MAJOR WATER PERMIT APPLICATION

Environmental Assessment Report

Applicant: Trans Americas Fiber (TAF) U.S., LLC.
Project: Butler Bay, St. Croix USVI Trans-Caribbean Fiber System Cable Landing Project

December 2023

Prepared by: Tysam Tech, LLC

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1.00 NAME AND ADDRESS OF APPLICANTS

Trans Americas Fiber (TAF) U.S., LLC.

Mailing Address:

2100 Ponce de Leon Blvd., Suite 1172
Coral Gables, Florida 33134

Physical Address:

2100 Ponce de Leon Blvd., Suite 1172
Coral Gables, Florida 33134

2.00 LOCATION OF PROJECT

The project is located at the following physical address:

Butler Bay Cable Station
4-A Estate North Side
Frederiksted, VI 00840

The Butler Bay, St. Croix, USVI Trans-Caribbean Fiber System Cable Landing Project, is located in northwestern St. Croix, on the coast between Hams Bay and Butler Bay, on Highway 63. The cable landing bores are positioned at 17°45'28.9"N 64°53'22.2"W while the cable station is located at 17°45'28.4"N 64°53'18.0"W. Sections 2.01 and 2.02 include Location and Agency Review Maps and Vicinity Maps, respectively.

2.01 Location and Agency Review Map

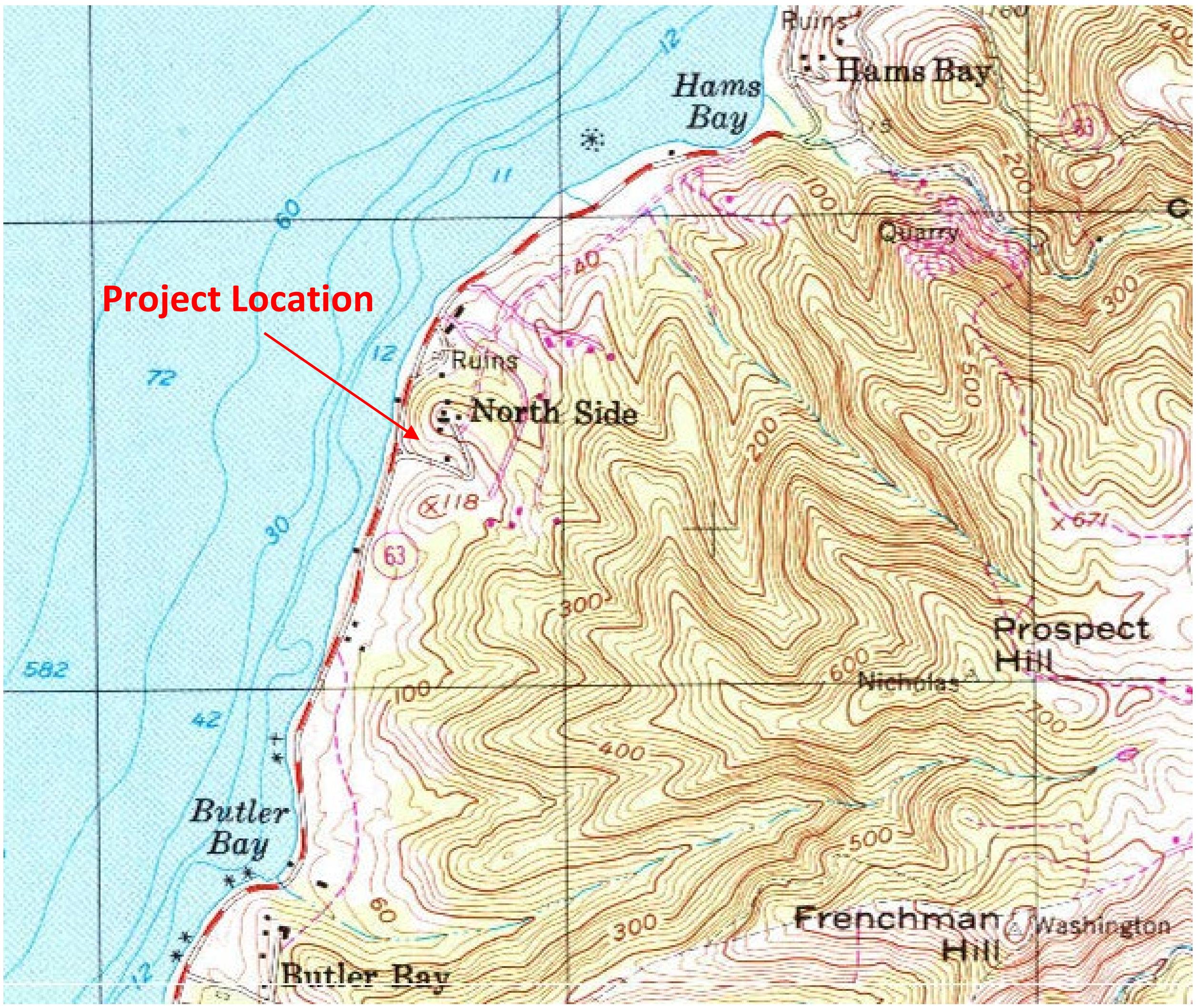

Figure 2.01.1 – Location and Agency Review Map (USGS Quadrangle Map, Frederiksted, VI, 1958, 1966 ed.)

Figure 2.01.2 – Location and Agency Review Map (USGS Quadrangle Map, Frederiksted, VI, 1958, 1983 ed.)

2.02 Vicinity Map

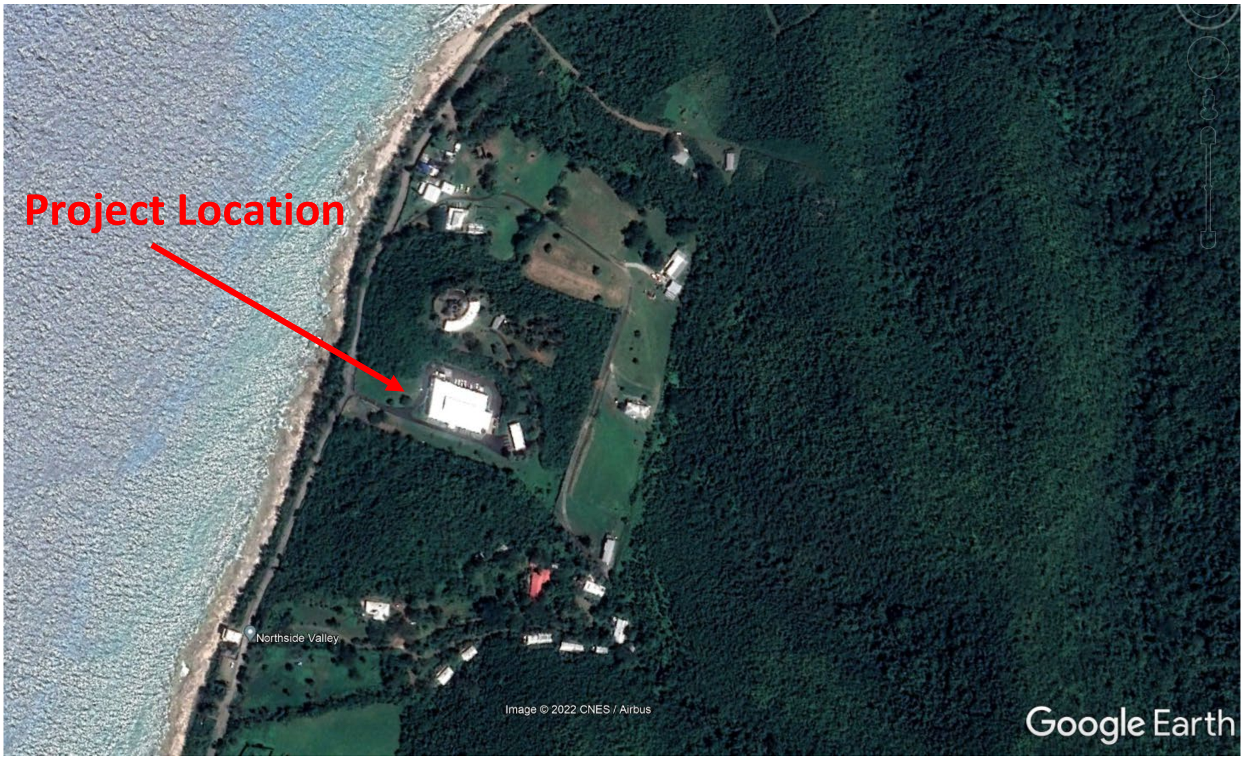

Figure 2.02.1 – Vicinity Map (Google Earth)

Figure 2.02.2 – Vicinity Map (MapGeo)

3.00 ABSTRACT

This project seeks to install an armored telecommunication fiber cable at Butler Bay, St. Croix USVI as part of a major Trans-Caribbean Fiber System venture to improve capacity and connectivity between the continental United States of America and the Caribbean. Of an approximate 4,393-kilometer cable system delineated across numerous segments, 2,166 kilometers will connect between Vero Beach, Florida and Butler Bay, St. Croix. The cable will enter through existing pipeline bores installed at Butler Bay, St. Croix and connect to the AT&T of the Virgin Islands telecommunications building located at No 4-A Estate Northside, St. Croix USVI.

Cable design and type were developed in the planning stages based on engineering considerations identified during the route planning process. The landings were selected to optimize the approach to existing infrastructure, minimize interference with existing cables, and use existing infrastructure where available to install new cable, minimizing environmental impact and maximizing the protection and projected life of the cables.

An important component of the route planning process is the minimization of impacts to the marine environment within the Waters of the USVI, particularly coral reefs and other benthic habitat. Deepwater marine route segment surveys were conducted along the cable route to the approach and entry into USVI Waters, in conjunction with concurrent benthic habitat surveys of the shallow and medium-depth waters from the edge of USVI Waters to shoreline transition points.

The submarine fiber optic cable is proposed to be laid on the seafloor coming from the west from deep water into shallow water at the northwest corner of St. Croix. The cable route terminates underwater at Butler Bay where it will enter an existing capped steel pipe conduit (bore) in shallow water previously installed by AT&T circa 1996.

Existing bores at the St. Croix landing will be used to avoid disruption of the shoreline and shallow water seafloor, as well as following seafloor contours that effectively function as a natural corridor for the cable route (e.g. optimizing use of flat sea bed, avoiding slopes, side-slopes and hard bottom areas where possible). This will allow for a shorter installation timeline with less impact through the use of minimally impacting installation methods.

Benthic surveys of this area were conducted in April, May, October and November of 2022 to identify and quantify the presence/absence of specific marine habitats, namely: coral reef structures (both mesophotic and shallow water), seagrasses, hardbottom, and fisheries habitat that may be impacted by the installation of the cable. In particular, Staghorn coral (Acropora cervicornis) and Elkhorn coral (Acropora palmata) were sought out as both species have historically been reported around the west end of St. Croix. In addition, the five 2014 NOAA-listed threatened coral species (Dendrogyra cylindrus, Orbicella annularis, Orbicella faveolata, Orbicella franksi, and Mycetophyllia ferox) had also been reported in these same waters. After review of the cable approach path through the noted surveys performed, none of these seven species were observed on or near the proposed cable path.

Based on the proposed route, lack of critical, sensitive or protected species within the cable route corridor, and the method of installation of the proposed cable, this project is anticipated to have minimal impact during temporary construction activities as well as long-term presence and operation, while providing a significant benefit to the island of St. Croix.

Anticipated start date of this project is May 2024.

Project Assurances

- Employees' and the public's health and safety are protected with the best available systems and technologies.
- Environmental impact is considered at all times.
- No significant negative impact to environment.
- Air quality is protected.
- Stormwater quality is protected.
- Nearshore water quality is protected.

4.00 STATEMENT OF OBJECTIVES SOUGHT BY THE PROPOSED PROJECT

The objectives of this proposed project are to improve connectivity, reliability, and accessibility of telecommunications and network services in St. Croix, USVI. The cable route and design were developed in the planning stages based on engineering considerations identified during the route planning process. Landings were selected to optimize the approach to existing infrastructure, minimize interference with existing cables, and use existing infrastructure where available to install the new cable, thereby minimizing environmental impact.

5.00 DESCRIPTION OF PROJECT

5.01 Summary of Proposed Activity/Proposed Dates of Construction

a. Purpose of Project

The purpose of the project is to increase telecommunication strength, bandwidth and reliability to minimize the risk of communications disruption by providing cable route diversity and alternative bandwidth access to existing cables in the Atlantic-Caribbean region.

b. Presence and Location of any Critical Area(s) and Possible Trouble Spots

The terrestrial portion of the project is in a largely unpopulated section of northwest St. Croix, along Highway 63, between Hams Bay and Butler Bay.

This is a highly vegetated rural section of St. Croix. An AT&T distribution building on the project site, located at No. 4-A Estate Northside, houses all the necessary infrastructure necessary to connect the proposed cable to active network systems. Existing manholes and bores will be used to install the cable at this distribution center and will not be altered.

The elevation varies from 0 to 60 feet above sea level, and slope is between 0 and 60 percent. The plot comprises approximately 10.9 acres and consists of 3 main structures with supporting driveways and parking that cover approximately 2.2 acres. The remainder is grassed or bush land.

There are no anticipated critical areas or spots for the land-side portion of this project, as existing infrastructure will not be modified, and cable is anticipated to be pulled without need for digging, grading, earth change or damage to existing vegetation, habitat or structures.

The majority of the project activity will take place seaward of the Mean High Tide Line (MHTL). An initial review of Endangered Species in the area, using the U.S. Fish & Wildlife Service (USFWS) Information for Planning and Consultation (IPaC) Tool, indicates there are potentially two endangered turtle species within the proposed project area. These two federal endangered sea turtle species that are known to swim in the offshore waters are the Hawksbill Sea Turtle (*Eretmochelys imbricata*) and Leatherback Sea Turtle (*Dermochelys coriacea*). In addition, the West Indian Manatee (*Trichechus manatus*) has also been found in the offshore waters and are a threatened species.

In-water benthic surveys of this area were conducted in April, May, October and November of 2022 to identify and quantify the presence/absence of all marine habitats, with a focus on identifying: coral reef structures (both mesophotic and shallow-water), seagrasses, hardbottom, and fisheries habitat that may be impacted by the installation of the cable. In particular, Staghorn coral (*Acropora cervicornis*) and Elkhorn coral (*Acropora palmata*) were sought out as both species have historically been reported around the west end of St. Croix. In addition, the five 2014 NOAA-listed threatened coral species (*Dendrogyra cylindrus, Orbicella annularis, Orbicella faveolata, Orbicella franksi*, and *Mycetophyllia ferox*) had also been reported in these same waters.

None of these seven species, mesophotic or other significant reef structures were observed on or near the proposed cable path in shallow-water surveys done through traditional diver transect evaluations. In deeper waters, a Submarine Remotely Operated Vehicle (ROV) was used to videotape the marine environment down to a depth of 108.2 meters (355 feet) along the proposed cable pathway. None of these seven coral species were observed during these deep-water surveys.

As provided in Figure 5.01.1, the proposed route through USVI Waters entails three connecting straight runs, starting from shore through the bore, to a slight jog in the bearing at the borehole, and finally another slight jog in 22 meters deep water (Route Jog Point).

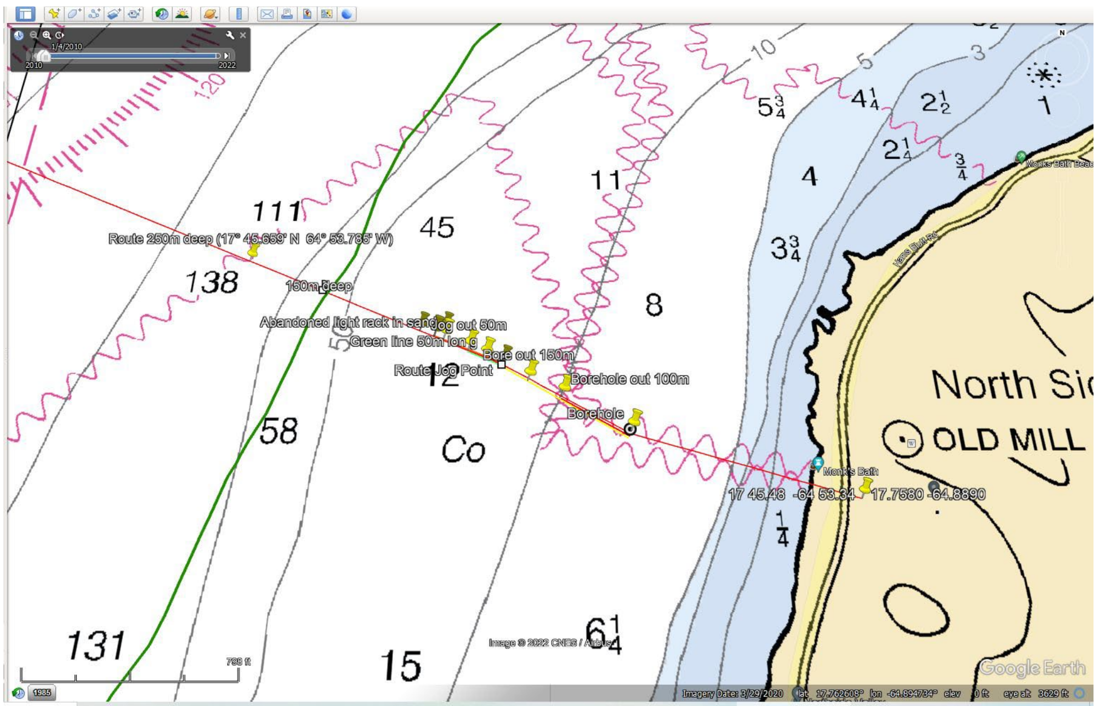

Figure 5.01.1 – Google Earth view using NOAA chart overlay showing proposed cable route in three red straight lines. Yellow pins show: Land termination GPS coordinates, Borehole location and points at various distances in meters from the Borehole including the Route Jog Point. Depths are in fathoms with existing cables shown using purple oscillating lines.

c. Proposed Method of Construction

A specialized transmission cable vessel will lay cable through the majority of the deep-water segments of the full TCFS route, with the assistance of sonar, GPS, and ROVs. As it enters the 3 nm boundary of USVI Waters, the cable placement will transition to small vessel, placing and floating the cable into place with the use of ROVs and eventually divers. The proposed fiber cable will be laid until it reaches the available existing AT&T pipeline bore, where it will be inserted through the bore via cable winch puller, with diver assist and small vessel monitoring. The cable will be pulled to an existing bore manhole (BMH) located on the subject property of AT&T of the Virgin Islands and connected to existing infrastructure at this location.

d. Provisions to Preserve Topsoil and Limit Site Disturbance

As the project involves work in and adjacent to the water line, site disturbance will be minimized and carefully performed, where required. In order to limit site disturbance, the proposed work timeline will be the minimum time required to perform each task to avoid unnecessary disturbance to surrounding areas. The project will stay almost exclusively within the footprint of existing infrastructure. On the landside of the installation activities, no earth change, digging, vegetation or structure removal is required.

