



NPDES Compliance Sampling Inspection Report

Mangrove Lagoon WWTF
#1A Estate Bovoni
St. Thomas, USVI 00802

NPDES/TPDES #: VI0002003

Inspection Dates: November 01-02, 2021

Report Prepared by:

THUAN TRAN Digitally signed by THUAN TRAN
Date: 2021.12.03 08:38:55 -05'00'

Thuan Tran; Physical Scientist

Date: _____

Report Approved by:

PHILIP COCUZZA Digitally signed by PHILIP
COCUZZA
Date: 2021.12.03 04:56:26 -05'00'

Phil Cocuzza, Chief
Monitoring Operations Section

Date: _____

1.0 OBJECTIVE

On November 01-02, 2021, at the request of Jaime Geliga of the Caribbean Environmental Protection Division (CEPD), the United States Environmental Protection Agency (USEPA) conducted a National Pollutant Discharge Elimination System (NPDES)/Territorial Pollutant Discharge Elimination System (TPDES) Compliance Sampling Inspection (CSI) at the Mangrove Lagoon Wastewater Treatment Facility located on #1A Estate Bovoni in St. Thomas, United States Virgin Island, 00802. The objective of the CSI was to gather information necessary to determine if the facility is in compliance with the requirements and limitations of their NPDES/TPDES permit, VI0002003.

2.0 KEY PARTICIPANTS

Listed below are key inspection participants and contact information, grouped by organization.

U.S. Environmental Protection Agency

Thuan Tran; Physical Scientist, Lead Inspector
732-321-4455 and tran.thuan@epa.gov
Robert Morrell, Geologist

Mangrove Lagoon Wastewater Treatment Facility

DeShaun Estrill, Chief Plant Operator
destrill@viwma.org
Marcella Jennings, Laboratory Coordinator/Technician
mjennings@viwma.org

3.0 FACILITY DESCRIPTION

3.1 General Information

Mangrove Lagoon Wastewater Treatment Facility (WWTF) is located on #1A Estate Bovoni in St. Thomas, USVI and began operations approximately in 2000 with EPA construction grant funds. The facility is operated and maintained by the Virgin Islands Waste Management Authority (VIWMA). Mangrove Lagoon WWTF has a designed capacity to treat 1.2 million gallons per day (MGD) of wastewater through three separate Sequential Batch Reactors (SBRs) and is categorized under Standard Industrial Classification (SIC) 4952 - Sewerage Systems and/or North American Industry Classification System (NAICS) 221320 – Sewage Treatment Facilities. Mangrove Lagoon WWTF employs 4 personnel; one Laboratory Technician, one Operation and Maintenance Technician, and two Wastewater Operators, and operates 8-hour per day, Monday-thru-Friday from 7:00AM to 3:00PM. The wastewater treatment facility serves the Towns of Old Tutu and New Tutu, Anna's Retreat, Turpentine Run Road, and the Towns of Nadir and Bovoni. Wastewater collected in the sewer collection system is directed to the treatment plant with the assistance of the Nadir and Bovoni Pump Stations. The two pump stations are power by the Water and Power Authority (WAPA) and are backed-up by generators. Mangrove Lagoon WWTF also receives wastewater from septic haulers.

Major operating equipment were observed out-of-service during the inspection. These equipment consist of the mechanical bar screen, the influent and effluent refrigerated automatic composite samplers, the influent and effluent flow measuring devices, the grit removal system, the process control monitoring devices (such as sensors for pH, DO, Temperature, etc...) in the Sequential Batch Reactors (SBRs), and the ultraviolet disinfection system.

3.2 Process Information

Incoming wastewater from the surrounding neighborhoods is pumped to the treatment plant and is intercepted by the mechanical bar screen. Rags and large matters are manually removed from the waste stream and are collected in 5-gallon buckets. The wastewater continues through the bar screen to the influent monitoring location, followed by the influent Parshall Flume with an ultrasonic flow sensor where incoming flow is recorded. The wastewater continues along the influent channel to the grit removal system before it is manually directed to one of the three Sequential Batch Reactors (SBRs). The entire sequential batch reaction process takes approximately 8 hours. The process starts with the Filling and Aerating Phase. The Filling and Aeration Phase takes approximately 4 hours in which the SBR chamber is filled to the designated level while light aeration is provided to homogenize the wastewater. Once filling stops, additional air is introduced in the Reaction Phase which takes about 1.5 hours to allow biological activity to consume, remove, and/or convert pollutants from the wastewater. After 1.5 hours, air is shut-off to begin the Settling Phase. The Mixed Liquor Suspended Solids (MLSS) undergoes phase separation for about 2 hours. After phase separation, the clear liquid is decanted from the SBRs for about 1.5 hours long. The decant exits the SBRs process to the effluent channel. The effluent is disinfected by the Ultraviolet (UV) Disinfection System. Once pathogens and viruses are disinfected, the effluent is contained in an effluent holding tank. From the holding tank, the effluent is pumped approximately 2-3 miles and discharges into Stalley Bay via Outfall 001.

