

USVI Integrated Water Quality Monitoring & Assessment Report

**Department of Planning & Natural Resources
Division of Environmental Protection
Water Quality Management & Planning Program**

2010



The 2010 USVI Integrated Water Quality Monitoring & Assessment Report intends to satisfy the USVI requirements of the Federal Clean Water Act Sections 305(b) and 303(d).

Submitted by:

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I. EXECUTIVE SUMMARY

A. Purpose

The 2010 US Virgin Islands Integrated Water Quality Monitoring and Assessment Report was prepared by the Department of Planning and Natural Resources, Division of Environmental Protection (DPNR/DEP) and is intended to satisfy abbreviated reporting requirements under section 305(b) of the Federal Clean Water Act (CWA). This report also is intended to satisfy the requirements of section 303(d) of the Federal CWA by developing a list of assessment units that will require Total Maximum Daily Loads (TMDLs). This report provides an assessment of the water quality conditions of the Virgin Island's surface and ground water resources for the period covering fiscal years 2008 and 2009 (October 1, 2007 through September 30, 2009).

B. Overview of Water Quality Conditions and Trends

Water quality in the US Virgin Islands is generally good but declining due to an increase in point and non-point source discharges into the marine environment. Sources such as direct discharges, stormwater run-off and vessel wastes increase stresses on US Virgin Islands (VI) waters.

1. Surface Water

Non-point source pollution is the major source of surface water contamination in the Virgin Islands. Non-point source pollution can be attributed to several causes such as:

- Failure to properly install effective silt control devices during construction,
- Failure to contain storm water run-off from unpaved roads,
- Failure of on-site disposal systems (OSDS).

The discharging of wastes overboard directly into the sea by boat owners and the difficulty in regulating such activity also contributes to non-point source pollution problems seen in the US Virgin Islands. Point Source Pollution can be attributed to an antiquated municipal sewage system. Poor preventive maintenance practices due to lack of funding and other resources within the Waste Management Authority result in "bypasses" that result in the release of untreated sewage directly into the waters of the US Virgin Islands. The Government of the US Virgin Islands has made considerable progress towards resolving these issues by the upgrading of new treatment plants and upgrading other portions of the municipal system.

2. Ground Water

The primary sources of groundwater contamination in the US Virgin Islands are:

- Bacteriological contamination from failing septic systems
- Leaking municipal sewer lines
- Migration of contamination from previous injections and disposal practices
- Frequent sewage bypasses (generally described as discharges direct to the sea, but with some percolation into sub-soils)

Other sources of ground water contamination include intrusion of salt water caused by the over-pumping of the aquifers, invasion of volatile organic compounds (VOC's), contamination from leaking underground storage tanks, and the indiscriminate/illegal discharges of waste.

C. Program Initiatives

Under the provisions of the Federal and Local Water Pollution Control Act, the US Virgin Islands Water Pollution Control (WPC) Program is mandated to conserve, protect, preserve, and improve the quality of water for public use, and the propagation of wildlife, fish and aquatic life for the USVI. To ensure the preservation of water quality WPC projects monitor compliance with the Water Quality Standards as set forth in the US Virgin Islands Environmental Laws and Regulations.

In addition, the program-reporting period (FY2008 and FY2009) saw water quality management activities in the US Virgin Islands being planned for integration for management and reporting purposes with the Unified Watershed Assessment process of the Clean Water Action Plan. This US Virgin Islands Water Quality Assessment presents water quality assessment information in a format that preserves the US Virgin Islands long-term data series by using the same water quality monitoring sites. This report also indicates how these data can be summarized at a level that is compatible for both Water Quality Assessment and Unified Watershed Assessment processes.

The Government of the Virgin Islands is presently enhancing and strengthening its territorial Water Pollution Control Act and revised its Water Quality Standards in July 2010. This ongoing process builds upon previous 305(b) and 303(d) reporting periods. The Department initiated the process of revising the Water Quality Standards in time for the Clean Water Act tri-annual update which was due in FY 2007; however a lack of resources, mainly staff, delayed this revision. The Territory developed and promulgated Stormwater Regulations in June 2007, developed to particularly reduce sedimentation from construction sites. The Department also began issuing General Permit Coverages for Construction Activities on December 1, 2007. Furthermore, DPNR-DEP advocates the use of best management practices (BMPs) in the *Revised Handbook for Homebuilders and Developers* (Wright, 2002). DPNR has developed Total Maximum Daily Loads (TMDLs) for various assessment units; although none were completed in FY2008 or 2009, numerous assessment units were identified in the 2010 303(d) impaired assessment units listing. DPNR continues to apply for additional funding through the 604(b) Water Quality Management Planning (WQMP), formerly known as the 205(j) program, to achieve some of these Management tasks.

D. Summary of Classified Uses

USVI waters are classified into three (3) groups based on designated uses: Class A, B, and C:

Class A waters are for the preservation of natural phenomena requiring special conditions with existing natural conditions that shall not be changed. Class A water standards are the most stringent of the three (3) classes because of its pristine or near-pristine state.

Class B and C waters are for the propagation of desirable species of marine life and for primary contact recreation.

Class C waters have less stringent water quality standards than Class B.

Detailed specifications for these classes are presented in Part II, Section B, below.

All waters of the Virgin Islands are designated for fish consumption, aquatic life support, primary contact recreation, and secondary contact uses pursuant to the Virgin Islands Water Quality Standard, Title 12, Chapter 7, §186-1 of the Virgin Islands Rules and Regulations (VIRR).

E. Highlights of the Rest of this Report

- Part II maps and explains the geographic delineation used by the Department of Planning and Natural Resources to report on this Water Quality Assessment, and to display the effects on watersheds and watershed restoration priorities in the Virgins Islands.
- Part III reports on surface water quality issues in the Virgin Islands.
- Part IV reports groundwater and related non-point source issues in the Virgin Islands.

II. BACKGROUND

A. Resource Overview

The territory of the United States Virgin Islands comprises three major islands: St. Croix, St. John and St. Thomas. Additionally, 57 smaller islands and cays were documented in *A Natural History Atlas to the Cays of the US Virgin Islands* (Thomas and Devine, 2005). Taken together, the territory encompasses a total land area of about 136 square miles or 110,000 acres (Table II.A.1) characterized by central mountain ranges and relatively small coastal plains. Peak elevations are 1,165 feet on St. Croix (Mount Eagle), 1,550 feet on St. Thomas, (Crown Mountain) and 1,297 feet on St. John (Bordeaux Mountain). The islands are generally only 2 to 6 miles wide, with no land location far from the coastal waters. All data in this report focus on the main islands of St. Croix, St. John, and St. Thomas although several enclosed bays within the main islands' watersheds include offshore islands and cays.

The return of Water Island to the control of the Government of the US Virgin Islands, after 50-some years of direct federal administration (first as a fort by the Department of the Army during the Second World War, and later as the responsibility of the US Department of the Interior) raises the question of whether this areas should be treated as a fourth island. For the purposes of the Water Quality Assessment, Water Island will be treated as another offshore cay or small inhabited island, such as Hassel Island or Great St. James because the area is small (less than 600 acres or 1 square mile), and because the island is practically within St. Thomas Harbor.

The offshore cays and small islands are an inherent piece of the natural heritage of the Virgin Islands. Additionally, as an economic asset, these offshore sites could be included within a broad eco-tourism program for the territory. Many government-owned cays have already been established as wildlife reserves pursuant to Title 12 94(b)(2) VI Rules and Regulations. A number are important seabird nesting sites, and several are important roosting areas. The surrounding waters of most of the cays and islands teem with marine life, providing food for seabirds and for the fish and shellfish sought by commercial and recreational fishermen. They are also popular dive sites, which are important to the local diving industry.

There are no large freshwater lakes or ponds, and no perennial streams on any of the islands; intermittent streams can only be seen after heavy rainfall or during the rainy season (May – November). The absence of large freshwater resources and perennial streams means that guts (watercourses) form the basis for watershed management in the territory.

This Water Quality Assessment is based on the United States Geological Survey (USGS) 8-digit Hydrologic Units for the US Virgin Islands, which designate two Virgin Islands watersheds: one for St. Croix, and one for the combined islands of St. Thomas and St. John.

In addition, this Water Quality Assessment also uses 11- and 14-digit Hydrologic Unit definitions, in the process of being finalized by the US Geological Service of the US Department of Interior and the Natural Resources Conservation Service of the US Department of Agriculture, to define territorial *Watersheds*. Within these fourteen draft watersheds (seven on St. Croix, four on St. Thomas, and three on St. John), the Virgin Islands have defined waterbody *Assessment Units*, which correspond to coastal elements of watersheds.

Table II.A.1 Characteristics of Virgin Islands Watersheds and Islands

	St. Croix	St. Thomas	St. John	Total
Population	51,389	54,259	4,014	109,661
Land Area (square miles)	84	32	20	136
Land Area (acres)	53,499	17,489	12,323	83,311
Tidal/sub-tidal wetlands (square miles)	2.5	2.4	1.1	5.9
Coastal Shoreline	70.3	52.8	49.7	172.8
Embayments (square miles)	1.5	0.9	0.1	3.5

Figure II.A.1 St. Croix subwatersheds and assessment unit overview

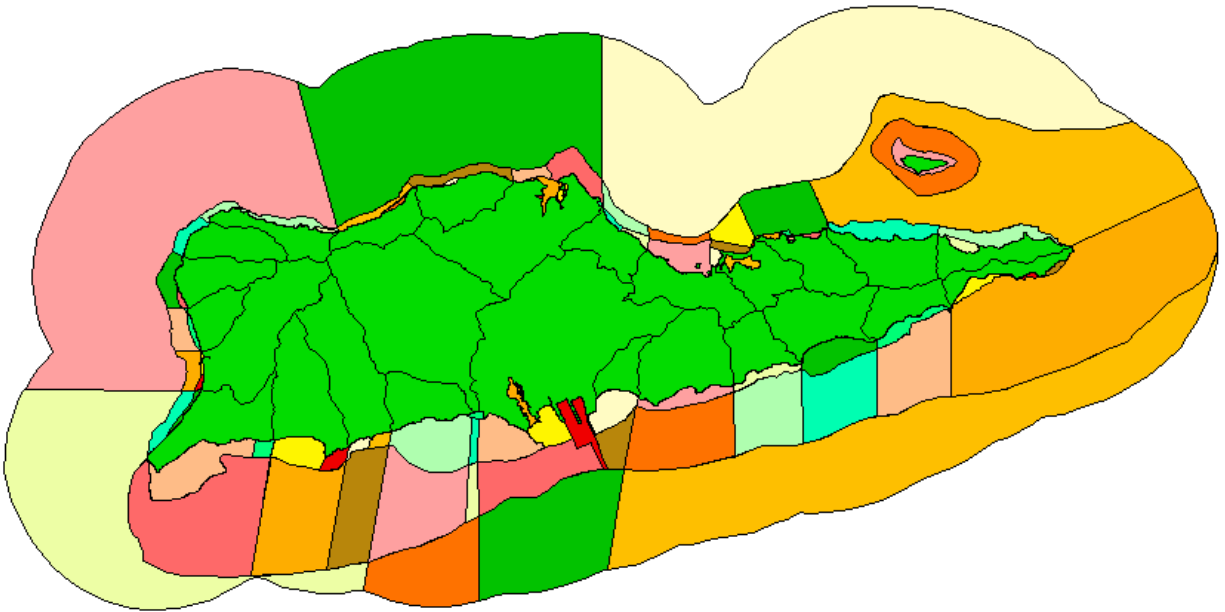
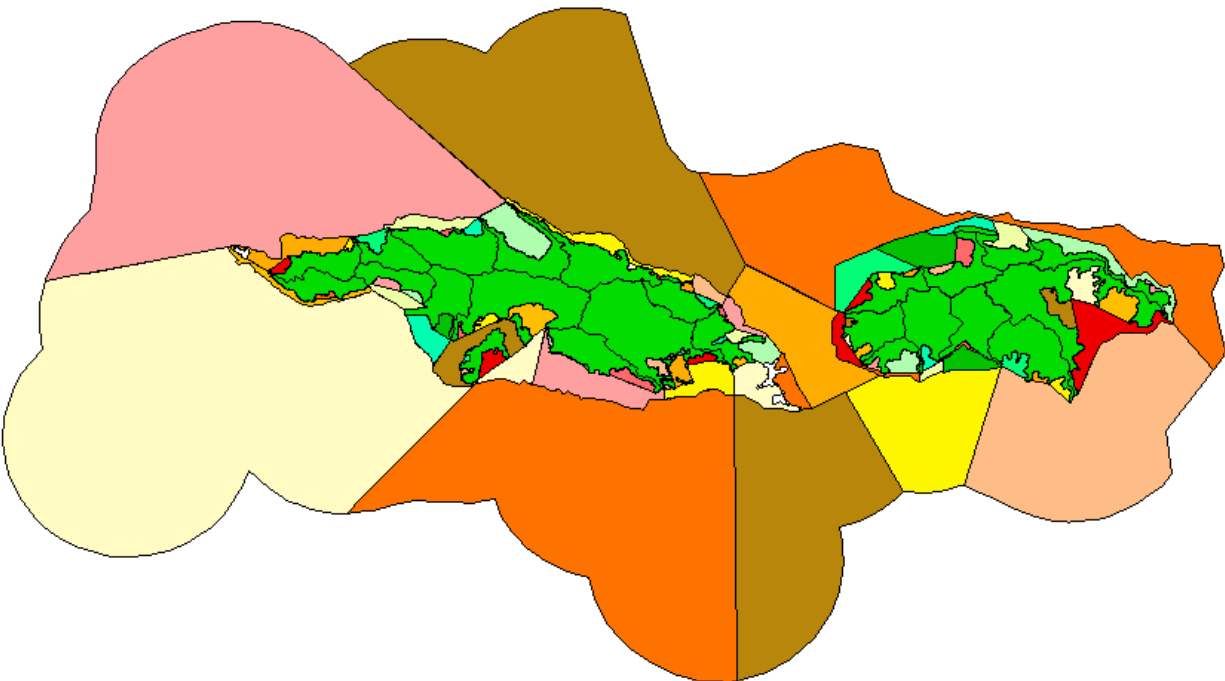


Figure II.A.2 St. Thomas/St. John subwatersheds and assessment unit overview



The 14-digit Hydrologic Unit delineations are to be integrated with the list of watersheds used for the analysis in the Unified Watershed Assessment: See Part III below.

Table II A.2 Sub-watersheds Listed in the Unified Watershed Assessment

St. Croix

Watershed Name	Acres	UWA Category	Watershed Name	Acres	UWA Category
A. Northside	2,258		N. Bugby Hole	998	2
B. Baron Bluff	1,262	4	O. Cane Garden Bay	1,527	2
C. Salt River Bay	3,510	2	P. HOVENSA	7,642	1
D. Princess	2,182		Q. Bethlehem	6,689	1
E. Christiansted	1,225	1	R. Airport	1,654	1
F. Altoona Lagoon	1,239		S. Diamond	2,577	1
G. Southgate	1,597	1	T. Long Point Bay	2,044	2
H. Solitude	1,691	4	U. Sandy Point	2,735	4
I. Teagues Bay	1,061		V. La Grange	3,137	2
J. Turner Hole	711		W. Prosperity	967	4
K. Madam Carty	1,128		X. Creque Dam	703	
L. Great Pond Bay	2,007	1	Y. Butler Bay	918	
M. Laprey Valley	1,853		Z. Rams Bay	757	
Total St. Croix Acres 54,072					

St. Thomas

Watershed Name	Acres	UWA Category	Watershed Name	Acres	UWA Category
A. Botany Point	945	4	H. Benner Bay	3,666	1
B. Santa Maria Bay	867	4	I. Frenchman Bay	1,137	
C. Dorothea Bay	1,861	4	J. St. Thomas Harbour	2,696	1
D. Magens Bay	1,210	1	K. Cyril E. King Airport	1,524	4
E. Mandahl Bay	1,883		L. Preseverance Bay	704	
F. Smith Bay	902		M. Fortuna Bay	707	

G. Redhook Bay	850	1	
Total St. Thomas 18,952			

St. John

Watershed Name	Acres	UWA Category	Watershed Name	Acres	UWA Category
N. Hawksnest	1,305		S. Great Lameshur Bay	1,545	3
O. Maho Bay	1,116	3	T. Genti (Reef) Bay	1,208	3
P. Leinster Bay	795		U. Fish Bay	1,503	1
Q. Minnebeck Bay	629	3	V. Rendezvous Bay	416	
R. Coral Bay	3,003		W. Great Cruz Bay	529	1
			X. Mary Point	110	
St. John Total Acres 12,159					

These watersheds align closely with the larger 14-digit Hydrologic Units drafted by the USGS and the NRCS.

The alignment is as follows:

Table II.A.3 Alignment of 14-Digit HUs and Watersheds

8-Digit	11-Digit	14-Digit	Name	Acres
21020002			St. Croix Watershed	54,072
	21020002010		North St. Croix	22,507
		21020002010010	Northwest St. Croix	6,482
			V. La Grange	3,137
			W. Prosperity	967
			X. Creque Dam	703
			Y. Butler Bay	918
			Z. Rams Bay	757
		21020002010020	Northcentral St. Croix	7,030
			A. Northside	2,258
			B. Baron Bluff	1,262
			C. Salt River Bay	3,510

	21020002010030	Northeast St. Croix	8,995
		D. Princess	2,182
		E. Christiansted	1,225
		F. Altoona Lagoon	1,239
		G. Southgate	1,597
		H. Solitude	1,691
		I. Teagues Bay	1,061
21020002020		South St. Croix	31,565
	21020002020010	Southeast St. Croix	8,224
		J. Turner Hole	711
		K. Madam Carty	1,128
		L.. Great Pond Bay	2,007
		M. Laprey Valley	1,853
		N. Bugby Hole	998
		O. Cane Garden Bay	1,527
	21020002020020	Southparts St. Croix	7,642
		P. HOVIC-VIALCO	7,642
	21020002020030	Airport St. Croix	8,343
		Q. Bethlehem	6,689
		R. Airport	1,654
	21020002020040	Southwest St. Croix	7,356
		S. Diamond	2,577
		T. Long Point Bay	2,044
		U. Sandy Point	2,735
21020001		St. Thomas-St. John Watershed	
21020001010		St. Thomas	18,952
	21020001010010	Northwest St. Thomas	4883
		A. Botany Point	945
		B. Santa Maria Bay	867
		C. Dorothea Bay	1,861
		D. Magens Bay	1,210

21020001020	21020001010020	Northeast St. Thomas	3,635
		E. Manual Bay	1,883
		F. Smith Bay	902
		G. Redhook Bay	850
	21020001010030	Southeast St. Thomas	4,803
		H. Benner Bay	3,666
		I. Frenchman Bay	1,137
	21020001010040	Southwest St. Thomas	5,631
		J. St. Thomas Hobart	2,696
		K. Cyril E King Airport	1,524
		L. Preseverance Bay	704
		M. Fortuna Bay	707
		St. John	12,049
	21020001020010	North St. John	3,845
		N. Hawksnest	1,305
		O. Maho Bay	1,116
		P. Leinster Bay	795
		Q. Minnebeck Bay	629
	21020001020020	Southeast St. John	4,548
		R. Coral Bay	3,003
		S. Great Lameshur Bay	1,545
	21020001020030	Southwest St. John	3,656
		T. Genti (Reef) Bay	1,208
		U. Fish Bay	1,503
		V. Rendezvous Bay	416
		W. Great Cruz Bay	529

Finally, these two systems are displayed with an indication of the monitoring stations associated with each assessment unit and the number of water quality monitoring sites (Battelle 2003) established by the US Virgin Islands Department of Planning and Natural Resources.

Table II.A.4 Assessment Units, Square Miles and Monitoring Sites

Assessment Unit ID	Assessment Unit Name	Class	AU Size (m ²)	Associated Monitoring Stations
VI-STT-01	Botany Bay	B	0.1576	STT-9 Botany Bay
VI-STT-02	Stumpy Bay	B	0.0597	STT-10 Stumpy Bay
VI-STT-03	Botany Bay subwatershed, offshore	B	1.309	There are currently no monitoring stations within this assessment unit.
VI-STT-04	Santa Maria Bay	B	0.3617	STT-11 Santa Maria Bay
VI-STT-05	Caret Bay	B	0.0266	STT-12 Caret Bay
VI-STT-06	Neltjeberg Bay	B	0.0562	STT-13B Neltjeberg Bay
VI-STT-07	Dorothea	B	0.0254	STT-13 Dorothea
VI-STT-08	Hull Bay	B	0.2049	STT-14 Hull Bay, VI616865 Hull Bay
VI-STT-09	Dorothea Bay subwatershed, offshore	B	0.7673	There are currently no monitoring stations within this assessment unit.
VI-STT-10	Magens Bay	B	1.6208	STT-15, STT-15A, STT-15B Magens Bay, VI672756 Magens Bay
VI-STT-11	Northwest St. Thomas HUC14, offshore	B	55.088	STT-OFF1 STT NW-1, STT-OFF9 STT NW-3
VI-STT-12	Lovenlund Bay	B	0.0228	There are currently no monitoring stations within this assessment unit.
VI-STT-13	Mandahl Bay (Marina)	B	0.0131	STT-16B Mandahl Bay Entrance, STT-16C Mandahl Point Entrance
VI-STT-14	Tutu Bay	B	0.0414	There are currently no monitoring stations within this assessment unit.
VI-STT-15	Sunsi Bay	B	0.0152	STT-17B Sunsi Bay
VI-STT-16	Spring Bay	B	0.0102	STT-17A Spring Bay
VI-STT-17	Mandahl Bay subwatershed, offshore	B	1.1379	STT-16A Mandahl Bay, STT-18 Coki Point Bay , VI577932 Coki Point
VI-STT-18	Water Bay	B	0.0845	STT-19 Water Bay, VI591668 Water Bay
VI-STT-19	Smith Bay	B	0.1187	STT-20 Smith Bay, VI431925 Lindquist Beach
VI-STT-20	Smith Bay subwatershed, offshore	B	0.4103	There are currently no monitoring stations within this assessment unit.
VI-STT-21	St. John Bay	B	0.0411	STT-21A St. John Bay, VI327776 Sapphire Beach
VI-STT-22	Red Bay	B	0.0078	STT-21B Red Bay
VI-STT-23	Vessup Bay	B	0.0619	STT-22B Vessup Bay, USGS-50263000 Vessup Bay West
VI-STT-24	Red Hook Bay	B	0.1772	STT-22A Red Hook Bay, USGS-

				50263500 Vessup Bay East, VI764950 Vessup Bay
VI-STT-25	Great Bay	B	0.5593	STT-23 Great Bay, VI505006 Bluebeards Beach
VI-STT-26	Red Hook Bay, offshore	B	0.4725	There are currently no monitoring stations within this assessment unit.
VI-STT-27	St. James Islands, offshore	B	0.6691	There are currently no monitoring stations within this assessment unit.
VI-STT-28	Cowpet Bay	B	0.0757	STT-24 Cowpet Bay, STT-24A Cowpet Bay West
VI-STT-29	St. James Bay	B	1.2439	There are currently no monitoring stations within this assessment unit.
VI-STT-30A	Northeast St. Thomas HUC14, offshore north	B	42.927	STT-16C Mandahl Point Entrance, STT-OFF6 STT North-2 , STT-OFF12 STT NE-4
VI-STT-30B	Northeast St. Thomas HUC14, offshore south	B	24.908	There are currently no monitoring stations within this assessment unit.
VI-STT-31	Nazareth Bay	B	0.1793	STT-25B Secret Harbour, STT-26, STT-26A Benner Bay, VI389422 Secret Harbor
VI-STT-32	Jersey Bay, offshore	B	1.2925	STT-25 Nazareth Bay
VI-STT-33	Benner Bay	B	0.4187	USGS-50265900 Benner Bay South
VI-STT-34	Benner Bay Lagoon Marina	B	0.0355	STT-27D Mangrove Lagoon, Near LaVida Marina, STT-27E Mangrove Lagoon, Near Compass Point, USGS-50265700 Benner Bay North
VI-STT-35	Mangrove Lagoon	B	0.2931	STT-27A Mangrove Lagoon, Near Treatment Plant, STT-27B Mangrove Lagoon, Off Sanitary Landfill (East of EcoTours), STT-27C Mangrove Lagoon, Near Tropical Marine Fuel Dock, USGS-50278800 Mangrove Lagoon West, USGS-50278500 Mangrove Lagoon East
VI-STT-36	Frenchman Bay subwatershed, east	B	0.3532	STT-28A Bovoni Bay, STT-28B Bolongo Bay, VI951607 Bolongo Bay
VI-STT-37	Frenchman Bay	B	0.0195	STT-29A Frenchman Bay, VI891065 Frenchman's Bay
VI-STT-38	Limetree Bay	B	0.0065	STT-29B Limetree Bay, VI776527 Limetree Bay
VI-STT-39	Morningstar Bay	B	0.0215	STT-30 Morningstar Bay, VI937158 Morningstar Bay

VI-STT-40	Pacquereau Bay	B	0.0453	STT-31A Flamboyant Cove
VI-STT-41	Frenchman Bay subwatershed, offshore	B	2.9233	There are currently no monitoring stations within this assessment unit.
VI-STT-42	Southeast St. Thomas HUC14, offshore	B	50.939	STT-OFF8 STT South-3, STT-OFF5 STT North2
VI-STT-43	St. Thomas Harbor, inner	C	0.7495	STT-31B Hassel Island, Off Navy Dock, STT-31C Hassel Island, Careening Cove, STT-32A Long Bay, Near South Dolphin, STT-32B Long Bay, Northeast Corner, STT-33A Long Bay, Off Outfall, STT-33B Long Bay, Off Outfall, STT-34 Long Bay, Off Pump Station, STT-35 Groden Bay, STT-36 St. Thomas Harbor, North of Coast Guard Dock, STT-37 St. Thomas Harbor, Cay Bay, STT-38 Haulover Cut
VI-STT-44	St. Thomas Harbor, outer	B	1.2128	There are currently no monitoring stations within this assessment unit.
VI-STT-45	Gregerie Channel	B	1.7072	STT-1 Crown Bay, Near Outfall, STT-39 Water Isle, East Gregorie Channel
VI-STT-46	Sprat Bay	B	0.3814	STT-42 Water Island Sprat Bay
VI-STT-47	Hassel Island at Haulover Cut to Regis Point	C	0.2074	STT-2 Crown Bay, Near Tamarind Outlet, STT-3 Subbase
VI-STT-48	Water Isle Hotel, Beach	B	0.0057	There are currently no monitoring stations within this assessment unit.
VI-STT-49	Druif Bay	B	0.0331	STT-40 Water Isle Hotel, Beach
VI-STT-50	Flamingo	B	0.061	STT-41 Water Island Flamingo Bay
VI-STT-51	Krum Bay	C	0.0754	STT-4 Krum Bay
VI-STT-52	Lindbergh Bay	B	0.2612	STT-5A Lindbergh Bay East, STT-5B Lindbergh Bay West, STT-5C WAPA Outfall, VI514102 Lindberg Bay
VI-STT-53	Cyril E. King Airport subwatershed, offshore	B	0.8499	STT-6C S.W. Road, Near Red Point Outfall
VI-STT-54	Perseverance Bay, offshore	B	0.4734	STT-6B College Cove
VI-STT-55	Brewers Bay	B	0.1076	STT-7A Brewers Bay, VI293962 Brewer's Bay
VI-STT-56	Perseverance Bay	B	0.2114	STT-7B Perseverance Bay
VI-STT-57	Fortuna Bay	B	0.0827	STT-8 Fortuna Bay

VI-STT-58	Fortuna Bay subwatershed, offshore	B	0.6553	There are currently no monitoring stations within this assessment unit.
VI-STT-59	Northwest St. Thomas HUC14, offshore	B	77.71	STT-6A Airport Runway, STT-OFF2 STT NW-1, STT-OFF11 STT SW-4
VI-STJ-01	Caneel Bay	B	0.2623	STJ-54 Caneel Bay, NPS-1 Caneel Bay, VI658467 Caneel Beach
VI-STJ-02	Hawksnest Bay	B	0.2246	STJ-44B Hawksnest Bay, NPS-3 Hawksnest (middle beach), NPS-4 Hawksnest (Gibney Beach), VI255380 Oppenheimer
VI-STJ-03	Trunk Bay	A	0.0685	STJ-44A Trunk Bay, NPS-5 Trunk Bay
VI-STJ-04	Hawksnest Bay subwatershed, offshore	B	1.7287	NPS-2 Henley Cay
VI-STJ-05	Cinnamon Bay	B	0.1456	STJ-44C Cinnamon Bay, NPS-6 Peter Bay, NPS-7 Cinnamon Bay
VI-STJ-06	Maho Bay/Francis Bay	B	0.346	STJ-44D Francis Bay, NPS-8 Maho Bay, NPS-9 Francis Bay, VI536165 Big Maho Bay
VI-STJ-07	Maho Bay subwatershed, offshore	B	1.6071	There are currently no monitoring stations within this assessment unit.
VI-STJ-08	Mary Point	B	0.4831	There are currently no monitoring stations within this assessment unit.
VI-STJ-09	Leinster Bay	B	0.6627	NPS-10 Leinster Bay
VI-STJ-10	Minnebeck Bay	B	1.4876	NPS-11 Haulover Bay, NPS-30 Newfoundland Bay, NPS-31 Haulover East
VI-STJ-11	Newfound Bay	B	0.0765	There are currently no monitoring stations within this assessment unit.
VI-STJ-12	North St. John HUC14, offshore	B	23.719	There are currently no monitoring stations within this assessment unit.
VI-STJ-13	Coral Harbor	B	0.6965	There are currently no monitoring stations within this assessment unit.
VI-STJ-14	Hurricane Hole	B	0.7689	NPS-13 Water Creek, NPS-14 Princess Bay
VI-STJ-15	Round Bay	B	0.6015	STJ-53 Coral Bay, NPS-15 Coral Bay Dock, NPS-16 Johnson Bay, VI823989 Johnson's Bay
VI-STJ-16	Coral Bay	B	2.2337	NPS-12 Long Point
VI-STJ-17	Salt Pond Bay	B	0.1978	STJ-52 Salt Pond Bay, NPS-17 Salt

				Pond Bay
VI-STJ-18	Grootman Bay	B	0.1046	There are currently no monitoring stations within this assessment unit.
VI-STJ-19	Great Lameshur Bay	B	0.359	STJ-51 Great Lameshur Bay, STJ-50 Little Lameshur Bay, NPS-18 Great Lameshur Bay, NPS-19 Yowsei Point, NPS-20 Little Lameshur Bay
VI-STJ-20	Southeast St. John HUC14, offshore	B	24.319	There are currently no monitoring stations within this assessment unit.
VI-STJ-21	Genti Bay, nearshore	B	0.0947	STJ-49 Genti Bay, NPS-21 Reef Bay
VI-STJ-22	Genti Bay, offshore	B	0.769	There are currently no monitoring stations within this assessment unit.
VI-STJ-23	Fish Bay	B	0.2103	STJ-48 Fish Bay, NPS-22 Fish Bay
VI-STJ-24	Fish Bay subwatershed, offshore	B	0.1824	There are currently no monitoring stations within this assessment unit.
VI-STJ-25	Rendezvous Bay	B	0.4677	STJ-47 Rendezvous Bay, NPS-23 Rendezvous Bay, VI204627 Klain Bay, VI402599 Hart Bay
VI-STJ-26	Chocolate Hole	B	0.1004	STJ-46 Chocolate Hole, NPS-24 Chocolate Hole, VI391298 Chocolate Hole
VI-STJ-27	Rendezvous Bay subwatershed, offshore	B	0.1863	There are currently no monitoring stations within this assessment unit.
VI-STJ-28	Great Cruz Bay	B	0.1396	STJ-45 Great Cruz Bay. NPS-25 Great Cruz Bay, VI779192 Great Cruz Bay
VI-STJ-29	Turner Bay/Enighed Pond	B,	0.057	STJ-55 Turner Bay, NPS-26 Turner Bay
VI-STJ-30	Cruz Bay	B	0.0674	STJ-43A Cruz Bay, North, STJ-43B Cruz Bay, South, STJ-43C Cruz Bay, North of Seaplane Ramp, STJ-43D Cruz Bay Creek North, NPS-27 Cruz Bay (ferry dock), NPS-28 Cruz Bay (airplane ramp), NPS-29 Cruz Bay (NPS dock), VI309453 Cruz Bay
VI-STJ-31	Great Cruz Bay watershed, offshore	B	0.5775	VI456779 Frank Bay

VI-STJ-32	Southwest St. John HUC14, offshore	B	10.142	There are currently no monitoring stations within this assessment unit.
VI-STJ-33	Pillsbury Sound	B	6.9399	STJ-OFF13 STJ West-4
VI-STC-01	Frederiksted, south	B	0.0451	There are currently no monitoring stations within this assessment unit.
VI-STC-02	Frederiksted Harbor	C	0.035	STC-28 Frederiksted Pier, STC-29 Frederiksted Public Beach, VI970611 F'sted (Fst. Target)
VI-STC-03	Lagrange subwatershed, offshore	B	0.375	There are currently no monitoring stations within this assessment unit.
VI-STC-04	Prosperity, nearshore	B	0.1118	VI252619 Rainbow (Prosperity)
VI-STC-05	Prosperity subwatershed, offshore	B	0.5129	There are currently no monitoring stations within this assessment unit.
VI-STC-06	Sprat Hall Beach	B	0.0609	STC-30 Sprat Hall Beach, VI645288 Sprat Hall
VI-STC-07	Creque Dam/Butler Bay	B	0.529	There are currently no monitoring stations within this assessment unit.
VI-STC-08	Hams Bay	B	0.3144	There are currently no monitoring stations within this assessment unit.
VI-STC-09	Davis Bay	B	0.0522	There are currently no monitoring stations within this assessment unit.
VI-STC-10	Hams Bluff	B	0.5506	There are currently no monitoring stations within this assessment unit.
VI-STC-11	Northwest St. Croix HUC14, offshore	B	33.302	STJ-OFF3 STJ NW-1, STJ-OFF10 STJ John-3
VI-STC-12	Cane Bay	B	0.0613	STC-32 Cane Bay, VI201013 Cane Bay
VI-STC-13	Baron Bluff subwatershed	B	0.3498	STC-31 Davis Bay, VI398766 Davis Bay
VI-STC-14	Belvedere	B	0.0557	There are currently no monitoring stations within this assessment unit.
VI-STC-15	Northside subwatershed	B	0.6109	There are currently no monitoring stations within this assessment unit.
VI-STC-16	Salt River Lagoon, Marina	B	0.0194	STC-33 Salt River Marina, STC-33C Salt River Lagoon, Marina
VI-STC-17	Salt River Lagoon, Sugar Bay	B	0.3244	STC-33D Salt River Lagoon, Sugar Bay
VI-STC-18	Salt River Bay	B	0.3229	STC-33A,B,E-J Salt River (Columbus Landing Beach), VI146901 Gentle

				Winds, VI558328 Columbus Landing
VI-STC-19	Judith Fancy	B	0.01	There are currently no monitoring stations within this assessment unit.
VI-STC-20	Salt River Bay subwatershed, west	B	0.2433	There are currently no monitoring stations within this assessment unit.
VI-STC-21	Salt River Bay subwatershed, east	B	0.8922	There are currently no monitoring stations within this assessment unit.
VI-STC-22	Northcentral St. Croix HUC14, offshore	B	23.61	STC-OFF4 North-2, STC-OFF11 North-4
VI-STC-23	St. Croix-By-the-Sea	B	0.0727	STC- 34 St. Croix-By-the-Sea, VI738082 Pelican Cove
VI-STC-24	Long Reef Backreef, west	C	0.1153	STC-48 Long Reef Backreef, west
VI-STC-25	Princess subwatershed, offshore	B	0.4343	STC-35 Long Reef Forereef West
VI-STC-26	Christiansted Harbor	C	0.9601	STC-37 Christiansted Harbor Entrance West, STC-40 St. Croix Marine, STC-41 Gallows Bay, STC-42 Public Wharf, STC-43 Water Gut Storm Drain, STC-44 Protestant Cay Beach, STC-45 Christiansted Harbor, STC-46 WAPA Intake, STC-47 Mill Harbor Condominium Beach, STC-49 Long Reef Back Reef East, VI572166 Condo Row (Princess), VI359239 Protestant Cay
VI-STC-27	Long Reef Forereef, east	B	0.3149	STC-36 Long Reef Forereef East, STC-35A LBJ (Pump Station) Outfall
VI-STC-28	Altona Lagoon	B	0.2337	There are currently no monitoring stations within this assessment unit.
VI-STC-29	Christiansted Harbor, east	C	0.1089	STC-1 Lagoon Recreational Beach ,STC-39 Altona Lagoon Inlet, VI213332 New Fort Louise Augusta
VI-STC-30	Beauregard Bay	B	0.2145	STC-2 Ft. Louise Augusta Beach, STC-38 Christiansted Harbour Entrance-East, VI651587 Buccaneer
VI-STC-31	Buccaneer Beach	B	0.0166	STC-3 Buccaneer Hotel
VI-STC-32	Altona Lagoon subwatershed, offshore	B	0.6812	There are currently no monitoring stations within this assessment unit.
VI-STC-33	Punnett Bay	B	0.0576	VI610321 Shoy's

VI-STC-34	Punnett Point, east	B	0.0223	There are currently no monitoring stations within this assessment unit.
VI-STC-35	Tamarind Reef Lagoon (Southgate Lagoon)	B	0.0205	STC-4 Tamarind Reef Lagoon
VI-STC-36	Green Cay Beach	B	0.1017	VI563397 Chenay Bay Beach
VI-STC-37	Southgate subwatershed, offshore	B	2.2219	STC-5 Green Cay Beach
VI-STC-38	Solitude Backreef	B	0.9681	There are currently no monitoring stations within this assessment unit.
VI-STC-39	Teague Bay	B	0.1773	STC-8 Reef Club Beach, STC-9 St. Croix Yacht Club Beach, VI381319 Teague Bay (Reef)
VI-STC-40	Teague Bay Backreef	B	0.8547	STC-10 Cramers Park, VI351774 Cramer's Park
VI-STC-41	Buck Island Backreef	A	0.7675	STC-6 Buck Island Backreef, STC-7 Buck Island Anchorage
VI-STC-42	Buck Island Forereef	A	3.3497	There are currently no monitoring stations within this assessment unit.
VI-STC-43	Solitude and Teague Bay subwatersheds, offshore	B	18.822	There are currently no monitoring stations within this assessment unit.
VI-STC-44	Northeast St. Croix HUC14, offshore.	B	36.088	STC-OFF8 North-3
VI-STC-45	Isaac Bay	B	0.0853	There are currently no monitoring stations within this assessment unit.
VI-STC-46	Grapetree Bay	B	0.0425	STC-11B Isaacs Bay Forereef
VI-STC-47	Turner Hole Backreef	B	0.2772	STC-12 Grapetree Beach, VI297470 Grapetree Beach
VI-STC-48	Turner Hole subwatershed, offshore	B	16.949	STC-OFF5 East-2
VI-STC-49	Madam Carty Backreef	B	0.464	STC-13B Robin Bay
VI-STC-50	Madam Carty, offshore	B	3.5161	There are currently no monitoring stations within this assessment unit.
VI-STC-51	Great Pond	B	0.1578	There are currently no monitoring stations within this assessment unit.
VI-STC-52	Great Pond Bay	B	1.0184	STC-13A Great Pond Bay
VI-STC-53	Great Pond Bay subwatershed,	B	3.0288	STC-OFF13 SE-4

	offshore			
VI-STC-54	Leprey Valley Backreef	B	0.3712	There are currently no monitoring stations within this assessment unit.
VI-STC-55	Leprey Valley subwatershed, offshore	B	2.8455	There are currently no monitoring stations within this assessment unit.
VI-STC-56	Bugby Hole Backreef	B	0.7042	STC-14A Halfpenny Bay - Manchenil ,STC-14B Halfpenny Backreef, VI931289, Halfpenny
VI-STC-57	Bugby Hole subwatershed, offshore	B	3.9	There are currently no monitoring stations within this assessment unit.
VI-STC-58	Southeast St. Croix HUC14, offshore	B	24.146	STC-OFF2 SE-1, STC-OFF10 SE-3
VI-STC-59	Canegarden Bay	B	0.8542	STC-15 Canegarden Bay
VI-STC-60	Canegarden Bay, offshore	B	0.7933	There are currently no monitoring stations within this assessment unit.
VI-STC-61	Hess Oil Virgin Islands Harbor	C	0.671	STC-16 HOVENSA East Turning Basin, NW Corner, STC-17 HOVENSA West Turning Basin, NW Corner
VI-STC-62	Limetree Bay	B	0.7239	STC-18 Limetree Bay Container Port
VI-STC-63	Martin-Marietta Alumina Harbor	C	0.3228	STC-19 Krause Lagoon Channel, STC-20 Alumina Plant Dock
VI-STC-64	Manning Bay/Estate Anguilla Beach	B	0.0508	STC-23 Public Dump
VI-STC-65	HOVENSA, west	B	1.2865	STC-22A Treatment Plant (POTW) Outfall STC-21 Spoils Island (Ruth Island)
VI-STC-66	HOVENSA subwatershed, offshore	B	2.8305	There are currently no monitoring stations within this assessment unit.
VI-STC-67	Southports St. Croix HUC14, offshore	B	8.1966	STC-OFF9 SW-3
VI-STC-68	Bethlehem subwatershed, inshore	B	0.2149	There are currently no monitoring stations within this assessment unit.
VI-STC-69	Bethlehem subwatershed, offshore	B	0.3971	There are currently no monitoring stations within this assessment unit.
VI-STC-70	Airport, nearshore	B	2.1943	There are currently no monitoring

				stations within this assessment unit.
VI-STC-71	Airport, offshore	B	4.263	STC-OFF6 South-2
VI-STC-72	Airport St. Croix HUC14, offshore	B	4.1803	There are currently no monitoring stations within this assessment unit.
VI-STC-73	Diamond, nearshore	B	0.1699	There are currently no monitoring stations within this assessment unit.
VI-STC-74	Enfield Green Beach/VIRIL Outfall	B	0.1376	There are currently no monitoring stations within this assessment unit.
VI-STC-75	Diamond subwatershed, offshore	B	2.8479	STC-24B Rum Plant (VI Rum) Outfall
VI-STC-76	Carlton Beach	B	0.2447	STC-25 Long Point
VI-STC-77	Long Point Bay	B	0.8376	There are currently no monitoring stations within this assessment unit.
VI-STC-78	Long Point Bay subwatershed, offshore	B	4.9231	STC-OFF12 SW-4
VI-STC-79	Good Hope Beach	B	0.1876	STC-26 Good Hope Beach
VI-STC-80	Sandy Point, nearshore south	B	2.0121	There are currently no monitoring stations within this assessment unit.
VI-STC-81	Sandy Point, offshore south	B	7.4306	There are currently no monitoring stations within this assessment unit.
VI-STC-82	Sandy Point, nearshore west	B	0.1158	STC-27 Sandy Point Public Beach, VI896490 Dorsch Bay, VI907985 Stony Ground
VI-STC-83	Sandy Point, offshore west	B	0.4875	There are currently no monitoring stations within this assessment unit.
VI-STC-84	Southwest St. Croix HUC14, offshore	B	18.347	STC-OFF3 SW-1

B. Classifications, Total Waters and Applicable Standards

The information on Water Quality Criteria by Classification and pollutant are summarized in Table II. B.1, below, which closely follows the wording of Virgin Islands Rules and Regulations.

