STATE OF THE ENVIRONMENT

UNITED STATES VIRGIN ISLANDS

2004

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Department of Planning & Natural Resources

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STATE OF THE ENVIRONMENT
UNITED STATES VIRGIN ISLANDS

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To Protect and Conserve the Natural Resources of the US Virgin Islands... Air, Land and Water, Upon Which Life Depends and Flourishes.

STATE OF THE ENVIRONMENT UNITED STATES VIRGIN ISLANDS

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May 2004

GOVERNOR'S MESSAGE

The beauty of the United States Virgin Islands is rivaled only by the immense beauty of our culture and people. With a rich history dating back to 300 A.D., the islands have a unique and diverse mixture of culture, history and charm. Attracting millions of tourists who return each year to relish our brilliant sunshine, deep blue seas, beautiful beaches, world-class accommodations and attractions and other natural resources, the islands remain the stalwart of Caribbean tourism.

As governor, I have spearheaded governmental efforts to attract and support growing businesses, which further strengthen the Territorial economy. We have marketed each island with its unique qualities to attract tourists who can enjoy the pristine environment of the Virgin Islands.

Moreover, the cornerstone of growth and development in the Virgin Islands - education - remains as one of the most significant concerns of this government. I continue to support all initiatives that support the educational pursuits of our young people. By focusing on major issues and our goals, we will progress into the new century with clear direction. This report provides a baseline from which we can assess our progress. I thank those who participated in the preparation of the 2004 State of the Environment Report. Your hard work and dedication are truly appreciated.

May God bless the United States of America, the Virgin Islands and all of us.

Charles W. Turnbull

Honorable Charles Turnbull, PhD
Governor, United States Virgin Islands

COMMISSIONER'S MESSAGE

As we enter into this fourth year of the new millennium, it is with great pride that I announce that the Department of Planning and Natural Resources (DPNR), Division of Environmental Protection (DEP) has embarked upon a new initiative to further implement policies and practices that educate our people and visitors about our most precious resources and enhance our daily life. The Division of Environmental Protection is unwavering in its mission of emphasizing the importance of protecting and conserving the natural resources of the Territory.

Realizing the need to create a platform that would serve as an instrument to effectively measure development and/or decline of the environment while informing the general public now and for many years to come, DPNR/DEP initiated the "State of the Environment Report". This report is the first of its kind for the Department and the Territory. It is comprised of an extensive scope of past, present and projected environmental objectives from various local and mainland government agencies, industries and other organizations and cooperating entities.

I wish to thank and commend those agencies that provided the necessary information and supported this extremely important initiative. Your support has enabled the Department of Planning and Natural Resources, Division of Environmental Protection to continue to carryout its mandate and to be the vanguard for our environment.

Dean C. Plaskett, Esq., Commissioner
Department of Planning & Natural Resources

DIVISION OF ENVIRONMENTAL PROTECTION

Mission

To protect human health and preserve the quality of USVI air, land and water for use and enjoyment today and in the future.

Vision

The Division of Environment Protection envisions a future for USVI citizens wherein the quality of life is enhanced by the quality of their environment. We will assess, sustain, preserve and enhance environmental qualities in partnership with communities and businesses, and in concert with the economic vitality of the Territory.

INTRODUCTION

Thank you for taking this opportunity to read and support our 2004 State of the Environment Report. We are proud to present this accumulation of environmental information as we work toward developing facts and trends to effectively measure the current and future progress of our environmental efforts.

The Division of Environmental Protection, along with other divisions of the DPNR and the USVI Government, is working tirelessly to develop, maintain and promote programs that ensure the health, protection and sustainability of our breathtakingly beautiful environment for generations to come.

We are intensifying our information management efforts and developing real-time and historical environmental databases that assist us in analyzing and measuring current and projected environmental trends and progress. This information provides an invaluable resource for environmental planning. It also serves as a catalyst in the development of business and technical strategies for greater protection and preservation of the natural resources of the USVI.

Accomplishing these goals is a challenging responsibility that depends on the participation of our entire community—citizens, businesses, government and visitors alike.

The entire staff of the Division of Environment Protection extends its sincere thanks to all who have played a vital role in this consequential mission of protecting and enhancing the environment by complying with USVI and federal environmental regulations, program development and education.

With this report, we hope to provide a greater understanding of the state of environmental affairs in the United States Virgin Islands, and of the progress made by citizens, regulated business and industry, the Department of Planning and Natural Resources and other organizations, both public and private sector.

Employees of the Division of Environmental Protection
Department of Planning & Natural Resources


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STOP

Clean Air

One of the most astonishing views for residents and visitors alike are the beautiful clear skies of the United States Virgin Islands. Blessed by cooling trade winds, picturesque scenery and old-world charm, the United States Virgin Islands enjoy some of the clearest and cleanest skies in the nation.

Rich scents of oleander, bougainvillea, ginger and an almost endless variety of orchids permeate the United States Virgin Islands' countryside with a sweetness matched only by the sights and sounds of children at play.

Despite the natural beauty and clarity of its atmosphere, maintaining safe air quality levels in the United States Virgin Islands is an ongoing mission.

There are many sides, sites and scents of the United States Virgin Islands…from beautiful open spaces and coastal shores, hills and lush vegetation, residential and farming areas, bustling retail and business hubs, manufacturing and other industrial sites, ground and air transportation to various maritime trades.

Clean, safe air is very important to life and society in the United States Virgin Islands (USVI).

Significance of Clean Air

Air pollutants can damage the respiratory system and cause illness to other areas of the body. As an example, exposure to air pollutants can cause itchy eyes, rashes and other conditions of the skin, coughing, chest pain and throat irritation. Some cancers, birth defects, brain and nerve diseases and long-term injury to the lungs and breathing passages have also been associated with air pollution. Certain air pollutants are so dangerous, in fact, that accidental releases can result in serious injury or even death.

Air pollution can also damage the environment. Trees, lakes, ponds and other waterways are all susceptible to air pollution.

Air pollutants have thinned the protective ozone layer above the earth, triggering changes in the environment and health concerns in people and animals alike.

Scenes from a Restored Wall Mural
in Frederiksted, St. Croix

Refurbished 1948 and 1975
Sponsored by the St. Croix Art Council

Significance of Clean Air

Air pollution can also damage property. It can dirty buildings and other structures. Some common pollutants erode stone, damaging buildings, monuments, statues and outdoor murals. Air pollution can cause smog and haze, reducing visibility on roads and in national parks, and it sometimes interferes with aviation.

Sources of air pollution can generally be categorized into groups, including but not limited to:

Mobile Sources

- On Road
  - Cars & Motorcycles
  - Trucks, Buses, Trains, etc.

- Non-Road
  - Aircraft & Other Aviation Machinery
  - Construction Equipment
  - Farm Equipment
  - Lawn & Garden Equipment
  - Marine Vessels, etc.

Stationary Sources

- Major Sources/Major Point Sources
  - Chemical Plants & Manufacturing Factories
  - Hazardous Waste Incinerators
  - Oil Refineries & Power Plants (Water, Electricity, Gas, etc.)
  - Sewage & Waste Water Treatment Plants
  - Landfills/Other Waste Disposal/Processing Sites, etc.

- Area and Other Sources
  - Agricultural & Light Industrial Operations
  - Auto Body & Repair Shops, Gasoline Stations
  - Bakeries & Dry Cleaners
  - Paints & Other Surface Coatings
  - Pesticide Application, etc.

"Major" sources are defined as sources that emit or have the potential to emit 10 tons per year of any of the listed hazardous air pollutants (HAPs), or 25 tons per year of a mixture of HAPs.

"Point" sources are characterized as stationary facilities or processes that emit a significant amount of air pollution such as can be found during manufacturing, power generation, heating, incineration or other major source activities.

"Area" sources are defined as pollution sources that emit or have the potential to emit less than 10 tons per year of a single hazardous air pollut-ant (HAP), or less than 25 tons per year of a combination of air pollutants. Area sources typically consist of smaller-size facilities or small emission sources that release lesser quantities of toxic pollutants into the air than major sources do. While area pollution sources may not contribute large amounts of pollution individually, collectively, their emissions can be of concern, particularly when a large number of area sources are located within highly populated communities. Air pollution sources also include naturally occurring events such as volcanic eruptions and wind blown dusts.

Clean Air Laws

The nation's first air pollution laws were established in 1977. To more adequately address air pollution and air quality concerns, the clean air laws of 1977 were substantially broadened through the enactment of the 1990 Clean Air Act.

A federal law applying to all states and territories in the nation, the 1990 Clean Air Act requires the US Environmental Protection Agency (EPA) to set National Ambient Air Quality Standards for pollutants considered harmful to public health and the environment. Pursuant to this requirement, the EPA has set ambient air quality standards for six of the most common pollutants (referred to as criteria pollutants).

Criteria Pollutants	Source	Health Effects	Environmental Effects	Property Damage
Ozone (O_3) - Ground level ozone is the principal component of smog. Volatile organic compounds and NOx combine in the atmosphere to form ozone.	Chemical reaction of pollutants; volatile organic compounds (VOCs) and NOx. VOCs are released from burning fuel (gasoline, oil, wood coal, natural gas, etc.), solvents, paints, glues and other products used at work or at home. Transportation vehicles are a major source of VOCs. NOx is the sum of nitric oxide and nitrogen dioxide.	Breathing problems, reduced lung function, asthma, eye irritation, stuffy nose, reduced resistance to colds and other infections. May speed up aging of lung tissue and cause permanent lung damage with chronic exposure. Many VOCs are also hazardous air pollutants and can cause serious problems such as cancer and other major health effects.	Ozone can damage plants and trees; smog can cause reduced visibility.	Damages rubber, fabrics, etc.
Carbon Monoxide (CO) is a colorless, odorless, tasteless gas that is formed in large part by the incomplete combustion or burning of fuel.	Burning of gasoline, diesel, natural gas, coal, oil, etc.	Reduces ability of blood to bring oxygen to body cells and tissues; cells and tissues need oxygen to work. Carbon monoxide may be particularly hazardous to people who have heart or circulatory (blood vessel) problems and to people who have damaged lungs or breathing passages.		
Sulfur Dioxide (SO_2) is a gas that is released when fossil fuels are burned.	Burning of coal, diesel and oil, especially high-sulfur coal from the Eastern United States; industrial processes (paper, metals).	Breathing problems; may cause permanent damage to lungs.	SO_2 is an element in acid rain (acid aerosols) that can damage trees and lakes. Acid aerosols can also reduce visibility. SO_2 can also react with other chemicals in the air to form particulate matter.	Acid aerosols can eat away stone used on or in the construction of buildings, statues, monuments, etc.
Nitrogen Dioxide (NO_2) is a gas that is released when fossil fuels are burned. It is one of the NOx.	Burning of gasoline, diesel, natural gas, coal, oil, etc. Cars are an important source of NO_2.	Lung damage, illnesses of the breathing passages and lungs (respiratory system).	NO_2 is an ingredient in acid rain (acid aerosols). It can damage trees and lakes and reduce visibility. NO_2 can also react with other chemicals in the air to form particulate matter.	Aerosols can eat away stone used on or in the construction of buildings, statues, monuments, etc.
Lead (Pb) has been greatly reduced nation-wide. However, because of its persistence in the environment, it continues to pose a potential public health threat.	Leaded gasoline (being phased out), paint (houses, cars), smelters (metal refineries); manufacture of lead storage batteries.	Brain and other nervous system damage; children are at special risk. Some lead-containing chemicals cause cancer in animals. Lead causes digestive and other health problems and affects blood and blood pressure.	Lead can harm fish and other marine animals and wildlife.	
Particulate Matter (PM_{10} & $PM_{2.5}$) includes ash, soot, dust, fog, fumes, etc.	Burning of wood, diesel and other fuels; industrial plants; agriculture (plowing, burning off fields); unpaved roads.	Nose and throat irritation, lung damage, bronchitis, cardiovascular stress, exacerbation of respiratory diseases (such as asthma and emphysema) and early death.	Particulates are the main source of haze that reduces visibility.	Can dirty and discolor structures, other property, clothes, furniture, etc.

Clean Air Laws

There are two types of National Ambient Air Quality Standards (NAAQS): primary and secondary. Primary standards set limits to protect public health, including the health of "sensitive" populations such as asthmatics, children and the elderly. Secondary standards set limits to protect public welfare, including protection against decreased visibility, and damage to animals, crops, vegetation, buildings and other property and ecological resources

Under the National Ambient Air Quality Standards, the EPA has determined an allowable/maximum ambient limit for each criteria pollutant. Cities, communities and other geographic areas that exceed a standard a specified number of times may cause the entire area to be in violation. This is known as being in nonattainment. A geographic area that meets or performs better than NAAQS is called an attainment area.

Criteria Pollutant	Averaging Period	NAAQS Valve		Notes
		Primary	Secondary	
[1]Ozone	1-Hour 8-Hour	0.12 ppm 0.08 ppm	0.12 ppm 0.08 ppm	1 2
Carbon Monoxide	1-Hour 8-Hour	35 ppm 9 ppm		3 3
Sulfur Dioxide	Annual 24-Hour 3-Hour	0.03 ppm 0.14 ppm	 0.50 ppm	4 3
Nitrogen Dioxide	Annual	0.053 ppm	0.053 ppm	4
PM_{10} - Respirable Particulate Matter	24-Hour Annual	150.00 mg/m^3 50.00 mg/m^3	150.00 mg/m^3 50.00 mg/m^3	5 6
$PM_{2.5}$ - Fine Particulate Matter	24-Hour Annual	65.00 mg/m^3 15.00 mg/m^3	65.00 mg/m^3 15.00 mg/m^3	7 6
Lead	Quarterly	1.5 mg/m^3	1.5 mg/m^3	4

Notes Legend

ppm = parts per million
mg/m^3 = micrograms per cubic meter of air

1. Not to be at or above this level more than 3 days over 3 years. The 1-hour ozone standard is being phased out.
2. Average of yearly fourth highest 8-hour ozone level over 3 years not to be at or above this level.
3. Not to be at or above this level more than once per calendar year.
4. Not to be at or above this level.
5. Three-year average of the 99th percentile of concentrations not to be at or above this level.
6. Three-year average not to be at or above this level.
7. Three-year average of the 98th percentile of concentrations not to be at or above this level.

The Clean Air Act requires the EPA to regulate hazardous air pollutants based on a published list of pollutants and pollution source categories. [2]Hazardous air pollutants (HAPs) are those pollutants that cause or may cause serious health effects or adverse effects to the environment. The EPA has currently identified 188 HAPs. Examples of hazardous air pollutants, or HAPs, include benzene (found in gasoline); perchlorethlyene (emitted from some dry cleaning facilities); and methylene chloride, which is used as a solvent and paint stripper by a number of industries. As provided by law, the Clean Air Act list can be modified by the EPA.

Although the Clean Air Act is a national law, states and territories do much of the work to carry out the Act. In fact, various state rules and regulations have been promulgated to ensure adequate implementation and enforcement of Clean Air Act requirements on a local level.

[1]The 1-hour standard applies only to communities that did not meet the 1-hour standard when the 8-hour standard was adopted in July 1997.
[2]Hazardous air pollutants (HAPs) are also referred to as toxic air pollutants or air toxics.

USVI Action, Activity & Authority

The Division of Environmental Protection (DEP), an operating unit of the Department of Planning & Natural Resources (DPNR), provides regulatory oversight and has authority to implement and enforce air pollution and air quality requirements in the USVI. This includes laws and requirements under Title V of the Clean Air Act, as well as the Virgin Islands Air Pollution Control Act Rules and Regulations (VR&R) (i.e., Title 12, Virgin Islands Code, Chapter 9 and the 1995 Rules and Regulations of the Virgin Islands Air Pollution Control Act).

Under the auspices of its Air Pollution Control Program (APC), the DEP is responsible for the following:

Air Quality Monitoring – Weekly particulate matter samples are collected from five monitoring stations in the Territory. The local refinery, HOVENSA, LLC, conducts sulfur dioxide monitoring.

Compliance Monitoring – Annual or more frequent inspections of regulated facilities are conducted to monitor and determine compliance. DEP also relies on citizen complaints to help identify sources that are not in compliance with local and/or federal laws.

Permitting – Before a regulated entity can construct, install, erect or operate an air pollution emission source, an "Authority to Construct Permit" and a "Permit to Operate" must be obtained from DEP's APC Program. In general, emission sources that are subject to Title V of the Clean Air Act are classified and referred to as major air pollution sources based on their annual emission levels. However, some pollution sources are subject to Title V based on recent federal requirements, regardless of their emission levels.

Based on the regulatory requirements imposed on operations at major air pollution sources, the Title V Operating Permit Program is a comprehensive, high-profile program. Permit application processing for major sources is labor-intensive, requiring administrative and technical reviews as well as site assessments, public participation and mandatory public hearings.

The DEP has identified eleven (11) Title V facilities with multiple sources of emissions. The DEP has issued four (4) five-year operating permits to these sources. Six (6) additional permits are pending, with issuance anticipated by yearend 2004. At present, there are more that 525 minor source permits on record in the USVI.

Enforcement – The APC Program utilizes at least four (4) enforcement mechanisms in order to bring sources into compliance, including notices of violation, cease-and-desist orders, notices of deficiencies and notices of non-compliance. In most cases, administrative orders are issued.

Quality Assurance – To ensure the integrity of ambient air quality monitoring networks, the APC Program participates in various self-monitoring activities, including quarterly audits by the DEP Quality Assurance Program Coordinator and equipment flow checks. In addition, the EPA conducts quarterly audits of the DEP's state and local air monitoring stations (SLAMS) network to evaluate the performance of monitoring equipment and DEP's proficiency in the implementation of the EPA-approved Quality Assurance Project Plan (QAPP) and associated standard operating procedures.

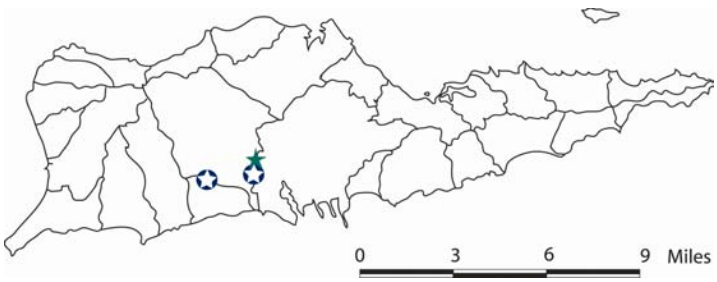
Air Quality in the USVI

Administered and managed by the DEP's Air Pollution Control Program, ambient air quality monitoring has taken place in the USVI since the 1970's. At various stations around the Territory, ambient air quality is monitored for three criteria pollutants:

1. Particulate Matter - PM_{10}, 10 micrometers or less
2. Particulate Matter - $PM_{2.5}$, 2 ½ micrometers or less
3. Sulfur Dioxide (SO_2)

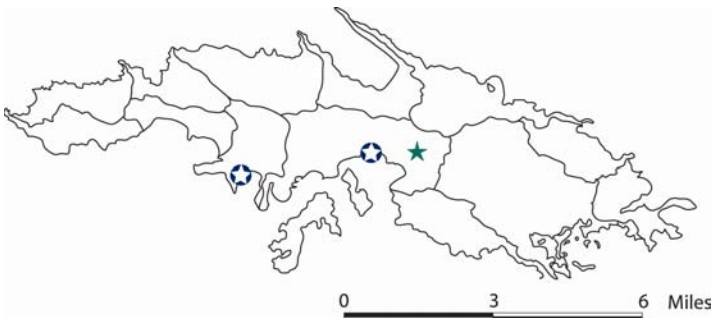
Although not shown on the map below, sulfur dioxide (SO_2) emissions are conducted in St. Croix at monitoring stations operated by HOVENSA, a local oil refinery. Ozone levels are monitored on the island of St. John by the Virgin Islands National Parks.

St. Croix Stations



- ✪ PM_{10} - FAA Emergency Pump Station, Est. Mannings Bay
- ✪ PM_{10} - Bethlehem Village Housing
- ★ $PM_{2.5}$ - Bethlehem Village Housing

St. Thomas Stations



- ✪ PM_{10} - Water Front & Emancipation Garden
- ✪ PM_{10} - Thomas - Cyril E. King Airport
- ★ $PM_{2.5}$ - Thomas - Post Office, Estate Thomas

[3]Emission levels for air pollutants currently monitored in the USVI have increased slightly over the past five years, but remain well below regulatory limits. Increases in emission readings are primarily attributed to Sahara and other dusts blown into the Territory by high trade winds, occasional ash from volcanic activity on the Island of Montserrat (UK) and vehicle emissions, which are gradually increasing due to the number of vehicles and road traffic. Intermittent increases in air pollution emissions have also been associated with various industrial plant sources, both large and small.

In partnership with the EPA, monitoring of local air quality is being expanded to cover air pollutants not currently monitored. Utilizing a phased-in approach, the intent of this endeavor is to increase the USVI's identification and inventory of local air pollutants and emission sources. This will result in improved air quality control, oversight of emission sources and increased regulatory compliance.

Expanded air quality monitoring will also bring the USVI closer to par with monitoring activities of US states. In addition, it will allow the USVI to participate in National Toxic Inventories (data banks), emission comparisons, and toxic trend and benchmarking projects on a real-time basis.

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[3]Except for very limited but occasional increases in particulate matter, ambient air quality in the Virgin Islands has not exceeded safe levels as defined by the 1990 Clean Air Act. All areas of the USVI attain national air quality standards.