After decanting, a fraction of the settled sludge from the SBRs is pumped twice per week for 2 hours to the sludge digesters that also receives septage from septic haulers. The digested sludge is pumped onto the belt filter press when it is mixed with a polymer to increase solid content. The sludge cake from the belt filter press is disposed of at Bovoni Landfill. The filtrate from the belt filter press and the supernatant from the sludge digester are pumped to the influent channel.

3.3 Facility Self-Monitoring Information

Mangrove Lagoon WWTF operators are responsible for collecting all permit compliance samples. On-site compliance samples are collected and analyzed by the plant operator for pH, Dissolved Oxygen (DO), Temperature, and Total Residual Chlorine (TRC). All other samples are analyzed by the in-house laboratory for 5-Day Biochemical Oxygen Demand

(BOD₅), Total Suspended Solids (TSS), Fecal Coliforms, Enterococci, Phosphorus, Turbidity, and Oil & Grease (O&G).

Mrs. Marcella Jennings, Laboratory Coordinator/Technician, provides the plant operator unpreserved containers to collect the samples for BOD₅, TSS, and turbidity at the designated monitoring locations in the treatment plant. The chief plant operator collects compliance samples for fecal coliforms, enterococci and phosphorus in Stalley Bay by boat.

4.0 EPA SAMPLING/INSPECTION ACTIVITIES

4.1 Sampling Activities

An ISCO automatic composite sampler was programmed to take 96 sample aliquots during the 24-hour sampling event from the effluent monitoring location. The 24-hour composite sample was collected and analyzed for 5-Day Biochemical Oxygen Demand (BOD₅) and Total Suspended Solids (TSS). Grab samples were collected from the designated "Effluent Grab Sampling Point" for Phosphorus, Oil & Grease (O&G), Turbidity, Fecal Coliforms and Enterococci.

On-site grab samples were collected and analyzed for pH, Temperature, Dissolved Oxygen (DO), and Total Residual Chlorine (TRC).

In addition, an ISCO automatic composite sampler was programmed to take 96 sample aliquots during the 24-hour sampling event from the influent monitoring location. The 24-hour composite sample was collected and analyzed for BOD₅ and TSS.

All sample containers, preservation techniques and holding times were in accordance with USEPA requirements specified in 40 CFR Part 136. Signed and dated custody seals were placed across the lids and along the sides of the sample containers. The custody sealed sample containers were placed inside plastic sample bags and sealed up. All samples were transported on ice by United Parcel Services (UPS) to the USEPA Laboratory in Edison, New Jersey for analysis, except for Fecal Coliform and Enterococcus. These analytes were contracted to Ocean Systems Laboratory on St. Thomas, USVI, due to the short holding time. Chain-of-custodies were maintained for all samples. EPA Laboratory Analytical Data and Ocean Systems Laboratory Analytical Data are attached.

Effluent flow monitoring data were not obtained from Mangrove Lagoon WWTF instrumentation because they are out-of-service. The last calibration of the flow monitoring instrumentation is unknown. The flow data obtained for this sampling inspection was an estimate from the plant operator.

Split samples were collected and given to the facility representative. The only exception were the samples for fecal coliforms and enterococci.

4.2 Inspection Activities

A NPDES/TPDES Compliance Sampling Inspection (CSI) at Mangrove Lagoon Wastewater Treatment Facility (WWTF) was conducted on November 01-02, 2021. The inspectors met with Mr. DeShaun Estrill, Chief Plant Operator, and Mrs. Marcella Jennings; Laboratory Coordinator/Technician. Inspector’s credentials were presented, and business cards were provided to the facility representatives. The facility representatives were aware of the inspection but were explained that the inspection purpose with supporting on-site activities was to determine if the facility is in compliance with their NPDES/TPDES permit.

Supporting on-site activities consists of collecting samples from the influent and effluent monitoring locations, observing and evaluating the monitoring locations, observing and evaluating the flow monitoring equipment, observing and evaluating the facility’s sampling protocol, touring and evaluating the wastewater treatment units and operation, and interviewing the facility’s representatives.

The facility representatives were briefed on the inspection activities during the closing conference. On-site sample results and concerns discovered or observed during the inspection were communicated so that they understand their responsibilities to comply with the Federal and Territory Regulations; as well as, the Limitations, General and Specific Conditions, and the Requirements of their NPDES/TPDES permit.

4.3 Deviations and/or Environmental Conditions

The designated effluent composite monitoring location is after the UV System. It was observed that the sampling point was too close to the edge of the free-fall flow into the effluent holding tank. The facility sampling probe was observed suspending in the free-fall flow. A professional judgement was made to set the automatic composite sampler ahead of the UV System. Since the UV System is out-of-service, the facility set-up two (2) 5-gallon buckets of chlorine tablets in the effluent channel for disinfection; one in-front of the UV System and one after the UV System. No chlorine tablets were observed in the buckets when the operator lifted the buckets out of the effluent channel. The effluent was tested for chlorine and the result was determined to be 0.00 mg/l. Furthermore, the facility is collecting fecal coliforms, enterococci and phosphorus samples in Stalley Bay by boat. Samples for these analytes were collected at the designated “Effluent Grab Sampling Point” at the plant.

