Exhibit 16

ENVIRONMENTAL ASSESSMENT REPORT FOR THE CONSOLIDATION OF COASTAL ZONE MANAGEMENT LAND AND WATER PERMITS, DEVELOPMENT ASSOCIATED WITH RESTART OF REFINING OPERATIONS AND FUTURE DEVELOPMENT AT LIMETREE BAY TERMINALS AND LIMETREE BAY REFINING ST. CROIX, U. S. VIRGIN ISLANDS

SUBMITTED TO

THE OFFICE OF COASTAL ZONE MANAGEMENT, DEPARTMENT OF PLANNING AND NATURAL RESOURCES GOVERNMENT OF THE VIRGIN ISLANDS

SUBMITTED BY

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1.00 NAME AND ADDRESS OF APPLICANT

Limetree Bay Terminals, LLC ("Limetree Bay Terminals" or "LBT")
1 Estate Hope
Christiansted, St. Croix, U.S. Virgin Islands 00820

Limetree Bay Refining, LLC ("Limetree Bay Refining" or "LBR")
1 Estate Hope
Christiansted, St. Croix, U.S. Virgin Islands 00820

Limetree Bay Terminals and Limetree Bay Refining are under common control, but are separate entities that are expected to own land and structures at the facility. Collectively, Limetree Bay Terminals and Limetree Bay Refining will be referred to as the Applicants.

2.00 LOCATION OF PROJECT

The Applicants' project is located at the Terminal Site and the Refinery Site as those terms are defined in the Amended and Restated Terminal Operating Agreement ("ARTOA") and Refinery Operating Agreement ("ROA"), both as ratified by the Virgin Islands Legislature on July 26, 2018 (Appendices C-3 and C-4). This application is for approval of development (as that term is used in 12 VIC Section 901 et. seq.) on the Terminal Site and the Refinery Site to the extent located in Tier 1 of the Coastal Zone (the "Project Site") and for other purposes enumerated below. The terms "Refinery Site" and "Terminal Site" include land that may be acquired by the Applicants from the ERT by option and used under an Easement Agreement (Appendix C-5) and includes "Property Acquired for Closing Payment" (as defined in the ROA and ARTOA) recently purchased from the Government of the U.S. Virgin Islands (GVI). Figure 2.00.1 is a map showing the relevant lands that comprise the Project Site.

Background Information About the Location of the Project

On September 15, 2015, the former owner of the project location, HOVENSA L.L.C. filed a voluntary petition for relief under Chapter 11 of the U.S. Bankruptcy Code in the District Court of the Virgin Islands, Bankruptcy Division (Case No. 15-10003). On December 1, 2015, the U.S. Bankruptcy Court for the District of the Virgin Islands approved an Amended and Restated Asset Purchase Agreement ("APA" as finally approved by the Court), for the acquisition by Limetree Bay Terminals of certain assets of HOVENSA L.L.C.

On December 29, 2015 the USVI Senate approved the Operating Agreement (Appendix C-2) executed on December 1, 2015, between Limetree Bay Terminals and GVI. The terms of the executed Operating Agreement govern operation of, and application of relevant duties, taxes and regulations to, the acquired assets. The acquired assets include the storage terminal tankage and piping, the marine terminal, the truck loading rack, the advanced wastewater treatment plant and the power plants, portions of lands owned by HOVENSA, submerged lands permits for docks used by HOVENSA, and portions of reclaimed submerged lands used by HOVENSA under the terms of a 1978 agreement with the GVI. Limetree Bay Terminals also acquired the Above Grade Refining Assets (as defined in the APA), which included refining process units, and buildings,

structures and fixtures that supported the refinery. Limetree Bay Terminals did not buy the land on which the Above Grade Refining Assets are located. However, it has an easement for access and use of these lands which was part of the APA and which has been recorded in the Virgin Islands land records.

Limetree Bay Terminals did not acquire the right to use or occupy submerged lands in certain areas covered by the 1978 agreement, such as the areas occupied by Landfarms 2 and 3, the reclaimed land (without the above-grade infrastructure) located in the southeast portion of the facility and consisting of former construction landfills, an asbestos landfill, the recycle yard, and other areas, specifically excluded from the Limetree Bay Terminals purchase. HOVENSA's rights to occupy and use any submerged lands were terminated by the Operating Agreement.

As part of the Operating Agreement and APA, the GVI received (a) Estates Blessing, Hope, Caldwall and Cottage (and portions of other Estates) owned by HOVENSA, and (b) approximately 300 acres of land to the east of HOVENSA known by the collective title "Estate Pearl" (collectively, "GVI Lands"). These Estates included the residential housing identified in Section 2 of this report. Limetree Bay Terminals leased 80 housing units in Estate Cottage and Blessing from the GVI and was responsible for maintenance. Under the APA, HOVENSA retained ownership of the refinery parcels, excluding the above-grade refinery infrastructure bought by Limetree Bay Terminals. The refinery parcels were transferred to the HOVENSA Environmental Response Trust (ERT) on February 17, 2016 under a Plan of Liquidation approved by the Bankruptcy Court. Limetree Bay Terminals has an option right to purchase the ERT lands for $1 per acre, which is assignable. The sale process was finalized on January 4, 2016, when the closing occurred.

Limetree Bay Refining was formed to carry out a proposed restart of a portion of the refinery. At closing of the ARTOA and ROA on November 30, 2018, the refining assets were transferred from Limetree Bay Terminals to Limetree Bay Refining. Limetree Bay Refining either owns an interest in, or operates, the refining assets, assumed rights to refinery submerged lands and has the option right to purchase lands from the ERT. Limetree Bay Refining exercised its option for some, but not all, of the lands owned by ERT, on November 7, 2018, however, all ERT lands are included in the Project Site because Limetree Bay Terminals retains the right to access and use these lands pursuant to an Easement Agreement, which is Attachment C-5. Limetree Bay Terminals will continue to own and operate the remaining assets, mostly terminal related and retains an ownership interest in many assets transferred to Limetree Bay Refining.

Under the ARTOA, Limetree Bay Terminals negotiated with the GVI the repurchase of Estates Blessing, Hope, Caldwall, Castle Coakley and Cottage, except for the vocational school and adjacent land located in Estate Blessing and Ludwig Minde. Those lands were transferred to Limetree Bay Terminals as part of the November 30, 2018 closing. LBT retains the option to purchase some of the Estate Pearl lands.

Table and Map Defining the Project Site

The following table and map capture the final disposition of HOVENSA's assets (property boundaries approximate) under the new agreements and also shows the lands subject to options

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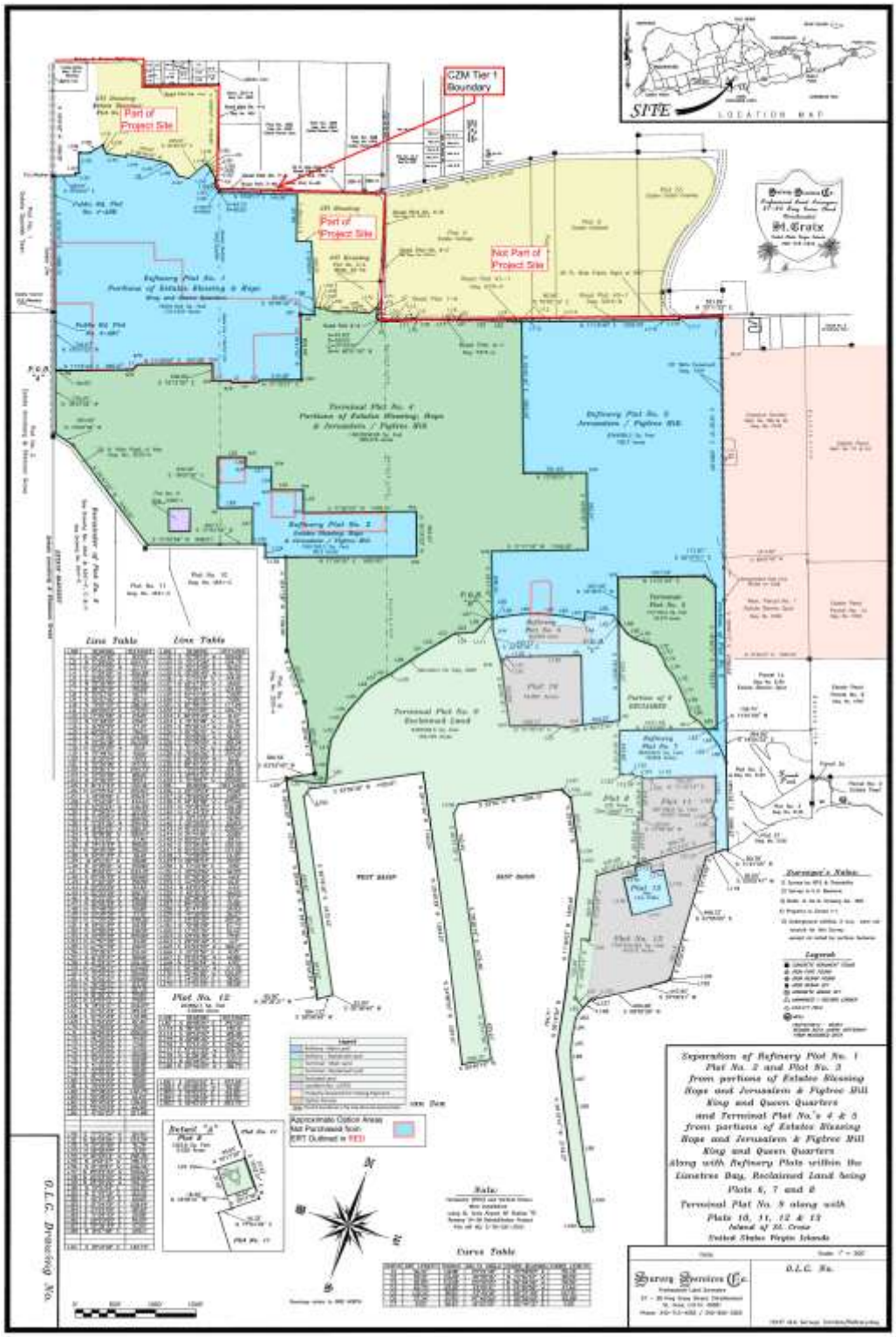
(exercised and unexercised) from the ERT. These lands comprise the Location of the Project Site

Table 1 – Project Location under the ROA, ARTOA and APA

Entity	Former HOVENSA Lands Comprising The Project Site
Limetree Bay Terminals	• Owns or leases/licenses fastlands used in terminal operations (GREEN) • Leases/licenses from the GVI Terminal Reclaimed Lands (LIGHT GREEN) • Has the right by deeded easement to use the ERT owned land where refinery assets are located and the right to acquire this land (BLUE) from ERT • On November 30, 2018, purchased the former HOVENSA Estates used for housing located to the north, which had been transferred to GVI after the 2016 sale closing (YELLOW). Former GVI lands in Estates Blessing and Hope are part of the Project Site, which are those inside the CZM Tier 1 boundary (VI 68 a/k/a Refinery Road), as shown on Figure 2.0.
Limetree Bay Refining	• Leases/licenses Refinery submerged lands except surface impoundments (LIGHT BLUE) • Has the right to use the ERT owned land where refinery assets are located and the right to acquire this land (BLUE), either directly from ERT or through LBT. Exercised option to purchase portions of BLUE ERT land on 11/7/18. Remainder of BLUE ERT land remains subject to easement rights of LBR and LBT (BLUE land outlined in red on Figure 2.0)
Entity	**Former HOVENSA Lands Not Part of Project Site**
Government of the Virgin Islands	• In 2016, some rights in the submerged lands (i.e. reclaimed land) reverted to the Virgin Islands and are referred to as "Excluded Lands" (GRAY) • Portions of Ludwig Minde and Estate Blessing, conveyed to the GVI in 2016 and not part of lands to be purchased under the ARTOA. (WHITE) • Owns vacant lands to the East formerly owned by HOVENSA (BROWN), as to which Limetree Bay Terminals has option and other rights for a portion of those lands
HOVENSA Environmental Response Trust (ERT)	• Owns Landfarm 1 (PURPLE) • Responsible for Landfarms 2 and 3 closure and post closure care but does not own land (GRAY).
Limetree Bay Terminals	• Former GVI lands purchased on November 30, 2018 (YELLOW), which are outside the CZM Tier 1 boundary which are located in Estates Cottage, Caldwall and Castle Coakley. These lands are not part of the Project Site because they are not in Tier 1 of the Coastal Zone.

Figure 2.00 – Map of Project Site



The following location map and agency review map depicts the projects in reference to adjacent properties and island features as well as the Tier 1 jurisdiction line of the Department of Planning and Natural Resources, Division of Coastal Zone Management. A navigation map is also attached showing the regional context of the Project Location and vicinity in the U.S. Virgin Islands.

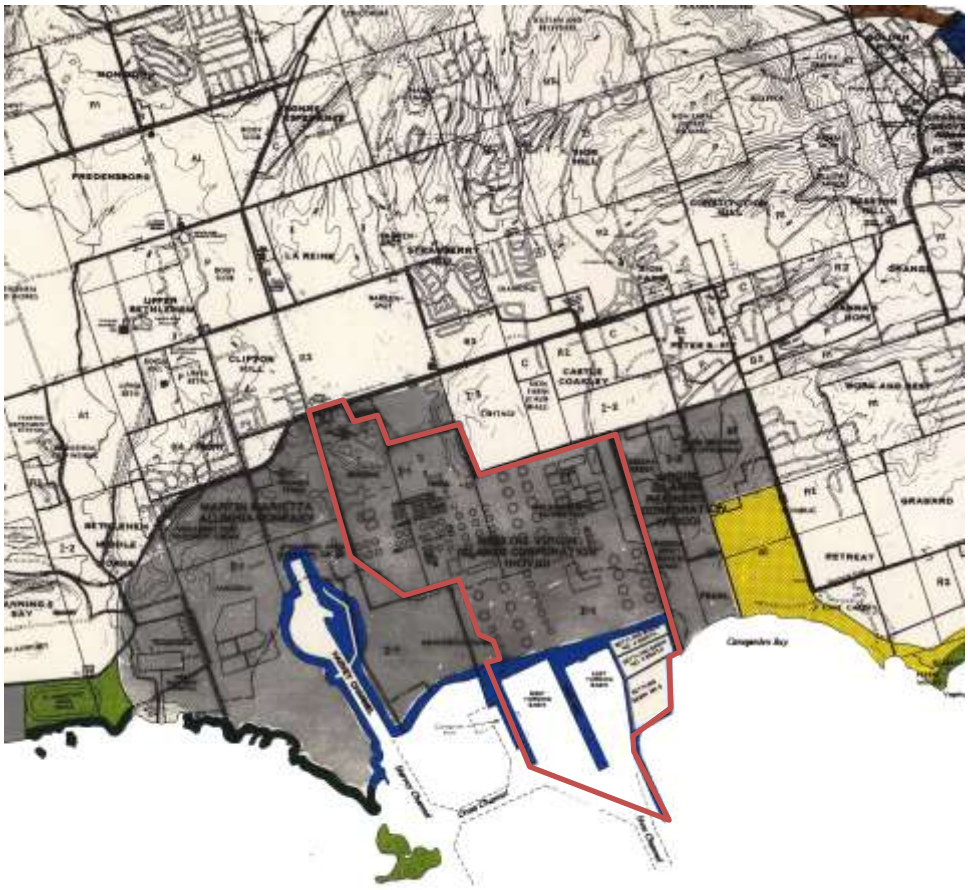


Figure 2.00.1 Location and Agency Review Map

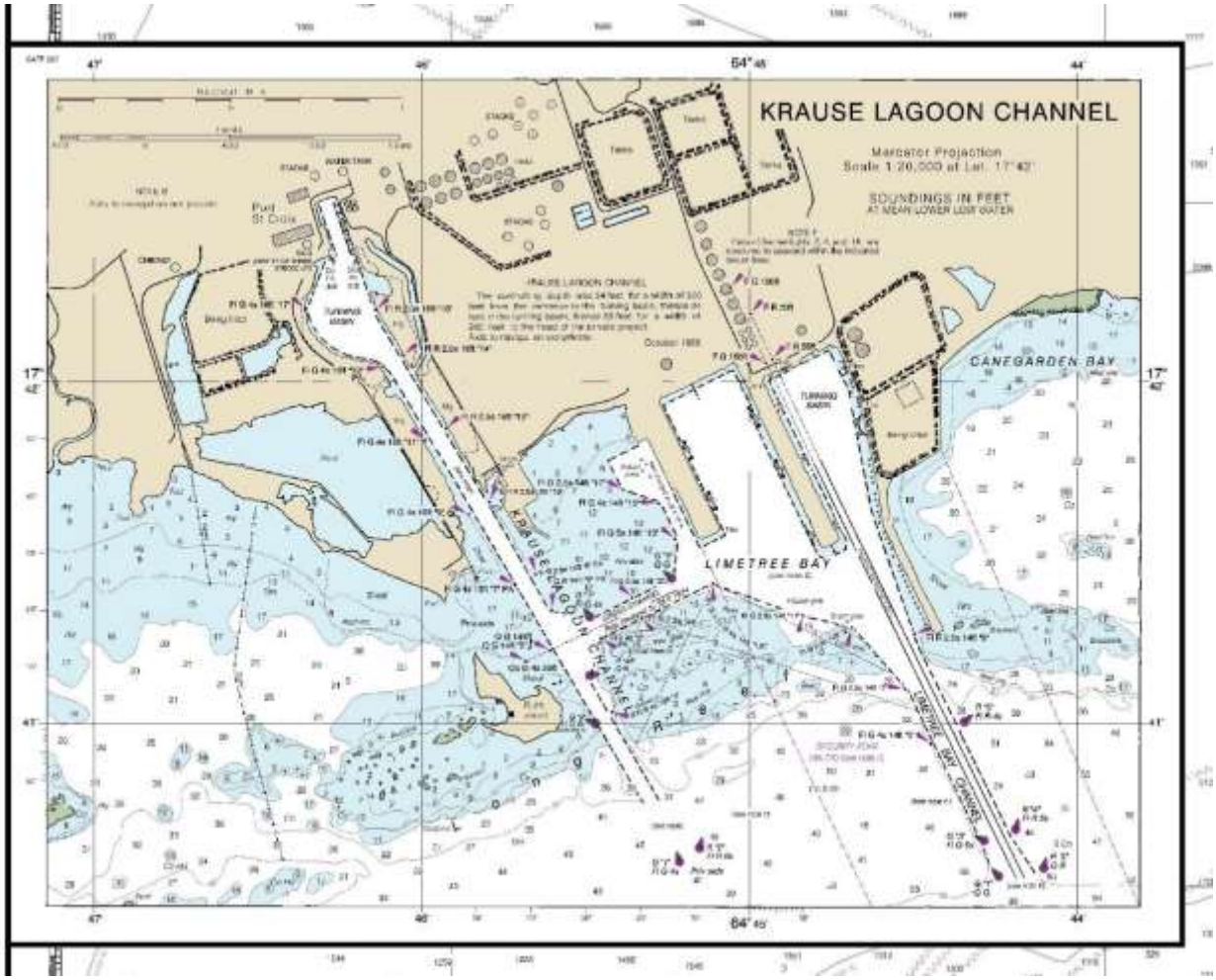


Figure 2.00.2 Navigation Map showing Project Location and Vicinity.

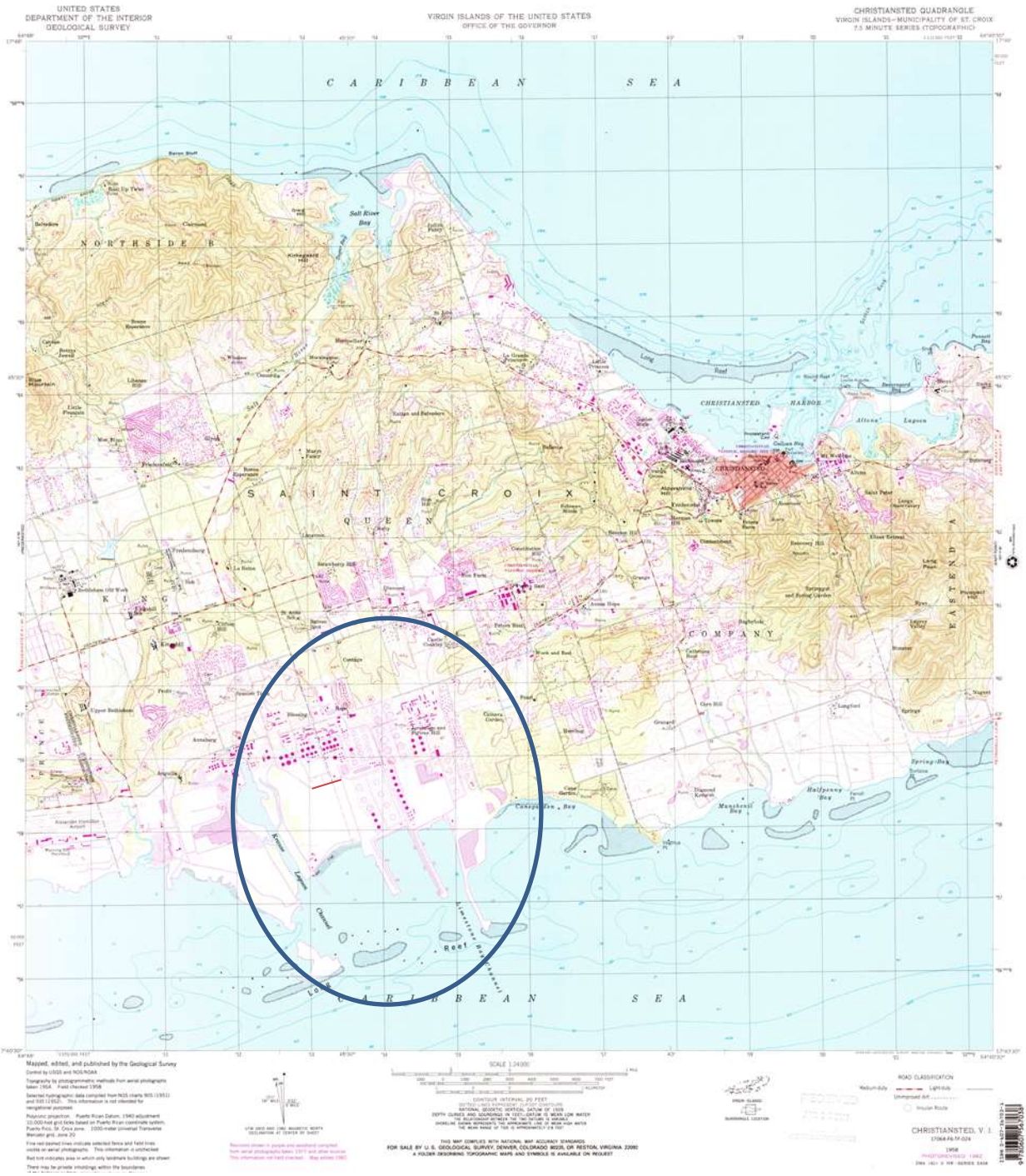


Figure 2.00.3 USGS Map of Project Location Vicinity

3.00 ABSTRACT

Summary
Applicants are proposing, at the request of the Virgin Islands Department of Planning and Natural Resources (DPNR), a single master CZM permit to permit (1) planned development at the Project Site that may occur in connection with restart of refining operations or future terminal projects, (2) to streamline permitting of future development at the Project Site and (3) consolidation of existing CZM permits in a single permit. With regard to purpose number (3), the proposed permit will incorporate facilities previously permitted pursuant to permits listed in Section 5.

The provisions of the proposed permit that relate to the restart of refining operations or permitting of planned work do not require legislative approval to be effective because the permitting of the proposed work is being done consistent with the provisions of the CZM Act and the Applicants do not require any addition grant of occupancy rights for submerged lands in view of the provisions of the APA, ARTOA and ROA. Because of the critical nature of the restart and the necessity to begin construction as quickly as possible, if it would be quicker than the granting of this permit, the applicants request that the permitting of the refinery restart work be handled, if necessary, as a Modification to CZM Permits CZX-5-99L (Coker, Coke Handling, Sour Water Strippers, Amine Units, Boiler 10 and QC Lab), CZM-27-05L (GT-13 and LSG), and SLP Permits 3, 23 and 52, because some of the restart work will be undertaken on developments already authorized by these permits.

A major purpose of this permit is to reduce the burden on DPNR in issuing CZM permits for development at the Project Site in circumstances where that development will not have a material impact on Tier 1 of the Coastal Zone. The proposed permit also establishes a tiered process for review of future proposed facility modifications based on scope of proposed changes. Three tiers are proposed. The first tier includes minor adjustments to facilities in connection with operations which will require notice be delivered to DPNR but for which no further regulatory review will be required. The second tier will include minor modifications and additions to equipment which will be subject to administrative review without public hearing, and third tier will include modifications, which due to their potential to impact areas offsite of the facility, will be subject to review utilizing the Major permit application or modification process. Applicants do not believe the proposed process requires legislative approval because the ROA and ARTOA already approve the use of the Project Site for an Oil Refinery and Related Facilities.

Finally, the proposed permit will include clarifications of the types of activities by Applicants that are not "development" for purposes of the CZM Act, consistent with prior interpretations by DPNR interpreting the existing exemptions from "development" in the CZM Act, such as the maintenance and "improvements inside a building" exclusions. These proposed provisions are within DPNR's authority to interpret the CZM Act as it has done in the past.

The proposed permit does not include any new or modified occupancy rights in submerged lands owned by the Virgin Islands, nor does it change the term of any of those occupancy rights. It incorporates, by direct reference to the ARTOA and TOA, those occupancy rights granted by those agreements as ratified by the Senate in 2018. The ARTOA and TOA also establish both the

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term of occupancy rights and the fees to be paid, either directly, or by reference to the underlying permit. Applicants propose no changes to the term, payment or extent of those occupancy rights.

A. Discussion of Streamlining Objectives:

The use and development of the Project Site for an Oil Refinery and Related Facilities has already been approved by the Legislature in the ARTOA and ROA and in the prior 1965 Agreement between HOVIC and the Virgin Islands. As a result, the Project Site has been extensively altered and improved over more than 50 years as shown in the comparison photos below. The first photo is aerial photograph showing the general location of the Project Site in 1962, which at that time was undeveloped, with Krause Lagoon to the West of the refinery. The second 2017 and Figures 5.1, 5.2, 5.3 and 5.4 provide aerial overviews of the Project Site as it appears today, and clearly illustrates the extensive alterations that have taken place since 1962. In view of these facts, additional construction activities at the site have no material impact on the Coastal Zone other than (potentially) for very large-scale changes to the Project Site or construction outside the current footprint of the facility.

SITE COMPARISON 1961 AND 2017

However, at present, the entire Project Site is located in Tier 1 of the Coastal Zone and "development" of any kind on the Project Site arguably requires a CZM permit. The definition of "development" in Section 902(j) of the CZM Act is very broad and could be interpreted to require CZM Permits for many routine activities at the Project Site, like maintenance or minor equipment upgrades, demolition or excavation of limited areas, or to smaller projects like pouring concrete slabs, small sheds or shelters or adding new pumps or piping. In that case, most of these activities would require Major CZM Permits, because the CZM Act sets dollar thresholds well below $100,000 for classification as a "Major" Development. These Major CZM Permits require significant resources from both the Applicants, who have to prepare extensive permit applications and repetitive Environmental Assessment Reports, and from Virgin Islands Department of Planning and Natural Resources ("DPNR") which must review the applications and EARs, hold

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public comment sessions and then issue a decision and permit. Occupancy permits also have a limited life under the CZM Act. Both the extensive process for obtaining a CZM permit and the time limits need to be made consistent with the Legislature's passage of the ROA and ARTOA and previous approvals of other land use agreements.

In some cases, the administrative burden can be reduced by modifying an existing permit for an already constructed development or building, as is proposed here as regards the refinery restart project. The existing law allows the Commissioner of the DPNR flexibility on what needs to be in an application for a modification and whether public hearings are needed. However, in the Applicants' case, most of the construction at the Project Site predates the October 1978 effective date of the CZM Act and, therefore, there is no CZM permit that can be modified to accommodate changes. This master permit will provide a vehicle to modify an existing permit, rather than issuance of a new permit, and thus provide the DPNR with important flexibility in handling development at the Project Site.

The permit will not include the proposed single point mooring, which is concurrently being permitted pursuant to a separate application but is intended to encompass all other operations and facilities at the facility.

B. Background on Legislation Granting the Right to Use The Project Site for the Oil Refinery and Related Facilities.

1. ARTOA, ROA and 1965 Agreement Rights of Land Use.

On September 1, 1965, the legislature approved Act 1524, "Agreement Between the Government of the Virgin Islands and Hess Oil Virgin Islands Corp., Relating to the Construction of an Oil Refinery and Other Related Facilities in St. Croix, Virgin Islands," which was later amended on several occasions (the "HOVIC Agreement")(Attachment C-1). The HOVIC Agreement specifically stated, "the use, for the purposes of the Oil Refinery and Related Facilities, of the site is hereby approved." This created vested rights for development as that term is used in the CZM Act. Construction commenced in 1966 on these facilities and by approximately 1976, numerous process units had been constructed at HOVIC, which reached a crude throughput of over 600.000 bbls. The ROA and ARTOA both confirm the continued right to use the Terminal Site and Refinery Sites for the Oil Refinery and Related facilities and further confirms that such use is consistent with land use regulations.

2. Land Use Rights Granted under Permits Issued by the United States and Later Confirmed by the Virgin Islands

As part of construction of the Oil Refinery and Related Facilities, HOVIC obtained dredge and fill Permits 3, 23 and 52 from the United States, as well as certain rights to use some of the filled lands for annual payments. The title to the filled lands was transferred in 1974 to the Virgin Islands. The Virgin Islands and HOVIC entered into a Contract dated as of September 22, 1976, which was approved by the Legislature of the U.S. Virgin Islands on September 29, 1976, which resulted in a Lease dated as of October 16, 1976, under which the Government leased to HOVIC approximately 52 acres of reclaimed submerged lands ("Submerged Lands Lease"). The Submerged Lands Lease stipulates that this land be used "for the purpose of developing the

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facilities of its oil refinery…." Under the Contract, renewal of the Submerged Lands Lease also continued the right to use the lands filled as authorized by Submerged Lands Permits No. 3, 23 and 52 ("Submerged Lands Permits"). The rights to the Submerged Lands Lease and Submerged Lands Permits were conveyed to HOVENSA in 1998, and rights under them to portions of the submerged lands were conveyed to Limetree Bay Terminals in 2016, as discussed above. The ROA confirms conveyance of rights to "Refinery Submerged Lands" to Limetree Bay Refining. The ARTOA confirms rights to "Terminal Submerged Lands" in Limetree Bay Terminals.

C. Facilities Overview

This section and Section 5 describe the existing Oil Refinery and Related Facilities so that modifications to development that occurred before the CZM Act, at the discretion of DPNR, can be permitted via permit modification, rather than a new Major CZM Permit. Only in the event of activities constituting "development" will pre-existing Oil Refinery and Related Facilities be subject to the general permitting requirements of the CZM Act. Table 5-1 and Figures 5.1, 5.2, 5.3 and 5.4 show the existing Oil Refinery and Related Facilities.

1. Refinery

The refinery was designed to receive and process crude from all over the world, both heavy and light as well as sour crude oils. The refinery consisted of three separate processing complexes: the West Refinery, constructed in the late 1960s; the East refinery, constructed in the early 1970s; and the Deep Conversion Complex, which included the Fluid Catalytic Cracking Complex constructed in 1993 and the Delayed Coker Unit Complex constructed in 2002. The Deep Conversion Complex is physically located in the East Refinery and is often included as part of the East Refinery. All refinery process unit assets have been idled since February 2012. Table 5.1 contains a detailed description of the existing assets at the facility. Figures 5.1, 5.2, 5.3 and 5.4 identify the locations of the assets on Table 5.1.

The process units are connected to downstream processing units, storage facilities and distribution systems by miles and miles of piping. They are also connected by distribution systems for water, power and steam. There are control rooms and shelters located throughout the Project Site

Most of land where the above grade assets are located had been owned by ERT until November 2018. An option was granted in the APA to LBT to purchase this land for $1 per acre, which was assigned to Limetree Bay Refining. Limetree Bay Refining exercised the option to acquire land where units are expected to be restarted and where support facilities and areas are located. The option was exercised on November 7, 2018. A deed, subject to later correction, was executed on November 15, 2008. Submerged lands where refinery assets are located belong to the USVI, and the right of LBT/LBR to use that land have been confirmed under the terms of ROA.

2. Storage Terminal

a. General

The facility has very significant marine terminal storage and loading assets because all feedstocks and almost all products are moved by marine vessels and historically was integral to the Refinery. The 34-mmbbls storage terminal consists of 141 storage tanks. The petroleum products historically stored at the terminal included crude oil, gasolines, distillates, benzene-toluene-xylene

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(BTX), propane, butane, liquefied petroleum gas (LPG), No. 6 fuel oils, vacuum gas oil (VGO) and bunkers among other petroleum products. The largest tanks at the site are those used for crude oil storage, of which there are 26 with approximately 631,828 barrels capacity. The tanks have all been returned to service. As with the refinery, the storage terminal tankage is connected by many large pipelines so that the products and feedstocks can be moved in, out and around the facility. The Storage Terminal is operated by a separate entity that is under common control with the Refinery. The Storage Terminal provides support facilities to the Refinery for product and feedstock storage and marine and land transfer of products and feedstocks.

b. Marine Loading Facilities

The marine loading facilities consist of 11 deep-water docks for the receipt or shipment of crude oil, refined products, intermediates and petroleum coke. The main crude oil docks can handle vessels with up to a 55-foot draft and 300,000 deadweight tons. The marine terminal also charters and operates a fleet of six tug boats to conduct dock operations. The tug boats were owned by HOVIC and acquired by LBT. All docks require tug assistance in the channel for docking and undocking activities. All tugs are equipped with fire pumps, monitors and foam towers to assist in fire-fighting.