Designated Uses of Class A Waters:

Preservation of natural phenomena requiring special conditions, such as the Natural Barrier Reef at Buck Island, St. Croix and the Under Water Trail at Trunk Bay, St. John. These are outstanding natural resource waters that cannot be altered except towards natural conditions. No new or increased

dischargers shall be permitted.

Legal Limits of Class A waters include:

- (i) Within 0.5 miles of the boundaries of Buck Island's Natural Barrier Reef, St. Croix.
- (ii) Trunk Bay, St. John

Designated Uses of Class B Waters:

For maintenance and propagation of desirable species of aquatic life (including threatened, endangered species listed pursuant to section 4 of the federal Endangered Species Act and threatened, endangered and indigenous species listed pursuant Title 12, Chapter 2 of the Virgin Islands Code) and for primary contact recreation (swimming, water skiing, etc.). This Class allows minimal changes in structure of the biotic community and minimal changes in ecosystem function. Virtually all native taxa are maintained with some changes in biomass and/or abundance; ecosystem functions are fully maintained within the range of natural variability.

Legal Limits of Class B waters defined as all other coastal waters not classified Class "A" or Class "C". In addition, those Class "B" waters not covered by color and turbidity criteria in Section 186-3(b)(11) [T. 12, Ch. 7] include:

- (i) St. Thomas coastal waters-Mandahl Bay (Marina), Vessup Bay, Water Bay, Benner Bay, and the Mangrove lagoon
- (ii) St. Croix Coastal Waters-Carlton Beach, Good Hope Beach, Salt River Lagoon (Marina), Salt River Lagoon (Sugar Bay), Estate Anguilla Beach, Buccaneer Beach, Tamarind Reef Lagoon, Green Cay Beach and Enfield Green Beach.
- (iii) All non-marine waters defined as all Virgin Islands waters shoreward of the mean high-tide line.

All other Class "B" waters are covered by the color and turbidity criteria in section 186-3(b)(11)(B) of this subchapter.

Designated Uses of Class C Waters:

For maintenance and propagation of desirable species of aquatic life (including threatened and endangered species listed pursuant to section 4 of the federal Endangered Species Act and threatened, endangered and indigenous species listed pursuant Title 12, Chapter 2 of the Virgin Islands Code) and for primary contact recreation (swimming, water skiing, etc.). This Class allows for evident changes in structure of the biotic community and minimal changes in ecosystem function. Evident changes in structure due to loss of some rare native taxa; shifts in relative abundance of taxa (community structure) are allowed but sensitive-ubiquitous taxa remain common and abundant; ecosystem functions are fully maintained through redundant attributes of the system.

Legal limits of Class C Waters defined as:

St. Thomas:

- (a) St. Thomas Harbor beginning at Rupert Rock and extending to Haulover Cut.
- (b) Crown Bay enclosed by a line from Hassel Island at Haulover Cut to Regis Point at West Gregerie Channel.
- (c) Krum Bay

St. Croix:

- (a) Christiansted Harbor from Fort Louise Augusta to Golden Rock, along the waterfront and seaward to include the navigational channels and mooring areas.
- (b) Frederiksted Harbor from La Grange to Fisher Street and seaward to the end of the Frederiksted Pier.
- (c) Hess Oil Virgin Islands Harbor (alternatively named HOVENSA Harbor).
- (d) Martin-Marietta Alumina Harbor (alternatively named Port Alucroix or St. Croix Renaissance Group Harbor).

St. John:

- (a) Enighed Pond Bay

Table II.B.1 Summary of US Virgin Islands Water Quality Criteria

Class A

Quality criteria: Existing natural conditions shall not be changed. The biological condition shall be similar or equivalent to reference condition for biological integrity. In no case shall Class B water quality standards be exceeded.

Criterion

Dissolved Oxygen

pH

Temperature

Class B

Not less than 5.5 mg/l from other than natural conditions

<8.3 Tolerable Limit >7.0

Not to exceed 32° Celsius at any time

Class C

Not less than 5.0 mg/l from other than natural conditions

<8.5 Tolerable Limit>6.7

Same as Class B

Bacteria	<p>A geometric (log) mean of 70 fecal coliforms per 100 ml by MF or MPN count</p> <p>Not to exceed a geometric mean of 35 enterococci per 100 mL., not to exceed a single sample maximum of 104 per 100 mL at any time.</p>	<p>A geometric (log) mean of 200 fecal coliforms per 100 ml by MF or MPN count</p> <p>Not to exceed a geometric mean of 35 enterococci per 100 mL., not to exceed a single sample maximum of 104 per 100 mL at any time</p>
Chlorine	<p>The 4-day average concentration of Chlorine shall not exceed 7.5 ug/l. The 1-hour average concentration of Chlorine shall not exceed 13 ug/l</p>	Same as Class B
Phosphorus	Not to exceed 50 ug/L any coastal waters	Same as Class B
Suspended, colloidal or settleable solids	None from waste water, which would cause deposition or be otherwise deleterious.	Same as Class B
Oil and Floating substances	No residue attributable to waste water. No visible film; no globules of grease	Same as Class B
Radioactivity	<p>Gross Beta: 1000 picocuries per liter, in the absence of Sr 90 and alpha emitters</p> <p>Radium-226: 3 picocuries per liter</p> <p>Strontium-90: 10 picocuries per liter</p>	Same as Class B
Taste and Odor	None in amounts to interfere with use for primary contact recreation, potable water supply or to render undesirable taste or odor to edible aquatic life	Same as Class B
Color and Turbidity	<ul style="list-style-type: none"> • A secchi disc shall be visible at a minimum depth of one meter • A maximum nephelometric turbidity unit reading of three (3) 	Same as Class B, but no NTU standard in Rules and Regulations

shall be permissible	
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The USVI Water Quality Standards were revised during this reporting cycle. The standards were promulgated in June 2010. The assessments outlined in this report were made based on the 2010 USVI Water Quality Standards.

Table II.B.2 Area of Water Classes by Island

	St. Croix	St. Thomas	St. John	Total
Class A	4.1172 sq. miles	---	0.0685 sq. miles	4.1857 sq. miles
Class B	244.89 sq. miles	272.95 sq. miles	79.958 sq. miles	597.8 sq. miles
Class C	2.2132 sq. miles	1.0323 sq. miles	---	3.2454 sq. miles
Total	251.2204 sq. miles	273.9823 sq. miles	80.0265 sq. miles	605.23 sq. miles

Figure II.B.2 Spatial Distribution of St. Croix Coastal Water Classes

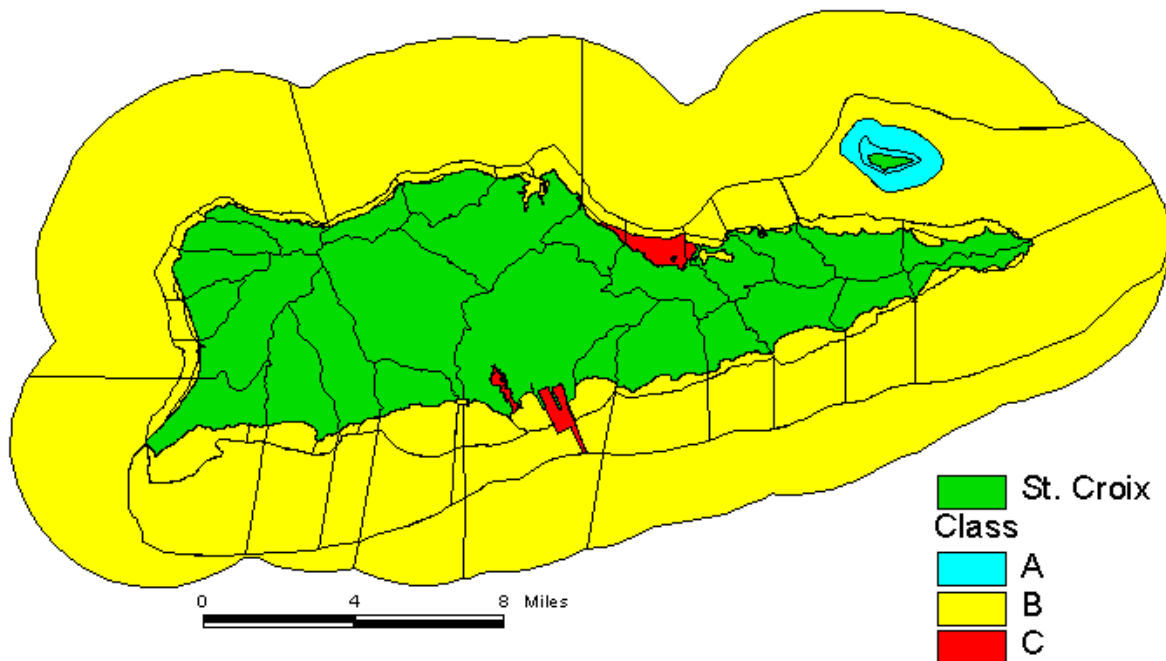
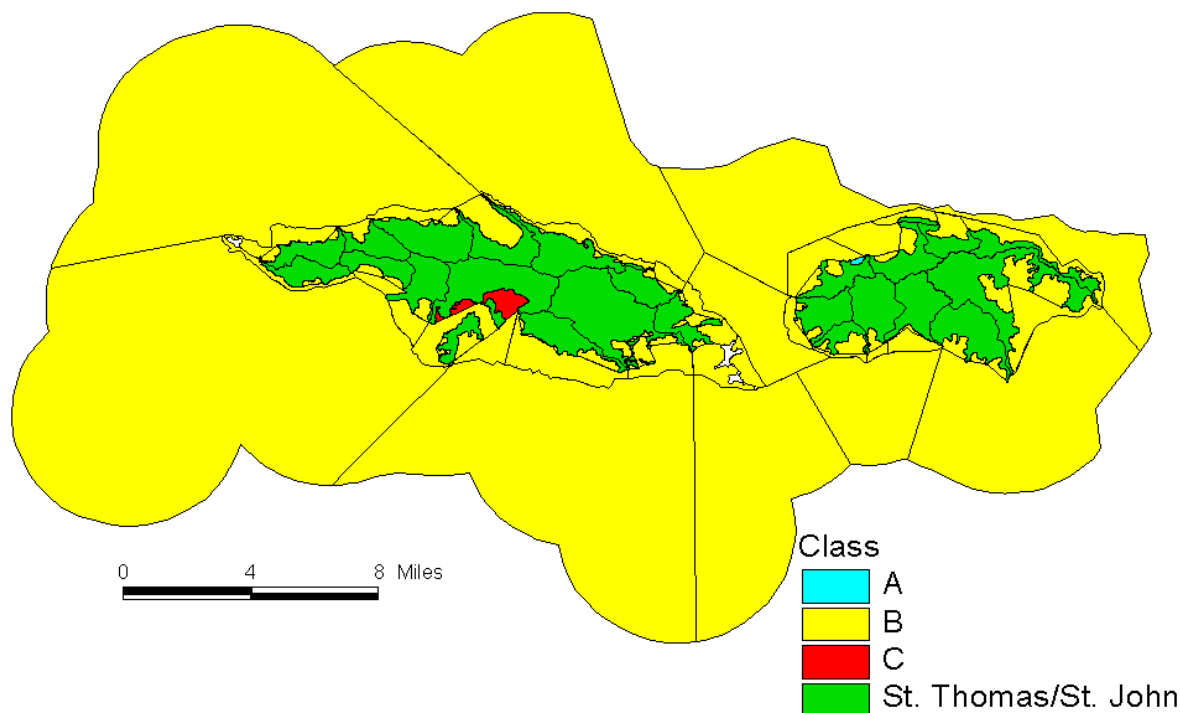


Figure II.B.3 Spatial Distribution of St. Thomas/St. John Coastal Water Classes



Water quality standards for each class of designated use are provided in Table II.B.1.

Water Quality Standards to Address Drinking Water Use Attainment

The water quality standards do not address drinking water use attainment. Since most of the USVI's drinking water supply comes from seawater purified by flash desalinization or reverse osmosis and from traditional rainwater cisterns (still required for all new construction) most national drinking water issues directed at surface or groundwater resources are moot in the Virgin Islands. There are no drinking water source-based quality standards available for organic compounds (volatile, synthetic, herbicides, pesticides and PCB), inorganic compounds, unregulated chemicals, and radiological contaminants that apply to the ocean surrounding the US Virgin Islands because ocean water does not fit the definition of surface water under the Safe Drinking Water Act. Standards do exist under the Virgin Islands Rules and Regulations that demand natural existing conditions for waters designated Class A remain unchanged. Waters designated Class B should not exceed 70 fecal coliform per 100mL and waters designated Class C should not exceed 200 fecal coliform per 100mL. All waters of the Virgin Islands should not exceed a geometric mean of 35 enterococci per 100 ml or not to exceed a single sample maximum of 104 per 100 ml at any time. The reason that drinking water source-based standards are not developed in the US Virgin Islands is that drinking water is generally derived from cisterns holding rainwater at each house, or supplemented for public housing and in droughts and other emergencies by desalinization of seawater, as a co-generation by-product of the Virgin Islands

Water and Power Authority. The Water and Power Authority in St. Croix maintains some public water supply wells.

No surface water is used directly for any drinking water supply, although questions have been raised about whether sea water intakes of contaminated water is capable of passing bacterial contamination through the relatively low temperature (60° C) flash desalinization processes.

C. Water Pollution Control Program

Under the Water Pollution Control Grant (pursuant to CWA §106), the V.I. Department of Planning and Natural Resources (DPNR), Division of Environmental Protection (DEP) is entrusted with the task of monitoring the marine waters of the USVI, and controlling the discharges into those waters. To accomplish this task the Water Pollution Control Program (WPC) is organized into the following sub-programs:

- TERMINAL FACILITY LICENSE AND INSPECTION PROGRAM
- AMBIENT MONITORING PROGRAM
- TMDL DEVELOPMENT AND IMPLEMENTATION PROGRAM
- TERRITORIAL POLLUTANT DISCHARGE ELIMINATION SYSTEMS PERMITTING AND COMPLIANCE PROGRAM
- VIRGIN ISLANDS BEACH MONITORING PROGRAM

The two WPC sub-programs that this report will concentrate its focus on are as follows:

1. The Territorial Pollutant Discharge Elimination Systems (TPDES) Permitting and Compliance Program permits and monitors point source waste streams, which are discharged into the waters of the VI, in accordance with the VI Water Quality Standards.
2. The Ambient Monitoring Program is the primary mechanism for monitoring the Virgin Islands coastal water quality.

1. Territorial Pollutant Discharge Elimination Systems Program

The Territorial Pollutant Discharge Elimination Systems (TPDES) Permitting and Compliance Program is a federally delegated program which determines what waste streams are allowed to be discharged into the waters of the Virgin Islands, TPDES Permits are issued in accordance to Title 12, Chapter 7 §184-11 of the Virgin Islands Rules and Regulations states, that “...no person shall discharge or cause a discharge of any pollutant without a TPDES permit having been issued to such person...”

TPDES permits require that point source discharges of pollution be monitored by the permittee (facility), and the self-monitoring results are submitted to DPNR-DEP and the United States Environmental Protection Agency (USEPA). Additionally, DPNR-DEP conducts compliance inspections and monitoring at all facilities that have been issued TPDES permits on an annual basis to ensure compliance. There are three types of compliance inspections conducted at TPDES permitted

facilities throughout the Territory - Compliance Sampling Inspections, Compliance Evaluation Inspections and Pump Station Inspections, which are conducted on a quarterly basis at the Territory's Publicly Owned Treatment Works (POTW).

If a facility is repeatedly found to be in non-compliance with its TPDES permit or has been found to violate the USVI's Water Quality Standards, enforcement actions may be taken against the facility. The enforcement action usually outlines corrective actions necessary for the facility to return to compliance and, if deemed necessary, fines may also be assessed. Facilities that are enforced against are usually granted the opportunity to work closely with the Department to develop a compliance schedule that sets the timeline for facility will use to achieve compliance.

If necessary or when requested, DPNR-DEP may work closely with the USEPA and the Department of Justice (DOJ) to address major enforcement cases. Cases this nature included an ongoing case against the Department of Public Works which is currently under Federal Consent Decree for unpermitted discharges caused by sewage treatment infrastructure problems throughout the Territory. In such cases, DEP is called upon to monitor the facility in question and produce supporting inspection reports and other pertinent documentation.

Regulated discharges and discharge sites include sewage treatment plant outfalls (both public and private facilities), brine discharges from reverse osmosis (and other technology) freshwater production plants, industrial facility process water discharges, and industrial facility drainage discharge.

The TPDES Program currently regulates discharges from sewage treatment plant outfalls (both public and private facilities), brine discharges from reverse osmosis, desalination freshwater production plants, industrial facility process water discharges.

TPDES Program has several components, all under the auspices of the Division of Environmental Protection:

- TPDES Permit Issuance;
- TPDES Compliance Inspections: Compliance Evaluation (CEI), Compliance Sampling (CSI) and Pump Station Inspections (PSI); and
- Enforcement

TPDES Permit Issuance:

Territorial TPDES permits are issued with effluent limitations pertinent to Federal and Local Regulations. The major industrial dischargers, which have permitted discharges of over 1 MGD, include, the HOVENSA Oil Refinery, VI Rum Distillery, Water and Power Authority in the St. Croix district; the Water and Power Authority and the Marriott Frenchman's Reef on St. Thomas. The major municipal dischargers include the St. Croix POTW, Mangrove Lagoon POTW and Charlotte Amalie POTW. The TPDES Program also permits a number of minor industrial and municipal facilities.

Table II.C.1 US Virgin Islands TPDES Permits, 2008 and 2009

Permit #	Facility Name	Permit Type	Priority
VI0000019	HOVENSA	Renewal	FY08
VI0040886	No. 7 Shoys	Renewal	FY08
VI0040231	Grapetree Shores, Inc. (Divi)	Renewal	FY08
VI0040231	St. Croix Financial Center (Green Cay Marina)	Renewal	FY08
VI0000051	VIWAPA St. Croix	Renewal	FY09
VI0040878	Reef Associates	Renewal	FY08
VI0050032	Coakley Bay Condos	Renewal	-
VI0050318	Chris Powers Residence	New	-
VI0040151	Westin St. John Hotel	Modification	-
VI0040525	Little St. James	Modification	-
VI0040843	Sea Star (Doug Stewart)	AOE	FY08
VI0040649	Texaco Tutu Service Station	AOE	-
VI0080080	Luvenlund Housing	Renewal	-
VI0039829	Frenchmans' Reef	Modification	-
VI0050253	Richard Borck Residence	New	-
VI0080063	Raphune Vistas	New	-
VI0000051	WAPA-Richmond	Renewal	-
VI0040452	WAPA STJ	Renewal	-
	Tutu Groundwater Remediation	Renewal	-
	Wallace Leopold	New	-
VI0050226	Gentle Winds	New	-
VI00400291	Coral World	Modification	-
VI0040835	Cruz Bay POTW	Renewal	
VI0002003	Mangrove Lagoon POTW	Renewal	
VI0020044	Francois (Red Point)	Renewal	
VI0020036	Nelthropp (Anguilla)	Renewal	
VI0020052	CVL (Cruzan VIRIL Ltd.)	Renewal	FY08
VI0080012	Bolongo Bay Beach Resort	New	-
VI0040801	Hull Bay Hideaway	Renewal	FY08
VI0040746	Market Square East WWTP	Renewal	FY08
VI0080004	Secret Harbour House III	New	-
VI0040444	Dorothea Beach Condos	Renewal	FY08
VI0080021	Dvergstem Company Inc. (LIMA)	New	-
VI0040584	Essence Properties	New	-
VI0039870	American Yacht Harbor	Renewal	FY09
VI0080055	Calabash Boom WWTF	New	

VI0080039	Windswept Villas	New	
VI0000060	St. Thomas WAPA	Renewal	FY09

Construction General Permit Coverages – FY08

TPDES Permit #	Project Name	Island
VIGSA0001	Reliance Housing (Calabash Boom)	STJ
VIGSA0002	K & C Development	STT
VIGSA0003	Villa Green Leaf	STX
VIGSA0004	Ahmed Abdulghani (#52 Hannah's Rest)	STX
VIGSA0005	Zenon Construction at Herman Hill	STX
VIGSA0006	Stanford Airport Project	STX
VIGSA0007	Island Crossing – Home Depot Project (Clearing Only)	STX
VIGSA0008	Caribbean Petroleum	STT
VIGSA0009	Christiansted Bypass Project	STX
VIGSA0010	WMA - Susannaburg Transfer Station	STJ
VIGSA0011	Santa Cruz Development Project – Estate Mt. Pleasant	STX
VIGSA0012	Raphune Vistas	STT
VIGSA0013	Golden Gaming Project	STX
VIGSA0014	Greathouse Estates	STT
VIGSA0015	Spring Gut Road Project	STX
VIGSA0017	Montpellier Small Farm Subdivision	STX

Construction General Permit Coverages – FY09

TPDES Permit #	Project Name	Island
VIGSA0018	St. Thomas Regional Library & Archives Center	STT
VIGSA0019	Department of Public Works – Scenic Drive Road	STX
VIGSA0020	All Saints Cathedral School Athletic Field	STT
VIGSA0021	VI Housing Authority – Louis E. Brown	STX
VIGSA0023	Frank C. Pollara Group LLC	STX
VIGSA0025	Hasmukh Ruparelia	STX
VIGSA0027	Island Crossing Development	STX
VIGSA0029	Department of Public Works – Queen Mary Highway	STX
VIGSA0031	North Shore Partners, Inc. – Estate Pearl Subdivision	STX
VIGSA0033	DIAGEO USVI (Distillery)	STX
VIGSA0035	GEC, LLC – Carlton Condos	STX
VIGSA0037	Sunny Isles Developer, LLC.	STX
VIGSA0039	DIAGEO USVI (Warehouse)	STX

VIGSA0041	Raymond Berkeley – Concordia Subdivision	STX
VIGSA0043	Jay-Ro-Mar, Inc. – Carlton Subdivision	STX
VIGSA0045	Jay-Ro-Mar, Inc. – Bonne Esperance Subdivision	STX

TPDES Compliance Inspections:

A schedule of compliance evaluation inspections (CEI) and compliance sampling inspections (CSI) is incorporated into the WPC program work-plan. In general, DEP staff conducts a CSI at major facilities and POTWs annually. Generally, facilities with minor permits receive only an annual CEI.

Table II.C.2 Summary of TPDES Activities, FY2008 - 2009

FY2008	St. Thomas/St. John	St. Croix
CEI	29	8
CSI	7	4
Supplementary	4	4

FY2009	St. Thomas/St. John	St. Croix
CEI	41	10
CSI	7	5
Supplementary	4	4
SCI	2	9

Additional inspections are conducted at the Territorial POTWs, including the major and minor pump stations. These inspections are scheduled quarterly.

Table II.C.3 Supplementary POTW Inspections: TPDES Activities, FY2008 - 2009

FY2008 and FY2009

Facility Name	Permit #	Type	Quarter
St. Thomas Pump Stations	VI0039811 VI0039977 VI0020044 VI0002003 VI0020133	PSI (C)	1 st -4 th
St. John Pump Stations	VI0040835 VI0040266	PSI (C)	
St. Croix Pump Station	VI0020036	PSI (C)	

Legend

C-Compliance Evaluation Inspection
 S-Compliance Sampling Inspection
 AOE-Affidavit of Exemption
 PSI-Pump Station Inspections
 MMI-Multi-Media Inspection
 ECS-Enforcement Case Support

2. Other Ambient Monitoring Activities

As part of the Ambient Monitoring Program, the DEP staff takes part in reviews of the Environmental Assessment Reports (EARs) submitted by individuals or groups seeking to acquire land development or earth change permits within the Coastal Zone. EARs are submitted to the DPNR-Division of Coastal Zone Management (CZM), which, in turn, distributes them to various divisions for review. If the CZM permittee's application involves potential impacts to Waters of the U.S. Virgin Islands, a Water Quality Certificate is necessary as part of the CZM Water Permits.

During this reporting period, certificates that were issued are as follows:

Table II.C.4 Summary of Issued Water Quality Certificates, FY 2008 - 2009

FY2008*St. Croix District*

There Water Quality Certificates were issued for the St. Croix District for FY2008.

St. Thomas/St. John District

Applicant	Water Quality Certificate #
Ethel Bryan (Inner Brass)	WQT-08-001(L&W)
Compass Point Marina	WQT-08-002(W)
Thatch Cay, LLC	WQT-08-003(L&W)
Island Green, LLC	WQT-08-004(W)
Essence Properties, LLC	WQT-08-005(W)
Island Tri-Corp, Inc.	WQT-08-006(W) - Cancelled

FY2009*St. Croix District*

Applicant	Water Quality Certificate #
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Golden Resorts LLP	WQC-09-001(L&W)
William and Punch, LLC	WQC-09-002(L&W)
Bryan's Marine Service, LLC	WQC-09-003(W)
Robin Bay Realty, LLC	WQC-09-004(W)

St. Thomas/St. John District

Applicant	Water Quality Certificate #
Marriott Ownership Resorts	WQT-09-001(W)
Wyndham Sugar Bay Resort & Spa	WQT-09-002(W)
Tri-Island Corp.	WQT-09-003(W)
West Indian Company, Ltd.	WQT-09-004(W)

3. Enforcement Actions

Violations within the TPDES program can come from non-compliance with permitted effluent limits, or failure to report monitoring as required by the permit. This includes any special conditions contained within the permit. For example, St. Croix POTW permit requires the permittee to take several specific actions in the event of a bypass. Violations issued by DEP during this reporting period were:

Table II.C.5 Summary of TPDES Enforcement Activities, FY 2008 - 2009

FY2008

Against	Type	Status
HOVENSA	NOV	Pending
Reliance Housing	AO	Served; Settled
WAPA St. Croix	NOV	Pending
WMA	NOV	Served
Magens Point	NOV	Settled; Consent Agreement
Heavy Materials	NOV	Negotiations On-Going

FY2009

Against	Type	Status
Caneel Bay		NOV drafted
HOVENSA LLC		NOV drafted
St. Croix POTW		NOV drafted
VI National Guard (STX)		NOV drafted
Sunset Grill (unpermitted discharge)		NOV drafted
Divi Carina Bay Resort		NOV drafted
VI WMA		NOV drafted
Giant Gas Station (TFL)		NOV drafted
Boynes Trucking & 3RC (TFL)		NOV drafted
Salvage (vessel – oil spill)		NOV drafted
VIWMA (LBJ)	Administrative Order	Settlement Conference (Sept. 15, 09)
Food Center	NOV	Settlement Conference (May 7, 09)

WPC continued to participate in the Department of Justice Teleconferences which discussed the Department of Public Works/Waste Management Authority's compliance with the Consent Decree.

Storage and Retrieval Program (STORET)

During this reporting cycle, DPNR-DEP began using the WQX_Web Template to catalog its water quality monitoring data. Once populated DPNR-DEP uploaded it to the Water Quality Exchange from which it can be queried using StoRet.

Comprehensive Watershed Restoration Action Strategy

USEPA guidelines request each state to develop a "comprehensive watershed assessment strategy." The Department of Planning and Natural Resources continues to work towards its plans to implement this assessment in the current multi-year monitoring strategy.

D. Non-Point Source Program

Non-point source pollution, in the form of polluted runoff, impairs more water bodies than any other source of pollution in the Virgin Islands. Non-point source pollution in the Virgin Islands is caused by rainfall moving over and through the ground. As runoff moves, it picks up and carries away both natural pollutants and pollutants resulting from human activities. These pollutants include sediments, nutrients, pesticides, and toxic substances such as hydrocarbons and heavy metals. Eventually these pollutants are deposited in wetlands, coastal waters and ground water.

There are numerous problems associated with non-point source pollution. Two of the major non-point source problems affecting the Virgin Islanders are sedimentation and bacterial contamination.

- Sedimentation occurs when soil is eroded from the land surface, such as at construction sites,

and deposited onto the land surface or into coastal water bodies. Sedimentation results in problems such as habitat losses and marine life mortality.

- Bacterial contamination from sources such as failed septic systems, runoff from animal operations, and sewage discharged from boats can cause serious threats to human health

THE NPS PROGRAM ACTIVITY MEASURES:

1. Waterbodies identified by States (in 2000 or subsequent years) as being primarily nonpoint source-impaired that will be partially or fully restored (cumulative).

There are fourteen waterbodies identified with established total maximum daily loads (TMDL) as listed below:

<u>TMDL Water body</u>	<u>TMDL Impairment</u>	<u>TMDL Established</u>
Benner Bay	Dissolved Oxygen	Sept 30, 2003
Benner Bay Lagoon	Dissolved Oxygen	
Mangrove Lagoon	Biological Oxygen Demand	
Salt River Bay	Dissolved Oxygen	Sept 24, 2004
Salt River Bay Lagoon	Dissolved Oxygen	
Salt River Lagoon, Marina	Dissolved Oxygen	
Salt River Lagoon, Sugar Bay	Dissolved Oxygen	
Great Cruz Bay, St. John	Oil & Grease	Sept, 29 2005
Red Hook Bay, St. Thomas	Oil & Grease	
Hassel Island at Haulover Cut to Regis Point, St. Thomas	Oil & Grease	
Mangrove Lagoon, St. Thomas	Fecal Coliform	
Benner Bay, St. Thomas	Fecal Coliform	
Limetree Bay, St. Thomas	Fecal Coliform	
Magens Bay, St. Thomas	Fecal Coliform	
Vessup Bay, St. Thomas	Fecal Coliform	Sept 19, 2006
Hassel Island at Haulover Cut to Regis Point, St. Thomas	Fecal Coliform	
North Shore St. Croix Assessment Units	Phosphorus, Biological Oxygen, Fecal Coliform, Sediment Oxygen Demand, Total Suspended Solids, Enterococcus Bacteria	Sept 26, 2007

*No TMDLs were established during this reporting period, FY2008-2009

2. Reduction in amount of total sediment loadings (in tons).

Not measured and quantified – currently revising the multi-year monitoring strategy to assess sediment reductions. Additionally a contract is being developed for the characterization of guts (intermittent streams), within watersheds feeding a TMDL waterbody, in relation to their location, daily flow, and condition (Manning’s roughness coefficient). The contractor, Tetra Tech Inc, of Fairfax, Virginia is scheduled to begin work during the second quarter of FY10.

3. Reduction in amount of total nitrogen loadings (in pounds).

Not measured and quantified – currently revising the multi-year monitoring strategy to assess nitrogen reductions. Additionally a contract is being developed for the characterization of land use coefficients for use in determining NPS pollution loadings for parameters such as Biological Oxygen demand, nutrients (particularly nitrogen) sediment, bacteria, oil/grease, and impervious surfaces. The contractor, Tetra Tech Inc, of Fairfax, Virginia is scheduled to begin work during the second quarter of FY10.

4. Reduction in amount of total phosphorus loadings (in pounds).

Not measured and quantified – currently developing a multi-year monitoring strategy to assess load reductions. See discussions under items 2 and 3 above.

5. Number of watershed-based plans (and water miles/acres covered), supported under state Nonpoint Source Management Programs since the beginning of FY’02 that have been substantially implemented.

Two watershed-based plans have been substantially implemented.

Fish Bay Watershed Management Plan, St. John) - 4.2 gut miles (water miles) covering 1,487.6 acres. The Fish Bay watershed is experiencing rapid residential development and corresponding impacts from uncontrolled erosion, sediment and stormwater. VI RC&D was contracted by the V.I. Department of Planning & Natural Resources Coastal Zone Management Program (DPNR-CZM) to assist in designing and implementing best management practices (BMPs) to mitigate pollution in the Fish Bay watershed. The primary goal of the project was to develop a Comprehensive Road Stabilization Plan with Best Management Practices. For more details please visit <http://www.usvircd.org/FishBayPhoto/Gallery/index.htm>

The Coral Bay Watershed Management Plan was finalized in March 2008 through a collaborative effort of multiple local and Federal agencies, the Coral Bay Community Council (CBCC), and many local land owners and developers -- to serve as a guide for developing ways to protect Coral Bay from sediment and stormwater pollution. The plan provides a

comprehensive set of objectives and actions that address land use planning, protection and restoration of sensitive lands and aquatic buffers, better site design and construction techniques, and effective stormwater management. Please note that the selected example sites are representative; there are many more sites in Coral Bay that deserve equal attention. This plan document is being used now as a helpful outline to undertake detailed actual multi-agency and community discussions to plan activities and prioritize actions on achieving the objectives. The EPA CARE grant being received by CBCC for 2009 and 2010 will bring stormwater expertise to Coral Bay expressly to implement the plan. The plan can be reviewed at <http://www.coralbaycommunitycouncil.org/watershed.htm>. The Coral Bay watershed is

- 5th largest watershed in VI: 3003 ac.
- Fastest developing area in VI
- 79% growth rate 1990-2000 Census
- 750+ residents in 2000
- 5% developed – Huge potential
- Area of Particular Concern
- Coral Reef National Monument
- Longest V.I. fringing mangrove
- 100's of acres of wetlands, coral reefs and seagrass beds

PROGRAM ACCOMPLISHMENTS

The NPS program can be subdivided into three sections:

1. Program Management to include development of total maximum daily loads (TMDLs)¹ implementation plans and restoration plans for Virgin Island's impaired waters; GIS capacity building, etc.
2. Section 319(h) nonpoint source control grants program; performs water quality restoration and educational projects
3. Earth Change permitting program in the second tier of the coastal zone.

Program Management

New Policies and Procedures were implemented during this reporting period as follows:

- Assessment of V.I. Zoning and Subdivision Code
 - The assessment was funded by \$35,000.00 by DPNR's Division of Comprehensive and Coastal Zone Planning (CCZP), and was completed in FY09. The assessment undertaken by Stuart Meck of Rutgers University and Marya Morris of the Chicago-based Duncan and Associates provided DPNR with critical findings and recommendations that would allow the Department to update and revise the close to forty year old zoning code. Of special interest to the NPS program are the following issues to be addressed:
 - Hillside development
 - Environmental and aesthetic controls

¹ A TMDL is calculation of the maximum amount of a pollutant a water body can receive and still meet water quality standards.

- Mixed uses
 - Conflicts among definitions, (such as those for mezzanines)
 - Natural hazards
- Rules and regulations for telecommunication facilities
 - In January 2009, the NPS program provided input into the development of draft due to the lack of standards and regulations in the V.I. Code that address such facilities. The first draft of the rules and regulations was completed and placed in the public domain in June 2009, when public hearings were conducted for feedback on same June 10-12, 2009. Thereafter, as a follow-up to the territorial public hearings that were conducted by the Planning Division in June, staff facilitated a workshop that was conducted on August 28, 2009 with stakeholders of the telecommunication industry, environmental groups, senators, attorneys and other interested persons, to garner their input in finalization of the draft rules and regulations prior to submittal to the Governor and the Office of the Attorney General.
- Small Wind Energy System Ordinance.
 - In conjunction with the VI Energy Office and as part of the Wind Energy Work Group, completed the final draft instruction sheet for applicants. The Application Guidelines Alternative Energy System will be used to ensure that applicants are made aware “up-front” the various permits and clearances
 - In conjunction with the VI Energy Office, and as part of the Wind Energy work group, completed the draft final version of the “Small Wind Energy System Ordinance.” The significant regulations as it relates to the earth change permitting program are as follows:
 - Tower Height: For all property sizes, the tower height shall be limited to 80 ft., provided that the application includes evidence that the proposed height does not exceed the height recommended by the manufacturer or distributor of the system.
 - Set-back: The setback of small wind energy systems from adjacent property and utility power lines shall not be less than the total height of the wind energy system. No part of the wind energy system structure, including guy wire anchors, may extend closer than the normally allowable setback distances to the property lines of the installation site as designated for the subject zoning district.
- In conjunction with the University of the Virgin Islands, Department of Agriculture, explored the potential for a “bladed equipment operator” certification program. In addition, the certification program may be expanded to include certification process for site inspectors for storm water discharges.
- In conjunction with UVI, provided input into the development of the USVI Ghut Monitoring project. The final plan on the use of ghut as recreational spaces in the USVI was produced by UVI and included recommendations to DPNR for incorporation into the earth change permitting review process.

- The Departmental Spatial Data Infrastructure Policy was completed and signed by Commissioner Robert Mathes. The policy establishes the following:
 - All departments and programs are encouraged to share GIS data and to make framework data available in ESRI Shapefile format with FGDC based metadata.
 - The DPNR GIS Work Group recommends that all data be submitted for use in a North American Datum of 1983 (NAD83) and a UTM20 North projection
 - All new GIS and CAD information be created using NAD83.
- In conjunction with The Nature Conservancy, and as part of the GIS work group, participated in kickoff meeting of the Conservation Planning for the U.S. Virgin Islands'. This charter of this committee was developed to facilitate the development of a strategy to implement the Conservation Planning process for U.S. Virgin Islands. Products and process outcomes are as follows:
 - Draft Conservation component of the USVI's Comprehensive Land and Water Use Plan.
 - Develop specific maps outlining zoning with regulations, vegetation map, marine and terrestrial use maps, significant natural resources and geological features, priority threats.
 - Transfer of skills and technology for the DPNR to complete the process for the cultural component of the Comprehensive Land and Water Use Plan.

Inter-agency support

Technical assistance was also provided to other DPNR Divisions and Programs, such as Comprehensive and Coastal Zone Planning (CCZP) and the Groundwater Program for Land Development Permit Applications and Land Subdivision/Rezoning.

A total of six hundred and seventy three (673) applications were submitted for review for zoning compliance. Sixty five percent (65%) of the applications reviewed were for residential developments; eighteen percent (18%) for land clearing; ten percent (10%) for other; five percent (5%) for agricultural purposes and two percent (2%) for non-residential developments.

Table II.D.1 Earth Change Summary

Earth Change Permit Applications Reviewed by Use FY 09						
	Residential (New/Addition)	Land Clearing	Non-Residential	Agriculture	Other (fences, roads etc.	Total
No. of Applications	439	124	15	31	64	673

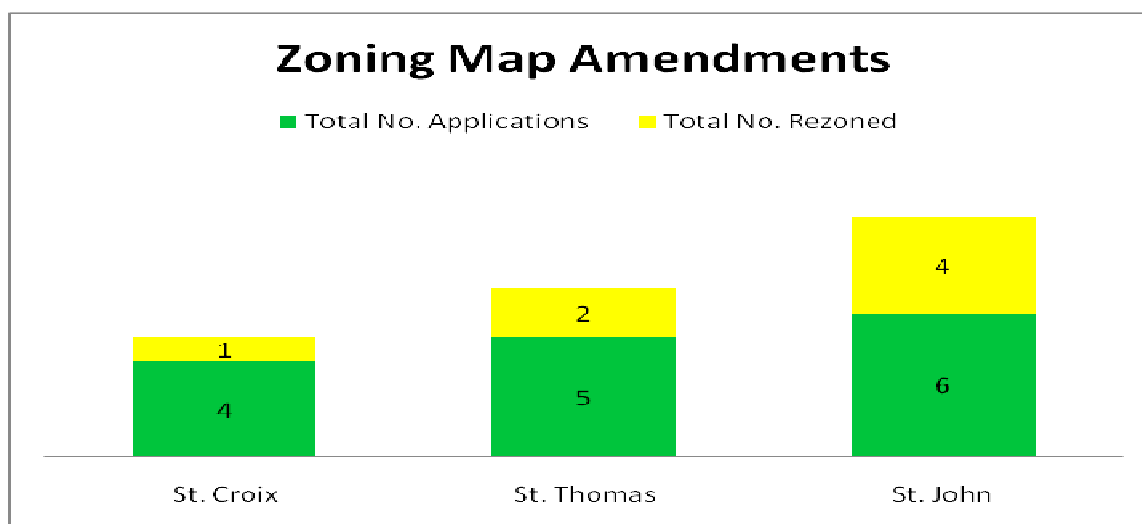
The NPS program also reviewed hydrology reports and provide environmental clearance for land subdivision applications, in support of the Division of Comprehensive and Coastal Zone Planning. Applications were reviewed for wellhead protection area concerns and other hydro-geological parameters such as drainage, ground water availability, septic tank suitability, flood plain concerns,

etc. While the number of applications for subdivision processed this year remained the same as that of last fiscal year, there was a marked increase in the total acreage of property proposed for subdivision and the number of lots proposed for creation in the St. Croix District. The increase in subdivision activity is proposed for the Rattan and Sion Hill areas of St. Croix.

SUBDIVISION APPLICATIONS FY 2009						
Preliminary						
	St. Croix	St. Thomas	St. John	Total		
Received	6	2	2	10		
Approved	6	1	1	8		
Total Lots	119	9	2	130		
Total Acreage	180	5	1	186		
Pending	0	0	0	0		
FINAL						
	St. Croix	St. Thomas	St. John	Total		
Received	2	0	0	2		
Approved	2	0	0	2		
Total Lots	36	0	0	36		
Total Acreage	11	0	0	11		
Pending	0	0	0	0		
PARTIAL FINAL						
	St. Croix	St. Thomas	St. John	Total		
Received	1	0	0	0		
Approved	1	0	0	0		
Total Lots	21	0	0	21		
Total Acreage	5	0	0	5		
Pending	0	0	0	0		
PRELIMINARY/FINAL						
	St. Croix	St. Thomas	St. John	Total		
Received	4	4	5	13		

Approved	4	4	5	13
Total Lots	4	33	2	39
Total Acreage	5	15	1	21
Pending	0	0	1	1

During FY 2009, the NPS Program also participated in pre-application meetings and public hearings for zoning map amendments, in support of the Division of Comprehensive and Coastal Zone Planning. A total of fifteen (15) petitions for zoning map amendments were reviewed. Ten (10) of the fifteen (15) petitions were approved by the 28th Legislature, to include three (3) for St. Croix, three (3) for St. Thomas, and four (4) for St. John. Of the ten applications approved, seven (7) resulted in the rezoning of properties.