Air Quality Monitoring

The Air Pollution Control Unit of DPNR/DEP strives to protect and improve the environment and public health by planning and implementing strategies that control sources of air pollution in the US Virgin Islands, today and into the future.

Through air quality monitoring and analytical efforts, ongoing regulatory activities and through coordination and collaboration with other territorial and federal agencies, APC works to ensure clean, safe and improved air quality in the US Virgin Islands.

Photographs:

Top Left - PM_{10} filter cartridge installation.

Top Middle - Handheld manometer in use at the Cyril E. King Airport PM_{10} site.

Top Right - Local Rock Quarry: A source of particulate matter emissions.

Bottom - Air Inspector sets up $PM_{2.5}$ monitor for 24-hour run cycle.

Air Quality in the USVI

Since 1988, the US EPA has prepared a National Toxics Release Inventory (TRI) that provides information on toxic releases by individual facilities, power plants and other sources. The following table shows toxic emission trends for various states, along with estimates produced for the USVI.

2001 Toxics Release Inventory for Select States

	State	Millions of Pounds of Toxic Air Emissions	
HIGHEST	Texas	84.4	
	Louisiana	53.9	
	Tennessee	50.7	
	Ohio	48.7	
	Illinois	39.7	
	Indiana	36.6	
	Alabama	36.4	
	Georgia	35.9	
	Eight Highest	386.4	
LOWEST	Wyoming	1.1	
	New Hampshire	1.0	
	US VIRGIN ISLANDS	0.9	←
	Rhode Island	0.6	
	Nevada	0.6	
	New Mexico	0.5	
	Vermont	0.1	
	Hawaii	0.1	
	Eight Lowest	4.9	

Source: Environmental Protection Agency, 2001 Toxics Release Inventory (TRI), query run on TRI Explorer available at http://www.epa.gov/triexployer. Includes industries from SIC Code 20 - 39.

The USVI is also developing a more complete air toxics inventory, which will include estimates of toxic air emissions from transportation and small emission sources.

Major Challenges To USVI Clean Air

1. Air Quality Monitoring. The USVI must remain an attainment area for all primary pollutants. To improve and preserve air quality, protect the environment and the health and safety of all living things, increased monitoring efforts, including monitoring of the nation's six most common air pollutants (criteria pollutants), are essential.

   "We cannot fully and appropriately manage what we do not identify and measure." To this end, the Air Pollution Control Program is broadening its air monitoring program, striving to more actively manage USVI air quality. These challenges and opportunities are being achieved by working closely with national and local government, industry and communities to promote compliance with air quality permits and regulations, through proactive prevention of air quality violations, and the reduction of air pollution emissions at the source.

   The Air Pollution Control Program is targeting prevention efforts that address emerging odor, smoke and toxic emission issues. Preventing air quality problems will provide the Territory with greater flexibility in managing its air quality and, thereby, in protecting public health and the environment.

2. Motor Engine Emissions. While a benefit to the economy and to the quality of life in the USVI, the increased number and use of "on-road and off-road" motor vehicles, as well as other fuel-burning engines, are a health and safety concern for the Territory's community. Motor emissions harm and injure people and animals, damage plant life, land, water and building structures, and cause haze and smog, reducing air and ground visibility.

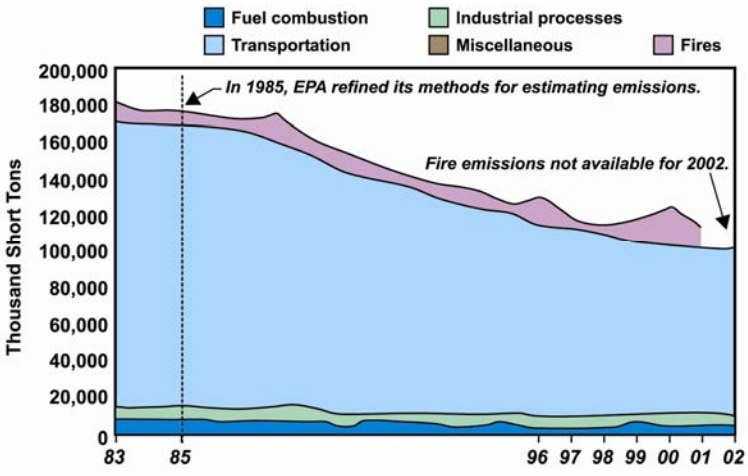
   Presently, the USVI does not have a vehicle emissions testing requirement or program. However, a vehicle emissions testing program and rules and regulations are being developed. The program is expected to be implemented by the latter part of fiscal year 2005.

What Can You Do To Improve Air Quality?

- Drive Less. Collectively, automobiles are the Territory's largest cause of air pollution. When shopping for a new car, look for fuel-efficient and low-emitting models.
- Conserve Energy. Almost all of the energy we use comes from the burning of fuel, whether in our cars, in our homes or at the power plant that supplies electricity to our homes. The more efficiently we use energy, the less pollution we create. Turn off unneeded lights, use a fan instead of an air conditioner whenever possible and consider energy efficiency when purchasing new appliances.
- Maintain Your Car Properly. Keep your car tuned and keep your tires properly inflated. You will get better gas mileage and you'll reduce fuel waste in the process.
- Delay Yard Chores. Mow your lawn less often. Consider using electric garden tools rather than gas-powered ones. They produce far less pollution and are quieter.
- Use Products That Pollute Less. The volatile organic compounds (VOCs) found in consumer products such as paints and household cleaners quickly evaporate and contribute to ozone pollution. Substitute water-based products whenever possible.

*Do not exercise outside on days when air quality is unhealthful, especially sunny, hot summer afternoons.

1983 – 2002 Carbon Dioxide Emissions (Nationwide)



1983—02: 41% Decrease
1993—02: 21% Decrease

Source: Environmental Protection Agency, 2002 EPA National Air Pollutant Emissions Trends Report Highlights (http://www.epa.gov/airtrends/highlights.html).

Part of the Lesser Antilles chain of islands in the West Indies, the United States Virgin Islands are located east of Puerto Rico, between the Caribbean Sea and the Atlantic Ocean, approximately 1,400 miles southeast of Miami.

Surrounded by crystal clear blue waters, the United States Virgin Islands consists of three (3) major islands and over 50 islets, most of which are uninhabited. Home to more than 108,000 residents, each of the three major islands has a unique structure. Major business industries include tourism, petroleum refining, construction, water and power generation and various manufacturing operations, including watch assembly, rum distilling, pharmaceuticals, textiles and electronics.

The most densely populated island, St. Thomas, measures 32 square miles and is the location of the USVI's capital city of Charlotte Amalie. St. Thomas has one of the best and most beautiful natural deep water harbors in the Caribbean. In addition, it holds the distinction of being one of the Caribbean's most frequently visited ports.

St. John measures 19 square miles, of which two-thirds are a national park. It possesses some of the most breathtaking aerial, land and shoreline views in the world. The geography of both St. Thomas and St. John primarily consists of steep hills and mountains, with lush vegetated valleys and gorges that slope to the shoreline.

St. Croix, the largest landmass of the USVI, measures in at approximately 84 square miles. Comprised of soft rolling green hills, mild basins and stretches of flat land, St. Croix is the USVI's agricultural hub (small farms and ranching) and is the locale of one of the world's largest petroleum refineries.

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All islands feature pristine emerald beaches, sheltered coves, spectacular coral reefs and varying degrees of unscathed rain forests. Some of the shorelines are characterized by deep indentations that form bays, many of which have ponds located just landward of the shoreline. These ponds act as sediment traps, filtering sediment-laden runoff before it reaches the ocean. They also provide important breeding habitats and feeding grounds for many different species of waterfowl, wading birds, crabs and other marine life.

The average temperature in the USVI ranges from 77°F in the winter to 83°F in the summer. Natural freshwater resources are very limited. There are no permanent freshwater streams or large bodies of fresh water, such as lakes or ponds. Freshwater streams flow mainly during periods of intense rainfall.

Steep terrains, limited natural freshwater resources, small land masses and other geographical characteristics, population and socioeconomic structures all combine to create unique environmental challenges for the USVI.

Pesticide Control

All bugs are insects but not all insects are bugs. Confusing? Not necessarily.

Some insects are universally known and accepted as pests (bugs), others are beneficial insects. A bee to someone who has a garden is a beneficial insect, to another—a potential painful sting (a bug).

Pests come in all shapes, sizes and categories: insects, rodents, weeds, fungus, trees, mites, bacteria, microorganisms and more. For some, even fish, birds and other animals have been targeted as pests.

Pests threaten crops and food production, interfere with the natural and man-made aesthetics of our environment, cause injury and disease in people, animals and plant life and disrupt our lifestyles.

Plain and simple, pests can literally be a bug.

In most dictionaries, the term pesticide is simply defined as "insect killer." However, there are many types and variants of pesticides: attractants, repellents, growth regulators that control and manage certain pests, pesticides that kill or rid us of problem pests and the list goes on.

As noted on the side chart, the term pesticide also refers to herbicides, fungicides and various other substances used to control pests.

Some Pesticide Types and Pests

Type of Pesticide	Target Pests
Avicide	Birds
Bactericide	Bacteria
Defoliant	Plants
Desiccant	Plants and Insects
Fungicide	Fungi
Growth Regulator	Insects and Plants
Herbicide	Weeds
Insecticide	Insects
Miticide/Acaricides	Mites
Molluscicide	Mollusks
Nematicide	Nematodes
Piscicide	Fish
Repellents	Insects and Vertebrates
Rodenticide	Rodents (Vertebrates)
Sexual Sterilants	Insects and Vertebrates
Silvicide	Trees and Shrubs

These household pesticides are not registered for use by the US EPA.

Many household products are pesticides: ant and roach sprays, insect baits, insect repellents for personal use, rat and other rodent poisons as well as flea and tick sprays, powders and pet collars. Kitchen and laundry detergents, sanitizers, even toilet bowl cleaners contain pesticides.

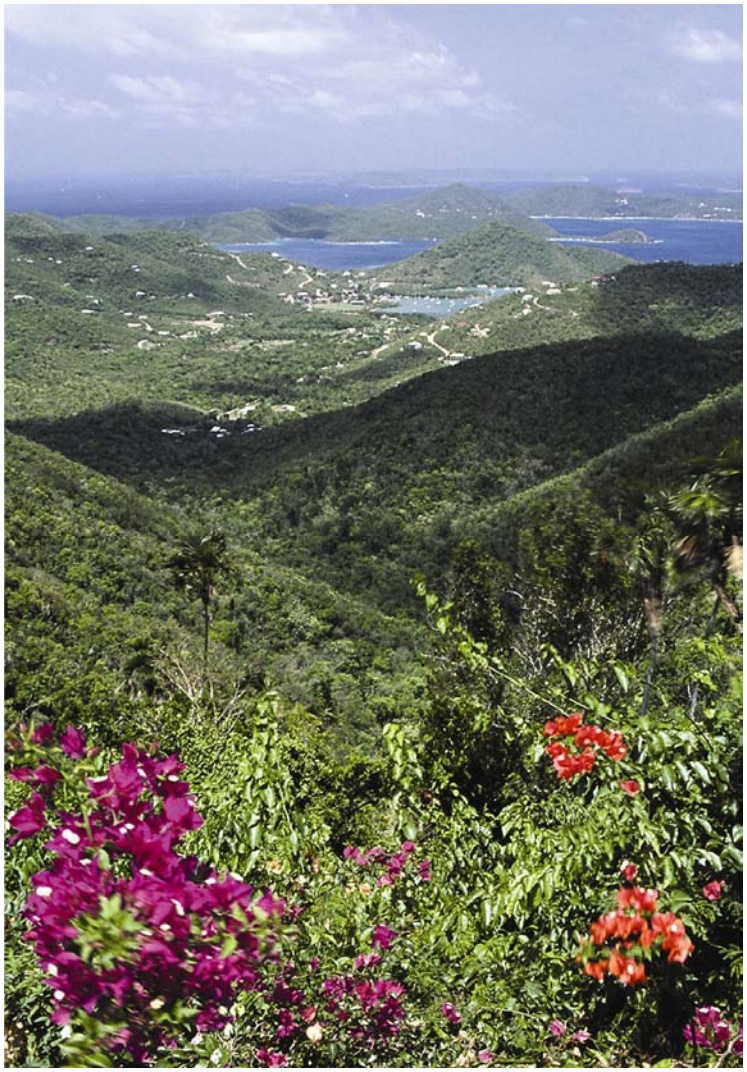
Around the world, pesticides have revolutionized farming and ranching, helping to cultivate hearty and plentiful food, other agricultural crops and animal stock.

A pesticide is any substance or mixture of substances intended for the purpose of preventing, destroying, repelling or mitigating pests.

While pesticides clearly help to relieve or rid us of troublesome pests, some pesticide products harm and destroy plant life and the environment. Others injure and cause serious illness and disease in people and other living things, and sometimes they kill.

The very nature and makeup of a pesticide is that it be toxic and harmful enough to adversely damage living organisms. As such, it is only reasonable—though not intended—that pesticides, even when properly used, can sometimes be harmful to people, animals and our environment.

Pesticide Control



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The same wonderful and temperate climate, cooling trade winds, diverse topography and natural features that bring millions of people to the USVI each year, also create a fertile ground for many types of insects and pests, and a particular vulnerability to harmful pesticides. Heavy winds can move some pests from area to area within the USVI, and occasionally from and across international lines.

Storm water runoffs from steep, hilly terrains can introduce pesticides into USVI soils, surface water and groundwater, wetlands and coastal shores. Pesticide contamination can originate from direct sources such as farms and business sites, to waste disposal facilities containing pesticide remains and used containers from industrial, residential and other sources.

Recognizing both the good and the potential harm that pesticide use can cause, federal and USVI laws were enacted to regulate and control the use and application of pesticides. These laws also place restrictions on the production, sale and entry of certain pesticides and pesticide components into states and territories.

All pesticides must be registered by the EPA's Office of Pesticide Programs before they can be used in the United States and its territories. Further, additional registration processes can be required by states and territories, deeming certain pesticides illegal for use. The manufacture, sale and use of pesticides cross many environmental topics and various local and national environmental laws.

Pesticides Cross Many Environmental Topics:

- ✓ *Air Pollution*
- ✓ *Ecological Systems*
- ✓ *Endangered Species*
- ✓ *Fish & Wildlife*
- ✓ *Food Safety*
- ✓ *Water Quality*
- ✓ *Waste Management*
- ✓ *Oceans & Coastlines*
- ✓ *Soil Contamination*
- ✓ *Watershed Management*
- ✓ *Worker Safety*
- ✓ *Public Health, etc.*

The USVI Pesticide Control Act, Title 12 of the Virgin Islands Code, Chapter 19 §801 - §822, is managed and administered by the Department of Planning & Natural Resources, Division of Environmental Protection. Through cooperative agreements, local pesticide control programs and regulations are enforced under the umbrella of various federal laws, including the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) and 40 Code of Federal Regulations (CFR), Part 150 – 189.

In brief, before a company can sell or distribute any pesticide in the USVI, federal and local laws require that the pesticide be reviewed and approved by the EPA, be scientifically determined not to pose unreasonable risks to human health or the environment and be registered with the EPA's Office of Pesticide Programs.

Pesticide Control

Pesticides must be used in strict accordance with label directions. Laws and regulations associated with pesticides set limits and restrictions on how much of a pesticide may be used on food during growing and processing, how much can remain on the food that we buy, and what pesticide components and amounts may result in drinking water safety concerns. Pesticide laws also cover pesticide applicator training and certification, worker protection and exposure to pesticides on the job, and regulatory compliance monitoring.

The Department of Planning & Natural Resources, Division of Environmental Protection's major program management responsibilities for the implementation and enforcement of national and USVI pesticide laws and regulations include but are not limited to:

Pesticide Applicator Certification

The DPNR/DEP, in partnership and collaboration with the University of the Virgin Islands Cooperative Extension Service, provides certification training for commercial and private pesticide applicators. Certified applicators must be able to read and comprehend pesticide label information and must demonstrate knowledge of the safe and proper use, application, handling, storage and disposal of pesticides.

Agricultural Chemicals in Groundwater Program

Groundwater is a highly threatened resource in the USVI. Recharge areas often lie close to the surface and may be affected by agricultural pesticides. Once contaminated, groundwater is difficult or sometimes impossible to clean.

It is DPNR's responsibility: to help protect the waters of the USVI by identifying areas most vulnerable to groundwater contamination by pesticides; to survey, inspect and regulate compliance with pesticide laws; and to provide outreach to and to collaborate with agriculturists and other government agencies that help facilitate the development of strategies that mitigate risks to groundwater.

Endangered Species Program

In cooperation with DPNR's Division of Fish & Wildlife, the US Environmental Protection Agency, the US Fish and Wildlife Service (FWS), local, state and regional organizations and pesticide users, DEP's Pesticide Control Program strives to protect endangered species from the use of pesticides. Under the Endangered Species Act of 1969, the USVI must endeavor to protect and promote the recovery of animals and plants that are in danger of becoming extinct due to the activities of people. Under this Act, the EPA and DPNR/DEP work to ensure that restricted pesticides do not harm protected and sensitive species listed as endangered and threatened by the US Fish and Wildlife Service or damage habitats critical to those species' survival.

Worker Protection Program

The Worker Protection Standard (WPS) strives to protect agricultural workers from risks posed by pesticides. The WPS is intended to reduce or prevent the risk of pesticide poisonings and injuries among agricultural workers who are exposed to pesticide residues. It encourages workplace safety and practices that reduce or eliminate exposures to pesticides and supports the development of response procedures for pesticide-related emergencies.

Total Certified Applicators	2000	2001	2002
Commercial	45	59	60
Private	0	49	45

Applicator Categories Commonly Used in the USVI	1. Agricultural Pest Control Plant/Animal
	2. Ornamental & Turf Pest Control
	3. Industrial, Institutional, Structural & Health Services
	4. Public Health Pest Control
	5. Regulatory Pest Control
	6. Demonstration and Research Pest Control
	7. Right-of-Way Pest Control

Most Common Enforcement Actions	1. Sale of Unregistered Pesticides
	2. Misbranding of Pesticides

Underground Storage Tanks

Removal of Leaking Underground Storage Tank

Twenty years later and the underground storage tank battles continue. In response to a growing concern over the number and frequency of soil and groundwater contamination events related to leaking underground storage tanks (USTs), in 1984 the United States Congress substantially broadened the Solid Waste Disposal Act (SWDA, 42 U.S.C. 6901, et seq.).

Under Subtitle I of SWDA, often referred to as the Resource Conservation and Recovery Act (RCRA), the law directed the EPA to set comprehensive operating requirements and technical standards for underground storage tanks storing petroleum or hazardous substances. These requirements addressed UST design and installation, leak detection, spill and overfill control, corrective actions and tank closures.

Nationally, the majority of underground storage tanks (USTs) contain petroleum products (gasoline, diesel, heating oil, kerosene, jet fuel, etc.). In the USVI nearly all (if not all) USTs contain petroleum products.

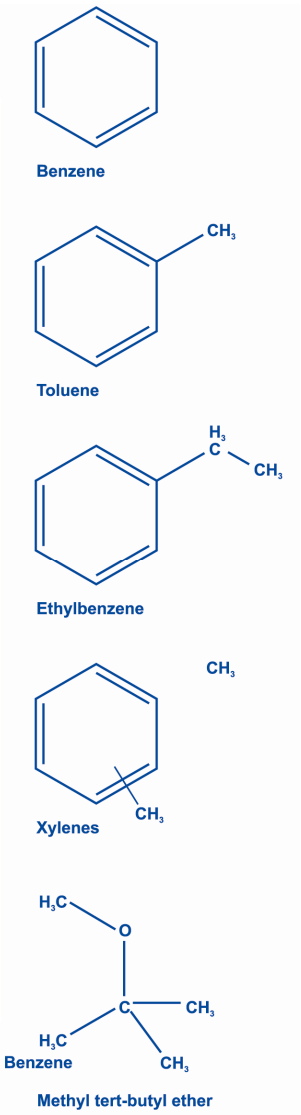
UST leaks, spills and overflows present significant health and environmental risks because of the hazardous and toxic chemicals they contain.

The greatest potential hazard from a leaking UST is that the petroleum or other hazardous substances stored therein can seep into the soil and contaminate groundwater, a primary source of drinking water for upwards of 15% of the USVI population. Nationwide, nearly half of all Americans depend on groundwater for their drinking water.

Many private and municipal wells have been closed as a result of contamination caused by UST releases. Leaking USTs can impair air quality and can also present potential risks for fire and explosion.

In light of the significant safety, health and environmental hazards presented by leaking underground storage tanks, national laws and regulations addressing UST safety have expanded several times since 1984.

Underground Storage Tanks



In 1985, the practice of installing and using unprotected steel tanks and piping was banned. A Federal Trust Fund was established in October of 1986 to finance the cleanup of petroleum releases from USTs. In 1988, a ten (10) year phase-in of various regulations went into place requiring that USTs be upgraded, replaced or closed.

In brief, national UST related regulations require that:

- Regulated underground storage tanks must have regular monthly monitoring, leak detection testing, inventory control, corrosion protection and spill prevention.
- Tanks, leaks, cleanup and closures must be reported and recorded.
- Certain sites may require cleanup.
- Existing tanks be replaced or upgraded to new tank standards by December 22, 1998.
- Owners or operators must have proof of financial responsibility.

