WBID 1937: PHILLIPPI CREEK BACTERIAL POLLUTION CONTROL PLAN

Sarasota County

Sarasota County Public Utilities Department
March 26, 2018

TABLE OF CONTENTS

LIST OF FIGURES

EXECUTIVE SUMMARY

Significant progress has been made in implementing best management practices to reduce bacterial pollution in the Phillippi Creek Watershed. It is expected that bacteria levels will drop as more septic systems are connected to sewage treatment service, as existing septic systems are held to higher standards, and as spill prevention upgrades are implemented. Outreach to the public about minimizing bacterial pollution from private property is expected to improve practices regarding picking up pet waste, conducting regular maintenance on septic systems and repairing connections from buildings to the sewage collection system at the property line. Improving stormwater management may also reduce pollution by implementing a mix of capital projects and smaller installations.

PHILLIPPI CREEK BASIN

The Phillippi Creek Basin is a large coastal basin (35,700 acres) located in Sarasota County and flows to Roberts Bay. Flow from Roberts Bay goes to Sarasota Bay then to the Gulf of Mexico. The City of Sarasota has jurisdiction over 2,630 acres in the basin (7.5%) and the rest is under the jurisdiction of unincorporated Sarasota County. WBID 1937 covers the northern half of the basin and is located upstream of the tidal portion of the creek so is entirely fresh water. WBIDs are hydrologic units, (parts of a watershed) that are identified by a waterbody ID number (WBID). Land use in the basin is predominantly residential (60%), with 14% commercial-transportation-industrial, 10% agricultural, 6% recreational, 4% wetlands and 6% open water.

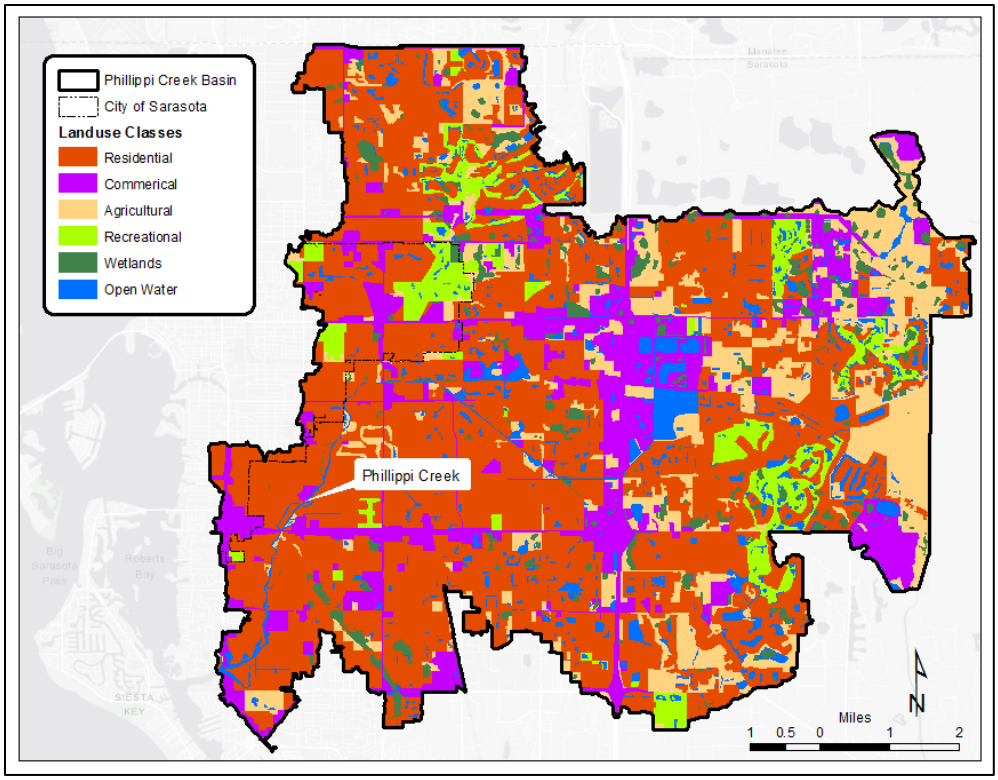

Figure 1. Phillippi Creek Basin Land Use Map.

TMDLS, IMPAIRED WATERS & WATER QUALITY STANDARDS

This document addresses the August 2010 EPA Total Maximum Daily Load (TMDL) for Phillippi Creek WBID 1937 that allocates a 98% reduction in fecal coliform bacteria. In accordance with the National Pollutant Discharge Elimination System (NPDES) permit FLS000004-004 for Municipal Separate Storm Sewer Systems (MS4), Sarasota County proposed that this TMDL be a bacterial priority in the 2014 to 2018 permit term and the Florida Department of Environmental Protection (FDEP) agreed. The TMDL can be found online at:http://www.sarasota.wateratlas.usf.edu/upload/documents/196_8f_sbb_1937_phillippi_creek_fc.pdf.

The approval document is available here: http://www.sarasota.wateratlas.usf.edu/upload/documents/FDEP-approved-Sarasota-County-TMDL-Prioritization-Plan-2014-10-03.pdf . A Walk-the-WBID activity was

conducted to investigate bacteria sources and a Microbial Source Tracking project is currently underway.

