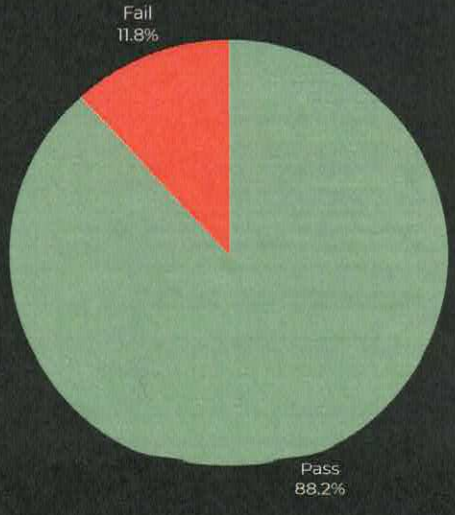
Swim Where It's Monitored

MOBILE BAYKEEPER 2023 SWIM REPORT

sponsored by: Town of Magnolia Springs

prepared by Mobile Baykeeper

Mobile Baykeeper exists to defend and revive the health of the waters of Coastal Alabama. One way we accomplish this is through bacteriological monitoring at several locations in Mobile and Baldwin counties and reporting our findings to the public. This document reports the data collected by the Mobile Baykeeper team at the **Magnolia River - "Bemis Bay" site.**