Affected USTs include tanks, and any underground piping connected to a tank, that have at least 10 percent of their combined volume underground. Federal UST regulations only apply to underground tanks and piping that store either petroleum or certain hazardous substances.

USTs not mandated by federal UST regulations include:

- Farm and residential tanks with a capacity of 1,100 gallons or less holding motor fuel that is used for noncommercial purposes;
- Tanks storing heating oil that is used on the premises where it is stored;
- Tanks on or above the floor of underground areas, such as basements or tunnels;
- Septic tanks and systems for collecting storm water and wastewater;
- Flow-through process tanks;
- Tanks with a capacity of 110 gallons or less; and
- Emergency spill and overfill tanks.

Although the above types of tanks are not affected by federal requirements for USTs, some fall under other environmental regulations.

Major initiatives continue to be made by the EPA, the USVI DPNR/DEP and other states and territories to prevent and minimize UST leaks, resultant groundwater and soil contamination, and associated human safety, health and environmental risks.

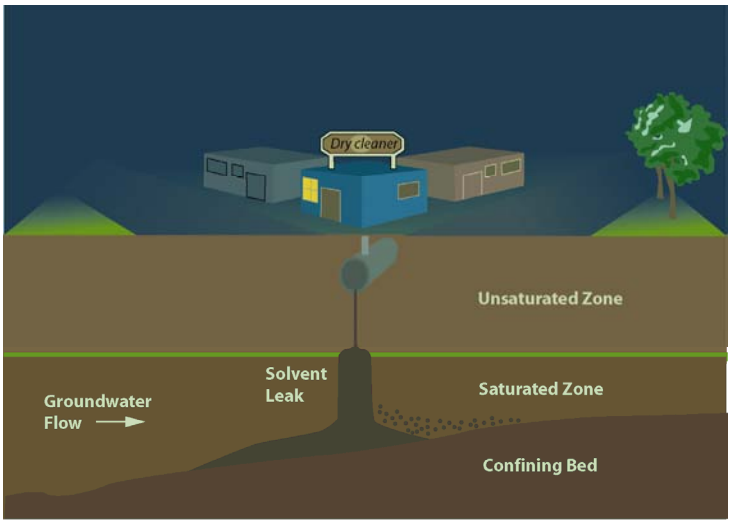
Underground Storage Tanks

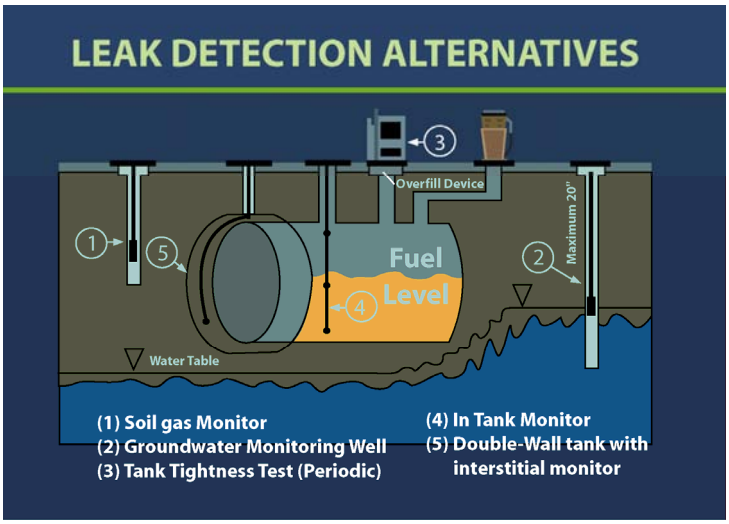
As of October 2003, approximately thirty-three (33) states, plus the District of Columbia and Puerto Rico, have passed their own UST regulations (EPA-approved) that are at least as strict as federal law and, in some cases, even more stringent.

The USVI is also working toward promulgation of UST regulations. In support of this endeavor, in 1998 the USVI Legislature enacted UST legislation. Piloted by the DPNR/DEP, local UST regulations are in final draft and are currently being reviewed by the EPA.

A major benefit of local UST regulations is that, in addition to meeting federal requirements, local regulations would take into consideration the diversity, unique needs and priorities of the USVI community and environment. Local UST regulations also give the USVI, through the DPNR/DEP, primary responsibility for management of UST regulatory compliance, including enforcement and assessment of fines and penalties for violations. The EPA currently holds primary responsibility for UST regulation in the USVI, but has delegated, through memorandum of agreement, certain responsibilities to the DPNR/DEP.

Local UST laws must be at least as stringent as national laws. As such, after approval of local regulations by the EPA, UST owners and operators would only have one (1) set of statues and regulations to adhere to.





National and Virgin Islands Experience

Protecting groundwater resources and soil from contamination is critically important to all communities. Because of its limited natural freshwater resources and its small land mass, it is even more crucial for the USVI. There are no freshwater lakes or rivers in the USVI to compensate for this dilemma.

Substantial progress has been made, both nationwide and in the USVI, to minimize and prevent UST leaks and contamination. However, more work remains to be done.

Underground Storage Tanks

National and Virgin Islands Experience

Prior to the enactment of UST regulations, over 2 million USTs were estimated to be in place nationally, of which more than 25% were suspected of leaking. Further, thousands of tanks were suspected of being buried and abandoned without documentation. As of September 2003, nationally there were approximately 683,000 active USTs that are regulated by UST technical regulations.

Since 1984, more than 1.5 million substandard USTs have been closed nationwide. As of September 2003, approximately 79% of active UST systems were in significant operational compliance with spill, overfill and corrosion protection requirements. While nearly all tanks now have leak detection equipment, 28% are estimated to be in noncompliance with leak detection requirements. In most cases, while proper equipment has been installed, it is not being monitored and checked as often as required.

In 1988, at the start of the USVI's Underground Storage Tank Program, approximately 302 regulated USTs were estimated to be active on the three major islands, St. Thomas, St. John and St. Croix. Since that time, over 280 USTs have been closed.

UST Results as of September 2003	USVI	*National
Active Underground Storage Tanks	124	683,000
Confirmed Releases	14	439,385
Number of Cleanups Completed	0	303,120
Cleanups to be Completed	14	136,265

*As of September 2003, US EPA

Corrective action for hazardous chemical leaks at UST sites involves identifying the extent of contamination, evaluating the risks to human health and the environment, risk management planning and treating affected soils and groundwater to acceptable standards.

DPNR/DEP Action & Authority

Since enactment of federal UST regulations, the Division of Environmental Protection, Department of Planning & Natural Resources, has launched various initiatives to reduce UST leaks and to enforce cleanup and remediation actions.

Each year, the DPNR/DEP conducts 35 to 40 UST compliance inspections at facilities throughout the USVI. When violations are found, the most common statement given by UST owners and operators is: "I didn't know."

While UST concerns and violations have been identified within almost all USVI business sectors utilizing USTs, many of the problems are associated with small, independent business operators, who often have limited financial resources. To address the needs of large and small businesses, DPNR/DEP provides various compliance and outreach services targeting UST owners and operators.

These programs include: periodic newsletters and other public communications; compliance inspections; site investigations and exposure assessments; and training and educational programs, coordinated with private industry and public entities such as the University of the Virgin Islands.

Underground Storage Tanks

DPNR/DEP Action & Authority

In further support of local industry, the DPNR/DEP has been entrusted with responsibility for oversight of the Federal Trust Fund to finance USVI cleanup of petroleum releases from underground storage tanks, as provided by Subtitle I of the Resource Conservation and Recovery Act.

Trust Fund monies are available from the EPA through cooperative agreements, pursuant to the development and maintenance of acceptable operational plans by the DPNR/DEP (i.e., UST program management, enforcement strategies and cost-recovery abilities, and management and administration of UST Trust Fund activities associated with cleanups at eligible facilities).

In addition to UST program management and administration, DPNR/DEP is actively working to minimize hazards presented by aboveground storage tanks. Aboveground storage tanks proliferate the USVI. Leaks and careless spills from aboveground storage tanks also contaminate soils, sub-soils and groundwater. The objective is to draft viable legislation that will regulate aboveground storage tanks, similar to laws promulgated for underground storage tanks.

UST regulatory challenges and efforts in the USVI continue to focus on:

- Inventorying of all regulated USTs;
- Identification of non-compliant systems that are still operating;
- Permanent closure of tanks taken out of service;
- Remediation of releases discovered during upgrades, tank removals, etc.;
- Education and outreach to UST Owners and Operators;
- Management, tracking and monitoring of the UST Federal Trust Fund;
- Development and implementation of USVI regulations for underground storage tanks.

Contaminants Associated With Gasoline

Most leaking underground storage tank sites are contaminated by gasoline. The following chemical components of gasoline are the typical contaminants of concern for UST sites:

Benzene is the most hazardous ingredient in gasoline. Its EPA Maximum Contaminant Level (MCL) is 5 parts per billion (ppb). Long-term exposure to benzene in drinking water at levels above the MCL increases the risk of cancer.

Toluene and Ethylbenzene are not considered carcinogenic (cancer-causing). Their MCLs are 1.0 and 0.7 parts per million (ppm) respectively. Over the long term, toluene and ethylbenzene damage the liver, kidneys and central nervous system.

Xylenes are a mixture of compounds (ortho-, meta- and para-xylene) with two methyl (-CH3) groups attached to a benzene ring. Xylenes also affect the liver, kidneys and nervous system, but they are not considered nearly as hazardous as the first three—the MCL for total xylenes is 10 ppm.

Methyl tertiary butyl ether (MTBE) is an additive used to increase the oxygen content of gasoline to improve air quality. In the language of the 1990 Clean Air Act, oxygenated gasoline is referred to as "reformulated gasoline" or "oxyfuel." At concentrations as low as 20 parts per billion (ppb), MTBE makes drinking water unfit for human consumption because of taste and odor (American Water Works Association, LUST Program). Currently, MTBE is classified as a potential human carcinogen, but as yet there is no Maximum Contaminant Level for drinking water. The US Geological Survey reports that about 20% of groundwater in areas where reformulated gasoline is sold is contaminated by MTBE.

MTBE is highly soluble in groundwater—about 43,000 ppm. The high solubility of MTBE allows it to be readily dissolved into groundwater from leaked gasoline and transported over great distances. In some cases, MTBE transport has exceeded the transport distances of *BTEX compounds by 10 times. Compared to MTBE, the BTEX compounds are less soluble and more readily absorbed into aquifer sediments.

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*Benzene, toluene, ethylbenzene and xylenes together are referred to as the BTEX compounds. They are the most common hazardous components of gasoline leaks.

Waste Management

All living things and almost all activities produce waste of some kind. Waste ranks high among the great certainties in life.

Household garbage; rubbish and trash from businesses, schools and other sources; discarded furniture and equipment; sewage and wastewater; paper, wood and metal scraps; toxic and non-toxic residential and industrial materials; human, animal and other biological waste; and an unlimited number and type of product containers—all represent waste.

Most of us do not give a lot of thought to waste after it is placed in a receptacle for disposal. However, there are numerous reasons to be concerned about waste.

Waste is costly to dispose of, and the generation of large amounts of waste affects the environment.

Waste Management

Household, industrial and other discharges of waste can contaminate air, land, drinking and other water resources with pollutants and toxins that can harm human health, animals and plant life. In addition, improper waste disposal can cause high-level growth of disease-carrying mosquitoes and can attract rodents, flies and other insects, further impacting the health, safety and overall quality of our lives.

It is very important for Virgin Islanders to think about where waste goes and what ultimately happens to it, especially since we are an island community with limited space and resources. The diverse and dynamic topography and geology of the USVI gives rise to many waste management concerns, as some natural features of our lands create unique susceptibilities to pollution, particularly soil and groundwater contamination.

DPNR/DEP Solid Waste Management Program

Solid waste management in the USVI is regulated by DPNR under the authority conferred by the Virgin Islands Solid and Hazardous Waste Disposal Act, Virgin Islands Code, Title 19, Chapter 56 and its rules and regulations, and pursuant to the Resource Conservation and Recovery Act (RCRA). A federal law applying to all states and territories in the nation, RCRA was enacted by the US Congress in 1976 as an amendment to the 1965 Solid Waste Disposal Act (SWDA).

The objectives of RCRA are to:

- Protect human health and the environment from the hazards posed by waste management and disposal;
- Conserve energy and natural resources through waste recycling and recovery;
- Reduce or eliminate, as expeditiously as possible, the amount of waste generated, including hazardous waste; and
- Ensure that wastes are managed in a safe, appropriate and legal manner from cradle to grave.

In line with national objectives, the mission of the DPNR/DEP Solid Waste Management Program is to protect the health, safety and well-being of the public and to preserve and improve the quality of the environment for all living things in our unique tropical locale.

The DPNR/DEP Solid Waste Management Program and assigned personnel are responsible for regulating storage, treatment and disposal of solid waste in the USVI. Major accountabilities include but are not limited to:

1. Regulatory compliance monitoring and enforcement
2. Issuance of solid waste disposal permits
3. Review and approval of waste management plans and specifications
4. Investigation of complaints pertaining to improper disposal and/or management of solid and hazardous wastes
5. Inspection of waste management facilities and disposal sites

Solid Waste Management Program personnel also conduct public awareness campaigns and outreach activities for the USVI community, provide technical assistance to regulated businesses and educational programs covering a variety of waste management related topics.

The diverse and dynamic topography and geology of the USVI gives rise to many waste management concerns, as some natural features of our lands create unique susceptibilities to pollution, particularly soil and groundwater contamination.

Waste Management

DPNR/DEP Solid Waste Management Program

Many of these activities are developed and presented in coordination and/or collaboration with the Department of Public Works, the USVI Department of Health, the EPA and other organizations.

Under USVI laws and regulations, solid waste is defined as any trash, rubbish (combustible or noncombustible), garbage, refuse, offal, filth, bottles, glass, crockery, cans, cartons, scrap metal, junked vehicles, appliances or hardware, brush, waste soil, rock, construction materials, animal carcasses, sludge from a waste treatment plant or air pollution control facility, or any unsanitary or offensive material or discarded matter, or parts or portions thereof, or any industrial, commercial, mining, agricultural or other waste that is not subject to point source discharge permits.

In addition to regulatory responsibility for solid waste, the DPNR/DEP's Solid Waste Program responsibilities extend to management of special wastes and wastes defined as "hazardous waste" under local and national laws and regulations, including human and animal medical waste.

Special wastes refer to items that require special or separate handling, such as household hazardous wastes, bulky wastes, tires and used oil.

Solid waste is a hazardous waste if it is not excluded by regulation (40 CFR 261.4) and if it is listed (261.30) as a hazardous waste, is a waste mixture containing one or more listed hazardous wastes or exhibits one or more characteristics of hazardous waste (i.e., ignitability, corrosivity, reactivity or toxicity) (40 CFR 261.21 to 261.24).

Medical waste in the USVI is classified as hazardous wastes.

The DPNR/DEP's regulatory authorities apply to waste management and waste disposal operators, generators and transporters of hazardous waste, used oil, medical and other wastes.

Waste Treatment & Disposal

There are no privately owned municipal waste disposal facilities in the USVI. Municipal solid waste collection and disposal operations along with litter enforcement in the USVI are under the direction and authority of the Department of Public Works, an agency of the USVI Government. Public Works oversees both local community and territory-wide municipal waste collection and disposal operations.

At the present time, municipal waste disposal operations are funded entirely by the general funds of the USVI Government. No waste site drop-off or tipping fees are charged to waste site users, industry or residents.

Waste Management

Waste Treatment & Disposal

The principal method for disposal of solid wastes in the USVI is [4]landfills. There are a total of two (2) active landfills in the USVI, one located on St. Croix and the other on St. Thomas.

Both landfill sites present serious environmental safety concerns. Each landfill has been cited by the DPNR for noncompliance. They are the subject of enforcement actions by the EPA and are under consent orders requiring the correction of all solid waste management and disposal activities not in compliance with federal regulations.

The USVI Government is examining various plans and options for the resolution of existing solid waste management and landfill noncompliance issues. This includes the identification and selection of alternative landfill sites, as well as the selection of alternative disposal methods such as waste-to-energy facilities.

The USVI Government recognizes the gravity of its current solid waste disposal issues. Lead agencies such as Public Works (Landfill Operator) and the DPNR/DEP (Regulator) are coordinating and collaborating with local and national agencies and other organizations to develop long-term permanent solutions for environmentally efficient and sound waste management facilities in the USVI.

[4]Under applicable federal regulations and Virgin Islands Code, the above referenced solid waste disposal facilities and/or "dump sites" do not meet legal requirements for classification as landfills. Use of the word "landfill" is for easy reference and descriptive purposes only.

USVI Disposal Facilities & Methods

- St. Croix: The Anguilla Landfill is located approximately 2,000 feet southeast of the eastern end of the Henry A. Rohlsen Airport, adjacent to the St. Croix Wastewater Treatment Plant. This facility is substantially oversubscribed and seriously noncompliant with various local and national environmental and aviation-related laws and regulations. Temporary improvements have been made at this landfill site, pending permanent resolutions and ultimate site closure. The DPNR/DEP is closely monitoring this site and is conducting regular site inspections. Environmental safety and health concerns at this site are of an urgent matter. Alternative solid waste management solutions and options are currently under review.

- St. Thomas: The Bovoni Landfill, a 30-acre facility at Long Point Peninsula on St. Thomas, is seriously noncompliant with local and national environmental laws and regulations. While there appears to be no immediate threat to human health and the environment, it is imperative that irregularities in the operation of this facility are improved and that permanent resolutions are devised as soon as possible. This landfill site is also oversubscribed. Alternative solid waste management solutions and options are currently under review.

- St. John: A solid waste staging and transfer station is in place on the Island of St. John. Waste is transported by barge to St. Thomas' Bovoni Landfill.

Other major waste disposal methods:

Recycling – A small number of redemption and recycling facilities operate within the USVI, processing used aluminum, copper, scrap metal and other recyclable waste materials.

Incineration – The incineration of medical wastes (human and veterinary) is suspended due to regulatory compliance matters, including equipment and other resource limitations.

Waste Exporting – Prior to September 2002, the primary method for disposing of medical wastes in the USVI was incineration. Classified as a hazardous waste under the Virgin Islands Code, USVI medical wastes are transported to an off-island waste disposal facility. The exporting of other solid wastes to mainland US or other off-island sites is cost-prohibitive.

Used Oil Burners/Energy Recovery – At present, the Virgin Islands Water and Power Authority in St. Thomas and Hovensa, a local oil refinery in St. Croix, are the only facilities in the USVI permitted to burn used oil.

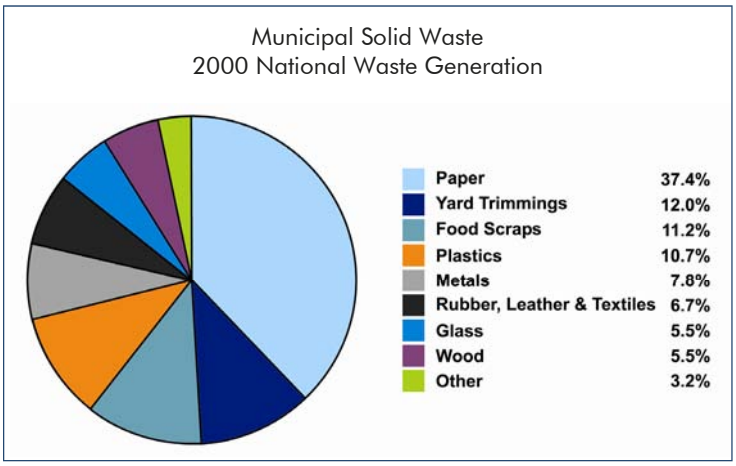
Waste Management

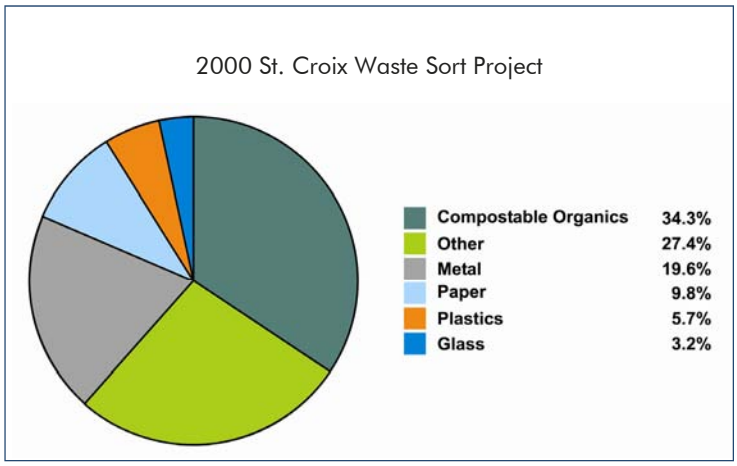
Waste Treatment & Disposal

Per EPA statistics, in the year 2000, US residents, businesses and institutions produced more than 230 million tons of municipal solid waste (before recycling), representing nearly five (5) pounds of waste per person per day, up from 2.7 pounds per person per day in 1960.

By comparison, information contained in the April 2000 Final Waste Sort Report, conducted at St. Croix's Anguilla Landfill, showed an estimate of 110,000 to 130,000 tons of solid waste generated annually on the island of St. Croix. This represents a waste per person per day rate of 12 pounds, more than twice the national average. Another way of viewing these results is that nearly two (2) tons of waste per St. Croix resident is sent to landfills each year.