In-water work will require no directional drilling, digging or addition/removal of dredged materials.

Any disturbance to the seafloor due to placement activities will be monitored at all times and a Water Quality Plan will be implemented during any in-water activities. If stabilization, pinning or anchoring of the cable is required, these activities will be done by divers and in a manner that minimizes potential sediment or sand plumes in the water.

e. Erosion and Sedimentation Control Methods to be Implemented

The following Best Management Practices (BMPs) will be implemented on the site to control runoff and protect natural resources:

Turbidity Curtain – Due to the work performed within the waterbody, a turbidity curtain will be used to minimize sedimentation during project implementation. These curtains are flexible, impermeable barriers which are weighted at the bottom to ensure that sediment does not travel underneath and are supported at the top through a flotation system.

Design of these BMPs will follow the minimum standards of the VI Environmental Protection Handbook (2002).

f. Schedule for Construction Activities and Implementation of Sediment Control Measures

Approach and installation of the cable is anticipated to begin by September 2023 and be completed by September 2024.

An important component of the route planning process is the minimization of impacts to the environment, particularly coral reefs.

The submarine fiber optic cable is proposed to be laid on the seafloor coming from the west in deep water into shallow water at the northwest corner of St. Croix. The cable route terminates underwater at Butler

Bay where it will enter an existing capped steel pipe conduit (bore) in shallow water previously installed by AT&T circa 1996.

Existing bores at the St. Croix landing will be used to avoid disruption of the shoreline and shallow water seafloor, as well as following seafloor contours that effectively function as a natural corridor for the cable route (e.g. optimizing use of flat seabed, avoiding slopes, side-slopes and hard bottom areas where possible). This will allow for a shorter installation timeline with less impact through minimally impacting installation methods. Shallow water laying will be aided by scuba divers while semi-deep and deepwater laying will be aided by remote operated vehicles.

Turbidity curtains will be installed around cable landing activity as it approaches shallow water and the shoreline. As placement of cable will be done with the aid of divers in shallow water, adjustment to the turbidity curtains will be made as needed through constant communication between in-water crew and boat/shoreline observers.

Figure 5.01.2 – St. Croix Bore Pipe Exits

g. *Maintenance of Sediment and Siltation Control Measures*

Turbidity curtains will be inspected daily during in-water work, with additional monitoring of performance during storms or inclement weather events. Any visible plume of cloudy water passing beyond the curtain from the project area will constitute inadequate performance of the curtain, and cessation of work until the faulty portion of the curtain can be modified, adjusted, or repaired to correct the inadequacy.

The site will be kept clear of litter, debris and materials such as paper, wood, concrete, etc. on a daily basis to prevent trash or construction material entering the water.

h. Method of Stormwater Management

No changes to topography, slope, land cover or use is proposed for this project, and no earth change is proposed for the shore-side portion of this project. As a result, there are no anticipated controls needed for stormwater control or pollution prevention.

i. Maintenance Schedule for Stormwater Facilities

No stormwater facilities existing at the site will be modified or obstructed, and no new stormwater structures or facilities are proposed for this project.

j. Maintenance of Sediment and Siltation Control Measures

No changes to topography, slope, land cover or use is proposed for this project, and no earth change is proposed for the shore-side portion of this project. As a result, there are no anticipated controls needed for stormwater control or pollution prevention and no anticipated maintenance requirements.

5.02 Exhibits and Drawings

5.02.01 Lot Layout (See Attached: Engineer/Surveyor drawings)

5.02.02 Position of Structures (See Attached: Engineer/Surveyor drawings)

5.02.03 Other Required Drawings (See Attached: Engineer/Surveyor drawings)

5.02.04 Required Maps (See Attached: Official Zoning Map, Parcel Map, FIRM)

5.03 Project Workplan

This project to install an armored telecommunication fiber cable at Butler Bay, St. Croix USVI is part of a major Trans-Caribbean Fiber System venture to improve capacity and connectivity between the continental United States of America and the Caribbean. Of an approximate 4,393-kilometer cable system delineated across numerous segments, 2,166 kilometers will connect between Vero Beach, Florida and Butler Bay, St. Croix.

The submarine fiber optic cable is proposed to be laid on the seafloor coming from the west in from deep water into shallower Waters of the USVI from the northwest of St. Croix. As it enters the 3 nm boundary of USVI Waters, it will transition from Lightweight (LW) submarine cable type to more durable Single Armor (SA) submarine cable at approximately 2.24 km offshore (17°46'14.8"N 64°54'20.3"W). At this distance, cable will be placed using the same specialized transmission cable vessel used in deep waters. It will lay cable through the majority of these deeper segments of the USVI Waters for the St. Croix route with the assistance of sonar, GPS, and ROVs.

As the depth gets shallower, the cable placement will transition to small vessel, placing and floating the cable into place with the use of ROVs and eventually divers guiding placement. Within ½ km from shore, the cable will be switched to Double Armor (DA) cable until the route termination point at an existing capped steel pipe conduit (bore) in shallow water (borehole) previously installed by AT&T circa 1996.

The cable will be pulled through this existing pipeline bore installed at Butler Bay, St. Croix and connect to the AT&T of the Virgin Islands distribution telecommunications building located at the referenced project address, No. 4-A Estate Northside, St. Croix USVI.

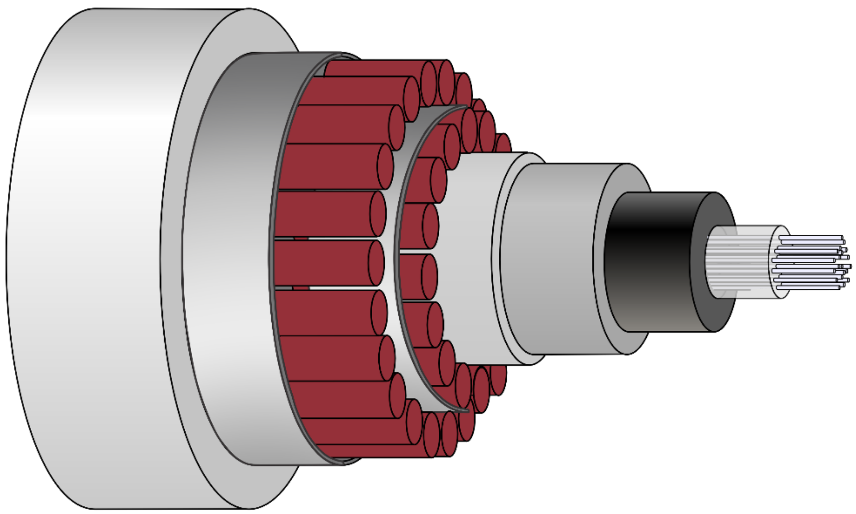

Figure 5.03.1 – Typical Cross-Section of Double Armored Telecommunication line

Table 5.03.1 below provides a summary of the cable route information, including key Location Route Points/Locations, GPS markers, cable depths/distances between those markers and cable type.

Pos No.	Location Marker	Latitude	Longitude	Cable Distance (km) Between Positions	Cable Distance (km) Cumulative Total	Cable Type	Cable Totals By Type (km)	Approx Depth (m)	Comments
1	Approximate BMH, Vero Beach, Florida USA	27 ° 37.960 ' N	80 ° 21.070 ' W		0.000		0.000	3	BEGIN PLSE
				2.030		DA			
5	AC004	27 ° 42.286 ' N	80 ° 01.623 ' W		33.500		33.500	50	
				56.728		SA			
20	AC019	28 ° 00.057 ' N	78 ° 22.766 ' W		228.432		194.932	1000	PLUP - END BURIAL
				51.667		LWP			
29	AC028	27 ° 16.948 ' N	76 ° 47.764 ' W		424.417		195.985	1501	
				18.132		LW			
42	BU 1 (Panama)	22 ° 44.736 ' N	71 ° 46.367 ' W		1171.285			5032	
				23.922		LW			
65	BU 2 (Puerto Rico)	18 ° 47.403 ' N	65 ° 46.782 ' W		1991.066			2131	
				18.831		LW			
69	AC066	18 ° 40.620 ' N	65 ° 27.542 ' W		2027.606		1603.189	1496	
				10.041		LWP			
72	AC069	18 ° 36.980 ' N	65 ° 20.403 ' W		2041.995		14.389	1009	PLDN - BEGIN BURIAL
				8.306		SA			
75	AC072	18 ° 31.120 ' N	65 ° 14.472 ' W		2057.349		15.354	50	
				1.137		DA			
92	AC087	18 ° 10.133 ' N	65 ° 09.868 ' W		2102.941		45.592	38	
				1.176		SA			
94	AC089	18 ° 05.423 ' N	65 ° 09.824 ' W		2111.719		8.778	988	PLUP - END BURIAL
				1.850		LWP			
95	AC090	18 ° 04.430 ' N	65 ° 09.805 ' W		2113.569		1.850	1504	
				13.303		LW			
109	AC104	17 ° 46.569 ' N	64 ° 54.463 ' W		2162.770		49.201	1517	
				0.642		LWP			
110	AC105	17 ° 46.246 ' N	64 ° 54.338 ' W		2163.412		0.642	1008	PLDN - BEGIN BURIAL
				0.147		SA			
111	AC106	17 ° 46.172 ' N	64 ° 54.309 ' W		2163.559			900	
				1.129		SA			
112	AC107	17 ° 45.695 ' N	64 ° 53.919 ' W		2164.688			252	
				0.470		SA			
113	AC108	17 ° 45.535 ' N	64 ° 53.716 ' W		2165.158			88	
				0.175		SA			
114	AC109	17 ° 45.515 ' N	64 ° 53.620 ' W		2165.333		1.921	42	
				0.114		DA			
115	AC110	17 ° 45.502 ' N	64 ° 53.557 ' W		2165.447			19	PLUP - END BURIAL, PLSE - BEGIN
				0.331		DA			
116	Approximate BMH, St. Croix USVI	17 ° 45.483 ' N	64 ° 53.373 ' W		2165.779		0.446	13	PLSE END

TA = Terrestrial Armour (Terrestrial) DA = Double Armour (Submarine) SA = Single Armour (Submarine)

LW = Light Weight (Submarine) LWP = Light Weight Protected (Submarine)

Table 5.03.1 – Summary Cable Route Information

6.00 ECOLOGICAL SETTING AND PROBABLE PROJECT IMPACT ON THE NATURAL ENVIRONMENT

6.01 Climate & Weather

Prevailing Winds

The Virgin Islands lie in the "Easterlies" or "Trade Winds" that traverse the southern part of the "Bermuda High" pressure area. The predominant winds are usually from the east- northeast and east (IRF, 1977). These trade winds vary seasonally and are broadly divided into 4 seasonal modes: 1) December to February; 2) March to May; 3) June to August; and 4) September to November. Below are the characteristics of these modes as taken from Marine Environments of the Virgin Islands Technical Supplement No. 1 (IRF, 1977), and based on U.S. Naval Oceanographic Office data.

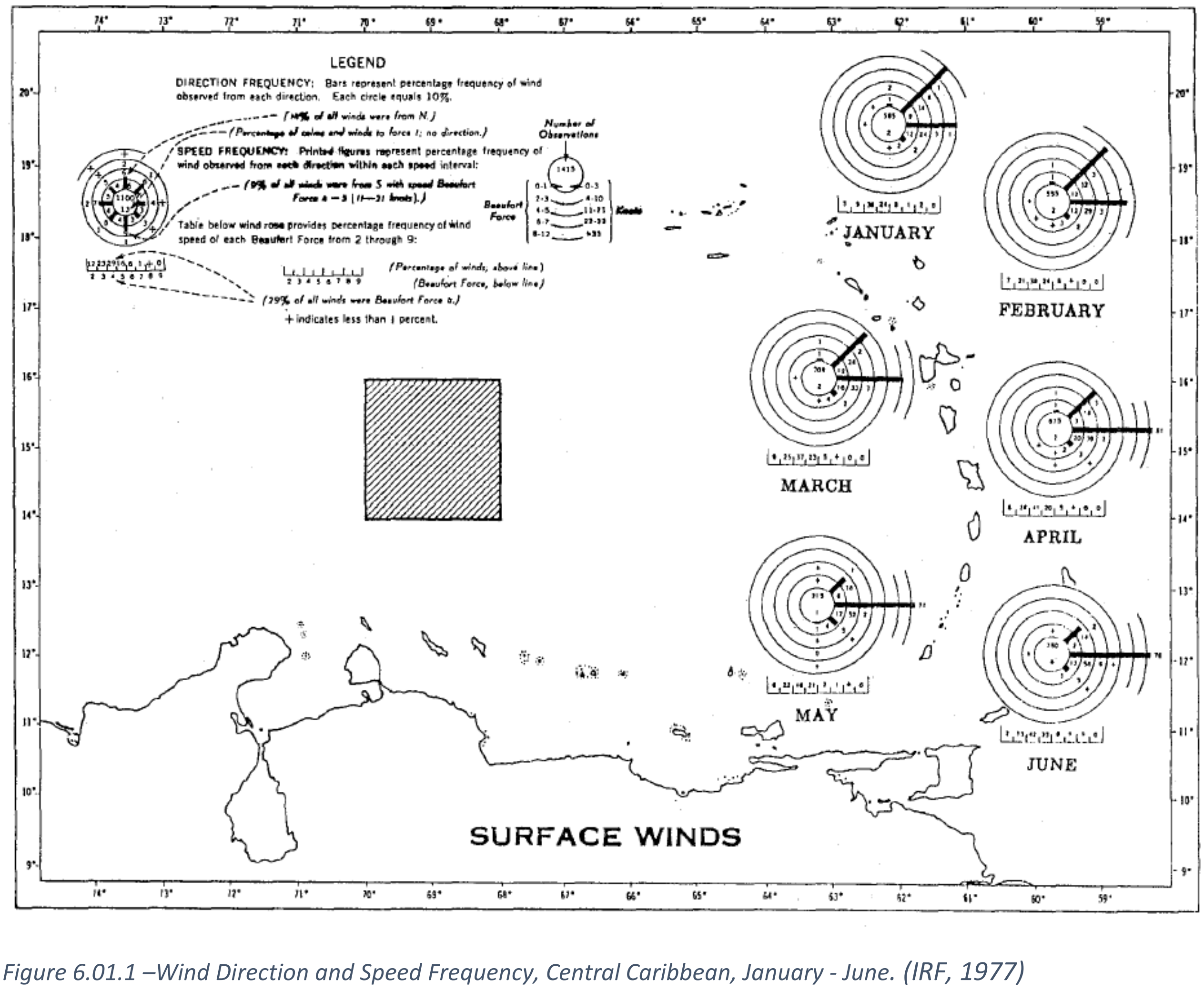

Figure 6.01.1 –Wind Direction and Speed Frequency, Central Caribbean, January - June. (IRF, 1977)

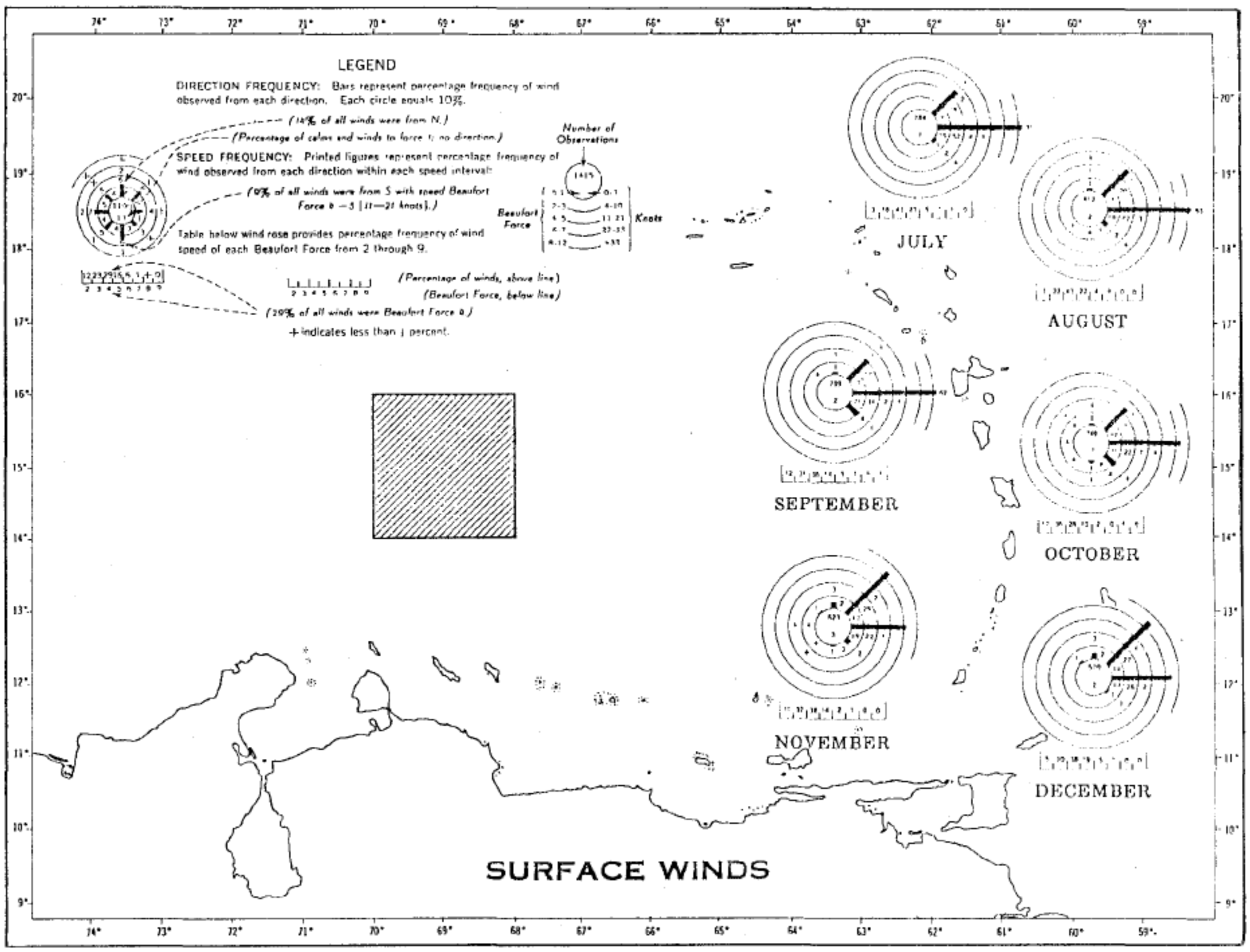

Figure 6.01.2 –Wind Direction and Speed Frequency, Central Caribbean, July - December. (IRF, 1977)

December – February

During the winter, the trade winds reach a maximum and blow with great regularity from the east-northeast. Wind speeds range from 11 to 21 knots about 60% of the time in January. This is a period when the Bermuda High is intensified with only nominal compensation pressure changes in the Equatorial Trough. The trade winds during this period are interrupted by “Northerners” or “Christmas Winds,” which blow more than twenty knots from a northerly direction in gusts from one to three days. Such outbreaks average about thirty each year. They are created by strengthening of high-pressure cells over the North American continent, which, in turn, allow weak cold fronts to move southeastward over the entire Caribbean region. These storms are accompanied by intermittent rains, clouds and low visibility.