Section 319 Contracts

During the reporting period, the NPS management plan was continually updated and reassessed to link the program's implementation goals to the accomplishment of other related programs, including TMDL development, stormwater permitting, and CZARA implementation schedules pursuant to the Coastal Nonpoint Pollution Control Program of the Coastal Zone Management Division

319 Nonpoint Source Pollution Projects 2004 - 2010	Completion Phase
<i>2004 - Continuation and Expansion of the Territorial Biological (UVI)</i> <i>The purpose of this task is to continue the biological monitoring program to track the health of one of our most sensitive and important biological resources – coral reefs.</i> <i>Total award amount \$52,380.00</i>	100%

<p>2004- NPS Pollution for St. Croix Youths - Center for Marine & Environmental Studies (UVI) <i>The purpose of this task is to help reduce nonpoint source pollution and increase awareness of NPS pollution among students. – Complete</i> Total award amount \$57,408.00</p>	100%
<p>2004 - Nonpoint Source Pollution Committee Operating-Budget(UVI) <i>The NPS Pollution Control Committee was created in 1992 to provide oversight to the DEP- NPS Program, as stipulated in the 1989 VI NPS Management Plan. The committee operated on a shoestring budget with the primary participating agencies (DPNR,UVI/CES, USDA, VIRC&D) providing funds for materials, supplied travel out of their individual budget.</i> Total award amount \$9,984.00</p>	100%
<p>2004 – (DOA & DPNR) Environmental Quality Incentive Program (EQIP) <i>goal is to install agricultural Best Management Practices to reduce nonpoint source pollution. The USDA-EQIP program is a cost shared program with the farmer whereby the farmer is responsible for a prescribed percentage of the cost.</i> Total award amount \$30,000.00 <i>DEP staff is waiting for a report from the Department of Agriculture. DOA matched DPNR award for the availability of funding for the Farmers.</i></p>	unknown%
<p>2004 - Clean Marinas Program – (DEP)In-House Project- Completed by the Water Pollution Program (STT) <i>To provide technical advice and educational material for marinas which would lead to a reduction in marina related pollution.</i> Total award amount \$22,000.00</p>	100%
<p>2005 -2009 Nonpoint Source Pollution Conservation School – <i>The objective of this program was to increase the level of environmental awareness among Virgin Islands public schools and to encourage schools to manage resources in their school grounds to help mitigate Nonpoint Source Pollution.</i> Total award amount \$52,000.00 - 13 Schools in the territory received \$4,000.00 each – All of the schools have completed their proposed task (8) St. Croix & (5) St. Thomas</p>	100%
<p>2005 – 2009 VI Nonpoint Source Pollution Conference – <i>Objective of this conference is to increase public and private sector awareness of nonpoint source pollution issues in the VI and to inform and educate regulators, businesses and contractors in the proper design of BMP's to reduce or mitigate NPS pollution.</i> Total award amount \$30,000.00 The Conference was held on May 6&7, 2010 in St. Thomas @ the</p>	100%

Wynham Sugar Bay Resort & Spa.	
2005 – 2009 Estate Adventure Gut Restoration Demonstration Project The purpose of this project is to restore riparian habitat and natural stream channel function in a designated corridor/buffer adjacent to the Estate Adventure Gut and Nature Trail. Total award amount \$26,840.00	100%
2009-2010 TMDL data development and gut characterization in priority bays and watersheds in the USVI by TetraTech, Inc. a). Characterization of land use coefficients for use in determining non-point source pollution loadings for parameters such as Biological Oxygen Demand, nutrients (particularly nitrogen), sediment, bacteria, oil/grease, and impervious surfaces b). Characterization of guts within watersheds feeding a TMDL waterbody in relation to their location, daily flow, and condition (Manning's roughness coefficient) Total award amount (\$60,643)	0%
VI Wellhead Protection Program Actualization Project by Rural Community Assistance Program (RCAP), Inc Prioritization of WHPP Total award amount (\$32,640)	80%

Earth Change Permitting

An earth change permit is required before any real property can be cleared, graded, filled, or otherwise disturbed. Erosion and sedimentation resulting from improper construction and land clearing activities has been identified as the major nonpoint source problem in the Virgin Islands. The earth change permitting program is designed for residential development; facilities an acre or less in size. Larger facilities will be regulated under the Stormwater permitting discussed under Task 4 below. The earth change permitting program will emphasize the implementation of non-point source pollution controls, including sediment control, erosion mitigation measures, and protection of coastal and ground water resources.

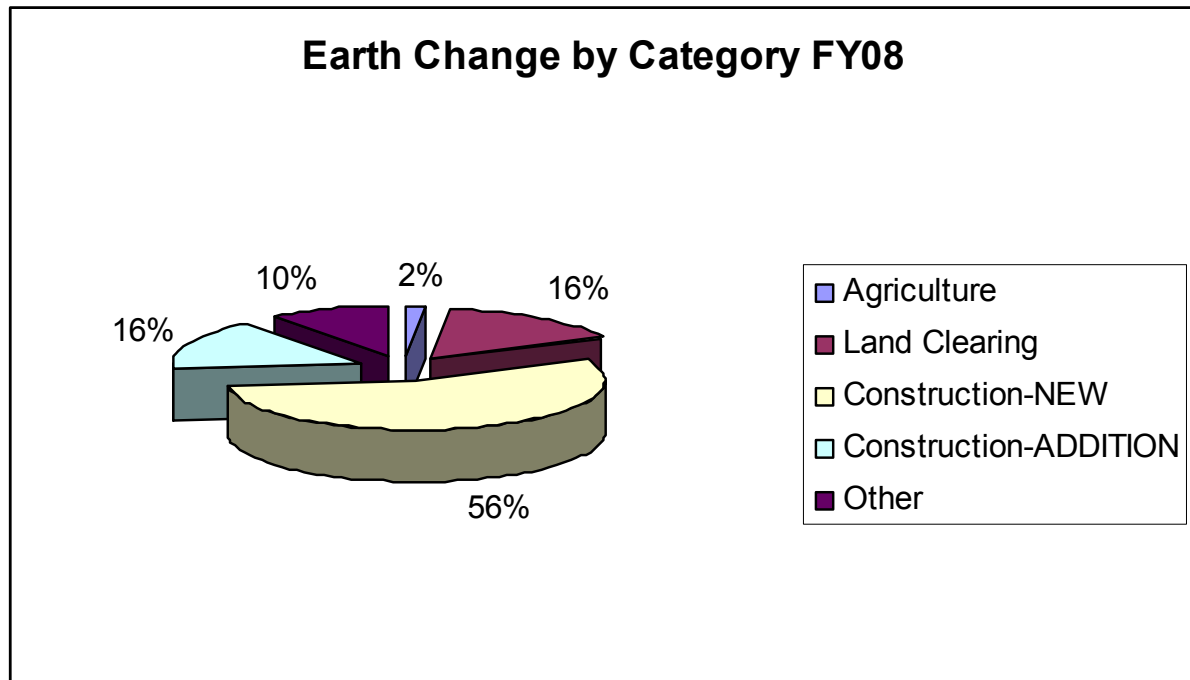
The total number of earth change permits issued during this reporting period are as follows:

Earth Change Summary

District	Earth Change Applications Reviewed	Earth Change Applications Approved	Earth Change Applications Denied
St. Croix	10/08-9/09: 408 10/07-9/08: 512	10/08-9/09: 408 10/07-9/08: 512	10/08-9/09: 0 10/07-9/08: 0

St. Thomas/St. John	10/08-9/09: 259 10/07-9/08: 302	10/08-9/09: 259 10/07-9/08: 302	10/08-9/09: 0 10/07-9/08: 0
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The breakdown by category for FY08 is shown below. FY09 exhibits a similar distribution.



Data management

All earth change permits issued were entered into the database. DPNR has contracted Ventera to develop online capabilities for the earth change permitting system. Ventera will provide an enterprise content management solution that will automate the Earth Change Permit Application Process. The project, as proposed, will be initiated in the first quarter of FY10 and is briefly summarized below

	Project: OnBase® Permitting Process- Earth Change Permit Process Date: 10/13/10
CR #: ECM Platform & Building Permit Process- Agency 2 Proposal for EC	Submitted Date: 4/15/2009 Agency 2 Proposal for Earth Change

Requestor: DPNR	Type: New Requirement	Priority: High	Status: Submitted
<p>Business Case: In an effort to reduce resource use and improve the efficiency of the permitting process, the Department of Natural Resources would greatly benefit from implementing the automation of the forms relating to the 'Earth Change Permit Process'.</p> <p>Tasks Undertaken: Ventera will provide an enterprise content management solution that will automate the Earth Change Permit Application Process. The solution will be implemented in the following phases</p> <ol style="list-style-type: none"> 1. Discovery Phase- will include analysis of the existing process and will involve a number of activities geared towards gathering requirements. At the end of this stage a composite requirements document called the 'Discovery Document' will be delivered. 2. Design Phase- will involve the design of the automated workflows, eForms, work queues, decision points. The functional and technical specifications are enumerated and designed during this stage. The deliverable will include a Design Document outlining the specs. 3. Build Phase – Following the approval of the Design Document by DPNR, Ventera will create the eForms, work queues and work flows in the existing OnBase environment. 4. Training Phase - will be done in two parts: customer training and system testing. The goal is to prepare and educate the business users on how to interact with the solution. The training will be followed by the user acceptance testing which will include an end-to-end test plan that incorporates all facets of the solution. Simultaneously, we will conduct training to educate end-users on how to interact with the solution. The deliverables at this stage will include a training and UAT plan. The users will given test plans to test various scenarios that they face in there day to day operations 5. Roll Out Phase - Ventera will move the development/testing environment to the production OnBase server. Ventera will also work with DPNR to 'turn on' the application to the internal DPNR users and to its customers. 			
<p>Impact Statement: The Earth Change Process will reside on the existing On Base Building Permit Process hardware and network infrastructure. No additional hardware or software is required since DPNR has already invested in the existing system. Through the use of electronic forms and automated workflows DPNR Earth Change will realize a significant improvement in process flow and functionality. External users will be able to submit forms and receive notifications all electronically once the system is in production.</p>			
<p>Affected Artifacts/Documentation:</p> <ul style="list-style-type: none"> ▪ Earth Change Permit Application Form I- Gut Clearing/Brush Clearings Only 		<p>Affected Lines of Code: This section is not applicable for the proposed solution.</p>	

<ul style="list-style-type: none"> ▪ Earth Change Permit Application Form II- Single Residential Lot ▪ Earth Change Permit Application Form III- Major Development ▪ Cashier Transmittal Form 	
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Issues/challenges encountered during this reporting period.

1. Onsite Sewage Treatment System Regulations

Septic System regulations and regulatory authority needs to better defined for second tier of the coastal zone. Currently there is overlapping and conflicting jurisdictions between the Waste Management Authority, Department of Health, and DPNR in the various statutes and regulations. There is a need to develop permitting process to include monitoring and pump out requirements.

2. Staffing needs

The Nonpoint Source program has developed an earth change action plan (during FY08) in an effort to improve on the earth change permitting and enforcement process. The action plan calls for two new positions within the Earth change program to facilitate timely review of applications and increased earth change enforcement actions. Implementation of the “Save our Soils” (SOS) initiative, partly through the adoption and implementation of the Earth Change Action Plan by management. The plan is comprised the following:

- Increase Enforcement capability – need to revise regulations especially with respect to issuance of administrative orders and stop work orders.
- Increase Inter-Divisional Permit Review – TMDL/Stormwater review in TMDL watersheds; septic system requirements and performance standards for water treatment plants; development in the floodplain, etc.

3. TMDL implementation

The NPS program was not able to facilitate the interdisciplinary approach necessary to achieve successful implementation of the TMDLs developed to date. The most fundamental element that will make the TMDL implementation more effective will be the involvement and integration of the different federal and local agencies and the citizens.

4. Driveway Permit

Beginning on May 7, 2008, attempted to address the subject of driveway permits for access onto public roads as many public roads on St. Thomas are being undermined by improperly constructed driveways. The issue at hand is the definition of what constitutes a “public road” versus an “estate road”. It was finally determined that an earth change permit will be issued without the requisite driveway permit, and it is the applicant’s responsibility to obtain a driveway permit from the Department of Public Works.

E. Solid Waste Program

Under Section 1553(g) of the Virgin Islands Code, the US Virgin Islands Government DPNR is authorized to enforce provisions related to environmental effects of waste disposal, resource recovery and hazardous wastes. Pursuant to Section 1560 of the Virgin Islands Code, the Commissioner of DPNR exercised his authority to promulgate rules and regulations for a Used Oil Collection Program under Title 19, Part VI, Chapter 56 of the Virgin Islands Rules and Regulations.

Within three years after its inception, the Used Oil Program issued more than 173 permits to facilities territory-wide. These permits were only valid for three years, and subsequently expired. Facilities are, therefore, required to submit updated information regarding their used oil management, and renew the permits to generate, store or transport used oil every three years.

The tables below provide a listing of used oil permits by District. All of the permits are listed to reflect the universe of facilities that have been issued permits to date, even if some permits are currently expired. Several businesses have become defunct since the previous reporting period or are no longer generating used oil, and those facilities are no longer included in the database.

One of the objectives of the Solid Waste Program's enforcement strategy is to pursue enforcement against facilities that have failed to renew their permits. Pursuant to Tile 19 of the Virgin Islands Code, these facilities will be issued a Notice of Noncompliance initially, and enforcement will be escalated if compliance is not achieved within the corrective action period.

F. Oil and Hazardous Materials

1. Underground Storage Tank Program

The Underground Storage Tank Program has undergone management changes during last few years and has undergone a considerable amount of progress during this time. Draft regulations are in development to support the Underground Storage Tank Act (12 V.I.C. §§ 651-684) that authorizes the Virgin Islands Department of Planning and Natural Resources to manage the underground storage tank program. A permitting program was implemented by 12 V.I.C. §§ 658-660 in order to better track UST systems and their compliance status. The program requires all UST facilities to apply for permits to use/operate, upgrade, and close their systems; in addition EPA notifications are required with each application.

Presently, compliance is the main ambition of the UST program. DPNR is working with each service station to promote compliance efforts in terms of financial responsibility and sufficient leak detection monitoring. These issues are important to ensure the protection of the island's groundwater and DPNR is working to ensure that satisfactory leak detection monitoring will be conducted in the future. In doing so, DPNR intends to determine the full extent of leaking USTs within the territory.

The Leaking Underground Storage Tanks (LUST) program is an important issue to be addressed. The program is implemented, however, the status list needs to be updated on a continuous basis. DPNR was awarded \$80,000 in ARRA funds to address the LUST Sites.

The LUST list to date is as follows:

St. Croix

1. Texaco-Midway s/s
2. Esso-Estate Glynn
3. Esso-Farmingdale s/s
4. Esso-Estate Mint s/s
5. Esso-Hassan s/s
6. LaRaine s/s

St. Thomas

1. Esso-Devcon
2. Esso-Gottlieb s/s
3. Esso-One Stop Sugar Estate s/s

St. John

None to date.

DPNR is investigating the status to date on each of these sites.

UST enforcement is in full force. A Civil Action Penalty Matrix was drafted for the program and an enforcement policy has been initiated. DPNR has issued numerous Notices of Violation.

2. The Used Oil Program

Table II.E.1.a List of Used Oil Permit Holders – St. Thomas-St. John District

238T	12/31/2011	Carty's Auto Repair, Inc.	St. Thomas
237T	12/31/2010	M &S Auto Inc	St. Thomas
224C	12/31/2010	VI Recycling Company	St. Thomas
223T	12/31/2009	Joel's Auto Repair Tech	St. Thomas
220T	12/31/2009	Amalie Car Rental	St. Thomas
128T	12/31/2009	Trans Caribbean Dairy	St. Thomas
125J	12/31/2009	Varlack Ventures, Inc	St. John
120T	12/31/2009	Automotive Enterprises Inc. dba Midas	St. Thomas
118J	12/31/2009	P&S Trucking & Water Delivery	St. John
109T	12/31/2009	U.S. Postal Service Aubrey C. Ottley Branch-GPO	St. Thomas
039T	12/31/2009	It's Black It's White	St. Thomas
201J	12/31/2008	Pimpy's Trucking	St. John
200T	12/31/2008	MOF VI Limited Partnership/DBA American Yacht Harbor	St. Thomas
138T	12/31/2008	Discount Water Deliveries and Trucking Services	St. Thomas
131T	12/31/2008	University of The Virgin Islands	St. Thomas

126T	12/31/2008	Crowley Liner Services (STT)	St. Thomas
089T	12/31/2008	Lennards Auto Repairs	St. Thomas
076T	12/31/2008	Sapphire Beach Resort Marina	St. Thomas
056T	12/31/2008	N & S Auto Services	St. Thomas
188T	12/31/2007	Lew Henley's Sewage Disposal L.L.C.	St. Thomas
158T	12/31/2007	VI Cement and Building Products Inc.	St. Thomas
151T	12/31/2007	Matthews Auto Repairs	St. Thomas
150T	12/31/2007	VI Recycling Company	St. Thomas
149T	12/31/2007	Castillo Auto Repair	St. Thomas
146T	12/31/2006	Innovative Telephone	St. Thomas
145T	12/31/2006	Antilles Gas (STT)	St. Thomas
143T	12/31/2006	Sanitary Trashmoval Services Inc.	St. Thomas
142T	12/31/2006	Cowpet Bay West	St. Thomas
140T	12/31/2006	Chuck Kline Water	St. Thomas
139T	12/31/2006	Challenger's Transport	St. Thomas
137T	12/31/2006	Tutu Texaco Service Station Inc	St. Thomas
136T	12/31/2006	Pueblo Supermarket	St. Thomas
135T	12/31/2006	Bohlke International Airway, Inc.	St. Thomas
134T	12/31/2006	Air St. Thomas	St. Thomas
133T	12/31/2006	Air Center Helicopters	St. Thomas
132T	12/31/2006	Ritz-Carlton Resort	St. Thomas
130T	12/31/2006	United Brothers Trucking	St. Thomas
129J	12/31/2006	O' Connor Car Rental*	St. John
129J	12/31/2006	St. John Development dba Texaco	St. John
125T	12/31/2006	Motor Trend	St. Thomas
124T	12/31/2006	Amco Auto Sales & Service Inc.	St. Thomas
123T	12/31/2006	Compass Point Marina, Inc.	St. Thomas
122T	12/31/2006	V.I. Housing Authority	St. Thomas
121T	12/31/2006	Wyndham Sugar Bay Resort	St. Thomas
119T	12/31/2006	Metro Motors	St. Thomas
117T	12/31/2006	Four Star Aviation, Inc.	St. Thomas
116T	12/31/2006	Dependable Car Rental	St. Thomas
114T	12/31/2006	Florida Coca Cola Bottling Comp.-St. Thomas	St. Thomas
113J	12/31/2006	Boyson Inc	St. John
112T	12/31/2006	VI Enterprises, Inc. (Avis)	St. Thomas
111T	12/31/2006	Auto Excellence	St. Thomas
110T	12/31/2006	Domino Oil Co. Inc.	St. Thomas
108T	12/31/2006	American Eagle dba Executive Airlines	St. Thomas
106T	12/31/2006	V.I. Department of Public Works (Bovoni)	St. Thomas
105J	12/31/2006	Public Works (Susannaberg)	St. John
105J	12/31/2006	V.I. Department of Public Works (St. John)	St. Thomas
104TT	12/31/2006	V.I. Department of Public Works (Subbase) Trans	St. Thomas

104T	/12/31/2006	Public Works (#8 Subbase)	St. Thomas
104T	12/31/2006	V.I. Department of Public Works (Sub Base)	St. Thomas
103T	12/31/2006	The Auto Clinic	St. Thomas
102T	12/31/2006	La Vida Marine Center L.P/B.J. Management *	St. Thomas
101T	12/31/2006	Patrick Charles Enterprises Inc.	St. Thomas
099T	12/31/2006	Heavy Materials (formerly St. Thomas Concrete)	St. Thomas
098T	12/31/2006	Western Auto Supply Co (STT)	St. Thomas
098J	12/31/2006	Caneel Bay Resort	St. John
097C	12/31/2006	Buccaneer Hotel	St. Thomas
096T	12/31/2006	Bussue Auto & Repair	St. Thomas
092T	12/31/2006	School Busing, Inc	St. Thomas
080T	12/31/2006	V.I. Port Authority, Transportation (STT)	St. Thomas
101T	12/31/2005	Valrick Charles Enterprises, Inc.	St. Thomas
100T	12/31/2005	Ge-Tech Auto Repair	St. Thomas
094T	12/31/2005	Hertz Rent A-Car	St. Thomas
091J	12/31/2005	Barry's Auto Service Center	St. John
090T	12/31/2005	Contran Resorts, Inc. dba Mahogany Run Golf Course	St. Thomas
090T	12/31/2005	Mahogany Run	St. Thomas
088J	12/31/2005	E. C. Gas & Service Station, Inc.	St. John
087J	12/31/2005	Westin St. John Hotel Company, Inc	St. John
079T	12/31/2005	Marriott Frenchman's Reef & Morning Star Beach Resort	St. Thomas
077T	12/31/2005	CTF Hotel Management Corp	St. Thomas
077T	12/31/2005	Grand Beach Palace *	St. Thomas
075T	12/31/2005	A.J. System	St. Thomas
075T	12/31/2005	SK Cove	St. Thomas
073T	12/31/2005	American Yacht Harbor Marina	St. Thomas
072TT	12/31/2005	VI Regulated Waste Management, Inc	St. Thomas
069TT	12/31/2005	Green Hornet Environmental Management Inc	St. Thomas
068T	12/31/2005	Budget Car Rental	St. Thomas
067T	12/31/2005	Yacht Haven (Long Bay Partners)	St. Thomas
066T	12/31/2005	John's Auto Center, Inc.	ST. Thomas
065T	12/31/2005	Community Motors, Inc.	St. Thomas
063T	12/31/2005	Crown Bay Marina	St. Thomas
061J	12/31/2005	Coral Bay Marina Services, Inc.	St. John
052T	12/31/2004	Gas Station Auto Repair	St. John
051T	12/31/2004	HI Performance Auto Repair	St. Thomas
049T	12/31/2004	Tropical Marine, Inc.	ST. Thomas
047T	12/31/2004	Diesel Dynamic Plus, Inc.	St. Thomas
046T	12/31/2004	Sun, Sea & Sand Leasing & Sales	St. Thomas
041T	12/31/2004	East End Wreck Shop	St. Thomas
037T	12/31/2004	Caribbean Auto Mart	St. Thomas
037R	12/31/2004	Caribbean Auto Mart, Inc. (STT)	St. Thomas

001T	12/31/2004	Allenton Auto Repairs	St. Thomas
004T	12/31/2003	Nadir Esso Service Center	St. Thomas
* Denotes facilities that have either gone out of business or are no longer generating used oil.			

Table II.E.1.b List of Used Oil Permit Holders – St. Croix District

031C	12/31/2010	H.H. Tire Sales	St. Croix
172C	12/31/2010	Old Time Auto Repair Shop	St. Croix
038C	12/31/2010	St. Croix Dairy Products, Inc.	St. Croix
168C	12/31/2010	Unique Auto Repair	St. Croix
169C	12/31/2010	University of the Virgin Islands	St. Croix
058C	12/31/2010	VI Regulated Waste Management, Inc.	St. Croix
134C	12/31/2009	Abramson Enterprises	St. Croix
144C	12/31/2009	Antilles Gas (STX)	St. Croix
115C	12/31/2009	Bohlke International Airways	St. Croix
160C	12/31/2009	Bunkers of St. Croix, Inc.	St. Croix
131C	12/31/2009	Centerline Car Rental	St. Croix
152C	12/31/2009	David's Auto Repair	St. Croix
165C	12/31/2009	Divi Carina Bay Resort	St. Croix
155C	12/31/2009	Frank's Garage	St. Croix
130C	12/31/2009	Hendricks International, Inc.	St. Croix
145C	12/31/2009	Human Services maintenance	St. Croix
164C	12/31/2009	Innovative Telephone Company	St. Croix
151C	12/31/2009	MARCO St. Croix, Inc. Water and Trucking Services	St. Croix
166C	12/31/2009	Monarch Heavy Equipment Rental	St. Croix
146C	12/31/2009	Olympic Rent-A-Car	St. Croix
153C	12/31/2009	Paradise Waste Systems, Inc.	St. Croix
033C	12/31/2009	Rodney's Auto Repair	St. Croix
141C	12/31/2009	Seaborne Airlines	St. Croix
035C	12/31/2009	St. Croix Foreign Auto Sales Corp	St. Croix
154C	12/31/2009	Tonges Concrete	St. Croix
131T	12/31/2009	University of the Virgin Islands (STT)	ST. Croix
135C	12/31/2009	Virgin Islands Rum	St. Croix
161C	12/31/2009	Welco Gas Station	St. Croix
103C	12/31/2008	Budget Car Rental	St. Croix
071C	12/31/2008	Caribbean Auto Mart St. Croix, Inc.	St. Croix
074C	12/31/2008	Metro Motors	St. Croix
083C	12/31/2008	St. Croix Marine	St. Croix
174CT	12/31/2007	Chitolie Trucking Equipment	St. Croix
170C	12/31/2007	Francis Water Services	St. Croix
175CT	12/31/2007	M & T Trucking	St. Croix

171C	12/31/2007	Ramco Transmission Repair	St. Croix
173C	12/31/2007	Tonn Motor Corp.	St. Croix
006C	12/31/2007	V.I. Department of Public Works (Annas Hope) DIY	St. Croix
148C	12/31/2006	A+ Auto Repair *	St. Croix
143C	12/31/2006	Anthony Auto Repair & Maintenance	St. Croix
126C	12/31/2006	Bates Trucking & Trash Removal	St. Croix
127C	12/31/2006	Better Engine Svc & Tire, Inc.	St. Croix
140C	12/31/2006	Caribout aka Florida Coca-Cola Bottling Company	St. Croix
150C	12/31/2006	Champion Auto Part	St. Croix
163C	12/31/2006	Department of Public Works (Maintenance)	St. Croix
142C	12/31/2006	Europa Motorworks *	St. Croix
136C	12/31/2006	Flemings Transport Company, Inc.	St. Croix
159C	12/31/2006	H & H Avionics	St. Croix
003C	12/31/2006	HOVENSA	St. Croix
132C	12/31/2006	Karim Service Station *	St. Croix
149C	12/31/2006	P.M. Auto	St. Croix
057T	12/31/2006	PM's Auto Inc.	St. Croix
162C	12/31/2006	Roach Auto Service, Inc.	St. Croix
129C	12/31/2006	Thrifty Car Rental	St. Croix
156C	12/31/2006	V.I. Housing Authority (STX)	St. Croix
133C	12/31/2006	V.I. Water & Power Authority	St. Croix
157C	12/31/2006	VI Cement & Building Products, Inc. *	St. Croix
137C	12/31/2006	VI Paving, Inc.	St. Croix
133C	12/31/2006	WAPA Maintenance	St. Croix
128C	12/31/2006	Zenon Construction Corp.	St. Croix
064C	12/31/2005	A & G Tire & Auto Service *	St. Croix
093C	12/31/2005	Chitolie Trucking & Equipment	St. Croix
086C	12/31/2005	Gold Coast Yachts Inc.	St. Croix
018C	12/31/2005	Marine Spill Response Corporation	St. Croix
008CT	12/31/2005	Public Works (Anna's Hope)	St. Croix
062TT	12/31/2005	Puerto Rico Used Oil Collectors, Inc.	San Juan, PR
078C	12/31/2005	Stanley & Stanley	St. Croix
094T	12/31/2005	Tropical Automotive Repair	St. Croix
082T	12/31/2005	V.I. Army National Guard (STT)	St. Croix
081C	12/31/2005	V.I. Army National Guard (STX)	St. Croix
030C	12/31/2004	Bill Auto Repair & Maintenance	St. Croix
045C	12/31/2004	Sun Sea & Sand Car Dealer	St. Croix
032C	12/31/2004	Tropical Cars of St. Croix, Inc.	St. Croix
009C	12/30/2004	Western Auto (STX) *	St. Croix
011CX	12/31/2003	Cruzan Environmental Services	St. Croix
007C	12/31/2003	Public Works (Concordia)	St. Croix
036C	12/31/2003	St. Croix Radiator	St. Croix

100C	12/31/2003	Peters Rest Texaco Svc. Station	St. Croix
* Denotes facilities that have either gone out of business or are no longer generating used oil.			

3. Hazardous Waste Program

The Virgin Islands implements its own hazardous waste program independent of the US Environmental Protection Agency. All facilities which generate, store, transport and or collect hazardous waste must meet the Territory's requirements except where federal requirements are more stringent or broader in scope.

The Virgin Islands has not adopted the Universal Waste Rule. As such, no waste may be managed as universal waste. Rather, all hazardous waste in the Virgin Islands must be managed under traditional hazardous waste requirements based on total monthly waste.

Any person engaged in the generation, storage, transportation, treatment, disposal or recovery of hazardous waste shall obtain a permit thereof from the Department of Planning and Natural Resources. Permit must be renewed annually.

Permit Number	Facility Name	Location
T-043	Kmart	9000 Lockhart Garden, St. Thomas
C-042	Kmart	Remainder Matriculate, St. Croix
T-041	Kmart	26-A Tutu Park Mall, St. Thomas
C-036	O'Neale Trucking	Wilfred Allick, St. Croix
C-038T	O'Neale Trucking	Wilfred Allick, St. Croix
C-069	Seaborne Airlines	St. Croix
C-191	VIPA	Rohlsen, St. Croix
C-023	Toyota	#1 Estate Body Slob, St. Croix
C-057	Adcon Environmental	Fort Louise Augusta Restrooms
C-063	VI Salvage d/b/a 180 Auto	236 Estate Glynn, St. Croix
C-024	Bunkers Of St. Croix	27 Castle Coakley, St. Croix
C-022	Caribbean Auto Mart	13 Glynn, St. Croix
T-028	FAA	Cyril E. King Airport, St. Thomas
C-025	FAA	#10 Estate White Lady, St. Croix
C-061	JFL Hospital	Estate Diamond, St. Croix
T-054	VIHA-Tutu Apartments	#387 Anna's Retreat, St. Thomas
C-041	VIHA-Paradise	Paradise, St. Croix
T-051	VI Army National Guard	Estate Nazareth, St. Thomas
C-052	VI Army National Guard	Estate Manning, St. Croix
C-002T	O'Neale's Trucking	Wilfred Allick, St. Croix
C-001T	VI Regulated Waste Mgt	Wilfred Allick, St. Croix

C-037	VI Regulated Waste Mgt	Wilfred Allick, St. Croix
T-190	TSA	Cyril King Airport, St. Thomas
C-040T	VI Regulated Waste Mgt	Wilfred Allick, St. Croix
T-032	FAA-Tower Control	St. Thomas
C-026	FAA-Recovery	St. Croix
C-027	FAA-ILS	St. Croix
T-031	FAA-Radar Facility	St. Thomas
T-030	FAA-Navigation Facility	St. Thomas
T-042	VIHA-Bovoni Apartments	Bovoni, St. Thomas
C-044	Managed Freight	Richmond, St. Croix
T-045	Total Petroleum	St. Thomas
T-046	RLS Hospital	Sugar Estate, St. Thomas
C-048	Seaborne	St. Croix
C-049	Hams Bluff Lighthouse	Hams Bluff, St. Croix
T-050	P&P	Sub Base, St. Thomas
C-191	TSA-Henry Rohlsen	St. Croix
T-053	DOE-LAGA Building	Tutu-St. Thomas
C-055	VI National Guard	Sprat Hall, St. Croix
C-056	VI National Guard	Hams Bluff, St. Croix
T-140T	VI Regulated Waste	Contant, St. Thomas
C-062	VI Rum	Diamond, St. Croix
C-066	Buccaneer Hotel	St. Croix
C-067	Bohlke International	Henry Rohlsen Airport, St. Croix
C-072	Salt River Restoration	Salt River, St. Croix
T-021	Heavy Materials, LLC.	St. Thomas
C-058	Gallows Bay	Gallows Bay, St. Croixc-059
C-059	DOL-STX	Sunny Isles, St. Croix
T-060	DOL-STT	St. Thomas

4. Brownfields Program

A brownfield is a property of which the expansion, redevelopment, or reuse may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. It is estimated that there are more than 450,000 brownfields in the United States.

Cleaning up and reinvesting in brownfield properties increases local tax bases, facilitates job growth, utilizes existing infrastructure, takes development pressures off of undeveloped, open land, and both improves and protects the environment

In 2009 DPNR conducted nine Phase I Environmental Site Assessments for properties located throughout the Territory. The purpose of these environmental assessments was to describe current site conditions and to establish if there was evidence that a release of oil or hazardous materials had occurred at the site or that a threat of release exists. Such a release could represent a liability to the property owner or operator.

Facility Name	Location	Recommendation
15 & 16 Prince Street & 54 & 55-B Hospital Street	Frederiksted, St. Croix	No further oil and/or hazardous materials assessments activities are necessary at this time
6, 6-a & 8 Penitentiary Land	Christiansted, St. Croix	Further assessment activities are necessary at the site. Phase II Assessment was recommended
10-13A West Lane	Christiansted, St. Croix	No further oil and/or hazardous materials assessments activities are necessary at this time
15 Sub Base	Sub Base, St. Thomas	Further assessment activities are necessary at the site
24 & 25 Sub Base	Sub Base, St. Thomas	Further assessment activities are necessary at the site.
72 Lindbergh Bay	Charlotte Amalie, St. Thomas	Further assessment activities are necessary at the site.
27 Strand Street	Christiansted, St. Croix	No further oil and/or hazardous materials assessments activities are necessary at this time
4 Wimmelskafte Gade, back Street	Charlotte Amalie, St. Croix	No further oil and/or hazardous materials assessments activities are necessary at this time
Oscar E. Henry Customs House	Frederiksted, St. Croix	No further oil and/or hazardous materials assessments activities are necessary at this time. However, mold assessment and abatement activities are necessary to eliminate health hazards

F. Wetlands Programs

BACKGROUND

The quality of life in the Virgin Islands and the strength of the Virgin Islands economy depend heavily on maintaining and restoring the health of the nearshore coastal environment; including wetlands, mangroves, coral reefs, and seagrass beds; communities that form a tightly linked ecosystem connected through hydrology and runoff. For the past several decades, population growth has compounded the effects of poor land use practices. This is manifested in catastrophic runoff, sedimentation, nutrient enrichment from failed septic systems and pollutant contamination of coastal wetlands, waters, and bays. Various studies have associated land use in upland areas of watersheds are adversely affecting low-lying terrestrial and marine resources. Nevertheless, the extent of the impacts across the Territory is unknown, and a comprehensive assessment of the watersheds and wetlands of the VI is not presently complete. Additionally, the existing datasets maintained by public

institutions have not been made available in published documents or placed into a web-accessible database for resource managers and public use.

PHASE I

The first phase of the wetlands inventory project, titled, “*The Virgin Islands Wetlands and Riparian Areas Inventory: A Pilot Study to Characterize Watersheds and Wetland Systems, Phase I*”, was completed in 2004 by the Department of Planning and Natural Resources, in partnership with Island Resources Foundation (IRF) and the University of the Virgin Islands (UVI). Phase I of the project focused on a limited assessment of watershed/wetland ecosystems. Geographic Information System (GIS) technology was used to produce an inventory of watersheds and wetlands (type and location) throughout the U.S. Virgin Islands (USVI), produce GIS map products, and data for statistical and spatial analyses. Eighteen (18) priority watersheds (of the 50 in the USVI) were assessed and characterized using a matrix based on categorizing watersheds into three groups; (i) undisturbed, (ii) moderately disturbed, and (iii) highly disturbed watersheds. Vegetation characterization, water chemistry sampling, sedimentation history, and an Index of Biological Integrity assessment were completed within each selected watershed. The information and data gathered from the pilot study of Phase I were used by the project collaborating institutions to determine the proposed Scope of Work for Phase II of the project.

PHASE II

The “*Virgin Islands Wetlands and Watersheds Characterization Phase II: Inventory, Monitoring, Assessment, Management, and Education in the U.S. Virgin Islands*”, began in 2007 and was designed initially to complete the watershed/wetlands assessment for the Virgin Islands by compiling existing data from multiple projects and sources, filling data gaps, developing appropriate management strategies, and educating the public about the importance of wetlands and watersheds.

Phase II is scheduled for completion at the end of 2010. The major outputs of Phase II are:

1. Formation of a Wetlands Working Group.
2. Adoption of a definition of wetland for use in the USVI.
3. Maps showing the locations of wetlands in the USVI.
4. Conceptual framework for management of wetlands in the USVI.
5. Publication titled “Wetlands of the U.S. Virgin Islands”.
6. Final Technical Report.

TYPES OF WETLANDS

Wetlands provide a range of goods and services that contribute to the economic and social development of the USVI. However, the various development activities result in significant degradation of the very resources that support the development of the USVI. In an effort to improve the development process, policies, laws, and initiatives have been developed to protect our natural resources. The primary purpose of the associated laws and programs is to ensure that development can be sustained and the quality of life can be maintained for current and future generations of Virgin Islanders. By definition, “Wetlands in the U.S. Virgin Islands generally include watercourses, marshes, swamps, artificial ponds and impoundment, salt ponds, lagoons, shallow seagrass beds, and other similar areas.”

Each type of wetland is formed under a specific set of conditions, and will typically have associated plants (flora) and animals (fauna).

Type 1: Watercourses

A watercourse is defined in the Virgin Islands Code as “... any stream with a reasonable well-defined channel, and includes streams which have a permanent flow, as well as those which result from the accumulation of water after rainfall and which regularly flow through channels formed by the force of the waters”

In the USVI, watercourses are commonly referred to as ghuts. These ghuts are the main drainage channels for discharge of runoff from rainfall events. In addition to that function, ghuts provide a range of goods and services that support the development processes of the USVI. Ghuts also contain permanent pools of freshwater, which function as habitats for rare species of aquatic animals (e.g. Mountain Mullet and American Eel). Ghuts take a range of shapes, sizes, and depths, depending on the terrain and the size of the watershed. The vegetation found inside ghuts also varies accordingly, but two distinct forest types have been associated with ghuts. These forest types are Gallery Moist Forest and Gallery Shrubland.

Ghuts of Interest are those that meet any one of the following criteria:

- Ghuts with permanent pools
- Ghuts currently used for recreational purposes
- Ghuts supporting other community uses
- Ghuts containing critical habitats
- Ghuts supporting endangered species of plants or animals
- Ghuts containing significant historic, archeological, or cultural resources
- Ghuts facing significant threats – e.g. dumping from construction activities or used for sewage disposal.

St. Croix	St. John	St. Thomas
Adventure Stream	Battery Gut	Bonne Resolution (Dorothea) Gut
Bethlehem Gut	Fish Bay Gut	Caret Bay/Sorgenfri Ghut
Butler Bay Ghut	Guinea Gut	Contant Gut
Caledonia Gut	Johnny Horn Ghut	deJongh Gut
Canaan Ghut	Living (Reef Bay) Gut	Magens Bay Gut
Cane Bay Ghut		Nadir Gut
Creque Gut		Neltjeberg Gut
Fountain Ghut		Santa Maria Gut

Harden Gut		Savan Gut
Jolly Hill Gut		Turpentine Run
La Grange Gut		
Mahogany Gut		
River Gut		

Type 2: Marshes

A marsh is defined as “a water saturated, poorly drained area, intermittently or permanently water covered, having aquatic and grass-like vegetation” (http://water.usgs.gov/water-basics_glossary.html). Marshes in the USVI are typically fresh-water wetlands formed in depressions in the landscape, and maintained by surface or subsurface flow of water.

Type 3: Swamps

A swamp is defined as “an area intermittently or permanently covered with water, and having trees and shrubs” (http://water.usgs.gov/water-basics_glossary.html). In the USVI, swamps are generally located on the coast. Water level is determined mainly by surface runoff during the rainy season, but brackish conditions exist in areas of the swamp closest to the sea, or during the dry season. As a result of this salinity gradient, plants adapted to both fresh water and saline conditions may be found in some swamps. Example, Magens Bay swamp, St. Thomas

Type 4: Artificial Ponds and Impoundments

“A pond is a body of standing water, either natural or man-made, that is usually smaller than a lake” (<http://en.wikipedia.org/wiki/Pond>). In the USVI, man-made (artificial) ponds are created primarily for provision of water for agricultural purposes. Increasingly, ponds are created for storm-water management purposes on sites with large developments or on sites that are periodically flooded. An impoundment is a body of water resulting from the placement of a stone dyke or earthen berm across a natural drainage channel (ghut). Impoundments were used in the early 1900s as part of the system of collection and distribution of potable water, particularly on St. Croix. Currently, impoundments are constructed and used mainly to provide water for agricultural purposes. Both ponds and impoundments provide habitats for a range of resident and migratory species of water birds.

Type 5: Salt Ponds

A salt pond is a coastal wetland that is separated from the sea by a low sandbank, sand dune, or similar feature. Salt ponds are formed over long periods by the accretion of reefs, growth of mangroves, or the accretion of sand along the mouth of an embayment. Once the pond is separated from the sea, water exchange between the two is primarily through the separating barrier. Depending on the size and structure of the salt pond, openings to the sea may be created during the rainy season if the pond collects significant amounts of surface runoff. The barrier may also be overtopped by the

sea during periods of significant wave action. Such wetlands are commonly called salt ponds because the water in the ponds becomes hypersaline during the periods when the water level is low; that is, the water becomes more saline than ordinary sea water. In some ponds, the salt can be seen as a crystalline deposit along the edges of the pond or towards the landward portion (back) of the pond.

Salt ponds provide a habitat for many species of birds, but few plants are adapted to survive in such hypersaline conditions. Plants typically found at salt ponds are Black Mangrove, White Mangrove, and the shrubs Saltwort and Sea Purslane

Type 6 Lagoons

A lagoon is defined as “a stretch of salt water separated from the sea by a low sandbank, coral reef or similar natural or manmade feature.” In the USVI, lagoons are typically formed by one of two processes. One process involves wave action moving sand and gravel along the shoreline, periodically closing the mouth of an embayment. Sandbars are sometimes breached by strong wave action, particularly during storms. Sandbars/sandbanks often become colonized and stabilized by plants, which can result in the closure becoming semi-permanent or permanent over time. The second process involves the formation of a sandbar across the mouth of a seasonal stream (ghut). In such cases, the sandbar is periodically breached by wave action or by surface runoff discharged through the ghut after rainfall events. Lagoons can have very restricted access or narrow channels that permit fairly consistent flows between the lagoon and the sea. Lagoons are ecologically productive sites, providing habitats for a range of fish and bird species, including migratory species of birds. Examples of lagoons are the Altona Lagoon (St. Croix) and Benner Bay/Mangrove Lagoon (St. Thomas).

Type 7: Seagrass beds

Seagrass beds are ecosystems dominated by marine grasses. Seagrass beds typically inhabit shallow nearshore areas, but can be found in a range of depths from shallow lagoons to open coastal areas 60 feet in depth. There are 40-50 species of seagrasses world-wide, and most are found in the tropics. Though seagrass beds are dominated by seagrasses, the communities contain many species of algae. Seagrass beds function as important nursery areas for a wide variety of marine organisms (including important food species). Seagrass beds also function to colonize open areas, and their root systems help to stabilize unconsolidated soils

PRIORITIES FOR MANAGEMENT OF WETLANDS

The major issues and priorities currently relevant to wetlands are:

1. Integration of the Policy Framework

There are several laws relevant to the management of wetlands, and those laws are administered by several agencies. The programs managed by the various agencies are usually in line with national priorities. In 2009, the Department of Planning and Natural Resources initiated activities to develop a Wetlands Management Program. That program will establish a mechanism for integration of the wetlands-related policies and programs of the public agencies in the U.S. Virgin Islands, including the involvement of community organizations

2. Reduction of Threats

There are significant threats to wetlands and associated resources from natural and man-made sources. The man-made threats are primarily from land use activities (e.g. changed drainage, sediment from construction activities, filling of wetlands, disposal of solid waste and effluents), but also from illegal practices (e.g. solid waste disposal). These threats reduce the benefits provided by wetlands. While threat reduction is a priority of the management agencies, the most important require changes in attitudes and practices of individuals in the community.

3. Storm Water Management

Due to the topography of the islands, most development activities (including residential development) involve the channeling of surface runoff from rainfall events. Poor storm-water management practices result in damage to wetlands, social infrastructure (e.g. roads), and private property. Individuals and companies undertaking developments must therefore use best practices in the design of stormwater management systems.