The April 2000 Final Waste Sort Project was an outgrowth of the USVI Antilitter and Beautification Commission's desire to assist in the development of locally based, sustainable recycling and waste reduction programs. The primary goal of the waste sort was to gain a thorough knowledge of the landfill characteristics in order to better assist in the design and implementation of efficient waste reduction and waste management strategies in the USVI.





Used Oil Management

The management of used oil is an important responsibility for DPNR/DEP's Solid Waste Program. Classified as a special waste, the EPA's regulatory definition of used oil is: "any oil that has been refined from crude oil or any synthetic oil that has been used and as a result of such use is contaminated by physical or chemical impurities."

Simply put, used oil is exactly what its name implies, "any petroleum-based or synthetic oil that has been used." During normal use, impurities such as dirt, metal scrapings, water or chemicals can get mixed in with the oil, so that in time the oil no longer performs well. Eventually, used oil must be replaced with new oil (virgin or re-refined oil) to do the job at hand.

Waste Management

Used Oil Effects on Our Land & Health

Used oil can contain such contaminants as lead, magnesium, copper, zinc, chromium, arsenic, chlorides, cadmium, chlorinated compounds and other toxic contaminants. These substances have been determined to present potential endangerment to human and animal health, and to the environment.

Oil poured down drains or onto the ground can work its way into soil, eventually reaching groundwater. When this happens, serious contamination can occur. Used oil on the soil can contaminate by causing harm to living organisms. Harm to these organisms can result in irreversible damage to the food chain. If the oil reaches groundwater, it could render that groundwater unsuitable for human use. Once an aquifer is contaminated, it may be unsuitable for years.

Just one gallon of used oil can render a million gallons of fresh water undrinkable.

It is very important for all stakeholders, citizens, government agencies and businesses alike to adhere to the provisions of used oil regulations in order to avoid environmental pollution and save energy and resources.

DPNR/DEP Action & Response

To address potential environmental hazards posed by the mismanagement of used oil, the DPNR/DEP implemented a used oil program, as provided by Title 19, Chapter 56, Section 1560-503. The standard for the management of used oil is identical to those in 40 CFR Part 279, except as distinguished in section 1560-102, 501 and 502 of subchapter 1560.

These regulations substantially changed public practices toward used oil collection, management, disposal and re-use in the Territory.

Through the used oil program, the DPNR/DEP tracks and records all known used oil handlers in the Territory, issues permits to generators and transporters and provides public educational opportunities for the general public and regulated community about proper used oil management.

"Do it Right….Dispose of Used Oil Properly"
Used Oil Recycling Drive

Sponsored by DPNR/DEP
and the VI Department of Public Works

Waste Management

Used Oil Management

Some of the largest generators of used oil include business industries such as auto repair shops, service stations, quick lube shops, government motor pools, grocery stores, metal working industries and boat marinas. These industries and other high-volume oil-use businesses are categorized as "Used Oil Generators," or simply "Generators."

Approximately 400 facilities in the USVI are considered used oil generators. The DPNR/DEP has inspected 255 of these facilities and has permitted 162 to date.

A key element for ensuring proper disposal of used oil is the exclusive use of permitted used oil transporters. The job of used oil transporters is to pick up and deliver used oil collected from all commercial sources to re-refiners, processors, burners or offsite disposal facilities. Currently, HOVENSA in St. Croix and the Virgin Islands Water and Power Authority in St. Thomas are the only facilities in the Territory that are permitted to burn used oil in their burners.

Used oil re-refiners and processors recycle used oil by blending or removing impurities so that it can be burned for energy recovery or reused to make new products such as lubricants. Similarly, burners burn used oil for energy recovery in boilers, industrial furnaces or in hazardous waste incinerators.

"Do It Yourselfers" (DIY) Collection Centers have been established for individuals who generate used oil through the maintenance of their personal vehicles and other equipment. These personal and non-commercial activities are not subject to regulations under the used oil management standards.

Used Oil Collection Sites	Location
Susanaberg Transfer Station	St. John
Public Works Motor Pool	St. Thomas
Bovoni (Waste Disposal Site)	St. Thomas
Anna's Hope Compound (DPW)	St. Croix
Concordia (DPW) -Temporarily Closed	St. Croix

Tips for Consumer Waste Reduction

REDUCE	• Whenever possible, buy bulk or concentrated products to reduce packaging. Examples include concentrated fruit juice, laundry detergent, etc. • Reduce toxic waste by purchasing paints, pesticides and other hazardous materials only in the quantities needed, or by sharing leftovers. • Buy products made from recycled materials. Many bottles, cans, cereal boxes, containers and cartons are made from recycled material.
REUSE	• Select reusable products. Sturdy, washable utensils, tableware, cloth napkins and dishcloths can be used many times before being thrown away. • Reuse newspaper, boxes, shipping "peanuts" and "bubble wrap" when shipping packages. • Choose furniture, sports equipment, toys and tools that will stand the test of time. Take unwanted items to charitable groups, sell them or give them away to those who can use them.
RECYCLE	• Buy recyclable goods—then remember to recycle (i.e., paper, glass, certain plastics, metals, etc.). • Take car batteries, antifreeze and motor oil to participating recycling centers and "Do It Yourselfers" (DIY) Collection Centers (used oil). • Learn how to make compost—food scraps and yard waste can become natural soil conditioners.

Major Challenges to USVI Land

1. Solid Waste Management remains the greatest challenge as the Territory continues to find an effective solution to its solid waste dilemma.

   In December 2003, legislation establishing a Waste Management Authority was passed by the USVI Senate. Near-term signing of this important legislation by Governor Charles W. Turnbull is anticipated.

2. Second, but of equal importance, is the absence of a USVI territory-wide land and water use plan. The lack of an effective land and water use plan causes havoc with the natural resources of the Territory.

3. The lack of Best Management Practices (BMP) in construction results in soil erosion and non-point source pollution. This is a major challenge to both land and water resources.

4. Improper disposal of used oil.


VIGILANT
BOSTON
WHALER

Clean Water

The islands and cays of the US Virgin Islands are surrounded by over one hundred and eighty-five nautical miles of the world's most pristine bays and beaches that, in turn, support some of the most beautiful coral reefs, mangroves, salt ponds and tropical sea grass beds.

Freshwater springs and streams support wildlife, mangroves, estuaries, forests and recharge groundwater.

As in most places in the world, our islands and our waters are affected by development pressures from residents, industry and visitors. Associated activities like increased construction along coastlines, boating activities, increases in pollution sources such as vessel wastes and uncontrolled storm water runoff further impact our islands.

In order to protect the water resources of the US Virgin Islands, the Department of Planning & Natural Resources—in cooperation with the United States Environmental Protection Agency and the Government of the Virgin Islands—delegated authority to the Division of Environmental Protection to operate programs whose goals are to protect USVI water resources.

Water Pollution Control

The nation's first comprehensive water pollution law, the Federal Water Pollution Control Act, was established in 1948. To better address rapidly evolving water pollution and water quality concerns of states and territories, the Federal Water Pollution Control Act was substantially broadened through a series of amendments in the 1960's and 1972. As amended in 1977 and subsequently, the Federal Water Pollution Control Act is now commonly known as the Clean Water Act.

The objective of the Clean Water Act (CWA) is to restore and maintain the chemical, biological and physical integrity of the nation's waters.

To further protect, maintain and enhance water quality in the USVI, the VI Legislature enacted the Territorial Water Pollution Control Act of 1972.

Water Pollution Control

The protection of USVI waters, from land to sea, and the safeguarding of its distinctive marine and wildlife habitats have become increasingly difficult in the face of economic and industrial development and rising populations.

DPNR/DEP's Water Pollution Control Program (WPC) is entrusted with the responsibility of implementing and enforcing water quality and pollution control laws in the USVI. Under the Clean Water Act, Section 106, the WPC Program is tasked with monitoring the marine waters of the USVI and with controlling discharges into those waters.

Major objectives of the WPC Program are to:

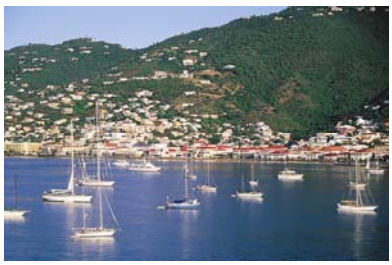
- Ensure compliance with Territorial water quality standards;
- Build and maintain information management systems for ongoing data analysis and development of critical environmental parameters;
- Monitor the health of potentially threatened biological communities;
- Prevent degradation of marine waters by carefully reviewing development proposals;
- Ensure that discharges into the waters of the USVI meet the requirements established by both the CWA and the Territorial Pollutant Discharge Elimination System (TPDES) Permitting Program.

Major programs administered and managed by the WPC Program include:

- Ambient Monitoring Program
- Territorial Pollutant Discharge Elimination System
- Virgin Islands Beach Monitoring Program

An important element of the WPC Program's business strategy involves collaboration and partnership with various local and national organizations, from private industry to educational institutions, government agencies and others.

The Ambient Monitoring Program



The goal of the Ambient Monitoring Program is to collect data on the quality of our coastal waters, in an effort to protect the ecosystem as well as those who enjoy our beaches and waters. USVI surface [5]waters are classified into three (3) groups based on designated uses.

[5]All waters of the US Virgin Islands are designated for fish consumption, aquatic life support, swimming and primary contact uses pursuant to the Virgin Islands Water Quality Standard, Title 12, Chapter 7, §186 1 of the Virgin Islands Rules and Regulations (VIR&R).

Water Pollution Control

The Ambient Monitoring Program

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 classes because of the pristine or near pristine state of waters in this classification.

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

Class C This classification is similar to Class B, except that it has slightly less stringent water quality standards for a limited number of parameters.

Data collected is used to:

- Help determine effluent (discharge) permit limits in order to ensure the water quality use classification requirements of the water body receiving the discharge.
- Develop various water body listings, which, in turn, promote water quality restoration and/or improvements.
- Develop new water quality standards as may be warranted.

Data samples are analyzed for specific parameters that can affect public or environmental health. If problems occur, DPNR/DEP will locate the source of the problem, can temporarily close the beach (if necessary) and will continue monitoring until the problem is corrected.

DPNR/DEP currently performs quarterly water quality monitoring at one hundred and thirty-five (135) locations across all three islands. The remaining sites are sampled under a beach monitoring network for protection of coastal waters.

Pursuant to provisions of the Beaches Environmental Assessment and Coastal Health Act of 2000 (BEACH Act), the DPNR/DEP has recently launched major efforts to improve public health and safety at USVI beaches. These efforts include the improvement and expansion of water quality monitoring, public communication and notification systems.

Development and oversight of the BEACH Act program falls under the auspices of DEP's WPC Program.

Territorial Pollutant Discharge Elimination System

The Territorial Pollutant Discharge Elimination System (TPDES) Program monitors discharges and enforces regulations controlling discharges from specific sites (point sources), including industrial, commercial and some residential sites that discharge into the waters of the Virgin Islands.

A point source is defined as "any discernable, confined and discrete conveyance, including, but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, or vessel or other floating craft from which pollutants are or may be discharged (VI Code T.12 §182(j))."

Water Pollution Control

Territorial Pollutant Discharge Elimination System

Most human activity produces a waste stream. Many of the US Virgin Islands' essential industries and services operate under the TPDES Program. Depending on the type of activity, its proximity to the coast and the waste generated, DPNR/DEP will require a TPDES permit.

Establishments that produce fresh water from seawater (hotels, power plants and residences), manufacturers, refineries and power generation plants are just a few types of facilities producing waste streams that must be regulated to minimize harmful effects to coastal waters.

Such facilities must comply with site-specific discharge limits for turbidity, suspended solids, temperature and other factors or face enforcement actions and/or fines. These discharge limits are set to minimize impacts to the waters of the US Virgin Islands and to guarantee the long-term health and safety of not only the Territory's people but also the coastal/marine environment. Facilities must obtain permits and must provide periodic reports on their discharge in order to comply with the TPDES program. DPNR/DEP also monitors the waters near these discharges as part of the Ambient Monitoring Program.

Water Pollution Control

Virgin Islands Beach Monitoring Program

The US Virgin Islands, with its year-round swimming season, renowned coastal waters, breathtaking beaches and high volume of beachgoers, presents a high exposure rate to near-shore waters for the local and visiting public.

USVI coastlines are dotted with numerous public-bathing beaches that are visited by hundreds of thousands of people each year. However, non-point source pollution from failing septic systems, agricultural runoff and the boating community—in conjunction with numerous troubled components of the Territory's public sewer system—may create health risk exposures to bathers at some USVI beaches.

Previous resource limitations and water quality monitoring approaches did not provide sufficient coverage and frequency to maximize human health protection from illness-causing bacteria and pollutants that may encroach upon or exit into marine waters and beach area environments.

According to the EPA's 2002 Beach Survey, more than one quarter of the reported beaches in the United States (672) issued at least one swimming advisory or beach closure in the summer of 2001. Most of these advisories were due to elevated bacteria levels, primarily from sewage overflows or storm water runoff.

The Beach Environmental Assessment and Coastal Health Act of 2000 (referred to as the BEACH Act) seeks to address these issues. To that end, it provides new opportunities for states and territories to not only improve monitoring of marine waters and beaches but, ultimately, to reduce health risks to the public as well.

The BEACH Act amends the Clean Water Act by authorizing the US Environmental Protection Agency (EPA) to appropriate funds to states and territories for the development of water quality monitoring and notification programs. Implementation of these programs by states and territories will result in a more uniform system for protecting the users of marine waters.

The DPNR/DEP applied for and received a grant from the EPA, in the amount of $303,488, to develop and initiate the Virgin Islands Beach Monitoring Program, pursuant to the requirements of the BEACH Act.

The goals of the Virgin Islands Beach Monitoring Program are to increase and improve water quality monitoring at local beaches, to expand the notification of beach warnings or closings to the public and to identify and eliminate threats to local beach water quality.

Water Pollution Control

Virgin Islands Beach Monitoring Program

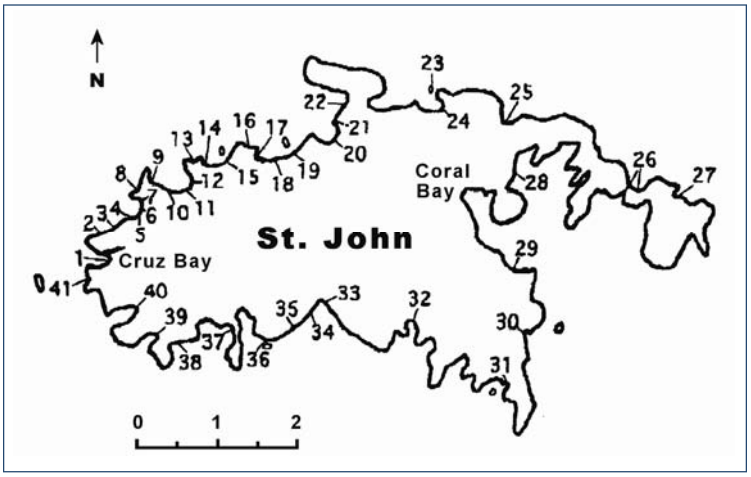
Initiated in the fall of 2003, further objectives of this program include:

- Development of a Risk-Based Beach Evaluation and Classification Plan
- Submission of Monitoring Reports to the EPA
- Providing Public Notification and Risk Communication Plans
- Development of Measures to Notify the Public
- Development of Public Evaluation of the Program
- Application of Effective Coastal Zone Management Strategies
- Evaluation of Near-shore Water Quality
- Development of Aquatic Sanitation Programs to Identify and Eliminate Potential Pollutant Sources
- Development of a USVI Tiered Beach Monitoring Plan
- Development of Assessment Methods and Procedures
- Development of Measures to Notify the EPA and Local Governments
- Providing Notification Report Submission and Delegation
- Development of Predictive Models for Assessing Recreational Water Quality
- Creation of Preemptive Warning Systems to Better Serve the Public

[6]USVI Beaches

St. John Beaches

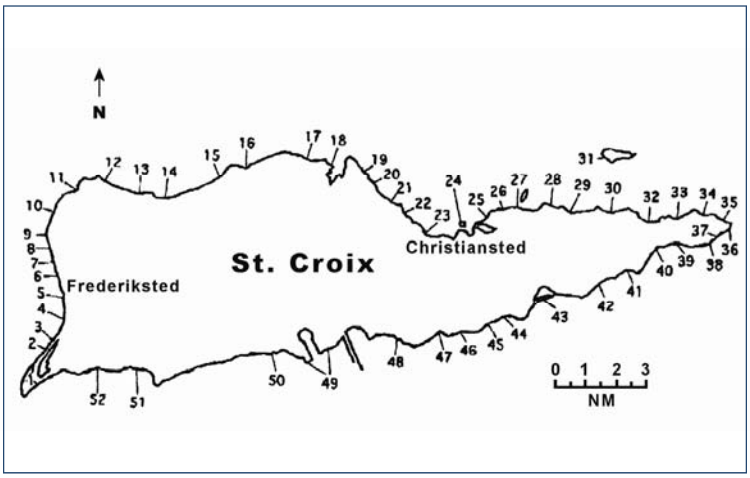
1	Cruz Bay	14	Jumby Bay	28	Zootenvaal
2	Salomon	15	Trunk Bay	29	Johnson's Bay
3	Honeymoon	16	Windswept Bay	30	John's Folly Bay
4	Little Caneel	17	Peter Bay	31	Saltpond Bay
5	Caneel	18	Little Cinnamon	32	Little Lameshur
6	Scott	19	Cinnamon Bay	33	Genti/ Reef Bay
7	Paradise	20	Big Maho Bay	34	Western
8	Turtle Bay	21	Little Maho Bay	35	Cocoloba
9	Hawksnest Caneel	22	Francis Bay	36	Dittlif
10	Skinny	23	Waterlemon Cay	37	Klain Bay
11	Public Hawksnest	24	Leinster Bay	38	Hart Bay
12	Private Hawksnest	25	Brown Bay	39	Chocolate Hole
12b	Oppenheimer	26	Haulover Bay	40	Great Cruz Bay
13	Denis Bay	27	Newfound Bay	41	Frank Bay

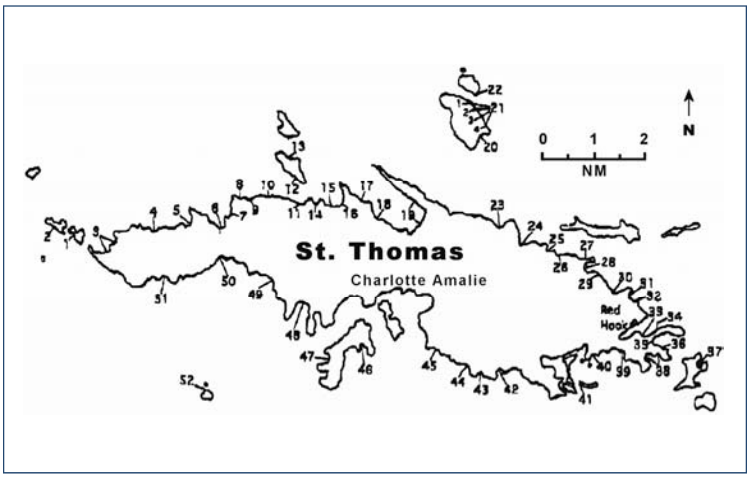


[6]Beaches shown in "blue" text are currently designated for monitoring.

Water Pollution Control

USVI Beaches





St. Croix Beaches

1 Sandy Point
2 Stony Ground
3 Second Target
4 Dorsch
5 Frederiksted (First Target)
6 LaGrange
7 Rainbow (Prosperity)
8 Williams
9 Sprat Hall
10 Butler Bay
11 Ham's Bay
12 Maroon Hole
13 Davis Bay
14 Northstar
15 Cane Bay
16 Rust-Op-Twist
17 Gentle Winds
18 Columbus Landing
19 Judith Fancy
20 Pelican Cove (Cormorant)
21 St. Croix by the Sea
22 Turquoise Bay
23 Princess (Condo Row)
24 Protestant Cay
25 New Fort (Ft. Louise Augusta)
25a Buccaneer
26 Shoy's
27 Green Cay
27a Chenay Bay
28 Prune
29 Coakley
30 Tague Bay (Reef Beach)
31 Buck Island
32 Smuggler's Cove
33 Knight Bay
34 Boiler Bay
35 Cramer's Park
36 East End Bay
37 Isaac Bay
38 Jack Bay
39 Grapetree Bay
40 Turner Hole
41 Rod Bay
42 Robin Bay
43 Great Pond
44 Fareham Bay
45 Spring Bay
46 Halfpenny
47 Mancheneil
48 Canegarden Bay
49 Krause Lagoon
50 Manning Bay
51 Campo Rico
52 White Lady

St. Thomas Beaches

1 West Cay
2 Salt Cay
3 Botany Bay
4 Bordeaux Bay
5 Stumpy Bay
6 Santa Maria Bay
7 Hendricks Bay
8 Sorgenfri Bay
9 Caret Bay
10 Penn Bay
11 Neltjeberg Bay
12 Inner Brass-Sandy Bay
13 Inner Brass-Hard Bay
14 Dorothea Bay
15 Palm Bay
16 Hull Bay
17 Tara Bay
18 Barrett Bay
19 Magens Bay
20 Hans Lollik-Coconut Bay
21 Hans Lollik-Dry Bays
22 Little Hans Lollik
23 Mandahl Bay
24 Tutu Bay
25 Sunsi Bay
26 Spring Bay
27 Coki Point
28 Water Bay
29 Sugar Bay
30 Lindquist
31 Pelican
32 Sapphire
33 Skinny
34 Vessup Bay
35 Bluebeards
36 Turtle Cove
37 Bareass Bay
38 Cowpet Bay
39 Secret Harbor
40 Scott
41 Cas Cay
42 Bolongo Bay
43 Limetree
44 Frenchman's Bay
45 Morningstar
46 Sprat Bay
47 Honeymoon
48 Lindberg Bay
49 Brewer's Bay
50 Perserverance Bay
51 Fortuna Bay
52 Saba Island

Groundwater

Water is one of the key elements for the creation of life. US Virgin Islanders are profoundly aware that fresh water is a limited yet extremely valuable and renewable resource. Water is there to be used but also to be conserved and protected. Groundwater belongs to all the people of the USVI.