5.0 ANALYTICAL RESULTS

**Mangrove Lagoon Wastewater Treatment Facility
 Inspection Dates: November 01-02, 2021**

Parameter	Units	Permit Limit	EPA Result
Flow	MGD	1.2* (Daily Max.)	0.225 (estimated)
Flow	MGD	0.75 (Monthly Avg.)	0.225 (estimated)
BOD5	mg/L	</= 45 (Weekly Avg.)	67
BOD5	mg/L	</= 30 (Monthly Avg.)	67
% BOD5 Removal	%	>/= 85	88
TSS	mg/L	</= 45 (Weekly Avg.)	28
TSS	mg/L	</= 30 (Monthly Avg.)	28
% TSS Removal	%	>/= 85	85

Parameter	Units	Permit Limit	EPA Result
Phosphorus	mg/L	<=/= 0.05 (Daily Max.)	6.67
Fecal Coliform	#/100-ml	<=/= 70** (Monthly Avg.)	>6,000
Enterococci	#/100-ml	<=/= 104 (Daily Max.)	8,326 J
Enterococci	#/100-ml	<=/= 35** (Monthly Avg.)	8,326 J
Dissolved Oxygen	mg/L	>/= 5.5	R1: 0.0 mg/l R2: 0.0 mg/l
Temperature	°C	<=/= 32	31.5
pH	SU	<=/= 8.3 (Daily Max.)	7.49
pH	SU	>/= 7.0 (Minimum)	7.49
TRC***	mg/L	<=/= 0.013	Zero
O&G	mg/L	Non-Detect	U
Turbidity	NTU	<=/= 3	125

- Notes:** R1= 1st Run
 R2= 2nd Run
 U= The analyte was not detected at or above the Reporting Limit.
 J= Estimated concentration above the adjusted method detection limit and below the adjusted reporting from Ocean Systems Laboratory, St. Thomas, USVI, for Fecal Coliform and Enterococci.
 *= To determine any percent removal of BOD5, or TSs, the influent must be sampled after bar screen.
 **= Bacteria shall not exceed a geometric (log) mean of 70 fecal coliforms per 100 ml by MF or MPN count.
 ***= Residual Chlorine limit for recycled effluent is 2ppm. (Not in Use)

6.0 FINDINGS

6.1 Sampling Result Findings

Although Mangrove Lagoon Wastewater Treatment Facility permit expired on April 30, 2020, the facility is still required to continue operation within the discharge concentration limitations, general and specific conditions and sampling requirements of their permit as stipulated in 40 Code of Federal Regulations Part 122.6 (40 CFR Part 122.6) Continuation of Expiring Permits and USVI Title 12 – Chapter 7- Water Pollution Control § 184. [(V.I. Code tit. 12, § 184, (2019)] Permit System (e) Duration of Permits.

The EPA analytical results obtained during this inspection show the following parameter(s) as being outside of the acceptable limits:

6.1.1 According to the permit, phosphorus has a discharge concentration daily maximum limitation of 0.05 milligrams per liter (mg/l). The analytical result for phosphorus was determined to be 6.67 mg/l.

6.1.2 According to the permit, fecal coliform has a discharge concentration monthly average geometric (log) mean limitation of 70 fecal coliforms per 100 milliliters (#/100-ml). The geometric (log) mean of the 5 grab samples for fecal coliform was determined to be greater than 6,000 counts/100-ml.

6.1.3 According to the permit, enterococcus has a discharge concentration daily maximum limitation of 104 counts/100-ml and a monthly average geometric (log) mean limitation of 35 counts/100-ml. Although a qualifier accompanied the results, the geometric (log) mean of the 5 grab samples for enterococcus was determined to be 8,326 counts/100-ml.

6.1.4 According to the permit, the minimum discharge concentration limitation for Dissolved Oxygen (DO) is 5.5 mg/l. The analytical results for DO were determined to be 0.0 mg/l.

6.1.5 According to the permit, turbidity has a discharge concentration daily maximum limitation of 3 Nephelometric Turbidity Unit (NTU). The analytical result for turbidity was determined to be 125 NTU.

6.2 Inspection Findings

In addition to the sampling, an inspection of the facility operations was conducted as discussed in Section 4.2 above. During this inspection the following observations were noted which may contravene the requirements of the permit or the applicable regulations:

6.2.1 The mechanical bar screen, the influent and effluent refrigerated automatic composite samplers, the influent and effluent flow measuring devices, the grit removal system, the process control monitoring devices (such as pH, DO, Temperature, etc..) for the SBRs, and the ultraviolet disinfection system are important equipment/treatment operating units that are out-of-service. According to 40 CFR Part 122.41 (e) – Operation and Maintenance, It states, *“The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of backup or auxiliary facilities or similar systems which are installed by a permittee only when operation is necessary to achieve compliance with the conditions of the permit.”* Furthermore, under V.I. Code tit. 12, § 184 (2019) Power and Duties, *“The Department shall have and may exercise the following powers and duties:*

(g) To establish and operate appropriate devices, methods, systems and procedures necessary to monitor, collect, update and disseminate information relating to the quality of navigable waters and ground waters and to water pollution and the prevention, control and abatement thereof, and to submit such information in the required form, to the Administrator of the United States Environmental Protection Agency in accordance with section 305(b) of the Federal Water Pollution Control Act, as amended;

(o) To require proper maintenance and operation of disposal systems.”

