

Water Quality Testing Results June 2020 Facilitated by the SLS Lab

The Nature Foundation confirmed and retested the concerning results mentioned in the 'Water Quality Testing report' (from the period February-April 2020) with the generous support of St. Maarten Laboratory Services. The beaches of Great Bay and Kim Sha beach were tested and retested respectively, 3 samples were taken from Kim Sha Beach and 4 samples were taken from Great Bay beach. Each sample was tested one for the specific bacterium called Enterococcus ssp. This bacterium is a sub-group within the fecal streptococcus group of bacteria, fecal streptococcus generally occurs in the digestive system of humans and other warm-blooded animals, moreover this bacterium can survive in saltwater which makes it an ideal indicator to research fecal contamination in marine waters. In figure 1 and 2 the sample locations for the water quality tests are shown for Kim Sha Beach and Great Bay Beach, conducted on the 22nd of June 2020.



Figure 1. locations of samples taken for testing fecal contamination on Great Bay beach on the 22nd of June 2020.



Figure 2. locations of samples taken for testing fecal contamination on Kim Sha beach on the 22nd of June 2020.

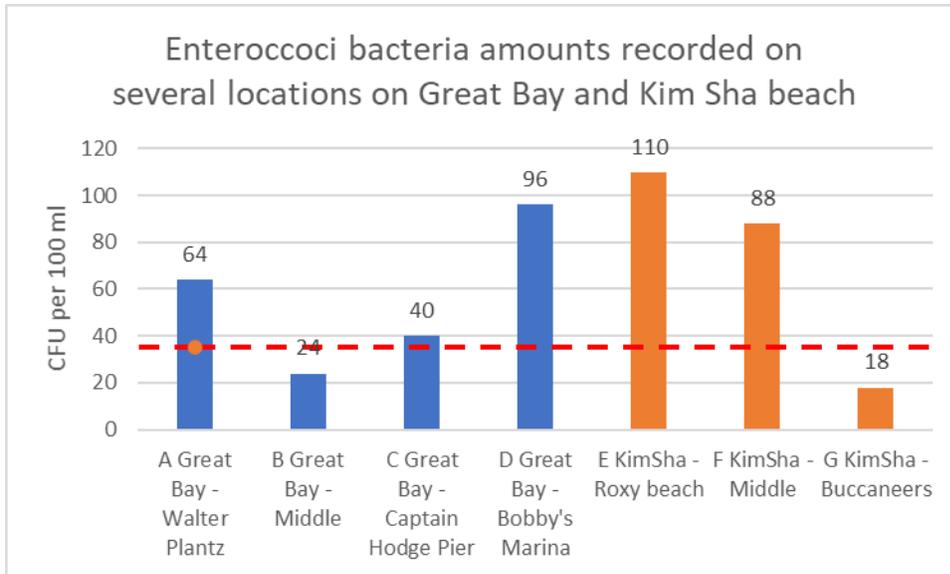
This rapid report follows the recommended standards by the EPA include the norm or threshold of 35 CFU (Colony Forming Unit) Enterococci bacteria per 100 ml, if a sample of water surpasses the specific bacterial count, it is considered contaminated by fecal matter. Table 1 shows the water testing results received from the SLS lab for each collected sample (corresponding with the locations shown in figure 1 and 2). This rapid report will hereby focus on the last column in table, which shows the Enterococci bacterial colony forming units per 100ml for each sample.

Table 1. Shows the results of the water quality testing performed per sample on the 22nd of June received from the SLS lab. Sample names correspond with the sample locations shown in figure 1 and 2.

DESCRIPTION	Accession	BOD	COD	Total Nitrogen	Total Phosphorus	Total Coliform	E. coli	pH	Conductivity	Enterococci
		EPA	EPA	EPA	USEPA	Iso:9308	epa	epa	epa	
Method >		BOD-5	410.4	351.1	365.3	2000	8156	8156	8160	7899-2
Reference Value >		<30	<150	<5	<1	<200	<200			
Unit of Measure >		ppm	ppm	ppm	ppm	CFU/100ml	CFU/100ml		µS/cm	CFU/100ml
Sample A	200622203	28	187	13.7	<1	4	4	8.06	55800	64
Sample B	200622204	42	179	12.3	<1	0	0	8.11	56400	24
Sample C	200622205	23	185	11.2	<1	1	1	8.16	56200	40
Sample D	200622206	29	179	12.1	<1	3	3	8.12	55600	96
Sample E	200622207	18	188	11.8	<1	8	8	8.10	56700	110
Sample F	200622208	24	181	13.1	<1	28	28	8.17	56700	88
Sample G	200622209	21	181	14.5	<1	50	50	8.14	56100	18

Graph 1 shows the water quality test results for the enterococci bacteria per sample and their location, made based on the SLS lab results (table 1). Figure 3 and 4 show a map overview with the average levels found on the two beaches (figure 3) and a more specific map showing the bacteria levels found on the different locations on the beaches (figure 4).

Kim Sha beach showed again bacteria values above the 35 CFU norm (on average 72 CFU) with the strongest contamination located in front of Roxy Beach Bar (110 CFU). In the middle of the beach a fecal contamination of 88 CFU was recorded, however close to Buccaneer Beach bar levels of the enterococci bacteria was low (18 CFU). Also, Great Bay showed an average of bacteria counts above the norm (on average 56 CFU) with strongest contamination close to Bobby’s Marina (96 CFU). Besides, two other collection points on Great Bay showed fecal contamination of 64 CFU by Walter Plantz and 40 CFU close to Captain Hodge Pier.