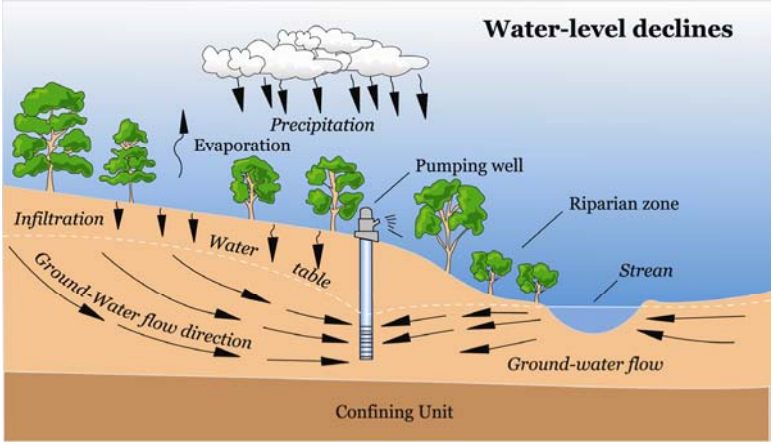
Many people in the USVI think of fresh water as coming principally from rainfall harvesting (catchments and cisterns), surface water (ponds, springs, streams) or desalination plants that convert seawater to fresh water. However, another very important source of fresh water in the USVI is groundwater.

Groundwater, extracted from wells, has long been an integral part of Virgin Islands' life and today it accounts for a significant portion of the Territory's private and public water supply. Groundwater currently accounts for 30% of the USVI public/private water supply and has provided up to 100% of the public's potable water supply after major disasters such as Hurricane Hugo (St. Croix-1989).

Early inhabitants used streams, springs and rainfall catchments to fulfill their freshwater needs. As the population grew and agricultural and commercial activities increased, additional water sources were needed. Simple hand-dug wells and later wind-powered wells were used to supply fresh water. Hand-dug wells and stone windmill pump towers from the 1700-1800's still exist, testifying to the importance of groundwater for daily living. Today, over 700 public and private wells in the USVI (excluding HOVENSA) produce about 2,927,000 gallons of fresh water per day. Well water serves as a vital supply for home, business, government and public/private water supply throughout the Territory. It is sometimes the only source of fresh water during disasters, when other water supply sources are unavailable. In addition, groundwater is very important to the USVI economy.

The use of groundwater reduces USVI dependency on imported oil. In order to produce 10,000 gallons of fresh water from seawater (desalination), approximately one (1) barrel of oil is required. The cost of producing fresh water from wells is a small fraction of the cost of desalinating seawater.

Source of Groundwater



A common misconception is that groundwater in the USVI occurs in underground rivers and lakes, or that it is seawater filtered by the earth. Contrary to these beliefs, all of our fresh groundwater comes from rain falling on the Islands and filtering into the earth. The production, deposition and transportation of water occurs in a cycle. Water evaporates from the earth and sea, collects as clouds in the atmosphere and then falls back as rain to the earth's surface. This is called the hydrologic cycle.

Soils and plants absorb a portion of the rain falling on the Islands, another portion runs off the surface into streams and a small portion gradually saturates the soils. The water in the saturated soil seeps deep into the earth and collects in the pores and spaces between particles of soil, sand and gravel. It also collects in the pores and fractures of rock. Groundwater moves slowly toward streams (guts) and the sea.

Groundwater

Groundwater provides necessary stores of moisture for plants and trees. It also contributes and recharges water to streams, ponds and springs, and is essential to wetlands and near-shore marine ecosystems. It is an integral part of the natural environment of the USVI.

Depending on rainfall, soil and subsurface conditions, water can collect underground in sufficient quantities to be available for use by people. These underground areas where water is available for use are called aquifers. Just as streams (guts) are categorized as belonging to specific drainage areas that are defined by topography such as hills surrounding lowlands, aquifers are categorized as being located in particular areas which are defined by surface and subsurface features (geology) and topography. Groundwater is available in most areas of the Virgin Islands. Due to the differences in topography and geology on St. Thomas, St. Croix and St. John, groundwater varies in quantity and quality between and within each island.

The most common method for extracting groundwater from the earth is by digging or drilling a well. Whether by hand or machine (drill rig), the concept is the same. A hole is dug/drilled into the earth until groundwater is found (water table). Wells have to be deep enough that sufficient water can move from the saturated earth and fill the portion of the hole below the water table. The water can then be removed manually or by pumps. As water is removed from a well, the water table drops.

Water then moves in from the surrounding area, replacing the water that was removed. The more water that is removed, the more the subsurface area around the well is affected.

If properly constructed, the simple hand-dug wells of the past supplied a reliable source of water, although they were susceptible to contamination from the surface. The relatively small amount of water that could be extracted would not likely have exceeded the freshwater supply.

Modern wells in the USVI are constructed by drill rigs. These machines bore into the earth, making a round hole typically measuring 6-12 inches in diameter (borehole). The borehole is deepened until it reaches below the water table. A metal or plastic sleeve (casing) is inserted into the hole to keep its walls open and to prevent loose material from falling into the borehole.

If the water table is in rock, the casing will be installed to the hard rock and an "open hole" left below. If the water table is in loose material, like sand or gravel, a well screen (slotted screen) is lowered into the water-producing zone. The well screen allows water to enter the well while, at the same time, prevents loose material from falling into the wall and clogging the borehole. The upper area, around the outside of the well near the surface, is sealed with cement to protect the groundwater from surface contamination.

Depending on the depth to water, surface-mounted or submersible pumps are used to extract the water. Not all wells are equally productive. Well production (yield) can vary, depending on local rainfall, landforms, land use and geology. All these factors affect the quantity and quality of water that can be extracted from a well. In productive areas on all three islands, numerous interconnected wells (well fields) are used for public and private consumption.

There are approximately 706 public and private wells in the USVI (excluding HOVENSA, a local oil refinery on St. Croix).

- St. Croix: 498 (468 private, 30 public supply systems)
- St. Thomas: 176 (156 private, 20 public supply systems)
- St. John: 32 (30 private, 2 public supply systems).

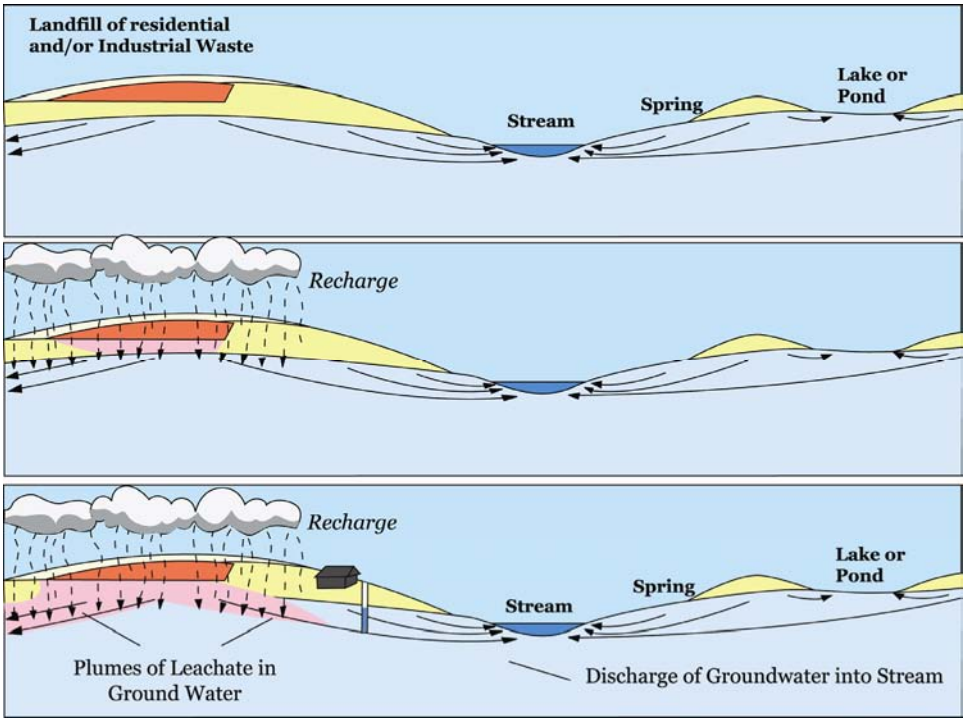
Total Pumping Rates:

- Private Wells: 327,000 Gallons Per Day (GPD)
- Public wells: 2,600,000 GPD
- Total: 2,927,000 GPD

HOVENSA has 121 active recovery wells, 9 vapor extraction wells, 489 monitoring wells and 101 regulated wells. Its total pumping rate is 500,000 GPD.

*Valued as of September 2003

Groundwater



Threats to Groundwater

Everyone's wells and everyone's groundwater resources are interconnected. Groundwater is literally a resource that is shared by all. Since it is always on the move, it is a resource with no regard for property boundaries.

Water from a well on the coast likely fell as rain in the mountains of that basin. Since its source originates from rain infiltrating through the soils, groundwater is very susceptible to contamination. Groundwater moves very slowly through the earth and, once contaminated, is very difficult to clean.

Groundwater is normally found in a relatively pure state. Filtration of rainfall through soils and subsoils purifies the water of many naturally occurring contaminants, such as airborne bacteria and sediments. Unfortunately, improper drilling, construction and maintenance of wells, over-pumping, improper use and storage of chemicals and improper disposal of wastes can contaminate groundwater. In addition, improper construction and sealing of wells allows surface runoff and pollution (bacteria, sediment, chemicals) a direct route into the aquifer. Proper sealing of the well protects the aquifer and the people using its water from unnecessary potential harm from surface pollutants.

Pumping water from a well removes a certain amount of water from the immediate area around the well. If too many wells are pumping from one area, at a rate higher than the natural replacement rate from rainfall (recharge), the water table will drop excessively. This over-pumping can result in reduced yield in nearby wells.

In some areas, over-pumping can cause seawater or mineralized water to be drawn into the well, turning the water salty. Lowering of the water table will increase pumping cost and, at the worst, can contaminate the aquifer with salt, rendering it useless unless expensive desalination treatment is used.

Improper use and storage of chemicals and disposal of wastes are other major causes of groundwater pollution. Leakages from aboveground and underground storage tanks, dumping of waste oil or other chemicals onto the ground and improperly constructed waste treatment systems will allow pollution to seep into the ground and mix with the groundwater.

It is not only large industrial facilities that can cause contamination but individuals too. For example, a gallon of waste oil dumped on the ground or into storm drains or septic systems can contaminate an acre of groundwater. Microorganisms and nutrients from livestock, fertilizers, domestic animals and improperly constructed septic systems can contaminate nearby wells with bacteria and viruses.

Water treatment can be simple (chlorination, ozone, boiling) or it can require complex treatment for chemical contamination. Sometimes the contamination is so severe that the aquifer cannot be used for generations.

Groundwater

It is far more practical and economical to protect groundwater than to clean it up.

Many aquifers in the USVI have been impacted and/or threatened by contamination. Economic damage can exceed millions of dollars in lost revenue and cleanup costs. This burden is often borne by taxpayers or is reflected in the loss of use of wells or increased costs of goods and services. What is being done to protect our Islands' most important resources?

Groundwater Management and Protection

The Department of Planning & Natural Resources, Division of Environmental Protection, has been entrusted with the management and protection of USVI groundwater resources. There are numerous programs within DPNR/DEP—often in coordination with other DPNR divisions or local and federal agencies—that identify groundwater resources, provide resource management and develop regulations and practices to protect and preserve groundwater resources.

Well Permitting - Since groundwater is a limited resource that can be "overdrawn," DPNR/DEP regulates the withdrawal of groundwater through its well permitting programs.

When an individual or business wants to drill a well, a DPNR/DEP representative will inspect the site to determine if it is a safe distance from potential contamination sources (leachfields, septic tanks) or other wells. DPNR will also evaluate the aquifer capacity and safe pumping rates for the well. To help ensure that proper equipment and techniques are used when drilling a well, all well drillers must be licensed by DPNR/DEP.

Once the well is drilled, an appropriation permit will be issued describing the total amount of water permitted to be withdrawn on a daily basis. For individual homes, this is typically 500 gallons per day. Businesses and industries are allotted pumping rates based on their needs and the capacity of the aquifer. Groundwater appropriation permits are issued for a two-year period. When the two-year period is up, the property owner must reapply for a groundwater appropriation permit and must meet appropriate well conditions governed by the Virgin Islands Rules and Regulations.

In the past, over-pumping has caused withdrawals of groundwater to exceed an aquifer's capacity, forcing temporary shutdown of all wells in a basin. Cooperation of all well owners is required to ensure all have enough water. It is important to remember that we share the Territory's water and that the regulations developed by DPNR guarantee a fair share of that resource to everyone.

Well Inventory - DPNR maintains extensive records on aquifer conditions and on the location, condition and pumping histories of wells in the USVI. This information is essential in managing groundwater resources and in ensuring that sufficient groundwater is available to all.

Wellhead Protection - As described above, rainfall infiltrating over a large area collects underground and moves toward the sea. Wells intercept this water. Contamination of the surface or subsurface within the "area of influence" threatens water quality. DPNR has completed analyses of major well fields to develop Well Head Protection Areas. These areas have been established with the aim of safeguarding our most valuable drinking water supplies. Maps of these areas delineate the land around major wells and wellfields that must be protected to ensure safe drinking water supplies.

Earth Change Permit Program - The Division of Environmental Protection has recently assumed administration of the Earth Change Permit Program. As anyone who has built a home, graded a new road or made a "change" to USVI land knows, an Earth Change Permit is required prior to commencement of such work. This is one of the Virgin Islands' most important environmental programs.

This permitting program helps to ensure that approved development plans are sound and that buildings, roads, septic systems, drainage ways, etc. function safely and effectively. The program also ensures that safeguards are in place during construction and over the life of the development that minimize impacts to groundwater and to our other natural resources, such as woodlands, streams, wetlands, beaches, coral reefs and wildlife.

Groundwater

Other Environmental Programs

Numerous interrelated programs such as Superfund, RCRA, Drinking Water, TPDES, UST, Water Pollution Control and others work together to regulate and manage threats to groundwater and to protect public health. They administer proper resource management and protection regulations, identify existing or potential sources of pollution and assist and facilitate the cleaning up of the environment. This can be very costly to both the polluter and the residents of the Islands. Loss of the use of wells, decreased economic activity and increased water costs are the unfortunate results of groundwater pollution.

DPNR is constantly updating its databases, developing and integrating environmental programs to provide a better understanding of groundwater resources, defining its relationship to other natural systems and looking for ways to increase the availability of the groundwater resource, while protecting it for future generations.

The interface between groundwater and the environment is a major focus of DPNR. Groundwater is directly related to and affected by forestry management, stream and pond protection and mangrove and marine health. It affects and is impacted by farming, industry, construction, tourism and homeowners. DPNR's groundwater development and management plan is rapidly moving toward the goal of integrating with the comprehensive resource management plan that includes:

- Comprehensive Resource Database and Mapping
- Watershed Management
- Well Construction Permitting and Appropriation
- Well Head Protection
- Non-Point Source Pollution Control
- TPDES Program
- Contamination Identification and Remediation
- Resource Monitoring
- Earth Change Permits
- Solid Waste Management
- Education and Outreach

DPNR has made great progress in defining and protecting this valuable and essential resource. DPNR's education and outreach programs increase cooperation by the public, who is an essential partner in protecting the resource. Public cooperation is crucial to the long-term success of the above programs and availability of our groundwater resources.

Even though not every Virgin Islander has a well, every Virgin Islander benefits from groundwater. Reduced costs for potable water, along with goods and services that rely on a safe and reliable water supply, serve every resident of the Territory.

Groundwater has proven to be a lifesaving commodity during hurricanes, when other sources of potable water were unavailable. It is not only the businesses and customers of those who rely directly on daily water supply (such as farmers, bottle water distributors and water truckers) that benefit from groundwater. Tourism, manufacturing, homeowners, industry, in other words, everyone has a stake in the development, conservation and protection of this essential resource.

As the trustee of this vital resource, DPNR is working hard to protect and manage groundwater resources, in close cooperation with the businesses, industries, visitors and, most importantly, people of the Virgin Islands who have entrusted DPNR with this life-giving resource.

Non-Point Source Pollution Program

The health of the Virgin Islands' economy depends, to a large extent, on maintaining clean and healthy coastal waters, coral reefs, productive fisheries and tourism. A primary concern is that human activities associated with upland areas of [7]watersheds, from ridge to shore, are adversely affecting marine resources. Unlike pollution from a specific point source, this pollution comes from many diffuse sources (non-point) combining to create a big problem.

Rainfall over the land surface (runoff) can pick up natural and human-made pollutants. These pollutants include:

- Excess fertilizers, herbicides and insecticides from agricultural lands and residential areas;
- Motor oil, grease and toxic chemicals from homes, small businesses and urban runoff;
- Sediment from unpaved roads, improperly managed construction sites, crop and forest lands and eroding stream banks;
- Bacteria and nutrients from livestock, pet wastes and faulty septic systems

Many seemingly small individual actions combine to cause a big problem. Unlike pollution from a single large point source (factory/oil spill), "non-point" source pollution is a combination of many small incidents. Pollutants accumulate on the land surface and subsurface and move through the environment toward the sea.

Sediment, chemical contaminants and microscopic pathogens are carried in rainfall runoff and contaminate our streams, groundwater and mangroves. These pollutants ultimately reach the sea, smothering coral reefs and damaging sea grass beds and other marine communities.

Recognizing the need for greater federal leadership to help focus on state and local non-point source pollution efforts, in 1987 Congress amended the Clean Water Act (CWA), establishing the Section 319 Non-Point Source Pollution Management Program (NPS).

Under Section 319, States, Territories and Native American Tribes receive grant monies to help support a wide variety of activities that assist in the reduction of non-point source pollution (i.e., technical assistance, financial assistance, education and training, technology transfer, demonstration projects, monitoring to assess the success of specific non-point source pollution implementation projects, etc.).

[7]Watershed - the area that drains to a common waterway, such as a stream, lake, estuary, wetland or, ultimately, the ocean (Source: EPA).

Non-Point Source Pollution Program

DPNR/DEP's NPS Program is coordinated through the Virgin Islands Non-Point Source Pollution Committee, which is made up of government representatives, non-government employees and private citizens.

DPNR and the Virgin Islands Non-Point Source Pollution Committee are successfully using a multifaceted education and outreach approach to address this problem. Workshops sponsored by the University of the Virgin Islands' Cooperative Extension Service assist regulators, developers and the general public in better understanding the impacts of erosion and sedimentation in the US Virgin Islands.

Newspaper articles inspired by committee members have widely publicized the erosion and sedimentation problem and the resources available to help reduce its magnitude. The annual Virgin Islands Non-Point Source Pollution Conference has highlighted innovative methods for reducing erosion and has featured the first-ever trade show of erosion and sediment control products in the Territory. More than ninety percent of those participating indicated that they would implement at least one practice presented at the conference. The NPS program is a prime example of how government, private industry and the general public can work together for the improvement of the quality of life in the USVI (epa.gov/owow/NPS/Section319II/virgin.html).

NPS Committee members at the Estate Little La Grange Gut Restoration Project during an afternoon tour.

Additional NPS Related Activities

Review and Revision of NPS Program - DPNR/DEP will continue to review and revise the NPS Management Program to ensure that it achieves nine key program elements, as described in the May 1996 Non-Point Source Program and Grants Guidance For Fiscal Year 1997 and Future Years.

Education and Outreach Programs - DPNR/DEP will continue to guide the activities of the USVI Non-Point Source Committee in an effort to address NPS issues in the Territory. The DPNR/DEP will also continue to participate in various educational and environmental events that promote NPS awareness within the community and in schools, through activities like Earth Day, Arbor Day, the Agricultural Fair and the Annual Non-Point Source Conference.

Mapping Potential Surface and Groundwater NPS Pollution - DPNR/DEP will continue mapping potential surface and groundwater NPS pollution threats in the USVI, using aerial photographs with field observation, verification and interviews.

Memorandum of Agreements - Interagency agreements between DPNR and the University of the Virgin Islands (UVI) - Eastern Caribbean Center (ECC), Cooperative Extension Service (CES), the Virgin Islands Resource Conservation and Development Council (VIRC&D), the Virgin Islands Marine Advisory Service (VIMAS), the Association of Marina Owners VI (AMOVI) and the United States Geological Survey (USGS) will be instituted in an effort to complete non-point source educational, demonstration and implementation projects.

Technical Assistance - Provide review and input to other programs within DEP and other divisions of the DPNR.