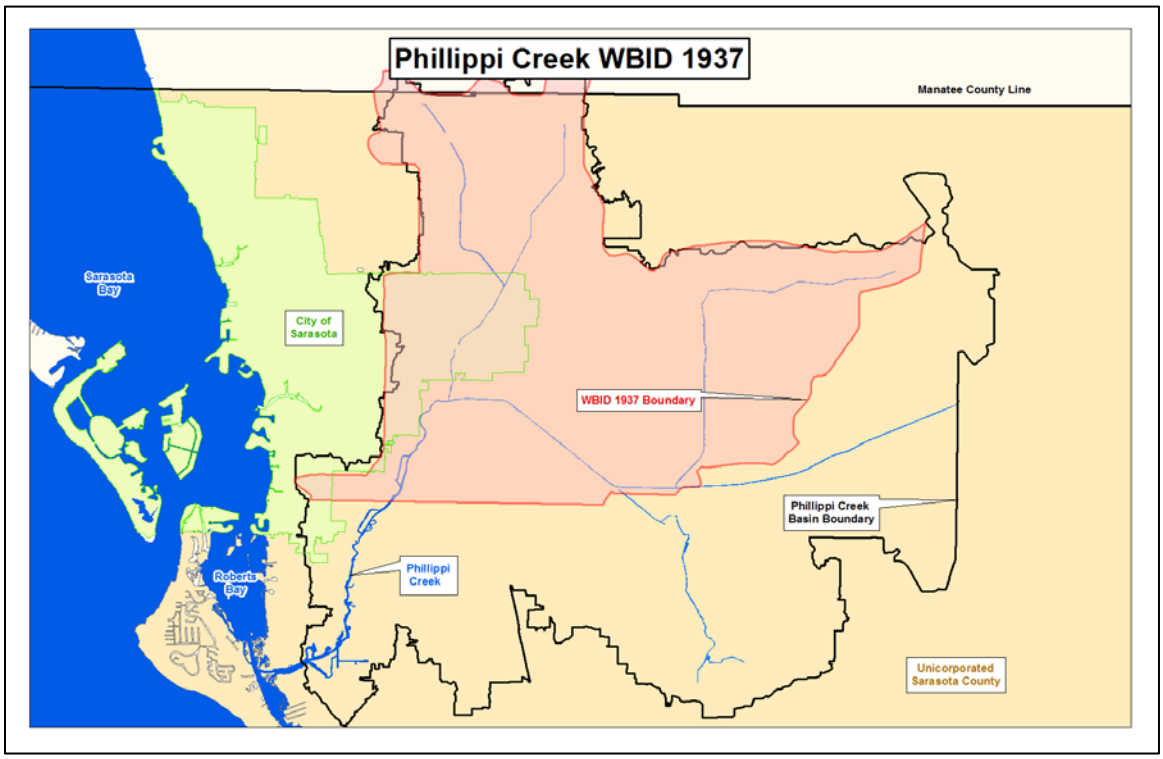

Figure 2. Phillippi Creek WBID 1937 Map.

Within the Phillippi Creek Basin there are 6 WBIDs, 2 of which are upstream of WBID 1937 and could be contributing to water quality conditions downstream. Within the Phillippi Creek Basin there are other TMDLs:

1. TMDL for Dissolved Oxygen and Nutrients in Phillippi Creek (WBID 1937), July 2011, EPA calls 70% reductions in Total Nitrogen, Total Phosphorus and Biochemical Oxygen Demand.
2. TMDL for Nutrients in Clark Lake (WBID 1971), January 2012, EPA calls for a 21% reduction in Total Nitrogen and an 80% reduction in Total Phosphorus.

According to the FDEP Statewide Comprehensive Verified List of Impaired Waters at https://floridadep.gov/dear/watershed-assessment-section/documents/statewide-comprehensive-verified-list-impaired-waters, WBID 1937 is currently designated as

impaired for fecal coliform bacteria. The following WBIDS in the basin are also deemed impaired by FDEP:

1. WBID 1947 impaired for fecal coliform bacteria
2. WBID 1966 impaired for nutrients (macrophytes) based on failing a linear vegetation survey.

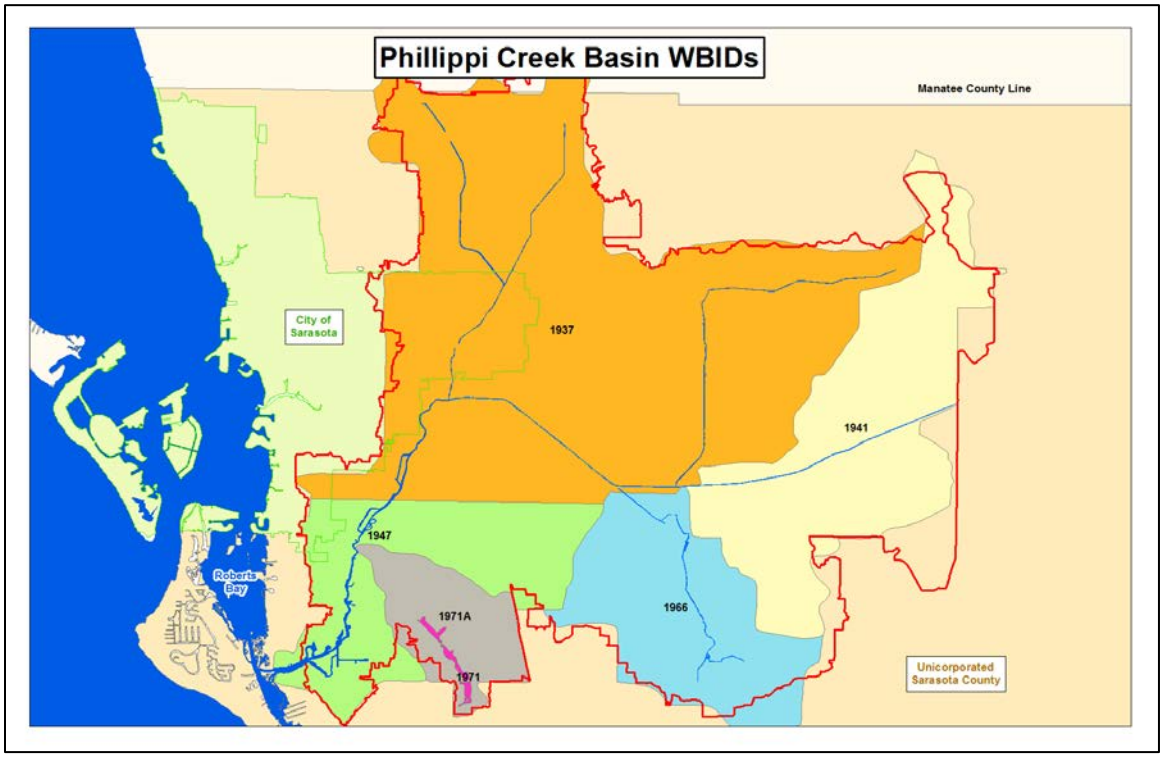

Figure 3. Phillippi Creek Basin WBIDs Map.

Sarasota Bay WBID 1968B contains an area designated as Shellfish Harvesting Area, one of only two such locations in Sarasota County. It is impaired for bacteria in shellfish. Water from the Phillippi Creek watershed can be expected to impact water quality in Sarasota Bay.