6.2.2 Total Suspended Solids (TSS) and 5-Day Biochemical Oxygen Demand (BOD₅) are collected as grab samples from the influent and effluent monitoring locations because the refrigerated automatic composite samplers are out-of-service. Under “*Sample Type*” column of “*A. REQUIRED EFFLUENT LIMITATIONS – TABLE I Outfall Serial Number 001*” of the

permit, TSS and BOD₅ are required to be collected as “24-hour composite” samples. Furthermore, 40 CFR Part 122.41(j)(1) states, “*Monitoring and Records; Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity.*” In addition, V.I. Code tit. 12, § 189 (2019) - Monitoring, Recording and Reporting, it states, “*The Commissioner may by regulation, order, permit or otherwise, require the owner or operator of any source of a discharge of pollutants or of any source which is an industrial user or publicly owned treatment works to:*

(4) sample such discharges (in accordance with such methods at such locations, at such intervals, in such manner as the Commissioner shall prescribe); and”

6.2.3 The facility is collecting samples for fecal coliforms, enterococci, and phosphorus at the surface of the end-of-pipe discharge outfall by boat. According to the footnote under “*A. REQUIRED EFFLUENT LIMITATIONS – TABLE 1 Outfall Serial Number :001*” of the permit, it states, “*Samples collected in compliance with the monitoring requirements specified in Table 1A shall be taken at any point after the treatment process has commenced but prior to being discharged into the receiving waters.*”

6.2.4 According to the permit, phosphorus is collected and analyzed twice per month. Phosphorus samples have not been analyzed in the laboratory due to a broken exhaust fan to the laboratory hood since June 2021. According to Section B (10)(d) for Monitoring and Records of the permit, it states, “*Monitoring shall be conducted according to test procedures approved und 40 CFR Part 136.*”

6.2.5 Solids were observed passing through the effluent channel into the effluent holding tank. When samples were collected at the designated “Effluent Grab Sampling Point,” solids were observed discharging. According to “*B – General Conditions #15a - Removed substances*” of the permit, it states, “*Solids, sludge’s, filter backwash or other pollutants removed in the course of treatment or control of wastewaters and/or the treatment of intake waters shall be disposed of in a manner such as to prevent any pollutant from such materials from entering navigable waters.*”

7.0 ATTACHMENTS

Attachment #1. Biological treatment process schematic at Mangrove Lagoon WWTF is performed in the Sequential Batch Reactors.

Attachment #2. Chain-of-Custody for Fecal Coliform and Enterococcus Samples was submitted and was received by Ocean Systems Laboratory in St. Thomas, USVI, on Monday, November 01, 2021.

Attachment #3. Ocean Systems Laboratory reissued Analytical Data for Fecal Coliforms and Enterococci for the Mangrove Lagoon WWTF sampling inspection was received on Tuesday, November 30, 2021.

Attachment #4. Chain-of-Custody for Samples was submitted and was received by EPA Laboratory in Edison, NJ, on Wednesday, November 03, 2021.