4. Future Demand for Goods and Services from Wetlands

The existing uses of wetlands are expected to continue. There is increased use for recreation, including eco-tourism ventures. With increased development activity, particularly larger resort projects, there is increased use of wetlands for storm-water management. It is forecasted that global warming will increase rainfall variability and intensity. As such, wetlands will play an even greater role in flood protection.

5. Information Management

In order to make informed decisions concerning the management of wetland resources, the regulatory agencies are constantly updating the databases on physical conditions and status of the resources. The community should become engaged in the management process, especially by sharing information on the use of wetlands and associated resources, and threats to such resources.

FRAMEWORK FOR MANAGEMENT OF WETLANDS IN THE USVI

Rationale for Development of a Wetlands Management Framework

Wetlands in the U.S. Virgin Islands (USVI) provide a range of goods and services that support the social and economic development of the Territory. Due to the range of benefits provided by wetlands, as well as their distribution across the topographic landscape, wetlands fall within the area of responsibility of several Territorial and U.S. Federal agencies. As such, wetlands form critical components of several programs designed to maintain the economic growth of the USVI and quality of life of its residents. Environment and development programs in which wetlands play a critical role include:

(a) Agriculture Development – Impoundments were established to collect water for agricultural uses. The 1979 report on the USVI Sediment Reduction Program noted that there were 278 impoundments in the USVI in 1979 (BC&E/CH2M Hill, 1979).

(b) Reduction in Non-Point Source Pollution – The 1979 Sediment Reduction Program was designed around the functioning of impoundments as sediment traps. The existing Earth Change Permit

process was similarly designed to reduce soil erosion and sedimentation of waterways, and development activities affecting ghuts are regulated within this process.

(c) Coastal Zone Management – Wetlands form one of the nine (9) Enhancement Areas for the USVI Coastal Zone Management Program, as required by Section 309 of the Coastal Zone Management Act, 1972.

(d) Wildlife Management – Wetlands function as important habitats for a range of wildlife species, and associated management interventions range from periodic resource assessments to designation and management of wildlife reserves by both Territorial and Federal agencies.

(e) Water Resources Management – Surface water forms one of the components of waters of the USVI as defined by the V.I. Code. While there is no water resource management program, the non-point source pollution program was developed to protect the quality of the waters of the USVI for a range of social and ecological purposes.

(f) Flood Control – Storm-water management in development activities and general flood control are managed by two separate agencies of the Government of the USVI (Department of Public Works and Department of Planning and Natural Resources).

(g) Waste Management – Wetlands are used as part of the waste disposal strategy in the USVI, in that; a number of municipal sewage treatment plants discharge effluent directly to ghuts. Discharge of untreated sewage to wetlands also takes place when there is equipment failure. Additionally, the two municipal landfills are located in wetlands.

Despite the above program imperatives that involve wetlands, there is no wetlands program in the USVI. Attempts to establish a wetlands program include the 2006 draft wetlands conservation plan prepared by the Division of Fish and Wildlife and the current attempt by the Division of Environmental Protection. However, a wetlands program designed for a single agency to fulfill its mission objectives will not accommodate the afore-mentioned range of program needs. This is particularly true as a number of the uses of wetlands are conflicting across the various programs. What is needed is a unified approach that supports multiple policies and program objectives, and that prevents program conflicts. This unified approach to wetlands management is hereby termed the “Wetlands Management Framework for the U.S. Virgin Islands”.

The purpose of the Wetlands Management Framework is to ensure that all management interventions for wetlands in the U.S. Virgin islands are designed based on a single policy and strategy and that institutional arrangements are establish to minimize waste and conflicts while maximizing the impacts of each management intervention.

Current Wetlands Management Framework

There is a variety of laws that provide the foundation for a wetland management framework, and there are both Federal and Territorial agencies that are involved in programs and initiatives affecting wetlands. Though there is this range of institutions and programming that affect wetlands in one way or another, the focus on wetlands appear to be tangential at best. Programs and resource management

strategies that should have wetlands management as a central feature have either been inexplicably terminated (Sediment Reduction Program), inconsistent in application (Areas of Particular Concern), relegated wetlands to a low level of priority (Coastal Zone Management Program), or treat wetlands as tangential (Water Pollution Control Program and 2005 Comprehensive Wildlife Conservation Strategy for the USVI). The single attempt to develop a wetlands conservation plan (Platenberg, 2006) focused on one district, and has been approved or implemented. Wetlands are not specifically mentioned in the priority goals or objectives identified in the 2010 USVI Coral Reef Management Program. However, two of the four priority sites (St. Thomas East End Reserve and St. Croix East End Marine Park) include large areas of wetlands).

The absence of policies and guidelines for wetlands management inhibit the development or integration of relevant programs. The 2009 Section 309 Assessment for the USVI Coastal Zone Management Program states that policies to increase protections for wetlands were approved by the Coastal Zone Management Commission in 2006, but now needs to be promulgated and adopted as rules and regulations within the coastal zone management program. Similarly, there is no institutional arrangement that supports information sharing and collaborative programming, both necessary to ensure the development of synergies between the various programs.

Trends and Major Issues Currently Relevant to Wetlands

The trends that have been identified are:

(a) Reduction in Acreage of Wetlands in the U.S. Virgin Islands – Damage to wetlands and loss of acreage has been chronicled in several reports (Sladen 1986, Stengel 1998). The major activity contributing to loss of wetlands is (past and current) development activity, primarily industrial, resort, and marina development. The continued generation of a range of other threats to wetlands and associated resources (Gardner et al, 2008) remain a cause of concern.

(b) Continued Provision of Goods and Services – Wetlands continue to provide a range of goods and services (Virgin Islands Department of Agriculture 1973, Smith 1989, Kelsey et al 2005, Rennis et al 2006, Gardner et al 2008, Valiulis 2009). In addition to the provision of water and food, the environmental services provided by wetlands include wildlife habitats, water purification, groundwater recharge, flood reduction, and storm protection.

(c) Contribution to Economic Development – Wetlands have played a significant role in the economic development of the U.S. Virgin Islands (Gardner et al, 2008) through the provision of water for domestic, agricultural, and industrial purposes. Current direct contributions include provision of recreational opportunities, educational opportunities, and water for agriculture.

The major issues and priorities are:

(a) Need for an Integrated Policy Framework – There are several laws relevant to the management of wetlands, and those laws are administered by different agencies. Though the programs managed by the various agencies are usually in line with national priorities, there is a need to establish a mechanism for integration of the wetlands-related policies and programs of the public agencies in the U.S. Virgin Islands, including the involvement of non-governmental organizations.

(b) Existence of Significant Threats – There are significant threats to wetlands and associated resources from natural and man-made sources. The man-made threats are primarily from land use activities (e.g. changed drainage, sediment from construction activities, filling of wetlands, disposal of solid waste and effluents), but also from illegal practices (e.g. solid waste disposal). These threats reduce the benefits provided by wetlands. While threat reduction is a priority of the management agencies, success of management interventions require changes in attitudes and practices of individuals and institutions in the community.

(c) Need for Improved Storm Water Management – Due to the topography of the islands, most development activities (including residential development) involves the channeling of surface runoff from rainfall events. Poor storm-water management practices result in damage to wetlands, social infrastructure (e.g. roads), and private property. Individuals and companies undertaking developments must therefore use best practices in the design of storm-water management systems.

(d) Future Demand for Goods and Services from Wetlands – The existing uses of wetlands are expected to continue. There is increased use for recreation, including ecotourism ventures. With increased development activity, particularly larger resort projects, there is increased use of wetlands for storm-water management. It is forecasted that global warming will increase rainfall variability and intensity. As such, wetlands will play an even greater role in flood protection.

(e) Need for Improved Information Management – There is no structured program for research and monitoring of wetland resources. As such, data collection is sporadic, ad hoc, and not necessarily linked to institutional mandates or programs. Data and information is consistently lost. Additionally, databases compiled by Federal agencies are not utilized by USVI regulatory agencies for management decision making. In order to improve decision making in the development planning and development control processes, the environmental management agencies need to develop an overall data management strategy. That strategy should ensure compatibility of data collection regimes and data management systems, as well as establishment of data sharing mechanisms. The civil society institutions engaged in wetland initiatives should also be brought into the information management process.

Other issues requiring attention are:

(a) Community Perception of the Value of Wetlands – The continuing threats to wetlands and associated resources indicate that there is a general perception in the USVI that wetlands are not important. However, the conflicts that sometimes arise during public hearings for development projects often focus on environmental issues, including potential impact on wetlands. This contradiction suggests that there is no consensus in the community regarding the value of wetlands. This issue should be addressed in order to reduce conflicts within the development control process, and enable the regulatory agencies and community to make informed decisions regarding tradeoffs in the development process.

(b) Climate Change associated with Global Warming – Climate change scenarios for the Caribbean suggest that sea level rise will be approximately 1.5 feet over the next century. This will result in inundation of some coastal areas, increasing acreage under wetlands, but also impacting negatively on

social infrastructure and some major resources (e.g. aquifers). More immediately, increased intensity of storms and changing rainfall patterns are expected to create significant impacts on ecosystems, including wetlands. A comprehensive monitoring program should be established to support informed resource management decision making, particularly for critical or fragile ecosystems.

PROPOSED WETLANDS MANAGEMENT FRAMEWORK

The Wetlands Wise Use Project of the Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention) identifies the elements of an effective wetlands management program as:

- Appropriate Policy Framework;
- Appropriate Legal Framework;
- Appropriate Institutional Framework;
- Management Strategy;
- Management Plan/Action Plan; and
- Institutional Program/Annual Plan.

Appropriate Policy Framework

The development of an appropriate policy framework is best guided by an environmental ethic, which provides the broad philosophical basis and guiding principles for policy and program development. The guidelines prepared by the Ramsar Secretariat on the wise use of wetlands (Davis, 1993) identify the following as principal elements of a national wetland policy:

- A. Improvement of institutional arrangements so that wetland policies can be fully integrated into the planning process; and the establishment of mechanisms and procedures for incorporating this integrated, multi-disciplinary approach into planning and execution of projects concerning wetlands.
- B. Review of existing legislation and government policies (including subsidies and incentives) including, where appropriate, application of existing legislation and policies, adoption of new ones, and use of development funds for wetlands.
- C. Increasing knowledge and awareness of wetlands and their values, including exchange of information, propagation of their benefits and values (a statement of which is given), review of traditional techniques, and training of appropriate staff.
- D. Review of the status of wetlands in the national context, including compilation of a national inventory, and definition of each wetland's particular values and conservation priorities.
- E. Addressing of problems at particular wetland sites, by integrating environmental considerations into their management, regulated utilization, establishment of management plans, designation as appropriate for the Ramsar List, establishment of nature reserves and, if necessary, restoration.

Appropriate Legal Framework

The legal framework supports not only the development of regulations, but also provides an underpinning for the establishment of creative and evolving management and compliance strategies. Elements of an effective legal framework include:

- A. A framework law that addresses wetland as a specific ecosystem requiring directed management intervention, that links the primary enabling legislation to other relevant legal instruments directed at other programs and development processes.
- B. Subsidiary legislation that facilitate the development of an effective institutional framework.
- C. Guidance and guidelines to support the use of a wide range of measures and instruments (regulatory, fiscal, and non-fiscal) to enable effective management interventions.

Appropriate Institutional Framework

Although one public sector institution will be given the responsibility of being the lead agency for coordination of a territorial program, effective management will include collaborative arrangements between several public, private, and civil society institutions. An appropriate institutional framework will address the following:

- A. Collaborative programming, to assist in resolving conflicts, assist in making decisions relating to trade-offs, clarify roles and responsibilities of different stakeholders, and facilitate diverse stakeholder involvement.
- B. Development of an institutional coordinating mechanism that facilitates harmonization of management arrangements and institutional cultures (planning and decision-making systems, legal requirements in the various regulatory processes, reporting requirements and mechanisms, etc.).
- C. Shared information collection and management systems.

Management Strategy

The territorial management strategy is meant to provide strategic focus, translating the policy framework into strategic directions for wetlands management over an agreed period. The territorial strategy should:

- A. Provide a structured framework for wetlands management, establishing the goals and objectives of the territorial program, and establishing guidelines and practices that link site management interventions to system management goals and objectives.
- B. Facilitate integration with other relevant planning strategies, such as those for tourism, biodiversity conservation, and protected areas.

- C. Facilitate integration with the economic development strategies and development control processes.
- D. Provide guidance on the design and implementation of a public engagement strategy.
- E. Provide a structured approach for coordinating the initiatives of the various institutions implementing wetlands-related activities.
- F. Provide a broader perspective for addressing site-specific issues.

Management Plan/Action Plan

The wetlands management plan is the action plan for the strategy period, and should:

- A. Identify priority interventions for the strategy period, setting targets and identifying milestones.
- B. Assign institutional roles within each area of intervention.
- C. Establish coordinating mechanisms and structures.
- D. Identify resource requirements.
- E. Establish monitoring and evaluation guidelines and procedures for the implementation of the management plan/action plan

Institutional Program/Annual Plan

Each institution with assigned roles in the management plan/action plan should establish an institutional plan designed to:

- A. Fulfill the institution's obligations identified in the Wetlands Strategy and Management Plan.
- B. Be responsive to the institution's legal mandate.

IMPLEMENTATION AGENDA

If the above program elements are used as the guide for the development of a wetlands management program for the USVI, the process of development of an appropriate wetland policy will take a minimum of five (5) years. As such, establishment of some elements will proceed apace, rather than wait on the completion of the policy process. The following actions are proposed as the initial steps in the development of the wetlands management framework for the USVI:

1. Preparation of a Draft Wetlands Policy.
2. Preparation of a Wetlands Management Strategy and Action Plan.
3. Design of inter-agency management structure and preparation of associated collaborative agreement.
4. Preparation of institutional work plans.

5. Development of data management policies and data management mechanisms¹.
6. Establishment of framework management support systems (planning, communications, etc.).
7. Establishment and testing of data management system.
8. Preparation of first biennial Territorial Wetlands Report.
9. Preparation of a 5-year work plan.
10. Preparation of program financing strategy and plan.
11. Convene workshop (finalize report and work plan).

G. Water Quality Management Planning Program

The Water Quality Management Planning (WQMP) Program was created in 2000. Under the WQMP Grant (pursuant to CWA §604(b)), the V.I. DPNR-DEP is entrusted with the task of planning and implementing Water Quality Management Projects to ensure the protection of the marine waters of the USVI. Several duties that were formerly under the auspices of the Water Pollution Control (WPC) Program were placed under the WQMP. In FY2009, WQMP was merged with WPC, as such the 2010 Integrated Report was drafted by the newly segmented Water Quality Management Program (WQM).

The Storage and Retrieval of Water-Related Data (StoRet) program is managed and updated by WQM staff. The monitoring data is uploaded to StoRet via the Water Quality Exchange Web Template.

The Assessment Database (ADB) was fully implemented once the Virgin Islands defined assessment units for more comprehensive water quality assessments. ADB is a valuable tool for storing assessment information and retrieving it for reporting purposes. Research Triangle Institute released ADB version 2 for 2002. The data stored in ADB v.2 is more accurate thanks to the VI Standard Waterbody Delineation project. The VI has been steadily upgrading ADB v.2 as necessary. The most current version of ADB is ADB v2.2

H. Coral Reef Monitoring

A number of agencies, including the United States Virgin Islands Government, have done sparse monitoring of coral reefs in the waters of the Virgin Islands for some time. In November and December 2007, EPA-ORD's OSV BOLD conducted a coral reef survey around St. Croix. The primary goal of the ORD's survey was to evaluate health condition of the coral reefs at 60 predetermined sites, in order to determine if there is a correlation between nutrient and TSS data and the health condition of the coral reefs. RARE Project Monitoring was also conducted during 3rd Quarter Ambient Monitoring FY2009 in STT/STJ District on July 8-19, 2009.

In an effort to stay abreast of the territory-wide coral reef monitoring efforts WPC staff attended the NOAA CREIOS Workshop in San Juan, Puerto Rico on May 13-14, 2009.

I. Other Non-Point Source Activities

1. Education Outreach/Non-point Source Newsletter

In order to increase the awareness of non point source pollution among school children, presentations were made reaching a majority of students. University of the Virgin Islands staff working with VI Education Department staff developed presentations on non-point source pollution and ways to prevent it. DPNR-DEP will continue to guide the activities of the NPS Committee to address NPS issues in the Territory and participate in various educational and environmental events to promote NPS awareness within the community and schools.

2. Public information dissemination/outreach

The Division of Environmental Protection added an Environmental Education and Outreach program during this cycle. The Environmental Education program has since been involved in numerous outreach projects (in most cases in conjunction with other DEP programs) including: used oil drives, elementary and high school presentations, environmental public service announcements, and the Non Point Source Conference. DEP has also been actively utilizing their website located at <http://www.dpnr.gov.vi> in order to disseminate information to the public, solicit comments on public documents, and inform the public of happenings within the Division.

Funded by Section 319 grant money, the quarterly publication of the *Non-point Source Newsletter* has been continuously published since December 1997. Its purpose is to educate and inform the public about the programs of the Non-point Source Committee and to increase the awareness of the different aspects of non-point source pollution. The newsletter was published regularly throughout this reporting period.

3. 9th Annual NPS Conference

The 9th Annual Non Point Source Conference was held on November 28-30, 2005 at the Westin St. John Resort and Villas. The conference brought together individuals involved in pollution prevention, resource conservation, research, and economic development in the Virgin Islands to examine environmental issues in the territory and throughout the Caribbean. Community groups, farmers, government personnel, members of the construction and boating industries, non-governmental organizations, researchers, students and vendors were all invited to participate.

III. SURFACE WATER MONITORING & ASSESSMENT

A. Surface Water Monitoring Program

DPNR-DEP work plans require quarterly monitoring of seventy-seven (67) stations around St. Croix, sixty-eight (68) stations around St. Thomas, and eighteen (18) around St. John. These sites are located offshore and are sampled by WPC staff using a vessel. DPNR-DEP expanded the monitoring network to include deep-water offshore sites at the outer rim of the USVI's three-mile boundary. Some sites in the St. John network were abandoned in this reporting cycle due to their location within the jurisdiction of expanded federal waters of national parks and monuments.

1. Monitoring Sites

Table III.A.1. Virgin Islands Ambient Monitoring Sites (153).

St. Croix 67 Sites					
Stations	Class	Location	Stations	Class	Location
STC-1	B	Lagoon Recreational Beach	STC-25	B	Long Point Bay
STC-2	B	Ft. Louise Augusta Beach	STC-26	B	Good Hope Beach
STC-3	B	Buccaneer Hotel	STC-27	B	Frederiksted Public Pool
STC-4	B	Tamarind Reef Lagoon	STC-28	C	Frederiksted Pier
STC-5	B	Green Cay Marina	STC-29	B	Frederiksted Public Beach
STC-6	A	Buck Island Beach	STC-30	B	Sprat Hall Beach
STC-7	A	Buck Island Anchorage	STC-31	B	Davis Bay
STC-8	B	Reef Club Beach	STC-33	B	Salt River Marina
STC-9	B	St. Croix Yacht Club Beach	STC-33A	B	Salt River (Columbus Landing Beach)
STC-10	B	Cramer Park	STC-33B	B	Salt River Bay
STC-11B	B	Jack Bay, Forereef	STC-34	B	St. Croix By the Sea
STC-12	B	Divi (Turner Hole Beach)	STC-35	B	Long Reef Forereef West
STC-13A	B	Great Pond	STC-35A	B	LBJ (Pump Station) Outfall
STC-13B	B	Robin Bay	STC-36	B	Long Reef Forereef East
STC-14A	B	Manchenil Bay	STC-37	B	Christiansted Harbor Entrance West
STC-14B	B	Halfpenny Backreef	STC-38	B	Christiansted Harbor Entrance East
STC-15	B	Canegarden Bay (Gut)	STC-39	C	Altoona Lagoon Inlet
STC-15A	B	Canegarden Bay	STC-40	C	St. Croix Marine
STC-16	C	HOVENSA East Turning Basin, NW Corner	STC-41	C	Gallows Bay
STC-17	C	HOVENSA West Turning Basin, NE Corner	STC-42	C	Public Wharf
STC-18	C	Limetree Bay Container Port	STC-43	C	Water Gut Storm Drain
STC-19	C	Krause Lagoon Channel	STC-44	C	Protestant Cay Beach
STC-20	C	Alumina Plant Dock	STC-45	C	Christiansted Harbor
STC-21	B	Spoils Island (Ruth Island)	STC-46	C	V. I Water and Power Intake

STC-22A	B	Treatment Plant (POTW) Outfall	STC-47	B	Mill Harbor Condominiums
STC-23	B	Public Dump	STC-48	B	Long Reef Back Reef West
STC-24B	B	Rum Plant (VI Rum) Outfall	STC-49	B	Long Reef Back Reef East
STC-OFF1	B	NW-1	STC-OFF2	B	SE-1
STC-OFF3	B	SW-1	STC-OFF4	B	North-2
STC-OFF5	B	East-2	STC-OFF6	B	South-2
STC-OFF7	B	West-3	STC-OFF8	B	North-3
STC-OFF9	B	SW-3	STC-OFF10	B	SE-3
STC-OFF11	B	North-4	STC-OFF12	B	SW-4
STC-OFF13	B	SE-4			

St. Thomas 68 Sites

Stations	Class	Location	Stations	Class	Location
STT-1	C	Crown Bay, Near Outfall	STT-22B	B	Vessup Bay
STT-2	C	Crown Bay, Near Tamarind Outlet	STT-23	B	Great Bay
STT-3	C	Subbase	STT-24	B	Cowpet Bay
STT-4	B	Krum Bay	STT-25	B	Nazareth Bay
STT-5A	B	Lindbergh Bay, East	STT-26	B	Benner Bay
STT-5B	B	Lindbergh Bay, West	STT-27A	B	Mangrove Lagoon, Near Treatment Plant
STT-6B	B	Airport College Cove	STT-27B	B	Mangrove Lagoon, Off Sanitary Landfill
STT-6C	B	S.W. Road, Near Red Point Outfall	STT-27C	B	Mangrove Lagoon, Near Tropical Marine Fuel Dock
STT-7A	B	Brewers Bay	STT-27D	B	Mangrove Lagoon, Near LaVida Marina
STT-7B	B	Perserverance Bay	STT-27E	B	Mangrove Lagoon, Near Compass Point
STT-8	B	Fortuna Bay	STT-28A	B	Bovoni Bay
STT-9	B	Botany Bay	STT-28B	B	Bolongo Bay
STT-10	B	Stumpy Bay	STT-29A	B	Frenchman's Bay
STT-11	B	Santa Maria Bay	STT-29B	B	Limetree
STT-12	B	Caret Bay	STT-30	B	Morning Star Bay
STT-13	B	Dorothea	STT-31A	B	Flamboyant Cove
STT-14	B	Hull Bay	STT-31B	B	Hassel Island, off Navy dock
STT-15	B	Magens Bay	STT-31C	B	Hassel Island, Careening Cove

STT-15A	B	Magens Bay, N.E.	STT-32A	C	Long Bay, Near South Dolphin
STT-15B	B	Magens Bay, NW..	STT-32B	C	Long Bay, N.E. Corner
STT-16A	B	Mandahl Bay	STT-33A	C	Long Bay, Off Outfall
STT-16B	B	Mandahl Bay Entrance	STT-33B	C	Long Bay, Off Outfall
STT-17A	B	Spring Bay	STT-35	C	Groden Bay
STT-17B	B	Sunsi Bay	STT-36	C	STT Harbor, North of Coast Guard Dock
STT-18	B	Coki Point Bay	STT-37	C	St. Thomas Harbor, Cay Bay
STT-19	B	Water Bay	STT-38	C	Haulover Cut
STT-20	B	Smith Bay	STT-39	B	Water Isle, East Gregorie Channel
STT-21A	B	St. John Bay	STT-40	B	Water Isle Hotel, Beach
STT-21B	B	Red Bay	STT-41	B	Water Island Flamingo Bay
STT-22A	B	Red Hook Bay	STT-42	B	Water Island Sprat Bay
STT-OFF1	B	STT-OFF1	STT-OFF8	B	STT-OFF8
STT-OFF2	B	STT-OFF2	STT-OFF9	B	STT-OFF9
STT-OFF5	B	STT-OFF5	STT-OFF11	B	STT-OFF11
STT-OFF6	B	STT-OFF6	STT-OFF12	B	STT-OFF12

St. John 18 Sites

Stations	Class	Location	Stations	Class	Location
STJ-43A	B	Cruz Bay, North	STJ-48	B	Fish Bay
STJ-43B	B	Cruz Bay, South	STJ-53	B	Coral Harbor
STJ-43C	B	Cruz Bay, North of Seaplane Ramp	STJ-55	B	Turner Bay
STJ-43D	B	Cruz Bay Creek North	STJ-56	B	Johnson Bay
STJ-45	B	Great Cruz Bay	STJ-57	B	Round Bay
STJ-46	B	Chocolate Hole	STJ-58	B	Privateer Bay
STJ-47	B	Rendezvous Bay			
STJ-OFF3	B	STJ-OFF3	STJ-OFF10	B	STJ-OFF10
STJ-OFF4	B	STJ-OFF4	STJ-OFF13	B	STJ-OFF13
STJ-OFF7	B	STJ-OFF7			

2. Monitoring Measurements

At each station, field measurements are made of the following:

Turbidity: expressed in Nephelometric Turbidity Units (NTU's) measured 1 meter below the surface and 1 meter above the sea floor (or at the max depth of the instrument (~30 m)) using an EPA approved field instrument.

Dissolved Oxygen: expressed in mg/l saturation and measured 1 meter below the surface and 1 meter above the sea floor (or at the max depth of the instrument (~30 m)) with an EPA approved field instrument.

pH: expressed in Standard Units (SU) measured 1 meter below the surface and 1 meter above the sea floor (or at the max depth of the instrument (~30 m)) with an EPA approved field instrument.

Temperature: expressed in degrees Centigrade measured 1 meter below the surface and 1 meter above the sea floor (or at the max depth of the instrument (~30 m)) with an EPA approved field instrument.

Salinity: expressed in parts per thousand and measured 1 meter below the surface and 1 meter above the sea floor (or at the max depth of the instrument (~30 m)).

Secchi Depth: expressed in meters by a secchi depth recording light transparency.

Bacteria: Water samples are collected by surface grab sample at each station on a quarterly basis and taken to a DPNR certified laboratory where they are analyzed for **Fecal Coliform and Enterococci bacteria**. Results are expressed as number of colonies per 100 milliliters. Analysis is performed utilizing an EPA approved methodology. The geometric mean is also factored in before it is determined that an assessment does not meet the water quality standard.

Total Suspended Solids: Water samples are collected by surface grab sample at each station on an annual basis and taken to a DPNR certified laboratory where they are analyzed utilizing an EPA approved methodology.

Total Phosphorous / Total Kjeldhal Nitrogen: Water samples are collected by surface grab samples at each station on an annual basis and taken to a DPNR certified laboratory where they are analyzed utilizing an EPA approved methodology. DPNR-DEP is working to increase the sampling frequency for these parameters. A lack of resources, to include scheduling conflicts with the local lab, has resulted in limited sampling. Currently, the local lab is being checked for quality assurance issues and the efficiency of the methods used is also being evaluated. Once these issues are assessed, it is anticipated that the monitoring frequency will be increased.

3. 2008 and 2009 Monitoring Frequency

During this reporting period Ambient Monitoring was conducted for 3 quarters for FY2008 and once each quarter for FY2009. DPNR-DEP also conducted BEACH sampling on a weekly basis.

Figure III.A.1 St. Croix Water Quality Monitoring Network

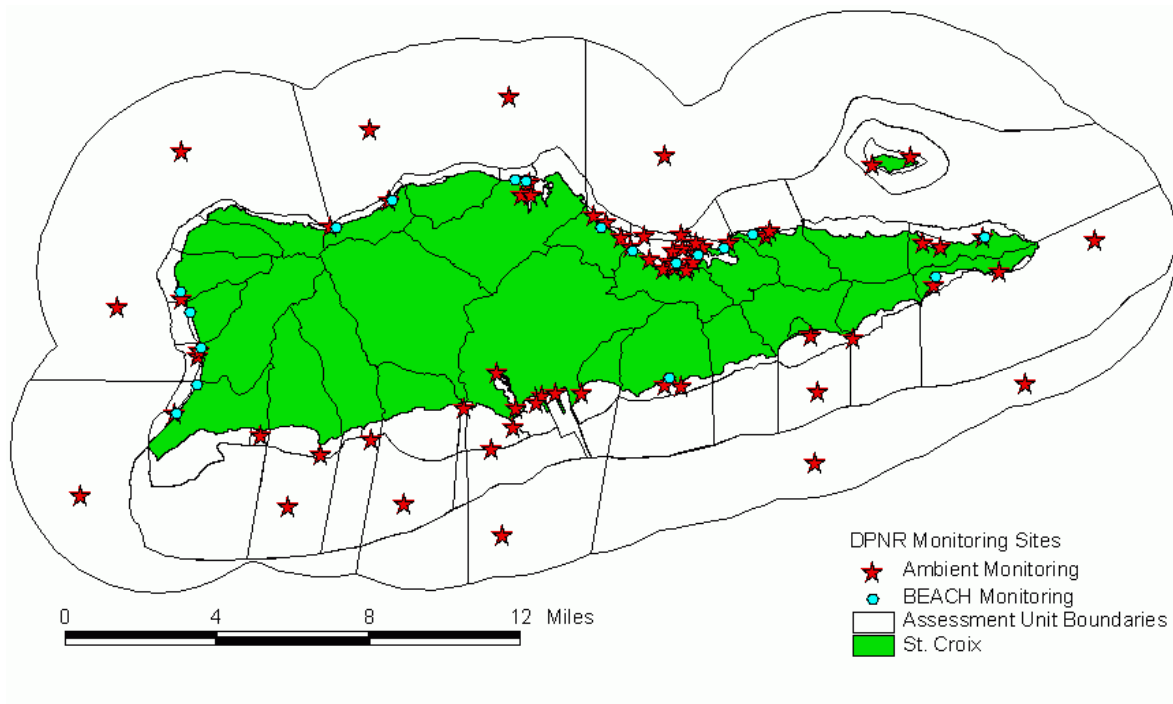
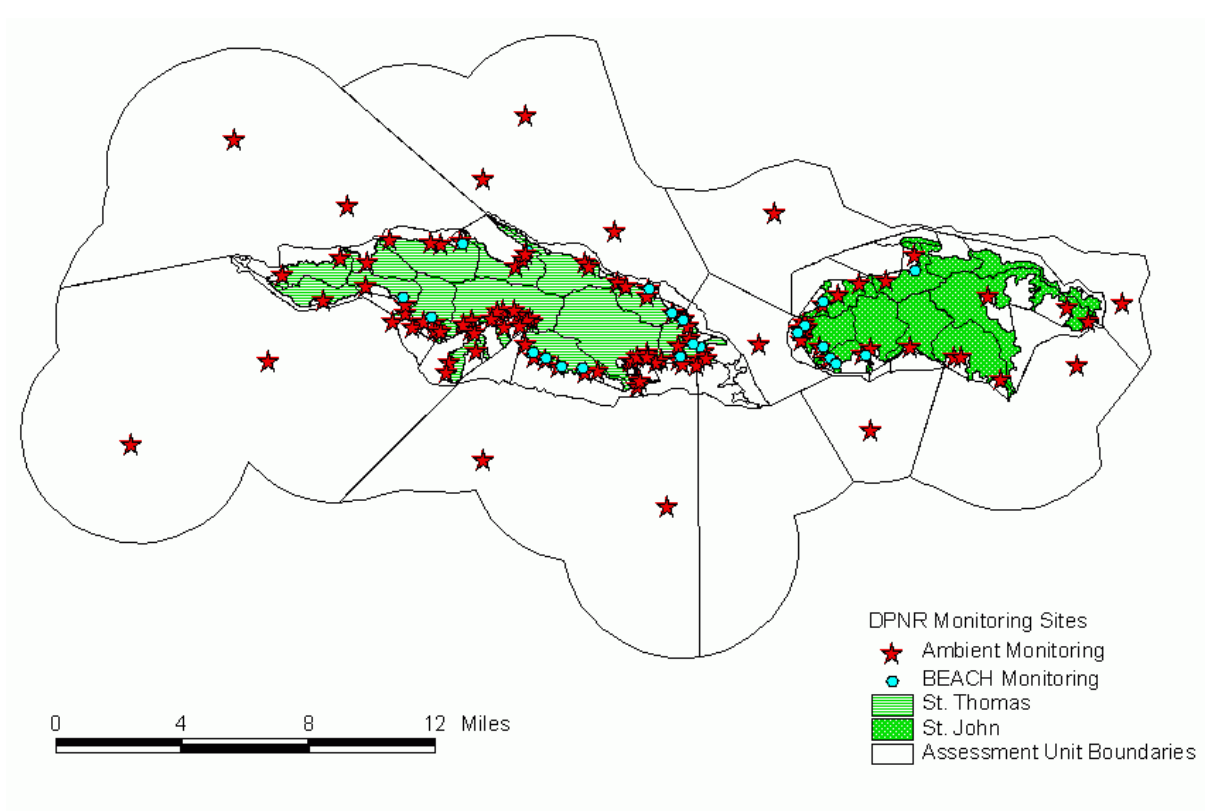


Figure III.A.2 St. Thomas/St. John Water Quality Monitoring Network



4. Toxics/biological monitoring

No monitoring for toxics or biological effects is conducted in the Virgin Islands for lack of baseline standards for Virgin Islands conditions. According to the Virgin Islands multi-year monitoring strategy, DPNR will explore options for implementing a biological component of the Ambient Monitoring Program. This may include developing a partnership with NOAA or another agency with similar monitoring objectives.

5. Fish tissue, sediment, shellfish monitoring:

The Virgin Islands Water Pollution Control program does not include toxic chemicals or biological monitoring. The program also does not monitor fish tissue, sediment or shellfish for toxicity. A background analysis of ambient water quality has not yet been performed to support the adoption of criteria for toxic chemicals (1996 VI 305(b)).

6. Quality assurance/quality control program

The US Virgin Islands DPNR-DEP Quality Assurance (QA) Program is committed to assuring and improving the quality of all environmental measurements performed by and for the Department. The goal of the QA program is for the acquisition of reliable and defensible environmental data. It is the policy of DPNR that adequate QA activities are conducted within the agency to ensure that all environmental data generated and processed be scientifically valid, of known precision and accuracy, of acceptable completeness, representative, comparability and where appropriate, legally defensible. During Fiscal Years 2008 and 2009 QA activities such as program technical audits, file audits, revision of the Quality Assurance Management Plan, Management System Reviews, review of program and contractual Quality Assurance Project Plans, review of all program Standard Operating Procedures, and Laboratory Certifications were performed. DPNR has a full-time QA/QC Officer who also acts the Laboratory Certification Officer for the Department.

7. Volunteer monitoring

DPNR had no monitoring volunteers during the reporting period. Volunteer monitoring, however, is being planned for implementation in future water quality monitoring program activities.

8. Program evaluation

- A background analysis of ambient water quality is needed to support the adoption of specific criteria for toxic pollutants (1998 305(b) Report). As part of the 2004 US Virgin Islands Water Quality Standards revision, the national recommended criteria were adopted;
- New equipment and staff training is needed to assess water quality for the development of toxic and biological criteria (1998 305(b) Report);
- Revisions of the existing Local Water Pollution Control Act and regulation are needed to enhance the program's ability to enforce its laws and statutes;

- Revisions to the Water Quality Standards and criteria to include numeric values instead of narrative description of desired water quality;
- Stormwater regulations are being implemented within the TPDES permitting program.

B. Assessment Methodology

Purpose:

The Clean Water Act requires each state, territory and tribe to conduct water quality surveys to determine if its waters are healthy and have sufficient quality to meet their designated uses and attain water quality standards. A report on this water quality assessment is submitted every two years to US Environmental Protection Agency – Region 2. The report incorporates physical, chemical, and microbiological data from the StoRet database, habitat assessments, and beach monitoring data (fish kills/advisories, oil spills, beach closings, etc.). Use of data is subject to availability.

The U.S. Environmental Protection Agency encourages states, territories and tribes to adopt the Integrated Reporting format which blends elements of the 305(b) Water Quality Assessment Report and the 303(d) Impaired Waterbody List. The United States Virgin Islands uses this format to more accurately and completely assess our waterbodies.

Complete assessments include:

Identification of waterbody type.

All waters of the U.S. Virgin Islands shall meet generally accepted aesthetic qualifications and shall be capable of supporting diversified aquatic life. "Waters" of the U.S. Virgin Islands shall be defined, as follows, as in by Title 12, Chapter 7, Section I82(f) of the Virgin Islands Code; all harbors, streams, lakes, ponds, impounding reservoirs, marshes, water-courses, water-ways, wells, springs, irrigation systems, drainage systems and all other bodies or accumulations of water, surface and underground, natural or artificial, public or private, situated wholly or partly within or bordering upon the United States Virgin Islands, including the territorial seas, contiguous zones, and oceans. These "waters" are included in the U.S. Virgin Islands 2010 Integrated Report. All available groundwater data will be reviewed for possible inclusion in the report and Division of Environmental Protection's Groundwater Program will provide groundwater discussion in the 2010 Integrated Report. At the very least, the Integrated Report should include an overview of groundwater and wetlands resources.

Identification of waterbody classification and designated use.

According to the US Virgin Islands water quality standards, the waters of the Virgin Islands exist in one of three classes: A, B and C. The following describes the geographical extent of the three waterbody classes, the associated designated uses, and the applicable water quality standards.

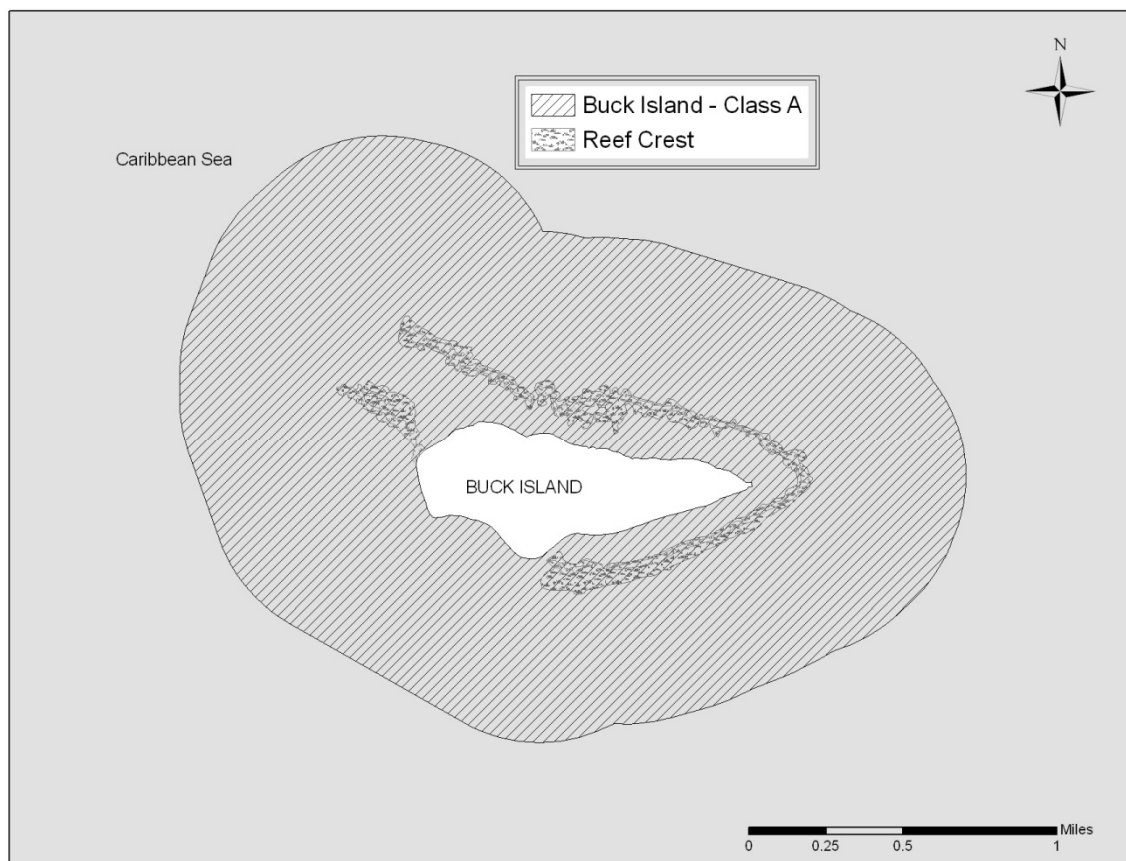
Class "A" Waters

Best usage of waters: Preservation of natural phenomena requiring special conditions, such as the Natural Barrier Reef at Buck Island, St. Croix and the Under Water Trail at Trunk Bay, St. John. These are outstanding natural resource waters that cannot be altered except towards natural conditions. No new or increased dischargers shall be permitted.

Quality criteria: Existing natural conditions shall not be changed. The biological condition shall be similar or equivalent to reference condition for biological integrity. In no case shall Class B water quality standards be exceeded.

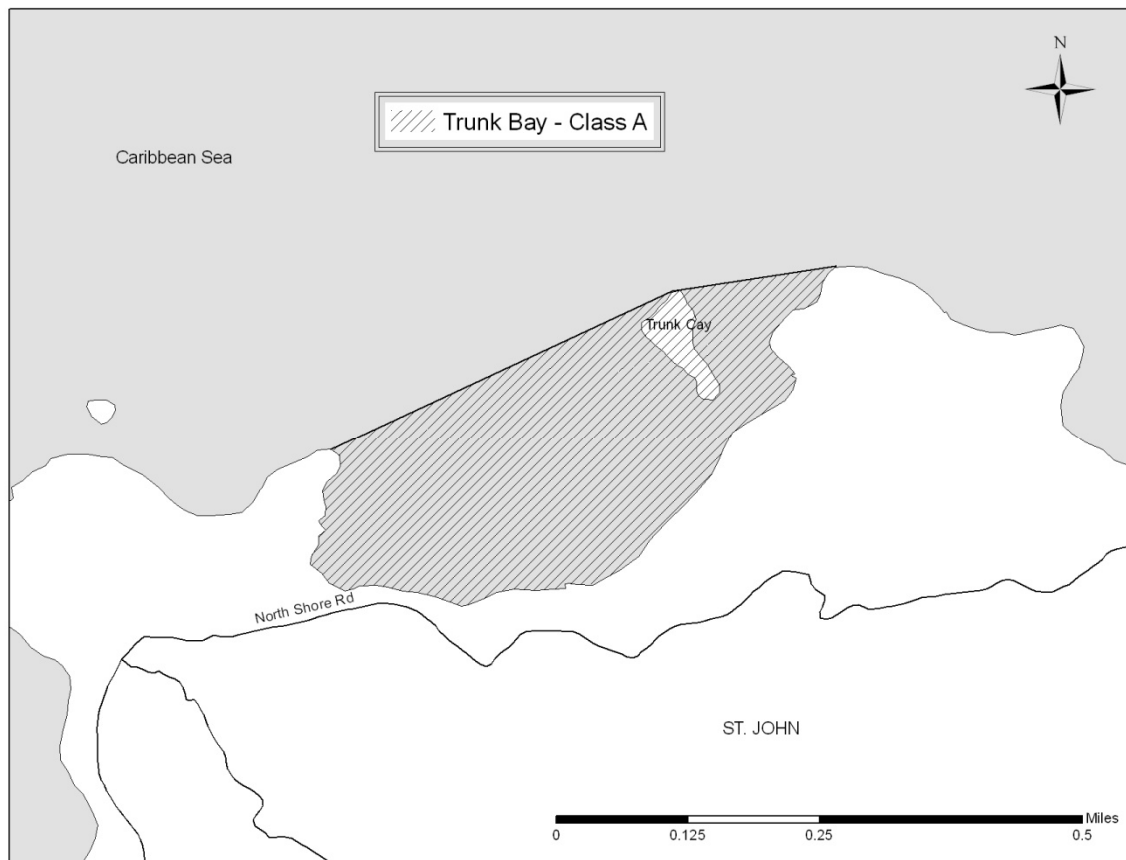
(1) Within 0.5 miles of the boundaries of Buck Island's Natural Barrier Reef, St. Croix.

