.0	11	A
30	4.33	7.89	98	0.06	0.05	3.56	150	0.004		0.13		221	0.0	14	
AVG	**3.93**	**7.91**	**102**	**0.05**	**0.05**	**3.61**	**158**	**0.005**	**0.008**	**0.09**	**0.003**	**227**	**0.0**	**13**	
TOTA	**117.77**														

HIGH SERVICE
December 2017

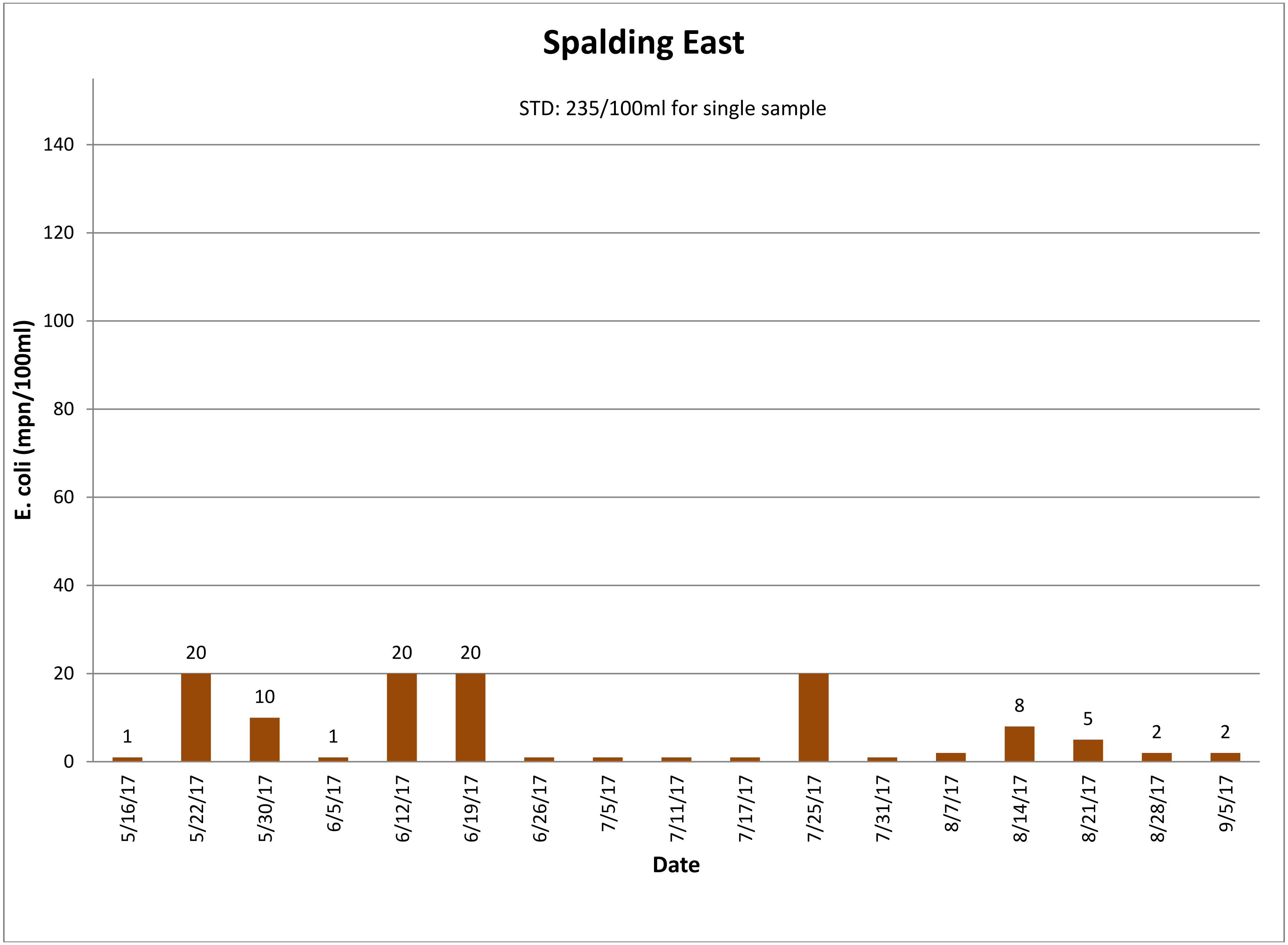
	PLANT EFFLUENT														
DATE	Flow (mgd)	pH -	Alkalinity (mg/l)	Turbidity (NTU)	Free Cl2 (mg/l)	Total Cl2 (mg/l)	Hardness (mg/l)	Iron (mg/l)	Mn (mg/l)	NH_3 (mg/l)	NO_2 (mg/l)	TDS (mg/l)	Color (u)	Temp (°C)	Total Coliforms
1	3.81	7.88	100	0.06	0.04	3.45	151	0.005		0.16		221	0.0	11	A
2	3.92	7.89	102	0.04	0.05	3.38	159	0.005		0.16		220	0.0	13	
3	3.92	8.01	103	0.04	0.05	3.41	130	0.004		0.15		221	0.0	12	
4	3.76	8.00	101	0.06	0.05	3.42	155	0.007		0.14		220	0.0	11	A
5	3.90	8.03	102	0.06	0.05	3.44	163	0.007		0.14		221	0.0	11	
6	3.55	8.06	101	0.05	0.06	3.35	165	0.005	0.018	0.06		222	0.0	13	A
7	3.74	8.01	104	0.03	0.05	3.36	157	0.007		0.10		221	0.0	12	
8	3.61	7.98	102	0.04	0.06	3.40	162	0.007		0.10		221	0.0	12	A
9	4.23	8.02	100	0.06	0.05	3.44	155	0.005		0.11		220	0.0	12	
10	4.08	7.94	99	0.06	0.05	3.38	156	0.007		0.10		224	0.0	11	
11	3.82	7.83	101	0.04	0.06	3.36	158	0.005		0.06		218	0.0	11	A
12	4.12	7.80	99	0.05	0.06	3.47	152	0.008		0.08		217	0.0	12	
13	3.84	7.79	98	0.05	0.06	3.61	157	0.034	0.010	0.06	0.002	216	0.0	12	A
