

LEBANON
 DAOURA/BOURJ HAMMOUD WASTEWATER TREATMENT PLANT
 FEASIBILITY STUDY
 ESIA Scoping Report and Stakeholder Engagement Plan

Table 5-5: Concentrations of phosphates, nitrogen, nitrate, silicate, chlorophyll a and Pheopigments at Bourj Hammoud sampling locations between August and December 2019

	Depth (m)	Phosphates (umol/L)		Nitrates (umol/L)		Nitrites (umol/L)		Silicates (umol/L)	Chlorophyll a (ug/L)		Pheopigments (ug/L)	
		Aug 19	Oct 19	Aug 19	Nov 19	Aug 19	Nov 19		Aug 19	Sep 19	Aug 19	Sep 19
DORA - 10a	0-0.05	0.088	9.812	0.491	3.131	0.081	0.687	-	0.53	0.19	0.28	0.21
DORA- 30a	0-0.05	0.083	3.012	4.656	3.262	0.051	0.475	-	0.29	0.18	0.22	0.38
DORA- 100a	0-0.05	0.079	0.103	0.438	0.192	0.059	0.079	0.57	0.35	0.57	0.21	0.23
DORA - 100b	40	0.034	0.024	0.459	0.115	0.032	0.042	1.28	-	0.08	-	0.04
DORA- 30c	20	0.069	0.044	0.434	0.097	0.038	0.044	2.49	0.26	0.12	0.13	0.05
DORA- 100c	100	0.059	0.053	0.905	0.509	0.162	0.110	-	0.08	0.01	0.05	0.01

Moreover, the National Centre for Marine Sciences (NCMS) at CNRS has recently released the results of the annual marine surveys of 31 locations from the Lebanese coast. Two surveyed locations were the nearest to the proposed WWTP. One location is below Manara in Beirut (Sample 1: 33.90051°N and 35.47038°E) and the other is between the fishermen’s harbor and Riviera (Sample 2: 33.90200°N and 35.47530°E). The samples were tested for Fecal Streptococci/100ml and Fecal Coliforms/100ml. The locations of sampling (Sample 1 and 2) undertaken by the NCMS are shown in Figure 5-23.

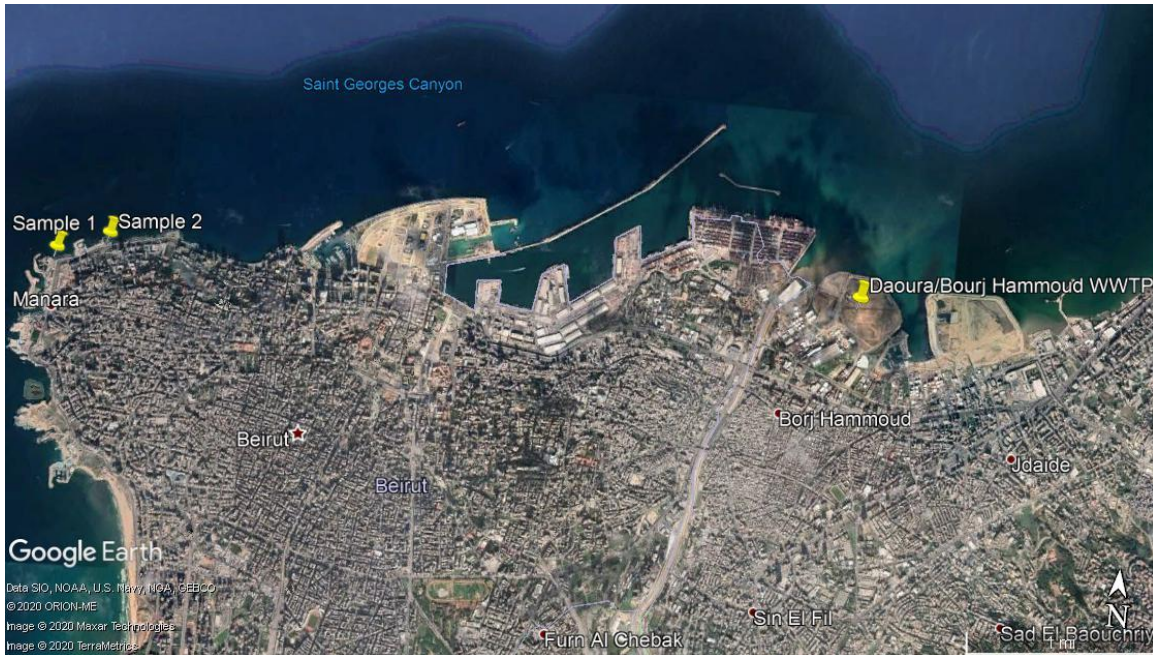


Figure 5-23: The Nearest sampled Locations to the WWTP undertaken by the NCMS in Reference to the proposed WWTP

Table 5-6 shows the results of the two surveyed locations mentioned above. Sample 1 showed high levels of Fecal Streptococci and Fecal Coliforms that were 3,200 and 3,000 per 100 ml respectively. According to the study, the surveyed area is very polluted and not adequate for swimming. However, Sample 2 has showed lower levels of Fecal Streptococci and Fecal (105 and 116 per 100 ml respectively) showing that this location is not polluted hence suitable for swimming.

Table 5-6: Levels of Fecal Streptococci and Fecal Coliforms per 100ml from the Nearest Surveyed Areas to the WWTP Location

Tested Indicators	Sample 1	Sample 2
Fecal Streptococci/100ml	3,200	105
Fecal Coliforms/100ml	3,000	116

In order to obtain additional information for the ESIA, the Consultant will continue to review collected studies undertaken by international organizations and government entities. The Consultant will also ask the Municipality of Bourj Hammoud about their water resources and any other potential pollution hotspots. It is common in Lebanon for wastewater to end up in surface and groundwater resources in areas with no or deteriorated wastewater infrastructure. The Consultant will then be able to determine the extent of the pollution in the study area using the available data from the literature and collected during the ESIA study. Samples of groundwater within the catchment area, sea water and onshore sea sand and sediments will be collected for testing. The parameters to be tested are pH, TSS, BOD, COD,

TN, TP, total and faecal coliforms and heavy metals and will be used to validate and complement existing information. The table below represents the sampling plan for these tests.

Table 5-7: Water and Sediment Sampling Plan

Sample Type		Sample Location	Study Area
Water	Sea water	<ul style="list-style-type: none"> - At Beirut River discharge point - Near emergency overflow pipe - Near outfall pipe 	Core Area of Influence
	Groundwater	<ul style="list-style-type: none"> - Existing onsite well (figure 17) - Existing wells in Bourj Hammoud (from a building) 	<ul style="list-style-type: none"> - Core Area of Influence - General Area of Influence
Sand and Sediment	Sediments	<ul style="list-style-type: none"> - Near the proposed project site - Near Beirut River discharge point 	Core Area of Influence



Figure 5-24: Onsite Well

There are currently no discharges from the existing outfall pipeline.