MOBILE BAYKEEPER®

INTRODUCTION

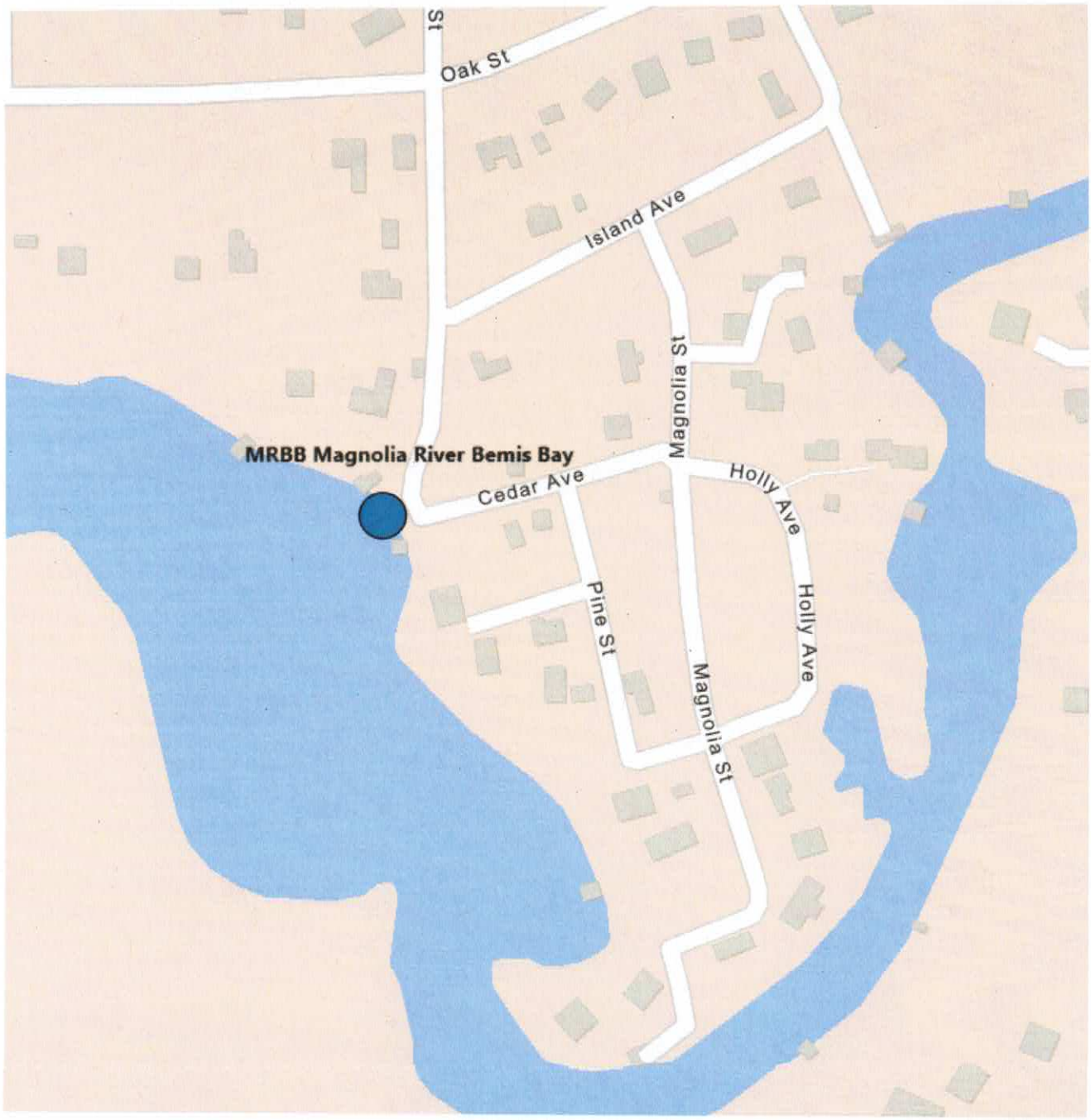
Purpose of the SWIM Program

The SWIM (Swim Where It's Monitored) Program's primary focus is to conduct bacteriological testing and report results of that testing to the public. Samples are tested for *Enterococcus* and *E. coli*. These bacteria are indicators of fecal pollution and pathogens. *Enterococcus* is the best indicator in saltwater systems while *E. coli* is the best indicator in freshwater systems. Mobile Bay was tested for *Enterococcus* because it is an area where saltwater and freshwater mix, also known as an estuary. Mobile Baykeeper's goal is to help citizens protect their health and that of their families by allowing them to make informed decisions on where to swim and play in the Mobile Bay Watershed. Mobile Baykeeper tests weekly from April 1st through September 30th, and monthly from October 1st through March 31st. Results are uploaded to our website and the SWIM guide app for Apple and Android smartphones.

Watershed Characteristics

The Magnolia River is a coastal river located in southwestern Baldwin County. The Magnolia River basin covers approximately 26,000 acres. The Magnolia River watershed drains 41 square miles to Weeks Bay, eventually emptying into Mobile Bay. The major tributaries draining into the watershed include Eslava Branch, Weeks Creek, Schoolhouse Branch and Noltie Creek. Most of its land use and land cover is categorized as agriculture and forests. In 2009, The Alabama Department of Environmental Management (ADEM) listed Magnolia River as an Outstanding Alabama Water, characterizing it as a high-quality water that constitutes an outstanding Alabama resource. This designation requires sewage treatment facilities to uphold higher standards of treatment and testing before discharging into the river. It also bans the direct discharge of pollutants.

SITE MAP



The testing site in Magnolia River at "Bemis Bay" is located near the blue circle.

Methods

Samples from Bemis Bay at Magnolia River were collected by Mobile Baykeeper to test for Enterococcus bacteria. Each sample was taken directly from the waterbody at the site following Mobile Baykeeper bacteriological standard operating procedures. The team tested for and quantified Enterococcus spp. using IDEXX's Enterolert test kit procedure, a procedure approved by the Environmental Protection Agency (EPA) for detection of Enterococcus. Samples were diluted 10x, which allows for a larger range of results and a more accurate representation of the approximate concentration of Enterococcus existing in each waterbody. After a 24-hour incubation period, results were quantified by reading a sealed well-tray under UV light (365 nm) to record the number of fluorescent wells. A standardized calculation is used to approximate the total most probable number of colony forming units in a 100 mL sample.

ADEM Data

The Alabama Department of Environmental Management (ADEM)'s "Water Use Classification" categorizes Mobile Bay as "Swimming", "Fish and Wildlife" and "Shellfish Harvesting". These classifications mean that protective standards for these waterbodies should allow for people to swim safely, and the water quality is suitable for fishing and the survival of wildlife. Water Quality Standards set for "Swimming" waters identify the acceptable ranges of water quality parameters. A table of standards applicable is below (Table 1).