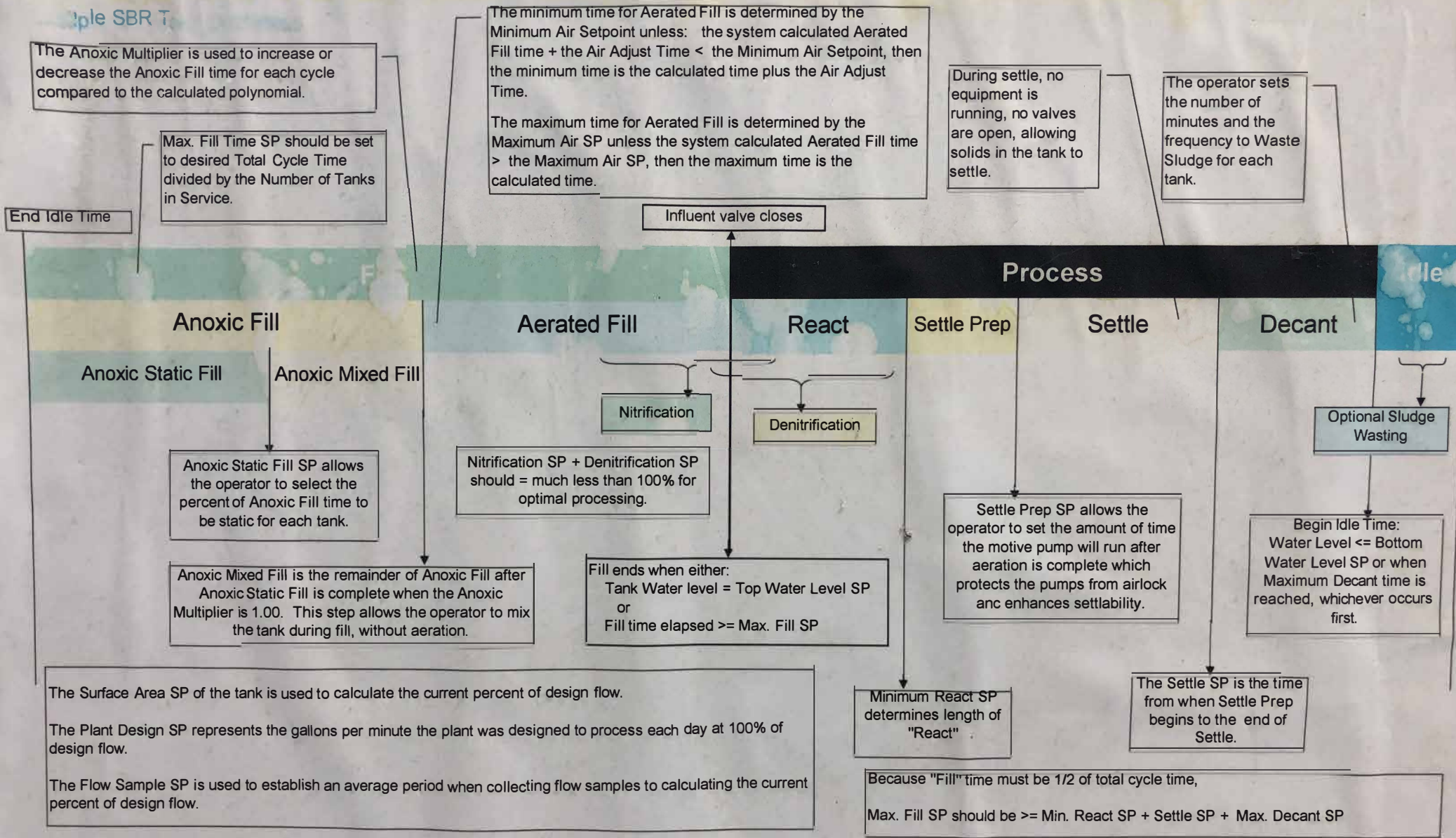
Attachment #5. EPA Laboratory Analytical Data for Mangrove Lagoon WWTF sampling inspection was received on Friday, November 12, 2021.

8.0 PHOTOGRAPHS

- Photo #1.** Rags and large matters are manually removed from the incoming waste stream due to the broken mechanical bar screen.
- Photo #2.** The facility's automatic composite sampler is set-up after the mechanical bar screen. The composite sampler is out-of-service. As a result, grab samples are collected.
- Photo #3.** EPA automatic composite sampler was set-up at the plant influent monitoring location.
- Photo #4.** Corroded grit removal system has been out-of-service for a long time.
- Photo #5.** Compliance grab samples are collected from the designated "Effluent Grab Sampling Point."
- Photo #6.** Effluent sample was collected from the "Effluent Grab Sampling Point" into the 2.5-gallon blue bucket for on-site analyses, such as Temperature, pH, DO, etc...
- Photo #7.** No dissolved oxygen (DO) concentration was determined from the titrated sample (left) compared to the un-titrated sample (right).
- Photo #8.** Reaction phase in one of the three SBRs is dark gray to black in color.
- Photo #9.** The effluent is not disinfected because the UV System is out-of-service and the alternative method of chlorine tablets in the 5-gallon buckets were empty.
- Photo #10.** The facility's effluent automatic composite sampler is out-of-service. As a result, the facility is collecting composite samples as grab samples.
- Photo #11.** Compliance grab samples are taken from the designated "Effluent Grab Sampling Point" (White PVC Pipe).
- Photo #12.** EPA effluent composite sampler was set-up ahead of the UV System.
- Photo #13.** Discharged effluent is monitored with an in-line magnetic flow sensor/meter which is out-of-service.

7.0 Attachments

Mangrove Lagoon WWTP Sequence Diagram with Setpoints



Attachment #1. The Sequential Batch Reactors at Mangrove Lagoon WWTF process operates based on these phases.

CHAIN OF CUSTODY/ FIELD DATA FORM

SURVEY NAME & LOCALITY EPA-ML WWTP

PROJECT LEADER Thuan Tran

PROGRAM: SF

SITE ID _____

OPERABLE UNIT _____

PROGRAM RESULTS CODE _____

Decision Unit Code Y206 RCRA D210 RCRA ENF D307 NPDES B304 SDWA C215 AM B224 CAA A305 TSCA L306 OD B253 FIFRA CRIMINAL ENF