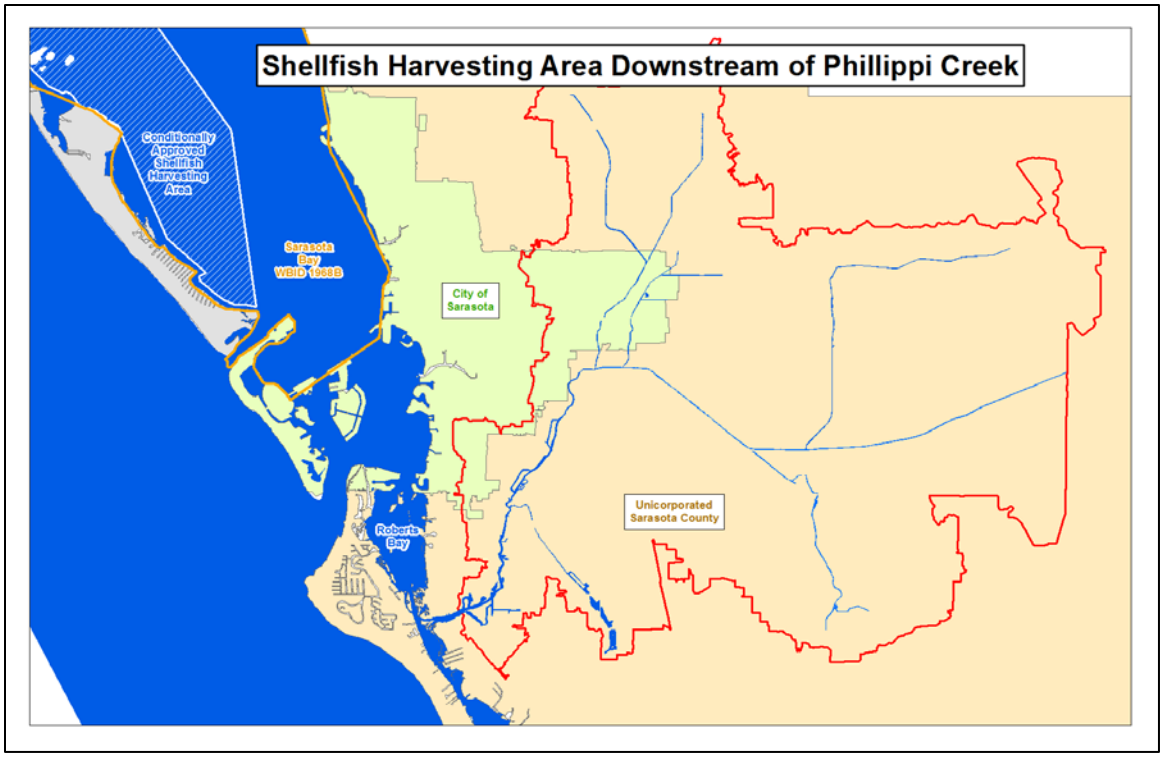

Figure 4. Location of Bacteria-Impaired WBID 1968B in Sarasota Bay.

In 2016, Florida water quality standards (62-302 FAC) were revised and fecal coliform was discontinued as a regulatory standard for surface waters for the assessment of verified impaired status. It was replaced with 2 standards - Escherichia coli in freshwater and Enterococci in marine waters. Fecal coliform was retained as the standard only for Class 2 Waters used for shellfish harvesting.

Fecal coliform bacteria commonly originate in the intestinal systems of warm-blooded animals and are indicative of the possible presence of pathogens. Bacteria may come from sewage systems, septic systems (aka onsite sewage disposal systems), pets, livestock, wildlife, or homeless people. Bacteria may also proliferate in the warm, wet settings. The objective of this TMDL is to ensure that waterbodies are free from preventable, man-made sources of disease-causing microorganisms so that these waters are suitable for recreation, wildlife and other uses.

WATER QUALITY

Sarasota County conducted creek monitoring from the 1970s to 1992 when the program was ended. Water quality monitoring was resumed in 2007 to provide a factual foundation for addressing impending impaired waters designations and TMDLs. Since then, elevated bacteria levels have been found intermittently at sampling sites in the basin but there may be an overall declining trend.

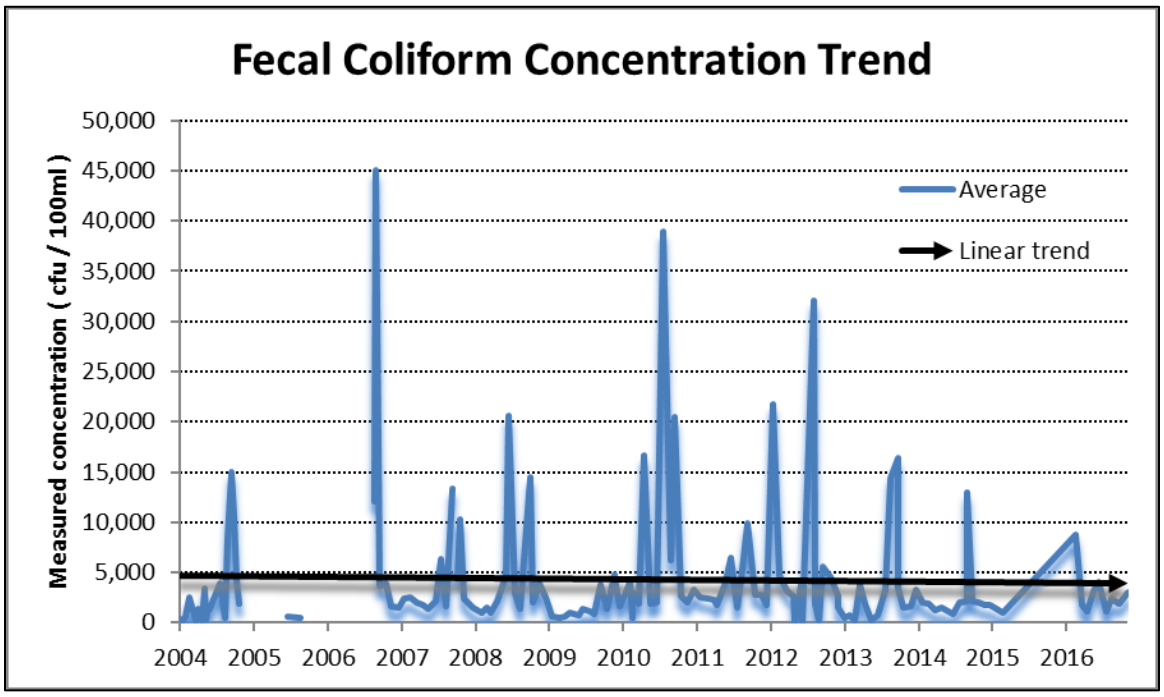

Figure 5. Graph of Fecal coliform in the Phillippi Creek WBID 1937.

In 2016, the data was analyzed and 9 hot spots were identified. The report is available on the Sarasota Water Atlas website at: http://www.sarasota.wateratlas.usf.edu/upload/documents/Phillippi-TMDL-Data-Summary-Book-8-5-16-web.pdf. In 2017, a Walk the WBID exercise was completed and submitted to FDEP for review. A summary of results for the exercise is available at http://www.sarasota.wateratlas.usf.edu/upload/documents/25_WTW-Summary-Report-Phillippi-Creek-FINALv2.9-27-17-web.pdf. It includes in-depth accounting of sites that were investigated. The investigation was unable to find failing septic tanks or sewer infrastructure as a point source of bacterial pollution. In 2018, an agreement was signed

with Johnson Engineering for Phillippi Basin Microbial Source Tracking that will include supplemental monitoring for fecal coliform, E. coli, total phosphorus, sucralose, acetaminophen, and DNA biomarkers for humans, dogs and birds. It is expected that this study may shed some light on bacteria sources.