ADEM Standards for Swimming Waters	
Temperature	< 90°
pH	6.0 - 8.5 s.u. (standard unit)
Dissolved Oxygen	> 4.0 - 5.0 mg/L
Enterococci	< 104 MPN / 100 mL (most probable number per 100 mL) geometric mean
Turbidity	< 50 NTU (nephelometric turbidity units) above background

Table 1. ADEM Water Quality Standards for Swimming waters in Mobile Bay watershed

Federal standards of Enterococcus for designated swimming waters are determined by the EPA to be 104 most probable number (MPN) colony forming units (CFU) of Enterococcus per 100 mL of water. At this level it is estimated that approximately 3% of healthy adult swimmers will become ill. These rates may be higher for children, pregnant women, the elderly, or those with weakened immune systems.

Mobile Baykeeper Data

Testing of Magnolia River waters at "Bemis Bay" has consistently shown low bacteria levels during both dry and wet weather (Table 2). 34 samples were collected during the SWIM season from April 2023 to September 2023. Of these samples, 4 resulted in being above the EPA threshold for safe swimming (Figure 1). The average Enterococcus level was 59.32 MPN/100 mL. The maximum Enterococcus level that was recorded was 253 MPN/100 mL. Unsafe swimming condition advisories were issued anytime the site tested above the EPA threshold initially and when resampled the next day.

Below EPA Threshold	Over EPA Threshold	% of passing	# of failing	# of times sampled
30	4	88.20%	11.80%	34

Table 2. Summary of Magnolia River at Bemis Bay Enterococcus sampling results

As stated before, the EPA threshold for safe swimming for Enterococcus is 104 MPN CFU Enterococcus per 100mL of water. Figure 1 shows this threshold compared to the sample results collected from April 2023 to September 2023.