In 2016 and 2017, LBT secured the necessary permits to upgrade marine loading pumps serving crude oil storage tank farms. DPNR has authorized new larger pumps to reduce the loading time at the existing marine loading docks and associated equipment, including a marine vapor collection system (MVCS) designed to achieve 98 percent capture efficiency of marine vapors during gasoline/gasoline blendstocks loading at the docks and a thermal oxidizer to destroy captured volatile organic compounds (VOC).

Construction started on February 6, 2017 and is expected to be completed by first or second quarter of 2019.

LBT has also secured the necessary air (STX-895-AC-PO-16) and CZM (CZX-29-17(L&W), which grants an occupancy right) permits for the construction and operation of an offshore single point mooring (SPM) buoy to allow certain vessels (Very Large Crude Carriers or "VLCCs") to load/unload at maximum draft. Construction has begun on the land side of the project only, pending receipt of a permit from the Army Corps of Engineers.

c. Truck Loading Rack

The terminal assets also include a truck loading rack, equipped with four operating system bays for regular grade gasoline, premium grade gasoline, jet fuel, ultra-low sulfur diesel and propane. Each loading system is equipped with a Vapor Recovery Unit (VRU). The truck loading rack resumed operations on May 2, 2016 serving local sales.

3. Utilities

a. Power Generation Facilities

The facility does not rely on any outside power generation for its operations. The facility has two power blocks that are interconnected electrically and are the only source of electricity for refining and terminal operations, housing and administrative buildings.

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The West Power Block consists of three GE Frame 5 combustion turbines (GT-1, GT-2 and GT-3) and a steam turbine generator (#11) for combined cycle operation and has remained idle since 2012. The East Power Block consists of eight GE Frame 5 combustion turbines (GT-4 through GT-10, and GT-13). All combustion turbines in the East and West Power Blocks have heat recovery steam generators (HRSGs) but only GT-13 is capable of supplemental duct firing. GT-13 is equipped with selective catalytic reduction (SCR) for nitrogen oxides (NO_x) emission control and an oxidation catalyst for carbon monoxide and formaldehyde emissions control. All the gas turbines may be operated with the exhaust exiting a simple cycle stack prior to the HRSG. Historically, each unit was started in simple cycle mode and the HRSG was brought on line after the gas turbine was in operation. Steam from the Power Blocks was used in the refining process.

In addition, the facility included a Fluid Catalytic Cracker (FCC) flue gas expander located in the East Refinery. This unit generated approximately 19 MW of power independently of the power blocks.

Since the idling of the refinery, only three turbines in the East Power Block remained operational (GT-4, GT-7 and GT-8), with one unit meeting all the electrical demand at the site, and the other two units on standby. It is currently anticipated that the remaining turbines will be operated by LBR, but some may be owned by LBT and/or through undivided interests held by both parties.

b. Boilers

The facility operated eight conventional boilers to provide additional 600 psig steam to the refinery process units. The boilers fired refinery fuel gas and No. 6 oil. The East and West Refinery each have an independent steam and air system. Boilers received approximately 2.5 million gallons per day (gpd) of fresh water from the facility desalination plants. The four desalination plants had a total capacity of 4.4 million gpd.

c. Advanced Wastewater Treatment Plant

In 2008, HOVENSA received authorization to operate an advanced wastewater treatment plant (AWWTP), replacing the three lagoons historically used for wastewater treatment. The AWWTP includes three aeration tanks, one clarifier tank, two degas tanks, two sludge holding tanks, two equalization tanks, two post aeration tanks and other associated tanks (i.e., surge tanks, caustic, sulfuric and phosphoric acid tanks). The AWWTP is connected to the two refinery A.P.I. oil/water separators. The AWWTP continued to be operated after the refinery idling to treat the facility wastewater as well as the contaminated groundwater recovered from the site and the adjacent St. Croix Renaissance Facility.

The AWWTP discharges into a drainage canal which flows into the East Turning Basin. It is currently anticipated that the AWWTP will be operated by LBR. The AWWTP is located on refinery lands, but the main outfall is located on terminal property.

d. Drinking Water

The facility has historically produced and distributed potable/drinking water to the onsite buildings and facilities, as well as to the adjacent residential housing and training center. LBT acquired the distribution system and the contract rights to the production systems under the APA,

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except for the systems associated with the residential housing conveyed to the GVI that were re-conveyed to LBT in 2018. Potable water is presently produced by a reverse osmosis (RO) of sea water. The RO process is owned and operated by a third-party contractor.

e. Residential Areas

Residential areas in Tier 1 of the Coastal Zone include Estate Blessing and Estate Hope on the west side and Estate Fig Tree on the east side. These areas were historically used for permanent and temporary employee housing. Power and water are provided to these residential areas by the facility Power Blocks and sea water treatment plant (i.e., desalination units and RO units). Electric substations are still in place at all Estates. All housing structures were removed from Estate Hope. Estate Fig Tree was mostly dismantled because of safety concerns but has several executive homes that are currently not occupied.

As part of the Operating Agreement and APA, the GVI received Estates Blessing, Hope, and Cottage (and land in some other estates) owned by HOVENSA, and an approximate 300 acres of land to the east of HOVENSA, known by the collective title "Estate Pearl." As noted above, LBT acquired the housing areas conveyed to the GVI in 2018 and retains an option to purchase portions of Estate Pearl.

4.00 STATEMENT OF OBJECTIVES SOUGHT BY THE PROPOSED PROJECT

The objective of a single master CZM permit to is permit (1) planned development at the Project Site that may occur in connection with restart of refining operations or future terminal expansion and (2) to streamline future development at the Project Site at the Project Site and (3) consolidation of existing CZM permits in a single permit. The objectives of the streamlining provisions of this permit is to reduce the administrative burden on DPNR in issuing CZM permits for development at the Project Site in circumstances where that development will not have a material impact on Tier 1 of the Coastal Zone and to recognize that the Senate has already approved the use of the Project Site for Oil Refinery and Related Facilities and established the term for occupancy of submerged lands. These provisions will also improve Limetree's financial viability and ability to respond to the global marketplace by providing certainty and greater speed in the permitting process applicable to proposed plant modifications. The provisions of the proposed permit that relate to the restart of refining operations or permitting of planned work do not require legislative approval to be effective because the permitting of the proposed work is being done consistent with the provisions of the CZM Act and the Applicants do not require any addition grant of occupancy rights for submerged lands in view of the provisions of the APA, ARTOA and ROA.

One of the key objectives of the proposed refinery restart project is to facilitate economic growth in the Virgin Islands. A more complete discussion is included in Section 7.05, but highlights are set forth in this section.
"Indirect Benefits

- Planned $1.4 billion investment for refinery refurbishment and restart
    - Estimated 1,200 workers—payroll of $450 million (This may be significant higher)
- Up to 700 permanent jobs when refinery restarts
    - Estimated $100 million per year payroll
    - Good jobs with excellent benefits
- Economists suggest investments such as these provide a substantial multiplier effect to the local economy
- Periodic large scale maintenance events with projected spending in excess of $200 million per event." {Source-Gaffney, Cline}

Direct benefits from the restart:

- "Upfront consideration of $70.0 million to prepay taxes and purchase cottages and other property
- Carried interest of 10% of the total profit, aligning the interests of Limetree and the GVI
- Annual base refinery payments to the GVI of $22.5 million (in addition to terminal payments)" {Source-Testimony of Limetree to Senate}

Limetree believes that some of the estimates presented may be on the low side. Regardless, this project will contribute significantly to revitalization of the economy of St. Croix and of Virgin Islands as a whole. As discussed below, the ROA ensures that residents of the Virgin Islands will benefit from this expansion.

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5 DESCRIPTION OF PROJECT

5.01 Summary of Proposed Activity

5.01.1 Restart Project

Applicants are currently planning to resume operation of some of the existing refinery process units and certain utilities. The refinery restart has been facilitated by a change to the rules of the International Convention for the Prevention of Pollution from Ships (otherwise known as MARPOL). This change, which comes into effect on January 1, 2020, lowers the amount of sulfur permitted in marine fuels (otherwise known as bunker fuels) from 3.5% to 0.5%. When the rule revision comes into effect, it will create an economic opportunity for the refinery to supply low-sulfur marine fuels. This MARPOL opportunity is critical to the refinery restart, making it very important to bring the refinery back online by the end of 2019 or early 2020.

The contemplated refinery project would entail restart of a deep-conversion refinery configuration involving a subset of the existing refining units capable of processing ~210 mbbl/d of feedstock and including ~62 mbbl/d of coking capacity. While the crude units being restarted (#5 and #6) have a theoretical capability of exceeding the ~210 mbbl/d of feedstock capacity represented in this application, the downstream processing capabilities do not support a higher sustained maximum throughput of ~210 mbbl/d. Crude units #5 and 6 are being restarted to provide redundant capacity in the event of mechanical issues or crude processing options for crudes better suited to the designs of Crude units #5 or 6. Put another way, Applicants cannot operate both crude units at the same time as a sustained matter. In addition to capturing the MARPOL opportunity, this refinery configuration will be well-positioned to generate products such as gasoline, diesel fuel and other fuels for sale into the growing USVI, Caribbean, Latin American, and African markets.

The refinery process units and utilities that are proposed to resume operation are listed in Table 1-1 that also includes gas turbines that are currently operating and will support the Restart Project. The table also includes an overview of the restart work and whether the work might, absent consideration of (a) the ARTOA, ROA and APA and (b) DPNR interpretation of CZM regulations, constitute CZM regulated development.

Table 1-1. Summary of MARPOL Project Work

Refinery Process Unit	Source ID(s)/ Emissions Unit	Overview of Restart Work [2]
#5 Crude Unit (#5 CDU)	1. Heater H-3101A 2. Heater H-3101B 3. #5 CDU Process Unit	1. Maintain and repair. Install ultra-low NOx burners 2. Maintain and repair. Install ultra-low NOx burners 3. Install tie-ins from #5CDU to #6 CDU desalter
#6 Crude Unit (#6 CDU)	1. Heater H-4101A 2. Heater H-4101B 3. #6 CDU Process Unit	1. Maintain and repair. 2. Maintain and repair. 3. A. Naphtha stabilizers and fractionators changes B. Changes as needed to function as alternative to #5 CDU
#3 Vacuum Unit (#3 VAC)	1. Heater H-4201 2. Heater H-4202 3. #3 VAC Process Unit	1. Maintain and repair 2. Maintain and repair 3. Maintain and repair
#7 Distillate Desulfurizer (#7 DD)	1. Heater H-4301A 2. Heater H-4301B 3. Heater H-4302 4. #7 DD Process Unit	1. Maintain and repair 2. Maintain and repair 3. Maintain and repair 4. Install new pressure swing adsorption system to purify hydrogen and on-line sulfur analyzer on
#3 Platformer (#3 Plat) #3 Hydrobon	1. Heater H-4401 2. Heater H-4402 3. 3 Plat Process Unit (#3 Hydrobon)	1. Maintain and repair 2. Maintain and repair 3. Repurpose #3 Plat Hydrobon section to a light naphtha hydrotreater

Refinery Process Unit	Source ID(s)/ Emissions Unit	Overview of Restart Work [2]
#3 Platformer (#3 Plat)	1. Heater H-4451 2. Heater H-4452 3. Heater H-4453 4. Heater H-4454 5. #3 Plat Process Unit	1. Maintain and repair 2. Maintain and repair 3. Maintain and repair 4. Maintain and repair 5. Changes as needed to function as alternative to # 4 Platformer
#6 Distillate Desulfurizer (#6 DD)	1. Heater H-4601A 2. Heater H-4601B 3. Heater H-4602 4. Compressor C-4601A 5. Compressor C-4601B 6. Compressor C-4601C 7. #6 DD Process Unit	1. Maintain and repair 2. Maintain and repair 3. Maintain and repair 4. Maintain and repair 5. Maintain and repair 6. Maintain and repair 7. A. Install piping and control valves to allow for feed bypass around inlet exchangers B. Install hydrogen quench line into reactors C. Install additional effluent exchanger -
#2 Distillate Desulfurizer (#2 DU)	1. Heater H-800A 2. Heater H-800B 3. Heater H-801 4. #2 DU Process Unit	1. Maintain and repair 2. Maintain and repair 3. Maintain and repair 4. Changes as needed to function as alternative to # 4 Platformer

#4 Platformer (#4 Plat)	1. Heater H-5401 2. Heater H-5402 3. Heater H-5451 4. Heater H-5452 5. Heater H-5453 6. Heater H-5454 7. Heater H-5455 8. #4 Plat Process Unit	1. Maintain and repair 2. Maintain and repair 3. Maintain and repair 4. Maintain and repair 5. Maintain and repair 6. Maintain and repair 7. Maintain and repair 8. A. Use #4 Plat Hydrobon section as a naphtha hydrotreater; use #4 Plat reformer section as a naphtha reformer B. Install chloride gas treaters C. Install chloride LPG treaters
Delayed Coker Unit (DCU)	1. Heater H-8501A 2. Heater H-8501B 3. DCU Vent 4. DCU Process Unit	1. Maintain and repair 2. Maintain and repair 3. Maintain and repair 4. A. Install blowdown eductor (to comply with MACT Subpart CC) system (2 psi vent target) B. Install additional instrumentation to support coke drum deheading process C. Install automatic unheading valves on the bottom of each coke drum

Refinery Process Unit	Source ID(s)/ Emissions Unit	Overview of Restart Work [2]
Penex Unit	1. Heater H-202 2. Compressor C-200A 3. Compressor C-200B 4. Compressor C-200C 5. Penex Process Unit	1. Maintain and repair 2. Maintain and repair 3. Maintain and repair 4. Maintain and repair 5. Install additional heat exchanger, modify fractionator stabilizers, reactor distributors, and piping
#9 Distillate Desulfurizer (#9 DD)	1. Heater H-5301A 2. Heater H-5301B 3. Heater H-5302 4. 9 DD Process Unit	1. Maintain and repair 2. Maintain and repair 3. Maintain and repair 4. Maintain and repair
Boilers	1. #8 Boiler (B-3303) 2. #9 Boiler (B-3304) 3. #10 Boiler (B-3701)	1. Install NO_X control technology (e.g., low NOx burners or Selective Catalytic Reduction ("SCR") as needed to comply with NSPS subpart D 2. Install NO_X control technology as needed to comply with NSPS subpart D 3. Maintain and repair
Utility Fractionator	1. Heater H-160 2. Util. Frac. Process Unit	1. Maintain and repair 2. Maintain and repair
Powerhouse 2 - Turbines Turbine/Steam Generators	- GT No. 7 (G-3407)[4] 1. - GT No. 8 (G-3408)[4] 2. - GT No. 9 (G-3409) 3. - GT No. 10 (G-3410) 4. - GT No. 13 (G-3413)	- Install SCR or steam injection to comply with NSPS Subpart GG 1. - Install SCR or steam injection to comply with NSPS Subpart GG 2. - Maintain and repair, repair or replace HRSG 3. - Maintain and repair 4. - Maintain and repair
Flares	1. - Flare 3 2. - Low-Pressure FCC Flare	1. - Maintain and repair, Install H_2S scrubbing system, install required monitoring systems 2. - Maintain and repair. Install H_2S scrubbing system, install required monitoring systems

Refinery Process Unit	Source ID(s)/ Emissions Unit	Overview of Restart Work[2]
East Fuel Gas System	East Fuel Gas System	Maintain and repair
West Fuel Gas System	West Fuel Gas System	Maintain and repair
Terminal	Terminal (Offsites/Rundowns/ transfers)	Maintain and repair
# 2 Gas Recovery Unit (#2 GRU)	- #2 GRU Process Unit	- Install jumpover connecting the product separator to the feed gas knockout drum at the high-pressure amine contactor
Amine Units	1. Gas Treatment (Unit No. 4800 #4 Amine Unit) 2. Gas Treatment (Unit No. 5800 #5 Amine Unit) 3. #6 Amine Unit 4. #7 Amine Unit	1. Maintain and repair 2. Replace #4/5 Amine Unit flash drum with larger drum and rich amine pump (P-4837 A/B) 3. Install tie-in from TGTU to #6 Amine Unit 4. Maintain and repair
East Sulfur Recovery Plant	- # 3 & #4 SRU / #2 Beavon / East Incinerator / Sulfur pits	- #3 SRU: Replace air blowers (higher discharge pressure), primary burner (high intensity/oxygen lance to support oxygen enrichment), intra-stage reheaters (steam reheaters), and reloading of catalyst (all reactors) - #4 SRU: Replace air blowers (higher discharge pressure), primary burner (high intensity/oxygen lance to support oxygen enrichment), and reloading of catalyst (all reactors) - #2 Beavon: Convert tail gas treating unit to a Shell Claus Offgas Treater ("SCOT") type unit by changing the hydrogenation reactor catalyst, replace fired TGTU reheater with steam reheater, install quench column, absorber, pumps, and quench water cooler and filter system - Install sulfur pit eductor system to transport pit vapors from sulfur pits to SRU thermal reactor - Install replacement of existing priller/pelletizer

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Refinery Process Unit	Source ID(s)/ Emissions Unit	Overview of Restart Work [2]
East Sulfur Storage Area	- East Sulfur Storage Area	- Maintain and repair
Sulfur storage & Ship Loading	- Sulfur storage & Ship Loading	- Maintain and repair
Coke Handling	- Coke handling, storage, and loading system	- Maintain and repair
Advanced Wastewater Treatment System	1. Advanced Wastewater Treatment System6 2. #3 and #4 Sour Water Stripper ("SWS") 3. #5 SWS	1. Maintain and repair 2. Maintain and repair 3. Maintain and repair

[2] The modifications that are summarized are based on the current definition of the project. Additional changes within a given process unit may be identified as part of the detailed design work. The Restart Project will result in work being performed on affected units, but that work is not expected to be a modification.

[3] Additional inspection or work scope changes may result in an update to the status of the listed process units with regards to CZM

The restart work scope is mostly repair or maintenance of parts of existing process units, which is exempt from CZM permitting under Section 910(b)(1) of the CZM Act so long as the size of the structure does not result in an addition, enlargement or expansion of the structure or object. Some structures may be changed or altered in a way that may (but do not necessarily) constitute "development" as that term is used in the CZM Act. Some examples are the pouring of new foundations, pumps, exchangers, piping and towers. Section 5.2 provides drawings or descriptions of proposed new foundations. One other specific example of potential development is the demolition of the existing East Beavon Unit. Most of this work takes place within the battery limits of existing process areas at the facility. Refining process units are not the typical structures regulated under CZM because the process unit not an enclosed building. However, work inside the battery limits of an existing process area can be viewed as analogous to the exclusion in Section 902 of "any improvement made in the interior of any structure" because such improvements do not change or affect the impact of the structure on the Coastal Zone, and thus could be viewed as exempt. Moreover, former Commissioner Mathes of DPNR issued a letter regarding changes at the facility that did not trigger CZM permitting because they had no material effect on the Coastal Zone. This included interconnecting piping, pumps, etc. A copy of that letter is attached to this application in Appendix D and Applicants request it be included in the permit for this Project.

Although this application describes the restart of a portion of the idled units at the Project Site, LBT/LBR are still studying, as required by the ROA, restart of additional refinery process units. Restart of these units would involve similar scopes to those set forth above, but with different units. Because the ROA and ARTOA make it clear that additional investment in the facility and potential unit restarts are critical to the Virgin Islands economy, Applicants request that the right to undertake development necessary to restart additional process units be included in the permit.

5.01.02 Demolition

Although Applicants are still reviewing business opportunities for restart of additional process units, the ROA and ARTOA contemplate "deconstruction" (i.e. demolition) of some refinery structures in certain circumstances. Those structures authorized by previously issued CZM permits may also be required to be demolished in accordance with terms of these permits. It may also be necessary or appropriate to demolish some terminal or structures for safety or environmental reasons. Moreover, given the nature of the activities and pre-existing structures at this site, it is unlikely that demolition would ever have significant effects on the Coastal Zone. Thus, Applicants seek a permit to demolish structures consistent with the provisions and requirements of the ROA and ARTOA or previously issued CZM permits.

5.01.03 Permit Streamlining

5.01.03.01 This application proposes several means of streamlining CZM permitting. First, it proposes to permit "development" at all LBT/LBR facilities shown in Table 5.1 under a three-tier permit modification system, consistent with the Senate's approvals of the right of LBT and LBR to use the Project Site for an Oil Refinery and Related Facilities. Because of these approvals, DPNR-CZM permitting authorities should not typically need to devote staff resources to determine if the proposed development is appropriate for the Coastal Zone, thus streamlining the proposal process. The first tier includes minor adjustments to facilities in connection with

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operations which will require notice be delivered to DPNR but for which no further regulatory review will be required. The second tier will include minor modifications and additions to equipment which will be subject to administrative review without public hearing, and third tier will include modifications, which due to their potential to impact areas offsite of the facility, will be subject to review utilizing the Major permit application process. Once such development occurs, the development in that structure or process unit will then become subject to the general provisions of this permit.

Second, the permit will tailor the definition of development and "Major" development to the site scale and activities.

- Changes, alterations, demolition and excavation within battery limits of a process area are not development unless the total cost of those changes, alterations, demolition and excavations exceeds more than 10% of the replacement cost of the process unit. {Maybe this is how we tier the permit? Cover tank fields, too?
- It will clarify the meaning of the repair/maintenance exclusion by incorporating the Table in 5XX, so that routine everyday activities at the facility will not require permitting.

Third, it consolidates existing permits into a single permit, by incorporating them by reference. The federal permits are summarized for information purposes only. The duration of all of these permits and the annual fees are governed by the ARTOA and the ROA.

5.01.04.02 General Permit Conditions

5.01.04.02 01 Scope

In lieu of the general conditions included in the above-described permits, the following conditions are proposed for the consolidated permit.

5.01.04.02 02

1) Actions that do not Constitute Development
    a. General maintenance or repair resulting from normal wear and tear or operations is not development may be carried out as a matter of right under this permit; other work as specified herein shall be approved through the PAFA process. General maintenance includes but is not limited to: cleaning and maintenance of tank, pipes and equipment, removing or replacing tanks and equipment, removing, repairing and replacing pipes if the amount of pipe affected is less than 1000 feet, road, gate and fence maintenance, repairing and resurfacing existing parking lots, sidewalks and roads, maintenance of existing drainage facilities; installation, modification and operation of surveillance equipment, radio telemetry equipment and exterior lighting systems on stacks, tanks, and structures; installation and maintenance of signage and landscaping, including, grass, shrubbery and trees, and interior renovations of structures; replacement of doors, windows and rooftops of structures; and painting tanks, pipes and structures. Testing and repairs of underground lines. Items on Attachment E (Mathes letter) are among the repair and maintenance activities that do not constitute development.
    b. Changes or alterations inside the battery limits of process areas or tank fields as shown in the Permit Application for this permit will be deemed changes or alterations to the interior of a structure; provided that they do not alter the size of a

structure by increase the height of the highest structure in the process area

5.01.04.02 02 Streamlining and Other Conditions for Consolidated Permit

2) Any development related to equipment and structures addressed herein will be reviewed and approved pursuant to the Process for Approval of Future Activities ("PAFA") set forth herein. A PAFA is not required for actions that do not constitute development, including those set forth in the preceding paragraph.

3) The PAFA process shall be as follows: There shall be three alternatives to review future work to be performed pursuant to this permit based on the complexity and scope of the proposed project: De Minimis, Administrative & Major.
   a. De Minimis Development Project. Development which will be subject to De Minimis Review include removing, repairing and replacing pipes if the amount of pipe affected exceeds 1000 feet (lesser amounts shall be considered General Maintenance), work authorized by an U.S. Army Corps of Engineers approved Nationwide Permit or site specific maintenance permit; replacing dock decking, curbing, bollards and fendering above the waterline; and removing, replacing, repairing and maintaining skids, pumps and electrical equipment utilized in operations. De Minimis development shall also include (a) development as part of a single project that costs less than the greater of $500,000 of site work, excluding equipment (adjusted for inflation) Administrative Review is appropriate for any project which is not subject to De Minimis Review, but which does not impact lands or waters outside the footprint of the facility, as well as for work which requires an individual (not an approved nationwide) federal permit or which requires a building permit prior to commencement. Examples include but are not limited to: work on docks below the waterline; demolition or reconstruction of more than 50% of a structure; increasing impervious surface in the facility by more than 10% of the current total facility impervious acreage; installing new or modifying existing drainage and storm water facilities; and changing environmental monitoring and control equipment. (b) demolition of structures or process units required or allowed under the ARTOA, ROA or relevant CZM permits. Review shall consist of delivery of a notice to the Division of CZM at least 15 days before the work has been commenced describing the work, the basis for its classification as De Minimis, its location and any applicable Erosion or Turbidity Control plans that are being followed in connection with completing the work. If the work is emergency work to protect human health or the environment or avoid significant economic loss, the notice may be delivered no later than five business days after commencement of the work. CZM shall assign a sequential number to the notice, which will thereafter be considered part of this permit. No further review or approval by CZM will be required after notice is delivered, unless CZM within 15 days of receipt of notice provides a notice to the Applicant that it believes that the work is development and is not De Minimis.
   b. Administrative Review Development Project: An Administrative Review Development Project is any project which is not subject to De Minimis Review,

but does not (i) materially impact lands or waters outside the footprint of the facility, (ii) require an individual (not an approved nationwide or general) federal permit, and (iii) does not cost in excess of the greater of $5,000,000 of site work excluding equipment (adjusted for inflation) or 10% of the replacement cost of the structures to be changed or modified. Examples include but are not limited to: work on docks below the waterline; demolition or reconstruction of more than 50% of a structure; increasing impervious surface in the facility by more than 10% of the current total facility impervious acreage; installing new or modifying existing drainage and storm water facilities; and changing environmental monitoring and control equipment. Review shall consist of submittal of a letter to CZM at least 30 days prior to commencement of the proposed work describing the proposed work, why the work is an Administrative Review Development Project, together with construction plans, a map identifying the location within the facility, and if applicable, environmental monitoring, erosion or turbidity control plans, and a proposed timetable for commencement and completion of the project. CZM Staff shall review within 15 days of submittal all submitted documents and either approve the work or respond with questions or concerns. If CZM does not respond within 20 days following any initial submittal or supplemental submittal responding to questions, the proposed work shall be deemed approved pursuant to this permit. Upon approval, the letter shall be assigned a sequential number and will thereafter be considered part of the permit. CZM may impose additional commercially reasonable conditions on the project beyond those contained in this permit. The Division of CZM may authorize shorter periods of time for notice, review or authorization if the work is emergency work to protect human health or the environment or avoid significant economic loss.

c. Major Review Development Project. A Major Review Development Project is a project that is not a De Minimis or Administrative Review Project. This category is appropriate for any proposed project which is proposed to expand the operations of the facility beyond current Terminal and Refinery site boundaries, large scale developments involving new process units, tanks or utilities or which will restrict use of land and water surrounding the Terminal and Refinery site by third parties. Examples include but are not limited to modifying shipping channels if public access will be restricted, expanding the facility to utilize additional offsite acreage, or permanently closing public roadways adjacent to the facility. The process for a Major Review Development Project shall be the same as the Modification of Approved Coastal Zone provisions of the CZM Act and implementing regulations, presently codified in 12 VIRR, Title 21 §910-14., except that any new or additional grant of an occupancy right in submerged lands must comply with all applicable requirements of the CZM Act and implementing regulations.

d. Aggregation of Work. To determine project classification dollar thresholds in the PAFA process, a project shall include all work performed or scheduled to be performed on a process unit, structure or in a process area within one year that has a common overall purpose.

4) The Permittee shall furnish the Division of CZM two (2) digital copies of all documents/submittals related to any work authorized pursuant to the PAFA and required

by Paragraph 3 , where an approval is required.

5) For any development authorized pursuant to this permit, the Division of CZM will be notified at least 48 hours prior to commencement of activities, except as provided with respect to emergency work.
6) When excavation work is performed pursuant to this permit or in connection with work approved pursuant to the PAFA, all trucks transporting excavated materials shall be covered when in motion.
7) The Permittee shall obtain all other necessary Federal and Territorial permits, including permits from the Division of Building Permits, prior to commencement of work. The Permittee shall comply with all applicable provisions of the Americans with Disabilities Act.
8) If the Permittee abandons, deserts or vacates the premises or discontinues its operations at the premises for a period totaling 6 consecutive months, then the permit will terminate automatically and be rendered null and void.
9) Construction of development authorized by this Permit or subsequently authorized pursuant to the PAFA, shall commence within 12 months of authorization. Failure to commence work within such period and continuously construct thereafter until the completion of construction shall cause the authorization for the project to terminate automatically and render it null and void, unless an extension is requested in writing and granted by the Commissioner.
10) The Permittee shall at all times maintain a Fire Control Plan in conformance with the Uniform Fire Code that addresses hazards that may occur at the proposed Coke Loading Dock, which includes any hazards to the facility from any coke transport ship which may be docked at this facility.
11) All waterside work authorized by this permit or the PAFA shall comply with all requirements of a Turbidity Control Plan prepared in connection with the plans for the work.
12) No oil or debris may be discharged into the waters of the US Virgin Islands. The Permittee shall maintain a Spill Prevention Countermeasure Control Plan at all times.
13) Permittee will comply with all requirements of its territorial pollutant discharge elimination system (TPDES) permit.
14) All landside work authorized by this permit or the PAFA shall comply with requirements of a Sedimentation and Erosion Control Plan prepared in connection with the plans for the work.
15) Any required silt fencing shall be installed with steel posts and wire fence support as described in the 2002 Environmental Protection Handbook, as it may be amended from time to time.
16) Site disturbance shall be limited to areas designated on the plans for each Administrative or Major Development Project authorized under this permit or authorized pursuant to the PAFA.
17) All excavation shall be limited to areas (i) designated for excavation on plans or (ii) located within the footprint of a building authorized for construction, renovation or demolition under this permit or authorized pursuant to the PAFA.
18) Work shall be performed in a manner that will not adversely impact existing water quality. In no case shall work be performed in a manner that causes any exceedance to the Virgin

Islands Water Quality Standards set forth in Title 12, Section 186 of the Virgin Islands Rules and Regulations.

19) No dispersants, soaps or biological agents shall be added to any release of petroleum or other pollutants within the waters of the US Virgin Islands without the joint and concurrent approval of DPNR.
20) Permittee shall retain exclusive ownership of all equipment and structures built in and on submerged and filled land subject to this permit and the ROA/ARTOA.
21) The Permittee shall monitor the environmental effects of construction and start-up activities and shall promptly notify the Commissioner of any unanticipated adverse environmental consequences. In the event of a material unanticipated adverse environmental impact, CZM may require appropriate and commercially reasonable mitigation measures to protect public health and welfare, in accordance with applicable law.
22) All projects which require site disturbance shall employ dust control measures to minimize pollution during construction.
23) No petroleum-based products shall be used as a form release agent during construction within the facility.
24) When completing work in or adjacent to water, any fallen debris such as chipped concrete, steel bars, etc., shall be removed from out of the waters at the end of construction.
25) If any historic ruins, cultural artifacts, or endangered species are encountered on any site, the property owner or agent must immediately stop all activity at the site, until such time as the property owner or agent **notifies** the Division of Environmental Protection and the respective State Historic & Preservation Office, or the Division of Fish & Wildlife of the encounter and an inspection of the site is completed.
26) To protect wildlife from noise and light impacts, an 8 foot earthen berm will be maintained on the eastern property line adjacent to the Coker.
27) Permittee shall maintain existing sedimentation control structures located within the facility, but may revise use of such sedimentation control structures utilizing the PAFA process.
28) This permit does not revise, change, alter or amend any right to occupy and use submerged lands either under the relevant permit or the ROA or ARTOA. The term of and rental for such occupancy and use rights is governed by the ROA and ARTOA.