Figure III.A.3 Class A - Buck Island, St. Croix



(2) Trunk Bay, St. John.

Figure III.A.4 Class A - Trunk Bay, St. John



Class “B” Waters.

Best usage of waters: For maintenance and propagation of desirable species of aquatic life (including threatened, endangered species listed pursuant to section 4 of the federal Endangered Species Act and threatened, endangered and indigenous species listed pursuant Title 12, Chapter 2 of the Virgin Islands Code) and for primary contact recreation (swimming, water skiing, etc.). This Class allows minimal changes in structure of the biotic community and minimal changes in ecosystem function. Virtually all native taxa are maintained with some changes in biomass and/or abundance; ecosystem functions are fully maintained within the range of natural variability.

(1) All other waters not classified as Class “A” or Class “C”.

(A) Those Class “B” waters not covered by color and turbidity criteria in section 186-3(b)(11) of this chapter include:

(i) St. Thomas waters-Mandahl Bay (Marina), Vessup Bay, Water Bay, Benner Bay, and the Mangrove Lagoon.

(ii) St. Croix waters-Carlton Beach, Good Hope Beach, Salt River Lagoon (Marina), Salt River Lagoon (Sugar Bay), Estate Anguilla Beach, Buccaneer Beach, Tamarind Reef Lagoon, Green Cay Beach and Enfield Green Beach.

(iii) All non-marine waters defined as all Virgin Islands waters shoreward of the mean high-tide line.

(B) All other Class “B” waters are covered by the color and turbidity criteria in section 186-3(b)(11)(B) of this subchapter.

Figure III.A.5 Class B - St. Croix (only marine waters displayed)

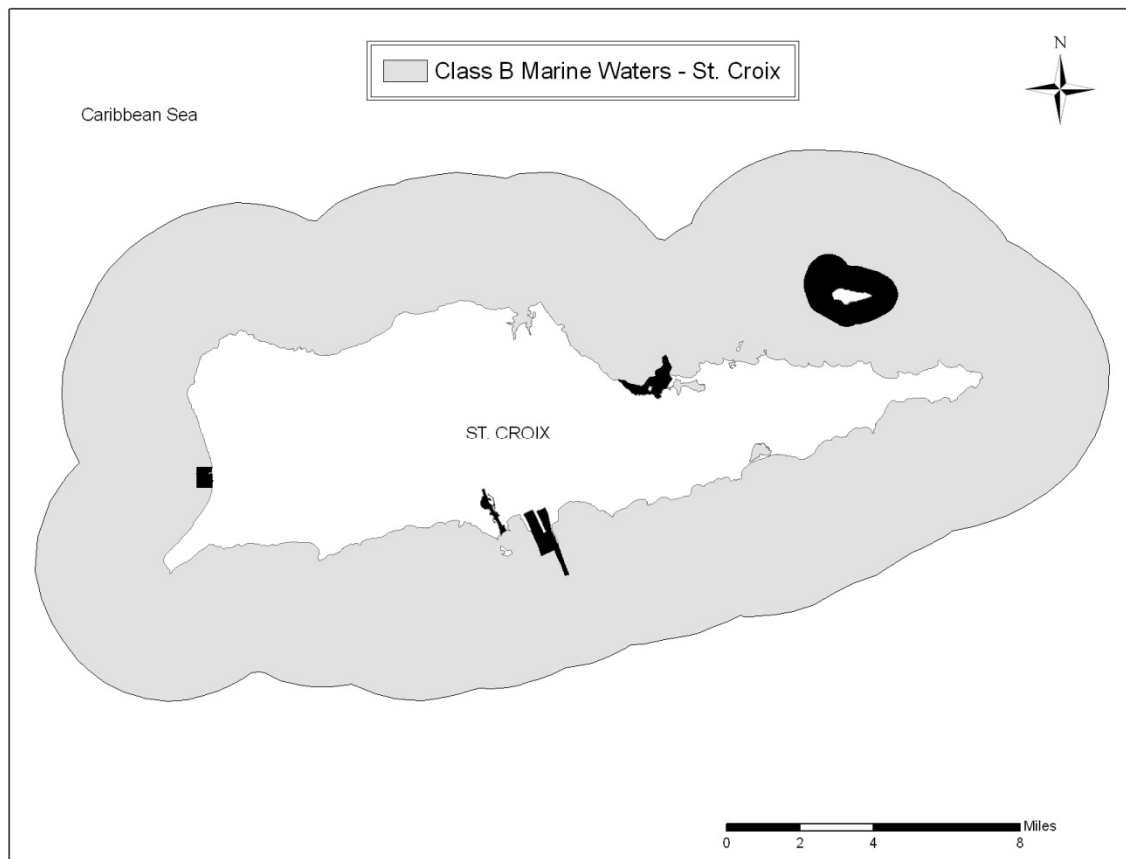
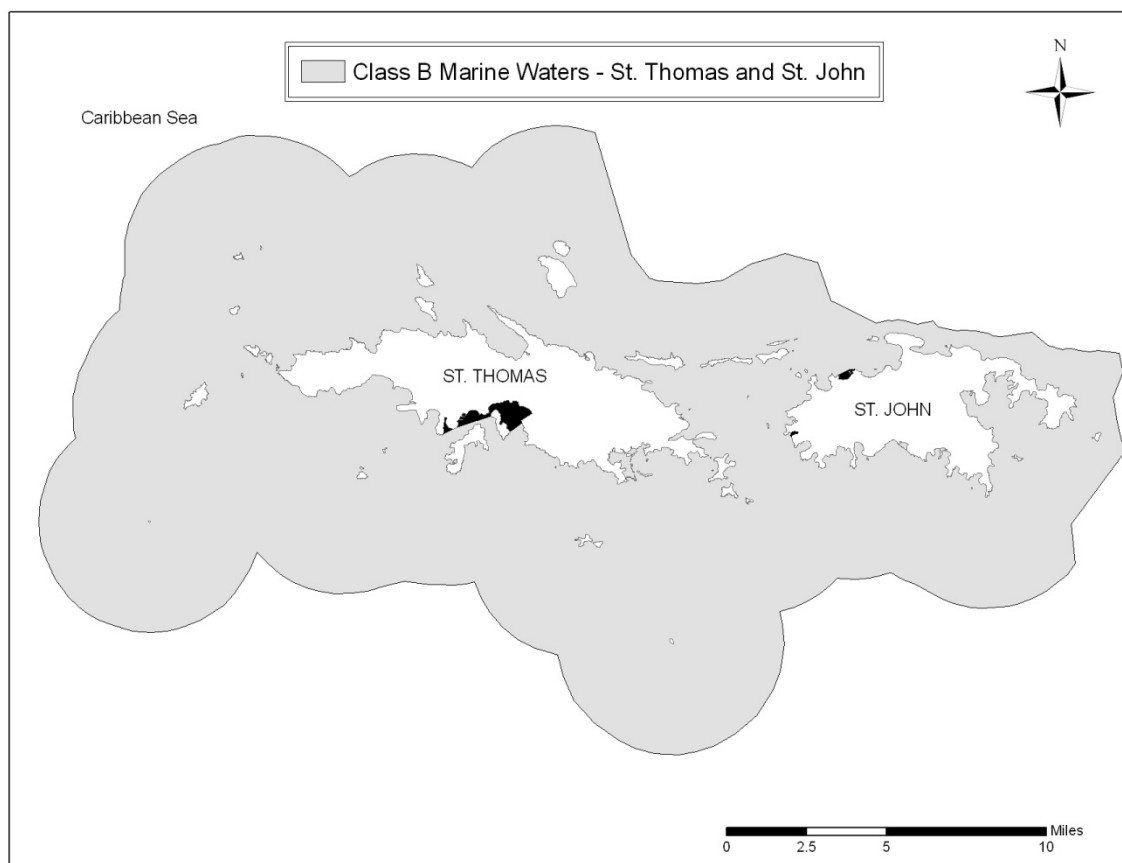


Figure III.A.6 Class B - St. Thomas and St. John (only marine waters displayed)



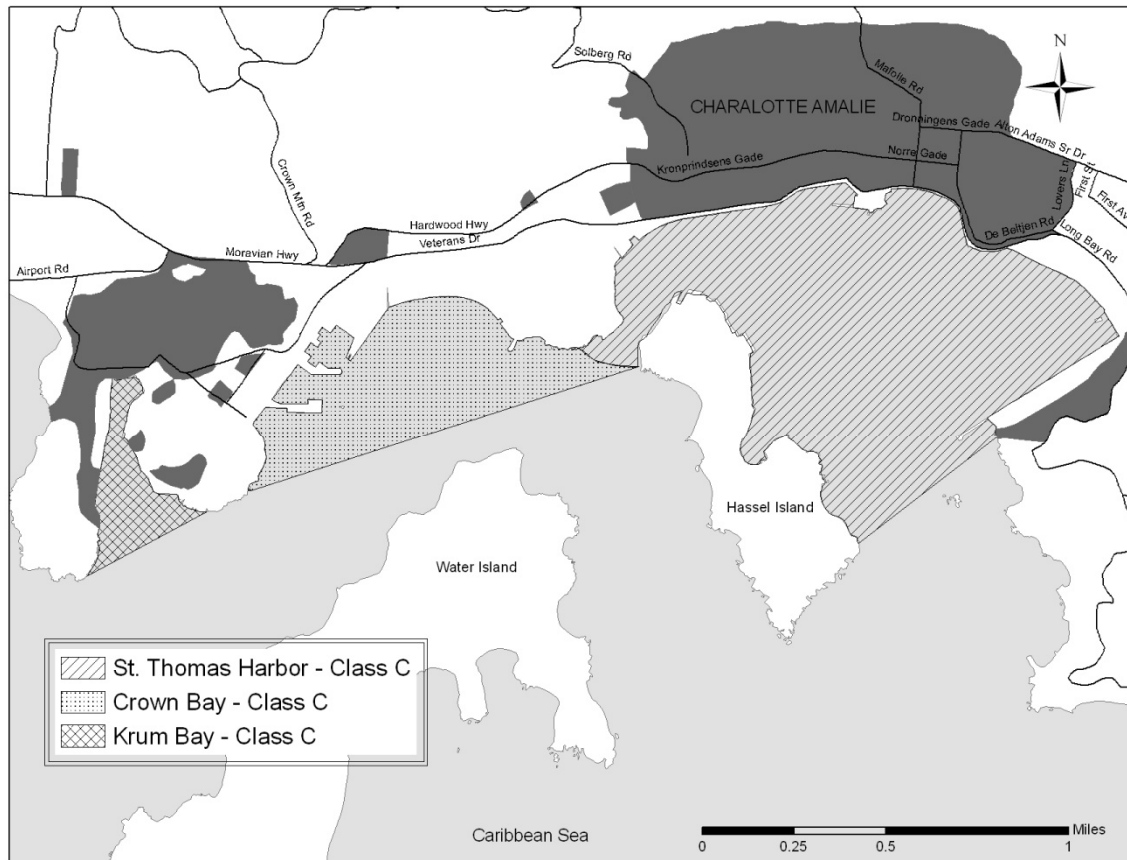
Class “C” Waters

Best usage of waters: For maintenance and propagation of desirable species of aquatic life (including threatened and endangered species listed pursuant to section 4 of the federal Endangered Species Act and threatened, endangered and indigenous species listed pursuant Title 12, Chapter 2 of the Virgin Islands Code) and for primary contact recreation (swimming, water skiing, etc.). This Class allows for evident changes in structure of the biotic community and minimal changes in ecosystem function. Evident changes in structure due to loss of some rare native taxa; shifts in relative abundance of taxa (community structure) are allowed but sensitive-ubiquitous taxa remain common and abundant; ecosystem functions are fully maintained through redundant attributes of the system.

(1) St. Thomas:

- (A) St. Thomas Harbor beginning at Rupert Rock and extending to Haulover Cut.
- (B) Crown Bay enclosed by a line from Hassel Island at Haulover Cut to Regis Point at West Gregerie Channel.
- (C) Krum Bay.

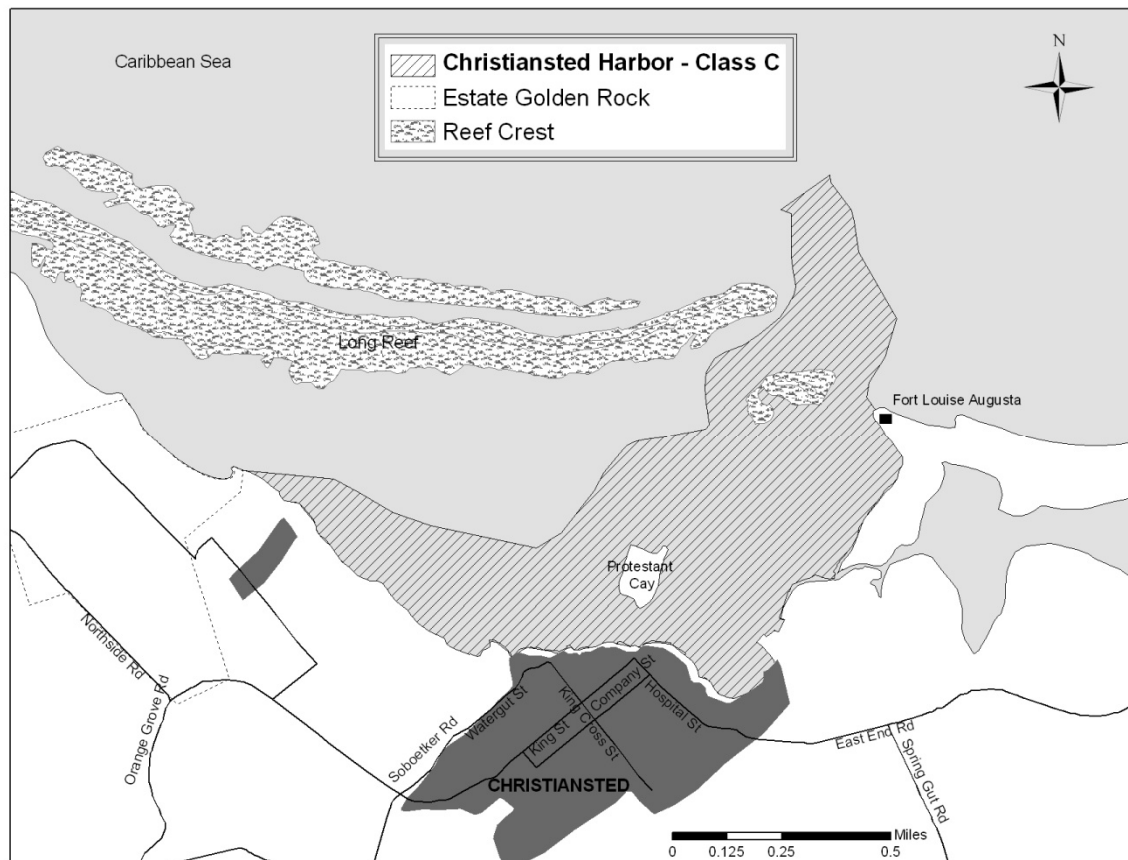
Figure III.A.7 Class C - St. Thomas Harbor, Crown Bay and Krum Bay, St. Thomas



(2) St. Croix:

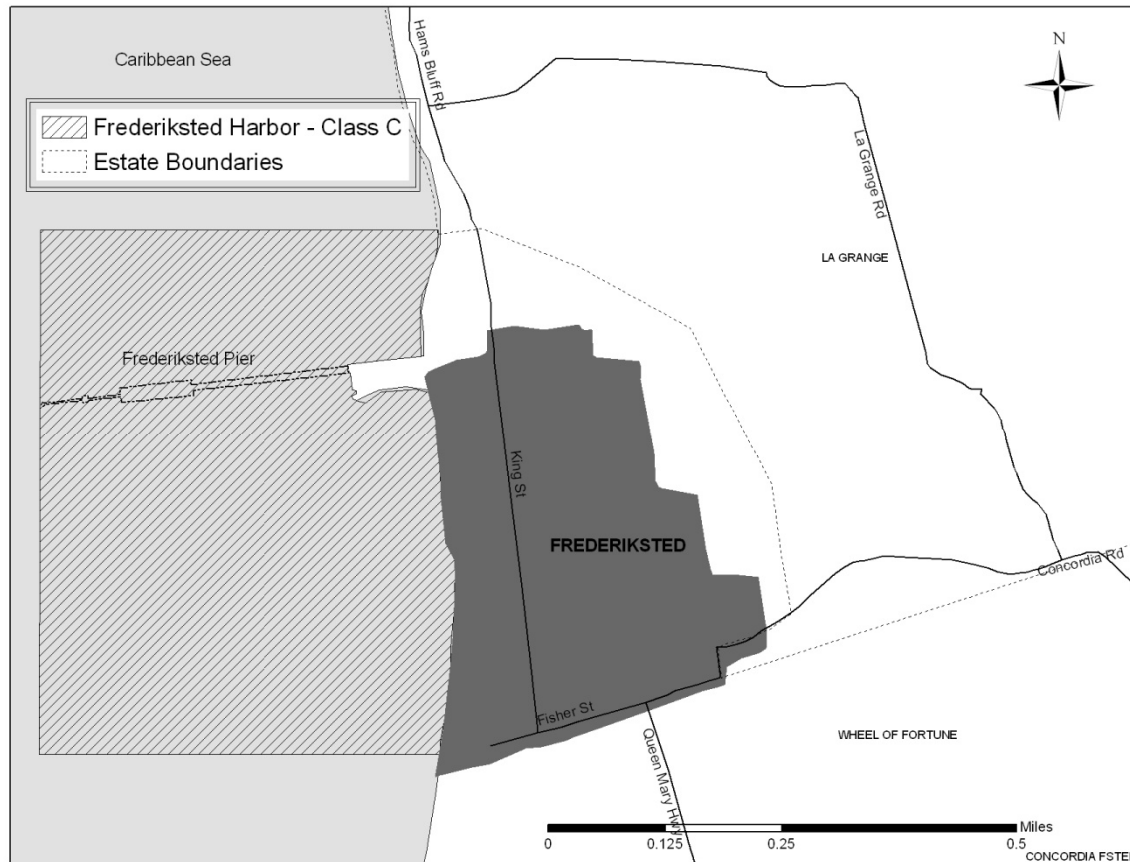
(A) Christiansted Harbor from Fort Louise Augusta to Golden Rock, along the waterfront and seaward to include the navigational channels and mooring areas.

Figure III.A.8 Class C - Christiansted Harbor, St. Croix



(B) Frederiksted Harbor from La Grange to Fisher Street and seaward to the end of the Frederiksted Pier.

Figure III.A.9 Class C - Frederiksted Harbor, St. Croix



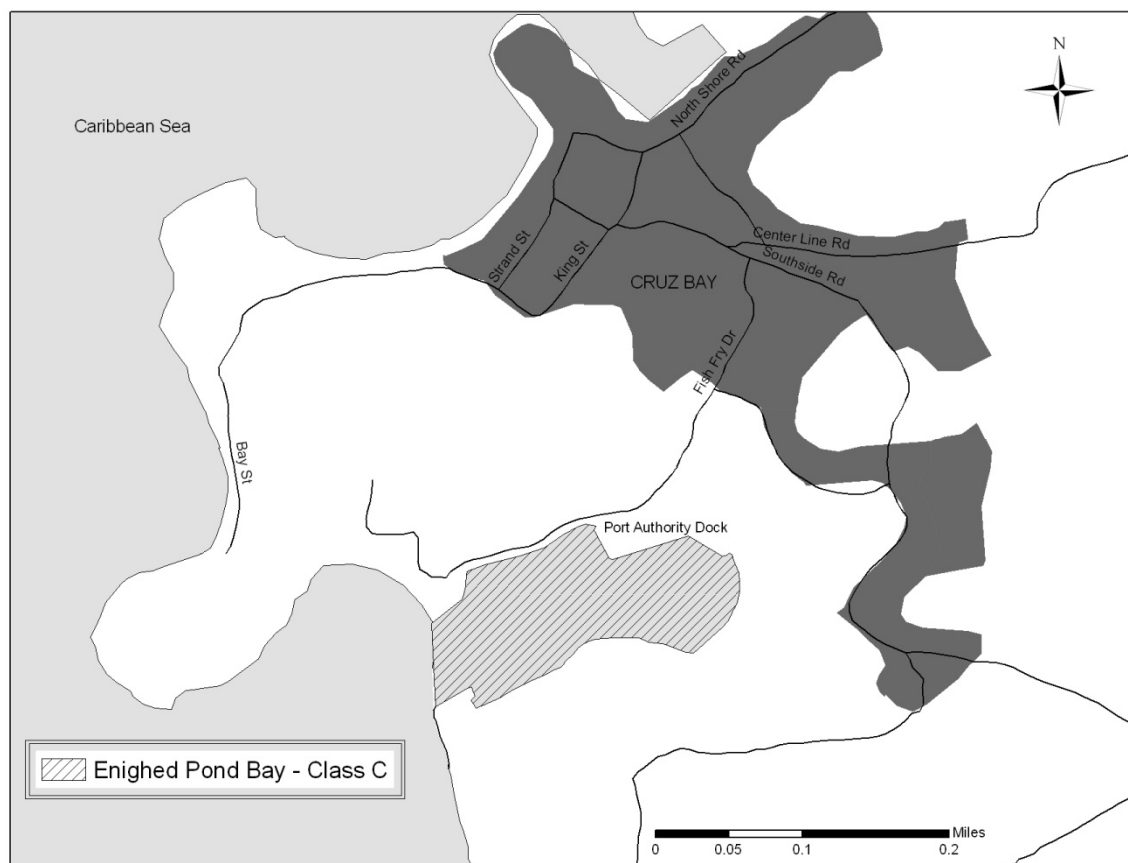
- (C) Hess Oil Virgin Islands Harbor (alternatively named HOVENSA Harbor).
(D) Martin-Marietta Alumina Harbor (alternatively named Port Alucroix or St. Croix Renaissance Group Harbor).

Figure III.A.10 Class C - HOVENSA Harbor and St. Croix Renaissance Group Harbor,



- (3) St. John:
(A) Enighed Pond Bay

Figure III.A.11 Class C - Enighed Pond, St. John



Summary of Criterion Levels of Virgin Islands Water Quality Standards:

Class A

Quality criteria: Existing natural conditions shall not be changed. The biological condition shall be similar or equivalent to reference condition for biological integrity. In no case shall Class B water quality standards be exceeded.

Criterion

Class B

Class C

Dissolved Oxygen

Not less than 5.5 mg/l from other than natural conditions

Not less than 5.0 mg/l from other than natural conditions

pH

<8.3 Tolerable Limit >7.0

<8.5 Tolerable Limit>6.7

Temperature

Not to exceed 32° Celsius at any time

Same as Class B

Bacteria

A geometric (log) mean of

A geometric (log) mean of 200

	70 fecal coliforms per 100 ml by MF or MPN count	fecal coliforms per 100 ml by MF or MPN count
	Not to exceed a geometric mean of 35 enterococci per 100 mL., not to exceed a single sample maximum of 104 per 100 mL at any time.	Not to exceed a geometric mean of 35 enterococci per 100 mL., not to exceed a single sample maximum of 104 per 100 mL at any time
Chlorine	The 4-day average concentration of Chlorine shall not exceed 7.5 ug/l. The 1-hour average concentration of Chlorine shall not exceed 13 ug/l	Same as Class B
Phosphorus	Not to exceed 50 ug/L any coastal waters	Same as Class B
Suspended, colloidal or settleable solids	None from waste water, which would cause deposition or be otherwise deleterious.	Same as Class B
Oil and Floating substances	No residue attributable to waste water. No visible film; no globules of grease	Same as Class B
Radioactivity	Gross Beta: 1000 picocuries per liter, in the absence of Sr 90 and alpha emitters Radium-226: 3 picocuries per liter Strontium-90: 10 picocuries per liter	Same as Class B
Taste and Odor	None in amounts to interfere with use for primary contact recreation, potable water supply or to render undesirable taste or odor to edible aquatic life	Same as Class B
Color and Turbidity	<ul style="list-style-type: none"> • A secchi disc shall be visible at a minimum depth of one meter • A maximum nephelometric turbidity unit reading of three (3) shall be permissible 	Same as Class B, but no NTU standard in Rules and Regulations

Inventory of physical, chemical and microbiological data

StoRet data extracts from fiscal years 2008-2009 will be considered for the 2010 water quality assessment. The source of StoRet's data is the result of the Division of Environmental Protection's Ambient Monitoring Program. The Water Quality Management Planning Program (WQMP) manages this program. Through the Ambient Monitoring Program, ambient water quality is monitored on a quarterly basis. WQMP also manages the Beach Water Quality Monitoring Planning which monitors designated recreational beaches on a weekly basis.

The Assessment Database (ADB) will be a valuable tool in storing information regarding designated uses for waterbodies. ADB will also be useful in storing pollutant and stressor data pertinent to making accurate assessments. ADB will also store cause and source data.

Habitat assessment data inventory

The US Virgin Islands Division of Fish and Wildlife has been identified as a possible data source for habitat assessments. Data provided by Fish and Wildlife will be reviewed to determine possible use in the water quality assessment report.

Visual Data Sources

The Department of Planning and Natural Resources Division of Environmental Protection keeps a log of all incidents of oil spills, fish kills and other events that affect water quality in the US Virgin Islands. This log will be reviewed for all incidents that could have had a negative impact on US Virgin Islands water quality.

Identify exceedences of water quality standards

The US Virgin Islands water quality standards set limits for various criteria. All readily available data that meet quality assurance / quality control requirements will be compared to the limits set by the USVI water quality standards to determine which waterbodies exceed these limits.

Use determination status

Use support determination is dependent upon the guidelines set by the United States Environmental Protection Agency's "Guidelines for Preparation of the Comprehensive State Water Quality Assessments (305(b) Reports) and Electronic Updates: Report Contents", "Guidelines for Preparation of the Comprehensive State Water Quality Assessments (305(b) Reports) and Electronic Updates: Supplement" and "2006 Integrated Water Quality Monitoring and Assessment Report Guidance".

Data gaps and error control

The US Virgin Islands will make every effort to control errors that may have been reported in data. Data determined to be erroneous or flawed will be discarded.

It is understood that the US Virgin Islands has a number of data gaps. These gaps are not limited to existing data sets, but it can also refer to the lack of certain types of data. The Integrated Report will make mention of US Virgin Islands data gaps.

The Integrated Report describes US Virgin Islands data gaps. Potential data gaps include beach closure data, habitat assessment data, toxicity and toxicant data, wetland assessment data, and intermittent streams data. DPNR intends to work on developing a data document in the near future. Any data gaps that are identified will be included in the multi-year monitoring strategy for resolution.

Natural Disasters

Hurricane season in the US Virgin Islands lasts from June through November each year. As part of the Territory's post hurricane Emergency Response Plan (ERP) the Water Pollution Control program conducts ambient beach monitoring at each of the beach monitoring stations until the water quality is determined to meet water quality standards.

There was no sampling this cycle related to natural disasters.

Evaluation of Internal Data

Due to issues with internal data collection, which included malfunctioning equipment, USEPA evaluated DPNR Basic Water Quality Monitoring Program data for FY2008 and 2009. USEPA determined there could be no reliance on any DO, pH, turbidity and temperature data reported from the field. Therefore, DPNR were required to use only the beach monitoring data, data received during the 2010 Integrated Report data solicitation process announced on October 16, 2009, and analytical data for bacteria, TSS, and turbidity to conduct assessments for the 2010 Integrated Report.

DPNR evaluates all internal monitoring data to determine if the Data Quality Objectives outlined in the USVI Ambient Water Quality Monitoring Program Quality Assurance Project Plan are met. Once the data is determined to meet the required objectives the data is used to conduct the assessments for the reporting cycle. The elements evaluated are as follows:

Precision and accuracy

The precision and accuracy of data are determined by particular actions of the analytical laboratory and field staff. The precision of data is a measure of the reproducibility of the measurement when an analysis is repeated. The precision of selected chemical analyses will be examined by using standard solutions and comparison of duplicate analysis. Relative percent difference (RPD) will be calculated for field duplicate analysis to assess precision of field collection procedure. Laboratory precision will be determined by calculating RPD of results of "unknown" analysis and laboratory duplicate analysis. The following is the formula used for calculation of RPD:

$$\text{RPD} = \{(C_1 - C_2) / [(C_1 + C_2) / 2]\} \times 100$$

RPD= Relative Percent Difference

C₁= Larger of two observed values

C₂= Smaller of two observe values

It is the responsibility of the program manager to verify that the data are representative while the analytical data's precision, accuracy, and comparability are mainly the responsibility of the laboratory supervisor.

Representativeness

The representativeness of the data is mainly dependent on the sampling locations and the sampling procedures adequately representing the true condition of the sample site. Sampling station siting, and use of only approved/documented analytical methods will determine that the measurement data represent the conditions at the site, to the extent possible. It is well known that water flowing past a given location on land is constantly changing in response to inflow, tidal cycle, weather, etc. Sampling schedules will be designed with respect to frequency, locations and methodology in order to maximize representativeness, where possible and applicable.

Laboratory representativeness will be achieved by following analytical procedure and standard operating procedures, meeting holding times, and assessment and comparison of field duplicate samples.

Comparability

The comparability of data produced by and for DPNR is predetermined by the commitment of its staff and analytical laboratories to use standardized methods, where possible, including EPA approved analytical methods, or documented modifications thereof which provide equal or better results. These methods have specified units in which the results are to be reported.

Completeness

The completeness of data is basically a relationship of how much of the data is available for use compared to the total potential data before any conclusion is reached. Ideally, 100% of the data should be available. However, the possibility of data becoming unavailable due to laboratory error, insufficient sample volume, or samples broken in shipping must be expected. Also, unexpected situations may arise where field conditions do not allow for 100% data completeness. Failure to achieve 100% data completeness usually will result from the field crew's inability to sample at stations because of logistical barriers, such as insufficient depth, or adverse weather conditions. In the limited number of instances where these may be encountered, efforts will be made to relocate the station in an adjacent area or re-sample the station. In addition, established protocols for tracking samples during shipment and laboratory processing must be followed to minimize data loss following successful sample collection.

Data From Other Sources

DPNR will consider data received up to one week prior to the submission of the draft 303(d) Total Maximum Daily Load List. All data received past the deadline will be reviewed for credibility and if determined to be of high quality and of great significance it may be added as an appendix.

Otherwise, the data will be considered during the next cycle. Other data sources refer to any data that was collected outside of the US Virgin Islands Department of Planning & Natural Resources.

The following agencies were contacted to request data during the Data Solicitation Period. The agencies were asked to submit all relative monitoring data for the monitoring period with the associated Quality Assurance Project Plan:

Contact Name	Title	Agency
Kofi Boateng	Associate State Director	UVI-CES
Jeffrey Potent	-	USEPA Region 2
Rafe Boufon	-	National Park Service
Barbara S.P. Moore	Director	NOAA/National Undersea Research Program
Eric Hawk	Section 7 Coordinator	National Marine Fisheries Service
Richard Nemeth, Ph.D.	Director	UVI-CMES
Pedro Diaz	-	USGS/GSA Center
Edwin Muniz	Supervisor	USFW/PR Field Office

Once received the QAPP and data would be evaluated to determine if DPNR's Data Quality Objectives were met. If the data is determined to be acceptable then the data would be used in the reporting cycle's assessments. A rationale for any decision to not use any existing and readily available data and information would also be included in the Integrated Report.

DPNR, however, did not receive data from external sources during the data solicitation period for the FY2008 and 2009 reporting cycle.

DPNR also intends to develop a Standard Operating Procedure for the evaluation of secondary data which will clearly articulate acceptance criteria. That criteria once developed will be incorporated into the relative version of the Assessment Methodology.

Monitored Waters

The coastal waters of the Virgin Islands are evaluated for the following uses: Primary Contact Recreation and Aquatic Life Use Support. All existing and readily available data and information will be assembled and used in the assessment.

Use Support Determination

Waterbody delineations used for determining use support are derived from global information system (GIS) coverages. The Division of Environmental Protection is currently in the process of contracting professional services to develop a standard waterbody delineation based on a number of prevailing factors.

Presently, use support will be determined using the most current version of the US Virgin Islands water quality standards. Water quality standard revision was initiated in 2008. The revision is complete and has been adopted into the Virgin Islands Rules and Regulations as of June 2011.

Ground Water Assessment

Ground Water Monitoring Program

Specific groundwater monitoring tasks:

- Collect continuous ground-water level records at selected sites in the major well fields in the U.S. Virgin Islands; St. Croix, St. Thomas, and St. John.
- Conduct monthly measurement of ground water level at selected sites in the U.S. Virgin Islands.
- Collect meteorological data (instantaneous point measurements) at one consistent station at each island to document climatic variations and seasonal patterns and to consider long term trends.
- Collect ground-water samples once a year at selected well fields to monitor ground-water quality for possible effects of degradation (changes in water quality as measured since 1960) from saltwater encroachment. This includes testing for sulfates, anions, cations, alkalinity, and conductivity.

Surface Water Assessment

As part of the assessment process, each assessment is rated as being supporting, partially supporting, not supporting or not applicable (not applicable is usually the result of a data gap). Under the integrated reporting format, partially supporting and not supporting **are both considered impaired and will be listed under category 5 provided water quality standards are exceeded**. The USVI uses partially supporting only as a measure of impairment severity. Severity is important in helping the USVI design a schedule for total maximum daily loads. While partially supporting waters are listed as impaired, not supporting waters are listed as impaired and threatened.

In order to assess an assessment unit, data must be available from at least one assessment type in each designated use. Impairment of any single indicator will result in the waterbody being listed as impaired (for that parameter), even if the other indicators do not exceed the standards.

Consideration will be taken in cases where a parameter falls within the degree of error of monitoring equipment.

1. Primary Contact Recreation

Microbiological Assessment

The use support is based on single sample maximum allowable density of fecal coliforms, beach closing data and reported oil spills. Allowable limits are determined by the class of the water body. Class A requires that in no case shall Class B water quality standards be exceeded, and in class B and

C, water bodies should not exceed 70 or 200 colonies/100mL in a single sample. The percent of total violations is evaluated as follows:

1. Fully Supporting: None of the Samples exceed 70 or 200 colonies/100 mL in class B and C waters for fecal coliform and 104 colonies/100 mL for enterococci.
2. Not supporting: Any of the Samples exceed 70 or 200 colonies/100 mL in class B and C waters for fecal coliform and 104 colonies/100 mL for enterococci.

Beach Closing Assessment

In addition to pathogens, beach-closing data will be used to determine primary contact recreation use support. The matrix of allowable violations is as follows:

1. Supporting: No bathing area closures or restrictions in effect during reporting period.
2. Not Supporting: On average, one bathing area closure per year of greater than 1 week's duration, or more than one bathing area closure per year.

The Department of Planning and Natural Resources only issues administrative advisories. Beach closures would only be enforced for very serious threats to human health. DEP has implemented a Beaches Environmental Assessment and Coastal Health (BEACH) monitoring program that takes enterococci at select sites on a weekly basis. This data will be used in conjunction with data collected from the Ambient Monitoring Program.

Toxicant Assessment (Human Health)

The applicable numeric water quality standards for toxic pollutants to protect the designated uses of waters of the U.S. Virgin Islands shall be the Environmental Protection Agency's (EPA) national recommended Clean Water Act section 304(a) water quality criteria, EPA's Office of Water, Office of Science and Technology (4304T), 2006.

The conditions for use support are as follows:

1. Fully Supporting: No toxicants noted in either acute or chronic tests compared to controls or reference conditions.
2. Partially Supporting: No toxicants noted in acute tests, but may be present in chronic tests in either slight amounts and/or infrequently within an annual cycle.
3. Not Supporting: Toxicants noted in many tests and occurs frequently.

Other Parameters

Throughout the course of collecting data for this report, data that does not fit within the auspices of the other assessment categories of Primary Contact Recreation Use Support (e.g. aesthetics, pH, turbidity, algae, odor, etc.) will be considered under Other Parameters. The following guidelines apply where appropriate:

1. Fully Supporting: For any one pollutant or stressor, criteria exceeded in none of the measurements.
2. Not Supporting: For any one pollutant, criteria exceeded in any of measurements.
3. Aquatic Life Use Support.

Habitat Assessment

Determination of Aquatic Life Use Support will consider habitat assessment data (based on availability) in relation to propagation of desired species of marine life and the biological integrity of the benthic communities living within waters. These communities shall be assessed by comparison to reference conditions(s) with similar abiotic and biotic environmental settings that represent the optimal or least disturbed condition for that system. Such reference conditions shall be those observed to support the greatest community diversity, and abundance of aquatic life as is expected to be or has been historically found in natural settings essentially undisturbed or minimally disturbed by human impacts, development, or discharges.

Habitat assessment data is considered as follows:

1. Fully Supporting: Reliable data indicate natural channel morphology, substrate composition, bank/riparian structure, and flow regime of region. Riparian vegetation of natural types and of relatively full standing crop biomass (i.e., minimal grazing or disruptive pressure).
2. Partially Supporting: Modification of habitat slight to moderate usually due to road crossings, limited riparian zones because of encroaching land use patterns, and some watershed erosion. Channel modification slight to moderate.
3. Not Supporting: Moderate to severe habitat alteration by channelization and dredging activities, removal of riparian vegetation, bank failure, heavy watershed erosion or alteration of flow regime and inclusion of exotic or aquatic nuisance species

DEP received no habitat assessment data for the 2008-2009 reporting cycle.

Toxicity Assessment

The applicable numeric water quality standards for toxic pollutants to protect the designated uses of waters of the U.S. Virgin Islands shall be the Environmental Protection Agency's (EPA) national

recommended Clean Water Act section 304(a) water quality criteria, EPA's Office of Water, Office of Science and Technology (4304T), 2006.

The conditions for use support are as follows:

1. Fully Supporting: No toxicity noted in either acute or chronic tests compared to controls or reference conditions.
2. Partially Supporting: No toxicity noted in acute tests, but may be present in chronic tests in either slight amounts and/or infrequently within an annual cycle.
3. Not Supporting: Toxicity noted in many tests and occurs frequently.

Conventional Assessment

Significant violations are determined for conventional parameters. Conventional parameters are evaluated using the frequency of violations.

The conventional parameters are:

- Dissolved Oxygen (not less than 5.5 mg/l from other than natural conditions)*;
- Temperature (not to exceed 32°C at any time, nor as a result of waste discharge to be greater than 1.0°C above natural conditions)*;
- Turbidity; and
- pH.

*The term “natural condition” for Dissolved Oxygen and Temperature will be addressed through work in collaboration with the Environmental Protection Agency (EPA) for Class B and C waters during the next Triennial Review of the WQS.

The conditions for use support for the conventional parameters are as follows:

1. Fully Supporting: For any one pollutant or stressor, criteria exceeded in none of the measurements.
2. Not Supporting: For any one pollutant, criteria exceeded in any of the measurements.

Toxicant Assessment (Aquatic Life)

The applicable numeric water quality standards for toxic pollutants to protect the designated uses of waters of the U.S. Virgin Islands shall be the Environmental Protection Agency's (EPA) national recommended Clean Water Act section 304(a) water quality criteria, EPA's Office of Water, Office of Science and Technology (4304T), 2006.

The conditions for use support are as follows:

1. Fully Supporting: No toxicants noted in either acute or chronic tests compared to controls or reference conditions.
2. Partially Supporting: No toxicants noted in acute tests, but may be present in chronic tests in either slight amounts and/or infrequently within an annual cycle.
3. Not Supporting: Toxicants noted in many tests and occurs frequently.

Biological Assessment

Upon identifying a source of data to apply towards a biological assessment, the conditions for use support is as follows:

1. Fully Supporting: Reliable data indicate functioning, sustainable biological assemblages (e.g., fish, macroinvertebrates, or algae) none of which has been modified significantly beyond the natural range of the reference condition.
2. Partially Supporting: At least one assemblage (e.g., fish, macroinvertebrates, or algae) indicates moderate modification of the biological community compared to the reference condition.
3. Not Supporting: At least one assemblage indicates nonsupport. Data clearly indicates severe modification of the biological community compared to the reference condition.

DEP received no biological data for the 2008-2009 reporting cycle.

Listing Rules

This methodology groups assessments as follows:

Primary Contact Recreation (PCR) Indicators	Aquatic Life Use Support (ALUS) Indicators
Microbiological Assessment Beach Closing Assessment Toxicant Assessment (Human Health) Other Parameters	Habitat Assessment Toxicity Assessment Conventional Assessment Toxicant Assessment (Aquatic Life) Biological Assessment

Category 1

The assessment unit is placed in this category if it meets the water quality standards for the parameters that define support for both Primary Contact Recreation (PCR) & Aquatic Life Use Support (ALUS).

Category 2

The assessment unit is placed in this category if it attains water quality standards for the parameters that define support for either PCR or ALUS but data is insufficient to determine support for the other use. In addition, there is no data to indicate that the uses are threatened under the US EPA definition of threatened. Waters with insufficient data will be scheduled for more extensive monitoring in the USVI's multi-year monitoring schedule.

Category 3

The assessment unit is placed in this category if insufficient or no data is available to determine if water quality standards are attained and any designated uses are supported. The Virgin Islands considers insufficient data as anything less than four quarters of monitoring data. However, waters with less than four quarters of monitoring data may be reviewed on a case-by-case basis if the limited data strongly suggests that water quality standards are exceeded and the designated uses are impaired. Such waters may be eligible for inclusion on the 303(d) List. Remaining waters with insufficient data will be scheduled for more extensive monitoring in the USVI's multi-year monitoring schedule.

Category 3A

No data is available from any of the identified data sources for the assessment unit in question.

Category 3B

Insufficient Data is available from any of the identified data sources for the assessment unit in question. Insufficient data is defined as less than four quarters of monitoring data. This category differs from Category 2 in that this condition must apply to all designated uses.

Category 3C

Inconclusive Data is available from any of the identified data sources for the assessment unit in question. This might include information from studies that do not directly provide information related to water quality standards.

Category 3D

Unreliable or low quality data is available from any of the identified data sources for the assessment unit in question. Unreliable or low quality data is defined as data sets that have significant gaps, obvious anomalies, etc.