14	3.59	7.72	99	0.06	0.07	3.46	154	0.007		0.05		211	0.0	11	
15	3.74	7.78	98	0.05	0.07	3.41	152	0.008		0.04		214	0.0	10	A
16	4.27	7.85	100	0.05	0.05	3.34	155	0.008		0.06		215	0.0	9	
17	3.75	7.93	102	0.04	0.05	3.40	159	0.003		0.03		214	0.0	11	
18	4.29	7.97	101	0.04	0.06	3.37	150	0.006		0.08		214	0.0	12	A
19	4.07	8.00	100	0.05	0.05	3.40	153	0.008		0.10		213	0.0	11	
20	3.71	7.96	101	0.04	0.07	3.47	158	0.004	0.020	0.01	0.004	213	0.0	12	A
21	3.64	7.96	103	0.04	0.09	3.36	161	0.007		0.07		215	0.0	11	
22	4.50	7.98	100	0.04	0.07	3.34	162	0.004		0.05		225	0.0	12	A
23	3.87	7.85	98	0.05	0.06	3.41	159	0.004		0.07		226	0.0	12	
24	3.58	7.82	100	0.04	0.07	3.09	168	0.007		0.02		233	0.0	12	
25	4.34	7.88	98	0.06	0.06	3.19	156	0.006		0.04		224	0.0	9	A
26	4.00	7.86	102	0.04	0.06	3.02	157	0.008		0.09		218	0.0	9	
27	4.81	7.94	100	0.05	0.06	3.49	156	0.004	0.002	0.19	0.004	212	0.0	7	A
28	4.11	7.90	101	0.04	0.09	3.63	160	0.004		0.19		209	0.0	8	
29	4.48	7.95	102	0.06	0.07	3.53	153	0.008		0.15		204	0.0	7	A
30	3.91	7.84	101	0.04	0.06	3.41	162	0.009		0.08		200	0.0	8	
31	4.49	7.85	101	0.04	0.06	3.87	157	0.005		0.06		221	0.0	7	
AVG	**3.98**	**7.91**	**100**	**0.05**	**0.06**	**3.41**	**156**	**0.007**	**0.013**	**0.09**	**0.003**	**217**	**0.0**	**10**	
TOTA	**123.45**														