	Table 5-1	**Identification of Existing Assets**			
1	Penex	Drums, towers, pumps, reactors, exchangers	Refinery Plot No. 1 Portions of Estate Blessing & Hope		
2	West Spheres	Gas Storage: Tanks 7530 – 7535 and Tanks 6892, 6866 and 6867	Terminal Plot No. 4 Estate Blessing, Hope & Jerusalem/Figtree Hill		
3	Tank Field #10	Tanks 7413 and 7416	Terminal Plot No. 4 Estate Blessing, Hope & Jerusalem/Figtree Hill		
4	Manifold #1	Pumps and Piping	Terminal Plot No. 4 Estate Blessing, Hope & Jerusalem/Figtree Hill		
5	Tank Field #7	Gasoline Storage-Tanks 6821-6825 &6831-8636	Terminal Plot No. 4 Estate Blessing, Hope & Jerusalem/Figtree Hill		
6	Seven Seas Reverse Osmosis Plant	Potable and Process Water Production	Terminal Plot No. 4 Estate Blessing, Hope & Jerusalem/Figtree Hill		
7	Control Buildings	Area 1 and 2 control panels and analyzers, work areas	Refinery Plot No. 1 Portions of Estate Blessing & Hope	CZX-44-05L 4/10/06	
8	Substation #30	Electrical hub Breakers, transformers, motor control center	Terminal Plot No. 4 Estate Blessing, Hope & Jerusalem/Figtree Hill		

9	West Sulfur	Sulfur recovery: drums, pumps, reactor, exchangers	Refinery Plot No. 2, Terminal Plot No. 4 Estate Blessing, Hope & Jerusalem Figtree Hill		
10	Zone Maintenance Field Building	Office Building	Terminal Plot No. 4 Estate Blessing, Hope & Jerusalem/Figtree Hill	CZX-44-05L 11/15/06	
11	Gas Blending Unit (GBU)	Blending heads and analyzers for fuel blending	Terminal Plot No. 4 Estate Blessing, Hope & Jerusalem/Figtree Hill		
12	Tank Field # 5	Tanks 7507-7509	Terminal Plot No. 4 Estate Blessing, Hope & Jerusalem/Figtree Hill		
13	Tank Field # 1	Tanks 6817-6819	Terminal Plot No. 4 Estate Blessing, Hope & Jerusalem/Figtree Hill		
14	West Refinery	Includes West Power house, boilers, crude distillation units, distillate desulfurizers, reformers and other process units (such as Penex) and utilities	Refinery Plot No. 1 Portions of Estate Blessing & Hope		
14	West Refinery	Includes West Power house, boilers, crude distillation units, distillate desulfurizers, reformers and other process units (such as Penex) and utilities	Refinery Plot No. 1 Portions of Estate Blessing & Hope		

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14	West Refinery	Includes West Power house, boilers, crude distillation units, distillate desulfurizers, reformers and other process units (such as Penex) and utilities	Refinery Plot No. 1 Portions of Estate Blessing & Hope		
15	Fire Station	Fire Fighting, rescue and breathing air equipment, ambulance	Refinery Plot No. 1 Portions of Estate Blessing & Hope		
16	Garage	Misc. Automotive repair equipment	Refinery Plot No. 1 Portions of Estate Blessing & Hope		
17	Central Maintenance	Machine shop and offices	Refinery Plot No. 1 Portions of Estate Blessing & Hope	CZX-44-05L 4/10/2006	
18	Turnaround Building	Office Building	Refinery Plot No. 1 Portions of Estate Blessing & Hope	CZX-07-06L	
19	Valve Shop	Valve Repair Equipment	Refinery Plot No. 1 Portions of Estate Blessing & Hope		
20	Maintenance Building	Office Building	Refinery Plot No. 1 Portions of Estate Blessing & Hope		
21	Warehouse Compound	Out of Service Tanks, Misc. equipment	Refinery Plot No. 1 Portions of Estate Blessing & Hope		

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22	Blessing Drinking Water Tanks	Out of Service water tanks	Refinery Plot No. 1 Portions of Estate Blessing & Hope		
23	St. Croix Petro - Chemical	Out of Service Chemical tanks	Refinery Plot No. 1 Portions of Estate Blessing & Hope		
24	West Gate	Secured Entrance and Parking Lot	Refinery Plot No. 1 Portions of Estate Blessing & Hope	CZX-14-06L	
25	Blessing Housing	Housing	Plot 4-B Estate Blessing	CZX-35-05L	
26	Substation #32	Electrical hub Breakers, transformers, motor control center	Refinery Plot No. 1 Portions of Estate Blessing & Hope		
27	Nine Plex	Office Buildings	Refinery Plot No. 1 Portions of Estate Blessing & Hope		
28	Vehicle/Equip-ment Wash Station	Car Wash	Refinery Plot No. 1 Portions of Estate Blessing & Hope		
29	Purchasing	Equipment and spare parts Warehouse	Refinery Plot No. 1 Portions of Estate Blessing & Hope		
30	Old QC Lab Building	Out of Service	Terminal Plot No. 4 Estate Blessing, Hope & Jerusalem/Figtree Hill		

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31	Administration Building	Office Building	Terminal Plot No. 4 Estate Blessing, Hope & Jerusalem/Figtree Hill		
32	Landscape Building	Landscape Equipment Storage	Terminal Plot No. 4 Estate Blessing, Hope & Jerusalem/Figtree Hill		
33	Day Tank Field	Storage for Loading Rack, Tanks 6851-6859	Terminal Plot No. 4 Estate Blessing, Hope & Jerusalem/Figtree Hill		
34	Tank Field #8	Tanks 6804-6806	Terminal Plot No. 4 Estate Blessing, Hope & Jerusalem/Figtree Hill		
35	New QC Lab	Lab Equipment and Offices	Terminal Plot No. 4 Estate Blessing, Hope & Jerusalem/Figtree Hill	CZX-06-99L	
36	Truck Loading Rack	Fuel Loading and emission control Equipment	Terminal Plot No. 4 Estate Blessing, Hope & Jerusalem/Figtree Hill		
37	Tank Field #4	Tanks 6801-6803	Terminal Plot No. 4 Estate Blessing, Hope & Jerusalem/Figtree Hill		
38	Tank Field #6	Tanks 6837-6841	Terminal Plot No. 4 Estate Blessing, Hope & Jerusalem/Figtree Hill		

39	Tank Field #2	Tanks 6814-6816	Terminal Plot No. 4 Estate Blessing, Hope & Jerusalem/Figtree Hill	
40	BTEX	Tanks 7432-7441	Terminal Plot No. 4 Estate Blessing, Hope & Jerusalem/Figtree Hill	
41	Tank Field #3	Tanks 6811-6813	Terminal Plot No. 4 Estate Blessing, Hope & Jerusalem/Figtree Hill	
42	Tank Field #9	Tanks 6807-6809	Terminal Plot No. 4 Estate Blessing, Hope & Jerusalem/Figtree Hill	
43	Tank Field #56 West	Tanks 7501-7506	Terminal Plot No. 4 Estate Blessing, Hope & Jerusalem/Figtree Hill	
44	Tank Field #56 East	Tanks 7427-7430	Terminal Plot No. 4 Estate Blessing, Hope & Jerusalem/Figtree Hill	
45	Tank Field #11	Tanks 7414 & 7417	Terminal Plot No. 4 Estate Blessing, Hope & Jerusalem/Figtree Hill	
46	Tank Field #12	Tanks 7401 &7402	Terminal Plot No. 4 Estate Blessing, Hope & Jerusalem/Figtree Hill	

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47	API #1, Bunker Tank Field	Mechanical O/W Separators and Bunker tanks	Refinery Plot No. 2 Estates Blessing, Hope & Jerusalem/Figtree Hill		
48	#2 Manifold	Pumps and Piping	Terminal Plot No. 4 Estates Blessing, Hope & Jerusalem/Figtree Hill		
49	Substation 28	Electrical hub Breakers, transformers, motor control center	Terminal Plot No. 4 Estates Blessing, Hope & Jerusalem/Figtree Hill		
50	#5 Manifold	Pumps and Piping	Terminal Plot No. 4 Estates Blessing, Hope & Jerusalem/Figtree Hill	CZX-27-05L	
50	Manifold #5	Pumps and Piping	Terminal Plot No. 4 Estates Blessing, Hope & Jerusalem/Figtree Hill	CZX-27-05L	
51	Recycled Metal	Staged clean metal for recycling	Terminal Plot No. 4 Estates Blessing, Hope & Jerusalem/Figtree Hill		
52	#3 Manifold	Pumps and Piping	Terminal Plot No. 4 Estates Blessing, Hope & Jerusalem/Figtree Hill		
54&55	Docks 8 & 9	Docking, Loading and unloading hoses, piping and sumps	Terminal Plot No. 9 Reclaimed Land	SLP 3	

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53	MSRC	Oil response equipment and docking facilities	Terminal Plot No. 9 Reclaimed Land	CZX-24-93W	
54	Dock 9	Docking, Loading and unloading hoses, piping and sumps	Terminal Plot No. 9 Reclaimed Land	SLP 3 (CZX-08-06W)	
55	Dock 8	Docking, Loading and unloading hoses, piping and sumps	Terminal Plot No. 9 Reclaimed Land	SPL 3 (CZX-08-06W)	
56	Boatlift	Boat Ramp	Terminal Plot No. 9 Reclaimed Land		
57	Maintenance Warehouse	Repair equipment, work space and offices	Terminal Plot No. 9 Reclaimed Land		
58	Substation #19	Electrical hub Breakers, transformers, motor control center	Terminal Plot No. 9 Reclaimed Land		
59	Dock Manifold	Pumps and Piping	Terminal Plot No. 9 Reclaimed Land		
60	Marine Terminal Building	Office Building	Terminal Plot No. 9 Reclaimed Land		

61	Dock 7	Docking, Loading and unloading hoses, piping and sumps	Terminal Plot No. 9 Reclaimed Land	SLP 3	
62	Dock 6	Docking, Loading and unloading hoses, piping and sumps	Terminal Plot No. 9 Reclaimed Land	SLP 3	
63	Dock 5	Docking, Loading and unloading hoses, piping, sumps, and vapor Recovery Equipment	Terminal Plot No. 9 Reclaimed Land	SLP 3	
64	Dock 4	Docking, Loading and unloading hoses, piping, sumps, and vapor Recovery Equipment	Terminal Plot No. 9 Reclaimed Land	SLP 3	
65	South Dolphin	Ship anchoring point	Terminal Plot No. 9 Reclaimed Land	SLP 3	
66	East Jetty	Breakwater	Terminal Plot No. 9 Reclaimed Land	SLP3	
67	Dock 3	Docking, Loading and unloading hoses, piping and sumps	Terminal Plot No. 9 Reclaimed Land	SLP 3	
68	Coke Loading and Coker Dock	Docking, Loading and unloading hoses, piping and sumps	Terminal Plot No. 9 Reclaimed Land	CZX-6-99W	

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69	Dock 2	Docking, Loading and unloading hoses, piping, sumps, and vapor Recovery Equipment	Terminal Plot No. 9 Reclaimed Land	SLP 3 (CZX-08-06W)	
70	Dock 1	Docking, Loading and unloading hoses, piping and sumps	Terminal Plot No. 9 Reclaimed Land	SLP 3	
71	Dry Cargo Dock	Docking, Loading and unloading hoses, piping and sumps	Terminal Plot No. 9 Reclaimed Land	SLP 3	
72	Marine Vapor combustion Unit	Blower, combustor and stack to reduce ship emissions when transferring	Terminal Plot No. 9 Reclaimed Land	SLP 3	
73	Substation #15 and BTEX Charge Manifold	Electrical hub Breakers, transformers, motor control center	Terminal Plot No. 9 Reclaimed Land		
74	Tank Field 20	Tanks 7452-7456	Terminal Plot No. 9 Reclaimed Land		
67, 69 &70	Docks 1, 2 & 3	Docking, Loading and unloading hoses, piping and sumps	Terminal Plot No. 9 Reclaimed Land	SLP 3	
75	Substation 37	Electrical hub Breakers, transformers, motor control center	Terminal Plot No. 9 Reclaimed Land		

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76	Refrigerated Tank and Support	Refrigerated storage and equipment	Terminal Plot No. 9 Reclaimed Land	
77	Aromatic Tanks	Tanks 7521-7526	Terminal Plot No. 9 Reclaimed Land	
78	Tank Field #21	Tanks 7421-7423	Terminal Plot No. 9 Reclaimed Land	
79	Tank Field #60	Tanks 7601-7605	Terminal Plot No. 9 Reclaimed Land & Terminal Plot No. 4 Estates Blessing, Hope & Jerusalem/Figtree Hill	
80	Tank Field #22	Tanks 7424-7426	Terminal Plot No. 9 Reclaimed Land & Terminal Plot No. 4 Estates Blessing, Hope & Jerusalem/Figtree Hill	
81	Butane Tanks	Tanks 7991 &7992	Terminal Plot No. 4 Estates Blessing, Hope & Jerusalem/Figtree Hill	
82	Tank Field #14	Tanks 7405 & 7406	Terminal Plot No. 4 Estates Blessing, Hope & Jerusalem/Figtree Hill	
83	WWTP	Waste Water treatment, pumps, sumps, tanks, chemical injection	Refinery Plot No. 6 & Refinery Plot No. 3 Jerusalem/Figtree Hill	

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84	Coker	Converts petroleum coke. Pits, drying pad, crane, conveyors	Refinery Plot No. 7	CZX-05-99L	
85	Warehouse	Equipment and spare parts Warehouse	Terminal Plot No. 9 Reclaimed Land		
86	Terminal Zone Maintenance	Work space and repair equipment and offices	Terminal Plot No. 9 Reclaimed Land		
87	Tank Field #59	Tanks 7510 - 7517	Portion of Terminal Plot No 9 Reclaimed Land & Terminal Plot No. 5		
84	Coker Domes	Store Petroleum coke	Terminal Plot No. 9 Reclaimed Land	CZX-05-99L	
87	Tank Field East #59	Tanks 7514 - 7517	Portion of Terminal Plot No 9 Reclaimed Land & Terminal Plot No. 5		
87	Tank Field West #59	Tanks 7510 - 7513	Portion of Terminal Plot No 9 Reclaimed Land & Terminal Plot No. 5		
88	Estate Pearl (reserved)	Undeveloped. Owned by GVI subject to an option to purchase in ARTOA, not presently part of Project Site.	Rem. Parcel No. 1 Estate Barren Spot, Parcel No. 14 Estate Pearl, Matr. No. 39A &49 Cassava Garden and Matr. No. 51 & 43 Estate Pearl		

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89	East Refinery/Acid Plant	Fans, pumps, compressors, tanks, exchangers, reactor vessels, stacks	Refinery Plot No. 3 Jerusalem/Figtree Hill		
90	Alkylation Unit	Drums, towers, pumps, fractionators, piping	Refinery Plot No. 3 Jerusalem/Figtree Hill	CZX-6-82L	
91	Fluid Catalytic Cracker Unit (FCC)	Converts heavy oils to lighter products. Air blower, reactor, regenerator, exchangers, towers, pumps	Refinery Plot No. 3 Jerusalem/Figtree Hill	CZX-6-82L	
91	Fluid Catalytic Cracker Unit (FCC)	Converts heavy oils to lighter products (Additional Photo)	Refinery Plot No. 3 Jerusalem/Figtree Hill	CZX-6-82L	
92	East Refinery Control Building	Offices, analyzers, controllers	Refinery Plot No. 3 Jerusalem/Figtree Hill	CZX-6-82L	
93	East Sulfur	Converts hydrogen sulfide and ammonia gas to molten sulfur. Pumps, drums, reactors, exchangers, tanks	Refinery Plot No. 3 Jerusalem/Figtree Hill		
94	LPG Merox Unit	Removes mercaptans. Pumps, drums, towers, exchangers	Refinery Plot No. 3 Jerusalem/Figtree Hill		
95	TAME/MTBE	Produces high octane material for blending. Pumps, drums, towers, reactors, piping	Refinery Plot No. 3 Jerusalem/Figtree Hill		

96	Selective Hydrogenation Unit	Desulfurizes feed. Pumps, tower, drums, exchanger, heater, piping	Refinery Plot No. 3 Jerusalem/Figtree Hill		
97	Gas Concentration Unit	Concentrates gas for refinery fuel. Pumps, drums, exchangers, piping	Refinery Plot No. 3 Jerusalem/Figtree Hill	CZX-6-82L	
98	Amine Regeneration Unit	Releases H2S and CO2 gas to make sulfur and rich amine. Pumps, towers, drums, exchangers	Refinery Plot No. 3 Jerusalem/Figtree Hill		
99	N^{o}4 Platformer Unit	Converts Naphthenes and paraffins to aromatics. Fans, reactors, fractionators, drums, towers, heaters	Refinery Plot No. 3 Jerusalem/Figtree Hill		
100	Dimersol Unit	Produces Dimates for blending	Refinery Plot No. 3 Jerusalem/Figtree Hill	CZX-6-82L	
101	N^{o}3 Platformer Unit	Converts Naphthenes and paraffins to aromatics. Fans, reactors, fractionators, drums, towers heaters	Refinery Plot No. 3 Jerusalem/Figtree Hill		
102	Power House	Produces electricity from fuel or gas. Pumps, drums, gas turbines, generators, transformers	Refinery Plot No. 3 Jerusalem/Figtree Hill		
103	Gas Turbine #13	Produces electricity. Can produce 25 MW	Refinery Plot No. 3 Jerusalem/Figtree Hill	CZX-27-05L	

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104	Ice Plant	Produces ice	Refinery Plot No. 3 Jerusalem/Figtree Hill		
105	East Maintenance	Office Building	Refinery Plot No. 3 Jerusalem/Figtree Hill		
106	Sulfolane	Solvent used to produce aromatics (BTX). Pumps, drums, towers, exchangers, regenerators	Refinery Plot No. 3 Jerusalem/Figtree Hill		
107	Crude Distillation Unit #6	Crude oils fractionated into many components. Pumps, exchangers, towers, drums, strippers, heaters, piping	Refinery Plot No. 3 Jerusalem/Figtree Hill		
108	Desalters	Removes inorganic salts, water and sediment from the incoming petroleum crude oil	Refinery Plot No. 3 Jerusalem/Figtree Hill		
109	#5 Crude	Crude oils fractionated into many components. Pumps, exchangers, towers, drums, strippers, heaters, piping	Refinery Plot No. 3 Jerusalem/Figtree Hill		
110	LPG	Liquid Petroleum gas is fractionated into commercial gas. Pumps, drums, towers, exchangers, piping…	Refinery Plot No. 3 Jerusalem/Figtree Hill		
111	Low Sulfur Gasoline Unit	Removes sulfur from gasoline blend stocks	Refinery Plot No. 3 Jerusalem/Figtree Hill	CZX-27-05L	

112	Tank Field #15	Tanks 7407 & 7408	Terminal Plot No. 4 Estates Blessing, Hope & Jerusalem/Figtree Hill	
113	Tank Field #16	Tanks 7409 & 7410	Terminal Plot No. 4 Estates Blessing, Hope & Jerusalem/Figtree Hill	
114	Tank Field #13	Tanks 7403 & 7404	Terminal Plot No. 4 Estates Blessing, Hope & Jerusalem/Figtree Hill	
82	Tank Field #14	Tanks 7405 & 7406	Terminal Plot No. 4 Estates Blessing, Hope & Jerusalem/Figtree Hill	
115	Tank Field #17	Tanks 7411 & 7412	Terminal Plot No. 4 Estates Blessing, Hope & Jerusalem/Figtree Hill	
116	Tank Field #18	Tanks 7443 - 7445	Terminal Plot No. 4 Estates Blessing, Hope & Jerusalem/Figtree Hill	
117	Tank Field #19	Tanks 7446 - 7448	Terminal Plot No. 4 Estates Blessing, Hope & Jerusalem/Figtree Hill	
118 Reserved	Borrow Pit	Caliche pit for fill	Matr. No 39A 49 Cassava Garden (Not part of Project Site and not included in the permit consolidation)	
119	Flares 2, 3,5, 6. 7, FCC LP, FCC HP and LPG	Pumps, drum Flare Combustor and Stacks	Throughout Plant, Terminal Plot No. 4, Plot 12, Plot 8, Refinery Plots 3 and 6	

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Stacks

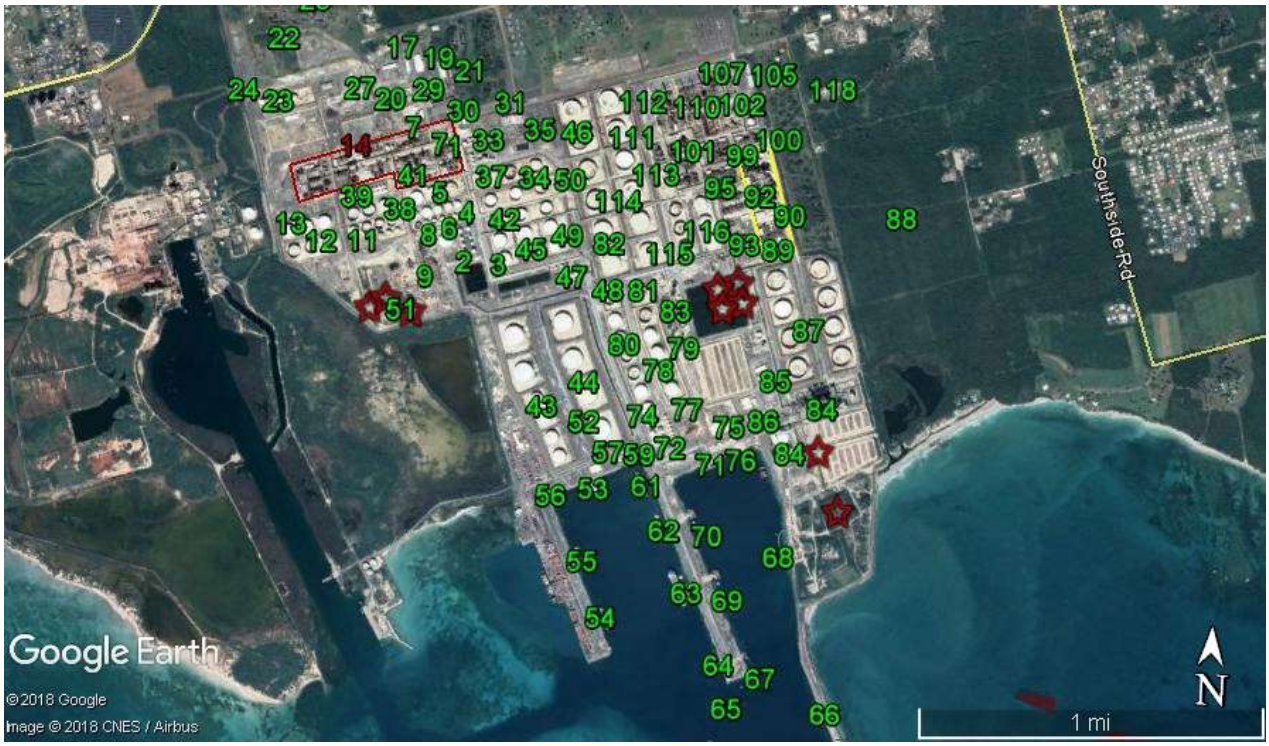

Figure 5.1 Location of Components (Overall)

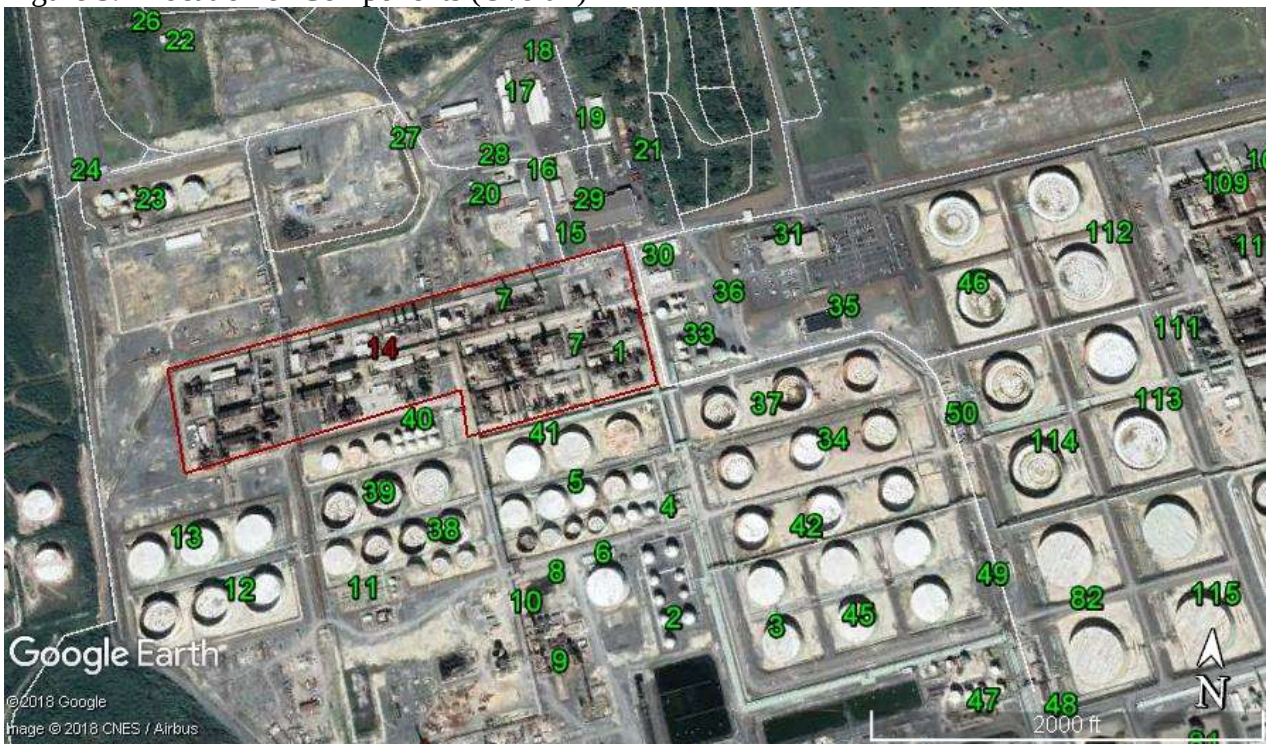

Figure 5.2 Location of Components Northwest

Figure 5.3 Location of Components Northeast

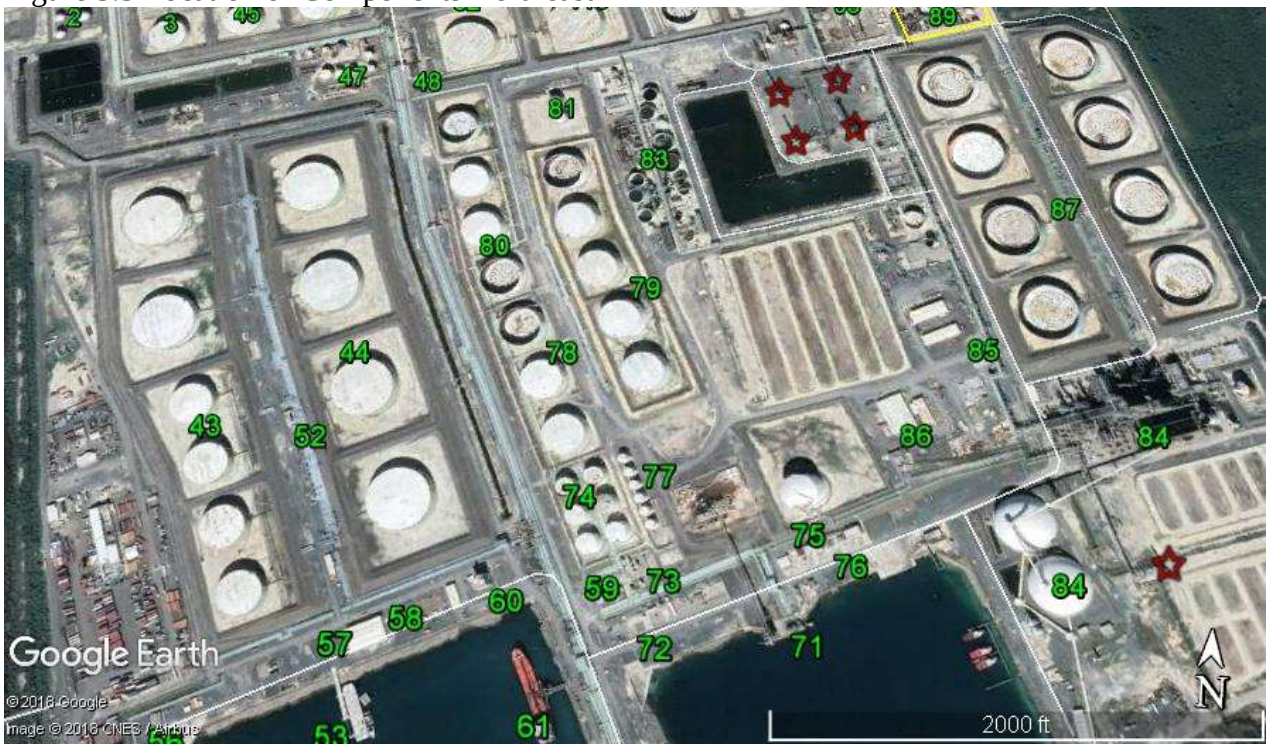

Figure 5.4 Location of Middle Components

Figure 5.5 Location of Southern Components

Permits/Rights Applicable to Construction of Land and Water Industrial Facilities

Act 1524-Agreement between HOVIC and GVI. APPROVED: September 1, 1965

The HOVIC Agreement specifically stated that "the use, for the purposes of the Oil Refinery and Related Facilities, of the site is hereby approved." It was later extended, amended, supplemented and/or clarified in 1966, 1967, 1968, 1969, 1981, 1990, 1998 and 2014 in a manner that did not affect the original development rights granted. Third Amendment transferred Agreement to HOVENSA. Superseded by ROA and ARTOA.

Submerged Lands Permit No. 3 (USDOI) ISSUED: 11-19-1965

This permit allows for the dredging of a ship channel in Limetree Bay and depositing of the resulting spoil. It provides for the Exclusive Occupancy and use of 25 acres of land, more or less, of the filled submerged lands to be created by the spoil from the channel dredging.

Amendment 1 to Submerged Lands Permit No. 3 ISSUED: 7-18-1968

This permit is an amendment to Submerged Lands Permit No. 3. It confirms the permission to construct the East Dike and to deepen the existing channel, and to deposit the resulting spoil.

Amendment 2 to Submerged Lands Permit No. 3 ISSUED: 12-10-1968

This permit is an amendment to Submerged Lands Permit No. 3. It permits the disposal of dredged material in that area designated "Proposed Underwater Disposal Area".

Amendment 3 to Submerged Lands Permit No. 3 ISSUED: 2-11-1972

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First Page Revised 4-18-1972
This permit is an amendment to Submerged Lands Permit No. 3. It allows the construction of 2 settling basins seaward of the Hess Oil Complex in Limetree Bay on the south shore of St. Croix, USVI. The settling basins are to be constructed of spoil dredged from the channel leading into the Hess Oil docking area in accordance with the plans in Exhibit A. Exhibit A consists of a 9/28/71 letter from Mr. Everett B. Birch, VP, on behalf of Hess Oil Virgin Islands Corporation, to the Governor of the Virgin Islands, together with two drawings dated 9/23/71. It also includes a copy of the Department of the Interior Water Quality Considerations for Construction and Dredging Operations, Revised September 1970. The permit also allows for the construction of two additional docking facilities as set out in the enclosures to Exhibit A.

Modification of CZX-08-06L (SLP No.3)/HOVENSA, LLC
This is a modification to permit CZX-08-06L. (Referenced in other permits, but no copy located).

Modification of Submerged Lands Permit No. 3 [Recorded as Major CZM Permit No. CZX-08-06W) ISSUED: 3-24-2006
This permit is a modification to Submerged Lands Permit No. 3. It allows the Permittee to rehabilitate and install new piles at Docks Nos. 2 and 8, plot No. 5 Limetree Bay (Reclaimed Land), St. Croix.

Modification of Submerged Lands Permit No. 3 ISSUED: 7-14-2006
This permit is a modification to Submerged Lands Permit No. 3. Modification of Submerged Lands Permit No. 3. It permits the installation of 2 new 30-inch piles at Docks No. 1 and 9, Plot No. 5, Estate Limetree Bay (Reclaimed Land), Christiansted, St. Croix.

Modification of Submerged Lands Permit No. 3 ISSUED: 12-1-2006
This permit is a modification to Submerged Lands Permit No. 3. It permits the construction of the Coker Zone Maintenance Field Building at Parcel No.5 Estate Limetree Bay (Reclaimed Land)

Submerged Lands Permit No. 23 ISSUED: 4-12-1972
This permit is a Submerged Lands Permit. It allows the dredging of a channel in Limetree Bay on the south shore of St. Croix by the removal of 2,500,000 cubic yards of sand, gravel, or coral from an area identified in Exhibit A.

Submerged Lands Permit No. 52 ISSUED: 2-20-1974
This permit is a Submerged Lands Permit. It allows the use by Permittee of 46.5 acres known as settling basin #3 described in Exhibit A. Exhibit A which consists of a letter dated 6/23/73, and two attached drawings thereto. This property is to be used in connection with the proposed refinery expansion.

Submerged Lands Permit No. 167 ISSUED: 9-21-1976
This permit is a Submerged Lands Permit. It allows the Permittee to excavate and refill a pipe trench, construct, install, maintain and operate a submarine pipeline and deep-water mooring tanker unloading terminal seaward of the Permittee's property in Limetree Bay on the South Shore of St. Croix, in accordance with the plans set forth in Exhibit A.

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Contract and Submerged Lands Lease, dated as of September 22, 1976, which was approved by the Legislature of the U.S. Virgin Islands on September 29, 1976. See Section 3, resulted in a **Lease** dated as of October 16, 1976, under which the Government leased to HOVIC approximately 52 acres of reclaimed submerged lands (Submerged Lands Lease"). Under the Contract, renewal of the Submerged Lands Lease also continued the right to use the lands filled as authorized by Submerged Lands Permits No. 3, 23 and 52. Allows land use for oil refinery and related facilities. Assigned to HOVENSA 1998, then lands partially assigned to Applicants under Operating Agreements, discussed below.

CZX-08-06W ISSUED:
This permit is a Coastal Zone Permit Application Water Quality Review and Certification. It allows the Permittee to rehabilitate portions of Docks Nos. 2 and 8. The center fenders will be replaced with a new design that requires that two new 30-inch diameter piles be driven into the seafloor at each dock to provide lateral support for the new fenders. The Permit specifies that the placement of additional piles at each dock would result in the loss of approximately 19.6 square feet of sea bottom.

Modification of CZX-08-06W ISSUED:
This is a modification to Permit CZX-08-06W. it withdrew Permit Application CZX-08-06 for the installation of two piles each at Docks 2 and 8 in Limetree Bay.

CZX-27-05L ISSUED: 9-2-2005
This is a Major Coastal Zone Management Permit. It allows the Permittee to construct a Low Sulfur Gasoline Desulfurizer (LSG) Unit located on Matriculars No.40,41, and 52, Estates Jerusalem and Figtree Hill, St. Croix.

Modification of Major CZM-27-05L/HOVENSA, LLC ISSUED: 11-1-2005
This permit is a modification of CZM-27-05L. It is a Major Coastal Zone Management Permit. It allows the construction of Combustion Turbine (GT-13) Power Generator in Matriculars No. 40, 41 and 52 Estates Jerusalem and Figtree Hill, St. Croix.

CZM Permit Application: CZX-27-05L; DPNR, DEP Water Quality Certificate WQC-06-001W ISSUED: 10-6-2005
This permit is a Coastal Zone Permit Application Water Quality Review and Certification document. It permits the installation of a combustion turbine, GT-13 to maintain its normal reserve power generation capacity at the refinery when the Low Sulfur Gasoline (LSG) is in operation.

CZM Permit Application: CZX-27-05L Modified: 5/15/17
Modified to include the installation of 5 pumps and additional concrete containment plus 300 feet of additional piping.

CZX-7-97L ISSUED:
This is an Earth Change/Coastal Zone Permit. It allows for the installation of 3 well pumps, an air

compressor and 1,700 feet of 3" fiberglass underground pipe for the recovery project. The objective of the project is to remove and remediate the contaminated groundwater at St. Croix Alumina. The Permit also allows for the installation of 2 new utility poles for Virgin Islands WAPA Electrical Service.

CZX-30-94L ISSUED: 7-13-1994
This is a Minor Coastal Zone and Earth Change Permit. It allows for the removal of two underground steel storage tanks located at Dock #6 HOVIC, Estate Jerusalem.