Sarasota County continues to conduct monthly ambient water quality at 13 locations in the Phillippi Creek basin. Even though fecal coliform is no longer a water quality standard for creeks, it is still monitored to provide information about trends and impacts on shellfish harvesting downstream. The current standards (E. coli and Enterococci) have been monitored at fresh and marine sites respectively since they became the legal criteria. The standard for E. coli is 410 colonies/100 milliliters and is 130 for Enterococci. The standard for fecal coliform was 800.

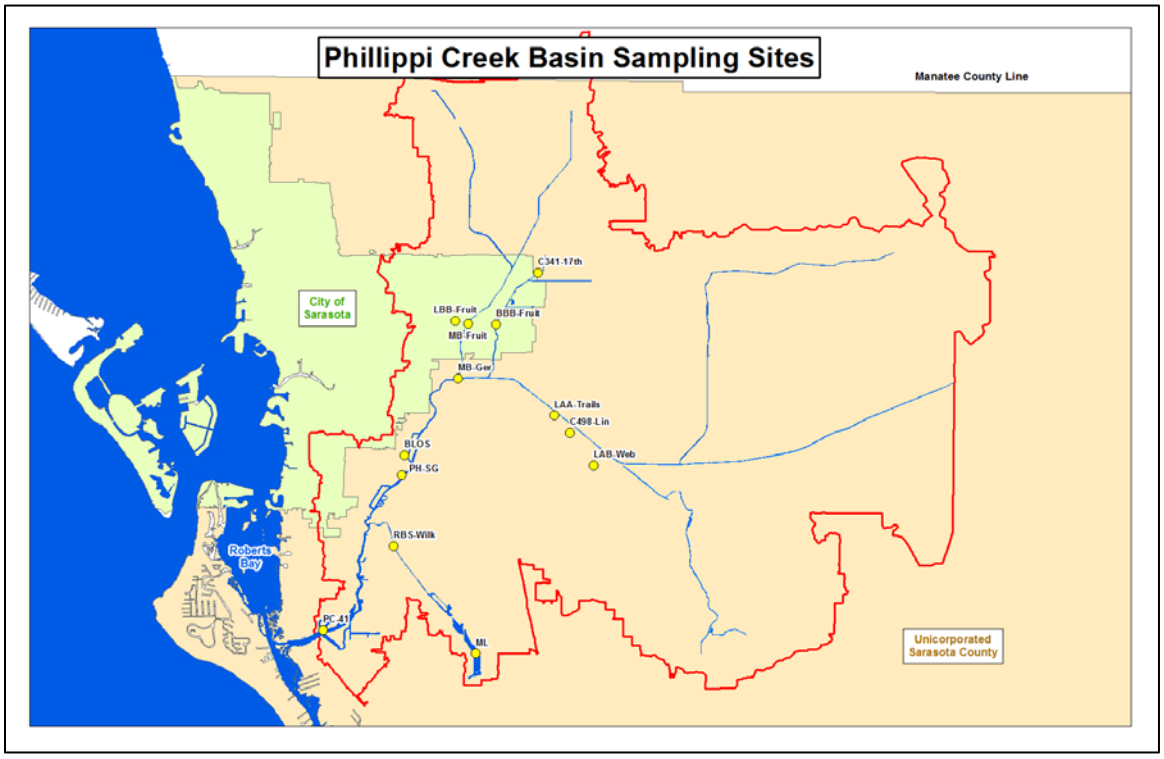

Figure 6. Map of Sampling Sites in the Phillippi Creek Basin.

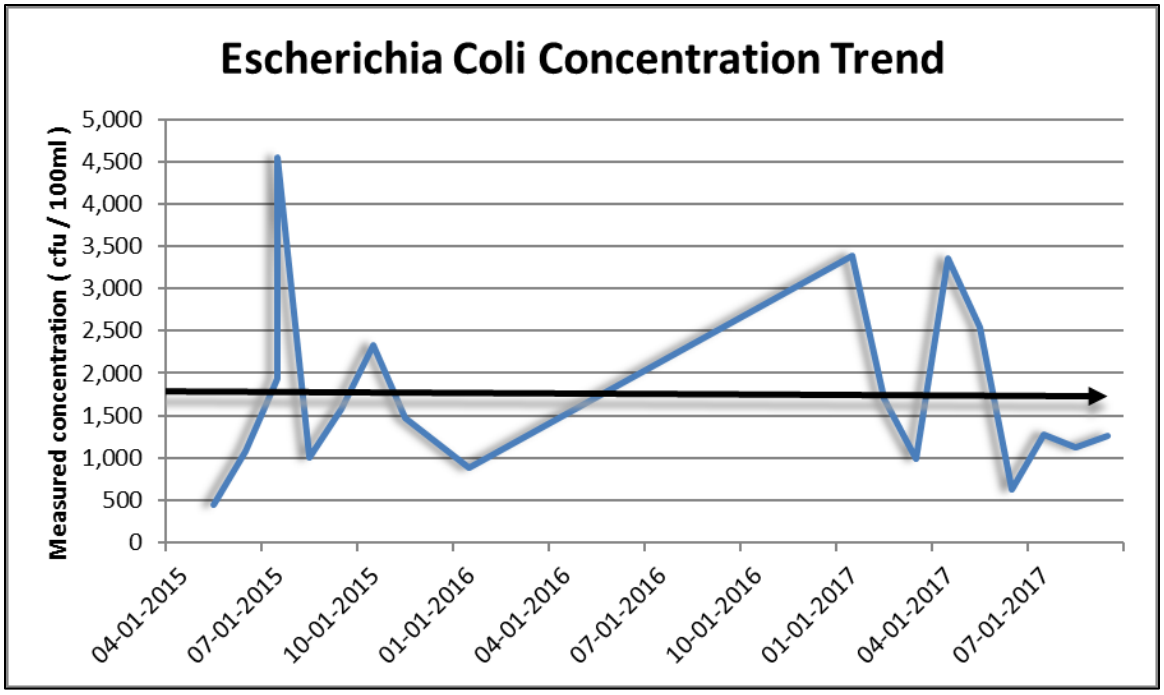

Figure 7. Graph of Escherichia coli in the Phillippi Creek Basin.