Permit # <u>TPDES: VI0002003</u>	CONTERS # OF	MATRIX	CHECK IF SPLIT SAMPLE <input type="checkbox"/>	DESCRIPTION & INSTRUCTIONS INCLUDING LOCATION, ESTIMATED CONCENTRATIONS, SPECIAL REPORTING LIMITS.	Res CL Checked <input type="checkbox"/>	Preservative (circle)	Collection Time (24hr clock) // //		Collection Date mm/dd/yy
							Begin	End	
	5	A	<input type="checkbox"/>	1, 500 -ml sterilized plastic: F. Coliforms/Entero: Grab 1	<input type="checkbox"/>	012345678910	11:22		11/1/2021
		A	<input type="checkbox"/>	1, 500 -ml sterilized plastic: F. Coliforms/Entero: Grab 2	<input type="checkbox"/>	012345678910	11:38		11/1/2021
		A	<input type="checkbox"/>	1, 500 -ml sterilized plastic: F. Coliforms/Entero: Grab 3	<input type="checkbox"/>	012345678910	11:53		11/1/2021
		A	<input type="checkbox"/>	1, 500 -ml sterilized plastic: F. Coliforms/Entero: Grab 4	<input type="checkbox"/>	012345678910	12:08		11/1/2021
		A	<input type="checkbox"/>	1, 500 -ml sterilized plastic: F. Coliforms/Entero: Grab 5	<input type="checkbox"/>	012345678910	12:23		11/1/2021
11/01/2021									
			<input type="checkbox"/>		<input type="checkbox"/>	012345678910			
			<input type="checkbox"/>		<input type="checkbox"/>	012345678910			
			<input type="checkbox"/>		<input type="checkbox"/>	012345678910			
			<input type="checkbox"/>		<input type="checkbox"/>	012345678910			
			<input type="checkbox"/>		<input type="checkbox"/>	012345678910			

COMMENTS & SPECIAL REQUIREMENTS:

4°C

TRC: ZERO.

Preservative Added & Checked
 0=ice 7=FAS
 1=H2SO4 pH<2 8=ZnAc
 2=HNO3 pH<2 9=NaOH pH>12
 3=HCl pH<2 10=NH4Cl
 4=Na2S2O3
 5=NaOH pH>9
 6=Ascorbic Acid

Person Assuming Responsibility for Sample(s):

Time: 14:56 Date: 11/1/21

Received By:

1501 11/1/21

Relinquished By:

Received By:

Relinquished By:

Received By:

Relinquished By:

Matrix:
 A=aqueous F=multiphasic
 B=aqueous (chlorinated) G=solvent
 C=soil H=biota
 D=sediment I=oil
 E=sludge J=other

Survey Complete? Y N



Ocean Systems Laboratory
6194 Estate Frydenhoj
St. Thomas, VI 00802
(340) 714 – 1911

Qualifiers

Definition:

ICP: in the cooling process

MPN: most probable number

MF: Membrane Filtration

J: Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit

Date: November 24, 2021

Ocean Systems Laboratory, INC

6194 Estate Frydenhoj # 43, St. Thomas, US VIRGIN 00802-1402

info@oceansystemslab.com

340-714-1911

LAB ID: VI000609

CERTIFICATE OF ANALYSIS Fecal /Enterococci Report

WWTP Identification: **EPA-ML WWTP Effluent**

Date of Sample: **11-01-2021**

Sampler:

Client: **ML WWTP / Permit # VI 0002003**

Sample Description: **Fecal-Enterococci Sample Collection**

Arrival at the Laboratory

Sample Location	Date/Time Taken	Date/Time Received	Date/Time Run	Condition	Received by
EFF – Grab # 1	11-01-21 @ 1122	11-01-21 @ 1501	11-01-21 @ 1648	Temp. 4.0°C	JM
EFF – Grab # 2	11-01-21 @ 1138	11-01-21 @ 1501	11-01-21 @ 1648	Temp. 4.0°C	JM
EFF – Grab # 3	11-01-21 @ 1153	11-01-21 @ 1501	11-01-21 @ 1648	Temp. 4.0°C	JM
EFF- Grab # 4	11-01-21 @ 1208	11-01-21 @ 1501	11-01-21 @ 1648	Temp. 4.0°C	JM
EFF – Grab # 5	11-01-21 @ 1223	11-01-21 @ 1501	11-01-21 @ 1648	Temp. 4.0°C	JM

Note: TRC: 0.0 mg/L

RESULTS

Outfall 001- ML	Fecal Count /100mL	Enterococci Count /100 mL
Grab 1: OSL # 8047	>6000 CFU/100mL	11, 100 J CFU /100mL
Grab 2: OSL # 8048	>6000 CFU/100mL	7600 J CFU /100mL
Grab 3: OSL # 8049	> 6000 CFU/100mL	7700 J CFU / 100mL
Grab 4: OSL # 8050	>6000 CFU/100mL	8000 J CFU / 100mL
Grab 5: OSL # 8051	>6000 CFU/100mL	7700 J CFU / 100mL
Method: MF EPA 1600	Dilutions: 100mL, 10mL, & 1mL	

Analyst _____ GC _____

Approval: _____

Gretchen M. Concepcion-Connor

Date: November 18, 2021

Qualifiers: ICP: in the cooling process
MPN: most probable number
MF: Membrane Filtration
J: Judgement (applied calculation)