CZX-24-93W ISSUED: 12-30-1993
This is a Major Coastal Zone Permit. It allows for the construction of a 20 ft. x 300 ft. pier with mooring piles to berth an oil response vessel and a barge. It also allows the use and occupancy of 46,500 sq. ft. of submerged lands in the Krause Lagoon Channel in the West Turning Basin of Hess Refinery, St. Croix, US VI. Permit in MSRC's name. Expired in 2003, but ARTOA makes it current and valid.

CZX-05-99L ISSUED: 2-22-1999
This is a Major Coastal Zone Management Permit. It allows the construction and operation of a Delayed Coking Unit (Coker); a Coke Handling and Storage Facility; a new Sour Water Stripper; a new Amine Treating Unit; and a 150,000 pound per hour Steam Boiler. The permit applies to Plots 52 and 53 Castle Coakley; filled lands identified in DOI Permit Nos. 3, 23, and 52, and Amendments thereto; Estates Jerusalem, Figtree Hill, Hope and Castle Coakley, St. Croix.

Modification of CZX-05-99L ISSUED: 6-30-05
This permit modifies Permit CZX-05-99L. It allows the Permittee to construct a quality control laboratory building including the required offsite utilities (power, water, steam, communication, waste effluent removal and sewer)

Modification of CZX-05-99L ISSUED: 3-26-07
This permit modifies Permit CZX-05-99L. It allows the Permittee to relocate proposed structures and add improvements for their Quality Control Laboratory Building (septic, leach field, oily waste lift station, sidewalk and drive entry).

CZX-06-99W ISSUED: 2-23-1999
This is a Major Coastal Zone Permit. It allows the construction of a Coke Loading dock on Pile Berthing Dolphins. The Coke Loading dock is located at approximately N17 41' 8"/W 64 44' 50 in the East Turning Basin of the HOVENAA Refinery. This Permit allows the Permittee to use the Coke Loading Dock described above for a certain term. The Permit provides that the Permit shall not constitute a property right and may be renewed only in accordance with Section 911 of the Act.

CZX-05-99L & CZX-06-99W ISSUED: 2/22/1999
These permits are modifications to CZM permits. They modify the name of Permittee. They include a more precise map and legal showing the location of the dock and area for which a Water Permit will be issued. They include the legal of the lands on which the Coker Complex and

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supporting units will be constructed. Finally, they allow HOVENSA to use of a one-arm alternate design, to load coke onto coke transport vessels that would significantly reduce construction over the water.

CZX-6-99(W) (Assignment) ISSUED: 9-1-2016
This is a CZM Permit Assignment. Permit CZX-6-99W permitted the construction and use of a Coke Loading dock on Pile Berthing Dolphins. The Coke Loading dock is located at approximately N17 41' 8"/W 64 44' 50 in the East Turning Basin of the HOVENAA Refinery. The Assignment provides that the scope of work for Permit CZX-6-99W was approved and completed, releases the Assignor (HOVENSA LLC) from permit compliance requirements and places permit compliance requirements with the Assignee (Limetree Bay Terminals LLC).

CZX-6-82L ISSUED: 2-22-82
This is a Coastal Zone Permit. It allows Permittee to construct the following at Hess Oil Complex in Estate Fig Tree Hill: (a) Two complete Fluid Catalytic Cracking Complexes (FCC). Each complex will include a 75,000 barrel per day FCC unit with associated gas concentration facilities, a Hydrofluoric Acid Alkylation Plant, a Catalytic Polymerization Unit, a Butamer Unit, and Merox and Amine Treating Facilities.

CZX-6-82L, Amendment 2 ISSUED: 6-29-1983
This is an amendment to Major Coastal Zone Permit CZX-6-82L. It allows Permittee to construct the following at Hess Oil Complex in Estate Fig Tree Hill: (a. Two complete Fluid Catalytic Cracking Complexes (FCC). Each complex will include a 75,000 barrel per day FCC unit with associated gas concentration facilities, a Hydrofluoric Acid Alkylation Plant, a Catalytic Polymerization Unit, a Butamer Unit, and Merox and Amine Treating Facilities
b. A visbreaker integrated with the existing No.2 Vacuum Unit consisting of a heater stack, a tower and related industrial equipment and piping.

CZX-02-06L ISSUED: 1-19-2006
This is a Major Coastal Zone Management Permit. It allows the Permittee to construct a 75-foot exhaust stack for the 5DD engine driven compressors located at Matricular 31, Remainder Estate Blessing, St. Croix.

CZX-07-06L ISSUED: 4-10-2006
This is a Major Coastal Zone Management Permit. It allows the Permittee to construct 2 modular buildings and one pre-engineered building located at Plat Nos. 6 and 7, Estate Hope, and Matricular Nos. 40, 41 and 42, Estate Jerusalem, St. Croix.

Modification to CZX-07-06L ISSUED: 12-5-2006
This permit modifies Permit CZX-07-06L. It allows the following: A. To move the location of the parking lot at the Turnaround Building from the south side of the building to the east; B. To relocate the fence at the building; and C. To change the interior portioning of the building to form five additional offices. The modification also allows Permittee to modify one of the other two modular buildings at Parcel No. 7 Estate Hope, St. Croix.

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CZX-14-06L ISSUED: 4-20-2006
This is a Major Coastal Zone Management Permit. It allows the Permittee to upgrade and improve the existing Gate No.2 parking lot, located at Plot No. 4, Estate Blessing, St. Croix

CZX-43-05L ISSUED: 11-16-2005
This is a Major Coastal Zone Management Permit. It allows the Permittee to mine and store fill at Matricular Nos. 38, 41, and 51 Estate Pearl, Christiansted, St. Croix for various projects throughout the life of the refinery (LBT has an option on these lands).

CZX-44-05L ISSUED: 1-19-2005
This is a Major Coastal Zone Management Permit. It allows the Permittee to construct a two-story Maintenance and Planning Controls building, a single story Electrical and Air Conditioning Shop, and a Locker/Shower Room building located on Parcel No. 7 Estate Hope, St. Croix.

Modification of CZX-44-05L ISSUED: 4-10-06
This permit modifies Permit CZX-44-05L. It allows Permittee to: A. Correct the legal description of the property on which the EMP and A/C buildings will be constructed; and B. Upgrade 2 existing control buildings in Area I and Area II on the western side of the refinery.

Modification of CZX-44-05L ISSUED: 12-6-2006
This permit modifies Permit CZX-44-05L. It allows the Permittee to construct 2 buildings in the refinery measuring 768 sf: West and West Sulfur Recovery Units (WSRU) Zone Maintenance Field Buildings.

Operating Agreement: RATIFIED 12/29/15 Bill No. 31-0283
Transfers rights to certain submerged lands to LBT. Creates option to repurchase Estate Pearl lands. The Government agreed that LBT had the right to occupy and use the Site, including the Submerged Lands in accordance with the Submerged Lands Lease and Submerged Lands permits as assigned and approved pursuant to Section 6.3 of the Operating Agreement. Superseded by ROA and ARTOA.

Amended and Restated Terminal Operating Agreement and Refinery Operating Agreement RATIFIED: 7/26/18
Transfers and confirms rights to certain submerged lands to LBT and LBR. Revises option to repurchase Estate Pearl lands. Provides for purchase by LBT of some lands transferred in 2016. The Government agreed that LBT/LBR had the right to occupy and use the Project Site, including the Submerged Lands in accordance with the Submerged Lands Lease and Submerged Lands permits as assigned and approved pursuant to Section 6.3 of the ROA and ARTOA. The ROA and ARTOA both confirm the continued right to use the Terminal Site and Refinery Sites for the Oil Refinery and Related facilities and further confirms that such use is consistent with land use regulations. Provides for a term of occupancy of submerged lands co-extensive with the ARTOA and ROA term.

<u>Housing Related Permits</u>

CZX-35-05L ISSUED: 9-2-2005

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This is a Major Coastal Zone Management Permit. It allows the Permittee to upgrade the existing housing by replacing the existing modular homes at Parcel No.4 Estate Blessing, St. Croix, with new structures that meet all of the current building codes. The new homes will be placed over the same footprint of the existing homes and will be 1800 square feet. The existing concrete pads and a portion of the existing driveway will be removed to accommodate the new structures.

Modification of CZX-36-05L ISSUED 10-6-2006
This permit modifies Permit CZX-36-05L. It allows the Permittee to replace 4 existing dormitory buildings at Parcel No. 4 Estate Blessing, St. Croix.

5.01b Presence and Location of Any Critical Areas and Possible Trouble Spots

The proposed permit does not permit any additional facilities or operations, other than minor foundation and structure changes for refinery restart. Existing facilities have been recognized to contain bird habitat, and nesting activities are continually monitored by Limetree personnel. Additional discussion of terrestrial resources is included in Section 6.07. Existing facilities impact the benthic areas and have been subject to detailed environmental surveys over time, most recently in conjunction with the currently pending application for a single point mooring offshore of the facility.

ESA and non-ESA coral species are present in the area and both *Acropora palmata* and *Orbicella faveolata* are present on the dolos and on the offshore pavement and channel edge. *Diploria strigosa, D. clivosa, Porties astreoides* and *Siderastrea siderea* are the most abundant corals in the area. Offshore, the slope is colonized by scattered black corals, *Cirrhipathes leutkeni.* The area offshore of the jetties is a rock pavement composed of old reef material and limestone. Regular operations, including ship traffic do not impact these resources.

Future work authorized pursuant to the PAFA may impact critical habitat and endangered species but will be completed pursuant to applicable federal permitting and guidelines, including but not limited to National Marine Fisheries Sea Turtle and Small Sawtooth Construction Conditions.

5.01c Proposed Methods of Construction

Construction methods implemented in the restart will be typical industrial construction methods, using heavy vehicles, cranes and access devices, such as lifts, ladders and scaffolds. All construction will follow the facility BMP and any construction related debris will be disposed of in an appropriate environmental manner according to the nature of the material. LBT and LBR will be recycle metals as appropriate and will dispose of hazardous material following appropriate environmental guidelines.

Future construction will be approved pursuant to the PAFA and will be subject to the International Building Code or other applicable Building Code adopted by the Virgin Islands. All projects will implement environmental controls to prevent against sedimentation and erosion if earthwork is required. Future in water construction methods will be regulated by the Army Corps and by the PAFA and CZM permitting processes as applicable.

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5.01d Provisions to Limit Site Disturbance

The locations for restart project work are entirely within the existing refinery in areas that have already been filled and graded Any site disturbance will be limited to that necessary to complete the require construction, primarily for excavation and foundation work. All construction will include proper sedimentation and erosion control in the event soils are disturbed.

Land clearing is not expected to be necessary for the restart project since the sites have no vegetation or growth that needs to be removed. The project will be constructed on already filled and graded surfaces. The staging areas for large components of the project are expected to be on existing paved or graveled surfaced areas.

Future site disturbance will be approved pursuant to the PAFA and the conditions of this permit. No earth change is anticipated in conjunction with the demolition.

5.01e Sediment Control Methods to be Implemented

The vast majority of the facility has been developed and much of it is impervious surface, therefore much if not all of the construction encompassed in the restart is within areas that are already paved.

There will be some removal of existing foundations and the installation of new foundations that will require breaking through the existing pavement and excavation of existing footer and or soils. When earth work is required, areas of disturbance will be surrounded with proper sediment barriers whether they be silt fencing in areas that are not paved or sand bags in the event the area is surrounded by concrete pavement. Soils which are removed will be stock piled and will be removed as quickly as possible to an appropriate disposal site which will not result in sedimentation. If soils are stock piled overnight, they must be covered to prevent runoff in the event of rain. In the event that there is a drainage in the immediate vicinity of proposed earthwork, it will be protected by sand bags to prevent the introduction of fines into the stormwater system.

Future work will be approved pursuant to PAFA and be subject to the conditions of this permit.

5.01f Schedule for Construction Activities and Implementation of Sediment Control Measures

The restart project is expected to commence in early 2019 and be completed in early 2010, although most of the project involves repairs and maintenance, rather than new construction. It is similar to major turnaround. The restart project will be requiring some excavation through the existing pavement and therefore will be exposing soils. Therefore, sedimentation and erosion control will be installed prior to breaking the concrete and exposing the soils. Sand bags will be used to surround the site and to protect any drains within the area prior to any work on the site. These will be maintained through the construction process. Once work has been

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completed any soil remaining on the concrete will be removed prior to the removal of the sedimentation and erosion control features.

Demolition. No demolition is currently scheduled, other than that required for the Restart Project. The only demolition presently known to be required, Beavon Unit #2, was permitted by DPNR via a building/earth change permit. Materials will be inspected for lead and asbestos and if necessary proper removal and handling and disposal methods will be employed. Equipment will be disassembled, and pieces taken to the appropriate disposal are or the scrap metal yard for shipment off island. Equipment may also be sold for reuse.

Future work will be approved pursuant to PAFA and be subject to the conditions of this permit.

5.01g Maintenance of Sediment and Siltation Control Measures

The vast majority of the facility has been developed and much of it is impervious surface, therefore much if not all of the construction encompassed in the restart is within areas that are already paved.

There will be some removal of existing foundations and the installation of new foundations that will require breaking through the existing pavement and excavation of existing footer and or soils. When earth work is required, areas of disturbance will be surrounded with proper sediment barriers whether they be silt fencing in areas that are not paved or sand bags in the event the area is surrounded by concrete pavement. Soils which are removed will be stock piled and will be removed as quickly as possible to an appropriate disposal site which will not result in sedimentation. If soils are stock piled overnight, they must be covered to prevent runoff in the event of rain. In the event that there is a drainage in the immediate vicinity of proposed earthwork, it will be protected by sand bags to prevent the introduction of fines into the stormwater system.

The sedimentation and erosion control features will be surveyed on a daily basis to make sure that they are properly installed and maintained and effective. If they are found to be ineffective additional measures will be implemented. Since most of the excavation will occur on paved land and will involve excavation below pavement levels, the actual likelihood of runoff is relatively low. Once the project is complete, the drainage system within the area will be maintained in accordance with the Applicants' normal maintenance schedule

Future work will be approved pursuant to PAFA and be subject to the conditions of this permit.

5.02 Exhibits and Drawings

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Coke Dock 44
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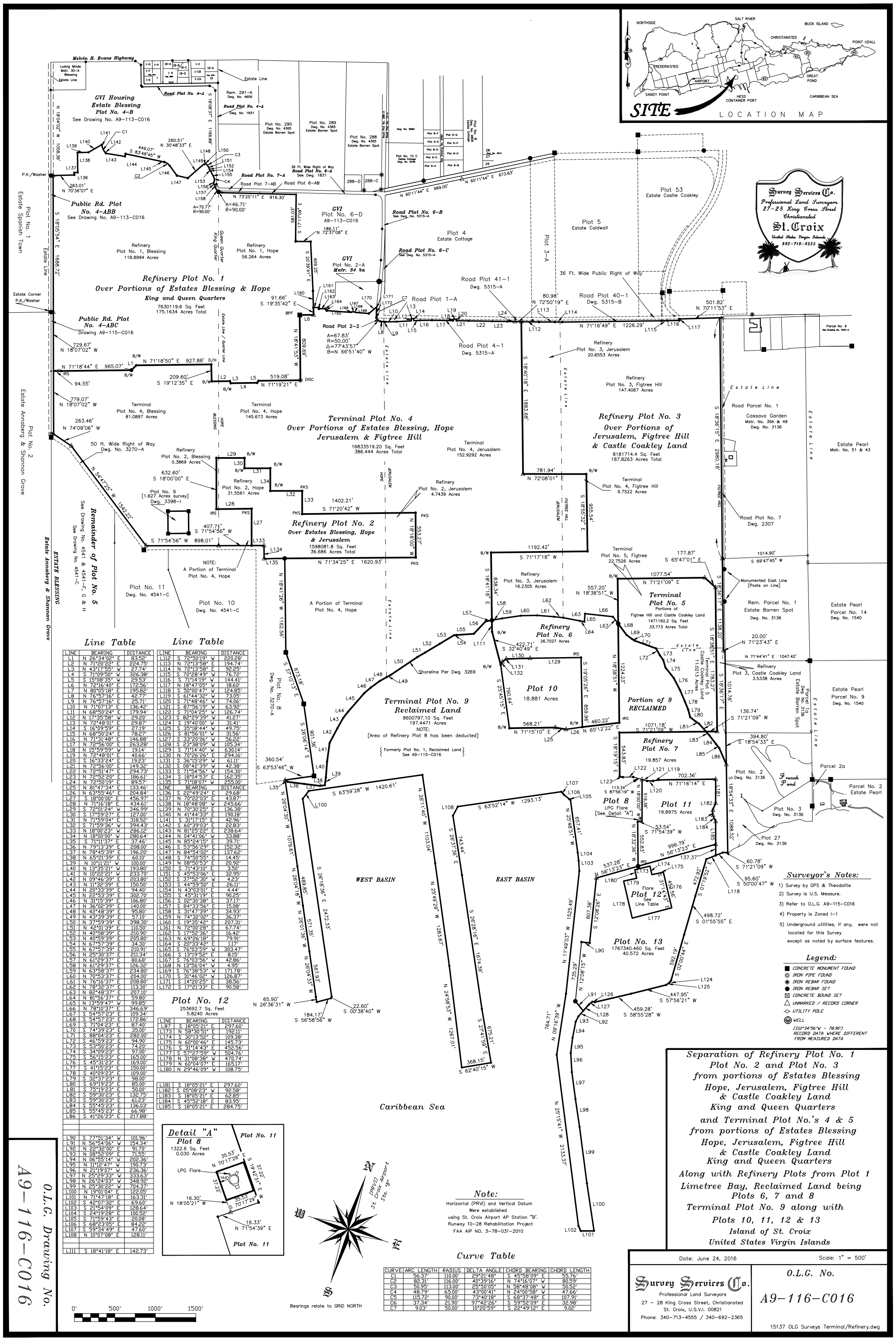
5.3 Project Workplan

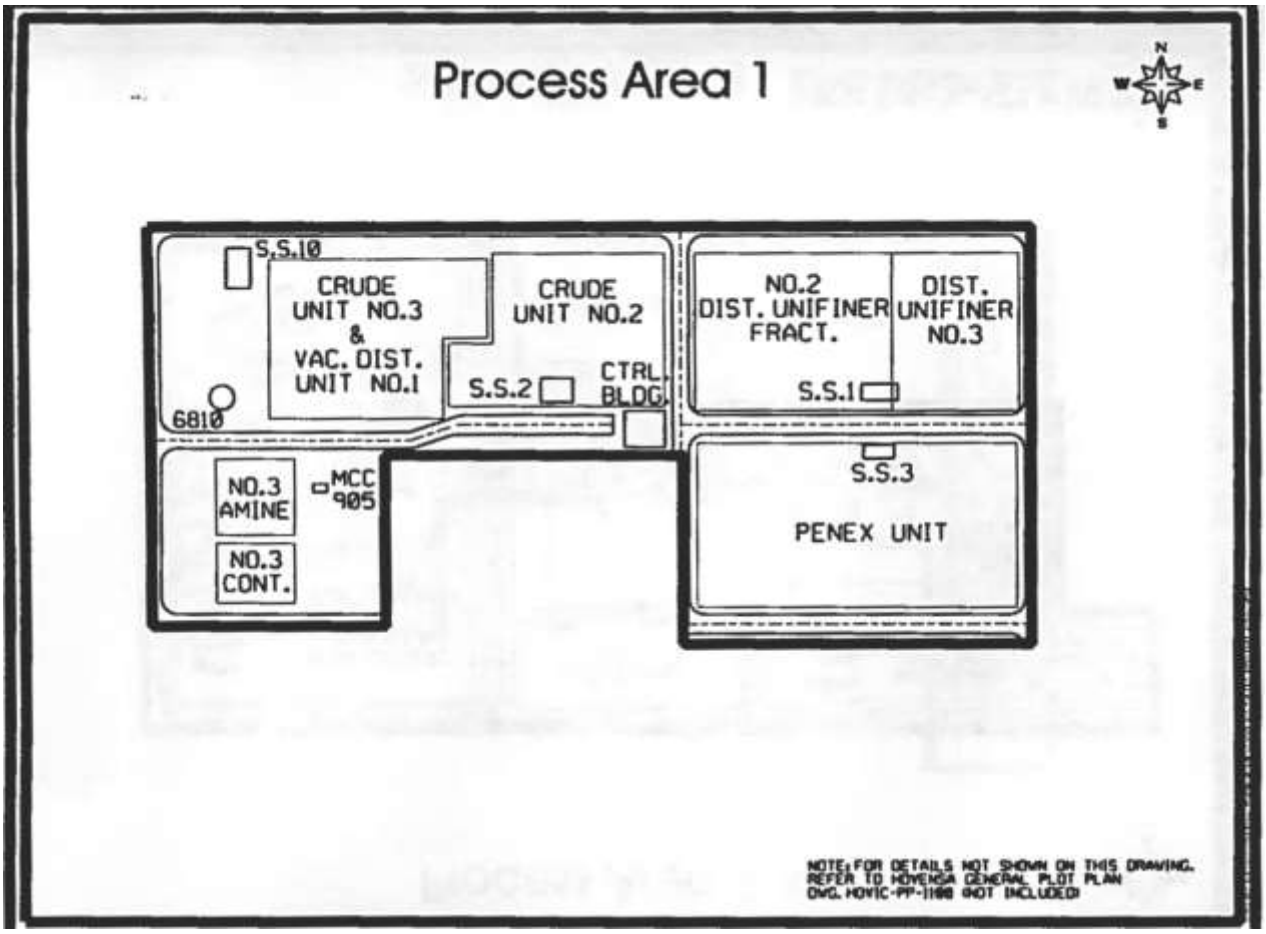
Construction of the Refinery Restart

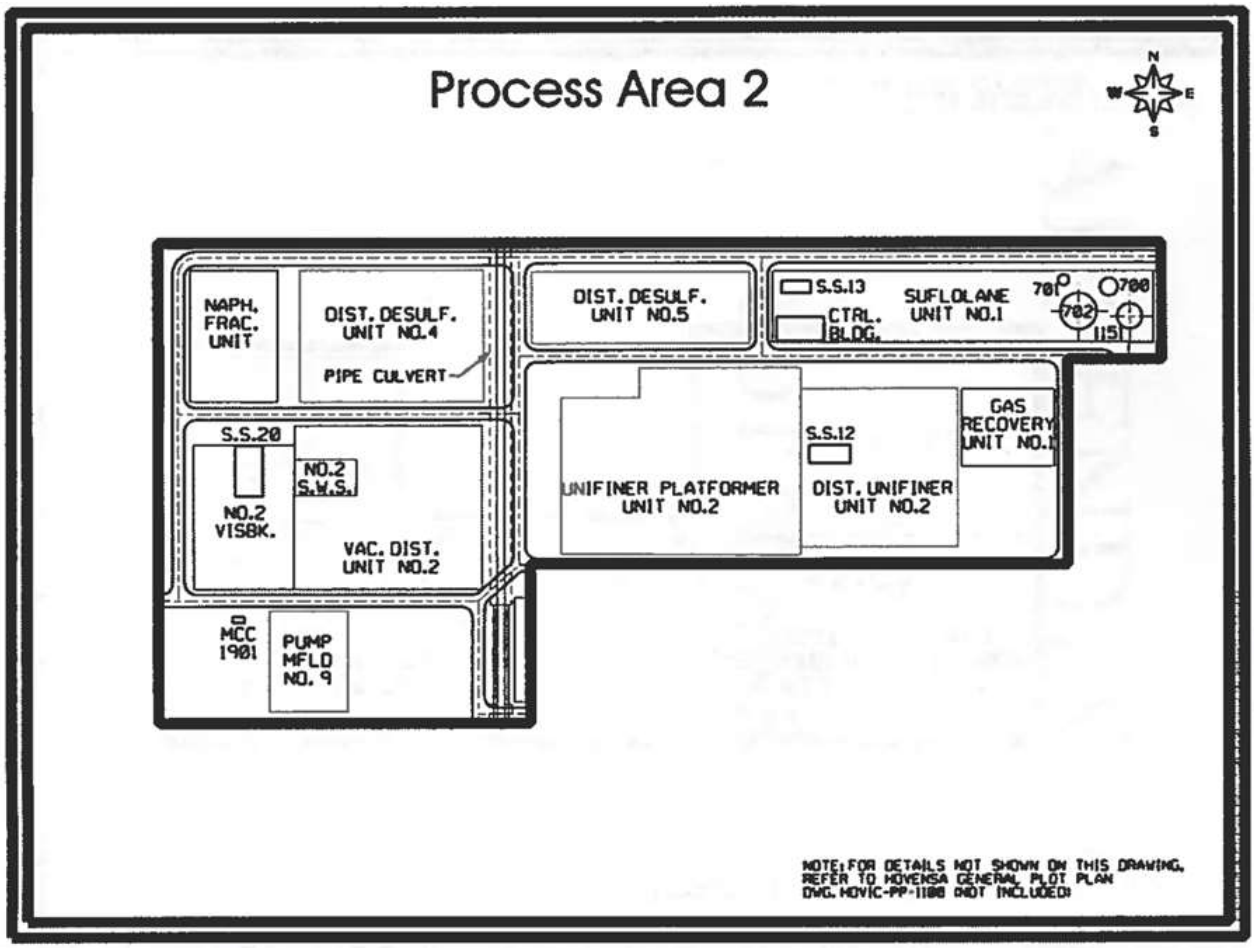
Sedimentation and erosion control will be implemented prior to any and all work which requires earth disturbance. Once sedimentation and erosion control has been implemented work on that component may begin. It is probable that there will be multiple areas of construction on going at the same time.

No demolition is currently scheduled, other than that required for the Restart Project.
The only demolition presently known to be required, Beavon Unit #2, was permitted by DPNR via a building/earth change permit. Materials will be inspected for lead and asbestos and if necessary proper removal and handling and disposal methods will be employed. Equipment will be disassembled, and pieces taken to the appropriate disposal are or the scrap metal yard for shipment off island. Equipment may also be sold for reuse.

Future work will be approved pursuant to PAFA and be subject to the conditions of this permit.


SITE
LOCATION MAP
Refinery Plot No. 1
Over Portions of Estates Blessing & Hope
King and Queen Quarters
Terminal Plot No. 4
Over Portions of Estates Blessing, Hope
Jerusalem & Figtree Hill
Refinery Plot No. 3
Over Portions of
Jerusalem, Figtree Hill
& Castle Coakley Land
Refinery Plot No. 2
Over Estates Blessing, Hope
& Jerusalem
Terminal Plot No. 9
Reclaimed Land
Terminal Plot No. 5
Refinery Plot No. 6
Plot 10
Plot 11
Plot 12
Plot No. 13
Plot 8
Portion of 9 RECLAIMED
Refinery Plot No. 7
Remainder of Plot No. 5
WEST BASIN
EAST BASIN
Caribbean Sea
Line Table
Curve Table
Plot No. 12
Detail "A"
Surveyor's Notes:
1) Survey by GPS & Theodolite
2) Survey is U.S. Measure.
3) Refer to O.L.G. A9-115-C016
4) Property is Zoned I-1
Legend:
Separation of Refinery Plot No. 1
Plot No. 2 and Plot No. 3
from portions of Estates Blessing
Hope, Jerusalem, Figtree Hill
& Castle Coakley Land
King and Queen Quarters
and Terminal Plot No.'s 4 & 5
from portions of Estates Blessing
Hope, Jerusalem, Figtree Hill
& Castle Coakley Land
King and Queen Quarters
Along with Refinery Plots from Plot 1
Limetree Bay, Reclaimed Land being
Plots 6, 7 and 8
Terminal Plot No. 9 along with
Plots 10, 11, 12 & 13
Island of St. Croix
United States Virgin Islands
Date: June 24, 2016
Scale: 1" = 500'
O.L.G. No.
A9-116-C016
Survey Services Co.
Professional Land Surveyors
Phone: 340-713-4555 / 340-692-2365
O.L.G. Drawing No.
A9-116-C016
Bearings relate to GRID NORTH