March – May

During the spring, the trade winds are reduced in speed and blow mainly from the east. Winds exceed 20 knots only 13% of the time in April. The change in speed and direction is the result of a decrease of the Equatorial Trough.

June – August

Trade winds reach a secondary maximum during this period and blow predominantly from the east to east-southeast. Speeds exceed twenty knots 23% of the time during July. The trend for increasing winds results from the strengthening of the Bermuda High and a concurrent lowering of the pressure in the Equatorial Trough. Trade winds during this period are interrupted by occasional hurricanes.

September – November

During the fall, winds blow mainly from the east or southeast and speeds reach an annual minimum. Only 7% of the winds exceed 20 knots in October. The low speeds result from a decrease in the Equatorial Trough. During this period, especially during late August through mid-October, the normal trade wind regime is often broken down by easterly waves, tropical storms and hurricanes.

Storms and Hurricanes

There are numerous storm events each year, from squalls and thunderstorms to hurricanes. Standard rain events occur most frequently during the summer, lasting only a few hours and causing no pronounced change in the trade winds.

A tropical cyclone whose winds exceed 74 miles per hour is termed a hurricane in the northern hemisphere and can range in strength from causing little to no damage, to destroying. These hurricanes occur most frequently between August and mid-October with their peak activity occurring in September.

Figure 6.01.3 depicts NOAA data on historic Hurricanes and Tropical Storms in the vicinity of St. Croix.

Figure 6.01.3 – Historic Tracks of Hurricanes and Tropical Storms for St. Croix (NOAA)

Climate

The climate of St. Croix, as well as that of the entire territory, is characterized by generally fair, tropical weather with usually consistent wind speed and direction. Temperature swings are narrow, both seasonally and diurnally.

The closest weather station to the facility is Christiansted AP, Meteorological Station ID: VQW00011624. Climate data from this station is found below in Table 6.01.1.

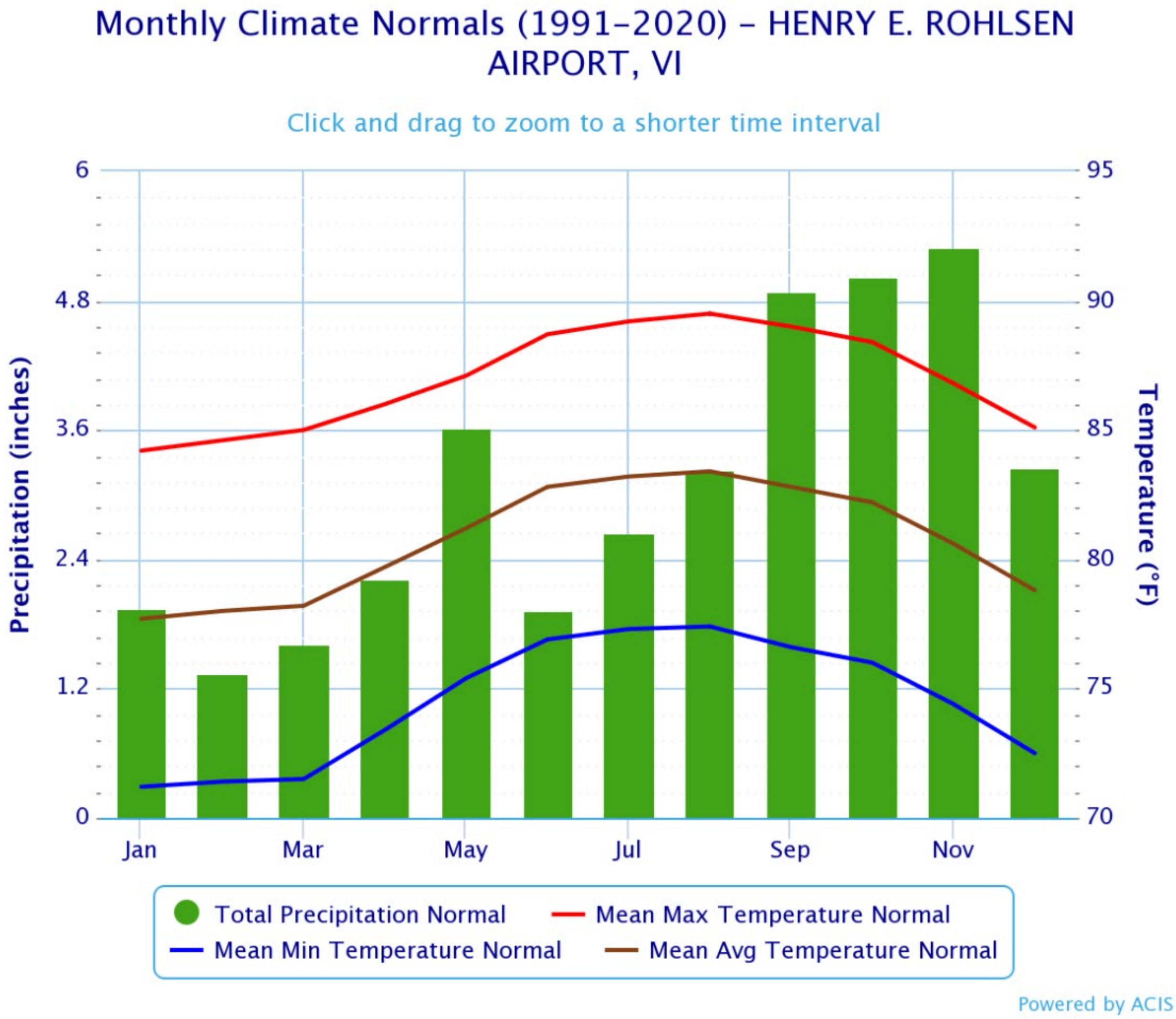

Table 6.01.1 –Average Temperatures at St. Croix Airport (NOAA)

The nearest NOAA National Ocean Service Weather Station is located in Lime Tree Bay, St. Croix, Station LTBV3 – 9751401. Climate data from this station is found in the tables below. Table 6.01.2 depicts the average wind speed (in knots) during each calendar month while Table 6.01.3 illustrates the peak wind gust (in knots) for each calendar month at the above-referenced weather station.

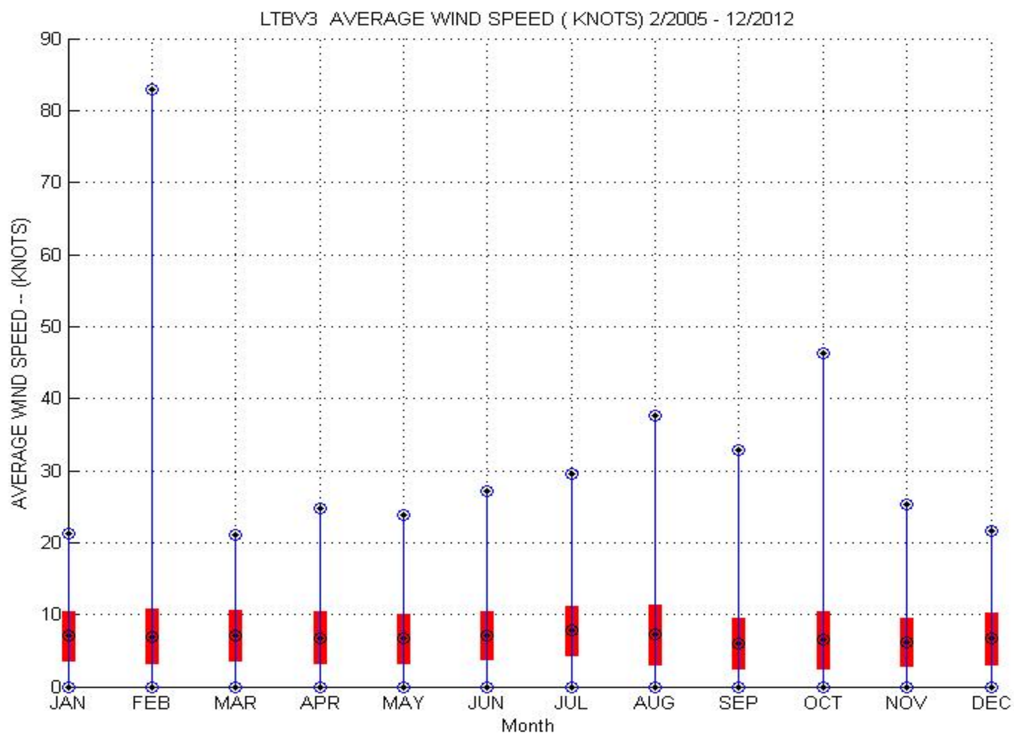

Table 6.01.2 – Average Wind Speed - Limetree Bay, St. Croix (NOAA)

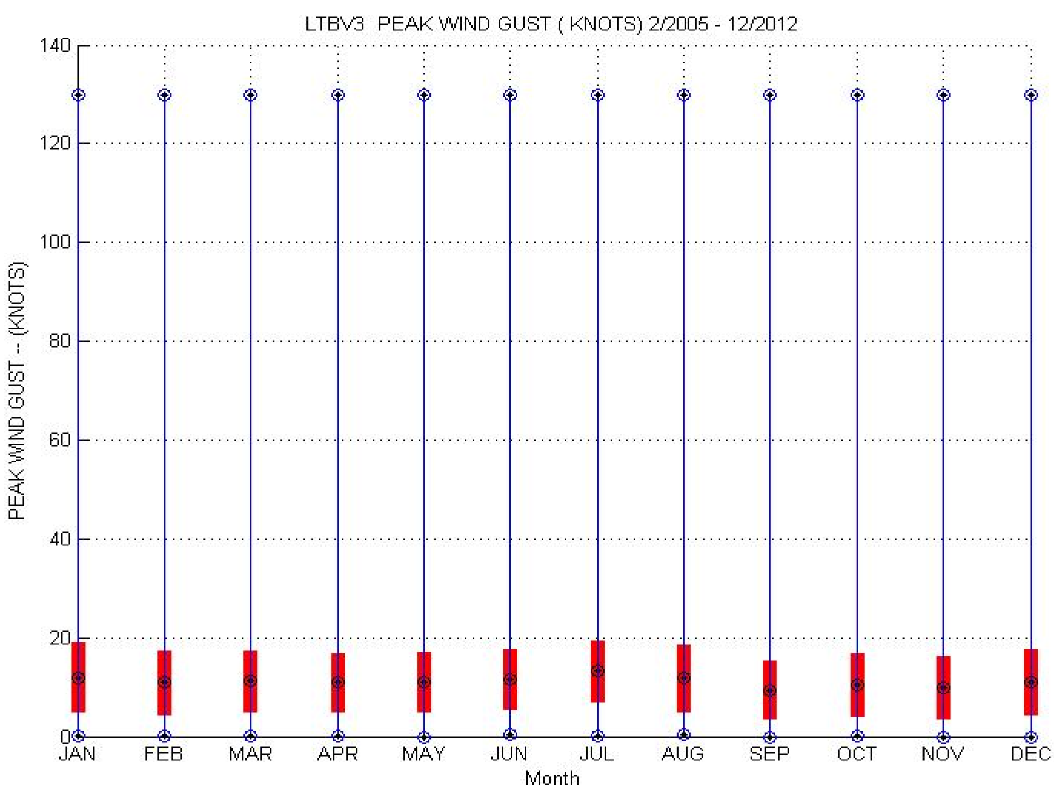

Table 6.01.3 – Peak Wind Gust - Limetree Bay, St. Croix (NOAA)

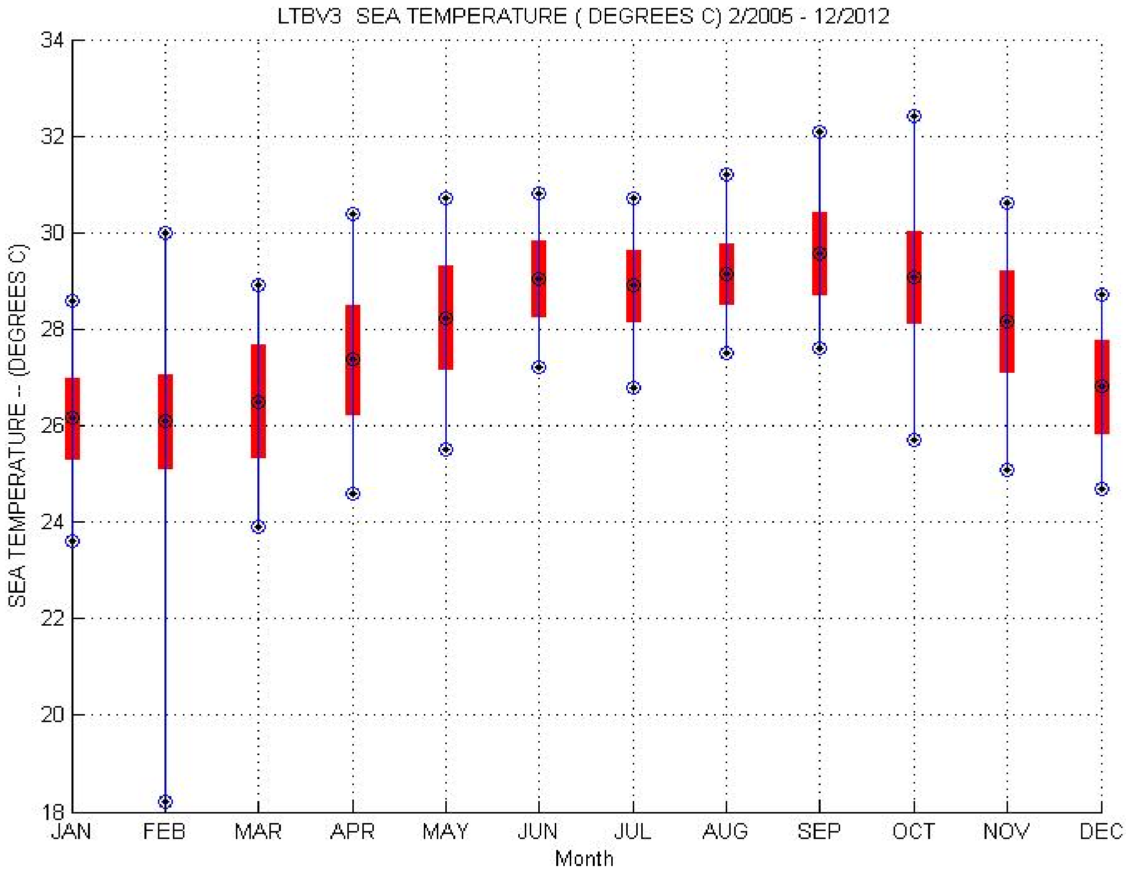

Table 6.01.4 – Average Sea Temperatures - Limetree Bay, St. Croix (NOAA)

The average annual rainfall on St. Croix is about 40 inches, ranging from about 30 inches in the east to more than 50 inches in the mountains of the northwest. Average annual temperature is a moderate 79°F, with an average low in winter of 76°F and an average high in summer of 84°F; temperatures are 2 to 3 degrees lower at altitudes of 800 to 1,000 feet. Occasionally, maximum daily temperatures will exceed 90°F and minimum temperatures will be less than 70°F. Prevailing wind direction is from the east or northeast.

Rain generally occurs in brief, intense showers of less than a few tenths of an inch. Rains exceeding one inch in 48 hours occur about 7 or 8 times a year in the central part of the island; they are slightly more frequent in the mountains of the northwest and less frequent in the eastern part. February and March are the driest months and September is the wettest. Nearly half the average annual rain falls from August through November. Large storms can occur in any month although more likely during July to November, the hurricane season. (Jordan, 1975).