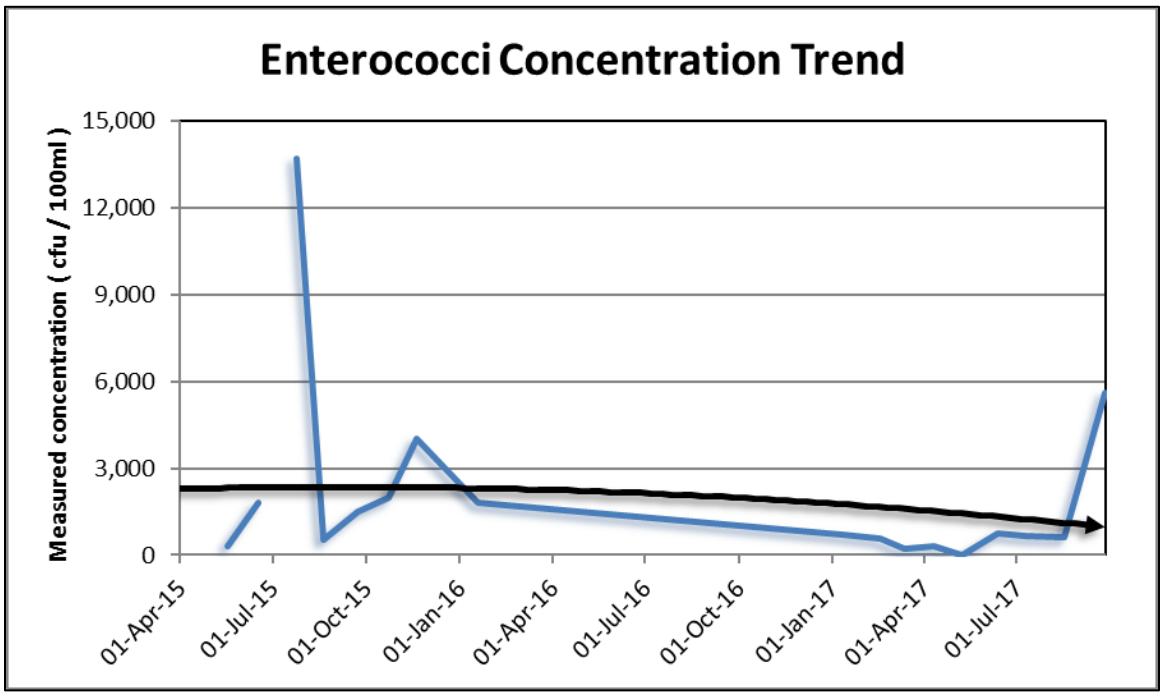

Figure 8. Graph of Enterococci in the Phillippi Creek Basin.

BACTERIA SOURCES & BEST MANAGEMENT PRACTICES

Sewage treatment services are provided by Sarasota County, the City of Sarasota and several small service providers. Regular maintenance is conducted to prevent accidental spills of sewage and reclaimed water. Reclaimed water is disinfected and not a source of bacteria. When spills occur, they are promptly and accurately reported to the FDEP Public Notice of Pollution reporting system. The Florida Department of Health in Sarasota County (FDOH) regulates septic systems and ensures that systems are installed, repaired and decommissioned in a manner that is protective of clean surface and ground waters.

There are currently no permitted surface water discharges of treated wastewater in the basin. Wastewater management is progressing from septic systems and numerous small wastewater treatment systems to more centralized sewage treatment that provides reclaimed water for landscape irrigation or injection well disposal.

The Phillippi Creek Septic System Replacement Program (PCSSRP) has made significant progress in reducing the impact of septic systems on surface water quality with about 10,000 septics taken off line to date. At a flow rate of 200 gallons per day per septic system, the reduction is 2 million gallons per day that is no longer discharged into the ground by septic systems. The PCSSRP was created to connect a total of 15,000 homes that are served by septic systems to sewage treatment service. Progress on septic system replacement depends on continued success with securing funding. More information about the PCSSRP is at https://www.scgov.net/government/utilities-water/phillippi-creek-septic. In Phillippi Creek Basin, Sarasota County has spent over $120,000,000 on septic system and package plant consolidation.

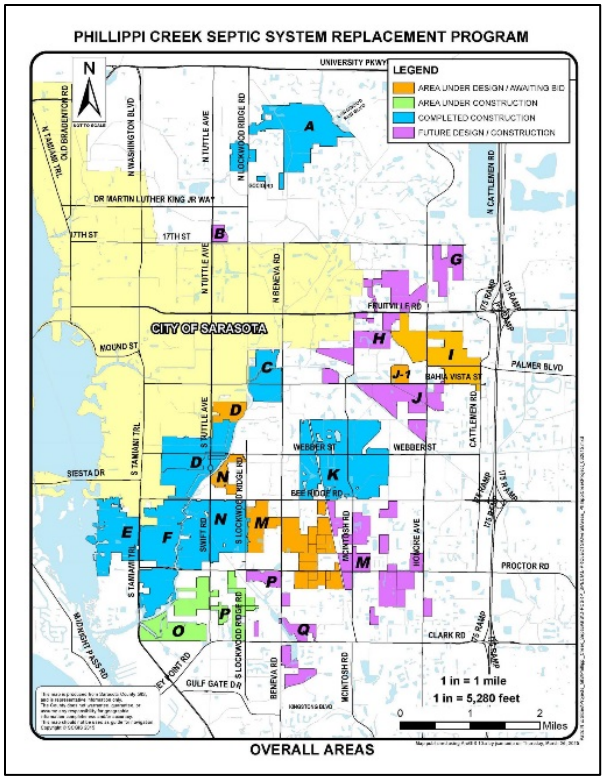

Figure 9. Phillippi Creek Septic System Replacement Program Map.