Graph 1. Showing the enterococci bacteria recorded in CFU per 100 ml for the individual samples taken on Great bay and Kim Sha beach on the 22nd of June 2020. Each bar represents one measurement from each sample, location names are included corresponding with sample location shown in figure 1 and 2 (samples A until G). The threshold recommended by the EPA is represented by the dashed red line at 35 CFU of Enterococci spp. per 100 ml.

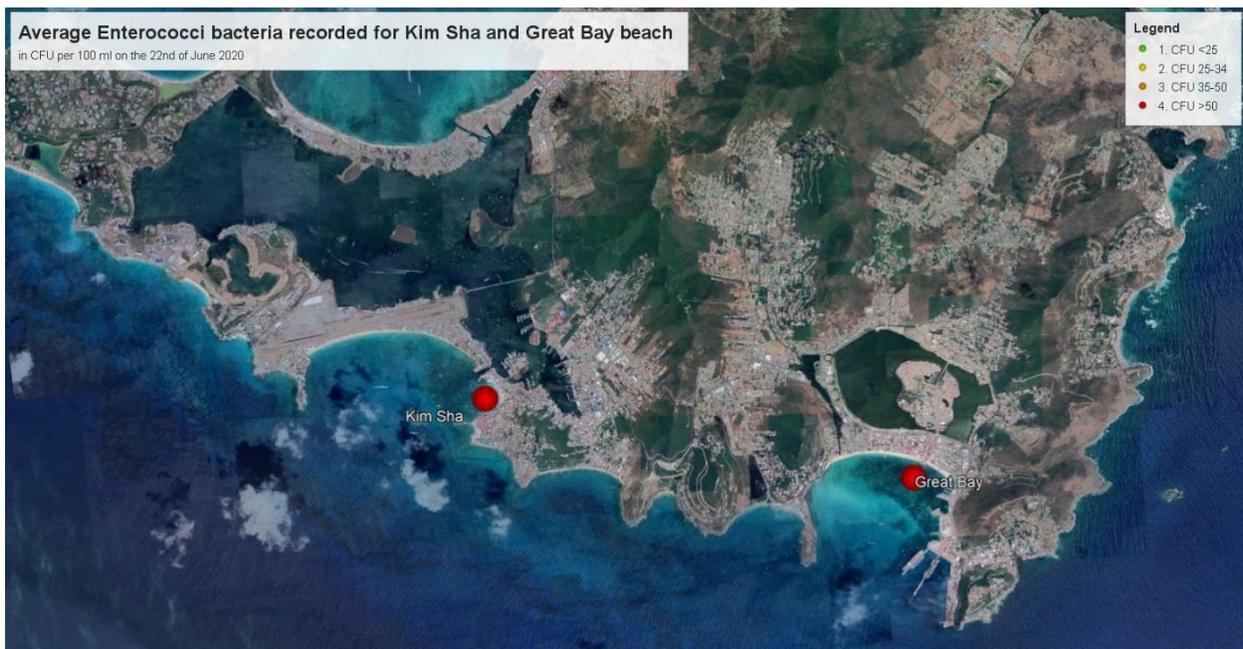


Figure 3. Map view of the average Enterococci bacteria levels recorded for Kim Sha and Great Bay beach, samples were taken on the 22nd of June 2020 and analyzed by the SLS lab. Enterococci bacteria amounts are shown in CFU (Colony Forming Units) per 100 ml. Red circles indicate strong fecal contamination with more than 50 CFU counted on that beach section, orange circles represent medium contamination in between 35-50 CFU counted, yellow circles are below the recommended threshold of 35 CFU up to 25 CFU however still close to contamination, green circles represent beach sections where low levels were recorded lower than 25 CFU and considered not to be fecal contaminated.



Figure 4. Shows the results mapped of the Enterococci bacteria levels per sample recorded for Kim Sha and Great Bay beach, samples were taken on the 22nd of June 2020 and analyzed by the SLS lab. Enterococci bacteria amounts are shown in CFU (Colony Forming Units) per 100 ml. Red circles indicate strong fecal contamination with more than 50 CFU counted on that beach section, orange circles represent medium contamination in between 35-50 CFU counted, yellow circles are below the recommended threshold of 35 CFU up to 25 CFU however still close to contamination, green circles represent beach sections where low levels were recorded lower than 25 CFU and considered not to be fecal contaminated.

Based on these results and the 'Water Quality Testing Report', Kim Sha beach shows continuous similar results, demonstrating the beach to be contaminated by fecal matter, and the contamination is considered to be high on most sample locations on this beach. Best on the results from the SLA lab, Great Bay is also considered to be fecal contaminated, as the average (including 3 of the 4 sample locations) test above the threshold of 35 CFU.

The fecal contamination is worrisome especially at Kim Sha beach and surroundings, but also at Great Bay beach. Swimming on these beaches is not advised due to the health issue which could occur, the government should warn the public. The Nature Foundation recommends the government to urgently improve the water quality at these beaches by enforcing the management of wastewater on the island. Please see the 'Water Quality Testing Research Report' for additional recommendations and conclusions.

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