Methods: Enterococci: EPA Method 1600

Email: info@oceansystemslab.com

US EPA REGION 2 LABORATORY
CHAIN OF CUSTODY/ FIELD DATA FORM

SURVEY NAME & LOCALITY Mangrove Lagoon WWTF

PROJECT LEADER Thuan Tran

PROGRAM: SF :

SITE ID _____

OPERABLE UNIT _____

PROGRAM RESULTS CODE _____

Decision Unit Code Y206 RCRA B210 RCRA ENF D307 NPDES B304 SDWA C215 AM B224 CAA A305 TSCA L306 OD B253 FIFRA CRIMINAL ENF

Permit #: <u>TPDES: VI0002003</u>	CONTERS # OF	MATRIX	CHECK IF SPLIT SAMPLE	DESCRIPTION & INSTRUCTIONS INCLUDING LOCATION, ESTIMATED CONCENTRATIONS, SPECIAL REPORTING LIMITS,	Res CL Checked	Preservative (circle)	Collection Time (24hr clock) Begin End	Collection Date mm/dd/yy
Outfall 001 - Comp. <u>2/1/03-01</u>	3	A	<input checked="" type="checkbox"/>	2, 1-Liter plastic bottles: BOD5: 24-Hr Comp.	<input type="checkbox"/>	0	09:22 09:07	11/01-02/21
			<input checked="" type="checkbox"/>	1, 500-ml plastic bottle: TSS: 24-Hr Comp.	<input type="checkbox"/>	0	↓ ↓	11/01-02/21
Outfall 001 - Grab <u>-02</u>	5	A	<input checked="" type="checkbox"/>	1, 125-ml plastic bottle: Phosphorus: Grab	<input type="checkbox"/>	0	10:38	11/2/2021
			<input checked="" type="checkbox"/>	1, 250-ml plastic bottle: Turbidity: Grab	<input type="checkbox"/>	0	↓	11/2/2021
			<input checked="" type="checkbox"/>	3, 1-Liter clear WM glasses: O&G: Grab	<input type="checkbox"/>	0	↓	11/2/2021
Influent - Comp. <u>-03</u>	2	A	<input checked="" type="checkbox"/>	1, 1-Liter plastic bottle: BOD5: 24-Hr Comp.	<input type="checkbox"/>	0	09:54 09:39	11/01-02/21
			<input checked="" type="checkbox"/>	1, 250-ml plastic bottle: TSS: 24-Hr Comp.	<input type="checkbox"/>	0	↓ ↓	11/01-02/21
			<input type="checkbox"/>		<input type="checkbox"/>	0		
			<input type="checkbox"/>		<input type="checkbox"/>	0		
			<input type="checkbox"/>		<input type="checkbox"/>	0		

COMMENTS & SPECIAL REQUIREMENTS:

Notes: BOD5 & Turbidity have short holding time (48-hours)
TRC: Zero.

Preservative Added & Checked
0=ice 7=FAS
1=H2SO4 pH<2 8=ZnAc
2=HNO3 pH<2 9=NaOH pH>12
3=HCl pH<2 10=NH4Cl
4=Na2S2O3
5=NaOH pH>9
6=Ascorbic Acid

Matrix:	Relinquished By:	Received By:	Time	Date
A=aqueous F=multiphasic	<i>[Signature]</i>	<i>[Signature]</i>	14:00	11/2/21
B=aqueous (chlorinated) G=solvent	<i>[Signature]</i>	<i>[Signature]</i>	10:00	11/3/21
C=soil H=biota	Relinquished By:	Received By:		
D=sediment I=oil	Relinquished By:	Received By:		
E=sludge J=other	Relinquished By:	Received By:		

Survey Complete? Y N

Temp = 0.3°C SW NE 2A 11/3/21



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

**Region 2 Laboratory
2890 Woodbridge Avenue
Edison , New Jersey 08837
732-906-6886 Phone
732-906-6165 Fax**

November 12, 2021

Thuan Tran
Monitoring & Assessment Branch
LSASD/MAB
Edison, NJ 08837

RE: Mangrove Lagoon WWTF - 2111013

Enclosed are the results of analyses for samples received by the laboratory on 11/03/2021. The signature below reflects the laboratory's approval of the reported results. If you have any questions concerning this report, please refer to Project Number 2111013 and contact the laboratory.

Sincerely,

A handwritten signature in black ink, appearing to read "Ness Tirol".

Ness Tirol
Acting Chief, LSASD/LB



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region 2 Laboratory

Final Report

Project: Mangrove Lagoon WWTF - 2111013

Project Number: 2111013

Project Narrative:

The National Environmental Laboratory Accreditation Conference Institute (TNI) is a voluntary environmental laboratory accreditation association of State and Federal agencies. TNI established and promoted a National Environmental Laboratory Accreditation Program (NELAP) that provides a uniform set of standards for the generation of environmental data that are of known and defensible quality. The EPA Region 2 Laboratory is NELAP accredited. The Laboratory tests that are accredited have met all the requirements established under the TNI Standards.