Category 4

Assessment units that are found to be partially or not supporting for one or both designated uses are placed in category 4 under the appropriate subcategory (4A, 4B, 4C).

Category 4A

The assessment unit is placed in this category if it was previously listed on the 303(d) list and a total maximum daily load has been established and approved by EPA.

Category 4B

The assessment unit is placed into this category only if other pollution control requirements are expected to address all water-pollutant combinations and attain all water quality standards within a

reasonable period of time. The Virgin Islands considers a reasonable period of time as being the time between reporting cycles. If the impairment is the result of a point source discharge, is expected that the Territorial Pollution Discharge Elimination System (TPDES) program will take appropriate measures to control point source pollution. If the impairment is the result of non-point source pollution, DPNR will provide evidence that a pollution control measure is in place.

Category 4C

The assessment unit is placed into this category if the impairment was not caused by a pollutant. Assessment units placed into this category must show improvement by the next reporting cycle. If the impairment persists because of current conditions it will be moved into Category 5. If the assessment unit shows improvement since the last cycle it will be moved into either Category 1 or 2. If the data available is insufficient to make an assessment, the assessment unit will be moved to Category 3 (see Category 3 for more detail).

Category 5

The assessment unit is placed into this category if water quality standards are exceeded in which case a total maximum daily load must be established. Assessment units that are placed into Category 5 will be placed on the 2010 303(d) Total Maximum Daily Load List.

De-listing

As a result of the abovementioned data restrictions, DPNR did not de-list any Assessment Units during the 2008-2009 reporting cycle.

C. Monitoring Strategy

The Water Pollution Control Program develops the Division of Environmental Protection's monitoring strategy. The current monitoring strategy addresses the integrated five categories and the assessment units delineated by Battelle (2003). The monitoring strategy is available for inclusion in this methodology and is attached as an appendix.

The Water Pollution Control Program developed the following Multi-Year Monitoring Strategy in which a monitoring plan was detailed for 9 years from the point of its creation:

FY 2004 ***

- Develop a comprehensive monitoring and assessment program
- Documentation and mapping of the USVI wetlands
- Database design
- Analysis of all wetlands and riparian areas
- Land ownership records
- Review of Quality Assurance Project Plan for monitoring and data analysis
- Establish monitoring priorities and targets
- Definition of field survey protocols
- Preliminary field data collection on water quality
- Characterization of plant communities and plant species
- DPNR training on data collection and GIS application

Training on Clean Water Act, Oil Pollution Act and SPCC Wetlands and Regulation
Develop mangrove restoration plan for Salt River
Reassessment of the 13 category I watersheds

FY 2005 ***

Develop a comprehensive monitoring and assessment program
Documentation and mapping of the USVI wetlands
Database design
Review of Quality Assurance Project Plan for new monitoring and data analysis
Establish monitoring priorities and targets
Definition of field survey protocols
Preliminary field data collection on water quality
Characterization of plant communities and plant species
Characterization of aquatic life
Start mangrove restoration for Salt River
Develop Watershed Restoration Strategies for Salt River
Training on wetland mitigation and delineation
Training on watershed assessment
Develop Watershed Restoration Strategies for Salt River and Benner Bay
BASINS training

FY 2006

Implement a comprehensive monitoring and assessment program
Input data on the database
Review of Quality Assurance Project Plan for new monitoring and data analysis
Field data collection on water quality
Data collection on biological assemblages
Develop standards for wetland health based on water quality and biological assemblages
Characterization of plant communities and plant species
Start mangrove restoration for Salt River
Implement Watershed Restoration Strategies for Salt River and Benner Bay

FY 2007

Implement a comprehensive monitoring and assessment program
Input data on the database
Review of Quality Assurance Project Plan for new monitoring and data analysis
Field data collection on water quality
Data collection on biological assemblages
Develop standards for wetland health based on water quality and biological assemblages
Characterization of plant communities and plant species
Continue mangrove restoration for Salt River
Implement Watershed Restoration Strategies for Salt River and Benner Bay

FY 2008

Implement a comprehensive monitoring and assessment program
Input data on the database

Aggregate wetlands by similar types of stressors
Input information from database on GIS
Field data collection on water quality
Data collection on biological assemblages
Develop standards for wetland health based on water quality and biological assemblages
Characterization of plant communities and plant species
Start mangrove restoration for Salt River
Implement Watershed Restoration Strategies for Salt River and Benner Bay

FY 2009

Review the wetlands monitoring and assessment program
Input data on the database
Field data collection on water quality
Data collection on biological assemblages
Develop standards for wetland health based on water quality and biological assemblages
Characterization of plant communities and plant species
Continue mangrove restoration for Salt River
Implement Watershed Restoration Strategies for Salt River and Benner Bay
Training on wetland restoration

FY 2010

Review the wetlands monitoring and assessment program
Input data on the database
Review of Quality Assurance Project Plan for new monitoring and data analysis
Field data collection on water quality
Data collection on biological assemblages
Test and evaluate standards for wetland health based on water quality and biological assemblages
Characterization of plant communities and plant species
Continue mangrove restoration for Salt River
Implement Watershed Restoration Strategies for Salt River and Benner Bay
Develop Great Pond Enhancement Plan

FY 2011

Make appropriate changes to the wetlands monitoring and assessment program
Input data on the database
Review of Quality Assurance Project Plan for new monitoring and data analysis
Review procedures for field data collection on water quality
Review procedures for data collection on biological assemblages
Present a complete assessment report on USVI wetlands health and water quality
Evaluate results from mangrove restoration project in Salt River
Implement Watershed Restoration Strategies for Salt River and Benner Bay
Implement Great Pond enhancement plan

FY 2012

Continue with wetlands monitoring and assessment program
Input data on the database

Field data collection on water quality
 Data collection on biological assemblages
 Review of assessment report on USVI wetlands health and water quality
 Establish a mangrove restoration plan for critical areas based on the Salt River experience
 Implement Watershed Restoration Strategies for Salt River and Benner Bay
 Implement Great Pond enhancement plan

FY 2013

Prepare a management plan for the USVI wetlands
 Establish regulations for USVI wetlands
 Identify new areas for wetland restoration
 Implement Watershed Restoration Strategies for Salt River and Benner Bay
 Implement Great Pond enhancement plan

Section 303(d) Waters

Section 303(d) of the Clean Water Act requires States and Territories to develop a list of impaired waters needing TMDLs every even-numbered calendar year. An impaired waterbody is one for which technology-based pollution controls are not stringent enough to attain or maintain compliance with applicable State and Territory water quality standards. In order for a water quality-limited waterbody to attain water quality standards, a TMDL must be developed and implemented specifically for that waterbody and pollutant(s) of concern. A TMDL is a quantitative assessment of the amount of pollution that a certain waterbody can assimilate while still meeting water quality standards.

On July 28, 2010 the Virgin Islands Department of Planning and Natural Resources released the 2010 TMDL list for public comment. The final list consists of 87 assessment units listed for a variety of impairments. The 2010 303(d) List of Impaired Waterbodies is attached to this report as an Attachment.

D. Estuary and Coastal Assessment

1. Designated Use Support Summary

Assessment of the Virgin Islands' coastal waters is presented in (estimated) square miles of assessment unit boundaries. Some 650 square miles are assessed in this report. A summary of use support assessments for coastal waters is shown in Table III.C.1. The mileage presented is based on Global Information Systems (GIS) approximations.

Table III.C.1. Waterbodies, Segments, and Categories

AU ID	AU Name	AU Size (sq. mi.)	305(b) Category	Integrated Category
VI-STT-01	Botany Bay	0.1576	Fully Supporting	1
VI-STT-02	Stumpy Bay	0.0597	Not Supporting	5
VI-STT-03	Botany Bay subwatershed, offshore	1.309	Insufficient Information	3A
VI-STT-04	Santa Maria Bay	0.3617	Not Supporting	5
VI-STT-05	Caret Bay	0.0266	Not Supporting	5
VI-STT-06	Neltjeberg Bay	0.0562	Fully Supporting	1

VI-STT-07	Dorothea	0.0254	Not Supporting	5
VI-STT-08	Hull Bay	0.2049	Not Supporting	5
VI-STT-09	Dorothea Bay subwatershed, offshore	0.7673	Insufficient Information	3A
VI-STT-10	Magens Bay	1.6208	Not Supporting	5
VI-STT-11	Northwest St. Thomas HUC14, offshore	55.088	Fully Supporting	1
VI-STT-12	Lovenlund Bay	0.0228	Insufficient Information	3A
VI-STT-13	Mandahl Bay (Marina)	0.0131	Not Supporting	5
VI-STT-14	Tutu Bay	0.0414	Insufficient Information	3A
VI-STT-15	Sunsi Bay	0.0152	Not Supporting	5
VI-STT-16	Spring Bay	0.0102	Not Supporting	5
VI-STT-17	Mandahl Bay subwatershed, offshore	1.1379	Not Supporting	5
VI-STT-18	Water Bay	0.0845	Not Supporting	5
VI-STT-19	Smith Bay	0.1187	Not Supporting	5
VI-STT-20	Smith Bay subwatershed, offshore	0.4103	Insufficient Information	3A
VI-STT-21	St. John Bay	0.0411	Not Supporting	5
VI-STT-22	Red Bay	0.0078	Not Supporting	5
VI-STT-23	Vessup Bay	0.0619	Not Supporting	5
VI-STT-24	Red Hook Bay	0.1772	Not Supporting	5
VI-STT-25	Great Bay	0.5593	Not Supporting	5
VI-STT-26	Red Hook Bay, offshore	0.4725	Insufficient Information	3A
VI-STT-27	St. James Islands, offshore	0.6691	Insufficient Information	3A
VI-STT-28	Cowpet Bay	0.0757	Not Supporting	5
VI-STT-29	St. James Bay	1.2439	Insufficient Information	3A
VI-STT-30A	Northeast St. Thomas HUC14, offshore north	42.927	Fully Supporting	1
VI-STT-30B	Northeast St. Thomas HUC14, offshore south	24.908	Insufficient Information	3A
VI-STT-31	Nazareth Bay	0.1793	Fully Supporting	1
VI-STT-32	Jersey Bay, offshore	1.2925	Not Supporting	5
VI-STT-33	Benner Bay	0.4187	Insufficient Information	3A
VI-STT-34	Benner Bay Lagoon Marina	0.0355	Not Supporting	5
VI-STT-35	Mangrove Lagoon	0.2931	Not Supporting	5
VI-STT-36	Frenchman Bay subwatershed, east	0.3532	Not Supporting	5
VI-STT-37	Frenchman Bay	0.0195	Not Supporting	5
VI-STT-38	Limetree Bay	0.0065	Not Supporting	5
VI-STT-39	Morningstar Bay	0.0215	Not Supporting	5
VI-STT-40	Pacquereau Bay	0.0453	Not Supporting	5
VI-STT-41	Frenchman Bay subwatershed, offshore	2.9233	Insufficient Information	3A
VI-STT-42	Southeast St. Thomas HUC14, offshore	50.939	Fully Supporting	1
VI-STT-43	St. Thomas Harbor, inner	0.7495	Not Supporting	5
VI-STT-44	St. Thomas Harbor, outer	1.2128	Insufficient Information	3A
VI-STT-45	Gregerie Channel	1.7072	Not Supporting	5
VI-STT-46	Sprat Bay	0.3814	Not Supporting	5
VI-STT-47	Hassel Island at Haulover Cut to Regis Point	0.2074	Not Supporting	5
VI-STT-48	Water Isle Hotel, Beach	0.0057	Insufficient Information	3A
VI-STT-49	Druif Bay	0.0331	Not Supporting	5
VI-STT-50	Flamingo	0.061	Not Supporting	5
VI-STT-51	Krum Bay	0.0754	Fully Supporting	1
VI-STT-52	Lindbergh Bay	0.2612	Not Supporting	5
VI-STT-53	Cyril E. King Airport subwatershed, offshore	0.8499	Not Supporting	5

VI-STT-54	Perseverance Bay, offshore	0.4734	Not Supporting	5
VI-STT-55	Brewers Bay	0.1076	Not Supporting	5
VI-STT-56	Perseverance Bay	0.2114	Not Supporting	5
VI-STT-57	Fortuna Bay	0.0827	Not Supporting	5
VI-STT-58	Fortuna Bay subwatershed, offshore	0.6553	Insufficient Information	3A
VI-STT-59	Northwest St. Thomas HUC14, offshore	77.71	Insufficient Information	1
VI-STJ-01	Caneel Bay	0.2623	Unassessed (NPS Jurisdiction)	-
VI-STJ-02	Hawksnest Bay	0.2246	Unassessed (NPS Jurisdiction)	-
VI-STJ-03	Trunk Bay	0.0685	Unassessed (NPS Jurisdiction)	-
VI-STJ-04	Hawksnest Bay subwatershed, offshore	1.7287	Unassessed (NPS Jurisdiction)	-
VI-STJ-05	Cinnamon Bay	0.1456	Unassessed (NPS Jurisdiction)	-
VI-STJ-06	Maho Bay/Francis Bay	0.346	Unassessed (NPS Jurisdiction)	-
VI-STJ-07	Maho Bay subwatershed, offshore	1.6071	Unassessed (NPS Jurisdiction)	-
VI-STJ-08	Mary Point	0.4831	Unassessed (NPS Jurisdiction)	-
VI-STJ-09	Leinster Bay	0.6627	Unassessed (NPS Jurisdiction)	-
VI-STJ-10	Minnebeck Bay	1.4876	Unassessed (NPS Jurisdiction)	-
VI-STJ-11	Newfound Bay	0.0765	Insufficient Information	3A
VI-STJ-12	North St. John HUC14, offshore	23.719	Insufficient Information	3A
VI-STJ-13	Coral Harbor	0.6965	Insufficient Information	3A
VI-STJ-14	Hurricane Hole	0.7689	Insufficient Information	3A
VI-STJ-15	Round Bay	0.6015	Not Supporting	5
VI-STJ-16	Coral Bay	2.2337	Insufficient Information	3A
VI-STJ-17	Salt Pond Bay	0.1978	Unassessed (NPS Jurisdiction)	-
VI-STJ-18	Grootman Bay	0.1046	Unassessed (NPS Jurisdiction)	-
VI-STJ-19	Great Lameshur Bay	0.359	Unassessed (NPS Jurisdiction)	-
VI-STJ-20	Southeast St. John HUC14, offshore	24.319	Insufficient Information	3A
VI-STJ-21	Genti Bay, nearshore	0.0947	Unassessed (NPS Jurisdiction)	-
VI-STJ-22	Genti Bay, offshore	0.769	Unassessed (NPS Jurisdiction)	-
VI-STJ-23	Fish Bay	0.2103	Unassessed (NPS Jurisdiction)	-
VI-STJ-24	Fish Bay subwatershed, offshore	0.1824	Unassessed (NPS Jurisdiction)	-
VI-STJ-25	Rendezvous Bay	0.4677	Not Supporting	5
VI-STJ-26	Chocolate Hole	0.1004	Not Supporting	5
VI-STJ-27	Rendezvous Bay subwatershed, offshore	0.1863	Insufficient Information	3A
VI-STJ-28	Great Cruz Bay	0.1396	Not Supporting	5
VI-STJ-29	Turner Bay/Enighed Pond	0.057	Not Supporting	5
VI-STJ-30	Cruz Bay	0.0674	Not Supporting	5

VI-STJ-31	Great Cruz Bay watershed, offshore	0.5775	Unassessed (NPS Jurisdiction)	-
VI-STJ-32	Southwest St. John HUC14, offshore	10.142	Insufficient Information	3A
VI-STJ-33	Pillsbury Sound	6.9399	Fully Supporting	1
VI-STC-01	Frederiksted, south	0.0451	Insufficient Information	3A
VI-STC-02	Frederiksted Harbor	0.035	Fully Supporting	1
VI-STC-03	Lagrange subwatershed, offshore	0.375	Insufficient Information	3A
VI-STC-04	Prosperity, nearshore	0.1118	Insufficient Information	3A
VI-STC-05	Prosperity subwatershed, offshore	0.5129	Insufficient Information	3A
VI-STC-06	Sprat Hall Beach	0.0609	Not Supporting	5
VI-STC-07	Creque Dam/Butler Bay	0.529	Insufficient Information	3A
VI-STC-08	Hams Bay	0.3144	Insufficient Information	3A
VI-STC-09	Davis Bay	0.0522	Insufficient Information	3A
VI-STC-10	Hams Bluff	0.5506	Insufficient Information	3A
VI-STC-11	Northwest St. Croix HUC14, offshore	33.302	Fully Supporting	1
VI-STC-12	Cane Bay	0.0613	Fully Supporting	1
VI-STC-13	Baron Bluff subwatershed	0.3498	Not Supporting	5
VI-STC-14	Belvedere	0.0557	Insufficient Information	3A
VI-STC-15	Northside subwatershed	0.6109	Insufficient Information	3A
VI-STC-16	Salt River Lagoon, Marina	0.0194	Not Supporting	5
VI-STC-17	Salt River Lagoon, Sugar Bay	0.3244	Fully Supporting	1
VI-STC-18	Salt River Bay	0.3229	Fully Supporting	1
VI-STC-19	Judith Fancy	0.01	Insufficient Information	3A
VI-STC-20	Salt River Bay subwatershed, west	0.2433	Insufficient Information	3A
VI-STC-21	Salt River Bay subwatershed, east	0.8922	Insufficient Information	3A
VI-STC-22	Northcentral St. Croix HUC14, offshore	23.61	Fully Supporting	1
VI-STC-23	St. Croix-By-the-Sea	0.0727	Not Supporting	5
VI-STC-24	Long Reef Backreef, west	0.1153	Not Supporting	5
VI-STC-25	Princess subwatershed, offshore	0.4343	Not Supporting	5
VI-STC-26	Christiansted Harbor	0.9601	Not Supporting	5
VI-STC-27	Long Reef Forereef, east	0.3149	Not Supporting	5
VI-STC-28	Altona Lagoon	0.2337	Insufficient Information	3A
VI-STC-29	Christiansted Harbor, east	0.1089	Not Supporting	5
VI-STC-30	Beauregard Bay	0.2145	Not Supporting	5
VI-STC-31	Buccaneer Beach	0.0166	Not Supporting	5
VI-STC-32	Altona Lagoon subwatershed, offshore	0.6812	Insufficient Information	3A
VI-STC-33	Punnett Bay	0.0576	Fully Supporting	1
VI-STC-34	Punnett Point, east	0.0223	Insufficient Information	3A
VI-STC-35	Tamarind Reef Lagoon (Southgate Lagoon)	0.0205	Not Supporting	5
VI-STC-36	Green Cay Beach	0.1017	Insufficient Information	3A
VI-STC-37	Southgate subwatershed, offshore	2.2219	Not Supporting	5
VI-STC-38	Solitude Backreef	0.9681	Insufficient Information	3A
VI-STC-39	Teague Bay	0.1773	Not Supporting	5
VI-STC-40	Teague Bay Backreef	0.8547	Not Supporting	5
VI-STC-41	Buck Island Backreef	0.7675	Unassessed (NPS Jurisdiction)	-
VI-STC-42	Buck Island Forereef	3.3497	Unassessed (NPS Jurisdiction)	-
VI-STC-43	Solitude and Teague Bay subwatersheds, offshore	18.822	Unassessed (NPS Jurisdiction)	-
VI-STC-44	Northeast St. Croix HUC14, offshore.	36.088	Unassessed (NPS	-

			Jurisdiction)	
VI-STC-45	Isaac Bay	0.0853	Insufficient Information	3A
VI-STC-46	Grapetree Bay	0.0425	Fully Supporting	1
VI-STC-47	Turner Hole Backreef	0.2772	Fully Supporting	1
VI-STC-48	Turner Hole subwatershed, offshore	16.949	Fully Supporting	1
VI-STC-49	Madam Carty Backreef	0.464	Fully Supporting	1
VI-STC-50	Madam Carty, offshore	3.5161	Insufficient Information	3A
VI-STC-51	Great Pond	0.1578	Insufficient Information	3A
VI-STC-52	Great Pond Bay	1.0184	Fully Supporting	1
VI-STC-53	Great Pond Bay subwatershed, offshore	3.0288	Fully Supporting	1
VI-STC-54	Leprey Valley Backreef	0.3712	Insufficient Information	3A
VI-STC-55	Leprey Valley subwatershed, offshore	2.8455	Insufficient Information	3A
VI-STC-56	Bugby Hole Backreef	0.7042	Not Supporting	5
VI-STC-57	Bugby Hole subwatershed, offshore	3.9	Insufficient Information	3A
VI-STC-58	Southeast St. Croix HUC14, offshore	24.146	Fully Supporting	1
VI-STC-59	Canegarden Bay	0.8542	Not Supporting	5
VI-STC-60	Canegarden Bay, offshore	0.7933	Insufficient Information	3A
VI-STC-61	Hess Oil Virgin Islands Harbor	0.671	Not Supporting	5
VI-STC-62	Limetree Bay	0.7239	Fully Supporting	1
VI-STC-63	Martin-Marietta Alumina Harbor	0.3228	Not Supporting	5
VI-STC-64	Manning Bay/Estate Anguilla Beach	0.0508	Not Supporting	5
VI-STC-65	HOVENSA, west	1.2865	Not Supporting	5
VI-STC-66	HOVENSA subwatershed, offshore	2.8305	Insufficient Information	3A
VI-STC-67	Southports St. Croix HUC14, offshore	8.1966	Fully Supporting	1
VI-STC-68	Bethlehem subwatershed, inshore	0.2149	Insufficient Information	3A
VI-STC-69	Bethlehem subwatershed, offshore	0.3971	Insufficient Information	3A
VI-STC-70	Airport, nearshore	2.1943	Insufficient Information	3A
VI-STC-71	Airport, offshore	4.263	Fully Supporting	1
VI-STC-72	Airport St. Croix HUC14, offshore	4.1803	Insufficient Information	3A
VI-STC-73	Diamond, nearshore	0.1699	Insufficient Information	3A
VI-STC-74	Enfield Green Beach/VIRIL Outfall	0.1376	Insufficient Information	3A
VI-STC-75	Diamond subwatershed, offshore	2.8479	Not Supporting	5
VI-STC-76	Carlton Beach	0.2447	Not Supporting	5
VI-STC-77	Long Point Bay	0.8376	Insufficient Information	3A
VI-STC-78	Long Point Bay subwatershed, offshore	4.9231	Fully Supporting	1
VI-STC-79	Good Hope Beach	0.1876	Fully Supporting	1
VI-STC-80	Sandy Point, nearshore south	2.0121	Insufficient Information	3A
VI-STC-81	Sandy Point, offshore south	7.4306	Insufficient Information	3A
VI-STC-82	Sandy Point, nearshore west	0.1158	Not Supporting	5
VI-STC-83	Sandy Point, offshore west	0.4875	Insufficient Information	3A
VI-STC-84	Southwest St. Croix HUC14, offshore	18.347	Fully Supporting	1

2. Individual Use Support Summary

Assessment of the Virgin Islands' coastal waters is presented in (estimated) square miles of assessment unit boundaries. Some 650 square miles are assessed in this report.

Figure III.C.2.a St. Thomas/St. John Integrated Categories

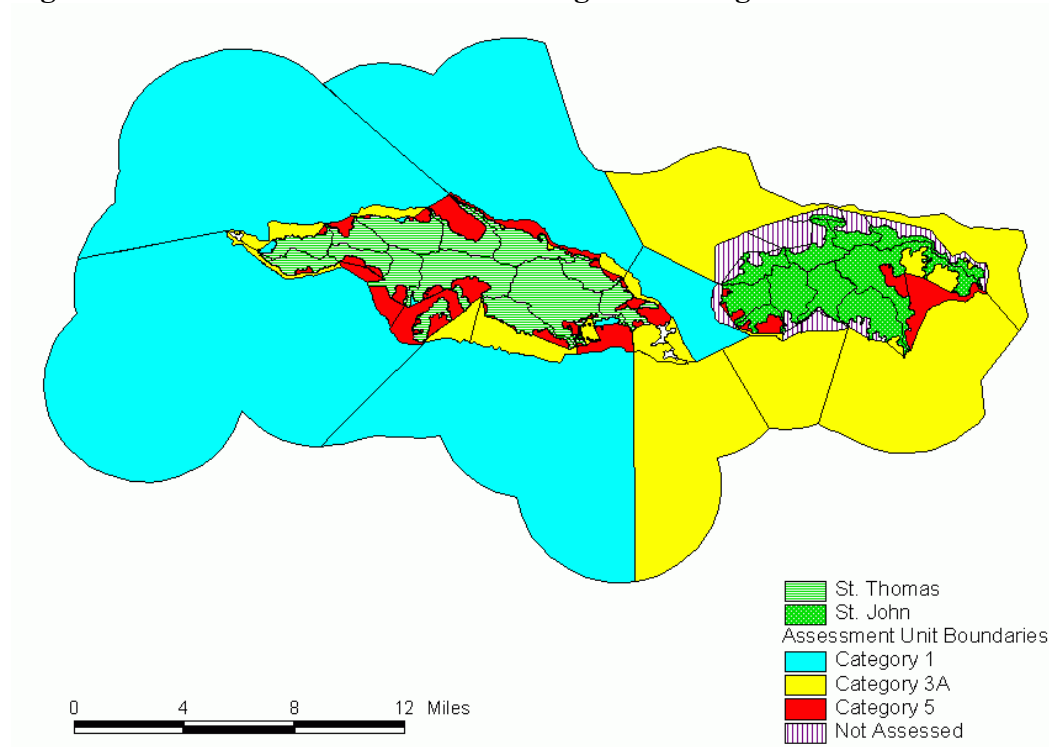
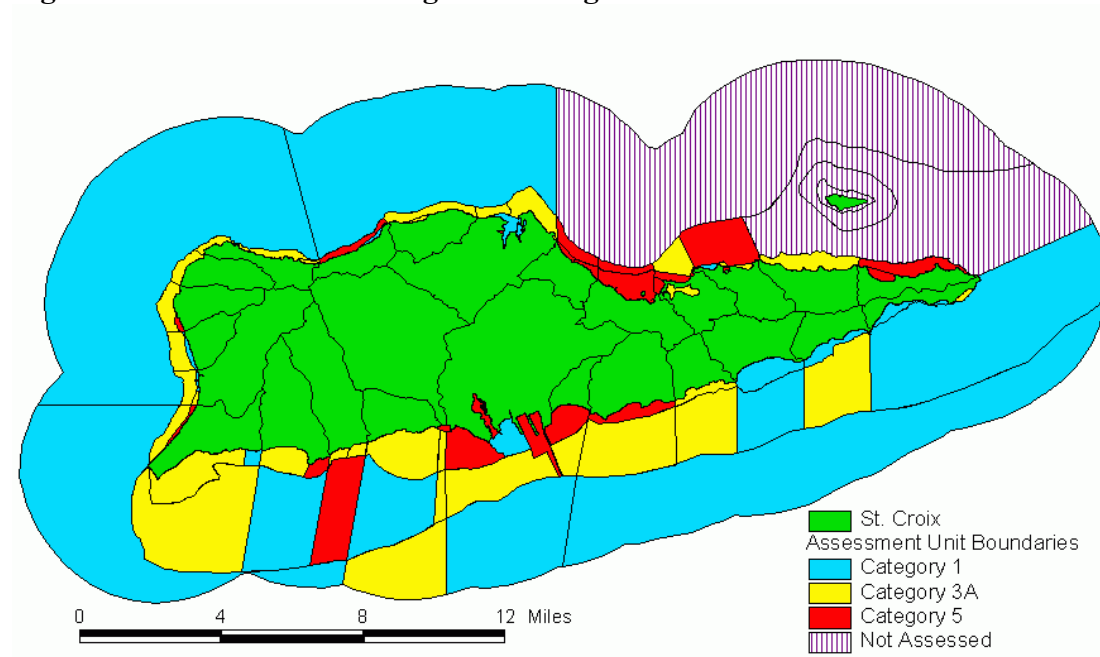


Figure III.C.2.b St. Croix Integrated Categories



Several assessment units were not assessed this cycle because certain areas fall within the jurisdiction of the National Park Service (refer to Attachment 1: 2006 303(d) List of Impaired Waterbodies for

greater detail). While the current assessment unit structure does not match perfectly with the waters under federal jurisdiction, Figures III.C.2.c and III.C.2.d illustrates these particular areas.

Figure III.C.2.c St. John Assessment Units Completely Under Federal Jurisdiction

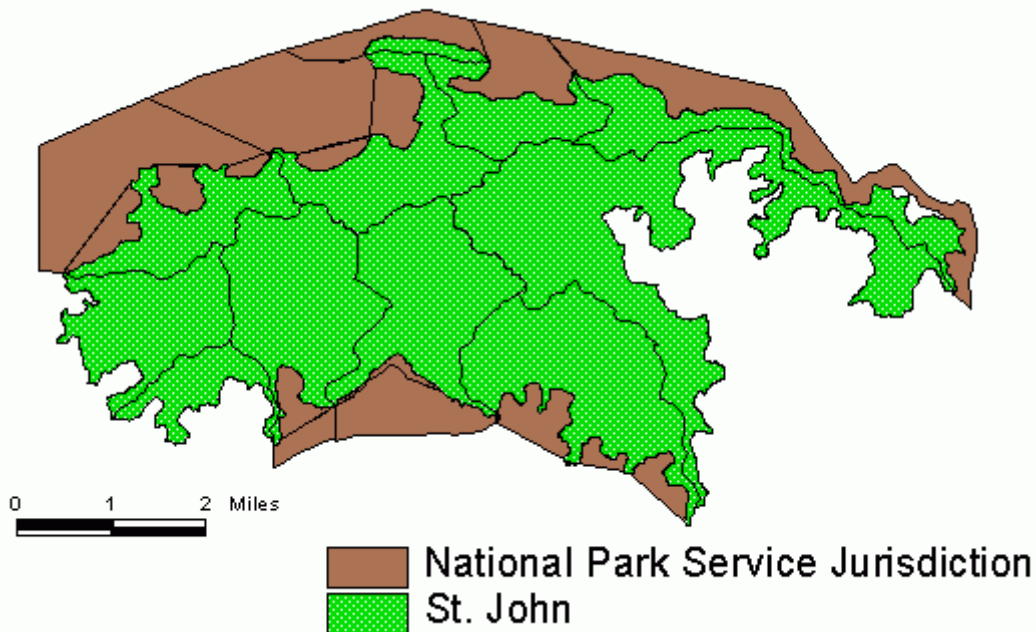
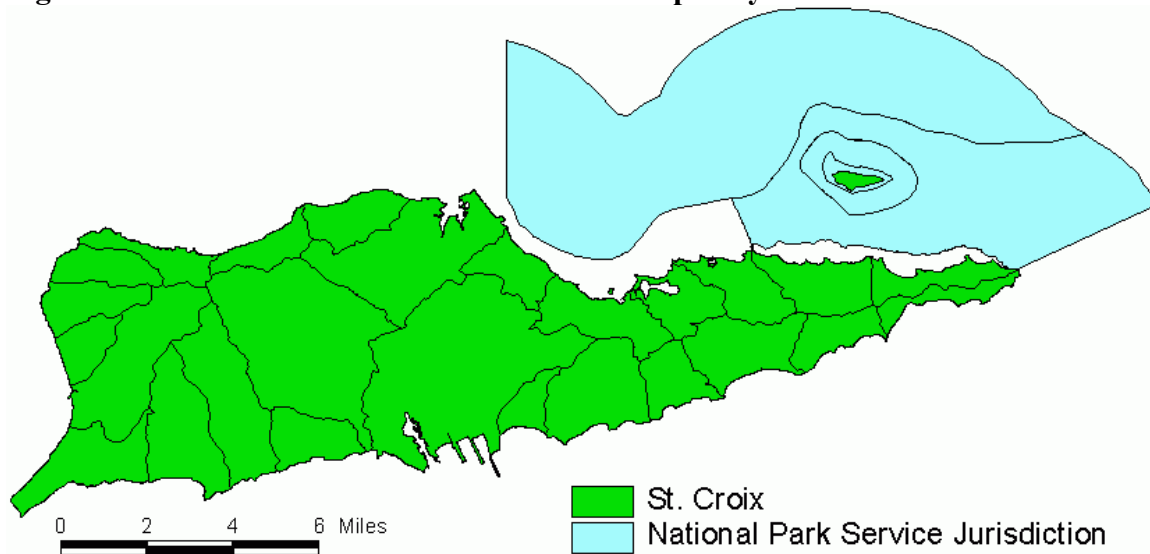


Figure III.C.2.d St. Croix Assessment Units Completely Under Federal Jurisdiction



3. Causes and Sources of Designated Use Impairment

a) Eutrophication

Eutrophication is rarely observed in the Virgin Islands because of tidal flushing and currents driven by the Caribbean current and steady tradewind patterns.¹¹

b) Case Studies

The Unified Watershed Assessment includes a detailed summary of existing conditions for the 18 Coastal Zone Management Areas of Particular Concern. These APC reports contain water quality reports for each APC.

E. Wetlands Assessment

1. Introduction

Prior to October 31, 1978, the US Army Corps of Engineers, as delegated by 404 of the Clean Water Act, performed protection of wetlands in the Virgin Islands. After that date, all coastal wetland protection was mandated to the Department of Planning and Natural Resources, Division of Coastal Zone Management. Guidelines are found in VIC Title 12, Chapter 21, §.903(b)(8), which states that the Division's responsibility is *"to conserve ecologically significant resource areas for their contribution to marine productivity and value as wildlife habitats, and preserve the function and integrity of reefs, marine meadows, salt ponds, mangroves and other significant areas"*.

2. Classification of Wetlands

Classification of wetlands is based on the US Fish and Wildlife Wetland and Deepwater Habitat System (Cowardin *et al.*, 1979). Wetlands are grouped into four categories: tidal, seep, landlocked ponds, and spring tidal wetlands.

Tidal ponds or lagoons have narrow inlets connecting to the sea and have a salinity level that is slightly higher than seawater.

Seep ponds and **landlocked ponds** are not open to the sea, and have fluctuating water and salinity levels depending on rainfall.

Spring tidal wetlands fringe bays, but standing water only occurs during spring tides, when strong onshore winds push water into the wetlands, or during times of heavy rainfall and consequent flooding.

The primary source of wetland impairment is non-point source pollution, construction intrusions, and sedimentation from upland run-off.

Table III.D.1 Wetlands Classification¹²

*[Classification of wetlands is based on the US Fish and Wildlife Wetland and Deepwater Habitat System (Cowardin *et al.*, 1979).]*

St. Croix	Classification
Great Pond	Estuarine, Intertidal, Forested
Billy French Pond	Estuarine, Intertidal, Forested, Scrub-Shrub, Basin
West End Salt Pond	Estuarine, Intertidal, Unconsolidated sanded shore, Scrub-shrub, Basin
Altoona Lagoon	Estuarine, Intertidal, Forested

Coakley Bay	Marine (Coastal), Intertidal, Unconsolidated sanded shore
Long Point Bay	Estuarine, Unconsolidated sanded shore, Intertidal
Mt. Fancy	Estuarine, Intertidal, Scrub- shrub, Unconsolidated shore, cobble-gravel
Robin Bay	Marine (Coastal), Intertidal, Unconsolidated cobble gravel
Southgate Pond	Estuarine, Intertidal, Scrub-shrub basin
Salt River/Sugar Bay	Estuarine, Intertidal, Unconsolidated sanded shore and bottom
Half Penny	Estuarine, Intertidal, Unconsolidated sanded shore, Scrub-shrub
Krause Lagoon	Estuarine, Intertidal, Scrub-shrub,
Manchenil	Marine (Coastal), Intertidal, Unconsolidated sanded shore
St Thomas	Classification
Mandahl Bay	Estuarine, Intertidal, Unconsolidated bottom, Scrub-shrub
Fortuna Bay	Estuarine, Intertidal, Unconsolidated sanded shore, Forested,
Magens Bay	Marine (Coastal), Sub-tidal, Coral Reef,
Perseverance Bay	Estuarine, Intertidal, Forested, Unconsolidated sanded shore
Frenchman's Bay	Estuarine, Intertidal, Unconsolidated sanded shore
Little Conculus Bay	Estuarine, Intertidal, Unconsolidated sanded shore, Scrub-shrub
Benner Bay	Estuarine, Intertidal, Forested, Unconsolidated Sanded shore, Scrub-shrub
Mangrove Lagoon	Estuarine, Intertidal, Forested, Unconsolidated Sanded shore, Scrub-shrub
Smith Bay	Estuarine, Intertidal, Unconsolidated sanded shore
St. John Bay	Estuarine, Intertidal, Unconsolidated sanded shore
Great Bay	Estuarine, Intertidal, Forested, Unconsolidated Sanded shore, Scrub-shrub
Cabrita Peninsula	Estuarine, Intertidal, Unconsolidated sanded shore
Cowpet Bay	Estuarine, Intertidal, Forested, Unconsolidated Sanded shore, Scrub-shrub
Vessup Bay	Estuarine, Intertidal, Forested,
Bolongo Bay	Estuarine, Intertidal, Forested, Unconsolidated Sanded shore, Scrub-shrub
Cabes Point	Estuarine, Intertidal, Scrub-shrub
Little St. James	Estuarine, Intertidal, Unconsolidated Sanded shore, Scrub-shrub
Salt Cay	Estuarine, Intertidal, Unconsolidated Mud,
Patricia Bay	Estuarine, Intertidal, Scrub-shrub

Muller Bay	Estuarine, Intertidal, Unconsolidated Sanded shore, Scrub-shrub
Water Island	Classification
Limestone Bay	Marine (Coastal), Intertidal, Unconsolidated Cobble gravel
Sprat Bay	Marine (Coastal), Intertidal, Unconsolidated sanded bottom
Sprat Point	Estuarine, Intertidal, Unconsolidated sanded shore, Scrub-shrub
St. John	Classification
Brown Bay	Estuarine, Intertidal, Forested, Unconsolidated Sanded shore, Scrub-shrub
Leinster Bay	Estuarine, Intertidal, Unconsolidated sanded shore
Kiddel Bay	Estuarine, Intertidal, Unconsolidated sanded shore, Scrub-shrub
Little Lameshur	Estuarine, Intertidal, Scrub-shrub
Great Lameshur	Estuarine, Intertidal, Scrub-shrub
Fish Bay	Estuarine, Intertidal, Unconsolidated sanded shore,
Frank Bay	Estuarine, Intertidal, Unconsolidated sanded shore, Scrub-shrub
Enighed Bay	Estuarine, Intertidal, Scrub-shrub
Francis Bay	Estuarine, Intertidal, Forested, Unconsolidated Sanded shore, Scrub-shrub
Salt Pond Bay	Marine (Coastal), Subtidal, Coral Reef, 2, Estuarine, Intertidal, Scrub-shrub
Privateer Bay	Estuarine, Intertidal, Unconsolidated sanded shore, Scrub-shrub
South side Pond	Estuarine, Intertidal, Unconsolidated sanded shore, Scrub-shrub
Elk Bay	Estuarine, Intertidal, Unconsolidated, sanded shore, Scrub-shrub
Water Creek	Estuarine, Sub-tidal, Unconsolidated bottom
Otter Creek	Estuarine, Sub-tidal, Unconsolidated bottom
Princess Bay	Estuarine, Intertidal, Forested, Unconsolidated Sanded shore, Scrub-shrub
Coral Bay	Estuarine, Intertidal, Forested, Unconsolidated cobble gravel, Forested
Chocolate Hole	Estuarine, Intertidal, Forested, Unconsolidated Sanded shore, Scrub-shrub
Peter Bay	Estuarine, Intertidal, Forested,
Turner Point	Estuarine, Intertidal, Forested, Unconsolidated Sanded shore, Scrub-shrub
Newfound Bay	Estuarine, Intertidal, Unconsolidated Sanded shore,
Reef Bay	Estuarine, Intertidal, Forested,

Calabash Boom	Estuarine, Intertidal, Forested, Unconsolidated Sanded shore
Annaberg	Annaberg Estuarine,
Europa Bay	1. Estuarine, Intertidal, Scrub-shrub 2. Estuarine, Sub-tidal, Unconsolidated sanded bottom
Grooto Pain Bay	Estuarine, Intertidal, Forested, Unconsolidated Sanded shore, Scrub-shrub
Hart Bay	Estuarine, Intertidal, Forested, Unconsolidated Sanded shore, Scrub-shrub
Mary Point	Estuarine, Intertidal, Forested, Unconsolidated Sanded shore, Scrub-shrub

3. Wetlands Protection Activities

The Department of Planning and Natural Resources very recently instituted a Wetlands Program. The program was short-lived though due to staffing problems.

F. Public Health/Aquatic Life Concerns

Pollution-caused fish kills, *ciguatera* or other abnormalities

The Department of Planning and Natural Resources keeps no log of fish kill incidents within the territory. DPNR will from time to time, however, issue public advisories when such incidents do occur.

Restrictions on swimming areas

- ❖ No sampling related to natural disasters (e.g. hurricanes) was conducted this cycle.
- ❖ Public advisories regarding beach water quality is broadcast over the available radio stations thorough the Virgin Islands Territory Emergency Management Agency (VITEMA) during the hurricane recovery period (interview with Officer Brad Thomas on March 16, 2000). Restrictions are also invoked when a sewage bypasses occurs that may be impacting a waterbody. The water quality sampling is performed by DPNR and a copy of the final results is forwarded to the Waste Management Authority and to the Department of Health's Division of Environmental Health.

The continual monitoring for beach contamination caused by a bypass is performed by DPNR-DEP Under TPDES permit requirements the Waste Management Authority broadcasts over the airwaves and publishes in the local newspapers a public advisory regarding the bypass; however, this action does not negate the fact that the Commissioner of DPNR may broadcast or publish a public advisory if it is deemed necessary.

The BEACH program issues notices on a weekly basis for territorial beaches that are being monitored. Advisories are issued following discovery of enterococci impairments.

IV. GROUNDWATER ASSESSMENT

In the VI, ground water is held primarily in three types of aquifers, principally under water table or semi-confined conditions:

- 1) Carbonate rock system in St. Croix, known as the Kingshill aquifer system
- 2) Fractured volcanic bedrock
3. Alluvial deposits

The ground water in the Virgin Islands is highly mineralized, often containing total dissolved solids (TDS) in excess of 1000 parts per million (ppm). Sodium, magnesium and calcium are the primary constituents, rendering continued consumption of untreated ground water unhealthy for those on a restricted sodium diet. Additionally, elevated nitrate levels and coliform bacteria have been found in some wells near the main sewer conveyance lines.

The Kingshill aquifer is the largest and most productive aquifer in the USVI. The aquifer has an area of 25 square miles and accounts for 67% of all groundwater withdrawals. Approximately one-third of the population (35,558 (census 2000)) of the entire USVI lives within the aquifer boundary area. Yields from wells can surpass 70,000 gpd/well. Most of the groundwater exists at relatively shallow depths in unconsolidated alluvial sediments or in shallow limestone deposits. The depth to groundwater could range from 5 feet (WAPA Concordia well field) to 60 feet (WAPA Golden Grove well field) below ground surface. Well yields ranged from less than 5 gallons per minute (gpm) (WAPA Adventure well field) to 80 gpm (WAPA Golden Grove well field). Aquifer specific capacity ranged from 1 to 14 gpm per foot draw down with a corresponding aquifer transmissivity ranging from 180 to 3,300 feet squared per day.