Impact of Wind, Climate and Weather on the Proposed Project

The applicant has carefully analyzed both climate and weather. The proposed cable system has been designed to have structural stability to withstand wave stresses and current forces through the anchoring mechanisms to be incorporated. It is not anticipated that there will be any impact from climate or weather on the proposed project, neither from routine events nor extreme weather events such as hurricanes while the cable is laid on the seafloor. The cable line profile will follow the sea floor contours, and the existing infrastructure structures will not extend farther than typical natural contour bumps, as such, no provisions for the structural design are needed to ensure safe navigation of seafaring vessels.

6.02 Landform Geology, Soils and Historic Land use

Geology of St. Croix

St. Croix is the southernmost island of the U.S. Virgin Islands, lying 40 miles south St. Thomas and separated from it by an ocean trench 3,600 meters deep. It lies about 95 miles southeast of San Juan, Puerto Rico. St. Croix is the largest island in the USVI, with a total area of 82 square miles. The island is approximately 22 miles long, east to west and is about 7 miles in width. St. Croix is geographically located in the Lesser Antilles and lies completely within the Caribbean Sea.

The Virgin Islands are near the northeastern corner of the present Caribbean Plate, a relatively small trapezoidal-shaped plate which is moving eastward relative to the North and South American continents carried on the American Plate. The arc of the Lesser Antilles is an active volcanic arc above a subduction zone in which Atlantic oceanic crust of the American Plate is carried downward under the Caribbean Plate. The Caribbean Plate is sliding past North and South American plates along east-west trending northern and southern boundaries. The western boundary is a subduction zone in which the Cocos Plate is being driven northeastward and down under the edge of the Caribbean Plate west of Central America (Rogers, 1988).

St. Croix lies on a somewhat isolated, submerged ridge separated from the Puerto Rico Bank by the Virgin Islands Basin. Geologically it is related to the islands of the Puerto Rico Bank. If St. Croix was ever connected to the northern Virgins, it may have been separated from that group by either block (Meyerhoff 1927, Whetten 1966) or shear faulting (Adey 1977). Figure 6.02.1 below illustrates the bathymetry contours specific to the area directly around the island of St. Croix, USVI.

The oldest rocks exposed on St. Croix are epiclastic volcanic sandstone and mudstone of the Caledonia Formation (Whetten 1966). These weakly metamorphosed, uplifted, folded and faulted rocks were derived from volcanic and other narrow-trench sediments originally deposited by turbidity currents on the deep ocean floor about 70 to 80 million years ago (Adey 1977). Buck Island is an emergent part of the St. Croix shelf.

Somewhat later in the Cretaceous, one or more volcanoes formed on the sea floor to the south or southeast of St. Croix. Volcanic debris was shed northward to form the Judith Fancy formation, composed of tuffaceous sedimentary rocks, which occur on St. Croix but not on Buck Island.

St. Croix was uplifted above sea level in the Oligocene (Whetten 1974), originally as two islands. The East End Range (including proto-Buck Island) and the Northside Range were separated by a trough several miles wide. The trough was subsequently filled in by the deposition of the Kingshill marl formation. There then followed a period of mild deformation, post-Miocene uplift, and erosion to form the present-day topographic features (Rogers, 1988). Therefore, the island of St. Croix consists geologically of two predominant mountainous areas (the North side and the East End ranges), with a central sediment filled valley in between.

The limestone and marls that overlay the Jealousy formation are known as the Kingshill formation. After these formations were deposited, the area underwent another period of uplifting, the two islands became connected by the newly emergent filled-in area, and the island of St. Croix was formed. Since that time, geologic activity has been limited primarily to the erosion of sediments and the formation of ponds, beaches, reefs, and beach rock coast.

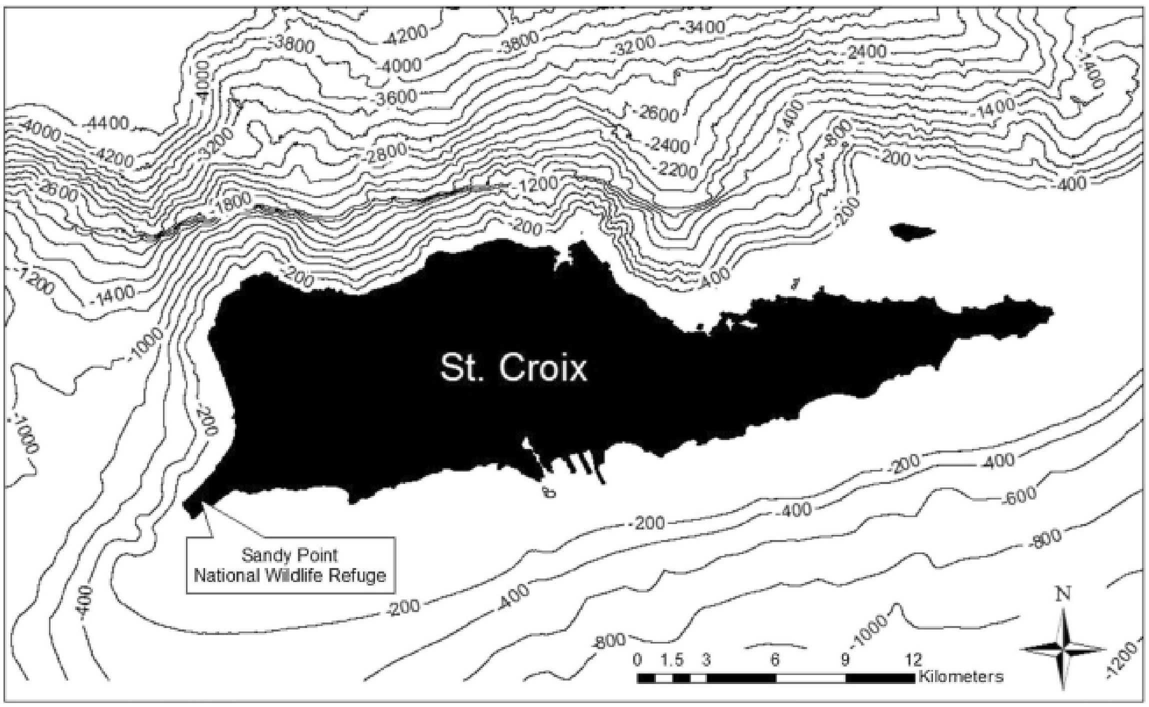

Figure 6.02.1 – Bathymetry contours in meters around St. Croix, US Virgin Islands (Hill J. et al, 2016)

Two large basins, the Virgin Islands Basin and the St. Croix Basin, separate St. Croix from the other Virgin Islands. Within the distance between St. Croix and St. Thomas (about 40 nautical miles), hydrographic charts show that the ascent from the sea floor north of St. Croix is as much as 70 degrees. Frasetto and Northrop (1957) indicate that this northern topographic slope extends downward to the Virgin Islands Basin at a gradient up to 43 degrees. There is an ascent of 13,656 feet within a horizontal distance of 25,800 feet, terminating with the steep north coast in the vicinity of Hams Bluff. Meyerhoff (1927) suggested that this block faulting took place during the late Pliocene or early Pleistocene, prior to which St. Croix was physically attached to the northern Virgin Islands.

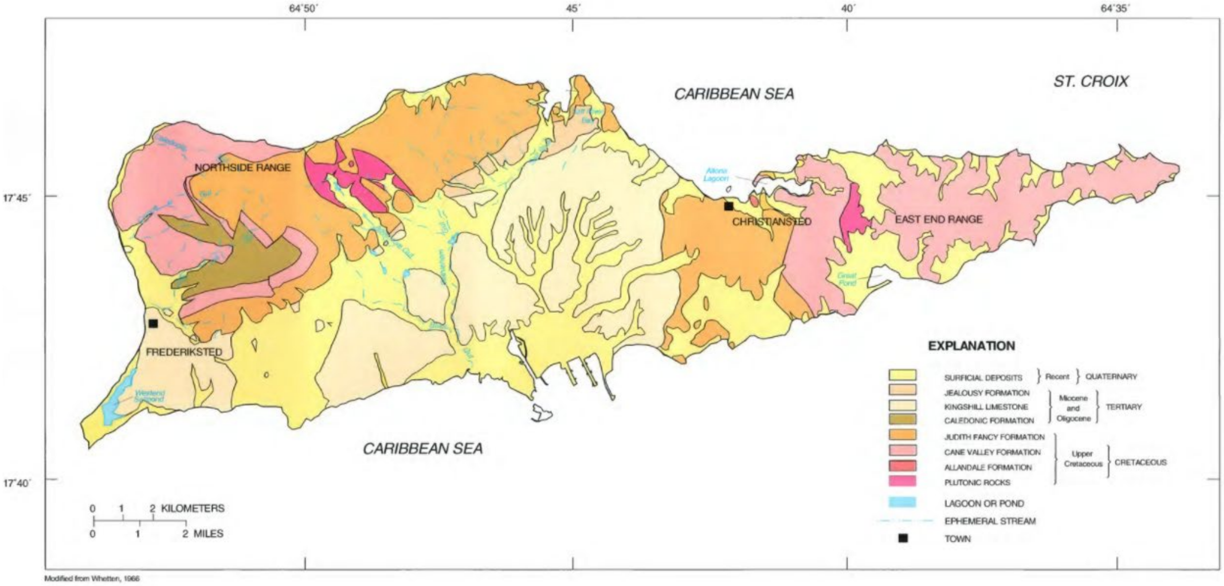

Figure 6.02.2 – Generalized surficial geology in St. Croix, U.S. Virgin Islands (Veve & Taggart, 1996)

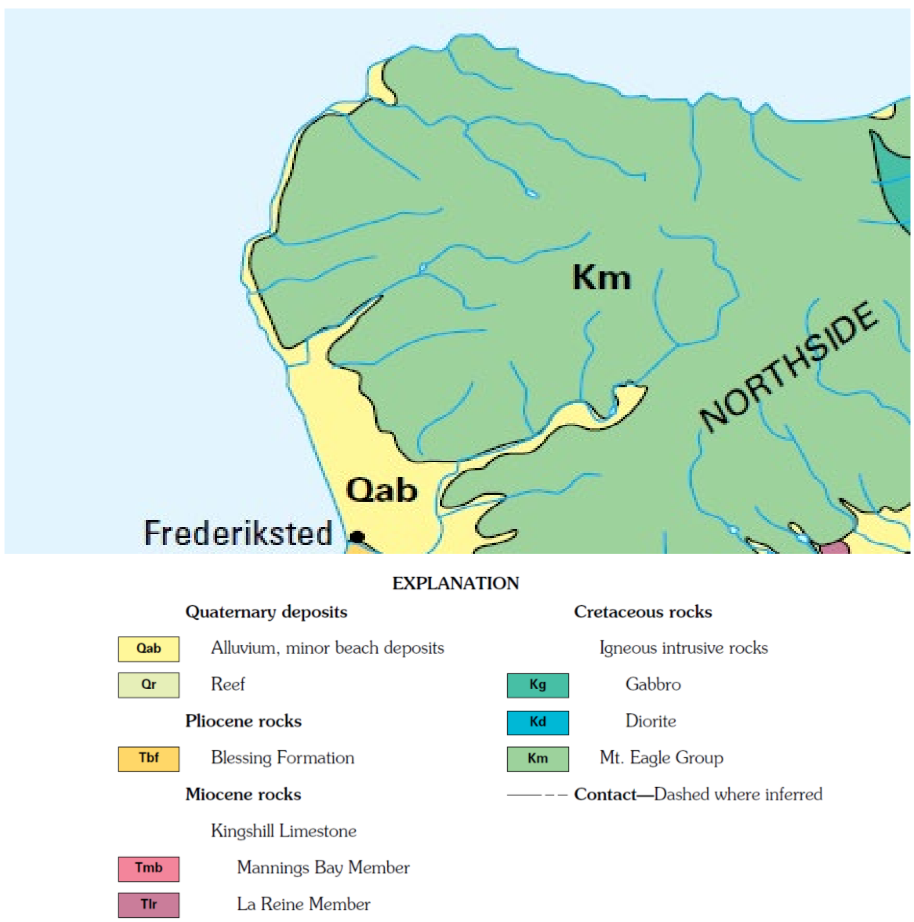

Figure 6.02.3 –Geological formations in the vicinity of project site (Renken R., 2002)

Geology

The project site is located at 17°45'28.4"N 64°53'18.0"W, along Highway 63, Hams Bluff Road. The Custom Soil Survey by the National Resource Conservation Service (NRCS) identifies the soil type for the project area as mostly Glynn gravelly loam (GyC) with parts of the project extending into areas with Annaberg-Cramer complex (AcF) and Beaches, rock outcrop (BrB). See Figure 6.02.4 below for details.

Glynn gravelly loam are very deep, well-drained, and moderately slowly permeable soils on alluvial fans and terraces. They formed in alluvial sediments weathered from volcanic residuum. GyC slopes vary from 5 to 12 percent.

Annaberg-Cramer complex are well drained and extremely stony soils that are not suitable for recreational uses, cultivated crops, or wildlife habitat. These soils are generally found on summits and side slopes of volcanic hills and mountains. AcF slopes vary from 40 to 60 percent.

Rock outcrop beaches consist of unvegetated areas of limestone rock adjacent to the sea. These areas are prone to flooding and subject to frequent ponding for long periods. Onsite investigation is recommended to determine suitability for any use. BrB slopes range from 0 to 5 percent. (USDA, 1994)

Elevation at the project site varies from 0 to 60 feet above sea level.

Figure 6.02.4 – Soil types in project vicinity (MapGeo)

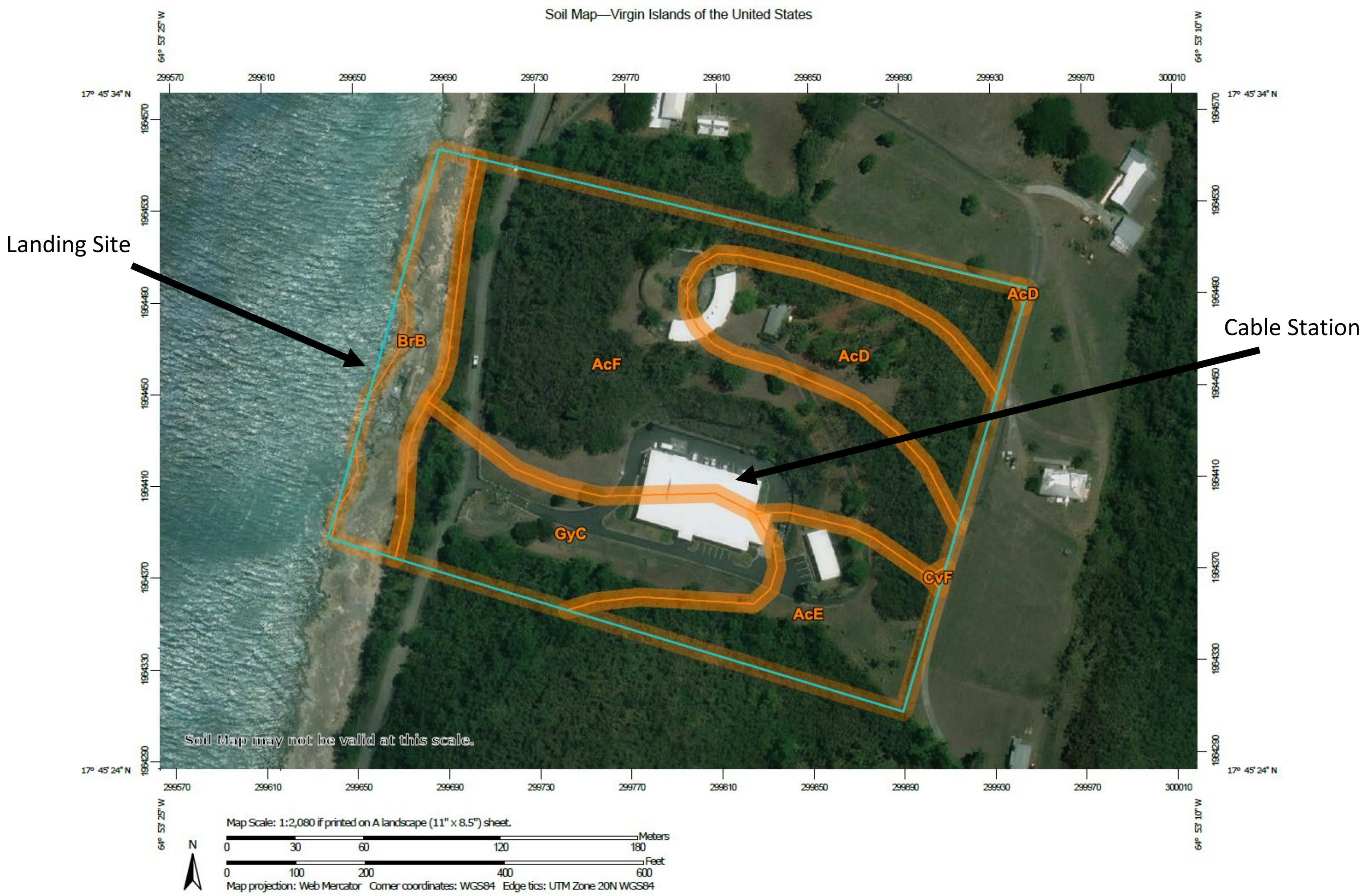

Figure 6.02.5 – Soil types in project vicinity (NRCS Soil Map)

Historic Use

The land has been used as a communications hub for AT&T since the mid-nineties, when telecommunication cables were installed along with horizontal direction drilling of bores to house the cables.

Figure 6.02.6 – 1999 Historical Photo, Butler Bay, Source: NOAA.

Historical use of the area during the colonial period, which includes Butler Bay, Prospect Hill and Estate Northside, included a developed plantation and mill, with associated support structures such as slave quarters and agricultural land. From Oxford's 1794 survey maps, the existing mill that sits on the property was a horse mill and the Butler Bay Plantation proper was submitted to the National Register of Historic Places in August 1977.