Process Area 1
N
W
E
S
S.S.10
CRUDE UNIT NO.3 & VAC. DIST. UNIT NO.1
CRUDE UNIT NO.2
NO.2 DIST. UNIFINER FRACT.
DIST. UNIFINER NO.3
S.S.2
CTRL BLDG.
S.S.1
6810
S.S.3
NO.3 AMINE
MCC 905
NO.3 CONT.
PENEX UNIT
NOTE: FOR DETAILS NOT SHOWN ON THIS DRAWING, REFER TO HOVENSA GENERAL PLOT PLAN DWG. HOVIC-PP-1198 (NOT INCLUDED)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W
E
S
NAPH. FRAC. UNIT
DIST. DESULF. UNIT NO.4
PIPE CULVERT
DIST. DESULF. UNIT NO.5
S.S.13
CTRL. BLDG.
SUFLOLANE UNIT NO.1
701
700
702
115
S.S.20
NO.2 S.W.S.
NO.2 VISBK.
VAC. DIST. UNIT NO.2
UNIFINER PLATFORMER UNIT NO.2
S.S.12
DIST. UNIFINER UNIT NO.2
GAS RECOVERY UNIT NO.1
MCC 1901
PUMP MFLD NO. 9
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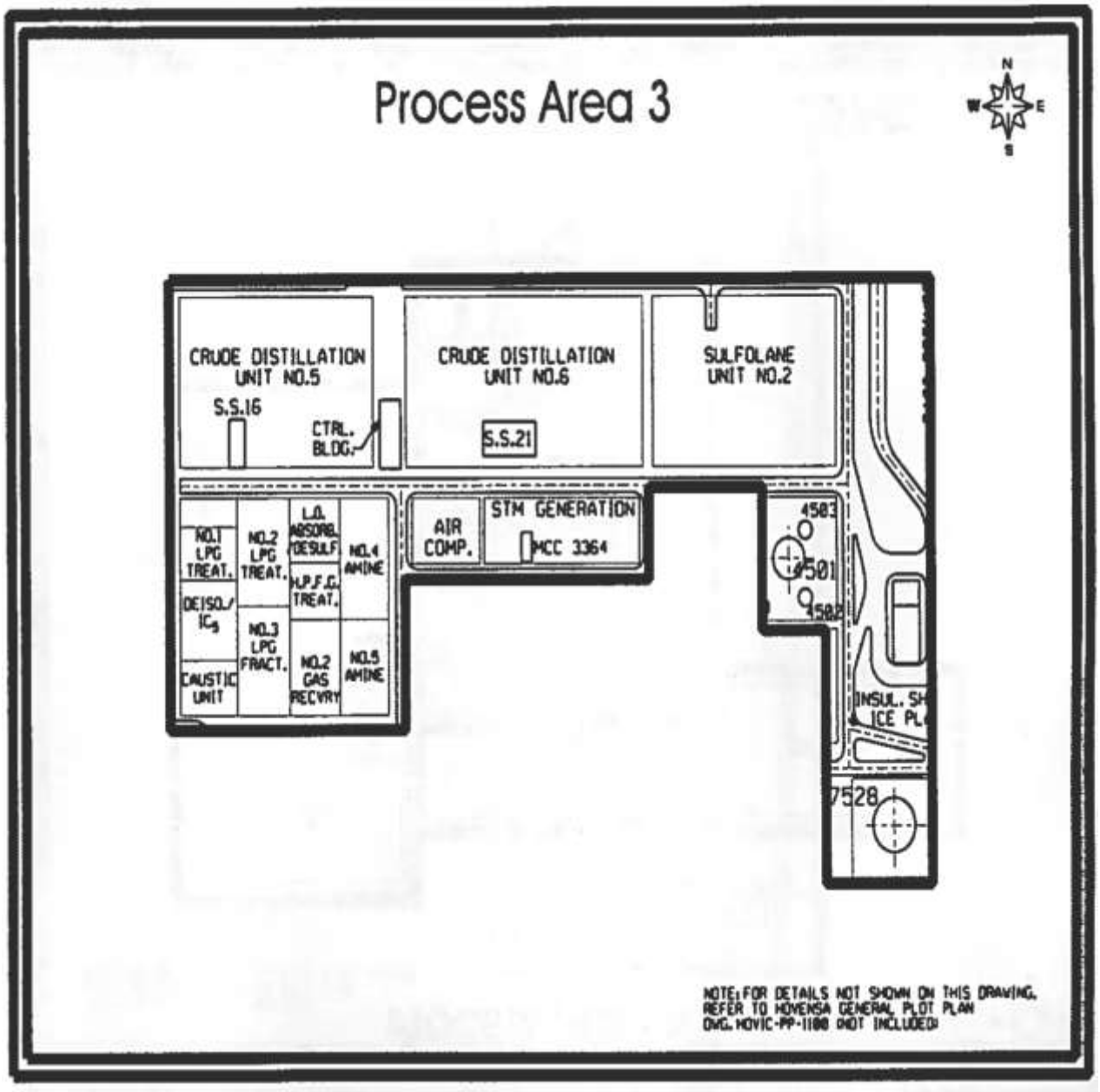
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E
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S.S.16
CTRL. BLDG.
CRUDE DISTILLATION UNIT NO.6
S.S.21
SULFOLANE UNIT NO.2
NO.1 LPG TREAT.
NO.2 LPG TREAT.
LQ. ABSORB. DESULF.
U.P.F.C. TREAT.
NO.4 AMINE
DEISO./ IC5
NO.3 LPG FRACT.
NO.2 GAS RECVRY
NO.5 AMINE
CAUSTIC UNIT
AIR COMP.
STM GENERATION
MCC 3364
4583
4501
4582
INSUL. SH
ICE PL
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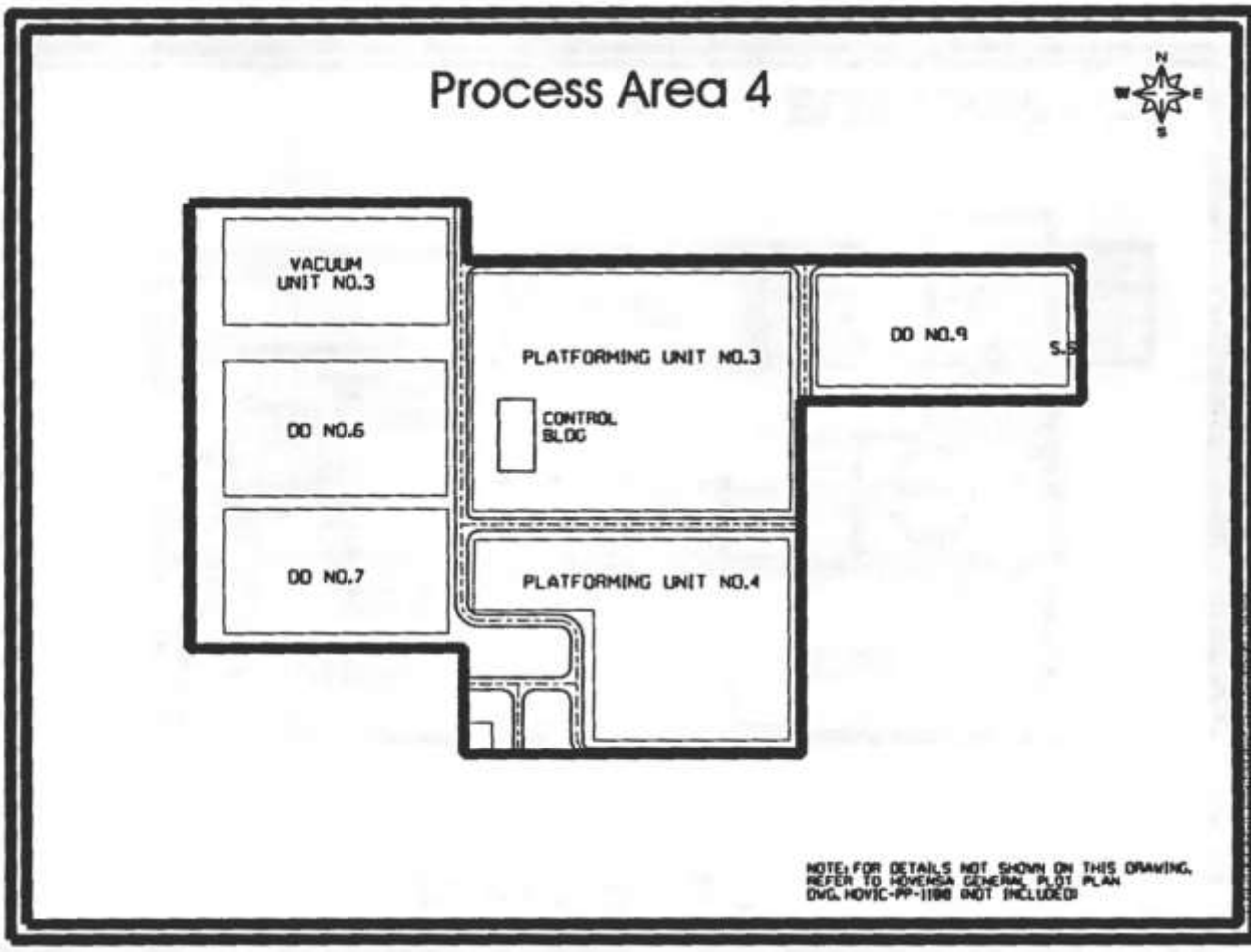
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DD NO.6
DD NO.7
PLATFORMING UNIT NO.3
CONTROL BLDG
PLATFORMING UNIT NO.4
DD NO.9
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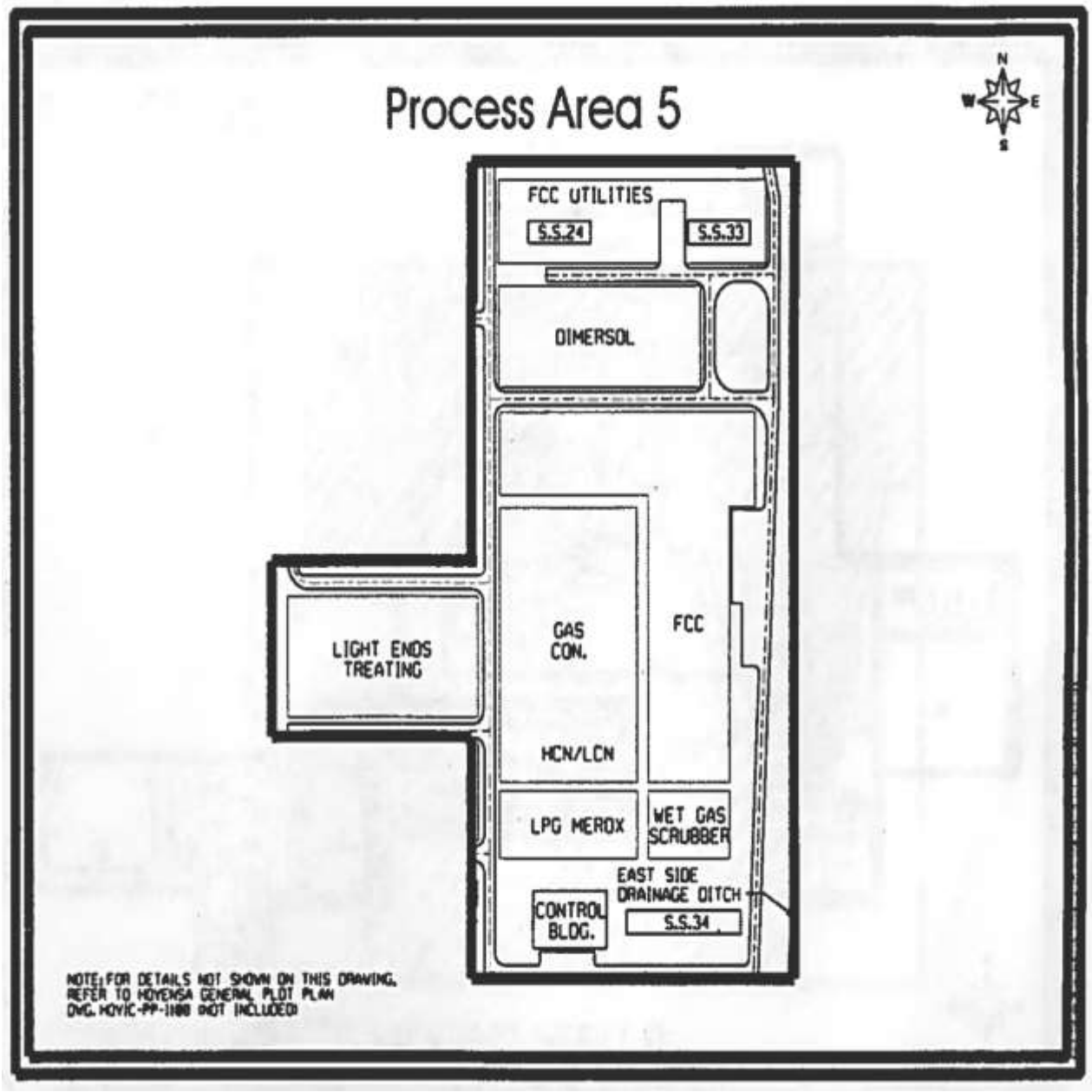
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E
S
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S.S.24
S.S.33
DIMERSOL
LIGHT ENDS TREATING
GAS CON.
FCC
HCN/LCN
LPG MEROX
WET GAS SCRUBBER
EAST SIDE DRAINAGE DITCH
CONTROL BLDG.
S.S.34
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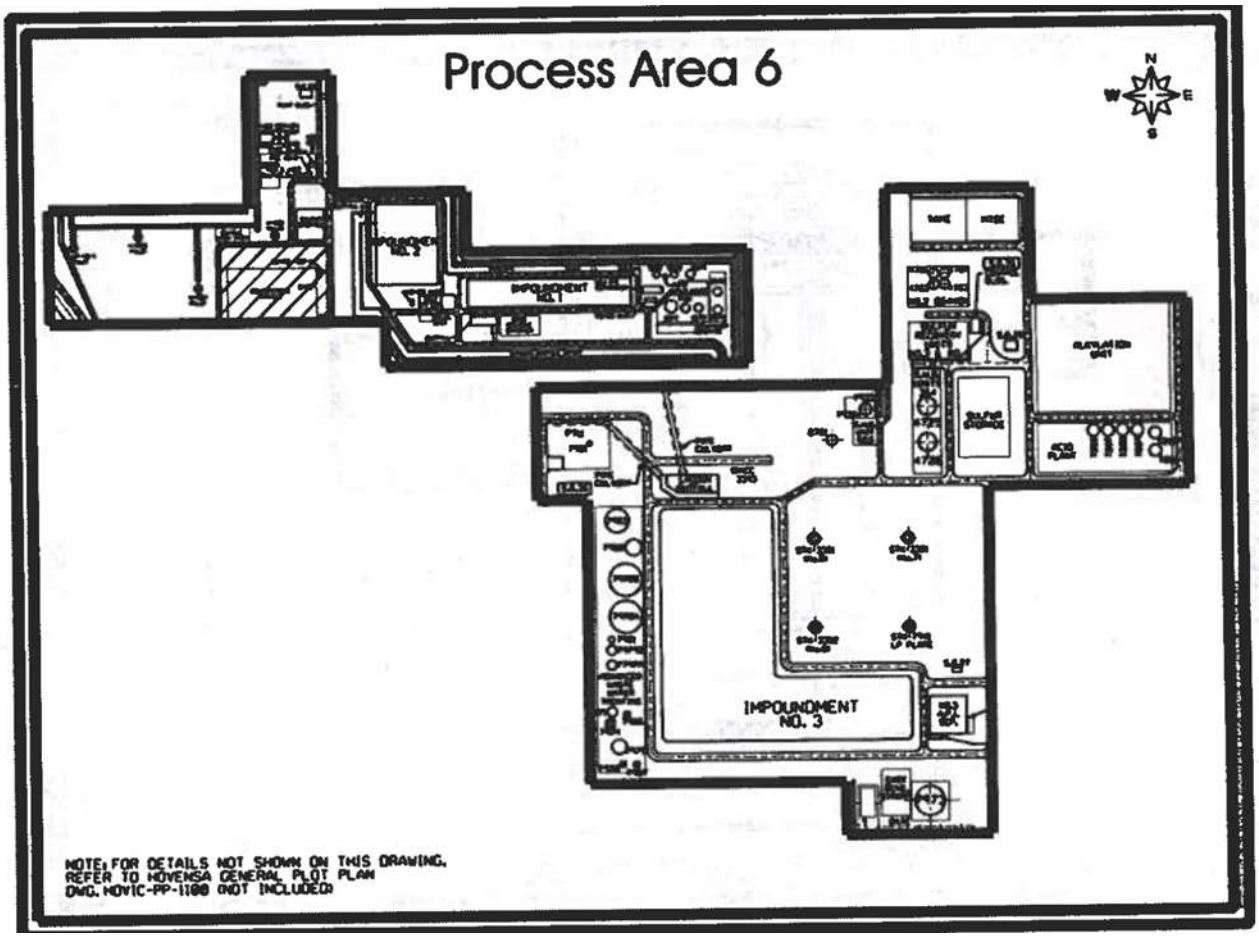
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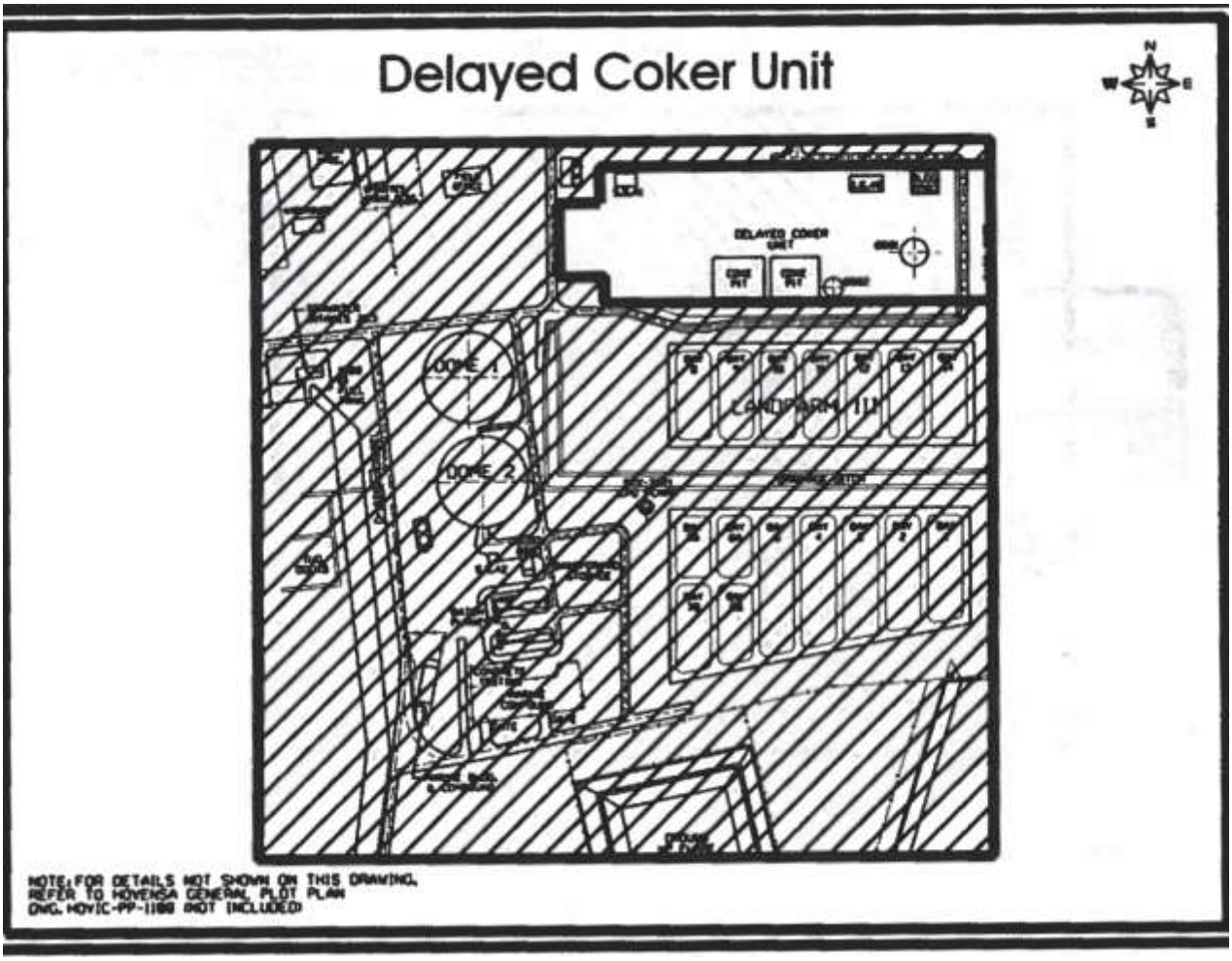
Delayed Coker Unit
N
W
E
S
DELAYED COKER UNIT
COKE 1
COKE 2
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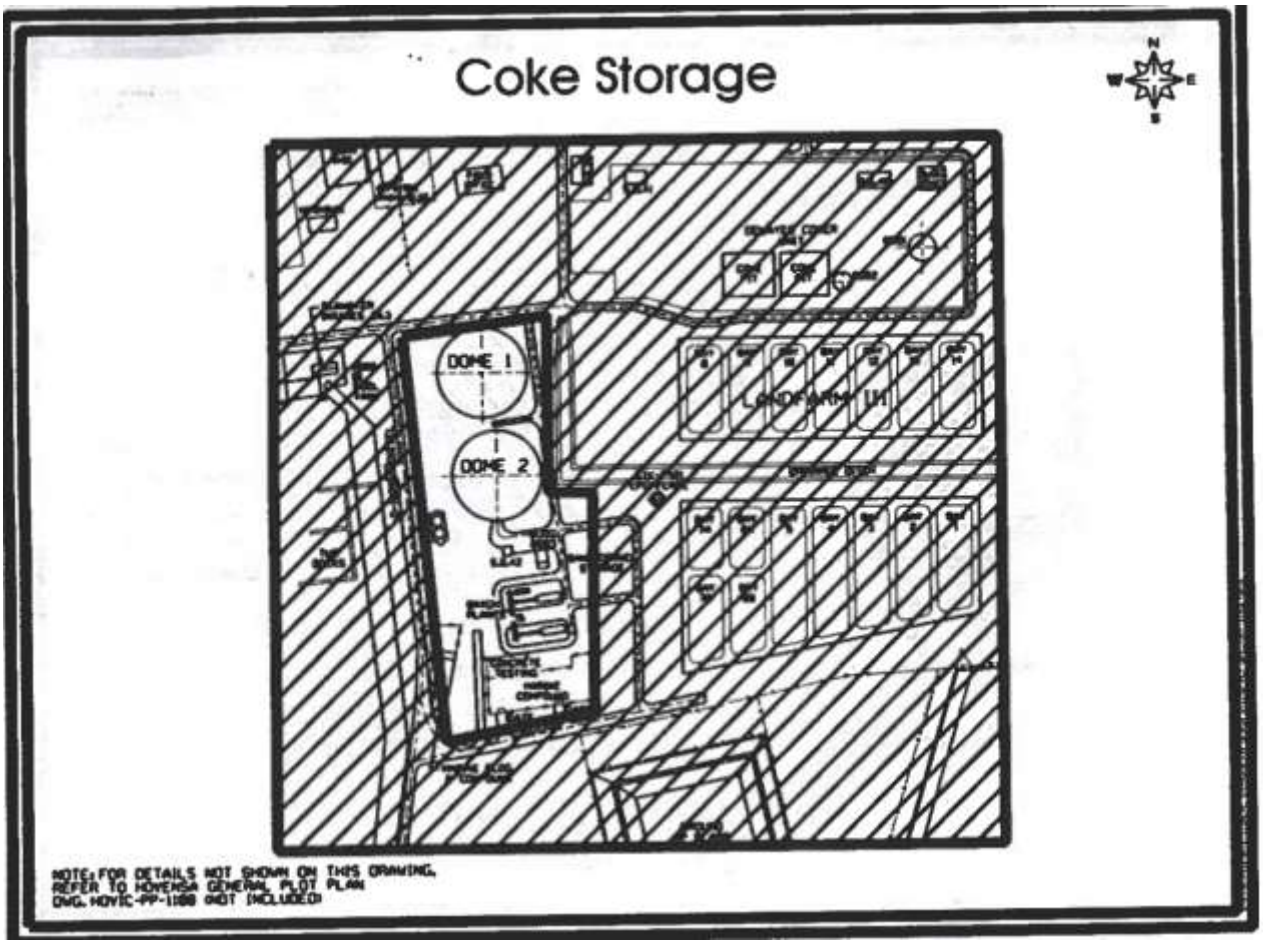
Coke Storage
DOME 1
DOME 2
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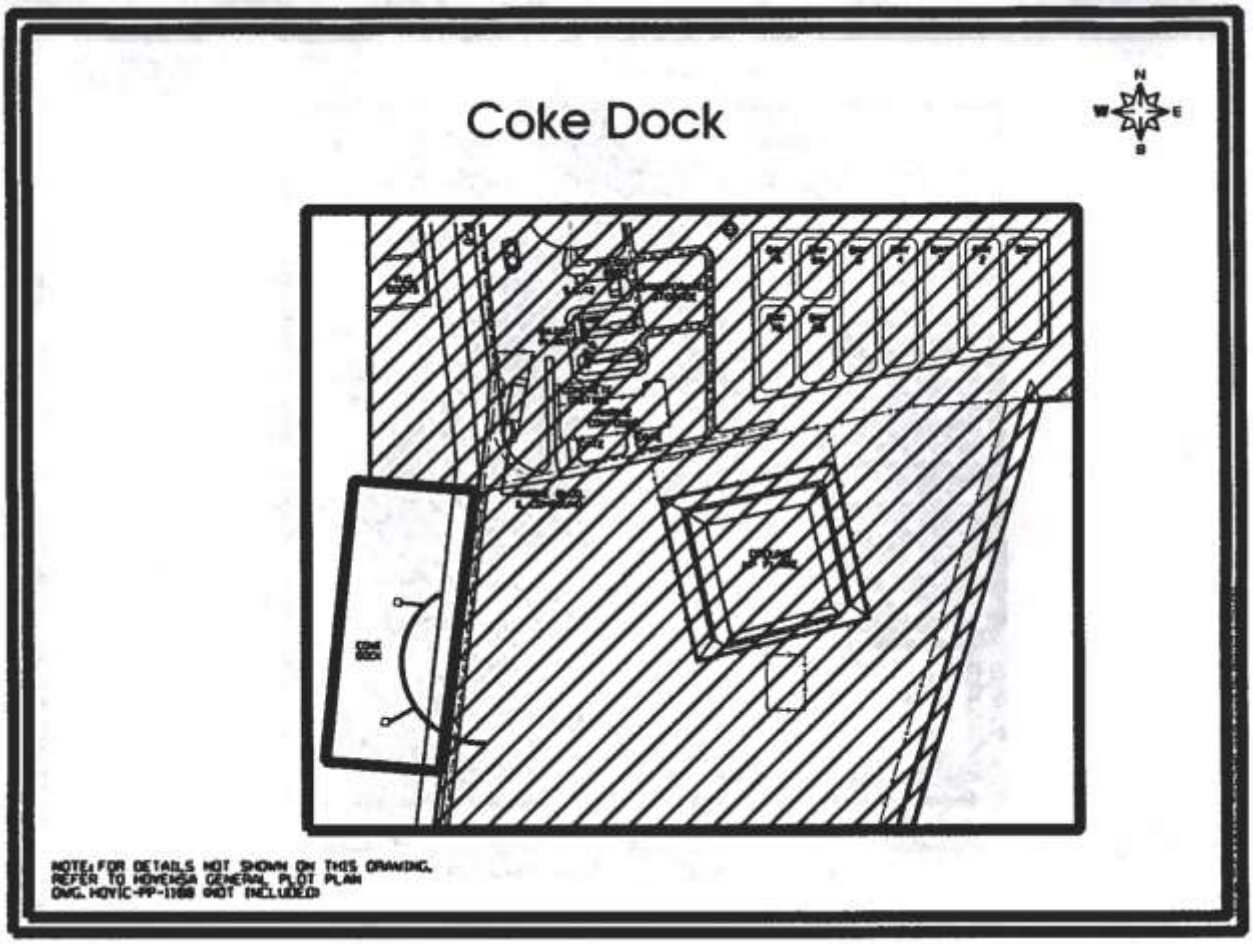
Coke Dock
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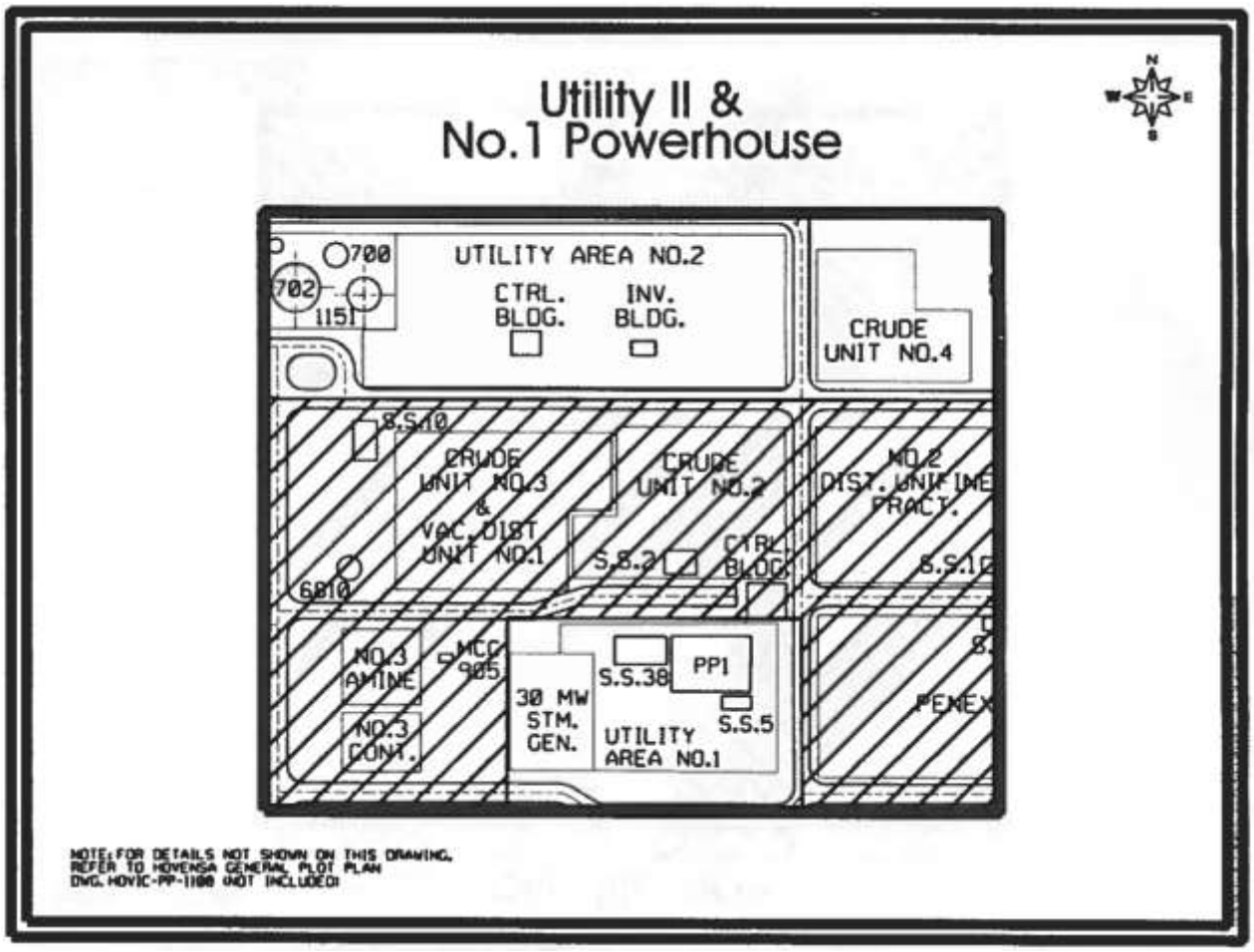
Utility II &
No.1 Powerhouse
UTILITY AREA NO.2
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INV. BLDG.
700
702
1151
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S.S.10
CRUDE UNIT NO.3 & VAC. DIST UNIT NO.1
CRUDE UNIT NO.2