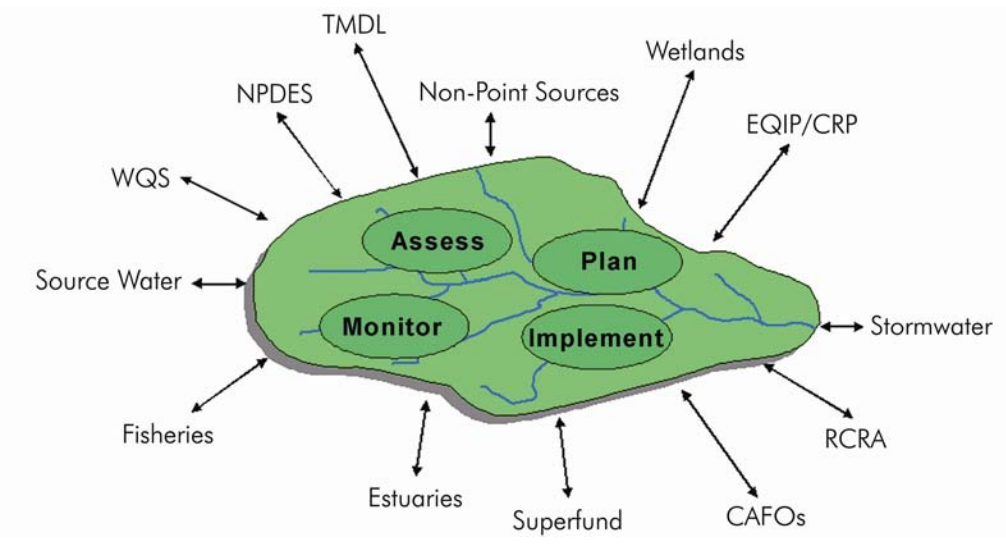
Recent & Future Initiatives

DPNR/DEP understands that a holistic approach to data collection and resource management is required to protect USVI waters. This approach will allow for increased protection and conservation of water resources by providing the information base to coordinate programs within the Division. It will also enhance such efforts' effectiveness, increase their efficiency and reflect the interrelation between various parts of the environment. To this end, innovative new programs are being created that provide a multidisciplinary approach. Such a strategy reflects the understanding that the entire ecosystem, from "ridge to reef," is interrelated and must be evaluated as a whole, where impacts at the mountaintop can and do affect life on the reef.

Integrated Watershed Management Plan

Resource conservation and development are not mutually exclusive. Both are necessary for our future. Unfortunately, they are not always coordinated as well as they could be. In an effort to overcome this dilemma, one of the most exciting and comprehensive programs being developed by DPNR/DEP—in cooperation with the EPA—is the Integrated Watershed Management Plan. This plan will evaluate all natural systems within a watershed, identify and locate pollutant sources, estimate the contaminant contribution of the pollutant source and measure the assimilative capacity of the watershed.

Total Maximum Daily Loads (TMDLs) will be determined for site-specific and non-point pollution discharges and will either be regulated under the TPDES Program or controlled under NPS (as applicable). The inventory of resources and the authority and roles of other local and federal programs, such as TPDES, NPS, Superfund, RCRA and others, will be combined in the Integrated Watershed Plan.



Example - Integrated Watershed Management Plan.
Source: ASIWPCA Mid-Winter Meeting March 10-13, 2002

The integration of these regulatory programs and resource databases will provide invaluable assessment and protection capabilities.

Under the Integrated Watershed Management Plan, programs can be modified to complement each other, inconsistencies between programs can be eliminated and overall program capabilities can be strengthened. In addition, increased efficiency will undoubtedly reduce costs and improve the effectiveness of these programs.

Multi-Year Monitoring Strategy

The purpose of the Virgin Islands Multi-Year Monitoring Strategy (MYMS) is to design and implement an Ambient Monitoring Program that will result in a comprehensive and representative assessment of the water quality in the US Virgin Islands.

Recent & Future Initiatives

Multi-Year Monitoring Strategy

The MYMS will be evaluated periodically to measure progress toward maintaining pristine water bodies and attaining a substantial improvement in water quality, especially for areas of impaired or degraded water quality. Results from this strategy will be used to aid in the design, development and management of various regulatory programs [i.e., 305(b) State Water Quality Assessment Reports, 303(d) Impaired Water Bodies' Lists and Total Maximum Daily Loads (TMDL)].

Basic Water Quality Monitoring Network

Traditionally, management of water resources has focused on surface water or groundwater as if they were separate entities. Yet, nearly all surface water features (guts, impoundments, wetlands, estuaries) interact with groundwater. Actions taken with one part of the system often have unintended consequences with other parts of the system. As development of land and water resources intensifies, it becomes increasingly important to manage surface water and groundwater as a single entity. The Ambient Monitoring Program is establishing and implementing the Basic Water Quality Monitoring Network.

Water quality sampling, conducted at surface and groundwater stations within this network, provides data that is and will be used to produce assessment reports on water quality in the USVI. To improve sampling and data management efforts, DPNR/DEP is increasing communication with other water quality monitoring entities, such as the United States National Park Service (USNPS), United States Geological Survey (USGS), National Oceanographic and Atmospheric Administration (NOAA), United States Fish & Wildlife Service (USF&W), United States Department of Agriculture (USDA), the University of the Virgin Islands (UVI) and/or other universities and non-governmental organizations.

Land Use Mapping

DPNR/DEP, in association with the University of the Virgin Island Eastern Caribbean Center, is developing a Geographic Information System (GIS)—based digitized land use maps—that will assist the Department in implementing its strategic, long-term Land and Water Use Plan for the Territory. Under this system, data is collected from all sectors of the Territory and mapped. These maps give planners information to make informed decisions on Earth Change Permits, large and small developments and population growth patterns. They also contribute to the control of non-point source pollution.

Earth Change Program

As discussed in the "Groundwater" section of this report, the Division of Environmental Protection has recently assumed administration of the Earth Change Program. Most major or minor construction projects and changes to the "earth" in the USVI must be permitted. Construction or land alteration plans are reviewed and approved as per VI regulations. Plans must include (where applicable) erosion control, proper drainage features, waste disposal and other pollution abatement practices.

The transfer of the Earth Change Program to DEP recognizes the interrelation between environmental protection and development and will assist the Department in promoting development and conservation practices.

Wetlands

Wetlands, once thought to be "wastelands," are now understood to be a vital part of our ecosystems. Although about one half of our nation's wetlands have been lost, we are now trying to conserve the precious wetlands that remain. Wetlands provide many important functions. They provide protection from storms and are homes to numerous plants and animals, including marine species that support the fisheries industry. They filter out land-based sediments and other pollution before it reaches the sea. Because of these and other vital functions, wetlands are essential to the environmental health of the US Virgin Islands.

Wetlands are defined by the EPA as *"lands where saturation with water is the dominant factor determining the nature of soil development and the types of plant and animal communities living in the soil and on its surface (Cowardin, December 1979). Wetlands vary widely because of regional and local differences in soils, topography, climate, hydrology, water chemistry, vegetation and other factors, including human disturbance. Indeed, wetlands are found from the tundra to the tropics and on every continent except Antarctica."*

For regulatory purposes under the Clean Water Act, the term wetlands means "*those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas."* (Source EPA)

Coastal wetlands are found along the Atlantic, Pacific, Alaskan and Gulf coasts, as well as the Caribbean Islands. They are closely linked to our nation's estuaries, where seawater mixes with fresh water to form an environment of varying salinities. The salt water and the fluctuating water levels (due to tidal action) combine to create a rather difficult environment for most plants to live and thrive.

Consequently, many shallow coastal areas are un-vegetated mud flats or sand flats. Some plants, however, have successfully adapted to this environment. Certain grasses and grass-like plants that adapt to the saline conditions form the tidal salt marshes that are found along the Atlantic, Gulf and Pacific coasts. Mangrove swamps, with salt-loving shrubs or trees, are common in tropical climates. Some tidal freshwater wetlands form beyond the upper edges of tidal salt marshes, where the influence of salt water ends (adapted from the EPA).

Wetlands are found on all three islands and many cays of the US Virgin Islands. Although a relatively small percentage (1,684 acres) of the Territory's total land area consists of mangroves, salt ponds and mud flats, these wetlands are often as biologically diverse as rainforests.

Wetlands

Jointly and individually, DPNR/DEP programs work to protect wetlands by creating a wetlands inventory and maps, by limiting construction or clearing of wetlands, by monitoring water quality as part of the WPC Program and by managing discharges into the near-shore and marine environment through the TPDES and NPS Programs. DPNR/DEP works closely with the EPA, the US and VI Departments of Fish & Wildlife, the UVI and other agencies to protect our wetlands.

Flooding

Flooding is a natural phenomenon that is exacerbated by human alterations to the landscape. Due to their steep topography, narrow stream beds, relatively small land area and geographic location, the US Virgin Islands are very susceptible to flooding.

Rainfall in the tropics usually comes in intense bursts. Floodwaters peak very rapidly. Soils cannot always absorb water quickly enough, so water runs across the surface in ever-increasing amounts. The volume and velocity of water increases as it moves from the hilltops through the watersheds. These resulting "flash floods" can form minutes after an intense storm and can race through the watershed, carrying loose materials across the surface of the land into the streams to the sea. Normally, soil and plants absorb rainfall and reduce water flow velocities. Streams and ponds collect and store excess rain and allow for recharge to groundwater. Mangroves, salt ponds and mud flats absorb excess sediments that reach the shore, protecting the reefs and benthic communities.

Another major form of flooding is storm surge. Wave action usually increases during storms. During severe storms and high tides, seawater can move inland causing damage to homes and roads and endangering lives.

Wetlands, mangroves, salt ponds and sand dunes protect shorelines against severe damage from storm surges and other potential threats.

Development, especially in flood-prone areas, improper land clearing, paving of large areas and channeling of streams and waterways increase erosion and runoff. The loss of woodlands, fields, wetlands and other natural systems reduces the water storage capacity of the land and its ability to filter runoff and sediment moving toward the sea.

Increased erosion, runoff and reduced holding capacity of the land allow large quantities of sediment, pollutants and other wastes to flow into the sea, harming our near-shore and marine ecosystems in the process.

Flooding

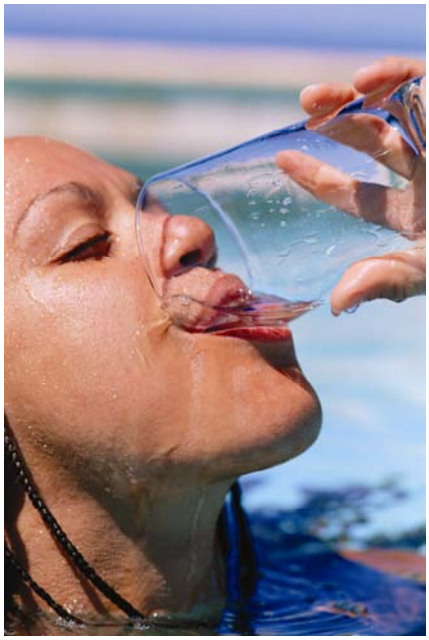
Loss of wetlands, dunes and the buffering effects of these areas increase the likelihood and severity of storm surge flooding and damage. Hurricanes or other major storm events can have catastrophic effects when these natural systems are disrupted or degraded.

DPNR/DEP's interdisciplinary approach to planning and conservation of natural resources includes flood mitigation measures. Promotion of proper construction techniques, development planning, improved building codes, shoreline protection and other land and water conservation practices aid in minimizing flood damage. Toward this end, DPNR/DEP coordinates many departmental programs, such as Earth Change, WPC, WHPP, NPS, Land Use Planning Maps, etc.

In addition, DPNR/DEP cooperates with the Virgin Islands Territorial Emergency Management Agency (VITEMA), EPA, the Army Corp of Engineers, the USGS, Natural Resource Conservation Service - USDA and other agencies to develop flood maps, conduct flood studies, to coordinate hazard response capabilities, promote soil conservation strategies and to develop measures and education programs for government, business and private citizens. The intent of these endeavors is to reduce potential risk factors and lessen the negative impacts of flooding to both the environment and property.

As with other DPNR/DEP programs, cooperation among government agencies, developers, business, industry and private citizens is essential.

Public Water Supply



One of the often-asked questions by residents and visitors to our islands is: "How is the quality of the water?"

Unlike many cities and small communities in our nation, with centralized water systems operated by a single municipal or privately run public water system, the three main islands of the USVI are host to hundreds of public water supply systems within a relatively small total mass of land.

Public water supply in the USVI is generally very good. However, a complete response to the aforementioned question, "How is the quality of the water?", is multifaceted and somewhat dependent upon the origin or source of the water, type of water system, local conditions and, of course, system supervision.

The topography and other natural characteristics of each of our islands and regions therein, aging sewage systems, poorly maintained solid waste disposal facilities and rapidly changing USVI demographics present potential threats and, in some instances, current challenges to water quality and public water supply systems at certain locales.

Maintaining the quality of public water throughout the US Virgin Islands is high on the list of DPNR priorities.

Public Water Supply

Public Water Systems

Federal law defines a public water system as a system that provides water, via piping or other constructed conveyances, for human consumption to at least 15 service connections or serves an average of at least 25 people for at least 60 days each year. In recognition of the USVI's unique characteristics and resource management needs, local laws are more stringent, requiring at least 8 service connections or 20 people served for at least 60 days.

There are three classifications of public water systems:

1. Community Water System
2. Non-Transient, Non-Community Water System
3. Transient, Non-Community Water System

The primary and largest source of public water supply in the USVI is provided by desalinization plants (saltwater conversion), which are operated by the Virgin Islands Water and Power Authority (WAPA). Other major public water sources include cisterns/rainwater collection systems and groundwater wells.

Types of Public Water Supply Systems

1. Community Water System (CWS) – regularly serves the same population all year round. Examples of CWS's include municipal systems such as the Virgin Islands Water and Power Authority and residential developments with their own water supplies. CWS's are further classified by size:

   a. Large CWS - Serves greater than 50,000 people.
   b. Medium CWS - Serves 3,301 - 50,000 people.
   c. Small CWS - Serves 3,300 or fewer people.

2. Non-Transient, Non-Community Water System (NTNCWS) – regularly serves at least 25 of the same persons for at least six months out of the year, such as schools and businesses.

3. Transient, Non-Community Water System (TNCWS) – serves different people at least sixty days out of the year. Examples of transient non-community systems include hotels, restaurants, state parks, campgrounds and similar locations having their own water supply.

The use of reverse osmosis treatment units to produce potable water from brackish wells or seawater is limited, but increasing, throughout the Territory. Reverse osmosis is a water treatment method whereby water is forced through a semi-permeable membrane (type of filter) that filters out impurities.

WAPA produces upwards of eight (8) million gallons per day (MGD) of desalinated water, with plants located on the Islands of St. Thomas, St. Croix and St. John. In St. Croix, groundwater produced by WAPA supplies approximately 0.5 MGD (June 2003) of additional public water supply and can produce up to 1.0 MGD when well fields are operating at or near capacity.

WAPA serves approximately 29,000 residents on a regular basis on St. Thomas, 35,000 on St. Croix and approximately 2,000 on St. John. Excluding transient populations such as tourists, this represents about 60% of the USVI population, or 66,000 out of [8]110,000 total residents (current estimate).

While WAPA is the largest public water supplier in the USVI, the majority of public water systems in the USVI are small systems, serving 25 to 1,000 persons. Most of these small public water systems utilize rainwater collection systems augmented by trucked water.

During the 2002 calendar year, there were approximately 350 public water systems in the USVI. The total number of public water systems varies from year to year because of new business openings, closings or inactivity due to direct connection by some facilities to public water systems.

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[8]Total population per the 2000 US Census report was 108,612 (Population and Housing Profile: 2000)

Public Water Supply

Public Water Systems

Public water systems in the USVI are regulated by the National Safe Drinking Water Act and by the Virgin Islands Safe Drinking Water Act, Title 19, Part VI, Chapter 51, from which the Department of Planning & Natural Resources derives its authorities. As delegated by the DPNR, the Division of Environmental Protection has regulatory responsibility for the USVI's Public Water System Supervision Program. This responsibility entails implementation and enforcement of drinking water laws as well as regulatory oversight of public water systems to ensure the delivery of water that is safe for human consumption.

Public Water System Supervision Program

The mission of the DPNR/DEP's Public Water System Supervision (PWSS) Program is to protect public water supplies in the USVI by ensuring that all public water systems, bottled water plants and ice manufacturers, as defined under the Virgin Islands Safe Drinking Water Act (VISWA), comply with national and territorial drinking water rules and regulations.

Under the Federal Safe Drinking Water Act (SDWA), the EPA establishes limits at which a contaminant may be present in a water supply. These limits, or "Maximum Contaminant Levels (MCL)," help to ensure that public water supplies are safe for human consumption. For some regulations, the EPA has established treatment techniques in place of MCLs to control unacceptable levels of a contaminant in water.

The Federal SDWA and the Virgin Islands SDWA also govern how often a public water system must monitor their water for contaminants and the frequency at which the results of those tests must be reported to the DPNR/DEP. In addition, the EPA requires public water systems to monitor and collect data on unregulated contaminants. This information is used for the development of future drinking water regulations.

Public water system managers are required to notify persons served by their system when it fails to comply with the requirements of the SDWA or when facing other situations that pose a risk to public health. Public Water systems that serve 15 or more service connections and/or are used by at least 25 year-round residents are required to prepare and deliver a written annual Consumer Confidence Report (CCR) to their customers. These reports provide valuable information on water quality to customers of community public water systems. Information contained in these reports allows customers to make informed personal health-based decisions regarding their drinking water consumption.

The DPNR/DEP Public Water System Supervision Program submits quarterly and annual reports to the EPA that provide comprehensive information on the accomplishment of various aspects of the PWSS Program's work plan activities (i.e., sanitary surveys, inventory updates, violations and enforcements actions, etc.). Annual reports prepared by the Public Water System Supervision Program are available to the public.

Public Water Supply

Public Water Systems

In addition to the aforementioned program management activities, major tasks and responsibilities of the Public Water System Supervision (PWSS) Program include but are not limited to:

1. Surveillance & Technical Assistance

   - Perform sanitary surveys of public water systems;
   - Conduct annual registration and inspection of tankers that haul water for human consumption;
   - Provide technical assistance to water purveyors and investigate water quality complaints by the public.

   Surveillance samples are collected during sanitary surveys of new public water systems, existing systems that have trouble complying with drinking water standards, inspections of WAPA's facilities, special investigations of water quality complaints made by the public and water hauler inspections. Typically, these samples are analyzed for microbiological contaminants by a DPNR/EPA certified lab.

2. Data Management

   The DEP/PWSS maintains several databases containing vital information on the Territory's public water systems and other aspects of the PWSS Program. An inventory containing administrative and technical information on each public water system is one of the most important databases maintained under the PWSS Program. Other databases include information on water quality monitoring results and violations. Some of the databases and monitoring data are as follows:

   - Total Coliform
   - Nitrate/Nitrite
   - Lead and Copper

3. Enforcement

   The DEP/PWSS issues Notices of Violation (NOVs), Administrative Orders and civil penalties to public water systems that do not comply with the monitoring requirements of the Safe Drinking Water Act.

Public Water Supply

Water Quality & Compliance

Total Coliform: In 2002, there were 57 monitoring/reporting (M/R) violations of the Total Coliform Rule (TCR). Failing to conduct monitoring and/or not providing test results to the DPNR/DE P constitutes a M/R violation. Thirty-six (36) public water systems, representing 10% of all USVI public water systems were responsible for these violations. This represents a 17% decrease over prior year TCR violations, and results, to a large degree, to DPNR/DEP's more aggressive outreach policy implemented under its PWSS Program.

Nitrate Monitoring: Nitrate is used in fertilizer and is found in sewage and waste from humans and animals. It is a known contaminant of public water supplies.

Thirty-four (34) public water systems (9.7% of all USVI systems) failed to monitor for Nitrate in 2002, representing a decrease in non-monitoring violations of 52% over the prior year, 2001.

Lead & Copper Monitoring: In 2003, one hundred and nineteen (119) public water systems were cited by DPNR for failure to conduct initial and reduced lead and copper monitoring.

Significant Non-Compliance: Significant Non-Compliance (SNC) occurs when a water system violates the TCR monitoring requirements for three (3) or more consecutive months or at least two (2) compliance monitoring periods for any chemical contaminant. SNC is considered the most reprehensible and significant violation of the SWDA, and is treated accordingly.

Twenty-seven (27) public water systems were cited for SNC in 2002.

VI Drinking Water Capital Improvement Grant Program

The Safe Drinking Water Act (SDWA) authorized a Drinking Water State Revolving Fund (DWSRF) to assist publicly and privately owned community water systems and non-profit non-community water systems in financing the costs of capital improvements needed to achieve compliance with the SDWA.

Through the DWSRF, grants are available to eligible water systems within the USVI. The Department of Planning & Natural Resources, Division pf Environmental Protection, acting on behalf of the Government of the US Virgin Islands, administers these grants through the Virgin Islands Drinking Water Capital Improvement Grants (VIDWCIG) Program.

The VIDWCIG Program helps to ensure that drinking water in the Virgin Islands remains safe and affordable, and that drinking water systems receiving funds are properly operated and maintained.