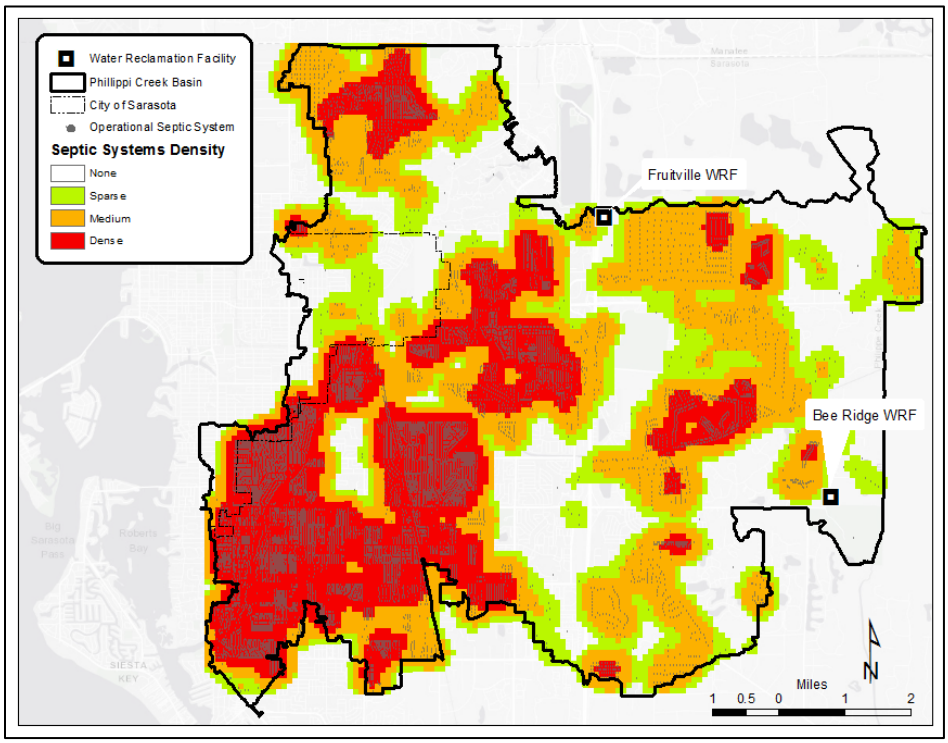

Figure 10. Septic Systems in the Phillippi Creek Basin Map.

Wastewater treatment plant consolidation in the basin has also seen real progress. Since 1988, 32 small package plants have been taken off line for a reduction of total permitted capacity of 7 million gallons per day. Eight small treatment plants remain in the basin as well as 2 modern, regional treatment plants called Water Reclamation Facilities.

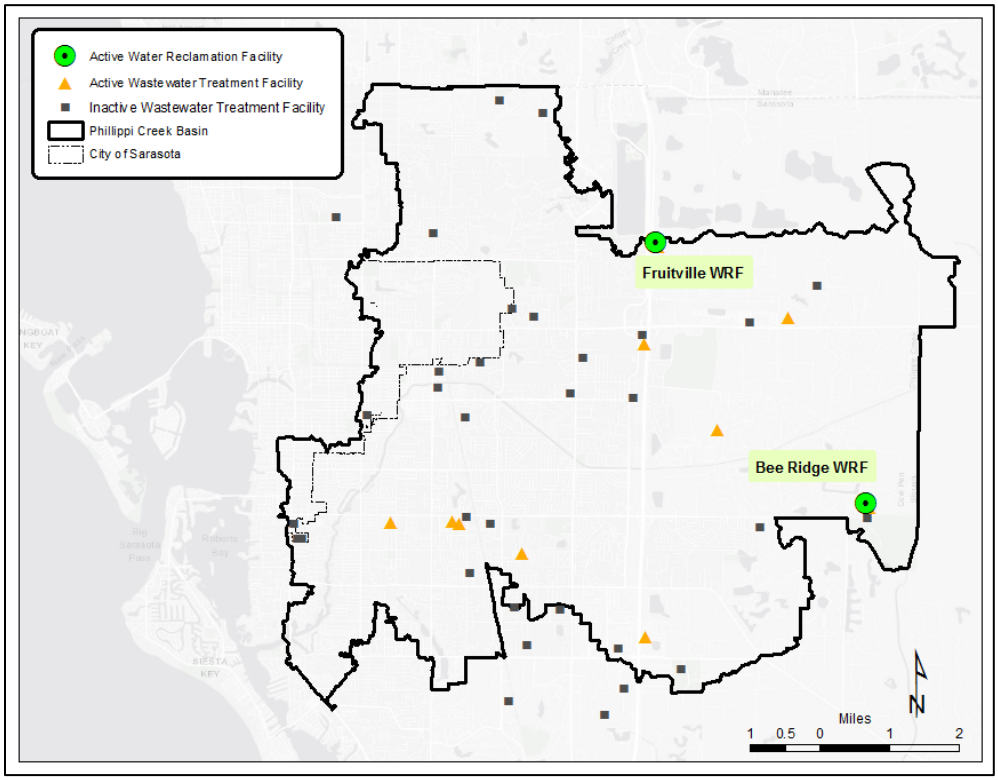

Figure 11. Map of the Wastewater Treatment Facilities in the Phillippi Creek Basin.

SPILL PREVENTION BMPS – CITY OF SARASOTA UTILITIES

- The City uses a continuous evaluation process for the sewage collection system using visual and televised inspections. The data is reviewed by staff and ranked for repair or rehabilitation. A five-year plan to televise and inspect the entire sewer collection system was completed in December 2017, a year ahead of schedule.

- Pipe sections identified by the inspection program that are ranked high for rehabilitation are compiled into work assignments for the pipe lining companies under contract to the City. City staff inspect the lining contractor's performance to ensure the work is done properly.

- The City has an annual budget for lift station rehabilitation to replace or upgrade pumps, electrical panels, valve vaults and wet wells. City crews have developed a standard electrical panel design for the lift stations that incorporates equipment to augment the functionality of the SCADA system.

- The City will be purchasing new standby generators for five additional lift stations. These new generators will be in addition to the existing twelve lift stations that currently have backup pumping or generator capability. In addition, the City is considering an increase to its fleet of portable generators to provide backup power to some of the smaller lift stations if needed.

SPILL PREVENTION BMPS – SARASOTA COUNTY UTILITIES

- Sarasota County conducts continuous evaluation of its sewer collection system via visual and televised inspection. These inspections follow the National Association of Sewer Service Companies (NASSCO) Pipeline Assessment Certification Program (PACP). PACP is the North American Standard for pipeline defect identification and assessment.

- Once identified and ranked, the County has an aggressive program to line structurally-deficient pipe sections to minimize sewer back-ups or spills within the County's watersheds.

- In addition to pipeline rehabilitation, the County also rehabilitates its lift stations to prevent spills and discharges. In Area N Phase 3 of the PCSSRP, the County

rehabilitated Lift Station 59 and Lift Station 57 rehabilitation is underway. The Area N Phase 3 collection system will be completed by the end of 2018.

- The County is re-examining its Collection, Management, Operation, and Maintenance (CMOM) program activities for lift stations. CMOM programs incorporate many of the standard operation and maintenance activities that are routinely implemented by collection system owners to: better manage, operate, and maintain collection systems; investigate capacity-constrained areas of the collection system; proactively prevent sanitary sewer overflows; and respond to and lessen impacts of sanitary sewer overflows events. The County expects to have a revised "roadmap" completed by the end of 2018 and a fully revised program in place by the end of 2021.

- A proposed budget amendment for fiscal year 2018 includes the purchase of 35 portable generators and 23 portable pumps to minimize lift station overflows. In FY2019, a proposed capital project will add generators or alternate pumping capacity to critical lift stations.

SEPTIC SYSTEMS AND SPILL RESPONSE BMPS – FDOH

The Florida Department of Health in Sarasota County Onsite Sewage Treatment and Disposal System (OSTDS) Program has recently made quality improvements focusing on two program elements: Education and Process Enhancement.