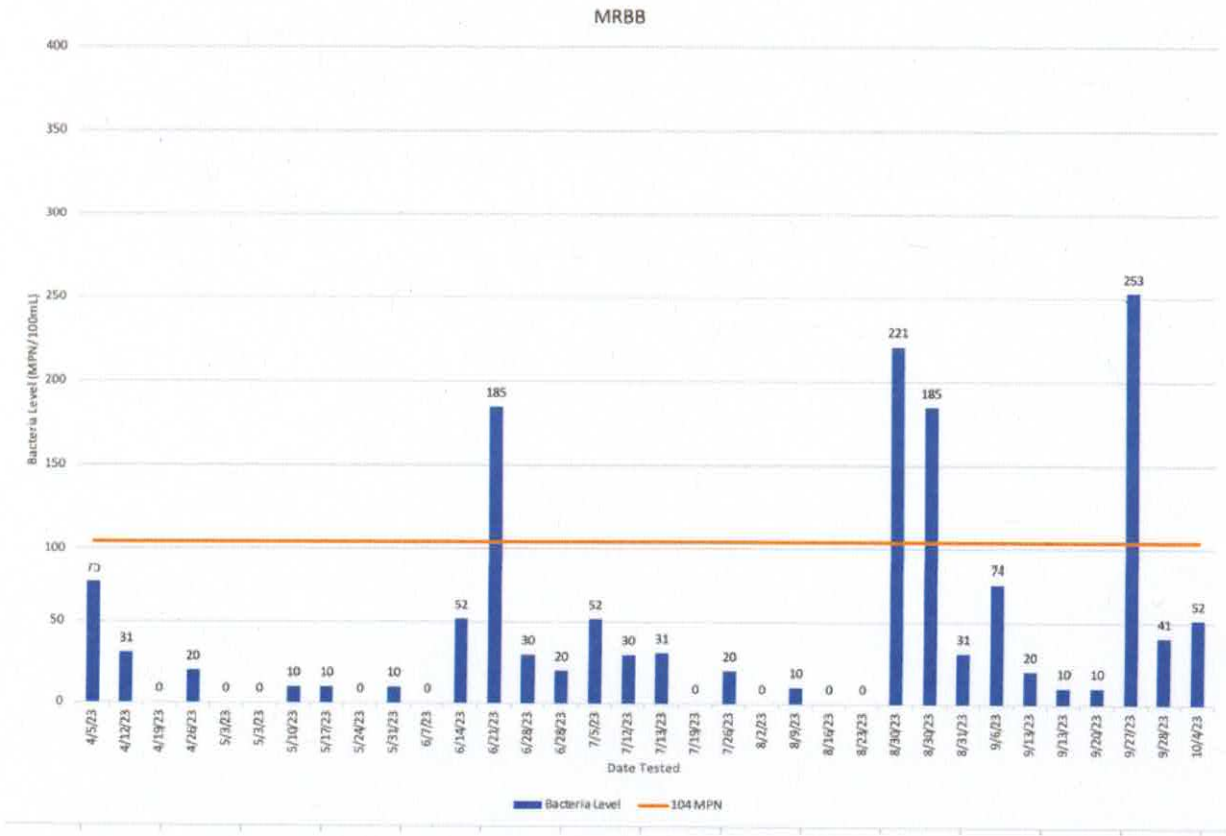


Figure 2 lists the dates sampled and the resulting *Enterococcus* levels. Green cells correspond to results below the EPA threshold, yellow cells correspond to an intermediate level above the threshold, but below 501 MPN, and red cells correspond to a high level above 501 MPN.

Date	MPN Enterococcus
4/5/2023	75
4/12/2023	31
4/19/2023	<10
4/26/2023	20
5/3/2023	<10
5/3/2023	<10
5/10/2023	10
5/17/2023	10
5/24/2023	<10
5/31/2023	10
6/7/2023	<10
6/14/2023	52
6/21/2023	185
6/28/2023	30
6/28/2023	20
7/5/2023	52
7/12/2023	30
7/13/2023	31
7/19/2023	<10
7/26/2023	20
8/2/2023	<10
8/9/2023	10
8/16/2023	<10
8/23/2023	<10
8/30/2023	221
8/30/2023	185
8/31/2023	31
9/6/2023	74
9/13/2023	20
9/13/2023	10
9/20/2023	10
9/27/2023	253
9/28/2023	41
10/4/2023	52

Mobile Baykeeper Data

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By continuing your sponsorship of SWIM testing in Magnolia River at "Bemis Bay", you are protecting the beauty, health, and heritage of the Mobile Bay Watershed and our coastal communities. Thank you for your continued support.

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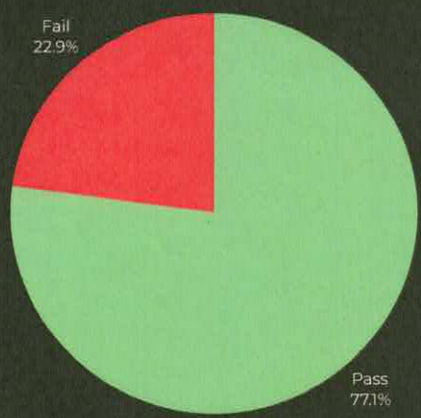