NO.2 DIST. UNIT INE PRACT.
S.S.2
CTRL BLDG.
6810
S.S.1
NO.3 AMINE
MCC 905
NO.3 CONT.
30 MW STM. GEN.
S.S.38
PP1
S.S.5
UTILITY AREA NO.1
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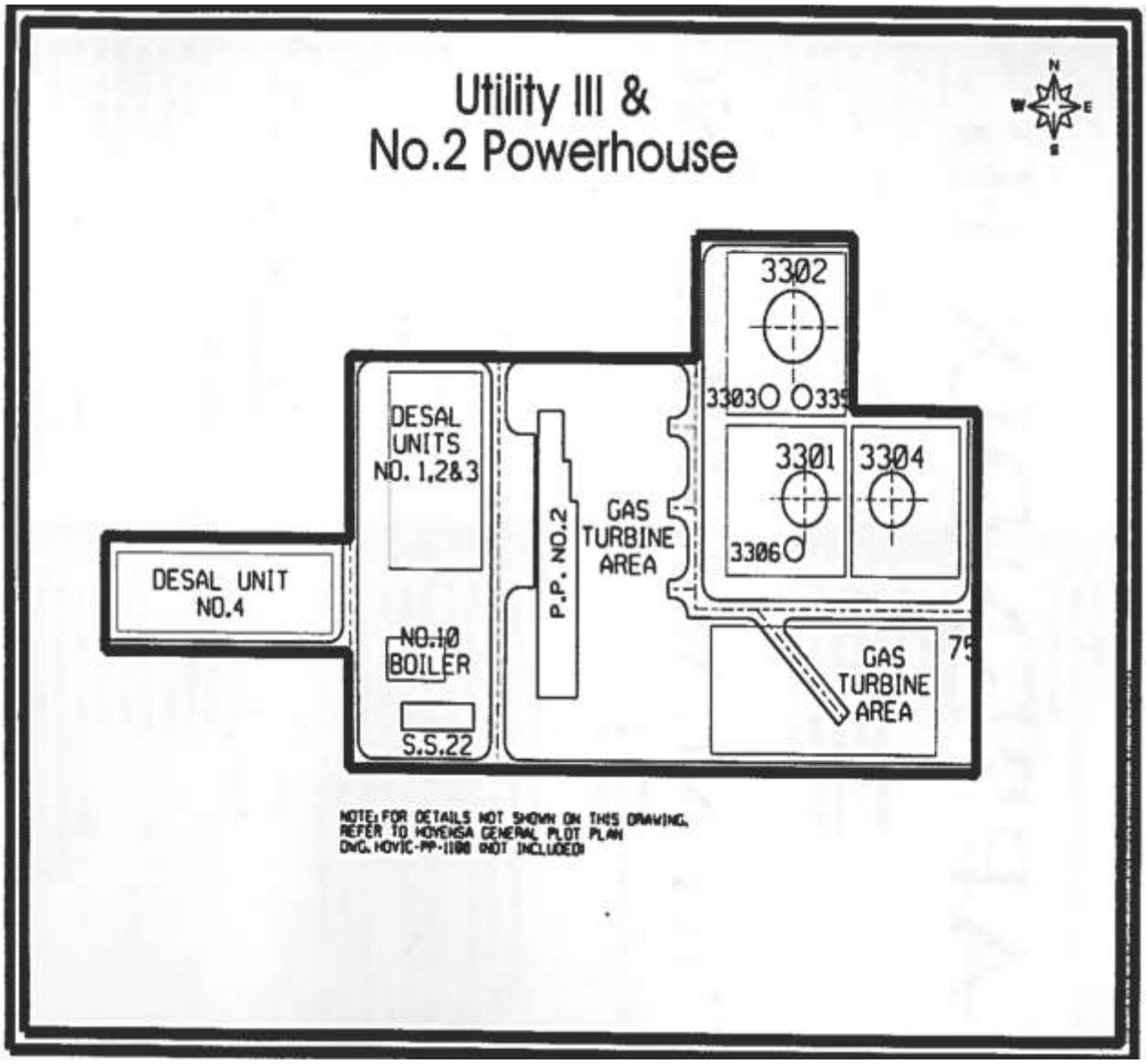
Utility III &
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N
W
E
S
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3303
3305
3301
3304
3306
DESAL
UNITS
NO. 1,2&3
P.P. NO.2
GAS
TURBINE
AREA
DESAL UNIT
NO.4
NO.10
BOILER
S.S.22
GAS
TURBINE
AREA
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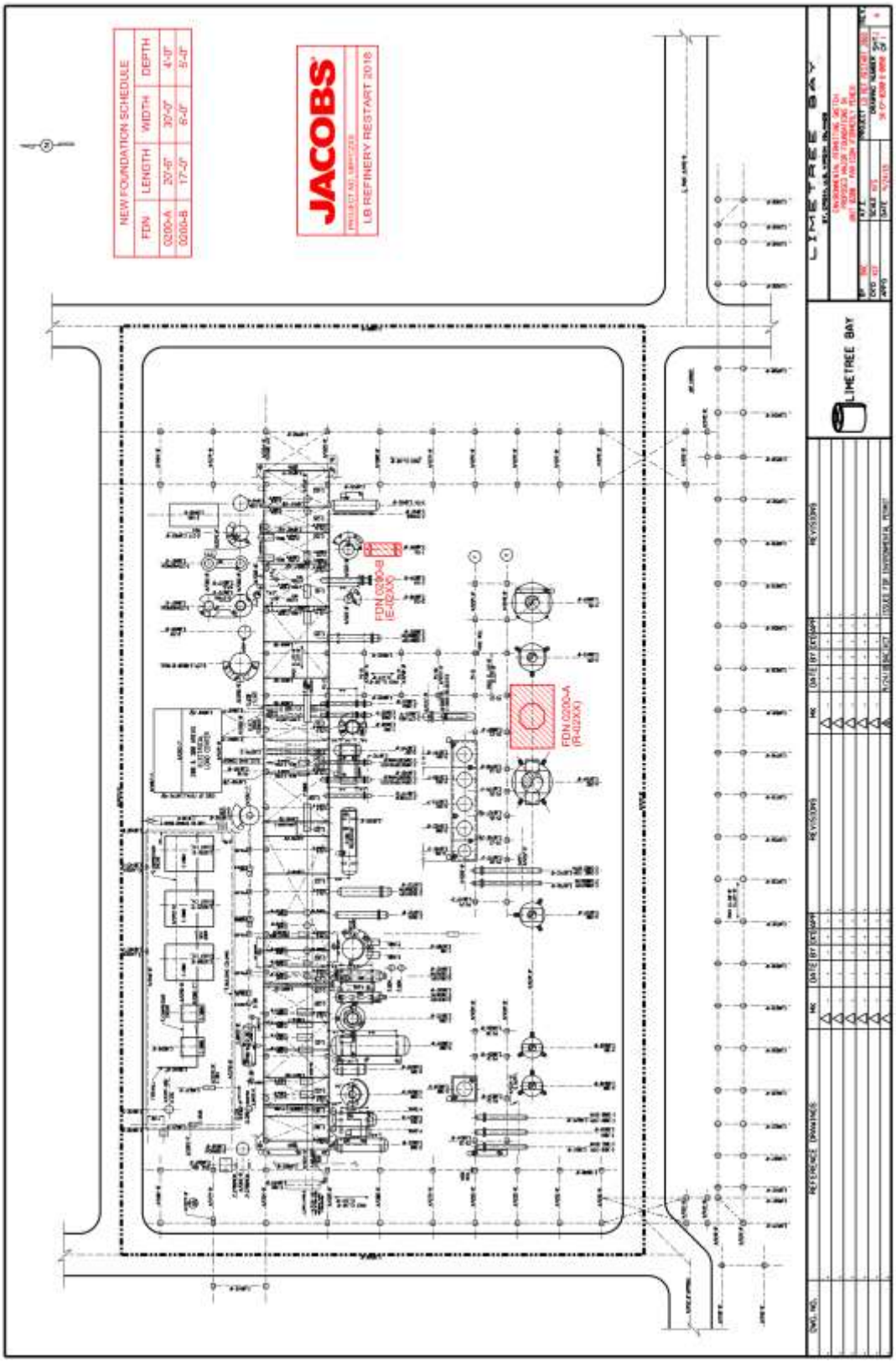
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0200-B
17'-0"
8'-0"
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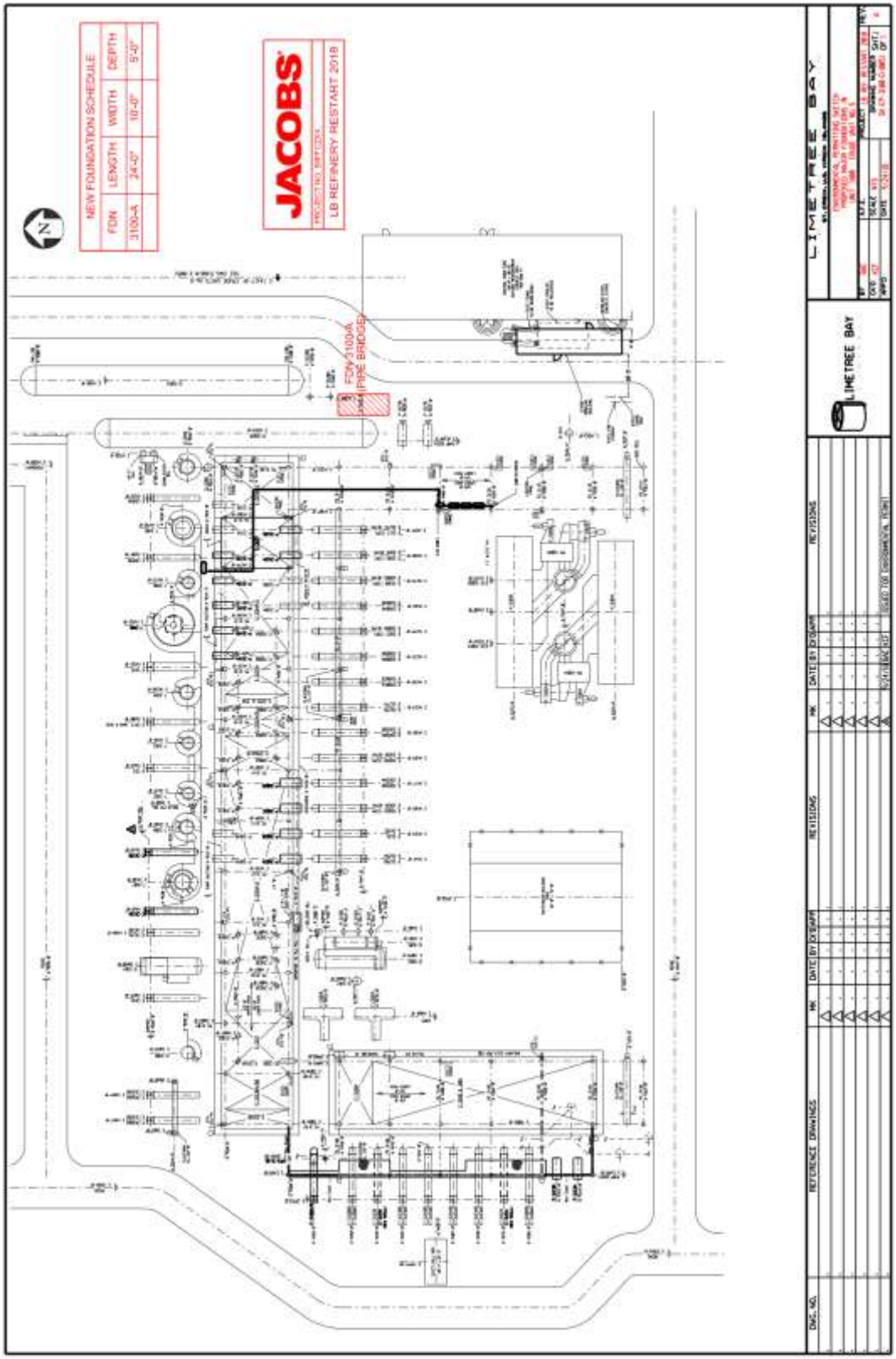
JACOBS
LB REFINERY RESTART 2018
LIMETREE BAY
FDN 0200-B (E-0201)
FDN 0200-A (R-0202A/B)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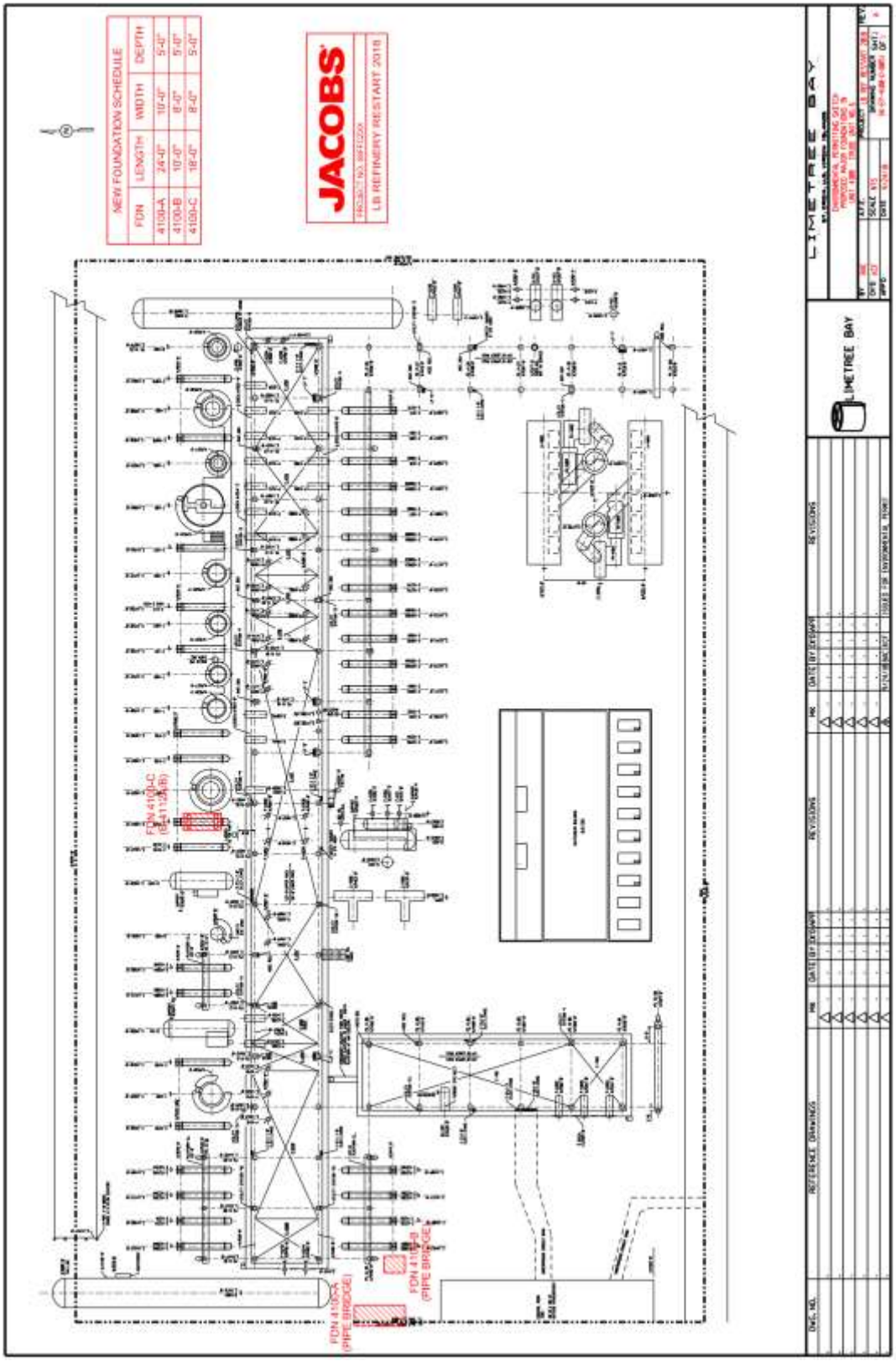
5'-0"
JACOBS
PROJECT NO. 69T1004
LB REFINERY RESTART 2018
FDN-3100A
PIPE BRIDGE
LIMETREE BAY
LIMETREE BAY
REFERENCE DRAWINGS
DWG. NO.
NO.
DATE
BY
DIAGRAM
REVISIONS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8'-0"
5'-0"
4100-C
18'-0"
8'-0"
5'-0"
JACOBS
LB REFINERY RESTART 2018
LIMETREE BAY
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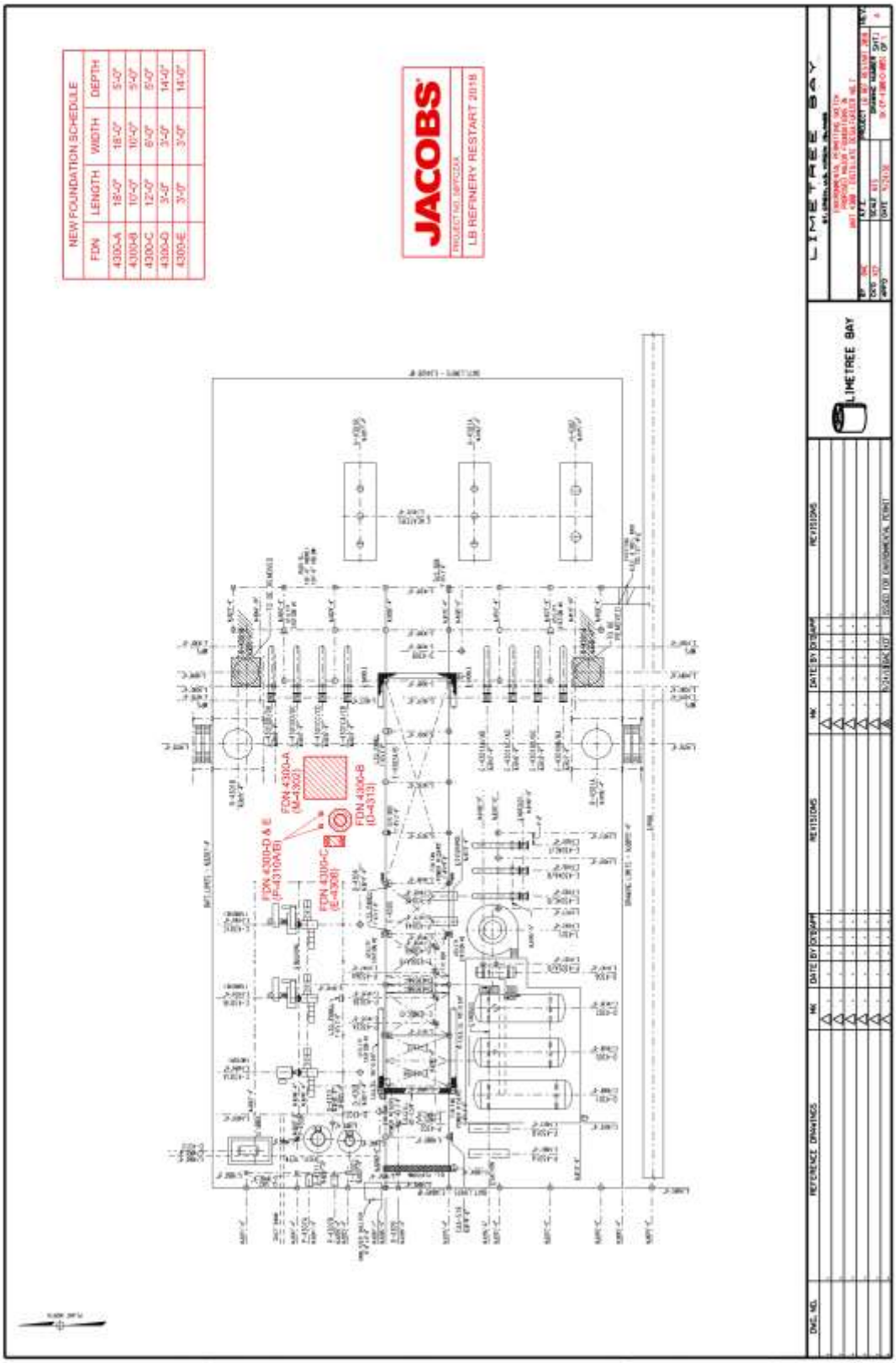
(PIPE BRIDGE)
FDN 4100B
(PIPE BRIDGE)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LIMETREE BAY
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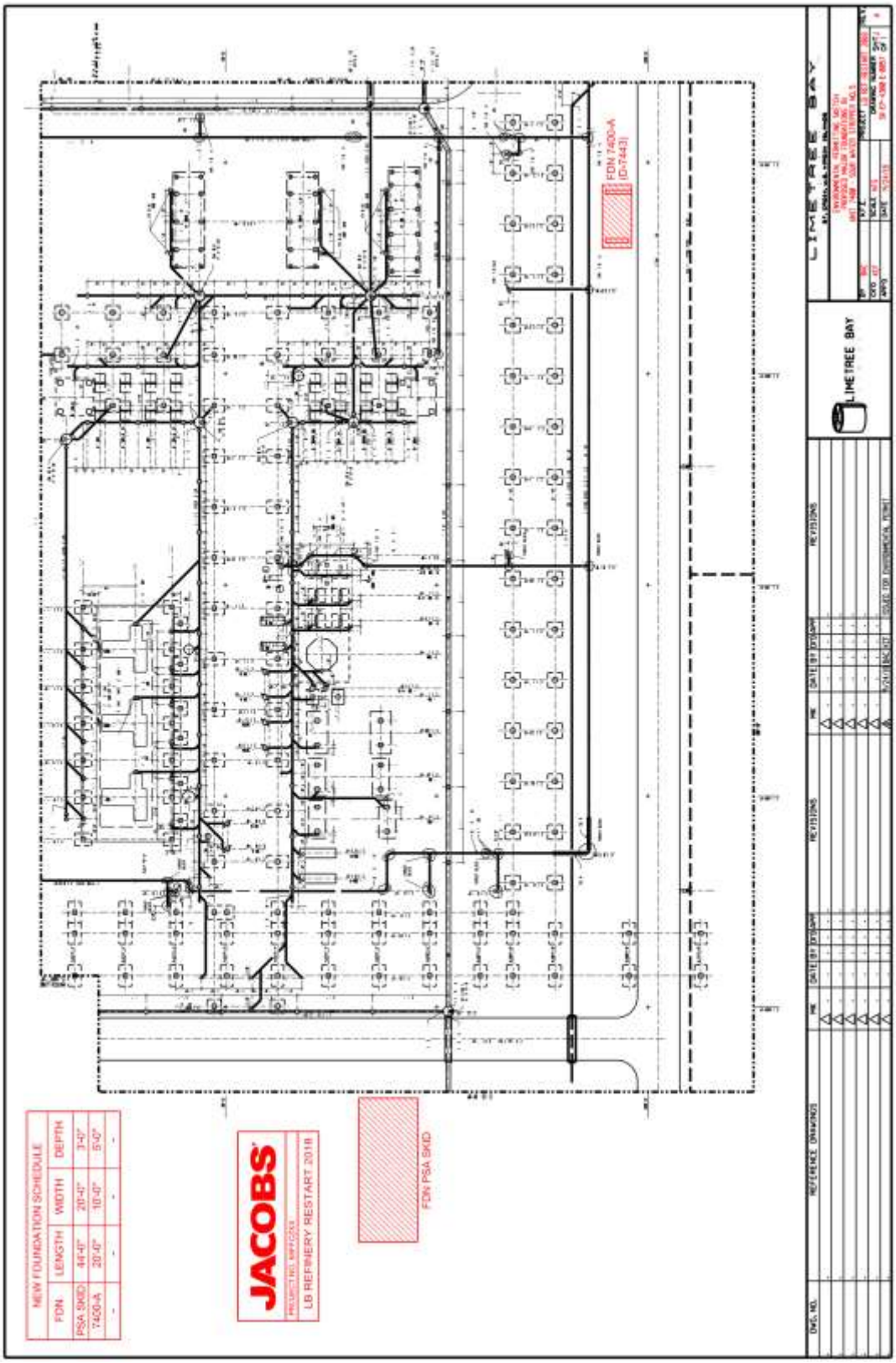
ISSUED FOR ENGINEERING, PERMIT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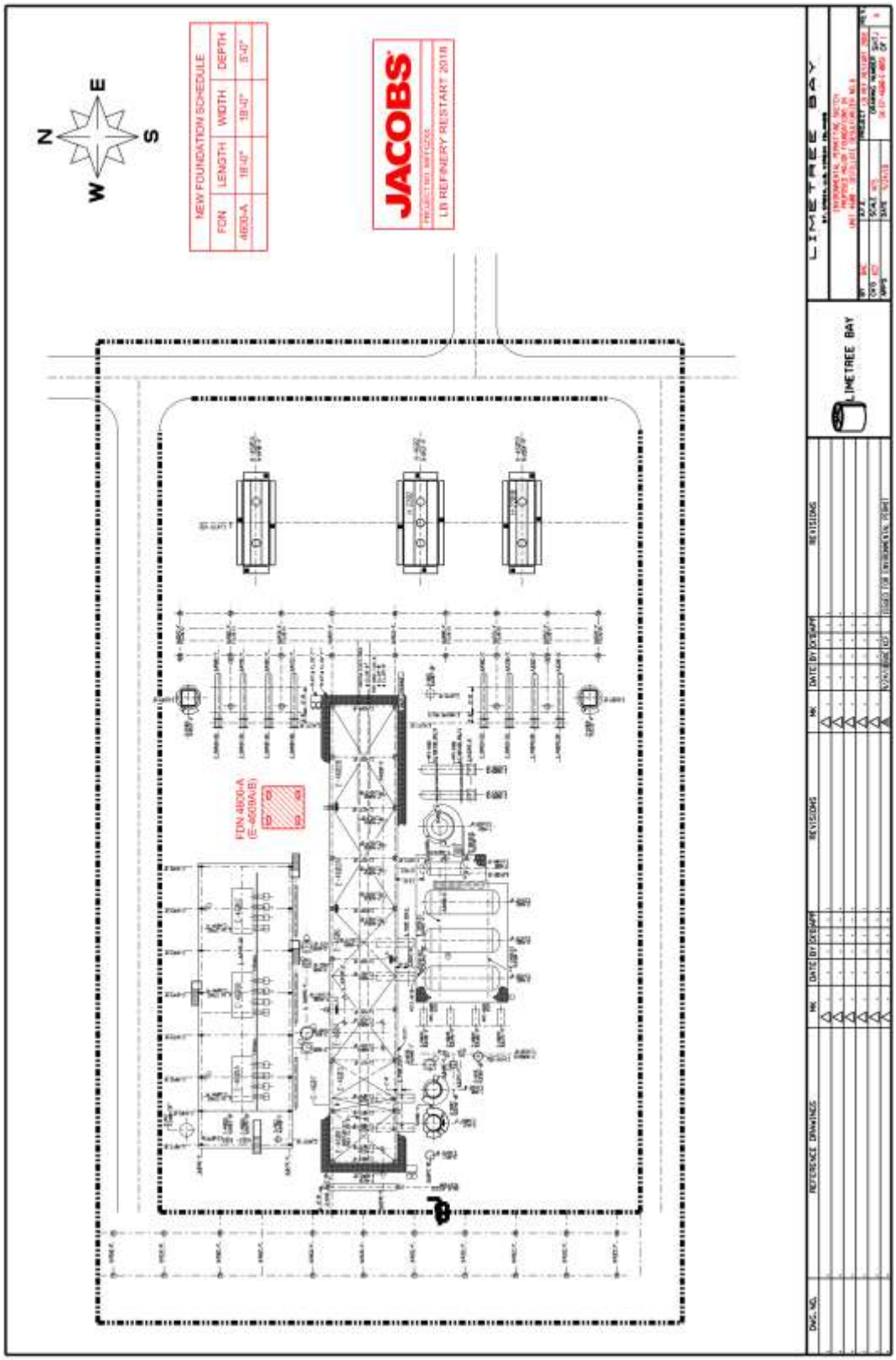
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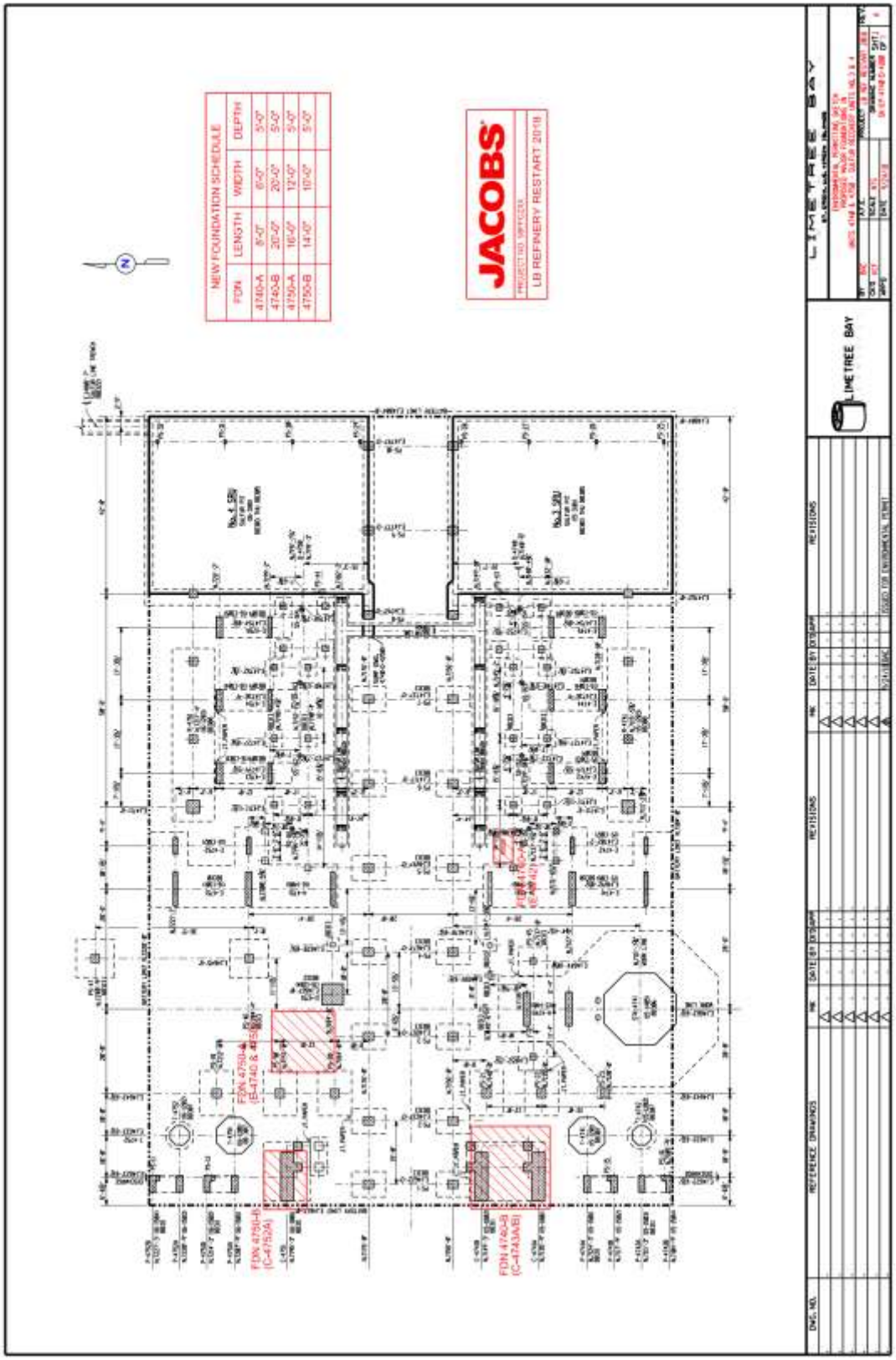
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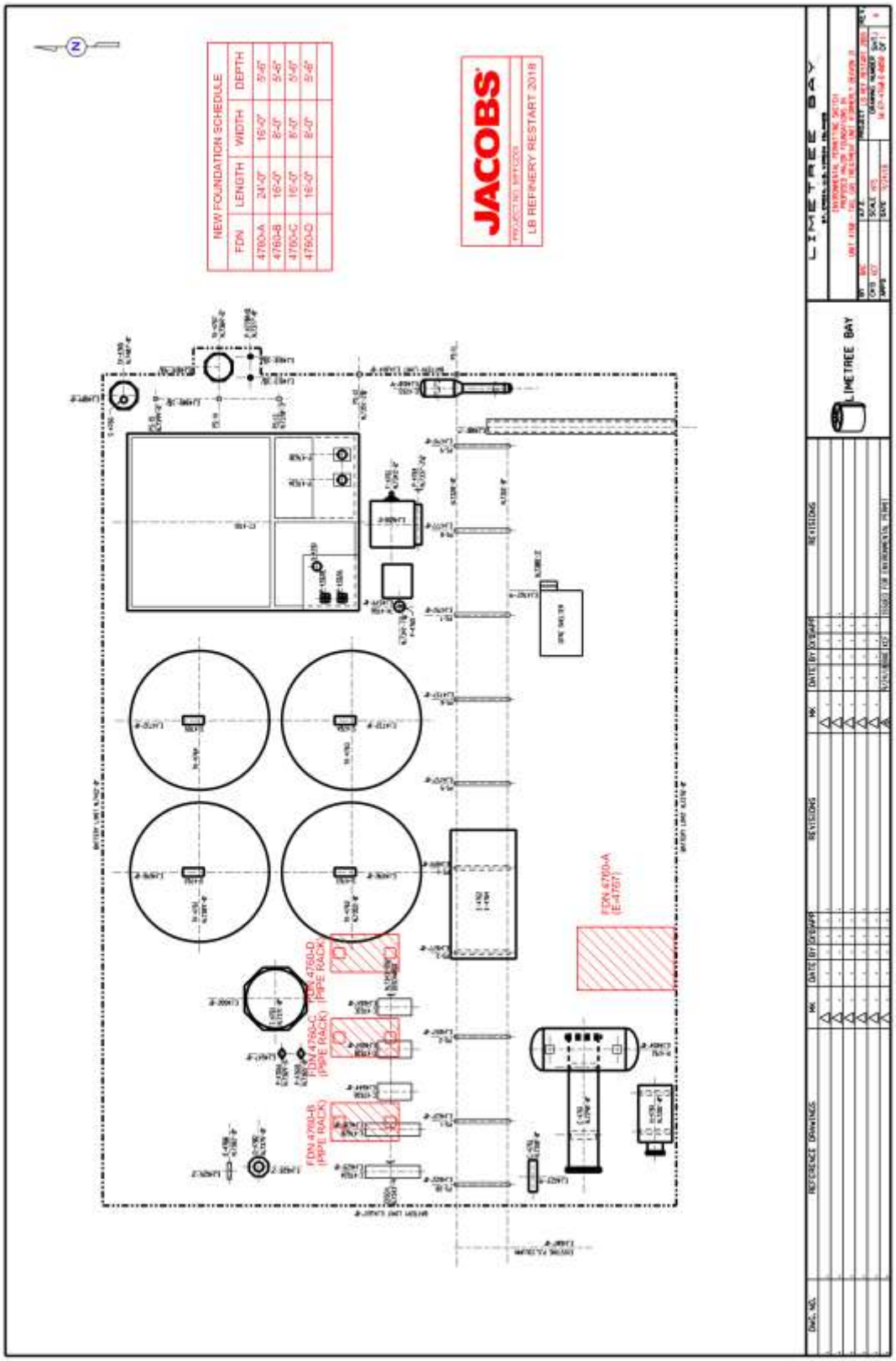
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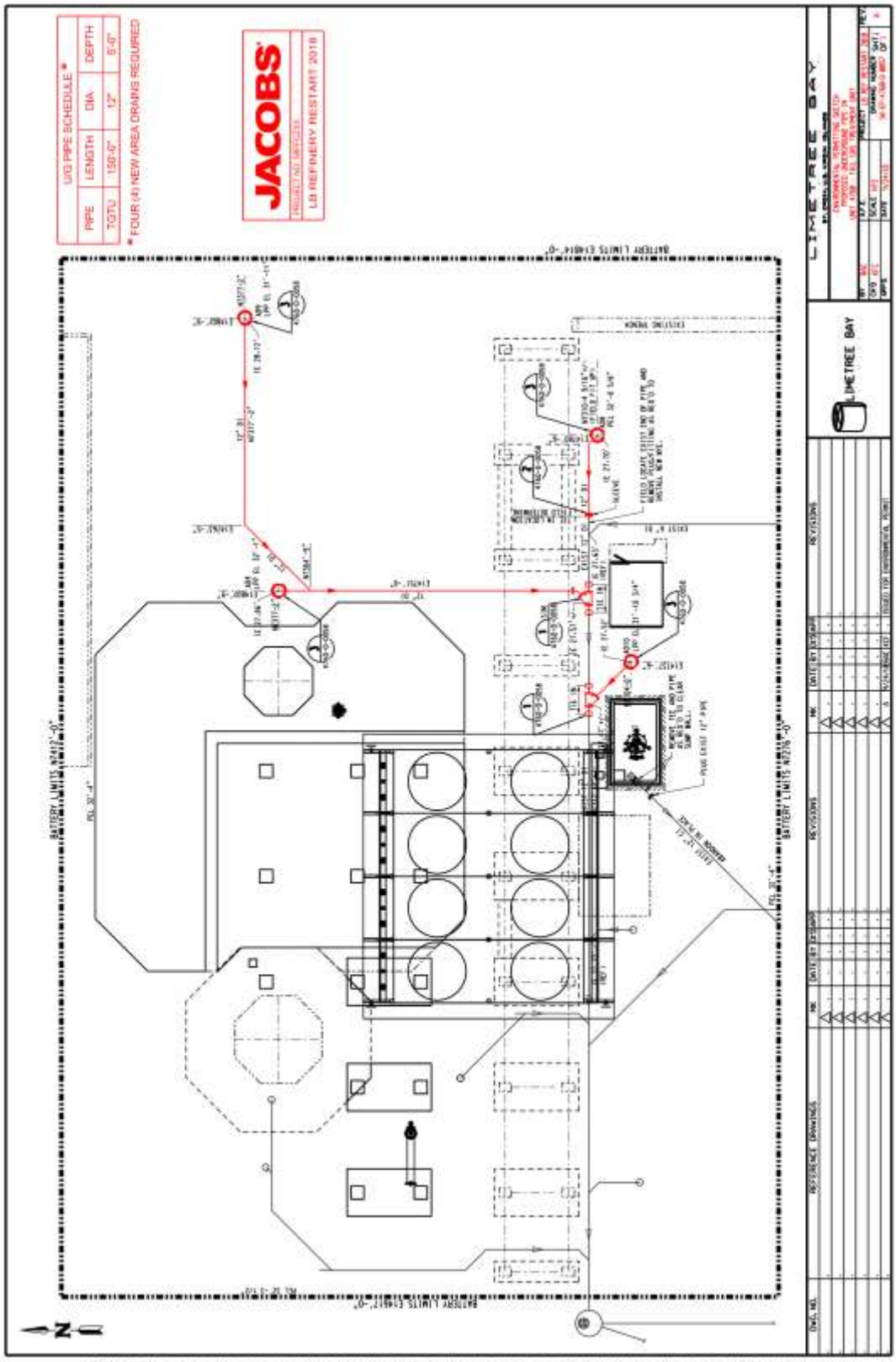
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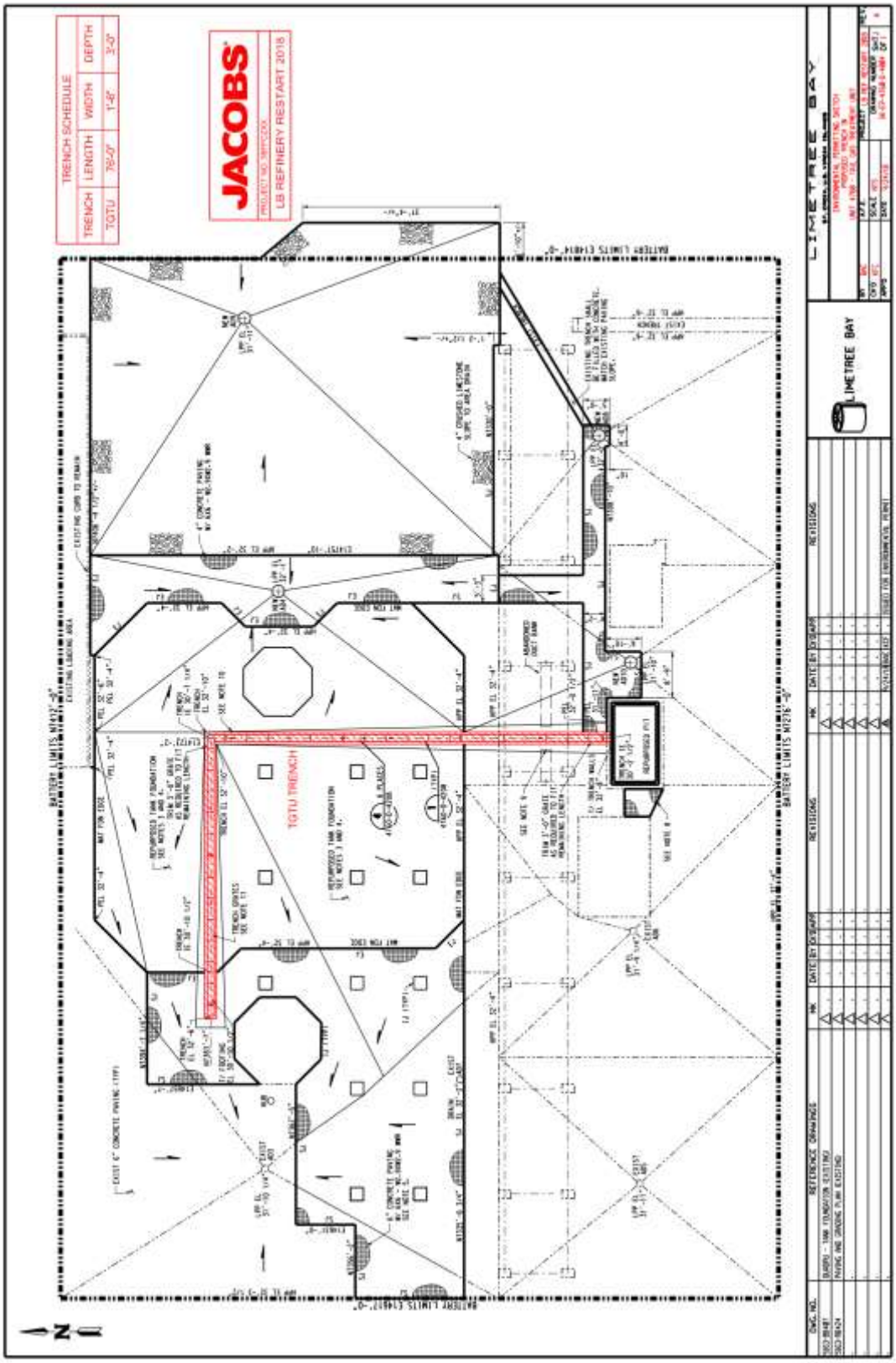
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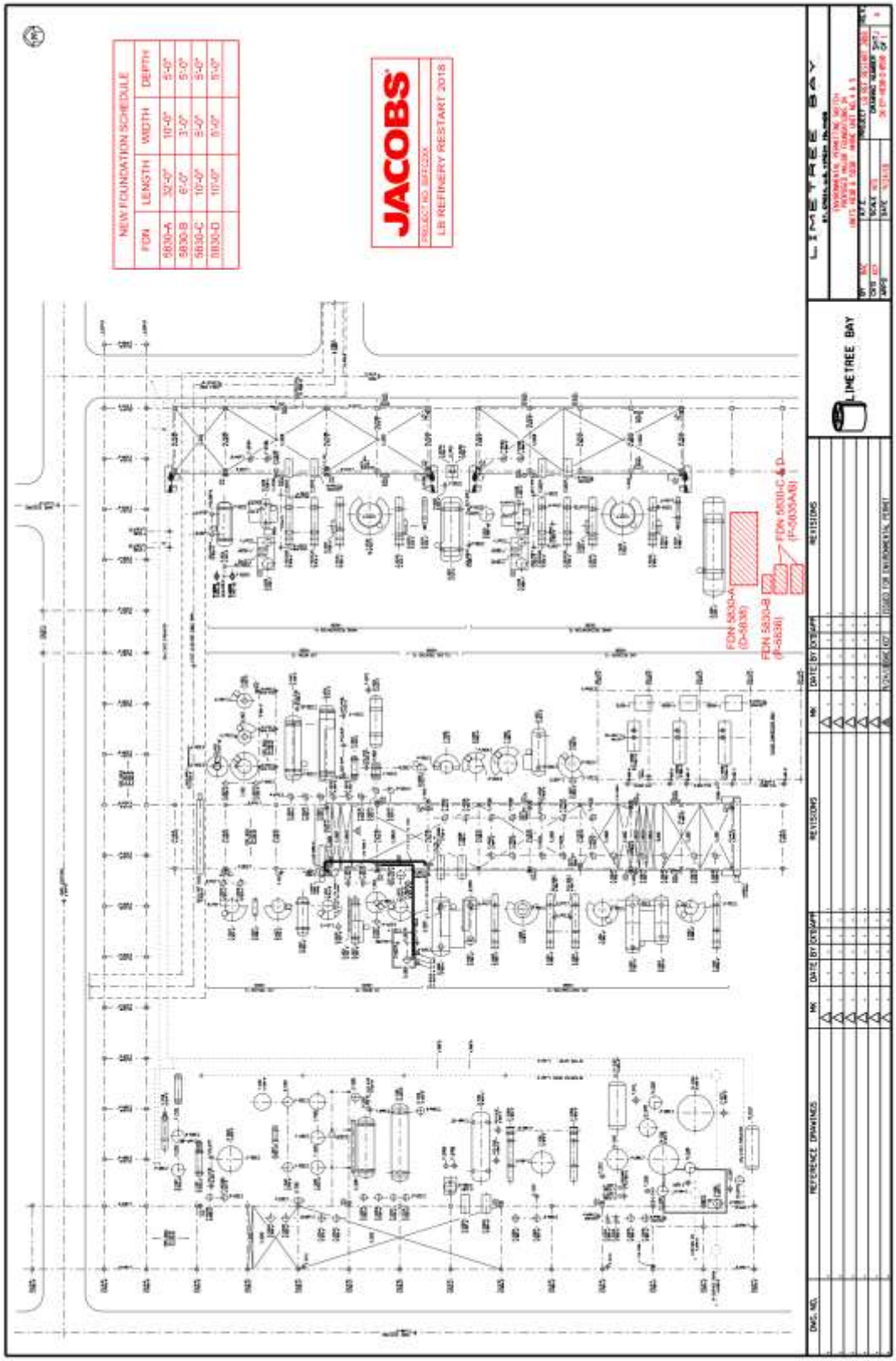
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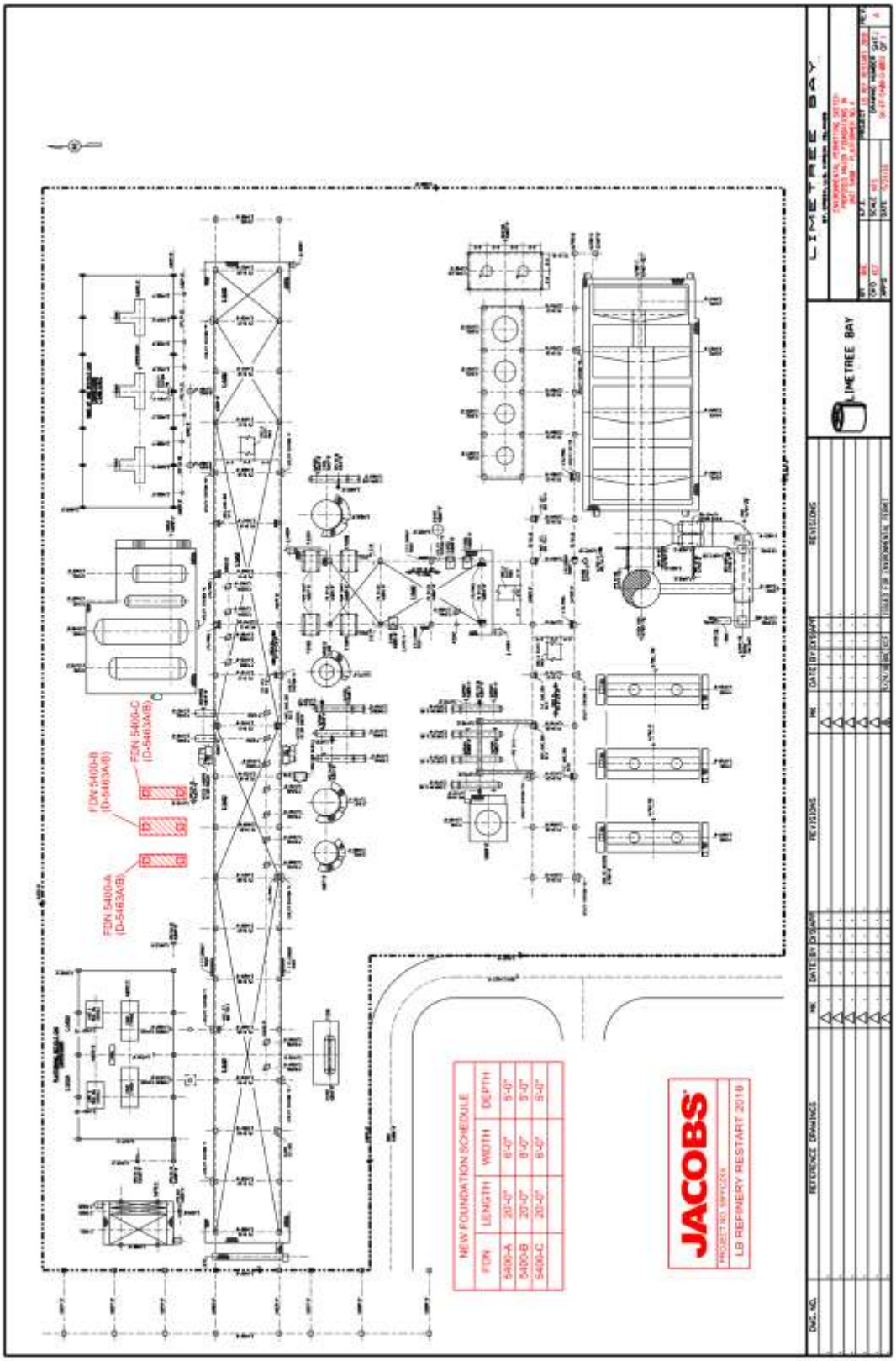
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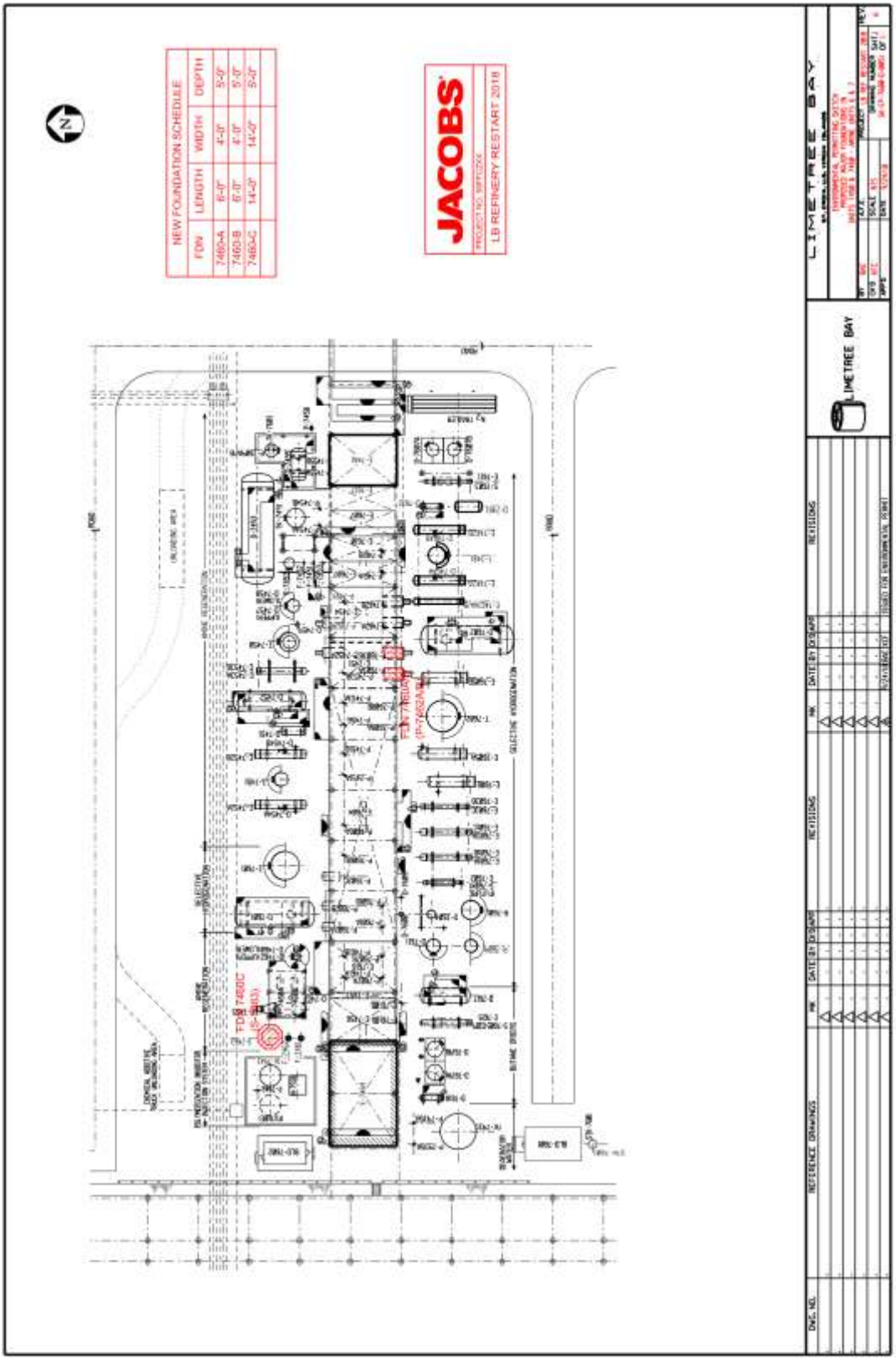
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LB REFINERY RESTART 2018
LIMETREE BAY
LIMETREE BAY
REFERENCE DRAWINGS
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6.0 ENVIRONMENTAL SETTING AND PROBABLE PROJECT MODIFICATIONS