The goals of the Virgin Islands Drinking Water Capital Improvement Grants Program include:

1. Implementing and maintaining the VIDWCIG Program for the Territory of the Virgin Islands.
2. Providing financial assistance to eligible public water systems for eligible projects associated with the capital improvements of water treatment, storage and distribution facilities.
3. Helping public water systems achieve and maintain compliance with USVI and National Primary Drinking Water Regulations.
4. Providing assistance that will enable public water systems to further the health protection objectives of the SDWA.
5. Improving technical, financial and managerial capacity of funded public water systems in the USVI so that they can provide safe drinking water over the long term.
6. Making funds available to improve small public water systems (population served: less than 3,300) of the US Virgin Islands.

Each year, the DPNR/DEP puts out a notice ("Call for Projects") and issues a letter and a pre-application form to each public water system in the Territory. Applications are ranked and prioritized by the DPNR/DEP and proposed new projects are included in a project priority list. During the development of the project priority list, DPNR/DEP also organizes a public review and comment period.

1997 - 2000	System Category	
	Large	Small - Medium
Project Funds Available	$4,983,927	$1,390,119
Number of Projects	19	17
Average Project Cost	$262,312	$81,772
Minimum Project Cost	$4,500	$3,320
Maximum Project Cost	$825,000	$301,000
Estimated Cost Per Person	$28	$63

Approximately $1,427,766 in project funds were available for 2001 and $1,195,586 for 2002.

Major Challenges to USVI Water Quality

1. Publicly Owned Treatment Works (POTWs) remain the greatest challenge as sewage is bypassed into the environment.

2. The lack of Best Management Practices (BMP) in construction that results in soil erosion and non-point source pollution.

3. Failing septic systems and onsite treatment systems continue to be prime sources of non-point source pollution.

4. Improper discharges of sewage and other wastes from marine vessels into territorial seas and coastlines.

*What You Can Do to Protect Our Waters

What can you do to help protect USVI waters? You can start at home. Begin by taking a close look at practices around your home that may impair groundwater and surface water quality.

- Be aware that many chemicals commonly used around the home are toxic. When possible, select less toxic alternatives. Use non-toxic substitutes when available.
- Buy paints, cleaning products and other chemicals only in the amount you expect to use, and apply them only as directed.
- Take unwanted household chemicals to appropriate hazardous waste facilities or collection centers; do not pour them down the drain. Pouring chemicals down the drain may disrupt your septic system or contaminate treatment plant sludge.
- Never pour unwanted chemicals on the ground. Soil cannot purify most chemicals, and they may eventually contaminate runoff.
- Inspect your septic system annually. Improperly maintained septic systems can contaminate both groundwater and surface water with nutrients and pathogens.
- Pump out your septic system regularly. Pumping out every three to five years is recommended for a three-bedroom house with a 1,000-gallon tank; smaller tanks should be pumped more often.
- Clean up after your pets. Pet waste contains nutrients and pathogens that can contaminate groundwater and surface water.
- Recycle used oil and antifreeze by taking them to an approved "Do It Yourselfers" (DIY) Collection Center (or oil recycling facility).
- Never put used oil or other chemicals down storm drains or in drainage ditches. One quart of oil can contaminate up to two million gallons of drinking water.
- When landscaping your yard, select plants that have low requirements for water, fertilizers and pesticides.
- Preserve existing trees and plant trees and shrubs to help prevent erosion and to promote infiltration of water into the soil.
- Leave lawn clippings on your lawn so that nutrients in the clippings are recycled and less yard waste goes to landfills.
- Test your soil before applying fertilizers. Over fertilization is a common problem, and the excess can leach into groundwater or contaminate surface waters.
- Get involved in local planning and zoning decisions and encourage your local officials to develop water and land use plans.
- Learn about your watershed and how non-point source pollution affects inland and coastal watersheds.
- Participate in DPNR and other local environmental education programs and special events.
- Encourage your neighbors and community to learn how they can help protect water quality.

*Excerpts from US EPA Website http://www//epa.gov/owow/nps, taken from an EPA Journal article by Robert Goo, November/December 1991, EPA-22K-1005.

Department of Planning & Natural Resources

Act 5265 of the Government Reorganization and Consolidation Act of 1987 established the United States Virgin Islands Department of Planning & Natural Resources. The DPNR serves as the agency responsible for the administration and enforcement of all laws pertaining to the protection, preservation and conservation of the natural resources of the USVI, including marine and wildlife, trees and vegetation, coastal zones, air, water and land, and cultural and historical resources. The Department is also responsible for oversight and compliance of land survey, land subdivision, development and building permits, code enforcement, earth change permits, zoning administration, boat registration and mooring and anchoring of vessels within USVI territorial waters.

The DPNR is further obligated to formulate long-range comprehensive and functional development plans for the Territory's human, economic and physical resources. It is mandated to promote, implement, maintain and coordinate libraries, museums and departmental information services and to preserve items of historical significance in the archives of the Virgin Islands.

The Department of Planning & Natural Resources has many different and distinct operating divisions, work units and programs, each with its own unique set of administrative and/or regulatory mandates. Common among all DPNR entities is the ultimate charge—"the infinite sustainability and flourishment of the United States Virgin Islands' environment, economy, culture, people and all living things."

A brief description of some of the DPNR's divisions and work units are summarized on the following pages.

Coastal Zone Management

In 1978, the Virgin Islands Legislature enacted the Virgin Islands Coastal Zone Management Act as a means of regulating development and managing coastal resources in the Territory. The Virgin Islands Coastal Zone Management Program (VICZMP) was established to carry out the mandates and objectives of this Act.

One of VICZMP's goals is to protect, preserve and, where feasible, enhance and restore the overall quality of the environment in the coastal zone. VICZMP works, coordinates and partners with various local and national government agencies to develop and implement a variety of projects and programs, including review, processing and enforcement of minor and major development permits in the first tier of the coastal zone.

Division of Fish and Wildlife

The Division of Fish and Wildlife (DFW) is charged with monitoring, assessing and implementing public awareness and other activities that help to enhance and safeguard fish and wildlife resources in the USVI. The DFW is the primary scientific advisor to the DPNR's Commissioner on the conditions of territorial wildlife and marine resources. The DPNR Commissioner then, in turn, advises the USVI Governor. The DFW is composed of three bureaus: the Bureau of Fisheries, the Bureau of Wildlife and the Bureau of Environmental Education. Unique within the DPNR, the DFW is 100% federally funded by awards from the US Department of Interior, the US Fish and Wildlife Service, the Federal Aid Division, the US Department of Commerce, the National Marine Fishers Service and the National Oceanic and Atmospheric Administration (NOAA).

Division of Permits

The primary responsibilities of the Division of Permits are to enforce and regulate the USVI's building codes and regulations. Major tasks and responsibilities of this division include:

- Review of building designs, construction plans, contractor licenses and related documents.
- Evaluation of building permit applications, issuance of permits and permits administration.
- Inspection of building and construction sites.
- Monitoring of existing building codes and the proposal of new codes and regulations to address changing demographics, public safety and environmental issues.

The Division also conducts public outreach programs and activities to educate building and construction professionals and the community at large about USVI building codes.

Comprehensive & Coastal Zone Planning

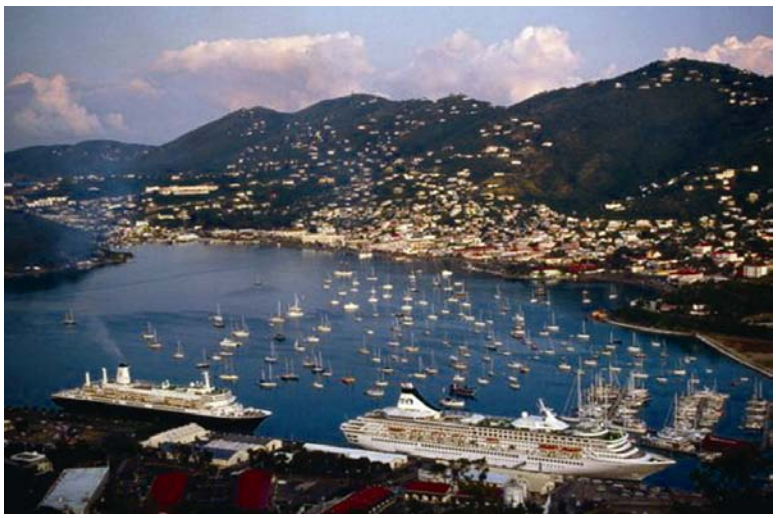
The Division of Comprehensive & Coastal Zone Planning has broad responsibility for long-range comprehensive planning, subdivision and zoning administration. The Division is also charged with providing information and technical assistance and support to various DPNR divisions, other USVI government agencies, business industries and the general public on a range of topics, including:

- Business Licensing
- Subdivision and Coastal Zone Planning
- Land and Water Use Planning, etc.

Environmental Enforcement

The Division of Environmental Enforcement serves as the law enforcement arm of the Department of Planning & Natural Resources. Its primary function is to enforce all laws applicable to the protection, preservation and conservation of the natural resources and overall environment of the USVI:

- Fish and wildlife;
- Antiquities and cultural resources;
- Boating safety; and
- Conditions stipulated in all permits related to development in the Territory, issued by the Department of Planning & Natural Resources.



State Historic Preservation Office

Major functions of the Virgin Islands State Historic Preservation Office include administration of the National Register of Historic Places; surveying and inventorying of historic places and sites (on land and in coastal waters); reviewing and ensuring of compliance with federal and territorial preservation laws; historic preservation planning; securing of technical assistance, implementing of public education and identifying of cultural resources.

The Division is also responsible for reviewing rehabilitation work that is eligible for federal and local tax incentives or federal grants, and for enforcing Acts 6234 and 2258 of the Antiquities and Cultural Properties Act of the Virgin Islands, for the protection of archaeological and historic property and cultural assets of the Virgin Islands.

Division of Libraries and Archives

Public libraries in the Virgin Islands are administered by the Division of Libraries, Department of Planning & Natural Resources. The mission of the Division of Libraries and Archives is to:

- Serve as a source of information and knowledge for the people of the USVI.
- Maintain the records of the Government of the USVI.
- Support the development of an informed citizenry by providing access to a world of ideas and information.
- Identify, preserve and promote the historical and public records of the USVI.
- Provide support to all Virgin Islanders in their pursuit of learning.

Business and Administrative Services

The Division of Business and Administrative Services is comprised of four units, which include: the Office of the Director; Personnel, Budget and Grants Management; Accounting and Payroll and Revenue and Contract Management. The Division has oversight responsibility for all fiscal matters pertaining to budgeting, personnel and payroll and for revenue collection involving general, federal and other special funds for all divisions within the DPNR.

Personnel activities include planning, directing and coordinating the preparation of local, federal, capital and special fund benefits and personnel actions. Fiscal responsibilities include posting, reconciling and auditing of all accounts, preparation of payroll, verification of federal purchases for conformity with grant guidelines and oversight of appropriations, allotments and grant awards. Revenue and Contract Management responsibilities include the monitoring and maintenance of all submerged and filled land leases, inclusive of collecting fees for permits relating to such leases.

Virgin Islands Energy Office

The Virgin Islands Energy Office (VIEO) is the primary administrator of energy programs in the USVI. Its mission is to research, select, apply, advocate and champion energy efficiency and renewable energy throughout the Territory.

VIEO monitors the integration of policies relating to conservation, use, control, distribution and allocation of energy, with respect to all energy matters. With major emphasis on the reduction of energy costs and consumption, VIEO responsibilities include planning, development, administration and delivery of education and information outreach activities; implementation of technical and financial assistance programs; securing and maintaining sound energy resources for the USVI; and promoting and implementing programs that foster energy efficiency.

Capital and Development Planning

The mission of the Division of Capital and Development Planning is to plan for and to facilitate the improvement of neighborhood and community services and facilities, especially those for the benefit of low-to-moderate income persons and disaffected segments of the USVI population (such as the elderly, the disabled and the homeless as well as victims of domestic violence).

The Division carries out its mission through the application, monitoring and evaluation of existing and proposed laws and regulations (local and federal), through the application and administration of grant funds and through the delivery of services and prioritization of issues that address facility and community service needs of its constituency. Grants include the Community Development Block Grant, Emergency Shelter Grant and Disaster Recovery Initiative Grant, funded by the U.S. Department of Housing and Urban Development and other sources as may be available.

DPNR MISSION STATEMENT

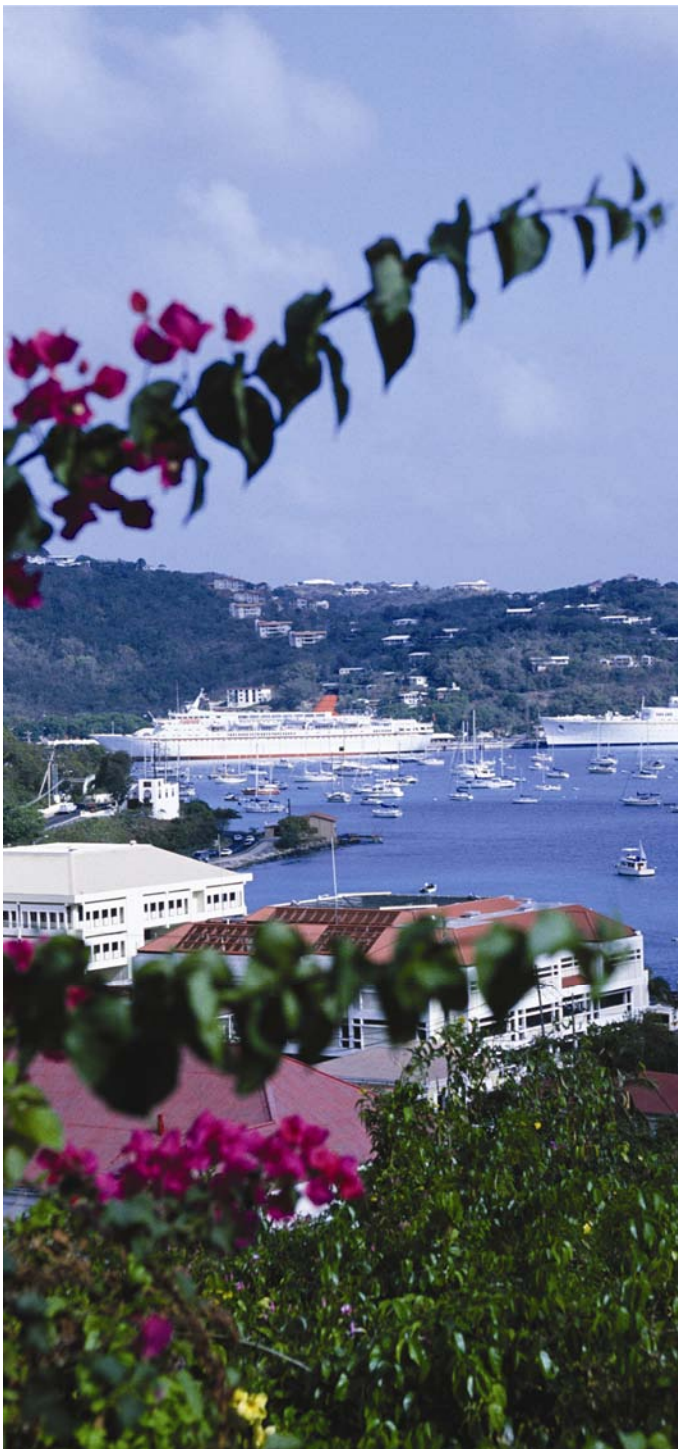
The mission of the Department of Planning & Natural Resources is to protect, maintain and manage the natural and cultural resources of the Virgin Islands through proper coordination of economic and structural development in collaboration with other local, federal and non-government organizations, for the benefit of present and future generations so they will live safer, fuller lives in harmony with their environment and cultural heritage.

Business & Society

The term "environment" or "environmental protection" means many things to many people. Some associate these terms with conservation, as in saving gas or electric energy, using less water, or ecological science. Others view these terms as meaning protecting the rain forests and wildlife, or preventing pollution and protecting human life, our water resources, land and air from man-made chemical hazards and industrial processes. Environment and environmental protection is a little bit of all those things and more.

Perhaps the simplest way to view the term environment is "home," humankind's only earthly home.

How well are you taking care of your home?



The protection, preservation and sustainability of our breathtakingly beautiful environment depend upon a single denominator—an informed and empowered community of people from all sectors of our society.

Education & Outreach

The most important action toward environmental protection is education. Consequently, the mission of our Environmental Education Program is to develop awareness on all levels by spreading our message that "Environmental Protection Begins With You." "You" being each person and every stakeholder. After all, our actions and lifestyles have a direct impact on our environment.

Understanding the cause, effect and impact our lives have on the environment empowers communities to partner with agencies such as the Department of Planning & Natural Resources to protect our environment and to improve the overall quality of life.

Everyone has a role to play, from industry to visitors, citizens and government. In acknowledgment of the many roles and responsibilities that stakeholders carry in protecting our environment, the Division of Environmental Protection is making a concerted effort to educate through the use of various mediums. The mediums utilized on a broader spectrum include radio, television and the Internet, as well as our quarterly newsletter, "Environmental Reports," and guest opinions in our locally circulated newspapers. More targeted interactions include speaking engagements, workshops, meetings and school outreach programs, for which our staff of scientists, engineers and environmental specialists (including our Director and Assistant Director) are made available.


Environmental Reports
DPNR Division of Environmental Protection
3RD QUARTER CALENDAR YEAR 2002
DEP Online
WPC Program Awarded $303,488
DEP Staffers Complete Hazmat Training

Environmental education, communication and outreach efforts are an integral part of DPNR/DEP programs and operations. Examples include: informational and technical workshops; environmental compliance and financing consultation services for small businesses; full or partial funding and administration and/or partnerships with many organizations for the delivery of activities and events, such as the Annual Non-Point Source Conference, the NPS Booklet, local agricultural fairs, solid waste reduction and used oil drives, certification and worker protection training for pesticide applicators, hazardous material training for first responders, community right-to-know programs, laboratory certification, various financial grant programs, etc.

Throughout the year, community outreach activities are held to address current environmental concerns or occurrences within a specific geographic area or on a particular topic, or in response to broader territory-wide environmental matters.

Future educational and outreach plans slated for the Division include the establishment of environmental associations within our schools. Through these school-based associations, students will be provided with an opportunity to learn about the environment and to assist with departmental projects and initiatives. The production of activity booklets and short video presentations is also being planned. This report is an example of one of our educational publications. The goal of this report—and of future educational/outreach projects—is to provide opportunities for stakeholders to learn more about USVI, global environmental issues impacting the Islands, DPNR/DEP programs and the Department's environmental vision for the Territory.

Non-Point Source Committee Members at the Estate Little LaGrange Gut Restoration Project during an afternoon tour.

Environmental Partnerships

The leadership role and authority of the Department of Planning & Natural Resources (and its operating divisions) as environmental regulators is unquestionable. However, we are wise to the reality that it is impracticable to fully execute our regulatory commission by working only within a vacuum of rules, regulations and enforcement.

Establishing and fostering environmental partnerships is an important element to achieving our mission of protecting and conserving the natural resources of the USVI and—it's smart business.

There are many circumstances in which it is advantageous for national and local governments, residential communities and private business sectors to share and join strengths identifying and resolving environmental concerns.

Bringing together similar, diverse and sometimes conflicting environmental interests, all with the common goal of protecting the USVI environment, can produce amazingly positive and powerful results.

Partnership activities with industry, trade associations, territorial and federal agencies, educational institutes, residential communities and others help to expand our body of knowledge and awareness of local and global environmental matters. They also provide opportunities for all parties that may otherwise not have been possible. The benefits of environmental partnership include:

- Information sharing and distribution
- Reduction in unnecessary duplicative efforts
- Clearer lines of communication with all parties
- Broader education, expertise and competency
- Improved timeliness, efficiency and productivity
- Greater awareness and understanding of the impact of environmental issues on the local community, culture and quality of life
- Augmentation of staff, technical, financial and other resources
- Improved environmental planning, decision-making and local community empowerment
- Increased regulatory compliance and reduction in pollutants and polluters

Environmental Partnerships

The Division of Environmental Protection has built, and continues to build, partnerships and strong working relationships with environmental stakeholders (i.e., local and national government agencies, large and small organizations and the USVI community at large).

As an example, various cooperative agreements with the EPA delegate certain responsibilities for national environmental laws and broaden regulatory authorities of the Division of Environmental Protection, thereby bringing federal clout and support to the Division while, at the same time, allowing for the management of important environmental matters from a local perspective and relevance.

The DPNR/DEP works in partnership and/or coordination with local and national government agencies as well as private and non-profit organizations to study and monitor various environmental issues impacting the USVI. Under its National Air Toxics Assessment initiative, the EPA recently launched a project to provide professional, technical and financial resources that expand toxic air emissions monitoring in the USVI.

In partnership and collaboration with the University of the Virgin Islands Cooperative Extension Service, the DPNR/DEP provides certification training for commercial and private pesticide applicators. The DPNR/DEP and the University of the Virgin Islands share efforts and sponsorship and formally partner on many environmental-related projects.

The Division of Environmental Protection has established many cooperative agreements, memorandums of understandings, partnerships and other advantageous working relationships with various organizations and communities. These agreements are too numerous to name; however, a few are noted below.