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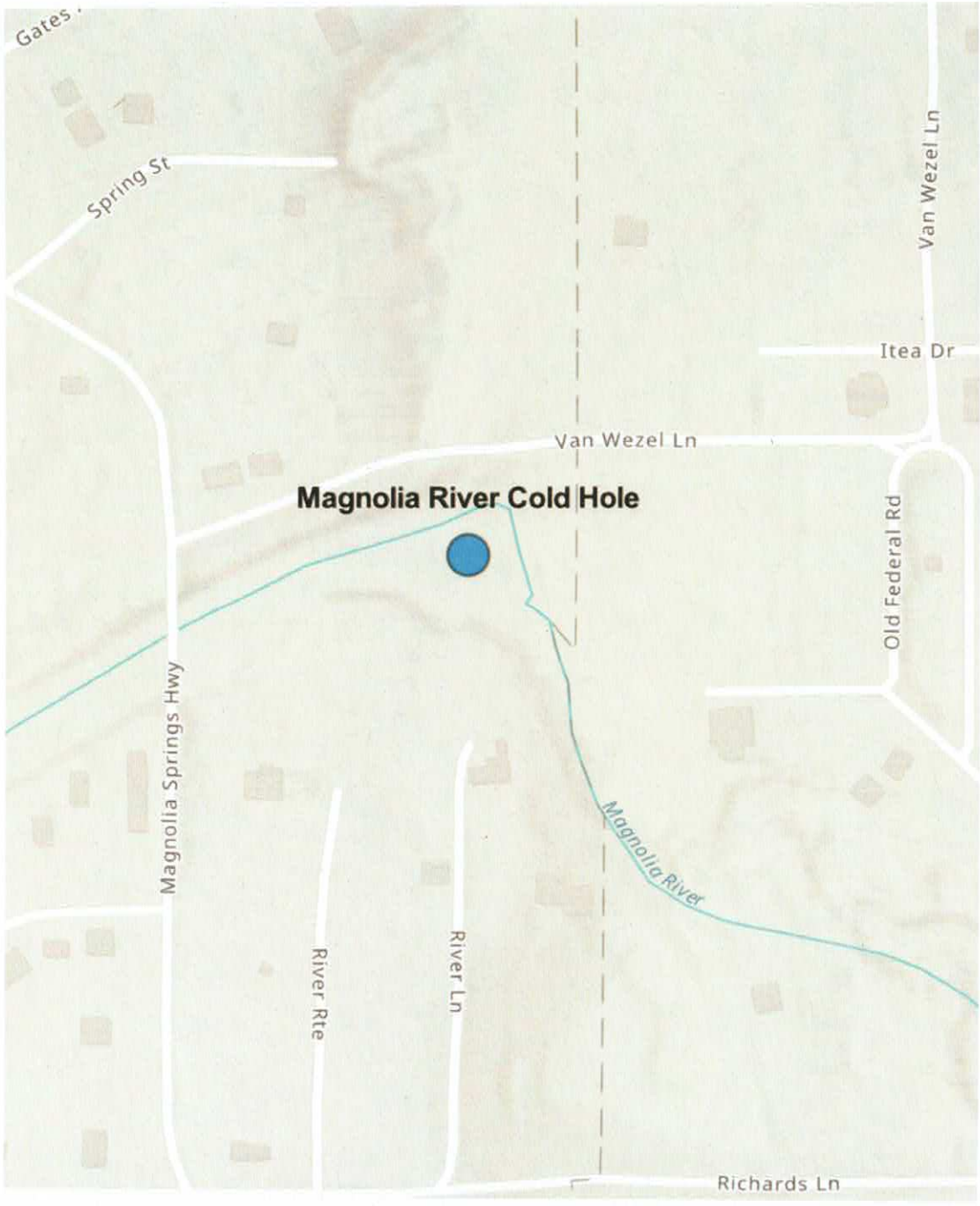

The testing site in Magnolia River at "Cold Hole" is located near the blue circle.

Methods

Samples from "Cold Hole" at Magnolia River were collected by Mobile Baykeeper to test for Enterococcus bacteria. Each sample was taken directly from the waterbody at the site following Mobile Baykeeper Bacteriological standard operating procedures. The team tested for and quantified Enterococcus spp. using IDEXX's Enterolert test kit procedure, a test approved by the Environmental Protection Agency (EPA) for detection of Enterococcus. Samples were diluted 10x, which allows for a larger range of results and a more accurate representation of the actual concentration of Enterococcus existing in each waterbody. After a 24-hour incubation period, results were quantified by reading a sealed well-tray under UV light (365 nm) to record the number of fluorescent wells. A standardized calculation is used to approximate the total most probable number of colony forming units in a 100 mL sample.