6.1 Climate and Weather

Prevailing Winds

The Virgin Islands lie in the "Easterlies" or "Trade Winds" which traverse the southern part of the "Bermuda High" pressure area, thus the predominant winds are usually from the east northeast and east (IRF, 1977). These trade winds vary seasonally (Figure 6.01.1) 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).

December - February

During the winter the trade winds reach a maximum and blow with great regularity from the east northeast. Wind speeds range from eleven to twenty-one knots about sixty percent 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 gust 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, allows weak cold fronts to move, southeastward over the entire Caribbean region. These storms are accompanied by intermittent rains and by clouds and low visibility for mariners.

March - May

During the spring, the trade winds are reduced in speed and blow mainly from the east. Winds exceed twenty knots only thirteen percent 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 twenty-three percent 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 seven percent of the winds exceed twenty 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.

Storm and Hurricanes

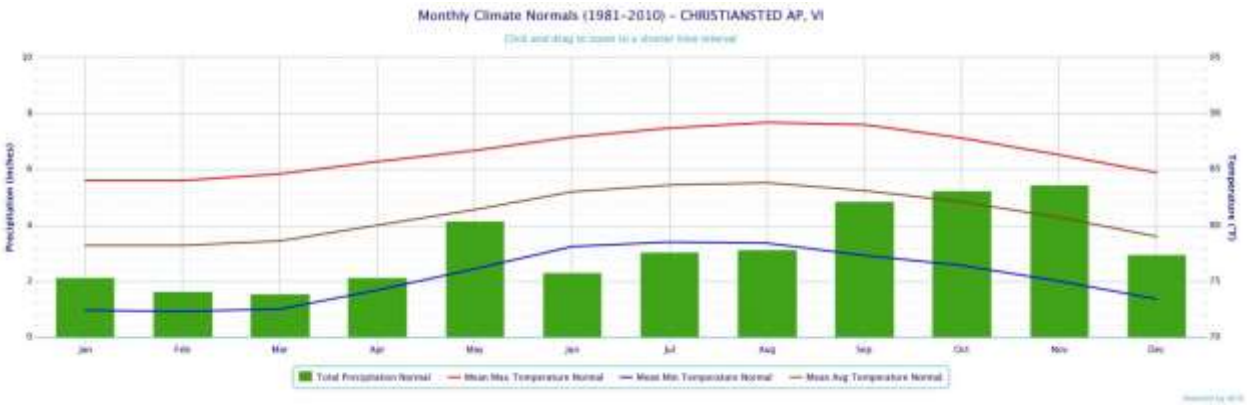
There are numerous disturbances during the year, especially squalls and thunderstorms. These occur most frequently during the summer, lasting only a few hours and causing no pronounced change in the trade winds.

A tropical cyclone whose winds exceed 74 miles per hour is termed a hurricane in the northern hemisphere, and significantly affects the area. These hurricanes occur most frequently between August and mid-October (Figure 6.01.2) with their peak activity occurring in September. The annual probability of a cyclone is one in sixteen years (Bowden, 1974). During 2017, portions of the facility were damaged during Category 5 Hurricanes Maria and Irma but the facility has been secured and is being currently being restored.

Climate

The average annual rainfall on St. Croix is approximately 40 inches, ranging from 30 inches toward the eastern end of the islands to more than 50 inches at the higher elevations to the west. The Limetree Bay Terminals area receives less than 40 inches of rainfall per year on average. Rainfall usually occurs in brief, intense showers of less than a few tenths of an inch and major rainfall events are associated with weather systems (USGS 1998). The Virgin Islands have no sharply defined wet season. The wettest period generally is from September to November, and the driest period is from January to June (USGS 1998).

Annual temperatures average 79 degrees Fahrenheit (F), with the winter low averaging 76 degrees F. and the summer high reaching an average of 84 degrees F. Occasionally, maximum daily temperatures will exceed 90 degrees F. and minimum temperatures will drop below 70 degrees F. (Jordan, 1975).



. https://noaa.maps.arcgis.com/home/webmap/viewer

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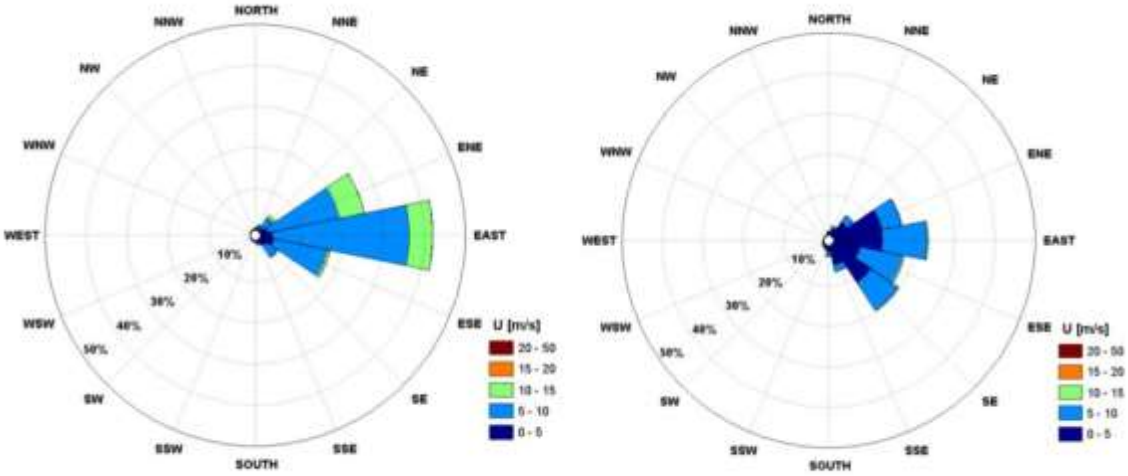


Figure 6.01 Day to day conditions shown from the Lime Tree Bay NOAA Station and at the OWI (Oceanweather Inc.) operational station.

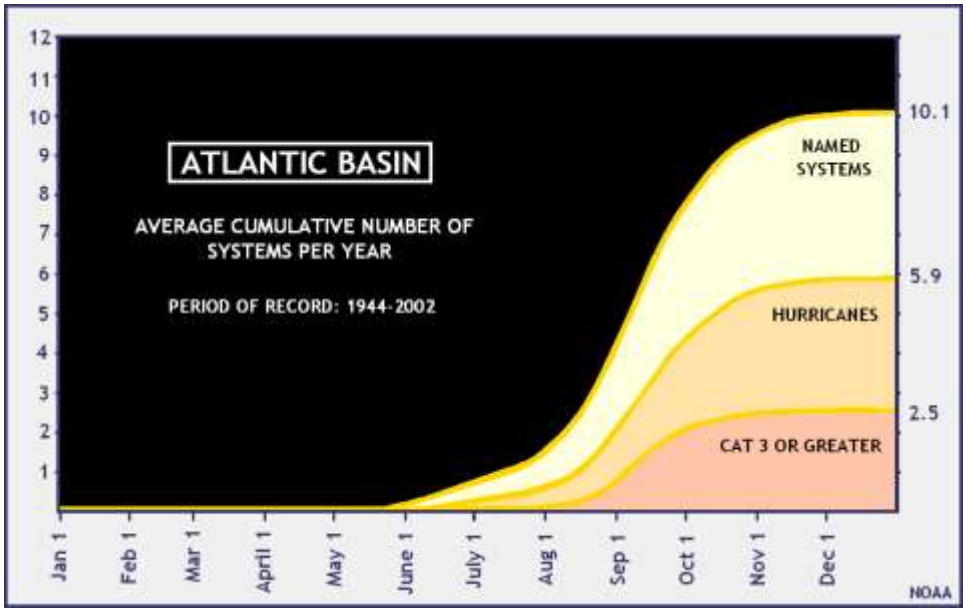
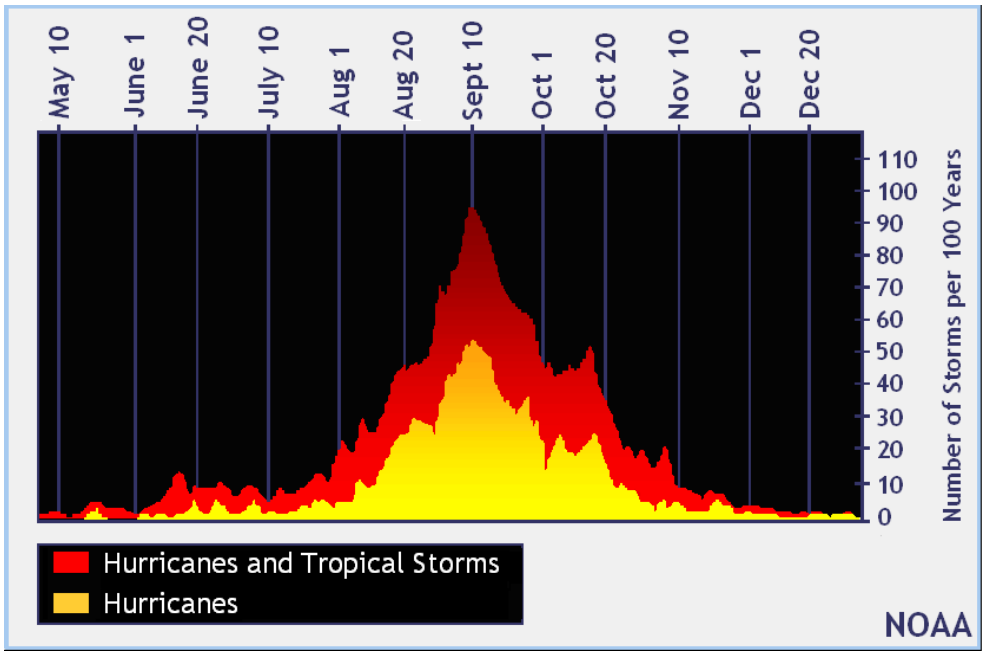


Figure 6.01.2 Tropical Cyclone Frequencies in the Atlantic (National Weather Service).



6.01.3 Tropical Storm and Hurricane Occurrences in the Atlantic (National Weather Service).

6.2 Landforms, Geology, Soils, and Historic Use

GEOLOGY OF ST. CROIX

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 the Atlantic oceanic crust of the American Plate is carried downward under the Caribbean Plate. The closest volcano to the Virgin Islands, which is still active, is Saba, about 160 km to the east.

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 oldest rock underlying both ranges, and probably in the valley as well, is from the Cretaceous period, 80 million years ago. These sedimentary rocks which were formed from the erosion of volcanic ash and debris, and are beset with igneous intrusions, underwent a period of orogeny lifting them up from the ocean floor and forming two islands with a channel in between. Oligocene clay and mud was deposited in this channel forming what is known as the Jealousy formation. Next, tertiary limestone was deposited when this channel area became a lagoon encircled by coral reef. 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.

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 70º. Frasetto and Northrop (1057) indicate that this northern topographic slope extends downward to the Virgin Islands Basin at a gradient up to 43º. 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. The area has been described as the south side of the Anegada Trough and its related fault scarp (Taber 1922). 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. The southern and eastern portions of the St. Croix Platform, differing greatly from the northern and western regions, have a gradient of much less amplitude and therefore, a wider shelf area.

The south shore of St. Croix has been subject to two major periods of human disturbance. The introduction of intensive agriculture began during the early 18th century; the disturbance of the native flora and fauna was so severe that the biological communities present prior to 1700 cannot be specifically determined.

The second major period of disturbance was the conversion of the south shore to industrial uses. The period of industrialization began in the early 1960's. Construction of the refinery was undertaken in 1965 with the encouragement of incentives offered by the Virgin Islands Government through the Virgin Islands Industrial Act of 1963.

GEOLOGY OF LIMETREE BAY AREA

The Limetree Bay Terminals property lies on the south coast of St. Croix in the Coastal Plain. The Coastal Plain, composed of sedimentary rocks of Tertiary age, occurs in a graben between the Northside and East End ranges. The Tertiary sediments are divided into two formations, the upper
Kingshill Marl and the older Jealousy Formation. The Jealousy Formation was seemingly derived from reworked volcanic ash, while the Kingshill Marl is composed of reef limestone. The majority of the land within the Limetree Bay Terminals was comprised of the Kingshill Marl; this formation is 400-600 feet thick and covers the surface of the Coastal Plain except where it is overlain by alluvium. The Kingshill Marl, deposited largely as a coral reef, is composed of buff to white, hard and somewhat brittle limestone, that alternates with cream to white, relatively soft, marl. The limestone forms cliffs where the softer underlying marl has been eroded. There are places that the limestone is composed chiefly of coral debris and the bedding planes are not well
defined so that the limestone appears to be without structure. Prior to development tiny solution holes dominated the limestone structures within the Limetree Bay Terminals property.
The natural surface deposits of the terminal area have been greatly disturbed by blasting, grading and filling; some of the Kingshill Marl excavated from high ground has been added to Limetree Bay as riprap. Material was removed from the high ground and was used to construct the dikes that surrounds the storage tanks as well as to construct portions of the terminal facilities. Through

dredge and fill activities, portions of the formerly productive Krause Lagoon mangrove community was destroyed. However, the principal disturbance to the lagoon system occurred with the earlier development of the Harvey (now St. Croix Renaissance LLP) processing facility.

Extensive dredging was required to cut the Limetree Bay Channel across the shallow offshore shelf and to provide sufficient depth along the docks and within the turning basins. The main channel is 500 feet wide and 60 feet deep. The two outermost berths on the main dock are dredged to 60 feet. The turning basins and remaining berths average 45 feet in depth. The Harvey Cross
Channel connects the HOVENSA port to the Krause Lagoon Channel a half mile to the west (Brown and Root 1974). Materials were blasted and dredged from the channel bottom. Large aggregate and fine materials were used to construct the mile-long breakwater on which the pipeline for the project is proposed and main dock.

Vessels embarking from and arriving to the facility utilize the Limetree Bay Channel. The channel leads from deep water through the reefs to a large turning basin and a 1,000 foot pier at the head of Krause Lagoon. The controlling depth in the channel is approximately 60 feet.

SOILS WITHIN THE FACILITY

The United States Department of Agriculture (USDA) Natural Resources Conservation Service's (NRCS) Custom Soil Survey for Limetree Bay Terminals indicated 3 soil types within the facility.
Urban land (UbD) covers most of the facility and this area has been highly altered by man's grading and filling and no area is left in its original condition. In most cases the top soil has been completely stripped away and reworked sediments cover the area. Ustorthents (Us) is found on the eastern jetty and on the berm along the eastern shoreline, these are areas where submerged land was filled with dredge spoils. Aquents, 0 to 2 percent slopes, ponded (AqA are found in the old dredge spoil holding pond and are described as tidal flats in the soil survey.

6.02.1 Custom Soils Map (https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx)

No construction is proposed as part of this application and there will be no impact to the geology of the area.

6.3 Drainage, Flooding and Erosion Control

6.03a Impacts of Terrestrial and Shoreline Erosion

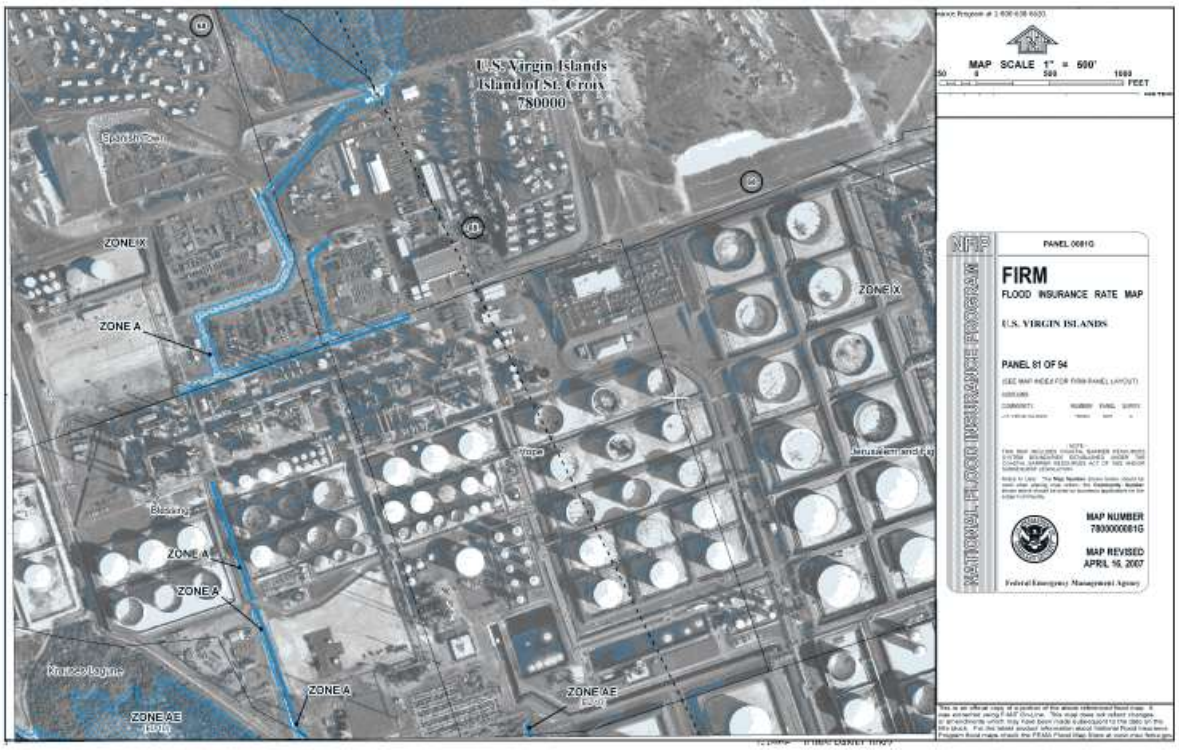
No material changes to existing facilities are proposed in connection with the application as it applies to the refinery restart that should affect drainage, flooding and erosion control, because most of the restart work is repair and maintenance to existing structures. In view of the overall developed nature of this site, the handful of foundations added by this project and the replacement of the Beavon Unit will have minimal impact. Future work will be approved pursuant to PAFA and be subject to the conditions of this permit.

6.03b Relationship of the Project to the Coastal Flood Plain

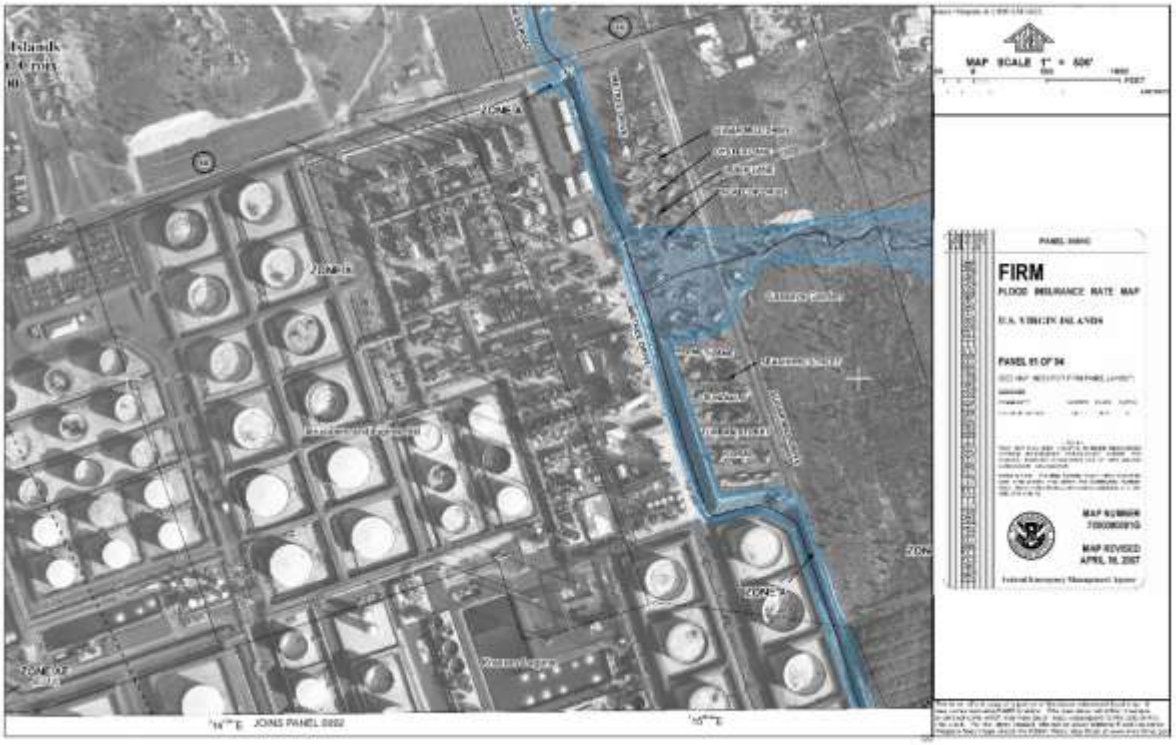
A portion of the facility (the jetty) is designated as Zone X where 100-year flooding is not expected. Other areas in the facility, to the west side and off the end of the jetty, the area is designated a Zone VE where coastal flooding with velocity (wave action) has been determined to

be 14’. The eastern side of the jetty has been designated Zone VE 13 where 100-year flooding with velocity has been determined to be 13’. (FEMA FIRM Maps 81G of 94 and 92G of 94).