PARTNERSHIPS

- USVI Department of Agriculture
- Catherineberg Owner's Association
- Good for St. John, Inc.
- Estate Fish Bay Owner's Association, LTD.
- Friends of the Virgin Islands National Park
- Island Resource Foundation
- Magens Bay Authority
- National Oceanic and Atmospheric Administration
- Virgin Islands National Parks
- Virgin Islands Non-Point-Source Committee
- USVI Department of Public Works
- St. Croix Environmental Association
- US Virgin Islands Resource Conservation and Development Council, Inc.
- United States Geological Survey
- US Environmental Protection Agency
- US Fish & Wildlife Service
- UVIA - University of the Virgin Islands (UVI)
- Conservation Data Center (UVI)
- Cooperative Extension Service (UVI)
- Eastern Caribbean Center (UVI)
- Virgin Islands Marine Advisory Service (UVI)
- Virgin Islands Water and Power Authority
- Water Resources Research Institute (UVI)
- We Grow Food, Inc.

Small Business Assistance

Small businesses are a major part of the United States Virgin Islands' business sector, helping to boost the economy in high times and sustaining it during weaker times. Nationwide, small businesses produce two out of every three new jobs.

Due to limited financial, technical and/or manpower resources, small businesses are sometimes disproportionately affected by government regulations and paperwork. While the need to regulate environmental protection matters is important and ever-present, it's also vital that small businesses operate in a climate that fosters growth and prosperity. The cost-benefit of such an approach is favorable to both small businesses and to the USVI community at large.

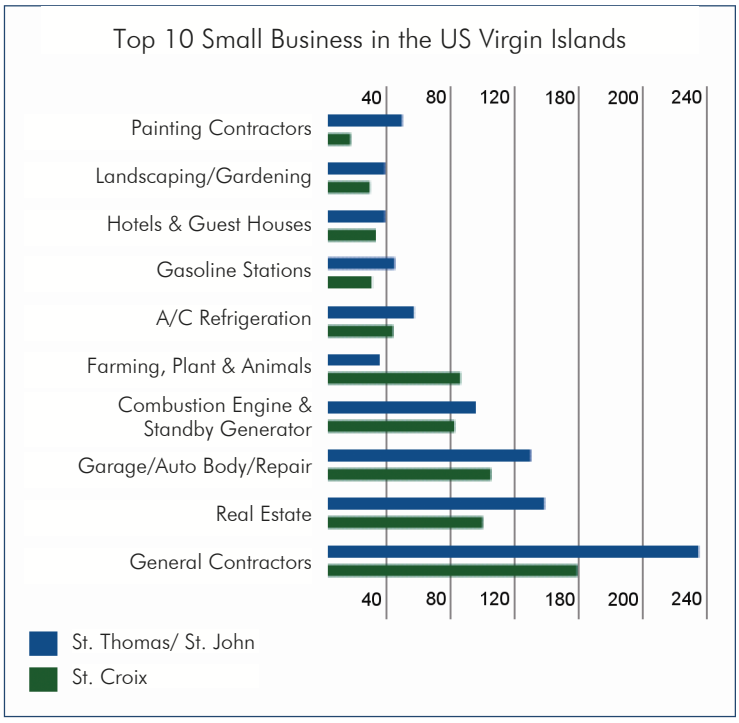
For many small businesses, determining whether or not environmental rules and regulations apply can be difficult. After a determination is made, an understanding of what permits are required, who issues those permits and the specific requirements of all necessary permits can be an even greater challenge.

The entire process of environmental regulatory compliance can be daunting for even the most experienced business operator, especially while working to start or maintain a small business.

[9]Small businesses represent essentially all environmental issues impacting the USVI as a whole. Generally, while small business activities individually do not contribute large amounts of pollution to the atmosphere, land or water, taken collectively, they emit more of certain types of pollutants than do some large industries.

In terms of environmental health, safety and protection, small business is big business.

Taking into consideration the large number and types of small businesses in the USVI, a major challenge to environmental protection and conservation is knowledge and awareness by all USVI small business owners of the environmental rules and regulations applicable to their specific business and industry. This includes requirements for air pollution or other environmental permits, as well as general business licensing.



The above chart excludes government agencies and trade associations

[9]The 1990 Clean Air Act defines a small business as a stationary source of emissions that: is owned or operated by a person employing 100 or fewer individuals; is a small business concern as defined in the Small Business Act; is not a major stationary pollution source as defined in Titles I and III of the Clean Air Act Amendments; does not emit more than 50 tons per year of any regulated pollutant; and emits fewer than 75 tons per year of all regulated pollutants.

Small Business Assistance

Local small business industries identified by DEP's Small Business Technical Assistance Program staff are shown below.

Category	STT/STJ	STX	Total
Aviation	14	7	21
Automotive Mechanical Road Service	16	3	19
Automotive Towing and Wrecking Service	51	11	62
Auto Polishing Shops	10	2	12
A/C Refrigeration	59	42	101
Asphalt Batching	4	1	5
Boat Building and Repair	23	4	27
Bakeries	28	14	42
Blasting	6	6	12
Combustion Engine and Standby Generators	104	81	185
Concrete Pumping	11	9	20
Dairies	1	1	2
Distilleries	1	4	5
Dry Cleaners/Laundromats	29	18	47
Engineering	46	13	59
Exterminating and Pest Control	12	3	15
Farming, Plant and Animals	36	89	125
Furniture Manufacturing and Repair	15	3	18
Flower Conservatory and Nursery	11	7	18
Fiberglass Shops	1	1	2
Garage and Auto Body Repair Shops	132	110	242
General Contractors	236	179	415
Gasoline Stations	44	30	74
General Manufacturing	19	2	21
Government Agencies/Trade Associations	85	91	176
Hazardous Waste Contractor	9	6	15
Hazardous Chemicals	22	15	37

Category	STT/STJ	STX	Total
Hospitals and Clinics	5	4	9
Hotels and Guest Houses	39	32	71
Janitorial Services	45	12	57
Jewelry and Watch Repair	17	11	28
Landscaping/Garden Maintenance	39	29	68
Lawnmower Repair Shop	1	2	3
Machine Shops	21	5	26
Medical Testing Labs	11	4	15
Printing and Publishing House	17	9	26
Pollution Control Service	4		4
Photographic Processing	22	11	33
Painting Contractors	50	18	68
Plumbing	42	26	68
Q. A. Laboratories	17	18	35
Real Estate	148	105	253
Roofing Contractors	9	6	15
Sign/Painting	6	1	7
Silk Screening	11	1	12
Septic Cleaning and Sewage Maintenance	10	4	14
Telecommunications Companies	13	2	15
Tree Surgery	2	1	3
Underground Storage Tanks	22	16	38
Veterinarian Services	4	4	8
Waste, Water and Sludge Removal	3	1	4
Welding Services	34	14	48
Wood Finishes/ Woodworking	19	10	29
	1,590	1,085	2,675

Under the Clean Air Act Amendments of 1990, Congress envisioned that each state and territory would need to develop a plan for assisting small businesses in meeting the requirements of the Act. Three (3) specific components requiring assistance and outreach to small businesses were written into the Clean Air Act:

1. The appointment of a state/territorial small business ombudsman;
2. The appointment and ongoing operation of a seven-member state/territorial compliance advisory panel; and
3. The establishment of a comprehensive small business technical assistance program.

Small Business Assistance

Business Ombudsman

The role of the small business ombudsman is to:

Facilitate communication between businesses and the Department of Planning & Natural Resources, and with other environmental regulatory agencies;

- Serve as an advocate for small businesses in the investigation and resolution of complaints and disputes;
- Work to provide small businesses with insight into governmental processes, including informing them of their appeal rights;
- Promote active small business participation in the development of environmental regulations;
- Provide free help to small businesses with grievances related to environmental issues.
- The USVI Small Business Technical Assistance Program was established in January 1993.

SMALL BUSINESS ASSISTANCE PROGRAMS
Serving Small Businesses and the Environment

DPNR/DEP Small Business Technical Assistance Program

Established in January 1993, the USVI Small Business Technical Assistance Program (SBTAP) is managed and administered by the Division of Environmental Protection, Department of Planning & Natural Resources, in partner-ship with the US Environmental Protection Agency. Funded by the DEP's Title V Air Pollution Control Fund, the SBTAP's mission is to assist small business owners in participating in rule development and in complying with clean air and other environmental rules and regulations, in the most cost-effective manner possible.

Through training, education and consultation services, the SBTAP helps small business owners learn how to identify and understand which environmental rules apply to their operations, how to meet those requirements, how to keep records, and how to obtain financing for pollution-control equipment at the best available terms. Assistance is also provided in the form of onsite visits or assessments, which are conducted by SBTAP's environmental engineers and program coordinators.

Small Business Assistance

DPNR/DEP Small Business Technical Assistance Program

SBTAP works to ensure that clean air regulations do not unduly burden small businesses. General services offered by the SBTAP include:

- Assisting small businesses in identifying rules and regulations that apply to their specific industry and operations.
- Responding to questions, providing consultation and information and training and guiding small businesses on how to comply with clean air and other environmental rules.
- Helping small businesses to understand their rights and obligations and assisting them in the identification of and application for environmental financial resources.
- Providing onsite "compliance" assessments for small business facilities. Violations uncovered during the site visit will not result in fines or penalties, provided that such violations are corrected within a reasonable period of time.
- Acting as an advocate for small businesses and providing coordination and assistance in the establishment and ongoing activities of the USVI's small business ombudsman and compliance advisory panel.

Annually, the Small Business Technical Assistance Program reaches over 2,000 individual businesses through its newsletter, telephone and consultation services. It also hosts a variety of environmental training workshops throughout the USVI, with more than 120 members of the business community participating each year. The SBTAP provides these services free of charge through its St. Thomas/St. John and St. Croix District offices.

Compliance & Enforcement

Complying with environmental regulations and protecting both public health and the environment are almost synonymous. These tasks are also not a bad place to start when carrying out our responsibilities of enforcing and assuring compliance with environmental laws and regulations in the USVI.

We take quite seriously our responsibility for compliance and enforcement of environmental regulations as we do our role in the protection of both public health and the environment. The DPNR/DEP is learning to work smarter and more efficiently by endeavoring to provide a more balanced, commonsensible approach to regulating and enforcing environmental protection in our community.

While a major part of our compliance management efforts involve facility and site inspections, permitting, compliance reporting and other environmental monitoring processes, we have learned that in many cases, the quickest means to ensuring compliance with environmental laws and regulations is through information, coordination and collaboration.

The DPNR/DEP strives to work closely and proactively in assisting business and communities with environmental compliance training, guidance, information and other activities that bolster our compliance and enforcement efforts.

Our first notice of an environmental incident often comes directly from the community, in the form of individual citizens calling to inform us of hazardous situations.

To augment and expand our environmental compliance and enforcement resources, we partner and coordinate with other local and national government agencies, such as DPNR's Division of Environmental Enforcement and Coastal Zone Management Program, the VI Police Department, the EPA, the Department of Justice and other organizations.

We have also made substantial progress in environmental compliance and enforcement through business and community education and outreach programs, and technical assistance.

Assistant Director Leonard G. Reed oversees environmental compliance and enforcement matters within the Division of Environmental Protection.

In November 2002, the US Attorney District of the Virgin Islands honored Assistant Director Reed with the US Attorney's LEO Award for "Sustained Exceptional Defense of the Environment."

The Division of Environmental Protection is a regulatory body within the Department of Planning & Natural Resources, Government of the United States Virgin Islands. In collaboration with various DPNR divisions, the Division of Environmental Protection is entrusted with responsibility for environmental protection and with the enforcement of USVI environmental laws and regulations and certain national environmental laws, as delegated by the United States Environmental Protection Agency.

As codified within various chapters of the Virgin Islands Code (VIC), mandates of the Division of Environmental Protection are to protect and conserve the natural resources of the United States Virgin Islands, air, water and land upon which life depends, and the health, comfort and repose of the public.

The DEP has two office locations. The Frederiksted office (pictured) serves the St. Croix community. Serving the islands of St. Thomas and St. John, DPNR/DEP's second office is located in the USVI capital city of Charlotte Amalie, on the 2nd floor of the main Cyril E. King Airport building.

Major operating units, programs and staff numbers managed by the Division of Environmental Protection are shown below.

Unit/Programs	DEP Staff Levels				
	2001	2002	2003	2004	Target
Air Pollution Control	4.5	4.5	8	9	10
Drinking Water State Revolving Fund	2	2	2	2	2
Financial Programs/Administrative	7	8	11	11	12
Groundwater	1.3	1.3	1.5	1.5	1.5
Legal Staff	2	2	4	4	4
Non-Point Source Pollution	2	2	5.3	6	8
Pesticide Control	1	1.5	1.5	1.5	1.5
Public Water System Supervision	6	6	4	4	4
Quality Assurance/Quality Control	1	1	1	1	1
Small Business Technical Assistance	2.5	3	3	3	4
Solid Waste	1	3	4	2	5
Super Fund	1	1	1	1	1
Underground Storage Tank	0.5	0.75	0.75	2	2
Water Pollution Control	6	6	9	9	10
Water Quality Management Planning	1	1	1	1	1
Wellhead Protection Program	0	0	0	0.5	0.5
Wetlands Program	0	0	1	1	1
Total	38.8	43.05	58.05	59.50	68.05

Quality Assurance

The Quality Assurance/Quality Control (QA) Program interacts with and is an essential element of all DPNR/DEP operations and functions. QA is responsible for ensuring that all environmental assessment activities performed by DPNR/DEP personnel are delivered at the highest possible level of quality. This includes responsibility for the collection and generation of internal data as well as oversight of externally collected data.

The EPA requires that all state and territorial agencies involved in the collection and generation of environmental data for the purposes of environmental health protection and compliance develop and maintain a quality assurance program.

Sufficient quality system activities must be in place to provide reasonable assurance that environmental data generated and prepared is scientifically valid, of adequate statistical quantity, of known precision and accuracy, of adequate completeness, representative and comparable and, where required, is legally defensible.

The DPNR/DEP believes that quality assurance in its environmental operations is imperative. Environmental quality assurance provides many benefits. Most important, it contributes to public health and safety, economic development, operational efficiencies, fiscal responsibility, and technical and professional credibility.

Quality Assurance

Major tasks and responsibilities of DPNR/DEP's QA Program include:

1. Development, management and maintenance of the DPNR/DEP's written quality assurance management plan (QAMP).
2. Review and approval of quality assurance project plans (QAPPs) and standard operating procedures (SOPs) for all DPNR/DEP environmental programs. Review and approval of QAPPs and SOPs for all contractors and permittees performing work on behalf of the DPNR and/or permittees.
3. Assisting and working closely with DPNR/DEP program coordinators and supervisors in the implementation of QA activities. Performing system and performance audits of DPNR/DEP technical staff and work practices.
4. Providing technical assistance to programs and obtaining assistance from the EPA's Quality Assurance Office as necessary.
5. Performing annual management system reviews (MSRs) of all applicable DPNR/DEP programs.
6. Performing annual file management and record-keeping audits on all programs.
7. Preparing and submitting quarterly and annual accomplishment reports, in addition to quality assurance work plans.
8. Overseeing the Drinking Water Laboratory Certification Program (DWLC). Performing system and performance audits on the field activities of the Public Water Supply System Program.
9. Ensuring that all contract laboratories used to analyze USVI drinking water samples have been certified to perform these analyses.

Drinking Water Laboratory Certification Program

All environmental laboratories, both government and privately owned, that supply data for decisions relating to compliance with the Safe Drinking Water Act must be certified.

Administration and oversight of the Drinking Water Laboratory Certification Program in the US Virgin Islands is provided under DPNR/DEP's QA Program.

DEP's QA staff manages the day-to-day operations of the Laboratory Certification Program, including the review of laboratory quality assurance plans, performance testing (PT), and the issuance of certifications, pursuant to each laboratory's compliance with all criteria and quality control standards required by the SDWA.

Strategic Planning

Nearly five years ago, we set out to revise planning processes at DEP in an effort to enhance accountability and improve our ability to track performance. To better strategize our vision of the Territory's environmental needs, we took into account not only the values and interests of USVI citizens but those of other stakeholders (local and national, business, government and other sectors) as well. We listened, asked questions, collaborated, learned and relearned. We then initiated constructive changes on how we do business.

Key challenges have been to develop, prioritize and deliver new plans, strategies and work products, both organizationally and culturally, while still meeting ongoing operational mandates and maintaining services to the community and other environmental stakeholders.

With a newfound team spirit, the DPNR/DEP developed and published its 5-Year Strategic Plan, covering fiscal years 2000 through 2005. Work has also begun on the development of a long-term, 25-year environmental vision for the Territory. This undertaking rests high among some of DEP's most comprehensive and significant projects.

New USVI environmental regulations and/or legislation addressing pesticides (use, sales and manufacturing), Underground Storage Tanks and the VI Sewage Infrastructure Research Demonstration Project have been drafted. Efforts to develop several vitally important environmental programs have begun (Vehicle Air Emissions, Brownsfields, Beach Monitoring, etc.).

DPNR/DEP's outreach activities, grant funds awarded to both local businesses and community organizations and grants received by the DEP have set new levels of achievement.

As a result of our renewed and increased public awareness efforts, compliance with public drinking water and waste oil disposal regulations have greatly improved in all sectors, business, government, schools and residential facilities. This report and its contents, which we view as an evolving product, also represent some of the fruits of our labor and new strategies for achieving our environmental objectives.

Strategic Planning

While the DEP is steadily progressing toward its aims, there is much in the short and long-term to be accomplished.

Management and treatment of solid waste and wastewater remain at the top of the Territory's list of critical environmental concerns. Implications of these issues cross many environmental areas, including water quality, public and private drinking water supplies, air pollution, damage to land, ecological systems and other environment interests, and human and animal safety and health.

These environmental concerns, most particularly wastewater treatment and solid waste management (local landfill issues) in the USVI, also have major legal and liability consequences. Recent and prior (1984) legal actions and compliance orders issued by the DPNR and the federal government concerning raw sewage releases and other USVI waste facility/management matters have not been met.

Along with DPNR and federal legal mandates calling for the correction and improvement of the above matters, various organizations, local and national, are working toward the resolution of these very critical environmental matters (i.e., the Government of the US Virgin Islands, the Department of Public Works, DPNR's Division of Environment Protection, other DPNR divisions, the EPA, etc.).

Goals and Opportunities

The Division of Environmental Protection has identified goals, opportunities and strategies, both internally and externally, that affect the Division's activities and the safekeeping of our environment. We have also evaluated and taken into consideration potential obstacles.

Major goals and opportunities of the Division include, but are not limited to:

- Effective and Innovative Environmental Leadership
- Long-Term 25-Year Environmental Vision
- Safe, Healthy and Prepared Communities
- Open, Proactive and Efficient Government
- Informed and Involved Citizens
- Trained, Professional Workforce

We believe our goals to be straightforward and achievable.

Goals and Opportunities

Current and future major DPNR/DEP projects and activities in support of stated goals are summarized below.

Air Quality	Solid Waste Management
• Revise local Air Pollution Regulations to include the control of refrigerants (chlorofluorocarbon). • Issue Title V Operating Permits to all identified air pollution sources that are subject to Title V of the Clean Air Act. • Coordinate, collaborate and initiate efforts to develop a vehicle emissions inspection and monitoring program that will help ensure that USVI vehicles meet national standards for tail pipe emissions.	• Coordinate with local and federal government agencies and provide regulatory oversight to ensure that USVI waste disposal sites are brought into compliance with all applicable laws, both local and federal. • Coordinate and assist in the establishment of a commercial used oil acceptance program at HOVENSA and the Virgin Islands Water and Power Authority. • Permit and regulate all used oil generators and transporters in the Territory.
Underground Storage Tanks	**Pesticides**
• Bring all underground storage tank (UST) owners and operations into compliance with financial responsibility provisions of the USVI UST law.	• Revise and draft new pesticide rules and regulations to meet evolving environmental safety and health issues, and to require local registration of pesticides.
Water Quality & Related Programs	
• Implement the national Grants Reporting and Tracking System (GRTS) as the main reporting vehicle for the 319 NPS Grant Program (i.e., non-point source pollution projects under Section 319 of the Clean Water Act). • Implement Earth Change Permitting Program (responsibility was recently transferred to DEP from another division). • Implement Total Maximum Daily Loads (TMDLs) for Salt River Bay and Marina on St. Croix, and Vessup Bay and Magens Bay on St. Thomas. • Draft and have enacted new groundwater laws and regulations.	• Obtain Territorial Pollutant Discharge Elimination System (TPDES) general permitting authority to efficiently issue storm water and decentralized wastewater systems (OSDS) permits. • Perform inventory and assessment of USVI wetlands. • Establish wetlands restoration in highly impacted areas. • Develop operator certification and training program for operators of community and non-transient non-community public water systems. • Develop and implement regulations for roof-coating materials that reduce potential health risks associated with roof catchment systems.
Education/Outreach & Small Business	**Governance & Quality Assurance**
• Partner with local schools to develop "School Based Environmental Clubs" in an effort to promote and heighten student awareness and interest in USVI environmental matters. Implement and deliver education and outreach programs through hands-on environmental activities and projects. • Develop an environmental video to aid in educating students and the community on environmental protection issues and DPNR/DEP program objectives. • Develop and provide free workshops to educate small businesses within the Territory on regulatory changes, environmental compliance and related subjects.	• Develop departmental Quality Assurance (QA) policy addressing the regulation of wastewater laboratories, training and certification requirements for wastewater operators. • Perform QA audits of all 319 NPS projects that are conducting monitoring to determine proper QA protocol. • Coordinate efforts within the various work units of the Division of Environmental Protection to develop a formal proposal and apply for a Brownfields Voluntary Clean Up Grant from the US Environmental Protection Agency.

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