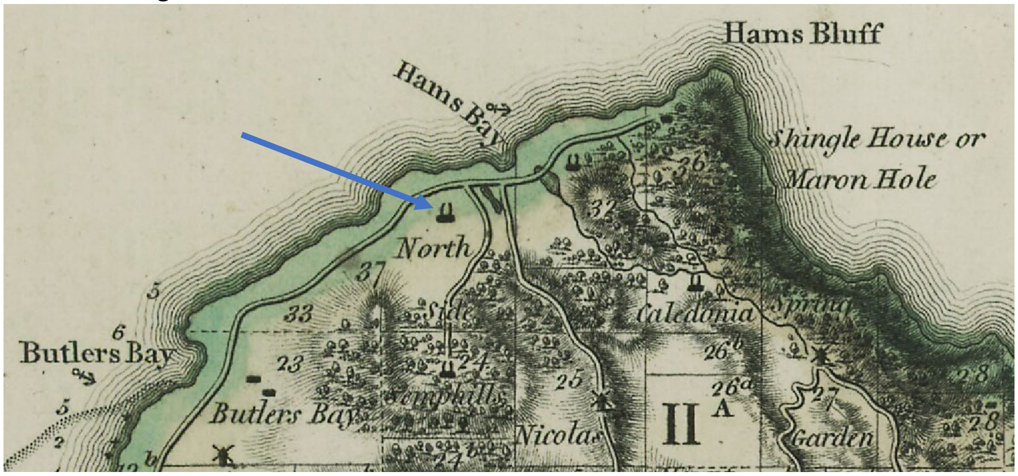

Figure 6.02.7 – 1794-1799 Oxholm Survey Map of St. Croix, USVI (Danish National Archives)

Seismic Activity

The Puerto Rico/Virgin Islands region is located at the northeastern corner of the Caribbean plate where motions are complex. The westward-moving North American plate is being driven under the Antilles Arc where volcanism is active. On the north side of the plate corner, the North American plate slides past the Caribbean but irregularities in the plate boundaries cause stresses that result in a complicated under thrusting of plate fragments. The interaction of plates causes the volcanism of the Antilles Arc on the eastern boundary of the Caribbean plate and creates major stresses all along the northern boundary (Nealon & Dillon, 2001).

Since the 1867 Virgin Islands Tsunami cause by a magnitude 7.5 earthquake in the Anegada trough (USC Tsunami Research Center), there has been continuous low intensity activity all below 6.0 Richter. Over the last several years, numerous minor tremors have been felt on the island. This increased activity is associated with the volcanic eruptions that have been occurring to the southeast on the island of Montserrat.

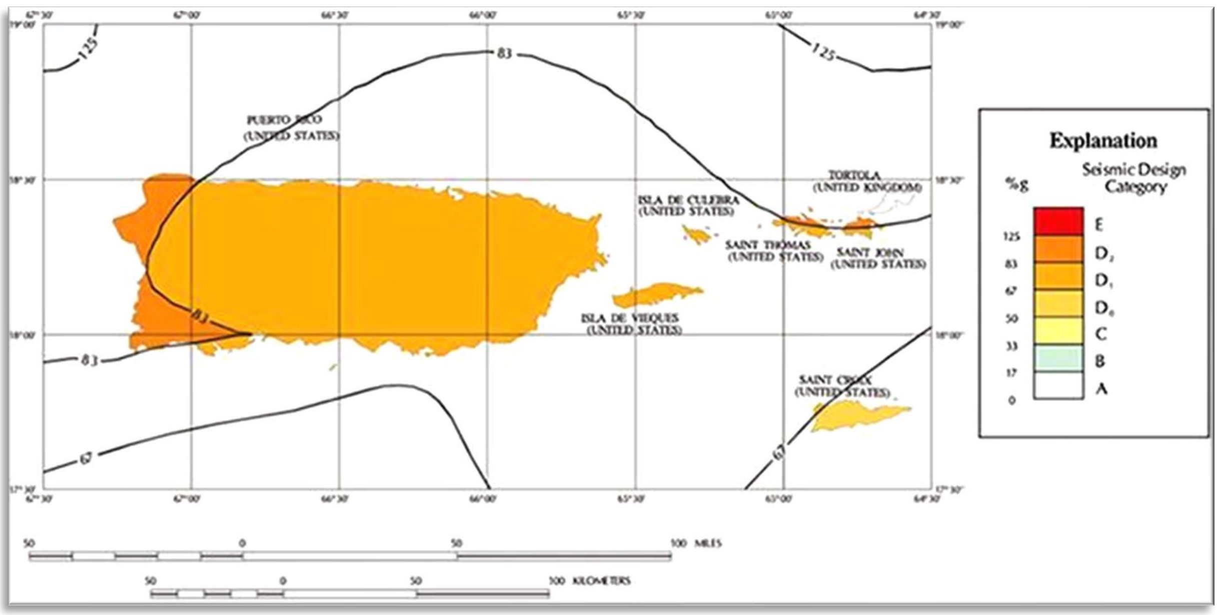

Figure 6.02.5 –FEMA Earthquake Hazard Map, Puerto Rico (FEMA Earthquake Hazard Maps)

Impact of Geology on Proposed Project

The applicant has carefully considered landform, geology, soils and historic land use. The project has been designed to be consistent with these conditions, and as the proposed project plans to utilize existing infrastructure and conduct little to no earth movement to minimize impact on the surrounding area and geology.

6.03 Drainage, Flooding and Erosion Control

a. Impacts of Terrestrial and Shoreline Erosion

This project will not alter impervious surfaces to the site, or change topography or contours for the site. There will be no impacts to terrestrial and shoreline erosion since existing bores and manholes will be used to connect the cable to the existing communications building and infrastructure. The proposed development will not alter the existing drainage patterns of the site. If required, standard sediment and erosion BMPs will be implemented when performing any site work and will be maintained throughout the life of the project.

b. Relationship of the Project to the Coastal Flood Plain

Review of Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM) for U.S. Virgin Islands Index indicate that part of the project area is within flood zones rated Zone X and Zone VE. See below in Figure 6.02.6 which is a portion of FIRM Panel 0066G, increased in size for clarity, depicting site location (red box) relative to flood zones. Project location rated Zone X has been determined to be outside the 0.2% annual chance floodplain. Zone VE is known as a coastal flood zone with velocity hazard (wave action) and a base flood (100-year flood) elevation of 12 feet.

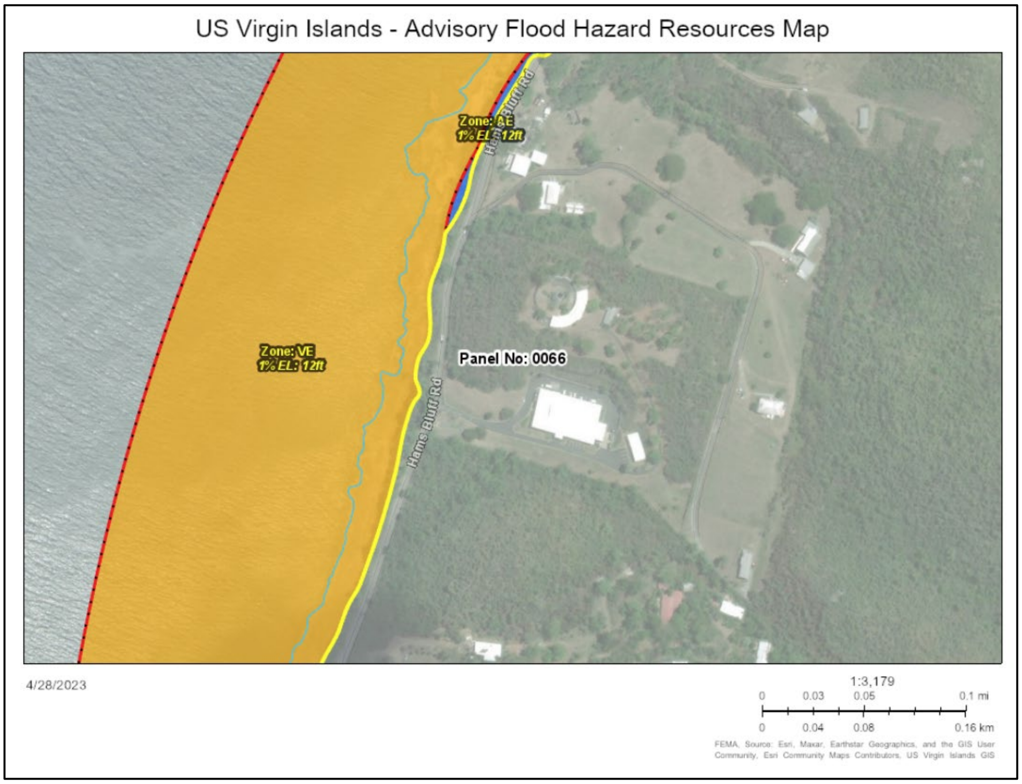

Figure 6.03.1 – Section of Flood Insurance Rate Map (FIRM) Panel 0066G, 66 of 94. (2018)

6.04 Fresh Water Resources

St. Croix, USVI is limited in the number of freshwater resources to a few wells located around the island and mostly intermittent and ephemeral streams and ponds which dry up during periods of limited rainfall. The west end of the island where the project is located sees more rainfall and therefore has more consistent sources of freshwater. Some perennial streams and freshwater ponds/basins do exist, particularly near the rainforest adjacent to the project site, but not as a reliable source of freshwater. The majority of potable water is either captured by rooftops or from wells and stored in cisterns or is desalinated seawater. The project is not located in or will affect any freshwater source in the area and will have no negative impact on the availability of freshwater resources.

6.05 Oceanography

a. Seabed Alteration

Laying cables can potentially lead to seabed disturbance, damage, displacement, or disturbance of flora and fauna, increased turbidity, as well as alteration and remobilization of contaminants from sediments. These effects are primarily restricted to the installation, repair and/or removal phase and are generally temporary. In addition, their spatial extent is limited to the cable corridor, which can be up to 10 m width if the cable has been ploughed into the seabed (OSPAR 2009). Some mobile benthic species (for example, crabs) are able to avoid most disturbance whereas sessile (bivalves, tubeworms etc.) and sensitive species (such as slower growing or fragile species) will be more impacted (OSPAR 12/22/1, Annex 14).

A double-armored submarine fiber optic cable is proposed to be laid on the seafloor coming from the west from deep water into shallow water at the northwest corner of St. Croix. The proposed approach path is provided in the attached drawings. The cable route terminates underwater at Butler Bay near a site known as Monk's Baths. Here it will enter an existing capped steel pipe conduit in shallow water (borehole) previously installed by AT&T circa 1996. The bore hole to the sand halo habitat section of the proposed cable path is inhabited almost entirely by the invasive sea grass *Halophila stipulacea.* There are scattered occurrences of sponges and soft corals but none are anticipated to be impacted by the cable's installation. During cable laying activities the cable can be easily repositioned by divers to any location near the proposed path before it even reaches the bottom. A denser abundance of scattered sponges and soft corals can be found in the sand halo habitat section of the cable path than the previous section. The cable will be positioned to be entirely in sand in this area and will likely bury itself rather quickly over time.

The final section where the route ends at the West End Wall, found along most of the west coast of St. Croix, the bottom drops off steeply starting at approximately 100 feet in depth at the western edge of the sand halo. The habitat is a homogenous mix of sponges and soft corals scattered throughout. As with the other two habitat types, the placement of the cable can be made to avoid any potential critical habitats or living organisms. This avoidance is possible because the density of organisms in this habitat is not high. The project is anticipated to have very little alteration or impact to the existing seabed along the entire route.

b. Tides and Currents

The Caribbean current is a powerful surface oceanic current passing west through the Caribbean Sea, then north through the Yucatan Channel, then east out to the Straits of Florida to form the Florida Current and join the Gulf Stream (See Figure 6.05.1). These surface currents are driven by the North Equatorial Current. The warm Caribbean Current, derived from the junction of the North Equatorial Current and the Guiana Current, flows at an average rate of 38 to 43 cm (15 to 17 inches) per second and transports about 27.5 million cubic meters (~1 billion cubic feet) of water per second (Britannica, 2007).

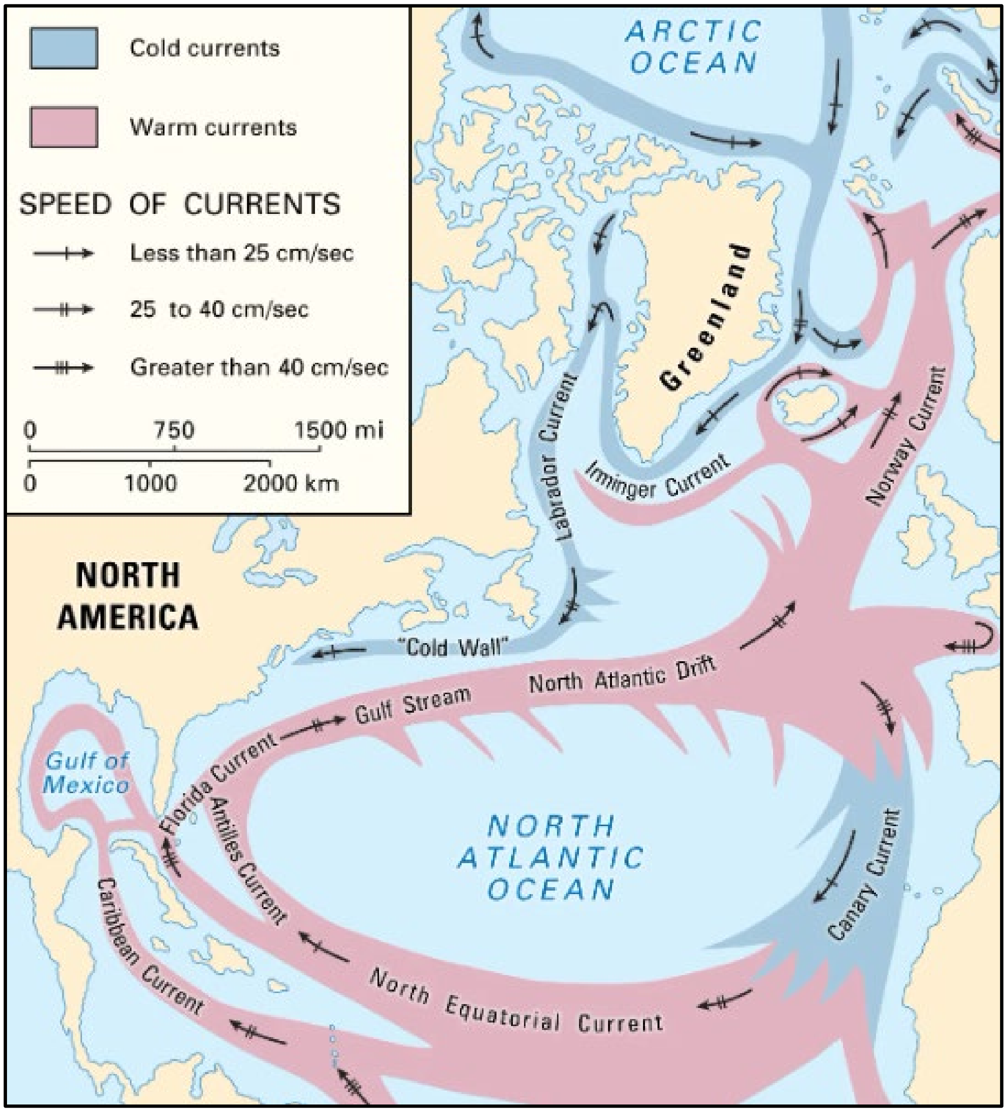

Figure 6.05.1 – Major currents, North Atlantic Ocean (LaMourie, 2021)

These currents change very little from season to season with the currents coming more from the south during the summer months (Figure 6.05.2). As the figure illustrates, there is usually a westerly current observed between St. Croix Island and St. Thomas Island (NOAA – BookletChart).

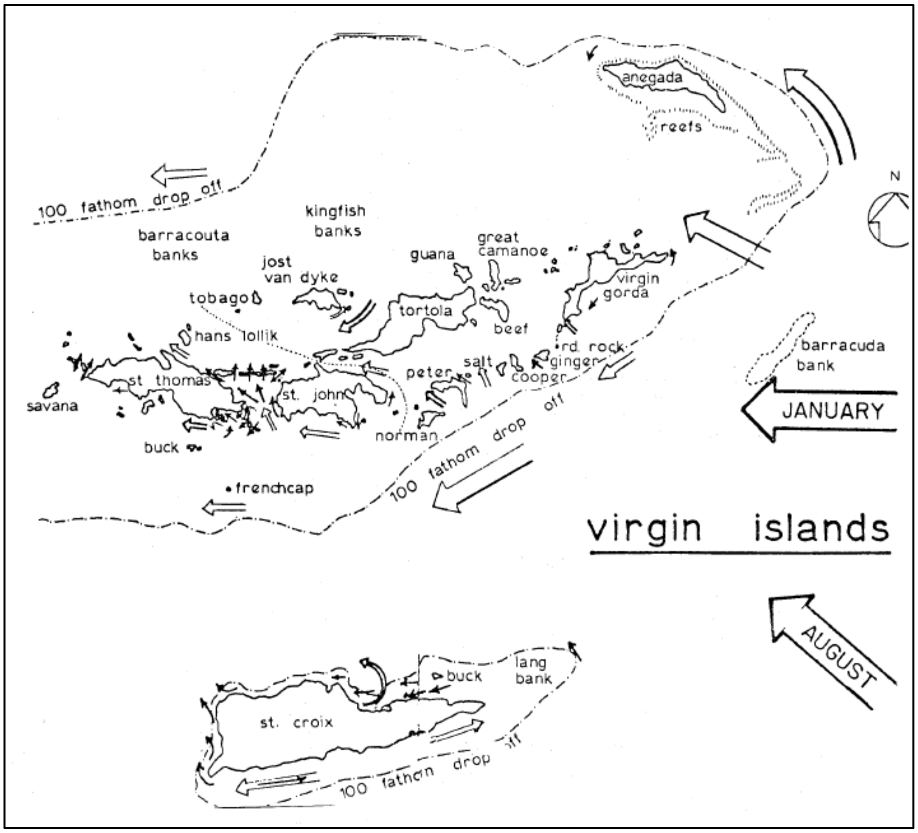

Figure 6.05.2 – General current patterns on the island platforms (Dammann, 1969)

St. Croix's tides typically exhibit two (bi-modal) 'peaks' during the diurnal period (24-hour day), with the second (lesser) 'peak' having relatively small ebbs and flows. The mean tides range from 0.8 feet to 1.0 feet and the spring tidal ranges reach up to 1.3 feet (IRF 1977).