Education advances include program-wide soils training by experts from the Environmental Health Bureau in Tallahassee, and staff training regarding the use of hydric and upland soils for locating seasonal high-water table elevations. Advanced succession training is underway for senior OSTDS staff to ensure the continuation of high quality program processes. Weekly septic tips are being emailed to staff to increase the overall expertise of program personnel.

Process improvements include a new supplemental review checklist to ensure that proper setbacks, elevations, and other requirements are met for septic system permitting, inspections, and development review. Advanced equipment was purchased to ensure that systems are installed at proper elevations and setback distances from groundwater and surface waters. A new two-tiered process adds another level of review for soil profile data and permitting. Lastly, two annual internal evaluations are completed using the statewide program evaluation tool. This is in addition to the regular evaluation that occurs every three years.

In the PCSSRP and other areas newly connected to central sewer, The FDOH issues septic tank abandonment permits and completes inspections to certify that tanks are pumped and filled in properly.

A spill response protocol is in place, as part of the FDOH sanitary nuisance abatement program, that includes posting signs at contaminated surface waters to protect and inform the public. Checking for proper disinfection of spill-contaminated waterbodies is also part of the process.

In 2005, the FDOH posted No Swimming signs at 10 access points to the Creek to prevent contact with bacteria in the creek.

Figure 12. No Swimming Sign for Phillippi Creek.

STORMWATER BMPS

Sarasota County provides many stormwater services for the City of Sarasota through an interlocal agreement. Although the stormwater drainage system is not a source of bacteria, it does pick up bacteria from wastewater, septic systems, pets, wildlife and other sources and carries it to receiving waterbodies. Stormwater treatment can be expected to reduce pollutants. In the Phillippi Creek basin, there is an extensive drainage network including almost 100 miles of canals and many more miles of ditches, pipe infrastructure, and numerous stormwater ponds and other impoundments such as borrow pits. Sources of bacteria are never far from receiving waters in a basin with such an abundance of waterbodies.

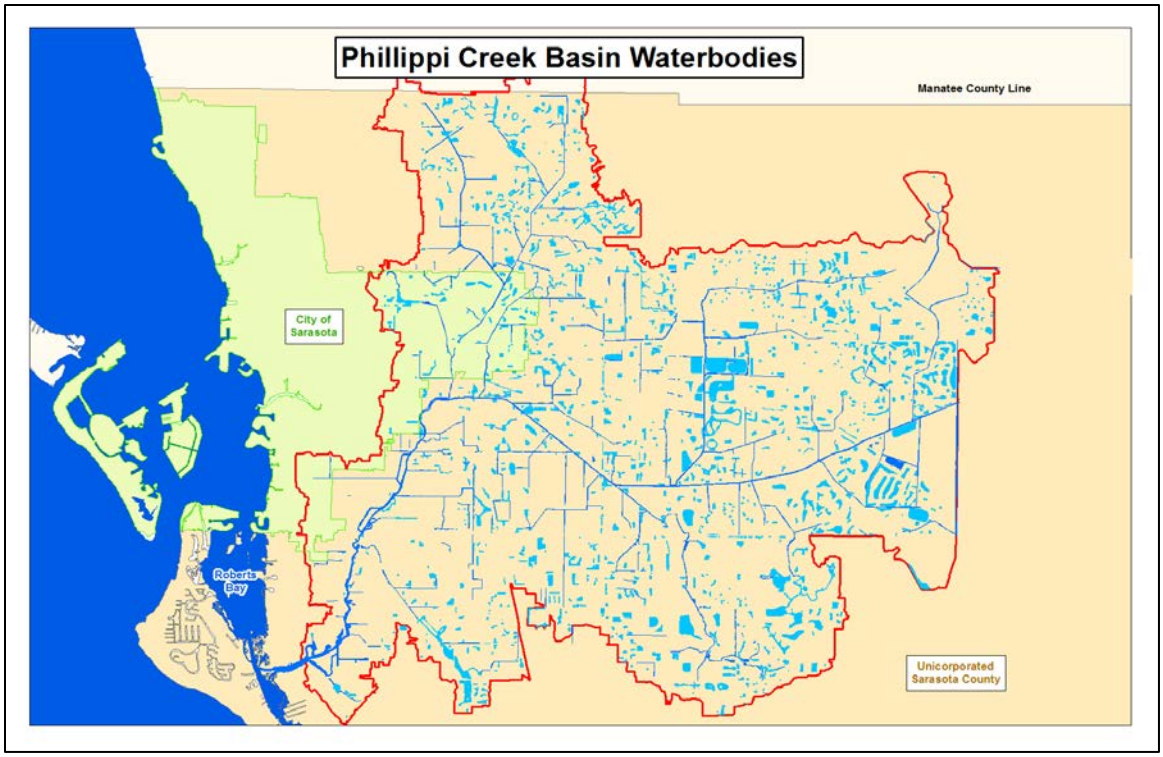

Figure 13. Waterbodies in the Phillippi Creek Basin Map.

The Celery Fields is a regional stormwater treatment system that was completed in 2014 and improves water quality from 3,500 acres, which is 10% percent of the basin. A study of pollutant removal is available at http://www.sarasota.wateratlas.usf.edu/upload/documents/Celery-Fields-Stormwater-BMP-Final-Reportop.pdf. Monitoring conducted for the report shows that water quality is improved by a combination of reducing pollutant concentrations and reducing flows. Two sediment traps were completed in 2013 and may offer some pollutant removal value too. More can be learned about these BMPs and other features of the basin at http://www.sarasota.wateratlas.usf.edu/watershedtours/phillippicreek/#. Other projects in the basin or WBID 1937 can be found at the Sarasota Water Atlas Projects Catalog pages at http://www.sarasota.wateratlas.usf.edu/projects-catalog/.