There are over 325 wells within the aquifer boundary and it is estimated that the total production of the aquifer is 2.21MGD (WAPA, 1.13 MGD; private wells, 0.55 MGD; industrial/commercial 0.53 MGD). It is estimated that the aquifer can safely supply up to 2.5MGD.

A. Permitting

The Ground Water program manages the installation of groundwater wells and groundwater withdrawals through a permitting system under Virgin Islands Code (VIC) Title 12, Chapter 5, Section 151 *et seq.* New wells can only be sited at locations providing adequate yield and a minimum risk of groundwater contamination from past, existing or future sources and activities.

Existing wells are regulated via groundwater appropriation permits that set groundwater withdrawal limits for the approved use, and are valid for a period of two years,.

Table IV.A.1 Number of permitted wells in the USVI

District	No. of Wells	Estimated Total Pumping Rate (million gallons per day)
St. Croix*	1078	3.5
St. Thomas	600	1.2
St. John	100	0.2

* Excluding HOVENSA groundwater monitoring and product recovery wells, regulated by RCRA Part B operating permit.

Table IV.A.2 Number of applications reviewed this reporting period

Period	New/Renewal appropriation permit	Drilling permit applications	Soil Boring permit applications	Drillers license issued
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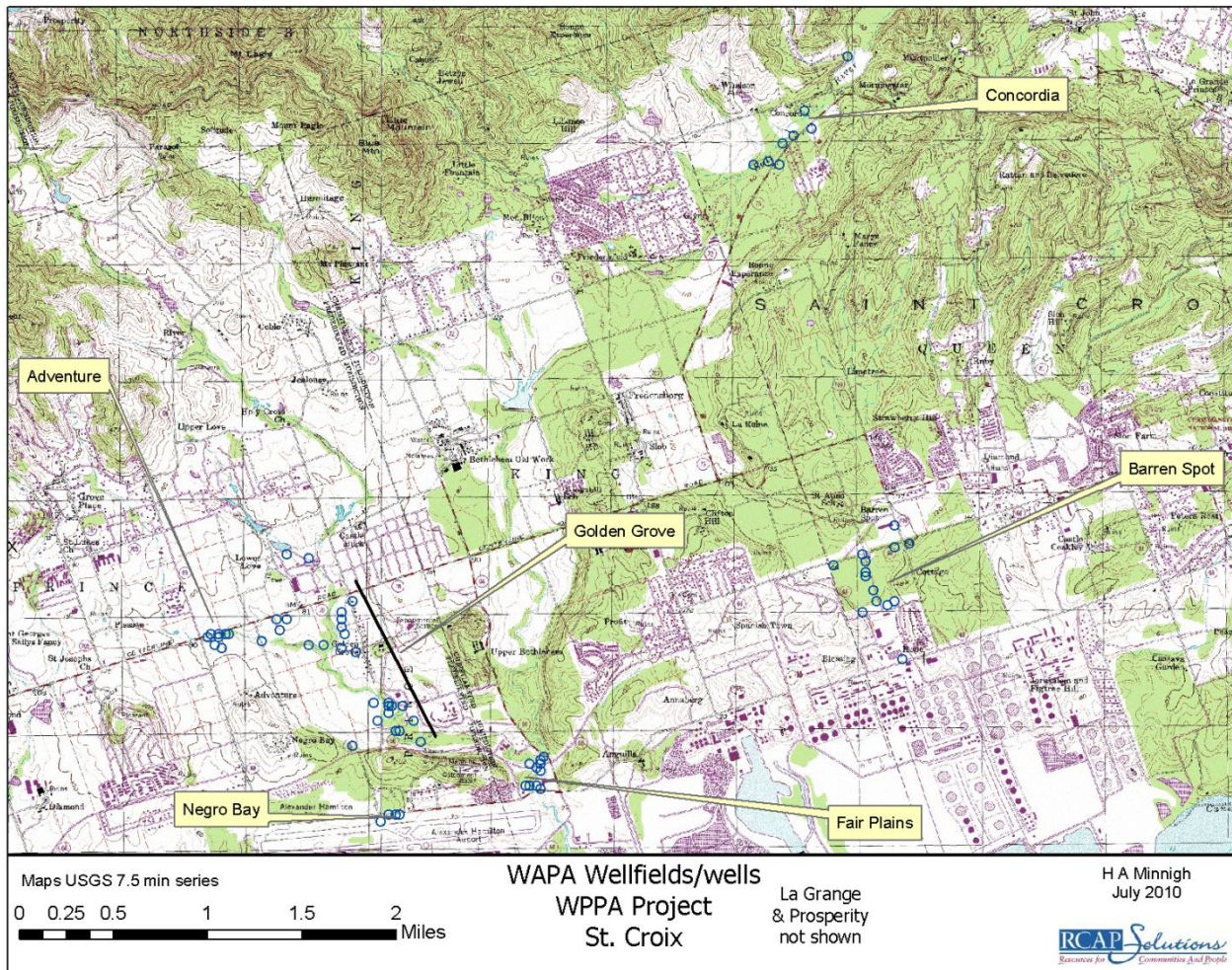
	applications			
October 2007 through September 2008	Approved: 65 Rejected: 1 Total: 66	Approved: 40 Rejected: 0 Total: 40	Approved: 78 Rejected: 0 Total: 78	Approved: 10 Rejected: 0 Total: 10
October 2008 through September 2009	Approved: 48 Rejected: 0 Total: 48	Approved: 30 Rejected: 0 Total: 30	Approved: 83 Rejected: 0 Total: 83	Approved: 9 Rejected: 0 Total: 9

DPNR/DEP has identified seven “Key Themes” to guide groundwater management activities over the next decade:

- 1) Clarifying "Whose Water is it?"
- 2) Recognizing the Connections between Groundwater and Surface Water
- 3) Evaluating and Managing Threats to Groundwater Quality
- 4) Linking Land Use Planning and Groundwater Protection
- 5) Developing a Comprehensive Approach to Groundwater Quantity
- 6) Addressing Water Use and Conservation Issues
- 7) Collecting Long-Term Groundwater Data to Address Long-term Problems

1. Virgin Islands Water and Power Authority (WAPA)

The "major" water supplier in the VI is the Virgin Islands Water and Power Authority (WAPA). Ground water has the potential to contribute up to 30% (up to about 1 million gallons per day (MGD)) of the WAPA potable water supply on the island of St. Croix (when the well fields are operating at or near capacity). No ground water is used in the WAPA distribution system on St. Thomas and St. John at the present time; however, the authority has previously investigated the use of ground water in the Sugar Estate, St. Thomas and Estates Adrian and Carolina, St. John, to augment the desalinated water supply.



WAPA : St. Croix

On St. Croix, WAPA's principal water supply comes from desalination units, which are capable of producing about 3 MGD(storage capacity =40 MG). Additionally, WAPA can potentially extract up to 1 MGD of ground water from seven (7) well fields. The principal aquifer in St. Croix is the Kingshill aquifer, predominantly a limestone aquifer that underlies the central portion of the island. The Estates Concordia, Adventure, Fairplains, Negro Bay and Barren Spot well fields tap this aquifer. The western Mahogany Road and La Grange well fields tap an alluvial and fractured bedrock aquifer.

WAPA : St. Thomas

On St. Thomas, WAPA provides desalinated water for distribution (approximately 2.2 MGD (storage capacity =40 MG)). Although WAPA used several wells in the vicinity of the St. Thomas Hospital in Sugar Estate the late 1960s to the early 1980s, they are no longer used. As part of a recent ground water source exploration program designed for WAPA's Emergency Ground Water Supply (EGWS) Program, the US Geological Survey (USGS) drilled several test wells in various locations on St. Thomas. USGS performed pumping tests on these wells in the Sugar Estate area, but to date, the wells have not been put into production.

WAPA : St. John

On St. John, WAPA's principal potable water source is a 500,000 GPD vapor vacuum compression unit. Additionally, several wells were drilled on St. John under the EGWS program described above, but to date, with the exception of one well in Estate Carolina, the wells have not been put into production. The Estate Carolina WAPA well was put on line in the spring of 1994 as supplemental water supply for the eastern portion of St. John. The well provides mineral-rich water (TDS of approximately 2500 ppm) from a shallow, unconsolidated material aquifer, which is pumped into pressure tanks to meters for non-potable use only.

2. Public Water Systems that utilize groundwater

In addition to WAPA, water-hauling companies utilize wells as a secondary water supply source. Several water-hauling companies treat the ground water by reverse osmosis (RO), and then distribute the water via trucks to individual residences and businesses. Several water-bottling companies also do the same prior to bottling and distribution. These public water systems also include apartment complexes, schools, condominiums, hotels, bars and restaurants. In addition to drinking water quality monitoring parameters, these systems must monitor their well water for Total Dissolved Solids.

Table IV.A.3 Overview of VI Public Water Systems Utilizing Groundwater

Island	Number of Water Systems Utilizing Groundwater			
	Community	Non-Transient, Non-Community	Transient, Non-Community	Bottled Water Plant
St. Croix	30	70	38	1
St. Thomas	43	69	40	4
St. John	7	11	11	1

Wellhead protection is vital to the long-term quality of life in the VI as the population increases. Fresh water is an especially valuable resource in the VI. The meager but important ground water resources are valuable supplements to the expensive, highly energy-consumptive desalinated water which is so heavily relied upon by the much of the population of the VI. Existing untainted ground water resources must be protected. The resources that have already been subjected to contamination by leaking underground storage tanks (USTs), leaking sewer lines and improper storage and disposal of chemicals must be managed to protect adjacent uncontaminated sources and restore damaged resources for future use.

B. Wellhead Protection Actualization Assessment

The Territory does not at this time have a formal Wellhead Protection Plan (WHPP). There is a Wellhead Protection Final Report which was intended to form the nexus for a WHPP. It is anticipated that a WHPP be developed following the US EPA example ordinance². The categories of permitted and non-permitted activities around wellheads³ contained in the model ordinance will be used. See Table , below for examples of the most common problems in St. Croix.

² The model is available at <http://www.epa.gov/nps/ordinance/mol7.htm#groundwater>.

³ Actually, in Zone 1, which for St. Croix is the 20-yr TOT radius.

Table IV.B.1 Non-Permitted uses in Zone 1	
Automobile body/repair shop	1
Gas station	2
Fleet/trucking/bus terminal	3
Dry cleaner	4
Electrical/electronic manufacturing facility	5
Machine shop	6
Metal plating/finishing/fabricating facility	7
Chemical processing/storage facility	8
Wood preserving/treating facility	9
Junk/scrap/salvage yard	10
Mines/gravel pit	11
Irrigated nursery/greenhouse stock	12
Confined animal feeding operations	13
Land divisions resulting in high density (>1 unit/acre) septic systems	14
Equipment maintenance/fueling areas	15
Injection wells/dry wells/sumps, except for single-family residences directing gutter downspouts to a drywell	16
Underground storage tanks, (except those with spill, overfill, and corrosion protection requirements in place)	17
All other facilities involving the collection, handling, manufacture, use, storage, transfer or disposal of any solid or liquid material or waste having potentially harmful impact on groundwater quality including illegal disposal of solid waste on the surface not directly associated with a facility	18
All uses not permitted in the underlying zone district	19

In Table , note that the sequential numbers are not intended as rankings; these numbers will be used to reference the specific threats in the database under development.

1. Time of Travel Buffers

It is abundantly clear that essentially none of the existing priority wells, vendors, WAPA or large user, will meet any of the Time-of-Travel (TOT) suggested , either of the Model Ordinance, which uses 1,000 feet radius (as typical of a 6-month TOT) or in the calculations which are both more rigorous and locally calculated but give 20-yr TOT's radii of approximately 1,400 feet or less with most around 1,000 feet. Examples of these buffers are provided at Figure IV.C.20 and Figure

IV.C.21. On the La Grange TOT illustration (Figure IV.C.20) the primary threats are the number of residences, all with on-site wastewater treatment as well as solid waste, industrial waste and stored or abandoned equipment. For Negro Bay wells (Figure IV.C.21) the primary threats are solid waste (informal dumps) and possible spills from the National Guard facility and the several warehousing facilities to the North. Negro Bay and New Golden Grove are probably the best-sited wellfields on St. Croix from the standpoint of nearby risks; i.e., risks within the TOT wellhead protection area.

2. Flooding

All of the WAPA and vendor production wells and many of the large users' wells are located in flood hazard areas (see Figure IV.C.19). Most WAPA wells are protected from inundation by reinforced concrete (RC) platforms and risers; an example is at Figure IV.C.1. These are typical of the wells inherited by WAPA from DPW and those developed by the Authority since. A much rarer WAPA well is at Figure IV.C.2 where the casing is continued to about 3' above a platform but without the RC riser. This may be typical of wells developed by private owners and leased to WAPA.

A number of vendors and smaller users near WAPA production wells are notably susceptible to flooding or entry of contaminants through inadequate siting or poorly sealed or unsealed well heads. Illustrations of these are at Figure IV.C.3 through Figure 10.

3. Particular threats – poor siting or construction

There are a number of egregiously poor sites with wells; poor either because of sites selected and developed or because of poor or mismanagement of the wellhead area or areas adjacent. Since much of this development occurred before there was concerted effort to control development and manage wellhead impact areas there is little that can be done at this point. Some ideas are at discussed below in the section - Suggestions for Interim Measures. Often, in the case of adjacent problems, the well owner or operator has little or no control over the use of that area. An example of poor siting is at Figure IV.C.7; this is a shallow well with a compromised seal and subject to overland flows that could include significant amounts of diesel and material from the road.

An example of poor site management (and a very poor well seal) is at Figure IV.C.11 and Figure IV.C.12. While the fuel tank might not exceed the minimum to require containment, it is directly adjacent to a well. In addition, the wellhead is very poorly sealed.

Another example is at Figure IV.C.13 and Figure IV.C.14. Figure IV.C.14 is the cut-off well pipe and conduit for what was a production well at this site. This well is within 10 feet of a well in production for a water vendor and is, as may be seen, completely unprotected.

4. Summary

The most common threat to wells and well recharge areas are the ubiquitous aggregations of household, construction and mechanical solid waste. However, it is apparent that the efforts of the Waste Management Authority have borne fruit; much of this material no longer occurs with the density nor has the age once more common. Exceptions are piles of waste on private property (see Figure IV.C.15 and Figure IV.C.16).

It is important to note that few of these threats to groundwater are the result of intentional misconduct or malfeasance. More typically, they are the result of a lack of understanding of the possible consequences of action or inaction. DPNR will schedule some community consciousness-raising meetings, utilizing some school time for students, for example. In addition, reminding landowners and agencies of responsible land management and the fragility of the groundwater resource in the Territory might also pay dividends.

5. Suggestions for Interim Measures

The following suggestions assume that more staff time and effort will be available for implementing the permit program. While many wells had permits most have expired and many do not meet minimum requirements for permitting. For example, it is believed that most residential wells do not have meters and many commercial wells also do not have meters – or functioning meters – and reporting and permit renovation is not done. In addition, there are a number of large production wells that are not and have never been permitted.

a. Educate Licensed well drillers

DPNR/DEP issues well drillers license. DPNR/DEP will use the opportunity to focus educational efforts on the single entity (well drillers) that would touch every new well. If permitted well drillers were responsible for acquiring permits for wells a body of knowledgeable persons would be dealing with DPNR/DEP in the siting and development of new wells.

b. Individual existing wells

At least some effort should be made to assist owners and operators of production wells to reduce threats in the areas of their wellheads. The adoption of a wellhead protection plan should help resolve this, but in the interim assistance in the form of consumer education and assistance with enforcement of Territorial regulations on unpermitted solid waste sites, illegal dumping and storage and handling of liquids, toxic and hazardous materials could provide some relief for owners of wells subject to surface and sub-surface threats.

c. Relief for owners of permitted wells

The Territory should begin to ensure that all permits are current and that permit holders understand their responsibilities in ensuring the viability of groundwater resources in USVI. As part of this effort DPNR/DEP could provide assistance with cataloguing specific threats to permitted wells and provide permittees with an understanding of the possible effects of those threats to their water quality and a record of the then-current state at the time of renovation. In addition, DPNR/DEP could provide permittees with measures they can undertake to eliminate, reduce or manage those risks. As an incentive to renovating permits DPNR/DEP could provide well owner/permittees a specific time period to deal with threats under their control with no penalties.

C. WAPA wells

WAPA wells to remain in service

The WAPA wells that are to remain in service are shown at Table, below. WAPA has not used any groundwater since about April of 2010 since the RO unit at Richmond came on-line. The wells to be retained will be secured and stand-by power will be provided. As part of the work in this project the possibility of distributing normal power from a central location, probably the Fairplains Pump Station, will be considered and reported. This will ease the provision of stand-by power since a single large generator located at or near the central location could be provided and power distributed using the same network used for normal power. Individual costs are not provided at this time, though approximate costs will be part of the final report following consultations with WAPA on the form and generality of security and service-assurance techniques. All these wells use the Fair Plains pump station.

Table IV.C.1 Primary WAPA Wells				
Well# ⁴	Well Name	GPM	SWL ⁵	Depth
9	Bethlehem	40	38.1	114.2
10	Bethlehem	40	27.6	121.3
5A	Negro Bay	10	52.7	110.5
5	Negro Bay	25	59.3	114.9
6	Negro Bay	20	65.3	130.1
7	Negro Bay	35	58.6	115.1
6	New Golden Grove	35	59.3	114.9
7	New Golden Grove	35	63.3	130.1
8	New Golden Grove	37	52.7	110.5
15A	New Golden Grove	40	62.1	122.5

Output of these wells, as reported by WAPA in 2010, sums to about 0.5 MGD (24-hr day, or 0.25/12 hr day). It remains to be seen if these will improve with reduced WAPA usage. DPNR/DEP has recommended placing well-level meters in at least one well in Negro Bay and one in New Golden Grove. Historical data for static water levels[3] in St. Croix are shown at Figure IV.C.17 and Figure IV.C.18. As may be seen Negro Bay and New Golden Grove show the best levels.

Half a million gallons per day would approximate around 20-25% of normal production. In the event that these wells would become the sole source in the event of a weather or geologic event interrupting normal service WAPA and St. Croix could probably maintain minimal service for several weeks. The risk of such an event and the value of additional emergency production must be considered.

WAPA Wells not now scheduled for service beyond 2010

⁴ These numbers will be standardized; at least two methods are currently in use.

⁵ Standing Water Level.

These are shown in Table . These are mostly wells that were developed and owned by others and WAPA has or will let leaseholds lapse. Owners will be advised that these wells must either be permitted and comply with construction and protection norms or abandoned and closed properly. WAPA-owned wells will be subject to the same requirements.

Table IV.C.2 WAPA Wells not intended for service after 2010				
Well#	Well Name	GPM	SWL	Depth
18	Adventure	7	25.6	88.2
19	Adventure	10	35.6	100.2
20	Adventure	14	33.6	97.6
5	Adventure	25	31.5	103.3
6	Adventure	13	39.3	99.2
8	Adventure	13	25.7	85.9
1	Fairplain	10	27.1	86.7
1	Old Golden Grove	10	29	91.3
15	Old Golden Grove	12	33.5	94.5
16	Old Golden Grove	13	35.7	86.7
21	Old Golden Grove	14	28.7	91.4

In addition to the wells and well fields above, the following well fields (see Table , below) have been in production or were developed at one time and will be visited and checked for WHPP compliance. Those that have reverted to private hands will be noted and DPNR will schedule dates for closing or rehabilitation, sanitary seal acceptability and security. A priority schedule will be developed.

Table IV.C.3 WAPA Well Fields not intended for service after 2010

Field Name	Number of Wells/ Name used for La Grange and Mahogany Road wells at one time
Prosperity	
Mahogany Road	4 All require proper closure or improved protection and seals if owner wants to continue use.
La Grange	2 Operated by Crystal Springs at this point.
Old Golden Grove	4
Barren Spot	9

Field Name	Number of Wells/
Adventure	9 All are acceptable; will need improved security if owner desires to use these.
Concordia	5

Wells selected by the amount of water pumped.

The amount of pumpage is generally uncertain and our cut-off is 6,000 gallons per day (gpd, ~2MG per year). The first priority for these wells will be to verify the production numbers.

It is known that a number of these wells belong in the high-risk category, in addition. For example, several of these wells are known to be located in parking lots though they are not precisely located. These are shown at Table IV.C.. In general, these have the same threats as do the WAPA wells, with the added problem that they can be very near unsewered population centers.

Wells prioritized by risk.

Risk is used as an analog for the population served or effected by this source and is estimated by:

- a. Type of purveyor
 - i. Water Source (vendors, standpipe)
 - ii. Bottled Water vendor or source
 - iii. Condominiums
 - iv. Apts
 - v. Hotels
- b. Population served
 - i. Total for Condos, Apts and Hotels
 - ii. NT for others

There are a total of approximately 60 wells in addition to the WAPA wells, or about 140 wells in all. These are listed in Table IV.C.6.



Figure IV.C.1. WAPA well with typical platform and riser.



Figure IV.C.2. Untypical WAPA well.



Figure IV.C.3. Cover of well in parking lot.

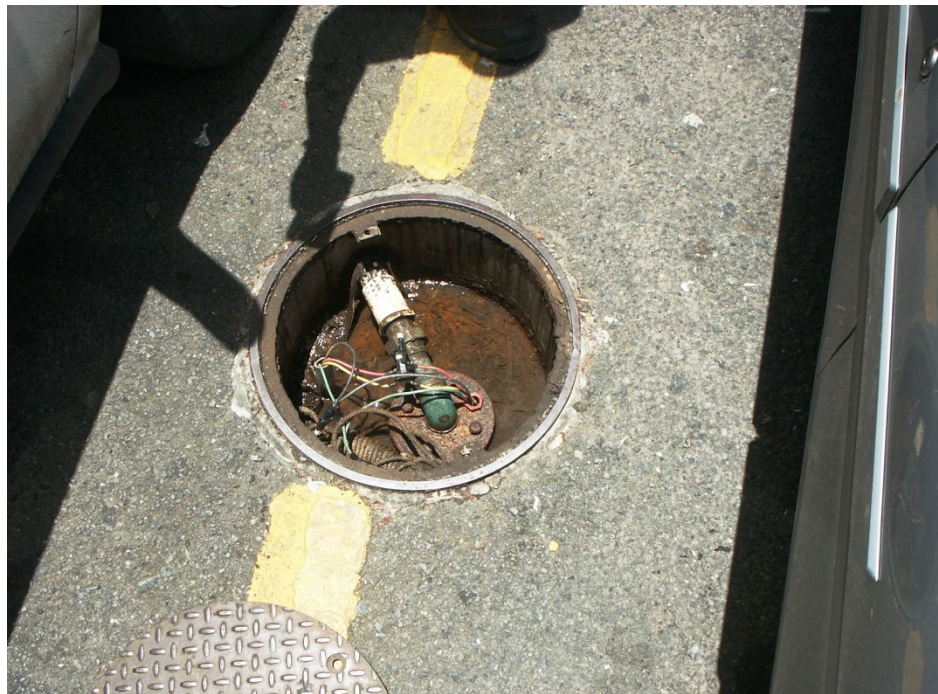


Figure IV.C.4. Wellhead in sump condition with open sanitary seal (rope and flexible conduit for pump).



Figure IV.C.5. Well with possible surface sources of contamination; note ditch from cistern/wastewater overflow and dumpster.



Figure IV.C.6. Wellhead with compromised sanitary seal and cut in casing.



Figure IV.C.7. Francis Water Delivery well site. Google Earth.



Figure IV.C.8. Francis Water Site; 1 is well house, 2 is oil tank and ditch.



Figure IV.C.9. View from North, near well house. Note slope towards well.



Figure IV.C.10. Well head and pump, shallow Francis Water Delivery well.



Figure IV.C.11. Laundromat well without effective seal.



Figure IV.C.12. Diesel tank without containment adjacent to well.



Figure IV.C.13. Production well for vendor; note the galvanized cover.



Figure IV.C.14. What's under the cover; this abandoned well is adjacent to a production well providing potable water.



Figure IV.C.15. Trash near Bethlehem Ghut and wells.



Figure IV.C.16. Abandoned Caustic tank near Bethlehem Ghut and wells.

Table IV.C.4. Wells Selected By Daily Pumpage		
PROPERTY_OWNER	PUMP_RATE (DAILY, ~2000)	STATUS for this project
SARGASSO CORPORATION	628,000	Same wells; these are in the littoral and are essentially seawater. No further action
SUNTERRA RESORTS (CARAMBOLA)	628,000	
FRANCIS, WILMOTH	628,000	
VI RUM INDUSTRIES LTD	176,000 ⁶	Need security and several need flood protection.
BUCCANEER HOTEL, THE	140,000	Security
SEVEN SEAS WATER CORP.	60,000	Security, these are brackish water wells for RO.
MCM TRUCKING	60,000	Unknown
LINDQUIST, ALBERT (DIAMOND WATER CO.)	56,000	Also Ideal Water – Out of service; wells to be properly closed.
O'NEIL, RAYMOND & CANTON, REUBEN	50,000	
GRENMA PEPPER TREE TERR.	50,000	
SCHUSTER, CHARLES O.	50,000	See Schuster Water; former well in Strawberry now abandoned in Emmanuel Water Service site. Requires proper closure.
VI PORT AUTHORITY	45,000	Fire Service only
GRAPETREE SHORES INC.	40,000	
HENDERSON, FLEMING (LA GRANGE TRUST, INC.)	30,000	Operated as Crystal Water; typical WHP area threats.
CURRAN, CHERIE	30,000	
BAPTISTE, SHAWN	30,000	
LOFTUS, NOEL	30,000	
PAUL, NEVILLE	23,000	
YUSUF, FATHI	23,000	United Water – Sion Farm Plaza. Wellhead improvements, numerous surface threats. Well for water sales out of service.
THE REEF ASSOCIATION	20,000	
YUSUF, MIKE	20,000	Plaza. Wellhead improvements, numerous surface threats.
COUNTRY DAY SCHOOL	20,000	
UNIVERSITY OF THE VIRGIN ISLANDS	15,000	Wells used only after failure of supply in rainwater capture cisterns and for kitchen. Good siting and protection; normal areal concerns.

⁶ VI Rum has recently applied for a permit to withdraw 250,000 gpd.

Table IV.C.4. Wells Selected By Daily Pumpage

PROPERTY_OWNER	PUMP_RATE (DAILY, ~2000)	STATUS for this project
COAKLEY BAY CONDOMINIUMS	15,000	
GOOD HOPE COMMUNITY TOWN HOUSE	15,000	
COAKLEY BAY TOWNHOUSE	12,000	
GALLOWAY, IRA	12,000	Out of service; compliant, but surface threats in area.
ARMSTRONG, ROBERT D.	10,000	
BRUGAL RUM & CO	7,500	Out of service; needs proper closure.
HARBOR VIEW APARTMENTS	7,200	
CHEUER, WALTER (prob typo for following)	7,200	
SCHEUER, WALTER	7,200	Nominally out of service, not yet verified.
SCHIERLOH, CORNELIA	6,000	
CANDLE REEF II ASSOCIATION	6,000	
MAHARAJ, PREMA (LA REINE LAUNDROMAT)	6,000	Usage estimate is considered low. Wellhead improvements, numerous surface threats.
Yusuf, Carl	~60	Poorly protected, serious threats on surface and very near WAPA Bethlehem wells and Bethlehem Ghut. Owner responsive.
VIAPCO	1,500	Well#1 good wellhead protection, well#2 poor. Company is aware and are planning rehabilitation. Surface threats.
Du-N-Save Laundromat	3,000	Well fair; site needs some work and are threats from work to South.
VIP Concrete	1,200(?)	Use seems unlikely; surface threats significant; wellhead fair.
Bureau of Corrections		Well under rehabilitation outside facility; may be other and this will be followed-up.
USDA Wells		Located well 2-C; need to verify production and other wells.
Contractor's Cement	100	This well was thought to be contaminated by leakage from gas station; production is very low and supplemented by purchased WAPA water. Well siting good and wellhead acceptable.

Table IV.C.5. Wells selected by risk to populace				
System Name	Class	Category	Source	Findings
Aqua-Mist	TNC	Water Bottler	R/GW	Purchased water for bottling. Well now only serves Laundromat on site; unable to access well, owner is finding keys.
Francis Water Service Delivery & Sales	TNC	Water Source	GW	Out of service; well requires work and better protection.
Francis Purified Water	BW	Bottled Water	GW	Out of service; well requires work and better protection.
Bates Trucking	TNC	Water Source	R/GW	Well is sited with many areal threats. Site housekeeping is notably good.
Caledonia Spring	TNC	Bottled Water	R	Well out-of-service and with acceptable surface closure. Bottling RO water purchased from others.
Country Water	TNC	Water Source	GW	Nominally this well is also treated by RO. Not verified through site and well visited. Distribution lines from abandoned well need to be blanked and some concerns with cistern.
Crystal Springs	TNC	Water Source	GW	Uses former WAPA La Grange well. Well is nearly acceptable; numerous areal threats.
Marcos Trucking	TNC	Water Source	R/GW	Wells difficult to verify; encased in RC structures. Fuel stored on-site next to subsurface electrical service. Site housekeeping particularly good.
Carlton Gardens	TNC	Water Source	GW	1-D Estate Carlton
Emmanuel's Service	TNC	Water Source	R/GW	Unprotected abandoned well adjacent to production well; surface threats. Owner is particularly responsive.
Galloway's Delivery	TNC	Water Source	R/GW	Out-of-service. Well is well-sited and seal is acceptable. Significant areal threats.
Schuster Water Delivery (Blue Mountain Water)		Water Source/ Bottled Water		Particularly good seals and siting on 2 wells in service. A third well under development (or rehabilitation) is open and needs attention. Significant areal threats.
Southgate Gardens	TNC	Water Source	GW	Unable to access; will continue. It is thought that Seven Seas is serving most of their former customers.
United Corp. Standpipe	TNC	Water Source	R/GW	Wells for shopping center need proper sanitary seals. Located in sump conditions and need to be reviewed for this.
Carino's Water Service	TNC	Water Source	GW	Out-of-service; now operated by Paradise Purification

Table IV.C.5. Wells selected by risk to populace				
System Name	Class	Category	Source	Findings
Unknown vendor		Water Source (supplies some water for bottlers)	GW	Near USVI National Guard at corner of MG Jean Augustine Romney Memorial Drive. Not able to enter, but significant threat from heavy use for livestock on site.
Paradise Purification	BW	Bottled Water	W/GW	Shallow well nominally out of service. Well and seal are acceptable but significant areal threats.
Divi Carina Bay Resort	NTNC	Hotel	GWR	
Sunny Isle Shopping Center	NTNC	Corp	R/GW	Wells not all seen; to date are well done and seals are acceptable.
Lorraine Village	C	Apt	R/W/GW	20 & 21-A Estate Plessen
Buccaneer Hotel (replicate of use table)	NTNC	Hotel	R/GW	Estate Shoy
Diamond Cinema	NTNC	Corp	R/GW	Plot# 93A Estate Diamond
Med-Isle I	NTNC	Corp	R/W/GW	29D Estate Diamond-Suite 47
Village Mall	NTNC	Corp	R/WGW	113 Estate Barren Spot
St. Croix Mutual Homes #14/15	C	Apt	R/W/GW	Well protected and seal acceptable.
St. Croix Mutual Homes #22/23	C	Apt	R/W/GW	Well protected and seal acceptable.
St. Croix Mutual Homes #36	C	Apt	R/W/GW	Well protected and seal acceptable.
St. Croix Mutual Homes #44/45	C	Apt	R/W/GW	Not served by wells
St. Croix Mutual Homes #54/55	C	Apt	R/W/GW	Not served by wells.
Queen Louise Home*	C	Corp	R/GW	71 Estate Concordia

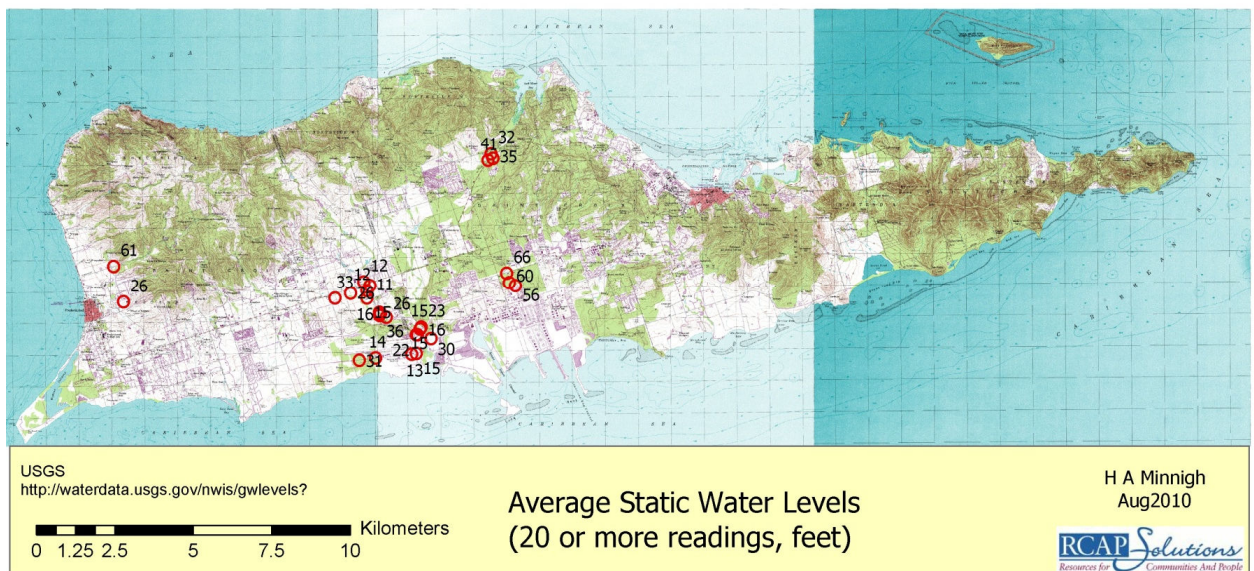


Figure IV.C.17. Average Static Water levels in wells on St. Croix.

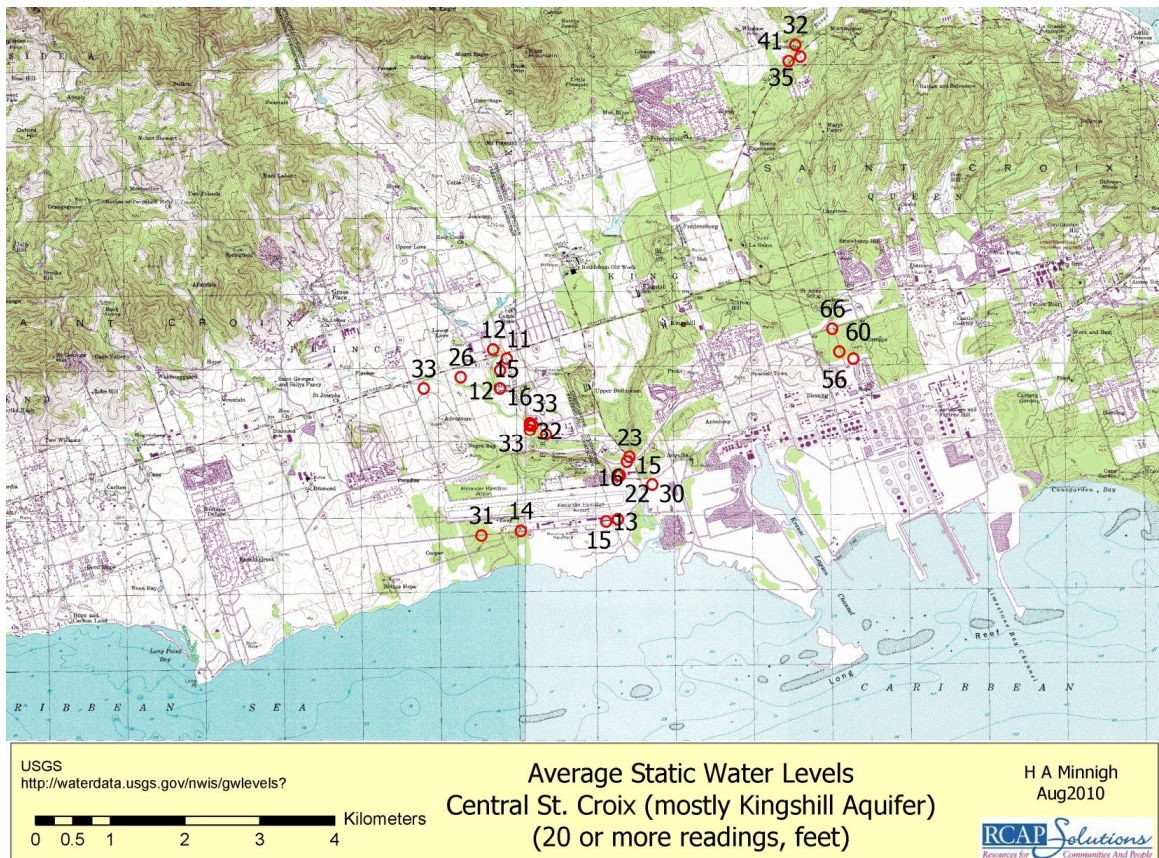


Figure IV.C.18. Static water levels, central St. Croix.