In the Virgin Islands, tidal ranges and tidal currents, except in some inshore localities, are not significant. The small islands, lacking complex shoreline physiography, do not restrict changes in water level. The sea flows around the islands relatively unimpeded, resulting in tidal fluctuations of only a few inches to a foot. Furthermore, the steep slopes of the islands rising out of the water means that the intertidal zone, the part of the shoreline regularly covered and uncovered by the tides, is very narrow. Therefore, there are no large areas of tidal flats uncovered at low tides as in other places in the world, especially along continental coastal zones.

One of the consequences of this small tidal action is that water exchange in bays due to tidal action is usually very small. For example, it is estimated that 24 to 40 tidal cycles alone would be necessary to exchange all the water in the main part of St. Thomas harbor. Fortunately, waves, swells and oceanic currents are generally successful at flushing most bays. However, these forces are considerably reduced by the time they reach the heads of deep embayments.

As a result, circulation may be poor in the inner reaches of some larger embayments. The innermost portions of the mangrove lagoon on St. Thomas, Salt River of St. Croix and Coral Bay of St. John are examples of this. To a lesser extent, similar conditions have been observed at the head of Vessup Bay (Redhook), St. Thomas and Cruz Bay, St. John, and most likely occur in other similar locations (IRF, 1977).

The closest NOAA tidal station is located in Limetree Bay, St. Croix, VI and is Station ID: 9751401. The NOAA tidal station is located at Latitude: 17° 41.7' N and Longitude: 64° 45.2' W. The mean range is 0.69 ft. and the diurnal range is 0.71 ft. Tidal data from the station is shown below in Table 6.05.1.

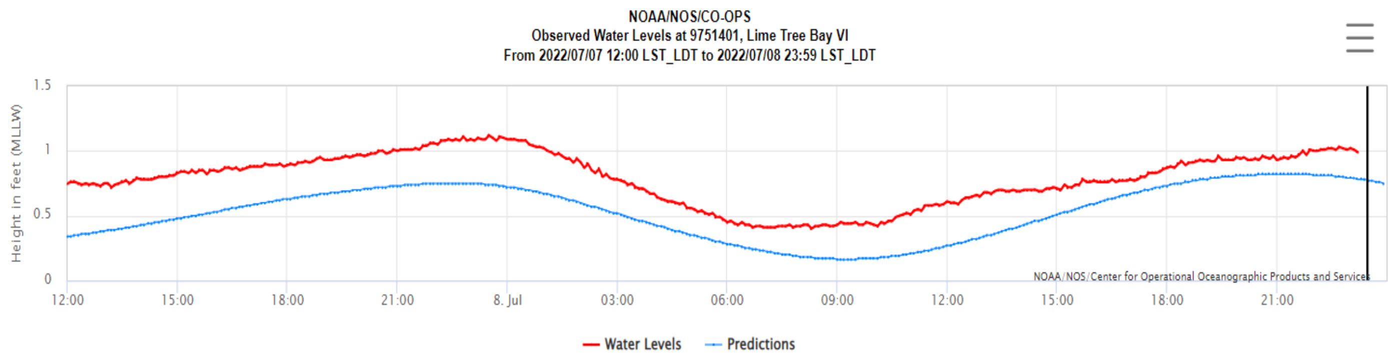

Table 6.05.1 – Observed Water Levels at Limetree Bay, St. Croix (NOAA)

c. Wave and Wind Impacts

The deep-water wave regime of offshore waters is driven by the northeast trade winds most of the year. On the average, wave heights of one to three feet approach from the east 42 percent of the time throughout the year. For short periods, 0.6 percent of the time, these easterly waves reach 12 feet. In addition to the normal easterly swell that affects the windward coasts of the islands, there are two seasonal modes of wave approach that affect leeward coasts: a southeasterly chop and swell and a northern swell. The southeasterly swell with waves one to twelve feet high becomes significant in late summer and fall when the trade winds blow from the east or when tropical storms and hurricanes pass the islands at a distance to the south. The east-southeasterly wind and wave regime is associated with the doldrum belt located over the interior of Venezuela and with an intensive high-pressure area over Bermuda. By contrast, during winter when the doldrum belt is located farther south along the equator and the Bermuda High is weak, a long length and long period northern swell develops. Although the swell offshore is only one to five feet high and occurs only four percent of the time, it is significant because it gains heights of ten to twelve feet nearshore.

Waves tend to straighten the north coast of St. Croix by erosion of headlands and deposition of sand in the bays. Straightening along the north coast of St. Thomas and St. John is opposed by the variations in resistance to erosion of different rock types. Commonly, on the north coasts, waves approach the shore from two principal directions. Short period waves and chop approach from the east and northeast, and, at the same time, long period swells approach from the north. However, in the winter, from November through March, the northern swells are larger than in summer, and they are refracted and redirected more around points and islands.

Around islands like Dutchcap Cay, St. Thomas and Buck Island, St. Croix, the two wave types produce very complicated patterns of crossing sea and swell which can be observed on aerial photographs. Along coasts fronted by partly submerged reefs, waves play a significant role in circulating back reef water. As demonstrated in Christiansted harbor, the mass transport of waves breaking over Long Reef drives a harbor-wide circulation that flushes most of the harbor water through the entrance in about fourteen hours. Consequently, the response of waves to reefs and nearshore bathymetry is significant in reducing pollution and improving water quality. (IRF, 1977)

Figure 6.05.5 below shows current wind speed data from the Limetree Bay NOAA tidal station referenced in Section 6.05.b.

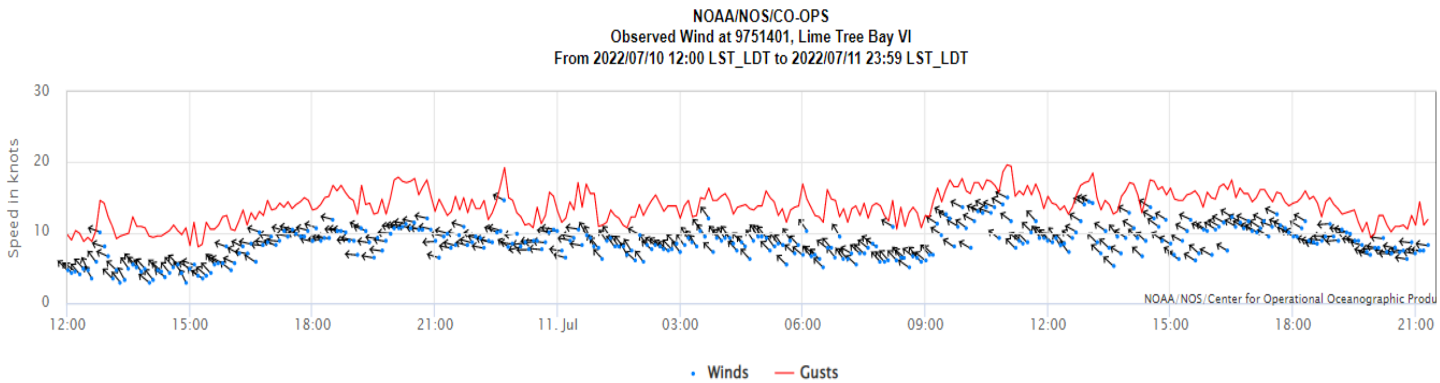

Table 6.05.2 – Observed Wind at Limetree Bay, St. Croix (NOAA)

d. Marine Water Quality

The water surrounding the site is classified as Class B as specified in the Amended V.I. Water Quality Standards of 12VIRR186. Class B waters have a designated use of propagation of desirable species of wildlife and aquatic life and primarily contact recreation such as swimming, fishing, etc. Water quality criteria include dissolved oxygen not less than 5.5 mg/l, exception if cause is natural forces. The pH must not vary by more than 0.1 pH unit from ambient, and at no time may the pH be less than 7.0 or greater than 8.3. Bacteria (enterococci) cannot exceed 30 CFU/100ml (30-day geometric mean), turbidity readings cannot exceed 3 NTUs, and clarity may not exceed a level where a Secchi disc cannot be visible at a minimum depth of one meter.

VI DPNR performs routine water quality measurements at select locations. The subject waterbody does not have an associated Water Quality Monitoring Station as noted below:

Waterbody	**Location**	**Sample Station Number**
VI-STC-08	Butler Bay	None

According to VI DPNR's 2020 Integrated Report (IR), which entails CWA Section 305(b) water status report and the CWA 303(d) list, the VI-STC-08 waterbody, Butler Bay, shows no available water quality data and therefore, the status of the water quality at the site is Unknown.

6.06 Marine Resources and Habitat Assessment

Overview & Research

Butler Bay and its surrounding areas have not been classified as particularly sensitive relating to marine resources. As seen in the Environmental Sensitivity Index (ESI) Map below (Figure 6.06.1), there are no indicators in the vicinity of the proposed project.

Although the ESI does not note the presence of sensitive or protected species' habitat, the U.S. Fish & Wildlife Information for Planning and Consultation (IPaC) website tool indicates that the hawksbill sea turtle (*Eretmochelys imbricata*) and the leatherback sea turtle (*Dermochelys coriacea*) have been spotted swimming in the waters of the project area shoreline. These species are listed as endangered on both the state and federal lists. In addition, IPaC indicates that the West Indian Manatee (*Trichechus manatus*), a threatened species, has been found in the waters near the project site as well.

ESI shoreline habitats in the project area are a mix of fine to medium-grained sand beaches and exposed wave-cut platforms in bedrock.

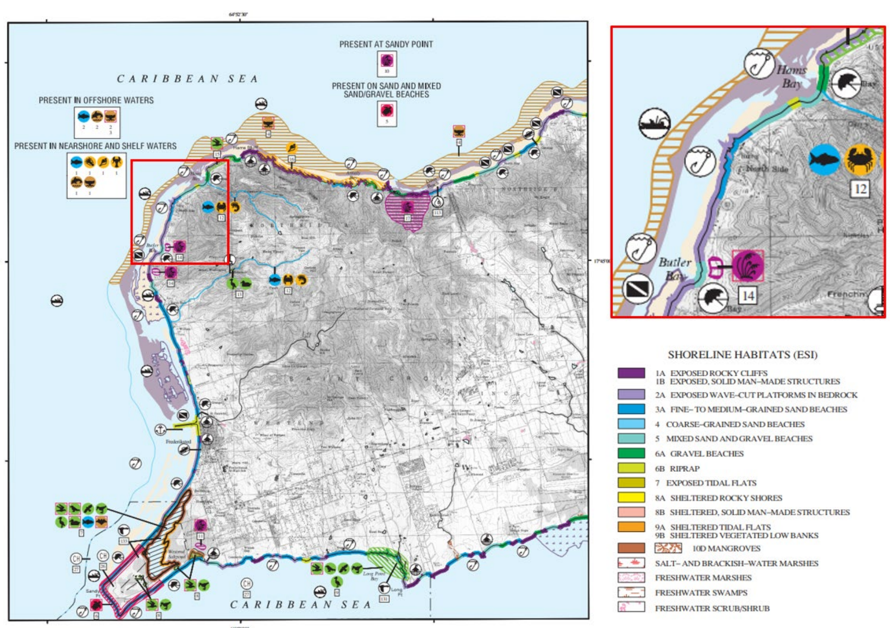

Figure 6.06.1 – Environmental Sensitivity Index Map with enlarged portion of project site (outlined in red), VI-1, St. Croix, USVI (NOAA)

A review of the 2002 NOAA Benthic Habitat Maps (Figure 6.06.2 below) shows significant diversity of benthic habitats in this region of St. Croix. Directly at the shoreline is classified as hardbottom/uncolonized bedrock for less than 50 meters. This is followed by approximately 125 meters of reef/colonized pavement. The habitat transitions to sand for approximately 200 meters which then turns to macroalgae/patchy/10-15%. After that, there is a mix of reef/scattered coral-rock and again reef/colonized pavement. Zones include shoreline intertidal (within the hardbottom/uncolonized bedrock habitat), bank/shelf, and slight back/shelf escarpment at the furthest distance from shore.

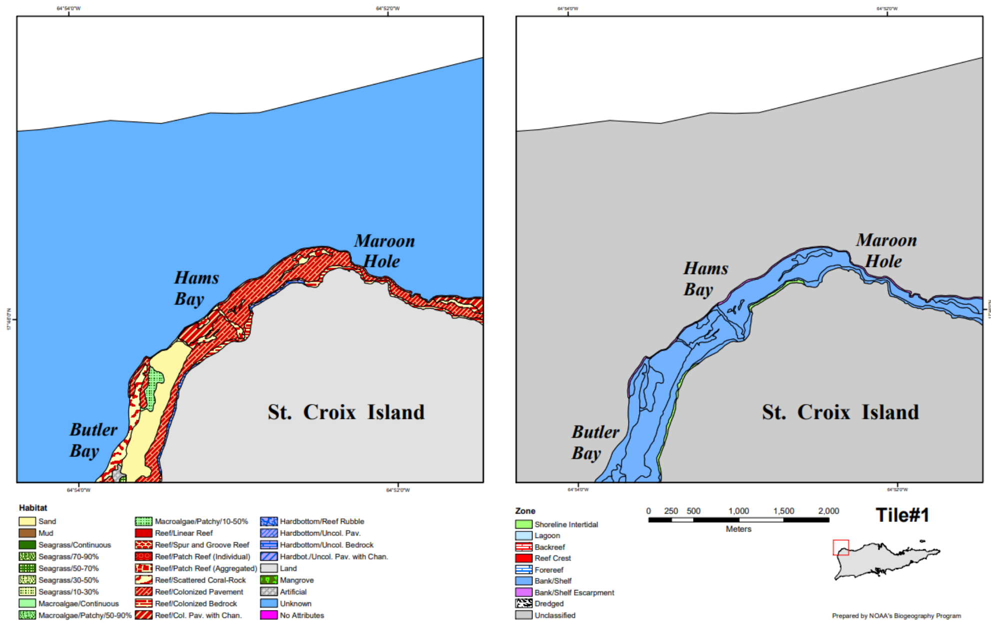

Figure 6.06.2 – Benthic Habitat in project vicinity, Tile #1 (NOAA)

<u>*Field Surveys*</u>

A series of 2022 benthic surveys of this area were conducted in April, May, October and November to identify, quantify and evaluate the project area, with a focus on specific marine habitats, namely: mesophotic reef structures, seagrasses, coral, hardbottom, and fisheries resources habitats that might be impacted by the installation of the cable.

On April 24, 2022 the underwater site was visited twice from shore, once via snorkel and once via SCUBA. The location of the bore hole was confirmed by snorkeling directly overhead with a Garmin76Cx GPS unit (Figure 6.06.2). Using SCUBA, the proposed cable path was followed out from the borehole using a compass out to a depth of 15 meters. No significant benthic habitats were observed and the bottom was covered almost entirely by the invasive sea grass *Halophila stipulacea*. This area was previously a sand bottom when the bore hole conduit pipes were installed.