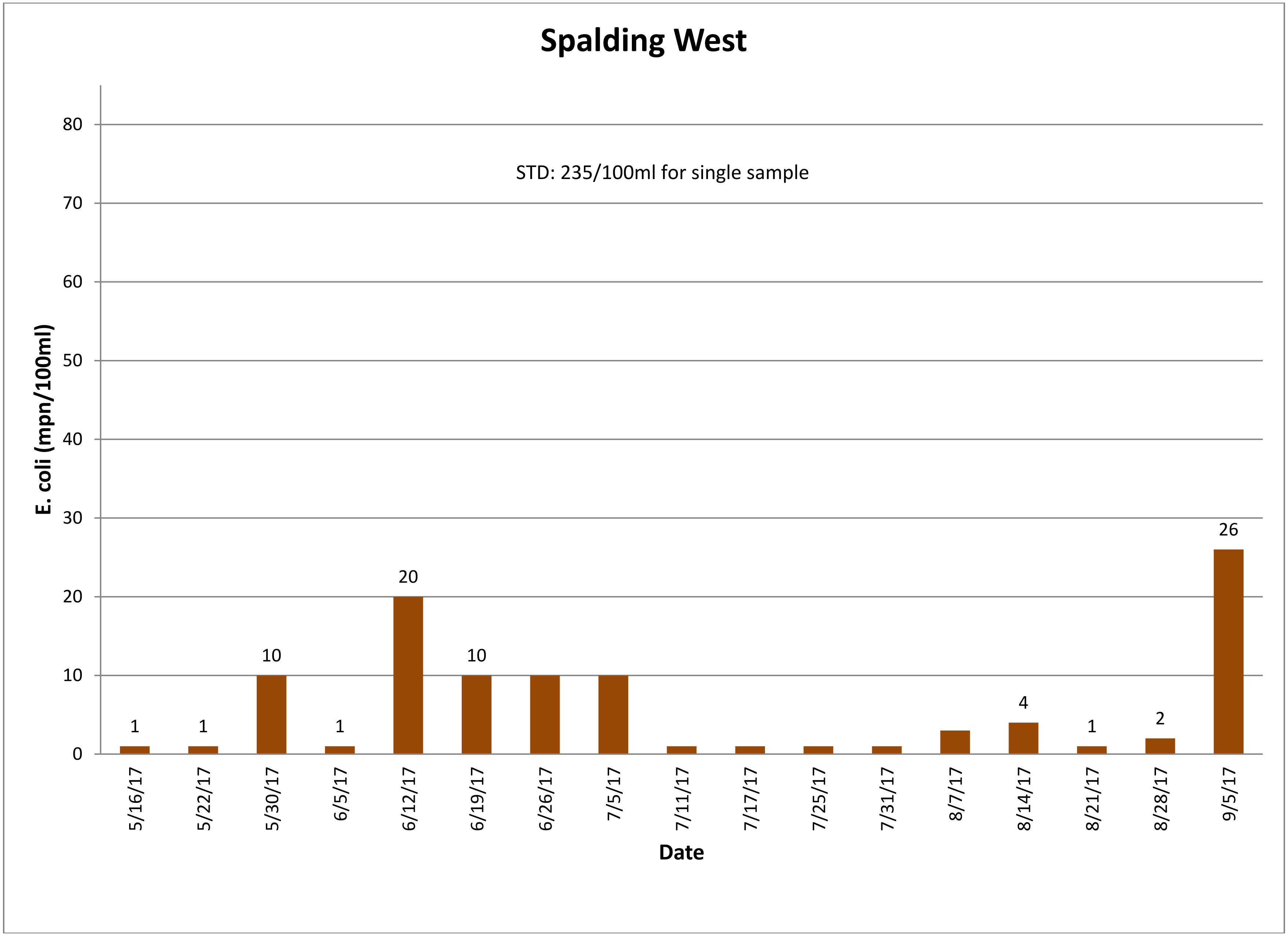
APPENDIX F

Beach Data & Graphs

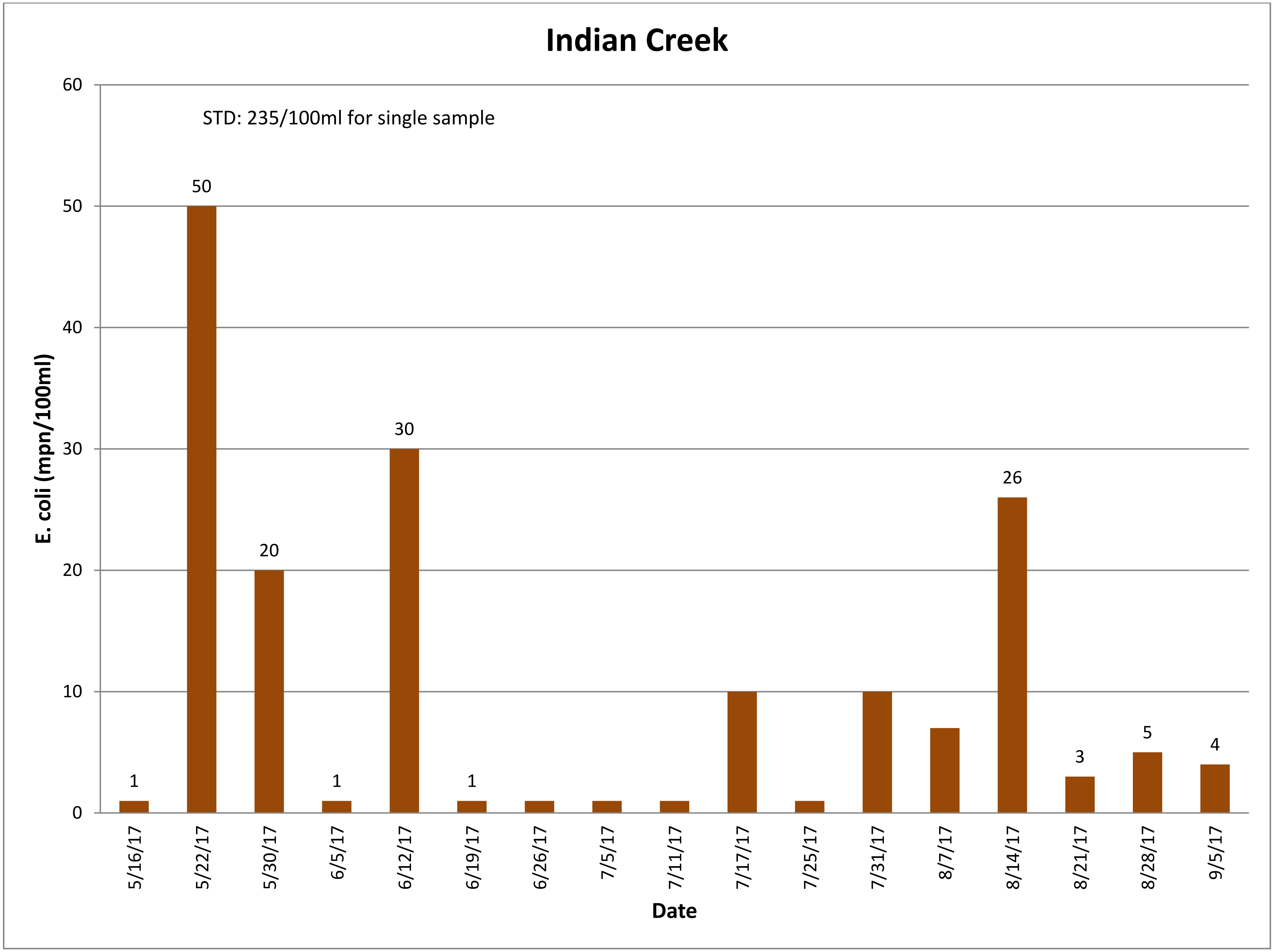
2017 Beach Data

Date	Bottle Number	Spalding East (E. Coli / 100 ml)	Bottle Number	Spalding West (E. Coli / 100 ml)	Bottle Number	Indian Creek (E. Coli / 100 ml)
5/8/2017		Flooded		Flooded		Flooded
5/16/2017	7934	1	7940	1	7941	1
5/22/2017	7887	20	7888	1	7889	50
5/30/2017	7921	10	7922	10	7928	20
6/5/2017	7957	1	7958	1	7960	1
6/12/2017	7933	20	7954	20	7962	30
6/19/2017	7939	20	7953	10	7963	1
6/26/2017	7967	1	7991	10	7968	1
7/5/2017	7979	1	7996	10	8000	1
7/11/2017	7977	1	7988	1	7990	1
7/17/2017	8009	1	8015	1	8022	10
7/25/2017	8148	20	8142	1	8118	1
7/31/2017	8135	1	8137	1	8139	10
8/7/2017	8038	2	8119	3	8157	7
8/14/2017	8174	8	8179	4	8181	26
8/21/2017	8176	5	8177	1	8183	3
8/28/2017	8028	2	8030	2	8037	5
9/5/2017	8027	2	8039	26	8048	4


Spalding East
STD: 235/100ml for single sample
E. coli (mpn/100ml)
140
120
100
80
60
40
20
0
1
20
10
1
20
20
8
5
2
2
5/16/17
5/22/17
5/30/17
6/5/17
6/12/17
6/19/17
6/26/17
7/5/17
7/11/17
7/17/17
7/25/17
7/31/17
8/7/17
8/14/17
8/21/17
8/28/17
9/5/17
Date