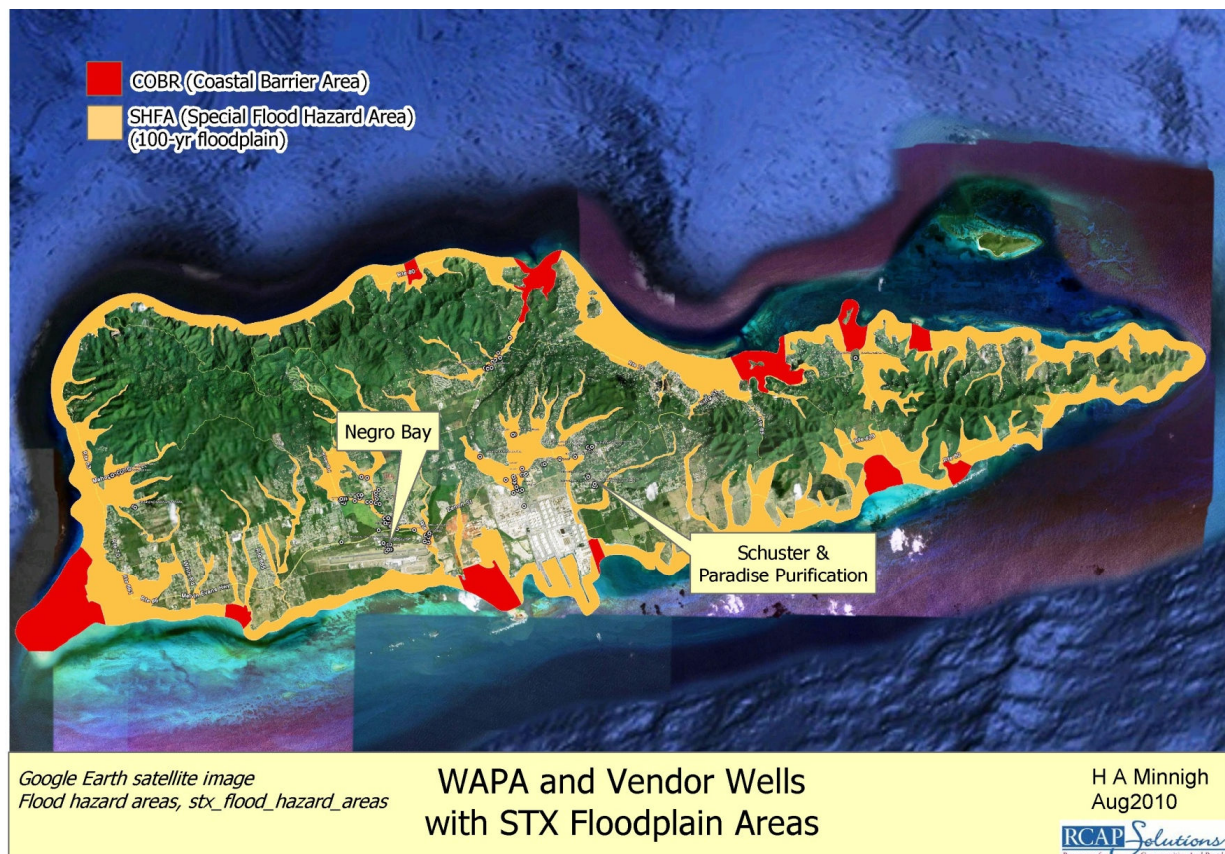


Figure IV.C.19. Flood Risks and Production Wells



Figure IV.C.20. Wellhead Protection Zone, La Grange

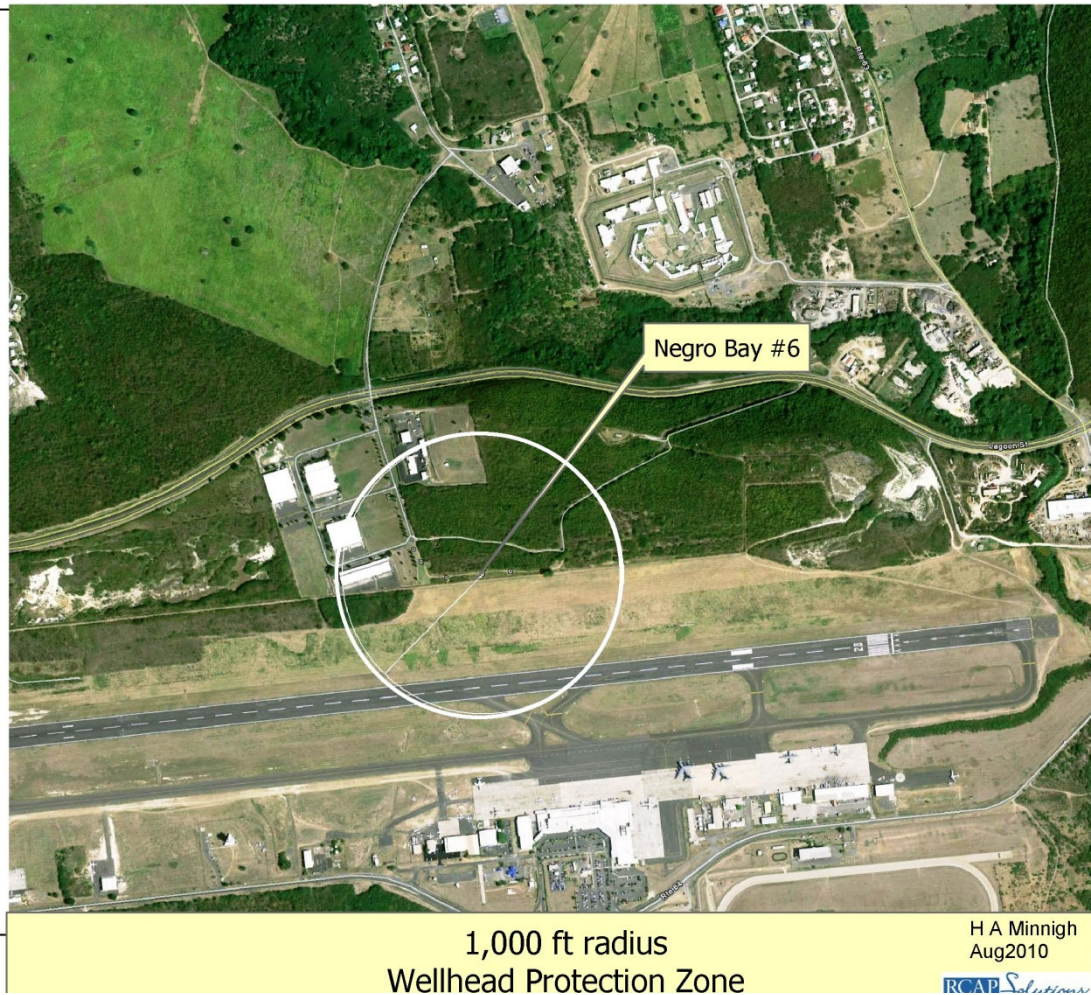


Figure IV.C.21. Wellhead Protection Zone, Negro Bay #6

Appendix 1: 2010 303(d) List of Impaired Waters

AU ID	AU Name	Associated Monitoring Stations	Priority	Class	Impairment	Source	Listed in 2008	Tentative Year of TMDL Completion
St. Croix								
VI-STC-02	Frederiksted Harbor	STC-29, STC-28 , VI970611	Medium	C	Dissolved Oxygen, Turbidity	Urban Runoff/Storm Sewers Highway/Road/Bridge Runoff (Non-construction Related)	Yes	2014
VI-STC-04	Prosperity, Nearshore	VI252619	Low	B	Turbidity	Erosion and Sedimentation	No	2014
VI-STC-06	Sprat Hall Beach	STC-30, VI645288	Low	B	Phosphorus, Turbidity, Dissolved Oxygen	Unknown	Yes	2014
VI-STC-12	Cane Bay	VI201013	Low	B	Turbidity	Erosion and Sedimentation	No	2020
VI-STC-13	Baron Bluff Subwatershed	STC-31, VI398766	Low	B	Enterococci, Dissolved Oxygen, Turbidity	Impacts from Resort Areas	Yes	2020
VI-STC-16	Salt River Lagoon, Marina	STC-33, STC-33C	Low	B	Enterococci, Fecal Coliform, Turbidity	Erosion from Derelict Land (Barren Land)		
VI-STC-18	Salt River Bay	STC-33A and STC-33B,	Low	B	Turbidity	Other Marina/ Boating On-vessel Discharges		
						Residential Districts	Yes	2020
						Land Development		
						Erosion and	No	2020

VI146901						Sedimentation Urban Runoff/Storm Sewers		
VI-STC-23	St. Croix-By-the-Sea Long Reef Backreef, west	STC-34, VI738082	Low	B	pH, Turbidity	Urban Runoff/Storm Sewers Erosion and Sedimentation Unknown	Yes	2023
VI-STC-24		STC-48	Low	B	Enterococci		No	2023
VI-STC-26	Christinsted Harbor	STC-40, STC-43, VI572166	Low	C	Fecal Coliform, Turbidity, Enterococci	Marina/Boating Sanitary On-vessel Discharges Discharges from Municipal Combined Storm Sewer Systems	No	2023
VI-STC-27	Long Reef Forereef, East	STC-35A, STC-36	Low	B	Turbidity, pH	Marina/Boating Sanitary On-vessel Discharges Discharges from Municipal Combined Storm Sewer Systems	Yes	2023
VI-STC-29	Christiansted Harbor, East	STC-1, STC-39	Low	C	Dissolved Oxygen, Turbidity, Secchi Depth, Turbidity, Fecal Coliform	Erosion and Sedimentation Urban Runoff/Storm Sewers Erosion and Sedimentation	Yes	2023
VI-STC-30	Beauregard Bay	STC-2, STC-38, VI651587	Low	B	Dissolved Oxygen,	Highways, Roads, Bridges, Infrastructure	Yes	2025
VI-STC-31	Buccaneer Beach	STC-3	Low	B				

					Secchi Depth, Turbidity, Fecal Coliform	(New Construction)		
VI-STC-33	Punnett Bay	VI610321	Low	B	Turbidity	Land Development Erosion and Sedimentation	No	2025
						Marina/Boating Sanitary On-vessel Discharges		
						Other Spill Related Impacts		
						Erosion from Derelict Land (Barren Land)		
						Post-development Erosion and Sedimentation		
						Impacts from Resort Areas (Winter and Non-winter Resorts)		
VI-STC-35	Tamarind Reef Lagoon (Southgate Lagoon)	STC-4	High	B	Dissolved Oxygen, Fecal Coliform, Secchi Depth, Turbidity	Discharges from Municipal Combined Storm Sewer Systems	Yes	2011
						Package Plants (Small Flows)		
VI-STC-36	Green Cay Beach	VI563397	High	B	Turbidity	Erosion and Sedimentation	No	2011
VI-STC-37	Southgate	STC-5	High	B	Dissolved	Marina Boat	Yes	2011

	Subwatershed, Offshore				Oxygen, Fecal Coliform, Enterococci, Turbidity	Maintenance Marina/Boating Sanitary On-vessel Discharges		
						Non-Point Source		
					Dissolved Oxygen, Turbidity, pH, Fecal Coliform	Highway/Road/Bridge Runoff (Non- construction Related)		
VI-STC-39	Teague Bay	STC-9, STC- 8, VI381319	Low	B			Yes	2027
						Highways, Roads, Bridges, Infrastructure (New Construction)		
VI-STC-40	Teague Bay Backreef	STC-10 , VI351774	Low	B	Turbidity, pH, Fecal Coliform	Marina/Boating Sanitary On-vessel Discharges	Yes	2027
VI-STC-46	Grapetree Bay	STC-11B	Low	B	Dissolved Oxygen	Erosion and Sedimentation	Yes	2029
VI-STC-47	Turner Hole Backreef	VI297470	Low	B	Turbidity	Erosion and Sedimentation	No	2029
						Highway/Road/Bridge Runoff (Non- construction)		
VI-STC-56	Bugby Hole Backreef	STC-14A, STC-14B, VI931289	Low	B	Phosphorus, Turbidity	Land Development	Yes	2031
VI-STC-59	Canegarden Bay	STC-15	Medium	B	Phosphorus, Turbidity	Erosion and Sedimentation	Yes	2031
					Phosphorus, Temperature, Dissolved Oxygen, Turbidity	Marina Boat Maintenance Major Industrial Point Source		
VI-STC-61	Hess Oil Virgin Islands Harbor	STC-16, STC- 17	Low	C			Yes	2031
VI-STC-62	Limetree Bay	STC-18	Low	B	Fecal	Unknown	No	2031

Coliform								
VI-STC-63	Martin-Marietta Alumina Harbor	STC-20, STC-19	Low	C	Dissolved Oxygen, Phosphorus	Unknown	Yes	2031
VI-STC-64	Manning Bay/Estate Anguilla Beach	STC-23	Low	B	Phosphorus, Fecal Coliform, Turbidity	Highway/ Road/ Bridge Runoff (Non-construction Related) Municipal Point Source Impacts from Inadequate Industrial/ Commercial Pretreatment	Yes	2031
VI-STC-65	Hovensa, West	STC-22A, STC-21	Low	B	Enterococci, Fecal Coliform, Phosphorus	Municipal Point Source Discharges	Yes	2031
VI-STC-75	Diamond Subwatershed, Offshore	STC-24B	Low	B	Dissolved Oxygen, Turbidity, Phosphorus, Enterococci, Secchi Depth, Toxicity	Industrial Point Source Discharge	Yes	2017
VI-STC-76	Carlton Beach	STC-25	Low	B	Dissolved Oxygen, Turbidity	Industrial Point Source Discharge	Yes	2017
VI-STC-79	Good Hope Beach	STC-26	Low	B	Turbidity	Erosion and Sedimentation	No	2017
VI-STC-82	Sandy Point, Nearshore West	STC-27 , VI896490	Low	B	Turbidity, Dissolved Oxygen	Erosion and Sedimentation	Yes	2017
St. John								

VI-STJ-01	Caneel Bay	STJ-54, NPS-1, VI658467	Low	B	Dissolved Oxygen, Turbidity	Unknown	No	2018
VI-STJ-02	Hawksnest Bay	STJ-44B, NPS-3, NPS-4, VI255380	Low	B	Dissolved Oxygen, Turbidity	Erosion and Sedimentation	No	2018
VI-STJ-03	Trunk Bay	STJ-44A, NPS-5	Low	A	Dissolved Oxygen	Unknown	No	2018
VI-STJ-05	Cinnamon Bay	STJ-44C, NPS-6, NPS-7	Low	B	Dissolved Oxygen	Unknown	No	2018
VI-STJ-06	Maho Bay/Francis Bay	STJ-44D, NPS-8, NPS-9, VI536165	Low	B	Dissolved Oxygen, Turbidity	Unknown	No	2018
VI-STJ-15	Round Bay	STJ-53, NPS-15, NPS-16, STJ-57, STJ-58, VI823989	High	B	Turbidity, pH	Unknown	Yes	2012
VI-STJ-23	Fish Bay	STJ-48	Med	B	pH, Turbidity	Unknown	Yes	2015
VI-STJ-25	Rendezvous Bay subwatershed, offshore	STJ-47, NPS-23, VI204627, VI402599	Med	B	Turbidity, pH, Fecal Coliform	Unknown	Yes	2015
VI-STJ-26	Chocolate Hole	STJ-46, NPS-24, VI391298	Med	B	Dissolved Oxygen, pH, Turbidity	Marina/Boating Sanitary; On-vessel Discharges, Non-Point Source	Yes	2015
VI-STJ-28	Great Cruz Bay	STJ-45, NPS-25, VI779192	Low	B	Turbidity, Dissolved Oxygen, pH	Illegal Dumping, Non-Point Source On-site Treatment Systems (Septic Systems and Similar)	Yes	2021

						Decentralized Systems)		
						Other Marina/Boating On- vessel Discharges		
						Other Recreational Pollution Sources		
						Municipal Point Source Discharges		
VI-STJ-29	Turner Bay/Enighed Pond	STJ-55, NPS-26	Low	B	Turbidity		Yes	2021
						Commercial Ferries		
						Fecal Coliform, Turbidity, Secchi Depth, Dissolved Oxygen, pH, Enterococci, Fecal Coliform		
						Marina Fueling Operations		
						Other Marina/Boating On-vessel Discharges		
VI-STJ-30	Cruz Bay	STJ-43A, STJ-43B, STJ-43C, STJ-43D, NPS-27, NPS-28, NPS-29, VI309453	Low	B		Other Recreational Pollution Sources	Yes	2021
						Erosion and Sedimentation		
VI-STJ-31	Great Cruz Bay Watershed, Offshore	VI456779	Low	B	Turbidity		No	2021
St. Thomas								
VI-STT-01	Botany Bay	STT-9	Low	B	pH, Enterococci	Highways, Roads, Bridges, Infrastructure (New Construction)	No	2019
VI-STT-02	Stumpy Bay	STT-10	Low	B	Turbidity, pH	Unknown	Yes	2019
VI-STT-04	Santa Maria Bay	STT-11	Low	B	Dissolved Oxygen, pH,	Post-development Erosion and	Yes	2019

					Turbidity	Sedimentation		
					Turbidity, Dissolved Oxygen, pH	Source Unknown		
VI-STT-05	Caret Bay	STT-12	Low	B			Yes	2022
					Turbidity, Dissolved Oxygen, pH	Source Unknown		
VI-STT-07	Dorothea	STT-13	Low	B			Yes	2022
					Dissolved Oxygen, pH, Turbidity	Other Marina/Boating On-vessel Discharges Other Recreational Pollution Sources	Yes	2022
VI-STT-08	Hull Bay	STT-14, VI616865	Low	B		Highways, Roads, Bridges, Infrastructure (New Construction)		
						On-site Treatment Systems (Septic Systems and Similar Decentralized Systems)		
						Other Recreational Pollution Sources		
						Changes in Tidal Circulation/ Flushing		
		STT-15, STT- 15A, STT- 15B, VI672756	Low	B	Turbidity, Dissolved Oxygen, pH, Fecal Coliform, Enterococci	Highway/ Road/ Bridge Runoff (Non-construction Related)	Yes	2022
VI-STT-10	Magen's Bay							
VI-STT-13	Mandahl Bay (Marina)	STT-16B, STT-16C	Medium	B	Enterococci, Fecal	Other Marina/ Boating On- vessel	Yes	2016

					Coliform, Dissolved Oxygen, pH, Secchi Depth, Turbidity	Discharges Other Recreational Pollution Sources Changes in Tidal Circulation/ Flushing		
VI-STT-15	Sunsi Bay	STT-17B	Low	B	Dissolved Oxygen, pH, Turbidity	Sources Unknown	Yes	2016
VI-STT-16	Spring Bay	STT-17A	Low	B	Dissolved Oxygen, pH	Sources Unknown Other Marina/ Boating On- vessel Discharges Other Recreational Pollution Sources	Yes	2016
VI-STT-17	Mandahl Bay Subwatershed, Offshore	STT-16A, STT-18, VI577932	Medium	B	Dissolved Oxygen, Total Fecal Coliform, Turbidity, pH	Illegal Dumping On-site Treatment Systems (Septic Systems and Similar Decentralized Systems)	Yes	2016
VI-STT-18	Water Bay	STT-19, VI591668	Low	B	Dissolved Oxygen, pH, Turbidity	Sources Unknown	Yes	2024
VI-STT-19	Smith Bay	STT-20, VI431925	Low	B	Dissolved Oxygen, Turbidity	On-site Treatment Systems (Septic Systems and Similar Decentralized Systems)	Yes	2024

VI-STT-21	St. John Bay	STT-21A, VI327776	Low	B	Dissolved Oxygen, Turbidity	Sources Unknown	Yes	2024
VI-STT-22	Red Bay	STT-21B	Low	B	Dissolved Oxygen, Turbidity, pH	Urban Runoff	Yes	2024
VI-STT-23	Vessup Bay	STT-22B	Low	B	Temperature, Enterococci	Major Municipal Point Source Discharge	Yes	2024
VI-STT-24	Red Hook Bay	STT-22A, VI1764950	Low	B	Enterococci, Turbidity	Urban Runoff Other Marina/Boating On-vessel Discharges	Yes	2024
VI-STT-25	Great Bay	STT-23, VI505006	Low	B	Dissolved Oxygen, Turbidity	Other Marina/ Boating On-vessel Discharges, Internal Nutrient Recycling	Yes	2026
VI-STT-28	Cowpet Bay	STT-24, STT- 24A	Low	B	Dissolved Oxygen	Package Plants (Small Flows)	Yes	2026
VI-STT-31	Nazareth Bay	VI389422	Low	B	Turbidity	Erosion and Sedimentation	No	2026
VI-STT-32	Jersey Bay, Offshore	STT-25	Low	B	Fecal Coliform	Urban Runoff	Yes	2028
						Other Marina/ Boating On- vessel Discharges		
						Discharges from Municipal Combined Storm Sewer Systems		
VI-STT-34	Benner Bay Lagoon Marina	STT-27D, STT-27E	Low	B	Enterococci, Turbidity	Changes in Tidal Circulation/ FlushingHighway/	Yes	2028

						Road/ Bridge Runoff (Non-construction Related)		
						Sanitary Sewer Overflows (Collection System Failures)		
						Changes in Tidal Circulation/ Flushing		
						Discharges from Municipal Combined Storm Sewer Systems		
						Highway/ Road/ Bridge Runoff (Non-construction Related)		
					Temperature, Enterococci, Turbidity, Fecal Coliform	Other Marina/ Boating On- vessel Discharges	Yes	2028
VI-STT-35	Mangrove Lagoon	STT-27B, STT-27A, STT-27C	Low	B				
VI-STT-36	Frenchman Bay Subwatershed East	STT-28A, STT-28B, VI951607	Med	B	Dissolved Oxygen, Turbidity	Erosion and Sedimentation	Yes	2013
						Impacts from Resort Areas (Winter and Non-winter Resorts)		
VI-STT-37	Frenchman Bay	STT- 29A, VI891065	Med	B	Dissolved Oxygen, Turbidity	Other Recreational Pollution Sources	Yes	2013
VI-STT-38	Limetree Bay	STT-29B,	Low/Med	B	Dissolved	On-site Treatment	Yes	2013

VI776527						Oxygen, Turbidity	Systems (Septic Systems and Similar Decentralized Systems)		
							Erosion from Derelict Land (Barren Land)		
							Highways, Roads, Bridges, Infrastructure (New Construction)		
							Impacts from Resort Areas (Winter and Non-winter Resorts)		
VI-STT-39	Morningstar Bay	STT-30, VI937158	Med	B		Dissolved Oxygen, Enterococci, Turbidity	Other Recreational Pollution Sources	Yes	2013
VI-STT-40	Pacquereau Bay	STT-31A	Med	B		Dissolved Oxygen	Sources Unknown	Yes	2013
VI-STT-43	St. Thomas Harbor, Inner	STT-31B, STT-31C, STT-38, STT-35, STT-32B, STT-32A, STT-33A, STT-33B, STT-34, STT-36, STT-37	Low	C		Dissolved Oxygen, Enterococci, Fecal Coliform, Turbidity	Residential Districts Urban Runoff/Storm Sewers Other	Yes	2030
							Non-Point Source, Marina Boat Maintenance, Marina/Boating Pumpout Releases		
VI-STT-45	Gregerie Channel	STT-1, STT-39	Low	B		Dissolved Oxygen		Yes	2030

VI-STT-46	Sprat Bay	STT-42	Low	B	Dissolved Oxygen	Residential	Yes	2030
						Dredging (e.g., for Navigation Channels)		
						Wastes from Pets		
						Other Spill Related Impacts		
						Other Marina/ Boating On-vessel Discharges		
	Hassel Island at Haulover Cut to Regis Point	STT-2, STT-3	Low	C	Enterococci, Dissolved Oxygen, Fecal Coliform, Turbidity	Highway/ Road/ Bridge Runoff (Non-construction) Ballast Water Releases	Yes	2030
VI-STT-47					Dissolved Oxygen, Turbidity	Land Development Erosion and Sedimentation	Yes	2030
VI-STT-49	Druif Bay	STT-40	Low	B		Commercial Ferries		
						Residential Districts		
						Other Marina/ Boating On-vessel Discharges		
VI-STT-50	Flamingo Bay	STT-41	Low	B	Dissolved Oxygen, Turbidity	Other Recreational Pollution Sources	Yes	2030
VI-STT-51	Krum Bay	STT-4	Low	C	Fecal	Other Marina/	No	2030

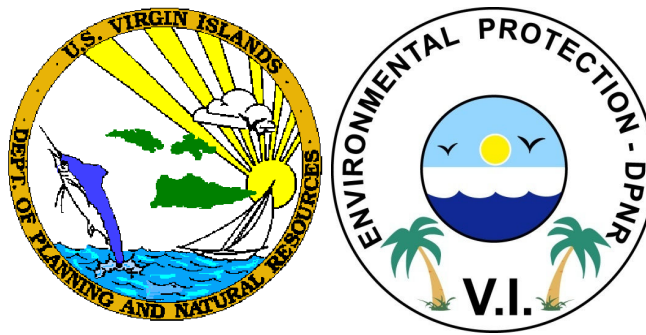
					Coliform	Boating On-vessel Discharges	
VI-STT-52	Lindbergh Bay	STT-5A, STT-5B, VI514102	Low	B	Dissolved Oxygen, Turbidity	Other Recreational Pollution Sources	2032
VI-STT-53	Cyril E. King Airport Subwatershed, Offshore	STT-6C	Low	B	Dissolved Oxygen	Major Municipal Point Source	2032
VI-STT-54	Perseverance Bay, Offshore	STT-6B	Low	B	Dissolved Oxygen, Turbidity	Erosion and Sedimentation	2033
VI-STT-55	Brewers Bay	STT-7A, VI293962	Low	B	Dissolved Oxygen, Turbidity	Erosion and Sedimentation	2033
VI-STT-56	Perseverance Bay	STT-7B	Low	B	Dissolved Oxygen	Erosion and Sedimentation	2033
VI-STT-57	Fortuna Bay	STT-8	Low	B	Dissolved Oxygen, Enterococci, Turbidity	Erosion and Sedimentation	2033

Key

Text in red =
paramater/AU
eligible for
delisting next
cycle

Text in green
= new listings

2010 Responsiveness Summary September 2010



**Prepared By:
Department of Planning & Natural Resources
Division of Environmental Protection**

I. Introduction

The Virgin Islands Department of Planning and Natural Resources (DPNR) Division of Environmental Protection (DEP) has prepared this report to summarize and respond to the comments received on the public noticed drafts of the US Virgin Islands 2010 List of Impaired Waterbodies and Assessment Methodology.

Comments were only received from the United States Environmental Protection Agency Region 2 (EPA) staff during the 30-day public notice period. The public comment period began on July 28, 2010 and ended on August 30, 2010. The public comment period was published in both local newspapers: The Virgin Islands Daily News and The Avis. Additionally, the public notice was posted on the DPNR-DEP website at the following link: http://dep.dpnr.gov.vi/documents/release.php?act=view_release_desc&release_id=86

II. Comments

Below is a summary of the comments received by DPNR and DPNR's responses to those comments:

Comments received on the Draft List of Impaired Waters

Number	Comment	Response
1	<p>Please find below the 2008 AU ID/Impairment combinations missing from the 2010 303(d) List:</p> <p>VI-STC-24/Enterococci VI-STC-62/Fecal Coliform VI-STJ-01/Dissolved Oxygen & Turbidity VI-STJ-02/Dissolved Oxygen VI-STJ-03/Dissolved Oxygen VI-STJ-05/Dissolved Oxygen VI-STJ-06/Dissolved Oxygen & Turbidity VI-STT-05/Dissolved Oxygen & Turbidity VI-STT-07/Dissolved Oxygen & Turbidity VI-STT-15/Dissolved Oxygen & pH VI-STT-22/Dissolved Oxygen & Turbidity VI-STT-57/Dissolved Oxygen</p>	<p>DPNR determined the following 2008 AU ID/Impairment combinations were not missing from the 2010 303(d) List:</p> <p>VI-STT-05/Dissolved Oxygen & Turbidity VI-STT-07/Dissolved Oxygen & Turbidity VI-STT-15/Dissolved Oxygen & pH VI-STT-22/Dissolved Oxygen & Turbidity VI-STT-57/Dissolved Oxygen</p> <p>DPNR determined the following 2008 AU ID/Impairment combinations were missing from the 2010 303(d) List and have been added:</p> <p>VI-STJ-01/Dissolved Oxygen & Turbidity VI-STJ-02/Dissolved Oxygen VI-STJ-03/Dissolved Oxygen VI-STJ-05/Dissolved Oxygen VI-STJ-06/Dissolved Oxygen & Turbidity VI-STC-24/Enterococci VI-STC-62/Fecal Coliform</p>
2	<p>With regards to the prioritization, it seems pretty aggressive that they will develop TMDLs in 2011 for waterbodies spread across all three islands when traditionally they have rotated efforts as well as targeted impaired waters that are geographically co-located:</p> <p>VI-STC-59 Canegarden Bay VI-STC-63 Martin-Marietta Alumina Harbor VI-STC-64 Manning Bay/Estate Anguilla Beach VI-STC-65 Hovensa, West VI-STJ-15 Round Bay VI-STJ-26 Chocolate Hole</p>	<p>DPNR has reassessed its prioritizations for TMDL development and revised the 303(d) List to target impaired waters that are geographically co-located.</p> <p>As such 2011 TMDL development goal will focus on the Green Cay Area, on the Northeastern coast of St. Croix. Assessment Units to be included in this round of TMDLs are VI-STC-35, VI-STC-36 and VI-STC-37.</p> <p>TMDL development in 2012 will target the Coral Bay Area on the Eastern coast of St. John. Assessment Units to be included in this round of TMDLs are VI-STJ-15.</p>

	VI-STT-37 Frenchman Bay VI-STT-38 Limetree Bay VI-STT-52 Lindbergh Bay VI-STT-53 Cyril E. King Airport Subwatershed, Offshore The same comment goes for the TMDLs slated for 2012: VI-STC-02 Frederiksted Harbor VI-STC-13 Baron Bluff Subwatershed VI-STJ-25 Rendezvous Bay subwatershed, offshore VI-STJ-30 Cruz Bay VI-STT-13 Mandahl Bay (Marina) VI-STT-17 Mandahl Bay Subwatershed, Offshore VI-STT-25 Great Bay VI-STT-28 Cowpet Bay VI-STT-36 Frenchman Bay Subwatershed East VI-STT-46 Sprat Bay VI-STT-47 Hassel Island at Haulover Cut to Regis Point VI-STT-49 Druif Bay VI-STT-51 Krum Bay VI-STT-54 Perseverance Bay, Offshore VI-STT-55 Brewers Bay	
3	<p>Also, pollutant loads that create impairments of pH and turbidity are not easily characterized. Pollutant loads that create impairments of low dissolved oxygen are characterized but could use study on how sediment oxygen demand is being created.</p> <p>I would recommend that the USVI start aggressive efforts in collecting data now from their priority waters for the TMDL analysis and schedule their TMDL development sometime soon later.</p>	DPNR appreciates these recommendations and currently has plans to begin sediment studies in collaboration with the University of the Virgin Islands in late 2010. DPNR-DEP also intends to look into additional similar studies in priority waters.

Comments received on the Draft Assessment Methodology

Number	Comment	Response
1.	<p>The methodology states "The US Virgin Islands has not identified any freshwater with designated uses or established water quality standards for freshwaters."</p> <p>Freshwaters are included in the USVI WQS under the general [narrative] water quality criteria (§ 186-1): http://www.dpnr.gov.vi/dep/pubs/2010_VIWQS.pdf</p> <p>Also, freshwater invertebrates are discussed in DPNR's 2005 Comprehensive Wildlife Conservation Strategy: "Freshwater fauna includes snails, crabs, crayfish, and a variety of insects." http://www.dpnr.gov.vi/dep/pubs/Responsiveness%20Summary%20to%20the%202006%20USVI.pdf</p> <p>The University of the Virgin Islands has also documented confirmed sightings of the American Eel in their report entitled "Watercourses As Landscapes In The U.S. Virgin</p>	<p>DPNR has revised this section of the Assessment Methodology to clarify that freshwaters are included within the definition of "Waters of the VI" and as such these waters are covered by the VI Water Quality Standards (WQS).</p> <p>DPNR acknowledge the receipt of this comment and although not included during the 2010 WQS Triennial Review; DPNR will consider making such amendments to the Water Quality Standards for the US Virgin Islands during its next revision cycle.</p>

	<p>Islands: State Of Knowledge" (October 2008): http://www.uvi.edu/sites/uvi/Publications/watercourses_lands_capes.pdf</p> <p>This was brought to the attention of the USVI during the public comment period of the 2006 list:</p> <p>http://www.dpnr.gov.vi/dep/pubs/Responsiveness%20Summary%20to%20the%202006%20USVI.pdf</p> <p>"Comment: We are concerned that there are no definitions, classifications, or standards for freshwater systems. The US Virgin Islands has several major streams, locally known as guts or runs. These include Turpentine Run and Dorothea Gut in St. Thomas, and Creque Dam in St. Croix. These and other intermittent streams in the Virgin Islands are habitats for native stream fauna such as the river shrimp and mountain mullet. While these freshwater systems may be intermittent during most of the year, they can definitely affect water quality of the bays into which they discharge. Maintaining water quality in the upper watershed is paramount to maintaining water quality in the nearshore waters and bays. However, currently there are no water quality criteria for any of the freshwater habitats in the US Virgin Islands. We continue to recommend that the DPNR consider adding the few major guts found in the USVI to its water quality standards and 303(d) lists.</p> <p>Response: The DPNR will consider making such amendments to the Water Quality Standards for the US Virgin Islands in the upcoming revision cycle."</p>	
2.	How do you assess Class A waters and what criteria do you use to delineate "natural phenomena"?	<p>Class A waters are assessed based on VI WQS Chapter 7 §186-2</p> <p>Quality criteria: Existing natural conditions shall not be changed. The biological condition shall be similar or equivalent to reference condition for biological integrity. In no case shall Class B water quality standards be exceeded.</p> <p>DPNR defines "natural phenomena" as the historical condition of an area; DPNR, however, does not have any other criteria by which to delineate this condition.</p>
3.	Any criteria for Class A waters?	<p>Class A waters are assessed based on VI WQS Chapter 7 §186-2</p> <p>Quality criteria: Existing natural conditions shall not be changed. The biological condition shall be similar or equivalent to reference condition for biological integrity. In no case shall Class B water quality standards be exceeded.</p> <p>This information has been added to the Assessment Methodology document.</p>
4.	What are natural sources? Do you have a baseline data set on	DPNR corrected this statement and replaced the

	these?	word “sources” with “conditions”. Natural conditions are the same as natural phenomena DPNR defines these as the historical condition of an area. DPNR does not have an official baseline data set for these conditions.
5.	Temperature should state “not to exceeded 32°” instead of “less than 32°”	DPNR corrected language in the table.
6.	“Not to exceed a geometric mean of 35 enterococci per 100 mL, not to exceed a single sample maximum of 104 per 100 mL at any time.” Comment: AND? OR? The same question for Class C.	The “and/or” statement within the bacteria criteria is language that was approved in the 2010 Revision of the VI WQS; DPNR will clarify this during its next WQS revision cycle.
7.	“Not to exceed 50 mg/l in any coastal waters” Comment: Guessing that it should be 50 micrograms per liter (ug/l)	DPNR corrected the unit in the table.
8.	•A secchi disc shall be visible at a minimum depth of one meter •A maximum nephelometric turbidity unit reading of three (3) shall be permissible Comment: AND? OR? In any event, is there a study to correlate the maximum NTU value with the minimum Secchi depth? For the next round of WQS revisions and updates, DPNR-DEP should contemplate an update.	DPNR will consider this suggested language change during its next WQS revision cycle.
9.	Same as Class B, but no NTU standard in Rules and Regulations Comment: Should consider adding or replacing with NTU measurement.	DPNR will consider this suggested language change during its next WQS revision cycle.
10.	Identify exceedences of water quality standards Comment: If the most recent WQS are being used, that would be the recently approved 2010 version. Has DPNR-DEP updated the narrative and numeric criteria in this methodology? The data covered by this methodology would have been collected and/or acquired before the new WQS were approved; would it make more sense to use the WQSS in force during the IR data period?	The 2010 USVI WQS were used in making the current assessments.
11.	“Any data gaps that are identified will be included in the multi-year monitoring strategy for resolution. “ Comment: Please provide an update to the gaps document.	A data gap document cannot be provided at this time. DEP intends to work on developing this document during the next Integrated Report cycle.
12.	Data From Other Sources Comment: Clearly articulated acceptance criteria are missing from this methodology. In their absence it is difficult to define what credible data “of high quality and of great significance” would be.	Agencies that were contacted to request data were asked to submit the data with the relative Quality Assurance Project Plan (QAPP). Once received the QAPP and data would be evaluated to determine if DPNR’s Data Quality Objectives were met. If the data is determined to be acceptable then the data would be used in the reporting cycle’s assessments.

		DPNR, also, intends to develop an SOP for the evaluation of secondary data which will clearly articulate acceptance criteria. That criteria once developed will be incorporated into the relative version of the Assessment Methodology during the next Integrated Report cycle.
13.	<p>“Presently, use support will be determined using the most current version of the US Virgin Islands water quality standards. Water quality standard revision was initiated in 2008. The revision is complete and has been adopted into the Virgin Islands Rules and Regulations as of June 2011.”</p> <p>Comment: See earlier comment #11 above</p>	The 2010 USVI WQS were used in making the current assessments.
14.	<p>DEP received no habitat assessment data for the 2008-2009 reporting cycle.</p> <p>Comment: How can ALUs be assessed in the absence of habitat data?</p>	Habitat assessment data was not assessed since data was received.
15.	<p>DEP received no biological data for the 2008-2009 reporting cycle.</p> <p>Comment: Please explain.</p>	Biological data was not assessed since data was received.
16.	<p>Category 3</p> <p>Comment: In the absence of sufficient monitoring data, habitat and biological assessment data, most waters not already listed in 303(d) for known impairments will fall into this category. This statement also appeared in the 2008 methodology. What is DPNR-DEP planning to do to remediate this?</p>	Category 3 is an USEPA Category; DPNR recently developed a Corrective Action Plan which outlined DPNR’s intentions to complete its full complement of monitoring for the next reporting period. DPNR will continue to work with USEPA’s Monitoring Branch to expand its monitoring efforts in the future.
17.	<p>Category 3C</p> <p>Inconclusive Data is available from any of the identified data sources for the assessment unit in question. This might include information from studies that do not directly provide information related to water quality standards.</p> <p>Category 3D</p> <p>Unreliable or low quality data is available from any of the identified data sources for the assessment unit in question. Unreliable or low quality data is defined as data sets that have significant gaps, obvious anomalies, etc.</p> <p>Comment: Usability and data quality criteria are missing from this methodology, as was the case for the 2008 document.</p>	DPNR has incorporated the recommended usability and data quality criterion into the 2010 Assessment Methodology. The information can be found in the <i>Evaluation of Internal Data</i> and <i>Data From Other Sources</i> sections. DPNR intends to continue to evaluate and improve upon the data quality criterion during the next Integrated Report cycle.
18.	<p>“The US Virgin Islands has not identified any freshwater with designated uses or established water quality standards for freshwaters.”</p> <p>Comment: The U.S. VI has narrative water quality standards (to meet generally accepted aesthetic qualifications and to support diversified aquatic life) for all waters of the U.S. VI including, but not limited to streams, lakes, ponds,</p>	DPNR has revised this section of the Assessment Methodology to clarify that freshwaters are included within the definition of “Waters of the VI” and as such these waters are covered by the VI Water Quality Standards.

	impounding reservoirs, and springs.	
19.	<p>“Class “B” (aquatic life and primary contact recreation).”</p> <p>Comment: For maintenance and propagation of desirable species of aquatic life.</p>	The language suggested has been incorporated.
20.	<p>“(iii) All non-marine waters defined as all Virgin Islands waters shoreward of the mean high-tide line”</p> <p>Comment: Please note that section (iii) was added to the WQS during the most recent triennial review – Approved by EPA in June 2010. If this assessment is being done based on 2004 WQS Regulations, this section should be revised.</p>	The 2010 USVI WQS were used in making the current assessments.
21.	<p>“Class “C” (aquatic life and primary contact recreation).”</p> <p>Comment: For maintenance and propagation of desirable species of aquatic life.</p>	The language suggested has been incorporated.
22.	<p>(2) St. Croix:</p> <p>(A) Christiansted Harbor from Fort Louise Augusta to Golden Rock, along the waterfront and seaward to include the navigational channels and mooring areas.</p> <p>Comment: Please note that the highlighted language was added to the WQS during the most recent triennial review – Approved by EPA in June 2010. If this assessment is being done based on 2004 WQS Regulations, this section should be revised.</p>	The 2010 USVI WQS were used in making the current assessments.
23.	<p>(B) Frederiksted Harbor from La Grange to Fisher Street and seaward to the end of the Frederiksted Pier.</p> <p>Comment: Please note that the highlighted language was added to WQS during the most recent triennial review – Approved by EPA in June 2010. If this assessment is being done based on 2004 WQS Regulations, this section should be revised.</p>	The 2010 USVI WQS were used in making the current assessments.
24.	<p>(3) St. John:</p> <p>(A) Enighed Pond Bay</p> <p>Comment: Please note that this Bay was added to Class C waters during the most recent triennial WQS review – Approved by EPA in June 2010. If this assessment is being done based on 2004 WQS Regulations, this section should be revised.</p>	The 2010 USVI WQS were used in making the current assessments.
25.	<p>“Not less than 5.5 mg/l from other than natural sources.”</p> <p>Comment: Change “sources” to “conditions”</p>	DPNR corrected this statement and replaced the word “sources” with “conditions”.
26.	<p>“Not less than 5.0 mg/l”</p> <p>Comment: Add “from other than natural conditions”</p>	The language suggested has been incorporated.
27.	<p>“Less than 32° Celsius”</p> <p>Comment: Change to “Not to exceed 32 deg C at any time”</p>	The language suggested has been incorporated.
28.	<p>“Not to exceed 70 fecal coliforms per 100 ml by MF or MPN count”</p>	The language suggested has been incorporated.

	Comment: Add “A geometric (log) mean of 70”	
29.	<p>“Not to exceed 200 fecal coliforms per 100 ml by MF or MPN count”</p> <p>Comment: Add “A geometric (log) mean of 200”</p>	The language suggested has been incorporated.
30.	<p>“Not to exceed 50 mg/l in any coastal waters”</p> <p>Comment: Change “mg/l” to “ug/l”</p>	The language suggested has been incorporated.
31.	<p>“Class A and B water bodies should not exceed 70 colonies/100mL in a single sample. Class C water bodies should not exceed 200 colonies/100mL in a single sample. ”</p> <p>Comment: Assessment is more stringent than standard which refers to geometric mean of 70 and 200 col/100mL of FC in class B and C waters, respectively.</p>	The language suggested has been incorporated.
32.	<p>“1. Fully Supporting: None of the Samples exceed 70 or 200 colonies/100 mL respectively for fecal coliform and 104 colonies/100 mL for enterococci.</p> <p>2. Not supporting: Any of the Samples exceed 70 or 200 colonies/100 mL respectively for fecal coliform and 104 colonies/100 mL for enterococci.”</p> <p>Comment: Add “in class B and C waters”</p>	The language suggested has been incorporated.
33.	<p>Toxicant Assessment</p> <p>“The US Virgin Islands currently has no water quality standards for toxicants. The US Virgin Islands does intend to, however, use the federally recommended limits. The conditions for use support are as follows:”</p> <p>Comment: Statement is incorrect. Previous VIWQS Regulations (adopted in October of 2004) included the applicable numeric water quality standards for toxic pollutants which were incorporated by reference from EPA (2002 version). The most recent VIWQS Regulations (adopted in July of 2010) also include the applicable numeric water quality standards for toxic pollutants which were also incorporated by reference from EPA (2006 version).</p>	The language suggested has been incorporated.
34.	<p>“1. Fully Supporting: No toxicants noted in either acute or chronic tests compared to controls or reference conditions.”</p> <p>Comment: How are reference conditions are established?</p>	DPNR currently does not have formal criteria for the establishment of reference conditions. DPNR will continue to work closely with USEPA Monitoring Branch to develop these criteria.
35.	<p>“Determination of Aquatic Life Use Support will consider habitat assessment data (based on availability) in relation to propagation of desired species of marine life.”</p> <p>Comment: If this assessment is being done based on 2010 WQS Regulations; please note that the new VIWQS include narrative bio-criteria for class B and C waters. In addition, “exotic or aquatic nuisance species” were added to the list of substances from which waters should be free.</p>	The language suggested has been incorporated to ensure conformity with the 2010 USVI WQS.
36.	Toxicity Assessment	The language suggested has been incorporated to

	<p>“The conditions for use support are as follows:</p> <ol style="list-style-type: none"> 1. Fully Supporting: No toxicity noted in either acute or chronic tests compared to controls or reference conditions. 2. Partially Supporting: No toxicity noted in acute tests, but may be present in chronic tests in either slight amounts and/or infrequently within an annual cycle. 3. Not Supporting: Toxicity noted in many tests and occurs frequently.” <p>Comment: Statement is incorrect. Previous VIWQS Regulations (adopted in October of 2004) included the applicable numeric water quality standards for toxic pollutants which were incorporated by reference from EPA (2002 version). The most recent VIWQS Regulations (adopted in July of 2010) also include the applicable numeric water quality standards for toxic pollutants which were also incorporated by reference from EPA (2006 version).</p>	ensure conformity with the 2010 USVI WQS.
37.	<p>Conventional Assessment</p> <p>“The conventional parameters are: Dissolved Oxygen, Temperature, Turbidity, and pH”</p> <p>Comment: VIWQS states that DO may not be less than 5.5 or 5.00 mg/L unless it is shown to be natural condition. How “natural condition” is being evaluated for class B and C waters?</p>	DPNR will work to develop criteria for evaluating “natural conditions” during the next Triennial Review Process.
38.	<p>Comment: VIWQS state that temperature, as a result of waste discharge, may not be greater than 1 deg C above natural. How “natural” temperature is being evaluated for class B and C waters?</p>	DPNR will work to develop criteria for evaluating “natural conditions” during the next Triennial Review Process.
39.	<p>“Considerations will be made for toxicants data (based on availability). The US Virgin Islands currently has no water quality standards for toxicants. ”</p> <p>Comment: Statement is incorrect. Previous VIWQS Regulations (adopted in October of 2004) included the applicable numeric water quality standards for toxic pollutants which were incorporated by reference from EPA (2002 version). The most recent VIWQS Regulations (adopted in July of 2010) also include the applicable numeric water quality standards for toxic pollutants which were also incorporated by reference from EPA (2006 version).</p>	The language suggested has been incorporated.

40.	<p>Biological Assessment</p> <p>“1. Fully Supporting: Reliable data indicate functioning, sustainable biological assemblages (e.g., fish, macroinvertebrates, or algae) none of which has been modified significantly beyond the natural range of the reference condition.”</p> <p>Comment: What thresholds are being used for assessment of biological indices? Are they different for different water classes?</p>	<p>DPNR continues to work towards the development of Biological Assessment Criteria. The 2010 WQS states:</p> <p>(b) Biocriteria: The Territory shall preserve, protect, and restore water resources to their most natural condition. The condition of these waterbodies shall be determined from measures of physical, chemical, and biological characteristics of each waterbody class, according to its designated use. As a component of these measures, the Territory may consider the biological integrity of the benthic communities living within waters. These communities shall be assessed by comparison to reference conditions(s) with similar abiotic and biotic environmental settings that represent the optimal or least disturbed condition for that system. Such reference conditions shall be those observed to support the greatest community diversity, and abundance of aquatic life as is expected to be or has been historically found in natural settings essentially undisturbed or minimally disturbed by human impacts, development, or discharges. This condition shall be determined by consistent sampling and reliable measures of selected indicator communities of flora and/or fauna and may be used in conjunction with other measures of water quality. Waters shall be of a sufficient quality to support a resident biological community as defined by metrics based upon reference conditions. These narrative biological criteria shall apply to fresh water, wetlands, estuarine, mangrove, seagrass, coral reef and other marine ecosystems based upon their respective reference conditions and metrics.</p>
41.	<p>Biological Assessment</p> <p>“1. Fully Supporting: Reliable data indicate functioning, sustainable biological assemblages (e.g., fish, macroinvertebrates, or algae) none of which has been modified significantly beyond the natural range of the reference condition.”</p> <p>Comment: How are reference conditions determined for classes A, B, and C waters?</p>	<p>DPNR intends to develop criteria for reference conditions. This process is being evaluated through the Nutrient Criteria Development Process. Once the criteria are developed it would be incorporated into the WQS Revision Process.</p> <p>DPNR expect to continue its work towards the development of numerical criteria by the next Integrated Repot cycle.</p>
42.	<p>Listing Rules</p> <p>Comment: This Report does not describe how “preservation of natural phenomena” is assessed for class A waters. These outstanding natural resource waters cannot be altered except towards natural conditions. It would be helpful to include description how it is being done.</p>	<p>DPNR through its monitoring efforts continues to assess whether degradation is occurring in the Class A waters.</p>