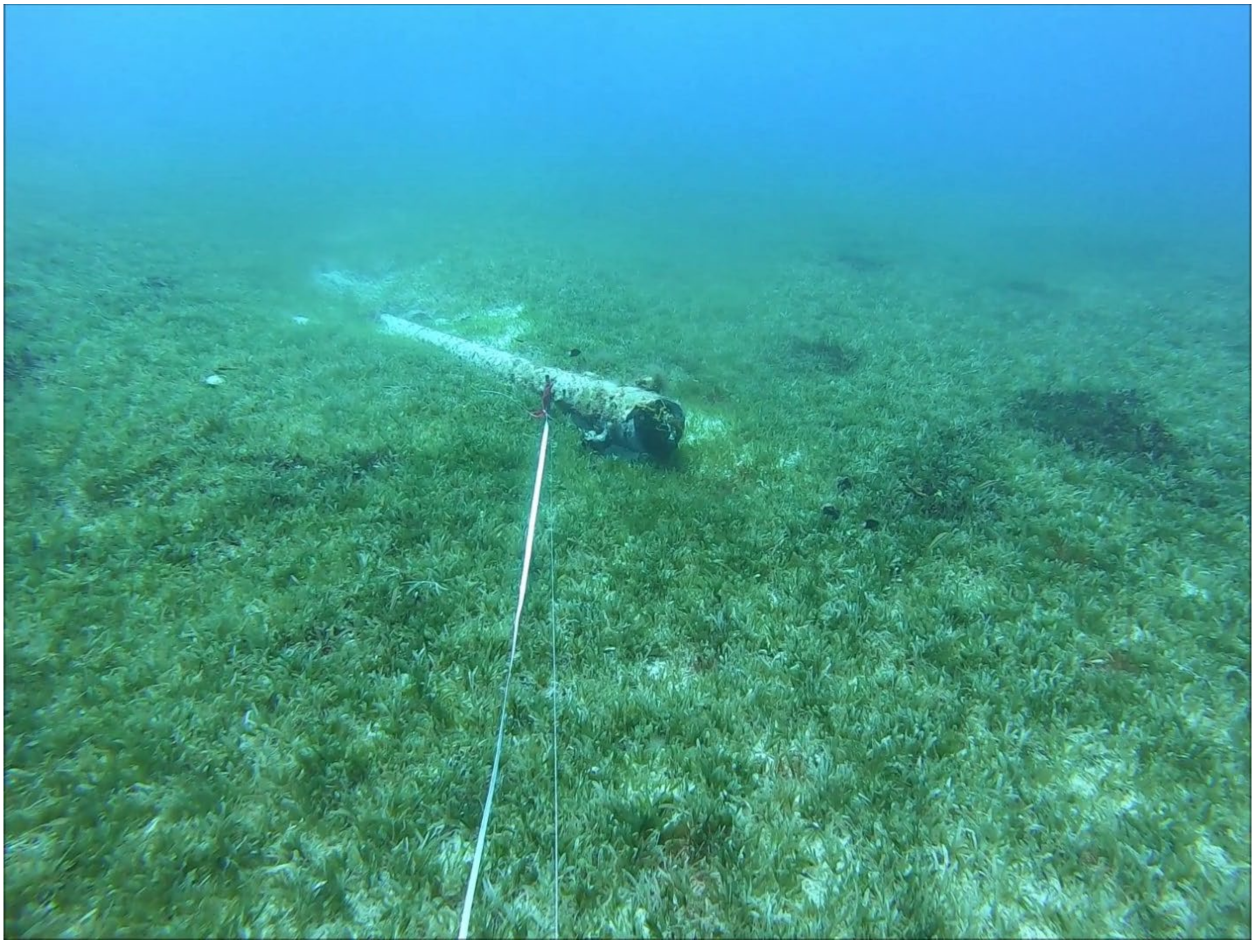

Figure 6.06.3 – Bore Hole Exit Conduit showing end cap in place. The same benthic habitat is found continuously out to the sand halo

The cable site was surveyed again on May 6, 2022 from a boat via SCUBA. A line was laid along the bottom to delineate the proposed cable path starting from the bore hole going out seaward 150 meters along the bottom. Using a Nikon W300 camera, video and photos were captured continuously along this line laid on the bottom. Although a few sponges and soft corals were within sight of the line, no significant habitats were observed near the proposed cable path. Again, almost the entire benthic community from the bore hole out 150 meters is *Halophila stipulacea.*

On May 10, 2022 a SCUBA inspection from a boat was again initiated at the bore hole. Various manmade and natural features were photographed using a Nikon W300 and GoPro Hero 4 cameras. Old growth covered markers likely from previous surveys were found near the cable route and were documented. The benthic communities at distances of 20 meters, 25 meters, 30 meters, 50 meters and 100 meters from the bore hole were also documented. South of the cable route at 96 meters from the borehole an exposed cable was found and documented (Figure 6.06.4). It is easily identified by its associated exposed sand areas. A likely octopus lair is here as evidenced by an area of discarded prey shells.

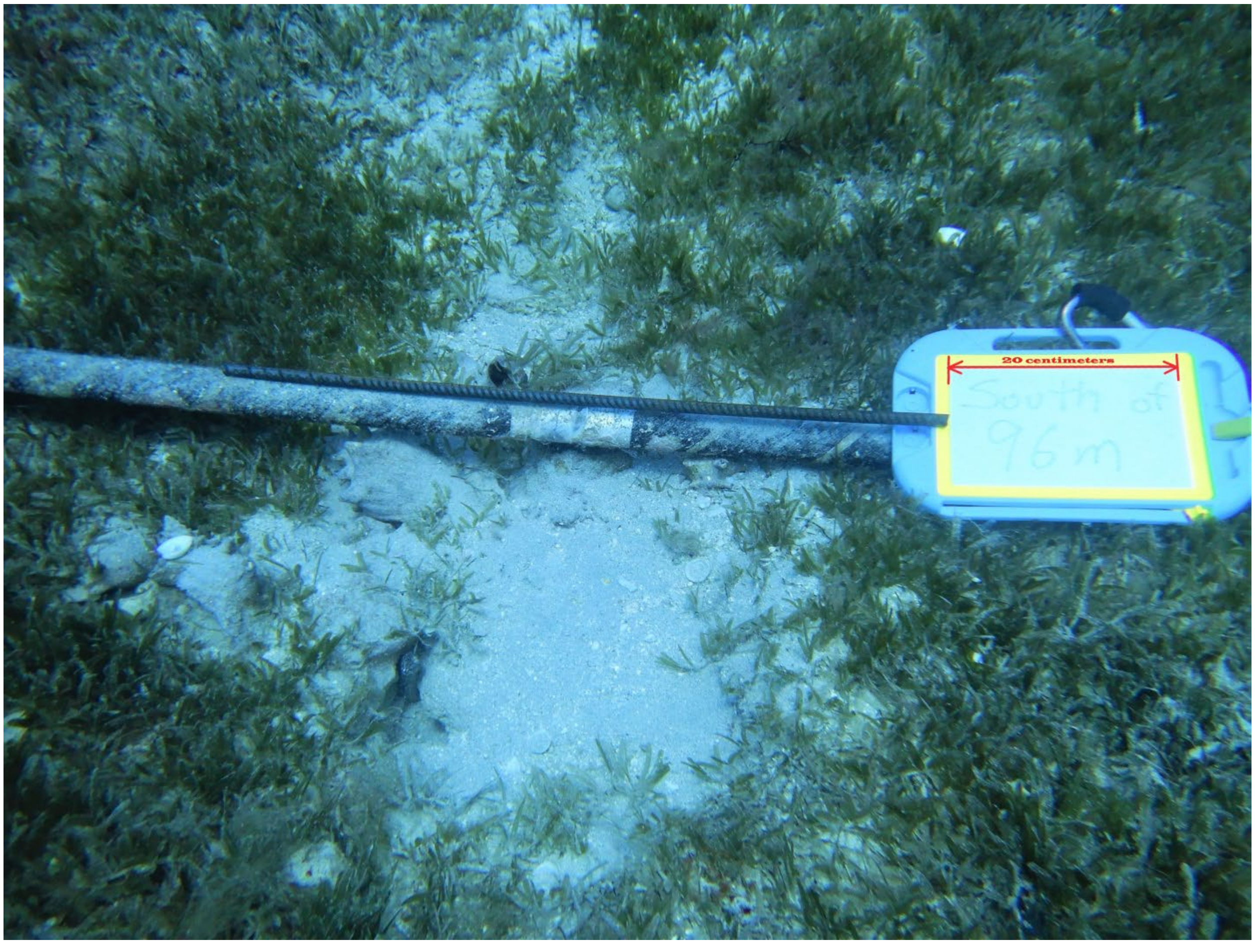

Figure 6.06.4 – Existing cable found to the south of the proposed cable route at 96 meters from the bore hole , eslxiatte showing scale

A second SCUBA dive began on the proposed cable route at 103’ deep where a subsurface buoy was anchored in place to mark the position. This area is largely inhabited by scattered sponges of various species up to one meter in height or width with a fewer number of soft coral colonies mixed in. The proposed cable path avoids the most concentrated sponge and soft coral area which is well to the south at the top of the wall.

From the 103’ depth site (subsurface buoy location), after traveling 38 meters east (shallower) along the steep bottom it flattens out at a depth of 86’ (25.1 meters). At this location there is the usual sand “halo” area that is often found between hard bottom habitats and adjacent seagrass habitats.

On May 17, 2022 both SCUBA and ROV (Remotely Operated Vehicle) dives were conducted. The video images obtained by the ROV (a Deep Trekker) start at a depth of 36’ and proceed along the proposed cable route down to a depth of 375’ then back up along the cable route to 68’ deep. The SCUBA dives were made with GoPro cameras documenting the area along the proposed cable route from a distance of 50 meters measured along the bottom from the subsurface buoy then back to the bore pipe.

On October 14, 2022 a visit was made to the site via boat with both the ROV and SCUBA gear. The ROV would not respond during the pre-dive check so only a SCUBA dive was made documenting the benthic communities with Nikon W300 and GoPro Hero 4 cameras. The line previously left on the bottom marking the proposed cable path had been displaced since the last site visit, likely by a fish trap dragging along the bottom during recovery. Proposed cable path locations were able to be identified from rebar stakes in the bottom marking specific locations that also had held the route line in place. Video and still images were captured starting at the 103' deep subsurface buoy with a 360-degree video view and then proceeding up the steep bottom to the flat area around the discarded navigation light mounting rack (360 degree video view). This rack on the proposed cable path is also prominently shown in videos and images from previous dives (Figure 6.06.5). Documentation continued to the area around the abandoned fish trap (with submerged floating coiled line still attached) at 86' deep and found north of the cable path then continuing onward to the proposed cable path jog site again.

Figure 6.06.5 – Discarded vessel navigation light rack (vertical and horizontal pipes) in the sand halo area between the invasive seagrass and the top of the wall. Pink framed data slate and red 100 meter tape also shown.

On November 3, 2022 the site was revisited via boat with the ROV. Five separate videos were recorded with the ROV. ROV dive #1 video begins at 13 meters deep then proceeds down to the sand halo area between the seagrass and the drop-off. Images of turtles and barracuda were recorded. After pausing at the subsurface buoy at 103' deep, the video records the proposed cable path down to 119 meters deep. The ROV then proceeds back up to 78.4 meters deep with 30 minutes of video recorded. ROV video #2 continues at the same location then proceeds along the bottom back up to the sand halo area with 9 ½ minutes of video footage. ROV video #3 begins again at the light rack location in the sand halo then proceeds down to the subsurface buoy site then on down to 42 meters deep. The current here was now too strong to continue on station so this ROV dive was aborted. ROV dive #4 began again at the abandoned light rack in the sand halo and proceeded along the proposed cable path area east to the abandoned fish trap area. It then goes on to the vicinity of the proposed cable path jog site. 9 minutes of video documents the bottom in this area. ROV video #5 records the area surrounding the cable path jog site then proceeds back to the sand halo area between the seagrass and the drop-off. A large male sea turtle is recorded close up in this location. The recording then proceeds down the wall to the subsurface buoy and beyond down to 55 meters deep where again the current is too strong to maintain ROV position so the ROV returns back up the wall recording the proposed cable route back to the light rack in the sand halo with 20 minutes of proposed cable path video.