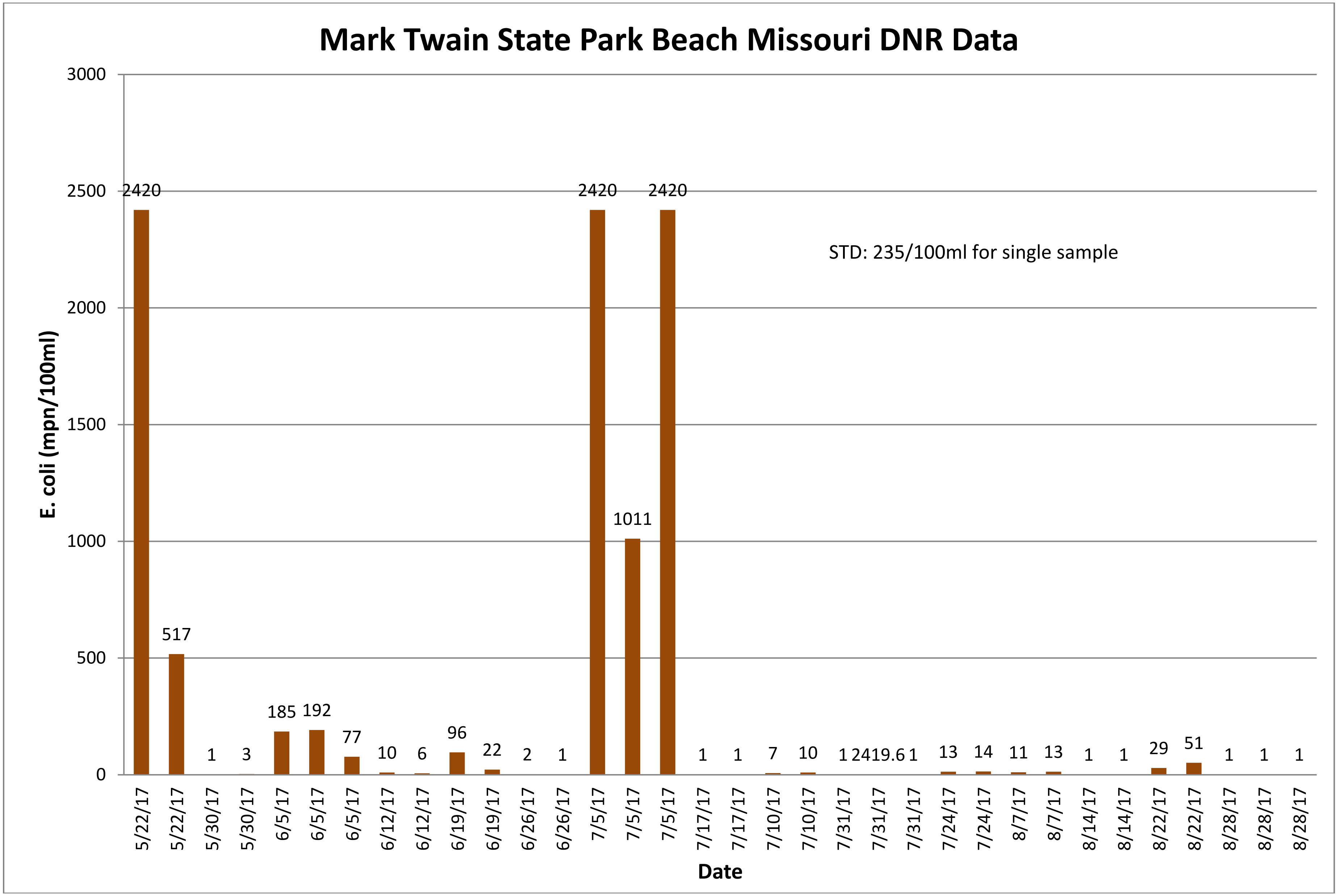
Spalding West
STD: 235/100ml for single sample
E. coli (mpn/100ml)
80
70
60
50
40
30
20
10
0
1
1
10
1
20
10
4
1
2
26
5/16/17
5/22/17
5/30/17
6/5/17
6/12/17
6/19/17
6/26/17
7/5/17
7/11/17
7/17/17
7/25/17
7/31/17
8/7/17
8/14/17
8/21/17
8/28/17
9/5/17
Date