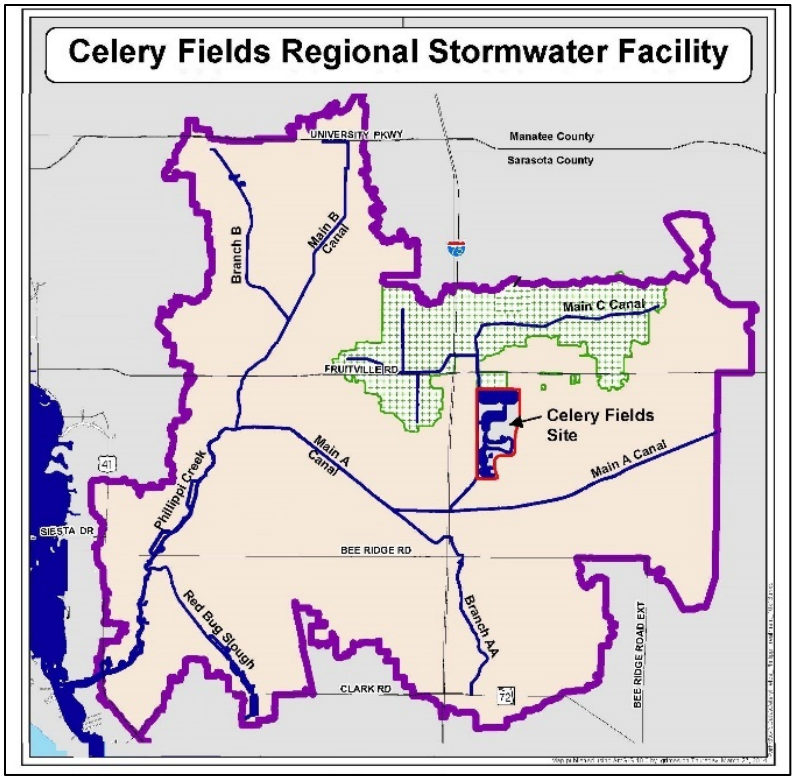

Figure 14. Celery Fields Regional Stormwater Facility in the Phillippi Creek Basin.

PUBLIC EDUCATION

Sarasota County Ordinances Chapter 14, Section 14-48 requires pick up and disposal of fecal matter from pets. The ordinance is available at http://sarasotacounty.elaws.us/code/coor_ptii_ch14_artii_sec14-48.

To minimize preventable bacteria pollution, Sarasota County has expanded its popular pet waste outreach campaign to include the Poop Fairy, a Poop Toss game used at public events, and encouraging neighborhood adoption of pet waste bag dispensers. Outreach includes events, theater promotion and social media.

Figure 15. Pet Waste Outreach – Poop Fairy and Poo-lution.

Figure 16. Pet Waste Outreach – Poop Toss Game and Adopted Bag Dispenser.

A 2018 contract with the Science and Environment Council of SW Florida includes development of outreach materials about septic system and sanitary sewer best management practices. A rack card will be produced and graphics may be used for distribution on Facebook or in movie theaters.

The FDOH conducts outreach for appropriate maintenance of septic systems. Their brochure is available online at: http://www.sarasota.wateratlas.usf.edu/upload/documents/Protecting-Your-Home-Caring-for-Your-Septic-System-FDOH.pdf

Figure 17. FDOH Septic System Brochure

COMMUNITY ENGAGEMENT

Sarasota County collaborated with partners to get the pubic involved in the effort to improve water quality. Partners include the Science and Environment Council, the University of Florida IFAS Extension, Sarasota Bay Watch, Sarasota Bay Estuary Program, South Gate Community Association, Orchid Oaks community, Around the

Bend Nature Tours, Keep Sarasota County Beautiful, Mote Marine Laboratory, Friends of Red Bug Slough, and others. Examples of their activities include outreach and education about living shorelines, shoreline plantings, a newsletter column on Phillippi Creek, research and outreach on snook and the importance of living shorelines, and an independent educational website promoting watershed awareness and best practices people can do at their homes and businesses to reduce nutrient and bacterial pollution (www.phillippicreek.org). On the Sarasota Water Atlas, there is a Phillippi Creek Watershed Tour in story map format.

STRATEGY FOR BACTERIA REDUCTION

The objective of the TMDL is restore Phillippi Creek to its designated use as a Florida Class 3 waterbody, meaning it should support recreation, fish and shellfish consumption, and the propagation and maintenance of a healthy, well-balanced population of fish and wildlife (62-302 Florida Administrative Code). A 98% reduction is expected to result in the attainment of water quality standards.

The Stormwater NPDES MS4 Permit (FLS000004-004) requires the development of a Bacterial Pollution Control Plan (BPCP) to identify sources and adopt activities to reduce pollution. At a minimum, the plan must include

a. Source identification
b. Bacterial source tracking
c. Pet waste ordinance
d. Schedule for additional BMP implementation
e. Annual reporting on structural and non-structural BMP implementation and load reductions.

The permit is available at: http://www.sarasota.wateratlas.usf.edu/upload/documents/Sarasota-County-2014-MS4-Permit.pdf. Compliance with the requirements for source identification, source tracking and a pet waste ordinance are already detailed in this report and progress reports will be included with future annual reports.

SCHEDULE FOR BMP IMPLEMENTATION

Substantial improvements in wastewater management have been accomplished in the Phillippi Creek Basin using State funding, grant funds and Utility fees. Additional improvements are contingent upon securing additional funds which makes scheduling of improvements uncertain. It is the intention of Sarasota County and the City of Sarasota to continue to improve water quality in a cost-effective way. Over the next permit term implementation of additional BMPs and load reductions for each will be documented in each NPDES MS4 annual report.

1. Continue to expand modern, centralized wastewater treatment service for customers currently served by septic systems or small wastewater treatment facilities. Report annually on numbers of septic system customers, sewage treatment customers, and annual bacterial load reductions in the basin.
2. Continue to proactively maintain and repair the sewage collection system infrastructure.
3. Continue to regulate existing and new septic systems according to current legal standards.
4. Continue to implement spill response protocols that reduce the impact of accidental sewage spills and submit timely and accurate notices to the FDEP Public Notice of Pollution reporting system. Report annually on spill volumes, types and locations in the basin.
5. Continue to conduct ambient monitoring of water quality for bacteria. Report annually on compliance with water quality standards and bacterial concentration trends cumulatively in the basin and for each monitoring site. Make the data available to the public on the Sarasota Water Atlas website. Upload the data into the FDEP Watershed Information Network database in support of future assessments of impaired waters.
6. Investigate elevated levels of bacteria or increasing trends of bacteria concentration that are detected in the ambient monitoring program. Locate and eliminate illicit sources of bacteria pollution that are identified by the investigation.

7. Report on the results of the Microbial Source Tracking once it is completed. Investigate sources of bacteria identified by the study.
8. Explore opportunities to improve water quality in cooperation with large publicly-owned parcels such as the Bobby Jones Golf Club, the Celery Fields Regional Stormwater Facility, Red Bug Slough Preserve or other properties.
9. Explore opportunities to improve water quality through smaller projects using the Neighborhood Environmental Stewardship Team Coordinator. More information is at: http://www.sarasota.wateratlas.usf.edu/nest/#nest-home
10. Continue to conduct public outreach about responsible pet waste management, septic system maintenance, and homeowner responsibilities for customers of sewage treatment services.
11. Report on water quality projects and load reductions on the Sarasota Water Atlas Project Catalog pages located at http://www.sarasota.wateratlas.usf.edu/projects-catalog/# and add the projects and load reductions to the SIMPLE-Monthly pollutant loading model used for NPDES MS4 reporting as required for the third year of the permit term.