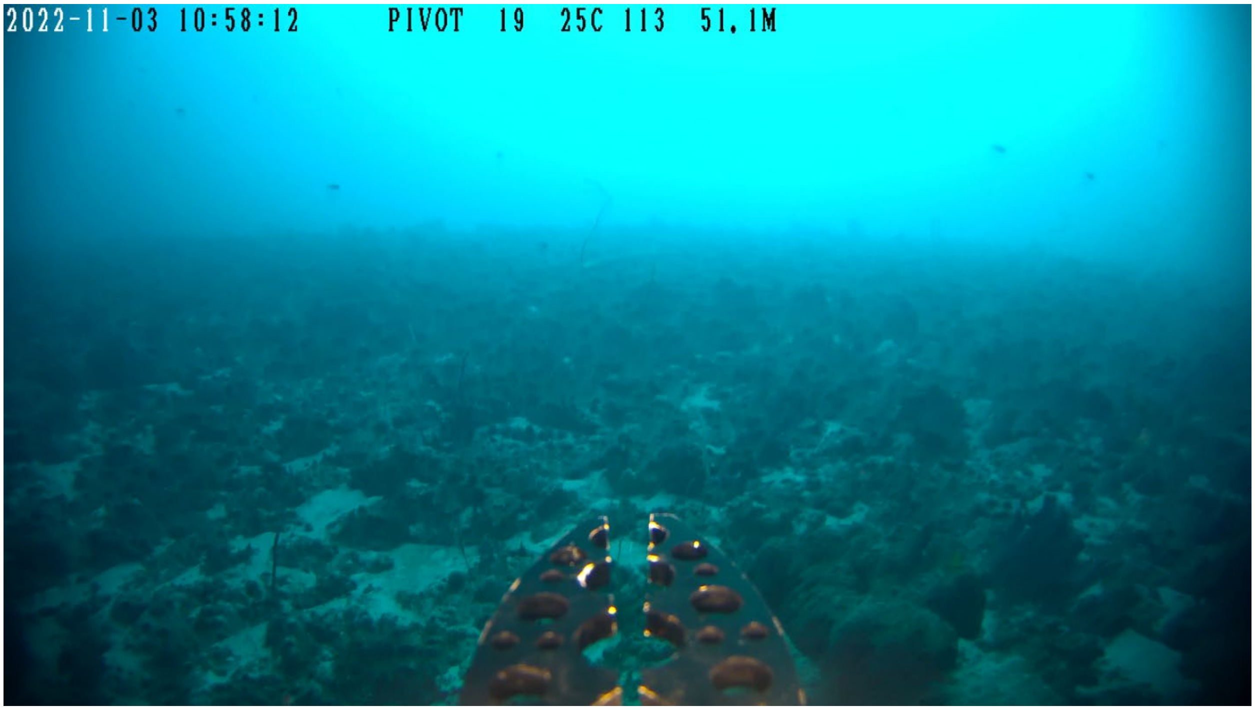

Figure 6.06.6 – ROV video frame grab at 51.1 meters deep looking up slope

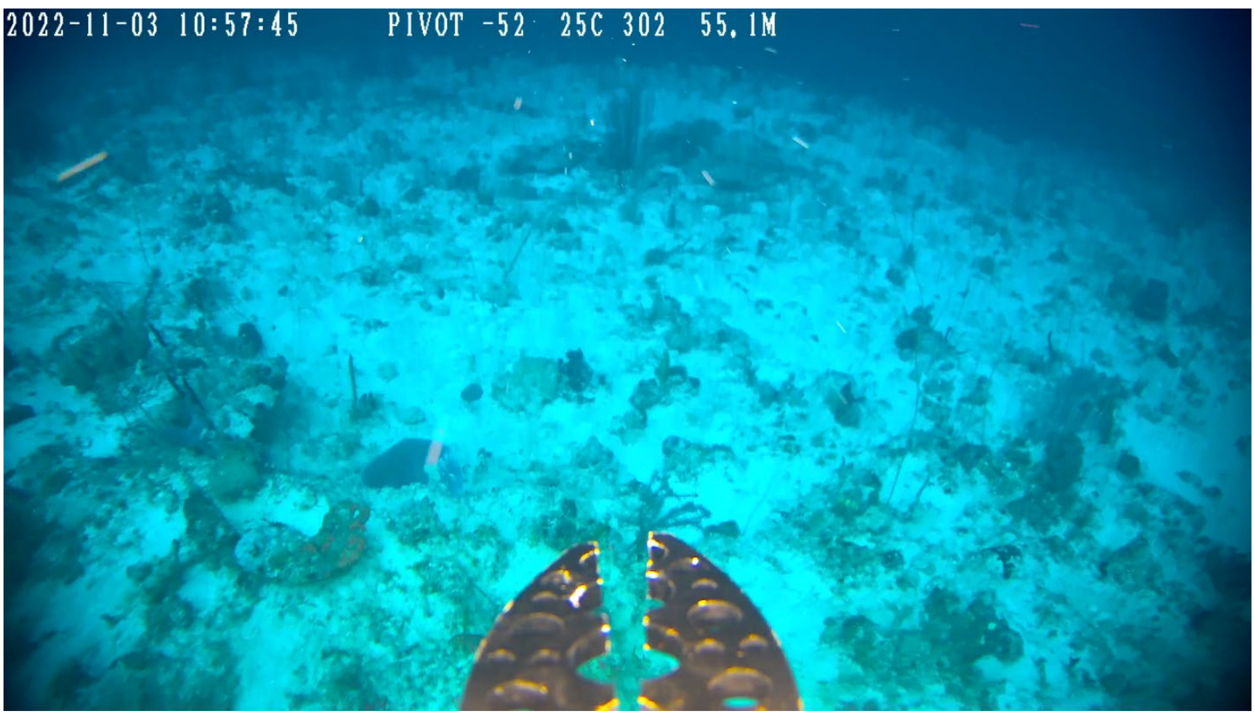

Figure 6.06.7 – ROV video frame grab at 55.1 meters deep looking down slope

Figure 6.06.8 – ROV dive at 94.1 meters deep looking down slope

Figure 6.06.9 – ROV dive at 102.7 meters deep looking across slope

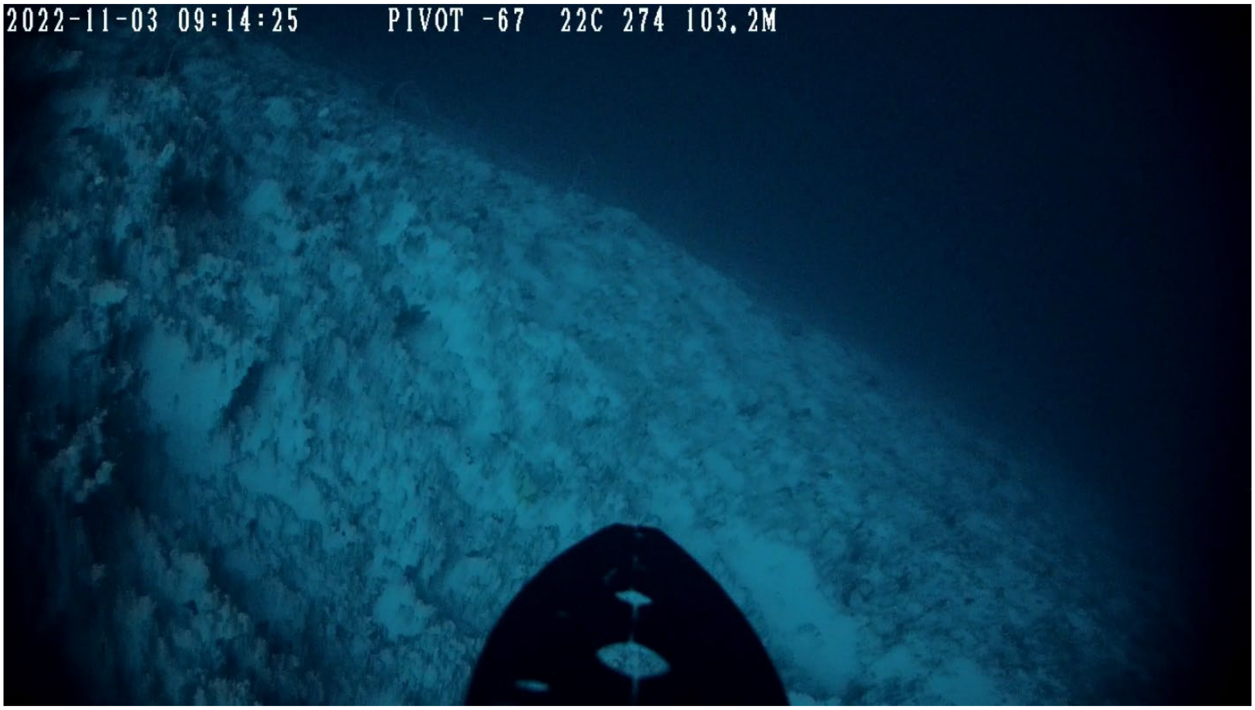

Figure 6.06.10 – ROV dive at 103.2 meters deep looking down slope

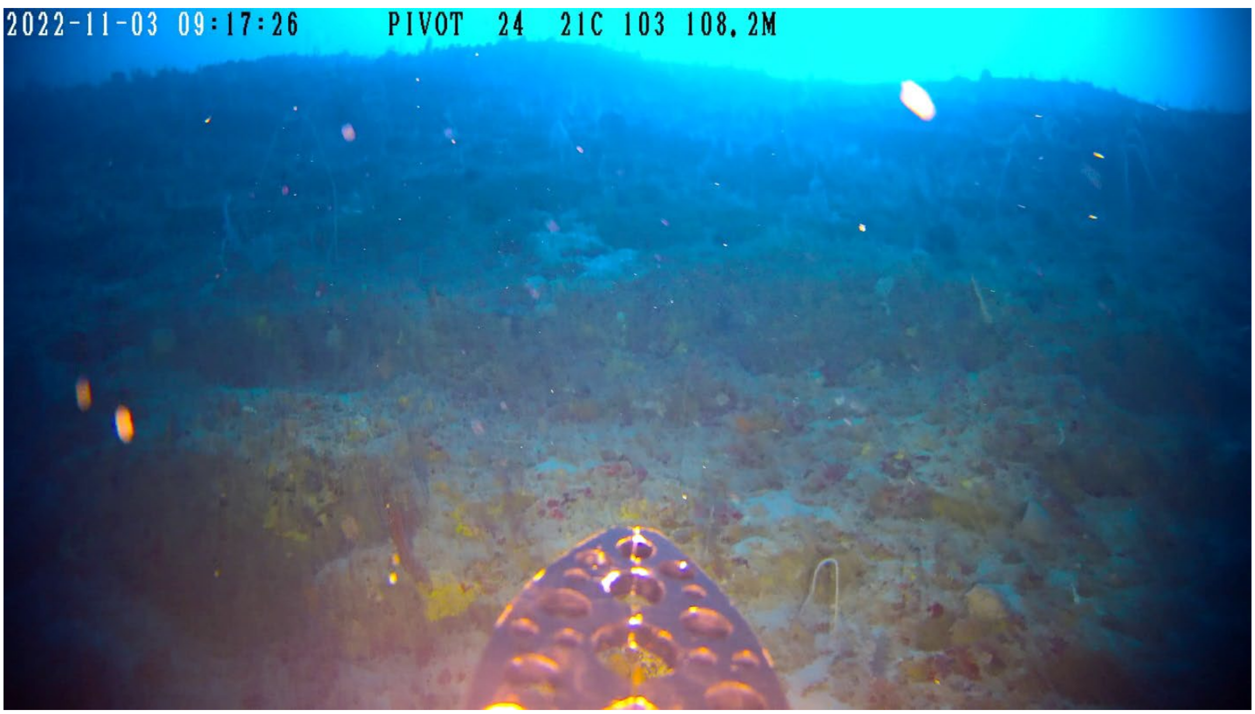

Figure 6.06.11 – ROV dive at 108.2 meters deep looking up slope

Staghorn coral (Acropora cervicornis) and elkhorn coral (Acropora palmata) were sought out as both species have been reported around the west end of St. Croix. In addition, the five 2014 NOAA listed threatened coral species (Dendrogyra cylindrus, Orbicella annularis, Orbicella faveolata, Orbicella franksi, and Mycetophyllia ferox) had also been reported in these same waters. None of these seven species were observed on or near the proposed cable path.

6.07 Terrestrial Resources

The project does not intend to conduct any construction, earth change, grading or digging for this project. A review of the landside area of this project, which includes the shoreline transition, the public road and shoulders, and the project property itself was conducted to assess potential terrestrial resources that may be affected by the project. All terrestrial areas that will be within the project boundaries are already developed, or will not be touched, such as the shoreline transition point, due to existing bores that will be used to pull the cable.

Adjacent to the property, and within the property itself are several acres of brushland. However, these areas will not be removed or trimmed in the course of installing the cable.

No observed wildlife or plant species were observed in the project area, and there are no noted terrestrial animals of particular sensitivity from review of the ESI or IPaC tool.

However, particularly near the coast, including landfall, it is necessary to consider temporal changes to habitat and wildlife patterns since many areas are habitats of species at certain times of the year that react sensitively to disturbances. These include resting grounds during bird migration, wintering and molting areas, feeding and coastal breeding habitats, and migration of sea turtles and sea mammals (OSPAR 12/22/1, Annex 14).

See below in Section 6.09 for proposed mitigation to minimize impacts to these species.

6.08 Wetlands

The U.S. Army Corps of Engineers defines wetlands as "those areas that are periodically inundated or saturated by surface or groundwater at a frequency and duration sufficient to support and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, bogs, marshes and similar areas." (Environmental Laboratory, 1987).

There are no observed terrestrial wetlands within the project area or indicated on the National Wetlands Inventory Maps.

6.09 Rare and Endangered Species

The known rare and endangered species identified within the project area are noted in Section 6.06. They are two federal endangered sea turtle species known to swim in the offshore waters, the Hawksbill Sea

Turtle (*Eretmochelys imbricata*) and Leatherback Sea Turtle (*Dermochelys coriacea*). In addition, the West Indian Manatee (*Trichechus manatus*), a threatened species, has been found in the offshore waters.

In-water work will require a Water Quality Monitoring Plan that includes mitigation for sea turtles that may also be impacted by vessels and cable placement during construction. During construction of the project in order to minimize and abate impacts to the listed turtle species, NMFS's construction conditions will be followed.

To avoid and minimize injury or death to marine mammals and sea turtles, the following NMFS measures from the Vessel Strike Avoidance Measures and Reporting for Mariners will be implemented by all vessels associated with the project construction. All divers, captains and workers assisting during the in-water installation portions will be trained on the following:

1. Vessel operators and crews should maintain a vigilant watch for marine mammals and sea turtles to avoid striking sighted protected species.

2. When whales are sighted, maintain a distance of 100 yards or greater between the whale and the vessel.

3. When sea turtles or small cetaceans are sighted, attempt to maintain a distance of 50 yards or greater between the animal and the vessel whenever possible.

4. When small cetaceans are sighted while a vessel is underway (e.g., bow-riding), attempt to remain parallel to the animal's course. Avoid excessive speed or abrupt changes in direction until the cetacean has left the area.

5. Reduce vessel speed to 10 knots or less when mother/calf pairs, groups, or large assemblages of cetaceans are observed near an underway vessel, when safety permits. A single cetacean at the surface may indicate the presence of submerged animals in the vicinity; therefore, prudent precautionary measures should always be exercised. The vessel should attempt to route around the animals, maintaining a minimum distance of 100 yards whenever possible.

6. Whales may surface in unpredictable locations or approach slowly moving vessels. When an animal is sighted in the vessel's path or in close proximity to a moving vessel and when safety permits, reduce speed and shift the engine to neutral. Do not engage the engines until the animals are clear of the area.

There may be a requirement for pinning or anchoring the cable in hardbottom areas, which comprise approximately 56% of the St. Croix cable approach route.

Sound in water moves four times faster than in air, and attenuation (sound dissipation) is much lower in water than air. Esonification of the marine environment can have a negative impact on sea turtles, marine mammals and fish. To minimize noise impacts to these species a vibratory hammer will be used to drive pins or anchors wherever possible. Vibratory hammers are recommended by NOAA as they have a lower acoustic impact.

6.10 Air Quality

No effects to air quality are anticipated as a result of the proposed project. There is no anticipated earth movement, and the use of vessels or heavy equipment in near-shore waters will be minimal.

7.00 IMPACT OF THE PROPOSED PROJECT ON THE HUMAN ENVIRONMENT

7.01 Land and Water Use Plans

The project will be connecting to existing infrastructure, following a similar approach and pathway as existing telecommunication cables. It will enter through existing bores and be installed in an existing building. No visual changes, expansion of the property or business, or change to land cover/use is anticipated, and no changes to future land or water use plans is anticipated.

7.02 Visual Impacts

The project location is currently an AT&T telecommunications station and the proposed project will only connect an additional cable to existing underground conduit. There will be no effect to the current aesthetics as the necessary infrastructure already exists on the property.

7.03 Impacts on Public Services and Utilities

a. Water

As noted in Part 6.04, the project will not use or affect significant amounts of water, either from public supply or otherwise. No municipal water sources exist in this area, and the project will have no negative impact on the availability of public water.

b. Sewage Treatment and Disposal

There are no public sewage utilities in the area. The project will not affect the amount of sewage generated in the area. No expansion of the business or structures is anticipated, and the additional cable installation is not anticipated to change the staffing needs or expectations in the building.

c. Solid Waste Disposal

Domestic solid waste will be managed with onsite waste bins. It will be trucked out by a licensed waste hauler as necessary and disposed of in accordance with local and federal solid waste requirements.

d. Roads, Traffic, and Parking

During the proposed work, an insignificant number of additional vehicles will use the main road leading to the project site, Route 63 as part of construction. This will only be routine traffic to and from the work site. During project implementation, vehicles will be parked in the private lot on the subject property, owned by AT&T of the Virgin Islands, Inc., where the project is located, and is not anticipated to change.

e. Electricity

There are no proposed changes to existing electrical systems required for the cable line install. All existing systems for system capability are already existing for the site.

f. Schools

There are no anticipated adverse effects on the local educational system for the project installation and construction. There is an anticipated positive long-term effect of this project, as there will be better communication technology and infrastructure for all residents, including school-age children to be better connected to the world and resources beyond the local community in St. Thomas.

g. Fire and Police Protection

Any nighttime work will provide adequate lighting for worker safety. In the case there is an emergency, Frederiksted Fire Station is located less than four miles from the project site and the Virgin Islands Police Department is located a little over three miles via Route 63. There are several parking spots on-site for emergency vehicles, if needed.

There are no anticipated long-term burdens or increase in fire or police services. The facility is fenced and gated, and under 24-hour security, and will not change post-construction.

h. Public Health

The project will not have any anticipated adverse effect on public health, nor increase the use of public health facilities.

7.04 Social Impacts

This project has the potential to achieve a greater flow of information through public services and utilities that rely on higher telecommunication reliability thus benefiting the social lives of their consumers. There will be an increase in reliability, stability and capacity of the telecommunications system on St. Croix, within the USVI, as well as with other countries as a result of this project.

7.05 Economic Impacts

The most notable effect is the increase in productivity. This is due to the level of individuals and organizations generated by advances in communications, connectivity and efficient access to information. Increased telecommunications in the region can create substantial amounts of consumer surplus and generate new employment opportunities particularly in remote areas as it enables a large number of workers to work from home (i.e. telecommuting) and thus reduces the importance of distances.

7.06 Impacts on Historical and Archeological Resources

The project site is located near historic areas. Historical use of the area during the colonial period, which includes Butler Bay, Prospect Hill and Estate Northside, included a developed plantation and mill, with associated support structures such as slave quarters and agricultural land. From Oxford's 1794 survey maps, the existing mill that sits on the property was a horse mill and the Butler Bay Plantation proper was submitted to the National Register of Historic Places in August 1977.

However, the project boundaries will be restricted to only areas that have already been evaluated and found to contain no notable archaeological resources or findings, and there are no anticipated digging, grading or earthwork activities anticipated. There are no negative impacts on Historical or Archaeological resources of the USVI anticipated for this project. Should any suspected or known resources or artifacts be discovered during the installation of the cable, either in the water or on the shore side of the project, the developers will immediately notify the State Historical Preservation Offices to evaluate the findings.

7.07 Recreational Use

The project itself will neither inhibit nor promote recreational activities in the vicinity of the project. The Environmental Sensitivity Index Map provided in Section 6.06 (Figure 6.06.1) indicates recreational fishing is a popular activity in the vicinity of the proposed project. Placement of cable on the surface of the seafloor may leave potential for impacts from fish pots, boat anchors or other impacts caused by fishing or boating activities. However, existing cables have run through this area for years and the potential impacts are low and not anticipated to hinder the recreational use of the area.

7.08 Waste Disposal

Any and all construction debris will be collected in appropriate roll-off containers to be transported and disposed of by a licensed waste-hauler, in accordance with solid waste requirements. Any unused or contaminated chemicals or materials will be disposed of in accordance with waste handing regulations.

7.09 Accidental Spills

Spills are not anticipated for this project. Any vessels used to guide and place cable in shallow water will be monitored for any potential spills of oil or fuel. Lubrication or chemicals will not be used for this project as an existing bore will function as the route for the cable, and drilling is not required.

7.10 Potential Adverse Effects which cannot be Avoided

The laying of cables, both telecommunication, power, or other utility types, can cause temporary disturbance, damage, displacement or stress to the seabed and marine flora/fauna, increase turbidity, and potentially release contaminants and cause alteration of sediments (Figure 7.10.1).

Seabed disturbances that may impact benthic organisms can be controlled through the use of turbidity curtains and careful and methodical cable placement, but even with a high level of care, sediment plumes within the project area are expected and cannot be eliminated.

Underwater noise is most relevant for marine mammals, though may affect fish and benthic habitat. While use of low impact equipment to minimize noise will be essential, elimination of all noise or impact from sound is unavoidable. Care to ensure all sensitive wildlife is outside the project impact area will be employed to ensure a minimization of negative impact.

The cable is anticipated to self-bury over time but will still be visible in areas with hard substrate. The visual impact will be minimal to both recreational users and marine habitat but will not be eliminated as the proposed approach is to not bury the cable.

Phase	Installation, maintenance, repair work and removal	Operational phase
Submarine Telecommunication cable	Seabed disturbance	Introdution of artificial hard surbstrate
	Damage/disturbance of organisms	
	Re-suspension of contaminants	
	Visual disturbance	
	Noise (Vessels, laying machinery...)	
	Emissions and wastes from vessels	

Figure 7.10.1 – Main Environmental Impacts Associated with Submarine Cables (IXSUREVEY, 2010)

These effects are mainly restricted to the installation, repair works and/or removal phase and are generally temporary. In addition, their spatial extent is limited to the cable corridor. Some mobile benthos can avoid disturbance, but smaller benthic communities may be impacted in the short-term. The duration, spatial extent and level of suspended sediment associated with route clearance and cable installation in this project are unlikely to cause such problems with turbidity and water clarity (IXSURVEY, 2010). Nevertheless, turbidity levels will be minimized during cable lay operations by minimizing the duration and extent of physical seabed disturbance with the use of turbidity curtains and an efficient work schedule.

8.00 MITIGATION PLANS

There is no anticipated loss or damage to sea life, benthic or otherwise, and no mitigation plans are needed for this project and operation.

9.00 ALTERNATIVES TO PROPOSED ACTION

The telecommunications needs of St. Croix, the USVI and the world are expanding and increasing due to increased number of and reliance on services that require high-speed internet. The current telecommunication bandwidth is currently limited and in a do-nothing scenario will soon be a limiting factor in productivity of the St. Croix community. As computer use increases, both in the population as well as percentage of individual use, reliability and stability of the network will start to decrease, and network speeds will reduce. Assuming that no other cable was installed, in this scenario the region would continue to be constrained by the lack of telecommunications capacity. The demand for capacity would continue to grow along with the overall economic growth (IXSSYSTEM, 2010)

Another alternative is to use wireless ways to increase bandwidth and the telecommunication system on the island, such as satellite or microwave tower transmissions. However, the use of fiber optic networks has a number of advantages over satellite and microwave transmissions. Radio has largely been phased out due to restricted bandwidth and poor data transmission while modern fiber optic networks transmit high volumes of voice and data traffic with higher security and reliability and at lower cost than satellite systems. Cable also has a more dependable installation and repair record. Bandwidth demand, particularly as a result of internet activity far exceeds satellite capacity (Hogan and Hartson, 1999).

An alternative to the placement of the existing cable is to install in another location that has little to no benthic life on the seafloor, and little to no critical areas for protection of environmental resources or recreational uses. However, that would require the installation of new bores, or construction of some form of shoreline transition structure, as well as all new shoreline infrastructure and buildings to house the land hub that would connect to the existing telecommunications system. The massive increase in construction and/or drilling and digging requirements will far outweigh the small and temporary impact to marine life found in the project area and cable path proposed.

Lastly, burying the cable along the entire route as opposed to surface placement was considered. This would require, however, more seafloor disturbance, first by ROV in deeper waters, and then by divers assisted by equipment to dig, cut or bore a trench to bury the cable along the intended path. This would increase suspension of sediments and construction time significantly, for a small benefit of having the cable buried. With careful placement of the cable, and pinning or anchoring where necessary, there is no anticipated impact in the long-term of having an exposed cable.

10.00 RELATIONSHIP BETWEEN SHORT & LONG TERM USES OF MAN'S ENVIRONMENT

The cable is designed, and path planned to have the least amount of impact to marine life, environmental resources and recreational uses. Most of the impacts will be temporary and short term during the placement and installation of the cable and pinning or anchoring for long term use. Once in place, the cable will require minimal to no maintenance, and have no effect on existing or future marine or terrestrial habitats in the project area. As a result of this project, St. Croix will have a significant improvement to the existing telecommunication capabilities with minimal impact to existing natural, cultural or functional resources of the island.

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