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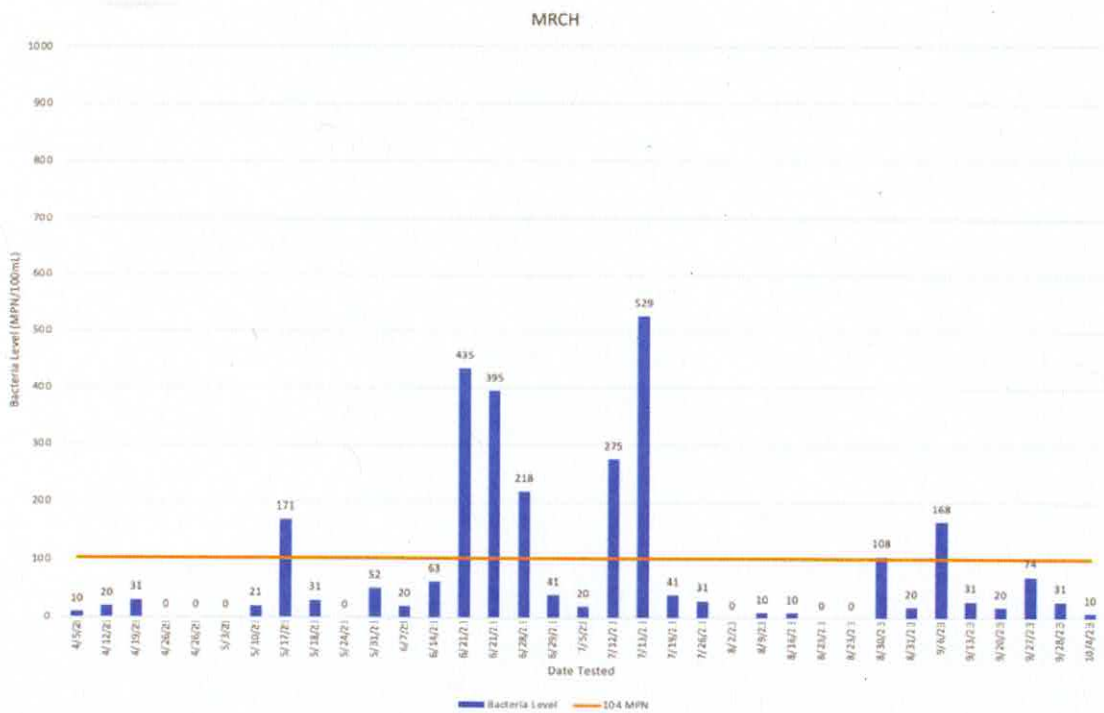
Mobile Baykeeper Data

Testing of Mobile Bay waters at "It'll Do" has consistently shown low bacteria levels (Table 2). 35 samples were collected during the SWIM season from April 2023 to September 2023. Of these samples, 8 resulted in being above the EPA threshold for safe swimming. The average Enterococcus level was 103 MPN/100 mL. The maximum Enterococcus level that was recorded was 529 MPN/100 mL. Unsafe swimming condition advisories were issued anytime the site tested above the EPA threshold initially and when resampled the next day.

Below EPA Threshold	Over EPA Threshold	% of passing	# of failing	# of times sampled
27	8	77.10%	22.90%	35

Table 2. Summary of Magnolia River at Cold Hole Enterococcus sampling results

As stated before, the EPA threshold for safe swimming for Enterococcus is 104 MPN CFU Enterococcus per 100mL of water. Figure 1 shows this threshold compared to the sample results collected from April 2023 to September 2023.



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4/12/2023	20
4/19/2023	31
4/26/2023	<10
4/26/2023	<10
5/3/2023	<10
5/10/2023	21
5/17/2023	171
5/18/2023	31
5/24/2023	<10
5/31/2023	52
6/7/2023	20
6/14/2023	63
6/21/2023	435
6/21/2023	395
6/28/2023	218
6/29/2023	41
7/5/2023	20
7/12/2023	275
7/13/2023	529
7/19/2023	41
7/26/2023	31
8/2/2023	<10
8/9/2023	10
8/16/2023	10
8/23/2023	<10
8/23/2023	<10
8/30/2023	108
8/31/2023	20
9/6/2023	168
9/13/2023	31
9/20/2023	20
9/27/2023	74
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