Condition Comments

Oil and Grease analysis - Due to a power outage in the lab, the residue weighings were done the morning after the extractions for the MS sample. There sample result was below the reporting limit so no action was taken.

Comment(s):

The "Sample Analysis Date and Time" is included in the results section for any analyte with a prescribed holding time of 72 hours or less.

Data Qualifier(s):

- U- The analyte was not detected at or above the Reporting Limit.
- J- The identification of the analyte is acceptable; the reported value is an estimate.
- K- The identification of the analyte is acceptable; the reported value may be biased high.
- L- The identification of the analyte is acceptable; the reported value may be biased low.
- NJ- There is presumptive evidence that the analyte is present; the analyte is reported as a tentative identification. The reported value is an estimate.



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Reporting Limit(s):

The Laboratory was able to achieve the appropriate limit for each analyte requested.

SUMMARY REPORT FOR SAMPLES

Field ID	Laboratory ID	Matrix	Date Sampled	Date Received
Outfall 001 - Comp.	2111013-01	Aqueous	11/02/2021 09:22	11/03/2021 10:00
Outfall 001 - Grab	2111013-02	Aqueous	11/02/2021 10:38	11/03/2021 10:00
Influent - Comp.	2111013-03	Aqueous	11/02/2021 09:39	11/03/2021 10:00



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SUMMARY REPORT FOR METHODS

Analysis	Method	Certification	Matrix
Biochemical Oxygen Demand	SM 5210B SOP C-21 Rev 2.7	NELAP	Aqueous
Oil & Grease	EPA 1664A SOP C-126 Rev 1.6	NELAP	Aqueous
Phosphorus	EPA 365.1 SOP C-68 Rev 2.7	NELAP	Aqueous
Residue, Non-Filterable	SM 2540D SOP C-33 Rev 3.7	NELAP	Aqueous
Turbidity	EPA 180.1 SOP C-81 Rev 2.7	NELAP	Aqueous



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Analyte	Result	Qualifier	Reporting Limit	Units	Date and Time of Analysis*
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Field ID: Outfall 001 - Comp.

Sample ID: 2111013-01

Sanitary

Biochemical Oxygen Demand	67.0		2.00	mg/L	11/4/2021 7:37:00AM
Residue, Non-Filterable	28.0		10.0	mg/L	

Field ID: Outfall 001 - Grab

Sample ID: 2111013-02

GC - Sanitary

Oil & Grease	---	U	5.70	mg/L	
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Sanitary

Phosphorus	6.67		0.500	mg/L	
Turbidity	125		0.400	NTU	11/3/2021 12:11:00PM

Field ID: Influent - Comp.

Sample ID: 2111013-03

Sanitary

Biochemical Oxygen Demand	543		2.00	mg/L	11/4/2021 7:37:00AM
Residue, Non-Filterable	192		10.0	mg/L	

8.0 Photographs

**Mangrove Lagoon WWTF, #1A Estate Bovoni, St. Thomas USVI Insp. Dates: 11/01-02/21
TPDES #: VI0002003**

Photo #1. Incoming wastewater is pumped to the head of the mechanical bar screen.



Photo #2. The facility's influent automatic composite sampler is out-of-service. As a result, composite samples are collected as grab samples.



**Mangrove Lagoon WWTF, #1A Estate Bovoni, St. Thomas USVI Insp. Dates: 11/01-02/21
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Photo #3. EPA composite sampler was set-up at the designated influent monitoring location.



Photo #4. Grit removal system has been out-of-service for a long time.



**Mangrove Lagoon WWTF, #1A Estate Bovoni, St. Thomas USVI Insp. Dates: 11/01-02/21
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Photo #5. Grab samples are collected from the designated “Effluent Grab Sampling Point (White PVC Pipe).



Photo #6. Effluent sample was collected into a 2.5-gallon blue bucket from the effluent sampling point for on-site analyses.



**Mangrove Lagoon WWTF, #1A Estate Bovoni, St. Thomas USVI Insp. Dates: 11/01-02/21
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Photo #7. There is no dissolved oxygen level in the titrated sample (left) compares to the un-titrated sample (right).



Photo #8. Reaction Phase in the Sequential Batch Reactor is dark gray to black.



**Mangrove Lagoon WWTF, #1A Estate Bovoni, St. Thomas USVI Insp. Dates: 11/01-02/21
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Photo #9. Discharged effluent overflows the out-of-service Ultraviolet Disinfection System.



Photo #10. The facility's effluent automatic composite sampler is out-of-service. As a result, composite samples are collected as grab samples.



**Mangrove Lagoon WWTF, #1A Estate Bovoni, St. Thomas USVI Insp. Dates: 11/01-02/21
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Photo #11. Compliance grab samples are collected from the effluent grab sampling point.



Photo #12. EPA automatic effluent composite sampler was set-up ahead of the UV System.



**Mangrove Lagoon WWTF, #1A Estate Bovoni, St. Thomas USVI Insp. Dates: 11/01-02/21
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Photo #13. Discharged effluent is monitored with an out-of-service in-line magnetic flow device.