Indian Creek
STD: 235/100ml for single sample
E. coli (mpn/100ml)
60
50
40
30
20
10
0
1
50
20
1
30
1
26
3
5
4
5/16/17
5/22/17
5/30/17
6/5/17
6/12/17
6/19/17
6/26/17
7/5/17
7/11/17
7/17/17
7/25/17
7/31/17
8/7/17
8/14/17
8/21/17
8/28/17
9/5/17
Date

2016 Mark Twain State Park Beach Data

Collect Date	Collect Time	Comment	Qualifier	E. Coli	Units
5/22/2017	10:15:00 AM	"We had several inches of rain Friday and Saturday. Lake came up. Muddy wind blowing into beach. Moderate amout of goose droppings."	>	2420	mpn/100ml
5/22/2017	10:17:00 AM	"We had several inches of rain Friday and Saturday. Lake came up. Muddy wind blowing into beach. Moderate amout of goose droppings."		517	mpn/100ml
5/30/2017	7:05:00 AM			1	mpn/100ml
5/30/2017	7:10:00 AM			3	mpn/100ml
6/5/2017	8:30:00 AM			185	mpn/100ml
6/5/2017	8:30:00 AM			192	mpn/100ml
6/5/2017	8:32:00 AM			77	mpn/100ml
6/12/2017	9:05:00 AM			10	mpn/100ml
6/12/2017	9:00:00 AM			6	mpn/100ml
6/19/2017	9:30:00 AM			96	mpn/100ml
6/19/2017	9:32:00 AM			22	mpn/100ml
6/26/2017	10:00:00 AM			2	mpn/100ml
6/26/2017	10:05:00 AM			1	mpn/100ml
7/5/2017	9:10:00 AM	"Was raining when took samples. Wind blowing into bank. 25	>	2420	mpn/100ml
7/5/2017	9:10:00 AM	"Was raining when took samples. Wind blowing into bank. 25		1011	mpn/100ml
7/5/2017	9:12:00 AM	"Was raining when took samples. Wind blowing into bank. 25		2420	mpn/100ml
7/17/2017	9:00:00 AM		ND	1	mpn/100ml
7/17/2017	9:05:00 AM		ND	1	mpn/100ml
7/10/2017				7	mpn/100ml
7/10/2017	9:15:00 AM	"Beach covered with white feathers from sea gulls. Lots of sea		10	mpn/100ml
7/31/2017	9:02:00 AM	"Was windy; blowing into beach water and was really muddy."	ND	1	mpn/100ml
7/31/2017	9:00:00 AM	"Was windy; blowing into beach water and was really muddy."		1	mpn/100ml
7/31/2017	9:00:00 AM	"Was windy; blowing into beach water and was really muddy."		1	mpn/100ml
7/24/2017	8:42:00 AM	We had rain last night maybe 1/2 inch water was clear today.		13	mpn/100ml
7/24/2017	8:40:00 AM	We had rain last night maybe 1/2 inch water was clear today.		14	mpn/100ml
8/7/2017	10:45:00 AM			11	mpn/100ml
8/7/2017	10:45:00 AM			13	mpn/100ml
8/14/2017	10:00:00 AM		ND	1	mpn/100ml

Collect Date	Collect Time	Comment	Qualifier	E. Coli	Units
Mark Twain	8/14/2017	10:05:00 AM		ND	1
Mark Twain	8/22/2017	9:32:00 AM			29
Mark Twain	8/22/2017	9:30:00 AM			51
Mark Twain	8/28/2017	9:00:00 AM		ND	1
Mark Twain	8/28/2017	9:05:00 AM			1
Mark Twain	8/28/2017	9:05:00 AM		ND	1


Mark Twain State Park Beach Missouri DNR Data
E. coli (mpn/100ml)
3000
2500
2000
1500
1000
500
0
2420
517
1
3
185
192
77
10
6
96
22
2
1
2420
1011
2420
1
1
7
10
1
2419.6
1
13
14
11
13
1
1
29
51
1
1
1
STD: 235/100ml for single sample
5/22/17
5/22/17
5/30/17
5/30/17
6/5/17
6/5/17
6/5/17
6/12/17
6/12/17
6/19/17
6/19/17
6/26/17
6/26/17
7/5/17
7/5/17
7/5/17
7/17/17
7/17/17
7/10/17
7/10/17
7/31/17
7/31/17
7/31/17
7/24/17
7/24/17
8/7/17
8/7/17
8/14/17
8/14/17
8/22/17
8/22/17
8/28/17
8/28/17
8/28/17
Date