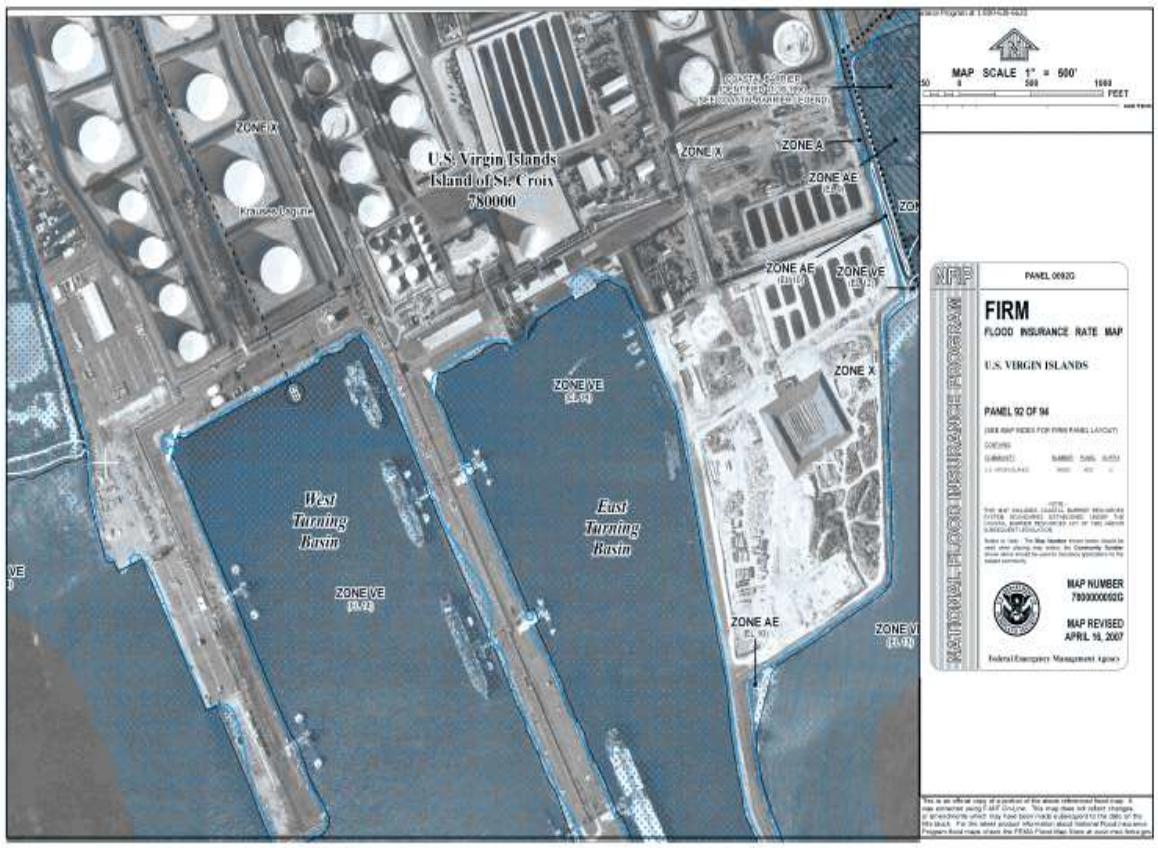
The facility has been designed with withstand the predicted sea conditions and flooding.



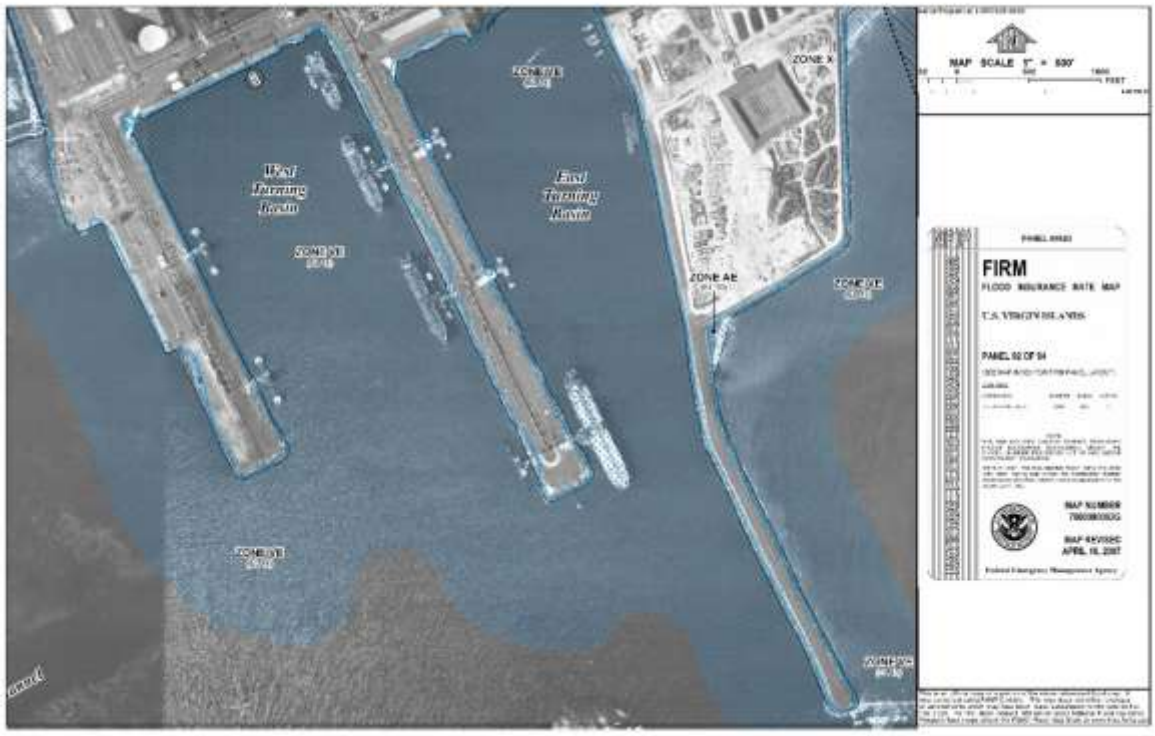
Western/Northern portion of FEMA FIRM 81 of 94.



Eastern portion of FEMA FIRM 81 of 94.



Southern portion of FEMA FIRM 92 of 94.



Southern portion of FEMA FIRM 92 of 94, showing end of docks and East Jetty.
Figure 6.03.1 FEMA FIRM Maps 81 of 94 and 92 of 94.

6.4 Fresh Water Resources

The continuation of operations will have no impact on fresh water resources. The facility produces water utilizing wells and a reverse osmosis plant. Future work will be approved pursuant to PAFA and be subject to the conditions of this permit.

6.5 Oceanography

6.05a Sea Bed Alteration

No seabed alteration is proposed in connection with the application. Future work will be approved pursuant to PAFA and be subject to the conditions of this permit.

6.05b Tides and Currents

The Virgin Islands coastal areas are not subject to significant tidal ranges or tidal currents. Due to the small size of the islands, the sea flows around the island causing an average tidal height of
only a few inches and a maximum change of only a little over one foot. Only very narrow intertidal zones are found because of this lack of tidal amplitude and the steepness of the island rising out of the sea. Normal tidal ranges may be greatly exceeded during storm conditions, when a combination of lower barometric pressure at the ocean surface and storm winds amplifies

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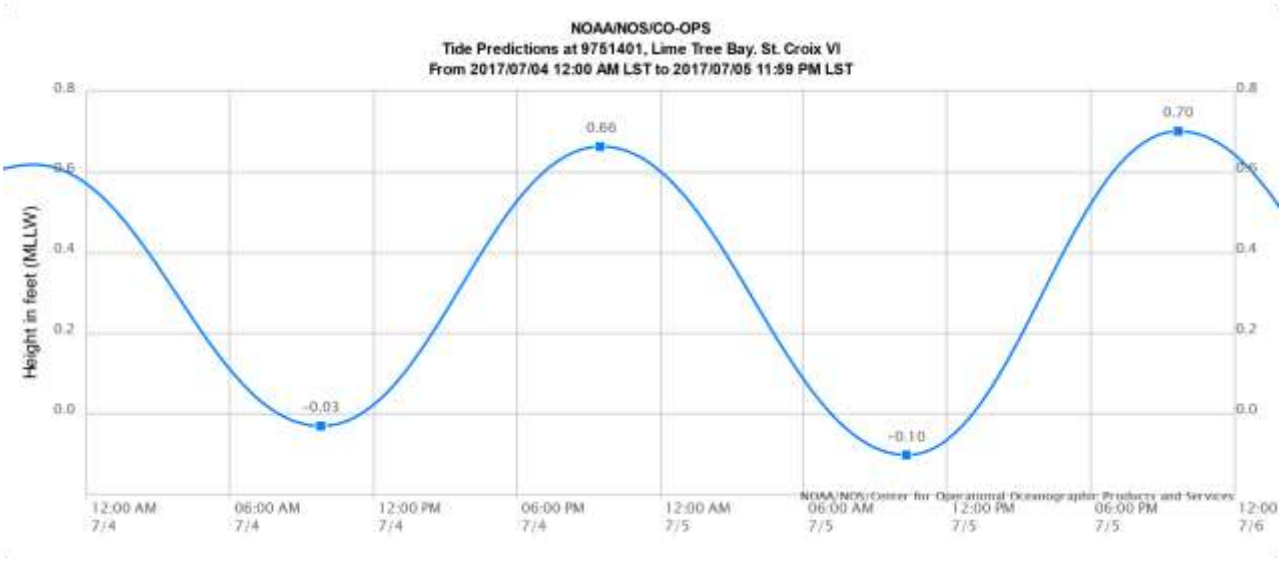
the tidal crest. The tides on the south coast of St. Croix are primarily diurnal in nature. There is a sight secondary cycle (semi-diurnal), but this is almost indistinguishable and is reduced to very small ebbs and floods. The mean tides range from 0.8 feet to feet and the spring tidal ranges reach up to 1.3 feet. The tidal zone is clearly visible on the dolos and riprap during low tides.



Datum	Description	MLLW (Epoch 1983-2001) [m]
MHHW	Mean Higher-High Water	0.22
MSL	Mean Sea Level	0.11
MLLW	Mean Lower-Low Water	0.00

Tidal Datums at NOAA Station 97514101 at Limetree Bay Terminals

The surface currents throughout the Caribbean are driven by the North Equatorial Current which
runs through the islands west northwest and then joins the Gulf Stream. These
currents change very little from season to season with the currents originating more from the south during the summer months. Because of the shallowness of the Caribbean basin, it is less than 1000m, mainly surface water from the Atlantic flows through the islands. Currents off the south shore of St. Croix average around 0.7 knots. In the vicinity of the Limetree Bay Terminals the tidal current contributes approximately 0.25 knot to the average annual total current (A.H. Glenn Associates, 1973).

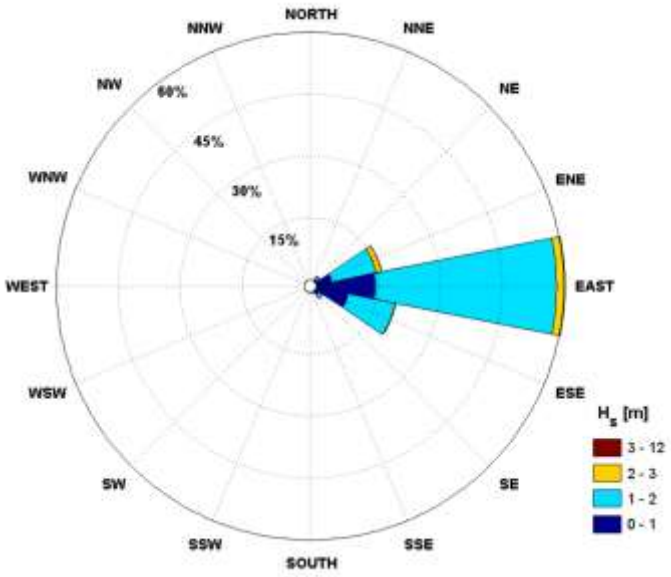
In general, the water flows parallel to the coast from east to west, following the trend of the bottom contours. Southeasterly winds, usually during the late summer, are known to induce

current reversals east of Canegarden Bay (east of the site).

The prevailing current is modified by physical barriers and dredged channels in the immediate vicinity of the Limetree Bay harbor. From east to west, the breakwater, main dock, west dike and
Ruth Island deflect the natural flow of water and induces eddies and changes in velocity. Amplification of the current velocity is particularly noticeable in the narrow passage between the
mainland and Ruth Island. Current speed and direction are also modified by the presence of dredge channels, which offer less resistance to water flow than the surrounding coral reefs and shoals Within the east turning basin currents are induced by the changing tides. Current measurements showed currents flowing out of the basin concurrently on both sides of the basin and conversations with Tug Captains for HOVENSA during their operation of the facility concurred that currents within the basins are tidal induced and there are no notable circular currents. The water flowing into the basin along the western jetty flows out along the eastern jetty.

6.05c Waves

The deep-water waves off St. Croix are primarily driven by the northeast trade winds, which blow most of the year. Waves average from 1 to 3 feet from the east, 42% of the time throughout the year. For 0.6% of the time, easterly waves reach 12 feet in height. The southeasterly swells, with waves one to twelve feet high, become 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. During the winter months, long length, long period, northern swells develop to a height of 1 to 5 feet. The roughest sea conditions prevail between June and August, and the second highest seas occur from December through February. September through November is the calmest period for waves. Waves between two and six feet in height are the most common, and almost all of the waves off the Limetree Bay Terminals approach from the east or southeast.



Wave rose at the OWI operational gauge.

6.05d Marine Water Quality

Due to the alterations that have occurred in Limetree Bay since the 1960's, and due to the continual ship traffic, water quality within the Limetree Bay has been impacted. Within the Limetree Bay area, there is extensive ship traffic with high-powered deep draft tugs assisting in the docking of large vessels at the Molasses Pier, the Container Port and the Limetree Facility. The Department of Planning and Natural Resources, Division of Environmental Protection conducted long term monitoring of the water quality at station #16. The long-term monitoring of station #16, from May 1992 through October 1997, showed turbidity readings ranging from 0.19 – 1.40 NTUs, with a mean turbidity for the five-year period being 0.79 NTU which is relatively good. The dissolved oxygen readings for the five-year period range from 4.89 mg/l – 8.30 mg/l, with a mean dissolved oxygen reading for the five-year period of 6.44 mg/l which is also a good value for healthy systems. The fecal coliform counts for station #16 were well below the allowable limits (70colonies/100ml) for the five-year period. In a 1984 study for the Virgin Islands Port Authority's Third Port Project, water quality within HOVENSA's East and West Turning Basins, the Container Port, and the Martin Marietta Channel (St. Croix Renaissance LLP) was compared. The report stated that the West Turning Basin had the highest turbidity and lowest dissolved oxygen, most probably due to the heavy ship traffic, and that water quality was better in the East Turning basin due to the lower incidence of ship traffic. However, the East Turning Basin has historically had more active docks than the West Basin, and has just as heavy, if not heavier, incidences of ship activity. The turbidity is also increased due to the presence of the tug dock and the movement of the tugs in and out of the harbor. During field visits to the Limetree Bay, water quality was noted to change markedly with the movement of ships and tugs within the channels, especially the larger vessels. The change in water quality was noted not only in channel but also within the adjacent shallows. Water clarity was also noted to improve seaward within the channels. Water quality measurements were taken during the months of January through June of 2017 at 3 stations offshore of the terminal in the vicinity of the proposed SPM. Turbidities were consistently lower to the east of the Limetree Channel, and lower offshore than the station to the west of the Limetree Channel.

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Date	Station 1		Station 2		Station 3	
Location	17° 41.181'N	64° 44.385'W	17° 41.099'N	64° 44.653'W	17° 40.241'N	64° 44.499'W
	Turbidity (NTU)	DO mg/l	Turbidity (NTU)	DO mg/l	Turbidity (NTU)	DO mg/l
1/22/2017	0.67	6.3mg/l	1.21	6.1mg/l	0.99	5.9mg/l
2/4/2017	0.81	6.1mg/l	1.32	6.2mg/l	0.81	6.3mg/l
3/23/2017	0.76	6.0mg/l	0.98	6.3mg/l	0.7	6.3mg/l
4/13/2017	1.21	5.9mg/l	2.11	5.4mg/l	1.01	6.2mg/l
5/21/2017	0.76	6.2mg/l	0.91	6.5mg/l	0.69	6.0mg/
6/13/2017	0.71	6.4mg/	0.87	6.6mg/	0.84	6.2mg/l

IMPACT OF PROPOSED PROJECT

No additional impacts are associated with the application because no significant disturbance work is proposed under the application nor will the work cause ship traffic to increase beyond historical levels. Specifically, the refinery restart work will place back into service a portion of the facility with potential daily production and throughputs well below production and throughputs in 2011 and prior years before the facility was idled for refinery operations. Generally, the ongoing activities at the facility include the transport of large quantities of hydrocarbons to and from vessels and as such there is a potential for spills. There are emergency cut offs throughout the pipeline system and hoses that can help limit the volume of spills. Limetree Bay Terminals has a detailed Spill Contingency Plan for the terminal which is being adapted to encompass the SPM. Limetree Bay Terminals conducted an exercise with the Coast Guard in August of 2017 to ensure that they can rapidly respond to a major spill and protect the sensitive environmental resources surrounding and downstream of Limetree Bay.

6.6 Marine Resources and Habitat Assessment

The Limetree Marine Terminal lies on the south shore of St. Croix within the South Shore Industrial Complex.

BACKGROUND

The south shore of St. Croix has been subject to two major periods of human disturbance. The introduction of intensive agriculture began during the early 18th century, the disturbance of the native flora and fauna was so severe that the biological communities present prior to 1700 cannot be specifically determined.

The second major period of disturbance was the conversion of the south shore to industrial uses. The period of industrialization began in the early 1960's, with the development of alumina operations. Construction of the refinery was undertaken in 1965 with the encouragement of incentives offered by the Virgin Islands Government through the Virgin Islands Industrial Act of 1963.

Prior to any development within the area the Krause Lagoon was an expansive estuary. Krause Lagoon Channel which lies to the west was blasted out of caliche (or limestone) in 1962 and 1963 by Harvey Aluminum. That channel is 7,000' long, 300' wide, and 36' deep and leads from Renaissance Parks Port facilities out into the Caribbean Sea.

Dredging of the Limetree Channel which lies to the east began in 1965, and the Cross Channel and the Container Port basin were dredged in 1971. The last major dredging in the area occurred in 1974.

The 1962 aerial shows the estuary prior to the intensive industrial development in the 60's and 70's. The photograph shows a shallow estuarine system with a fringing dense shoreline mangrove with dense seagrasses in the nearshore and reefs farther seaward.

Figure 6.01 The project area in 1962. The blue arrow shows the approximate location of the end of the eastern jetty.

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There have been changes since the mid 1970's when most of the significant marine alterations occurred but those have been limited to within the east and west basins of the refinery.
All of these activities since the 1960's have significantly impacted the natural environment, through the direct impacts of dredging, filling and blasting and through the indirect impacts of turbidity and sedimentation. Operations of the industrial activities, the alumina refinery, the oil refinery, and the heavy shipping also have impact on the resources through discharges into the marine environment, discharges into ground water which slowly seeps into the sea, and through groundings and the dropping of debris into the marine environment.

OVERVIEW OF EXISTING CONDITIONS

The Limetree facility has revetted jetties which are moderately colonized by coral and sponge species. The coral colonization on these jetties includes ESA listed corals including *Acropora palmata, Orbicella annularis, O. franksi* and *Dendrogyra cylindrus*. Limetree Channel extends seaward from the east basin at a depth of over 60ft. The channel is cut into limestone and steep slopes characterize the channel out to its seaward end. On the eastern side of the channel a shallow rock pavement extends from the end of the jetty seaward. The water is only 6 to 8' deep off the end of the eastern jetty. The pavement is sparsely colonized by hard and soft coral species at the end of the jetty, but the abundance of corals and sponges increases seaward. An *Acropora palmata* recruit which had not yet branched and a small *Acropora palmata* were both found on this eastern pavement. The skeletons of *Acropora* are common and scattered across the pavement. Several hundred feet off the end of the jetty a few *Orbicella* sp. become present. The algae Halimeda becomes more abundant on the pavement as you move offshore.

The channel edges vary in slope due to the substrate integrity and stability. The greatest coral and sponge colonization is in the upper several feet of the channel and the area closer to the seafloor is colonized primarily by algal species.

The channel bottom is composed of soft sediment and is basically uncolonized except by a few scattered hydroids. The western side of the channel has what was once a well-developed reef crest located about 2300' off the end of the western jetty. Between the cross channel and the reef crest there are scattered seagrass beds of *Thalassia testudinum* and *Syringodium filiforme*. Beyond the reef crest irregular rock pavement extends off shore with a scattered sand veneer. The hard bottom and the reef crest are minimally colonized with by scattered corals. There are a few areas of scattered seagrass, primarily *Syringodium filiforme*, with a few small patches of *Thalassia testudinum* on the sand veneer south of the reef. The seagrass beds are all slightly raised above the surrounding sand plains and algal beds.

On the southern plain between 50 and 150ft. there are expansive algal beds where *Halimeda* is the dominant algae and densely cover large areas. Between 50 and 150ft, the plain slopes gradually and there is intermittent sand and exposed pavement. The pavement is colonized by primarily sponges and soft corals. Very few hard corals were encountered. The slope become steeper at approximately 150' and it varies in angle with small intermittent rock ledges exposed between steep sand drops. The ledges are colonized by sponges, predominantly *Xestospongia*

muta, soft corals, branching sponges, hydroids and a very few hard corals. Black corals become present at 100’ and are one of the most abundant species at depth. This continues between 150’ and 600’ at which time the slope becomes less sever. Below 350’ only a few hydroids and black corals were noted.

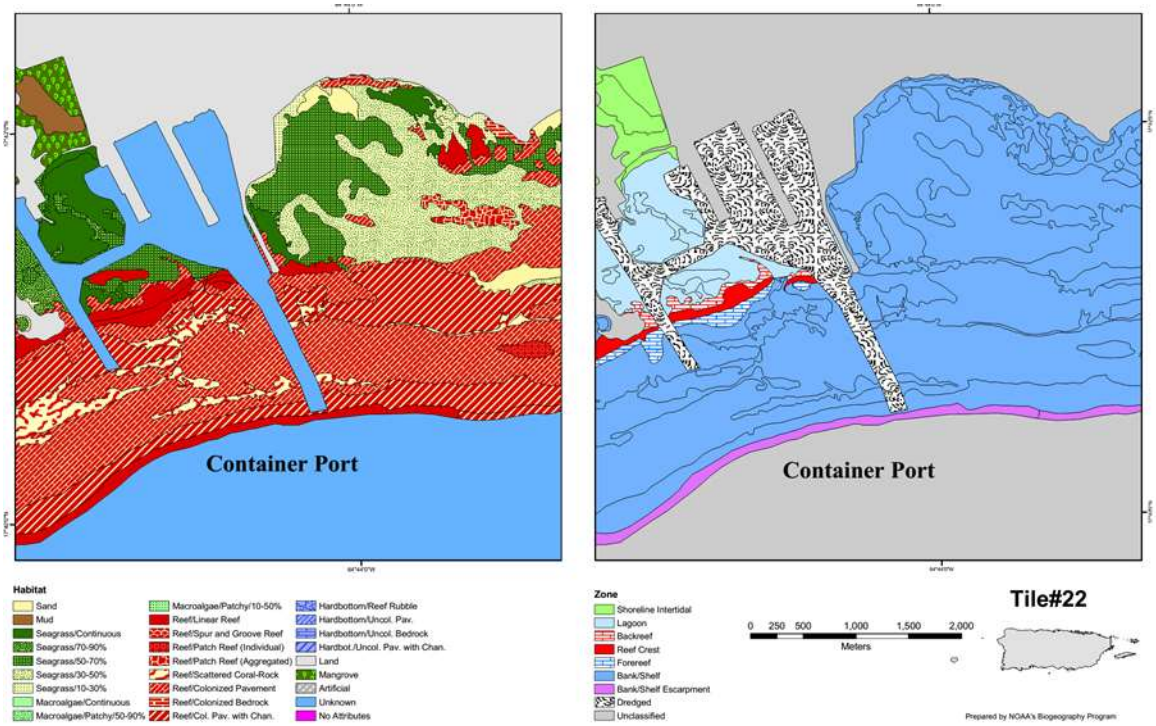

Figure 6.06.2 The NOAA NOS Benthic Habitat Map Tile 22 shows the area off shore of the terminal as a mixture of seagrass and reef with the channel show as blue and unknown.

Off the eastern jetty the NOS habitat map shows a linear reef to the east of the jetty and an expansive pavement and pavement with channels to the south. These features are accurately depicted and were confirmed during detailed benthic surveys. To the west of Limetree Channel and to the south of the Cross Channel the map depicts continuous seagrass beds. While seagrass beds are present, they are not as continuous as shown in the map. The map then shows linear reef along running between the two channels. This shallow reef crest is composed primarily of *Acropora* skeletons and has minimal colonization by live corals. The map then shows reef colonized pavement and reef colonized pavement with sand channels extending off shore to the drop, however on the western side of the channel past a depth of approximately 30’, expansive sand flats varying from colonization by algae and seagrass to expansive areas of uncolonized sand and sponge and soft coral colonized emergent pavement are present.

Detailed Habitat Descriptions

The eastern jetty is revetted by dolos or tetrapods. The dolos are about 10ft. in length and have two ends extending approximately 6ft. The “T” ends are perpendicular to each other. Despite being on the edge of a channel and harbor which periodically has elevated turbidity the dolos are

moderately colonized by both hard and soft coral species and sponges. The colonization is higher on the harbor side of the jetty than it is off the end of the jetty where it is impacted by the approaching waves. There is a narrow shelf on the side of the channel and some of the dolos have slipped onto that shelf. The following corals were noted in dolos in order of relative abundance; *Diploria strigosa, Palythoa caribbaeorum, Orbicella faveolata, Porites astreoides, Siderastrea siderea, Plexaura flexuosa, Acropora palmata, Diploria labyrinthiformis, Diploria clivosa, Desmapsamma anchorata,* and *Plexaurella grisea.*

There are scattered *Orbicella* (one of the ESA listed corals) on the dolos.

Some the dolos are more heavily colonized. These are on the inside of the jetty.

This large *Acropora* is located near the end of the jetty, the smaller is located on the inside of the

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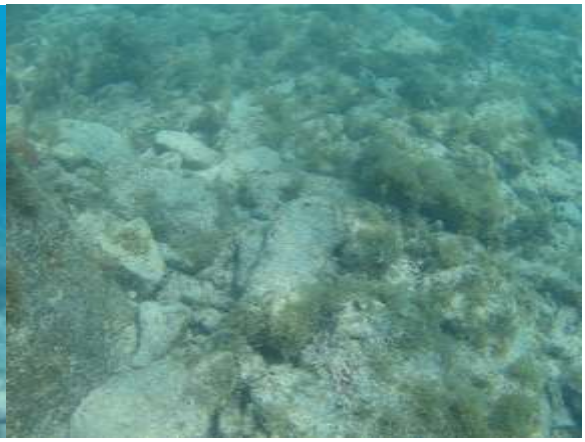
dolo stack is locate about 20’ to the north of the end of the jetty.

There are 5 *Acropora* within 100’. of the end of the jetty.



There is an accumulation of the cobble and loose rock at the base of the dolos inside the channel and this is primarily colonized by algal species as shown above.

The dolos of the end of the jetty have lower colonization due to the punishing wave action. Due to the almost continual breaking waves it was difficult to conduct a close survey of the end of the jetty. The end does not have the cobble build up as seen along the inside edge. There is a slight depression at the edge of the dolos and then the pavement rises slightly. The water depth varies from approximately 6 to 10’ at the end of the jetty. Coral colonization on the pavement begins about 15’ to 20’ off the end.

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The photograph below is the jetty off the very end. The dolos are lined up and the ends are straight up and down and lined up. The colonization is very limited, *Palythoa caribbaeorum*, is the most abundant colonizer adjacent to the end of the jetty and there are a few small patches on the dolos.

Dolos	Species	Relative Abundance	<1ft.	>1ft.
	Diploria strigosa	79	42	37
	Palythoa caribbaeorum	22	13	9
	Orbicella faveolata	19	7	12
	Porites astreiodes	18	16	2
	Siderastrea siderea	17	11	6
	Plexaura flexuosa	12		12
	Acropora palmata	5		5
	Diploria clivosa	5	3	2
	Diploria labyrinthiformis	4	3	1
	Desmapsamma anchorata	2	2	
	Plexaurella grisea	2		2
	Dictyota	5%		
	Halimeda	0.01%		

Table 6.05.1 Results of transects on Jetty

Eastern Pavement

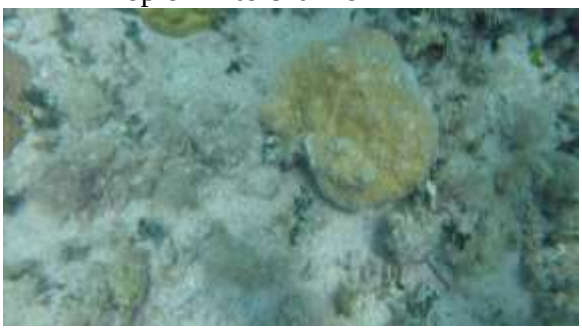
There is a limited diversity of organisms that have colonized the pavement and both the diversity and abundance increase seaward. The pavement has scattered depressions and irregularities and coral cobbles have accumulated in some of the depressions. The irregularity of the pavement increases offshore. The algal community is primarily composed of *Dictyota* and *Halimeda*. Dictyota being the most abundant with coverages of up to 40% on the pavement inshore and *Halimeda* representing 10-20% coverage. Offshore it becomes a more equally spilt with both species totally about 40% of the total bottom coverage. There are a few areas offshore where *Halimeda* represents as much as 75% of the total bottom coverage. Inshore *Diploria strigosa* and *Porites astreoides* are the most abundant colonizing corals with *D. strigosa* being far more abundant than any species encountered on the pavement. An *Acropora palmata* was found on the pavement which had not yet branched about 400' off the end of the jetty. And a small *Acropora* colony was encountered on the edge of the pavement near the top of the channel just to the west of the end of the jetty. There are a number of scattered soft corals species on the pavement and the diversity and abundance increase with distance off shore. There are few sponges on the eastern pavement. *Siderastrea siderea* abundance is highest along the top edge of the channel walls.

Pavement					Notes	
	Species	Relative Abundance	<1ft.	>1ft.		#/sq.ft.
	Dictyota	>50%				
	Halimeda	>10%	80%			
	Diploria strigosa	901	468	433		0.016322464
	Porities astreoides	508	458	50		0.009202899
	Siderastrea siderea	409	349	60	Increase off shore and towards channel	0.00740942
	Plexaura homomalla	242	4	238		0.004384058
	Plexaurella nutans	115	5	110	Increase off shore	0.002083333
	Diploria clivosa	77	9	68		0.001394928
	Pseudoplexaura sp.	65		65		0.001177536
	Callyspongia plicifera	48	48			0.000869565
	Plexaura flexuosa	47	8	67	Increase off shore	0.000851449
	Palythoa caribbaeorum	29	8	21		0.000525362
	Eunicea	25		25	Increase off shore	0.000452899
	Diploria labyrinthiformis	24	23	1		0.000434783
	Montastrea cavernosa	23	10	13		0.000416667
	Pterogorgia citrina	22	6	16		0.000398551
	Meandrina meandrites	18	12	6		0.000326087
	Desmapsamma anchorata	15	11	4		0.000271739
	Ircinia	14	10	4		0.000253623
	Dichocoenia stokesii	14	11	3		0.000253623
	Orbicella faveolata	11	1	10	5 within 2m channel edge	0.000199275
	Aplysina cauliformis	9		9		0.000163043
	Niphates erecta	9	4	5		0.000163043
	Calyx podatypa	9	9			0.000163043
	Gorgonia flabellum	8	2	6		0.000144928
	Stephanocoenia michilini	7		7		0.000126812
	Eusmilia fastigiata	5	4	1		9.05797E-05
	Porites porites	4	4			7.24638E-05
	Siderastra radians	3	3			5.43478E-05
	Favia fragum	3	3			5.43478E-05
	Agaricia fragilis	3	3			5.43478E-05
	Haliclona vansoesti	3	1	2		5.43478E-05
	Millepora complanata	2	6	7		3.62319E-05
	Chondrilla nucula	2	1	1		3.62319E-05
	Mycale laevis	2	2			3.62319E-05
	Ectyoplasia ferox	1	1			1.81159E-05
	Cliona caribbaea	1		1		1.81159E-05
	Muriceopsis	1	1			1.81159E-05
	Sabellastartle magnifica	1	1			1.81159E-05
	Amphimedon compressa	1		1		1.81159E-05
	Cassis flammea	1	1			1.81159E-05
	Xestospongia muta	1		1		1.81159E-05
	Acropora palmata	1		1		1.81159E-05
	Neofibularia nolitangere	1		1	0	1.81159E-05
	Ulva	0.50%				
	Galaxaura	0.01%				
						0.023115942

Table 6.05.2 Results of transects on eastern pavement and determination of abundance of species per sq.ft. Total colonization is approximately 0.023 corals per sq.ft.

Pavement

Drop off into channel



Some of the greatest densities of corals seen was at the channel edge. The Acropora which has not yet branched.

The highly irregular pavement with scattered coral colonization.

Channel Slope

The eastern channel wall varies from very steep edges to areas where the channel has slumped due to instability and integrity of the banks. The coraline structure of the substrate is clearly evident in the cut channel walls. Skeletons of branching *Acropora* can be seen buried in the channel walls and these provide niches for fish, eels and invertebrates to hide. Colonization on the channel slope is drastically different than the pavement. Colonization is extremely sparse and colonization by algae, *Dictyota* and *Halimeda*, ranges from 100% coverage in some areas to only 1% in others. Algal species are the most abundant colonizers followed by sponges, both encrusting and branching but these represent well less than 1% of the total bottom coverage. The greatest abundance of colonization by corals is near the upper edges of the channel wall. Dropping down the slope corals cover less than 1% of the channel walls. The abundance of colonizing sponge and coral species follows in order of abundance; *Aplysina cauliformis, Desmapsamma anchorata, Siderastrea siderea, Palythoa caribbaeorum, Niphates erecta,*

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Diploira strigosa, Orbicella faveolata, Madracis decactis, Porites astreoides, Chondrilla nucula, Meandrina meandrites, Plexaura flexuosa, Plexaurella nutans, Isophyllastrea rigida, Diploria labyrinthiformis. Agelas conifer, Epinephelus straitus, Callyspongia plicifera, Clonia sp.,Stichodactyla helianthus, Dichocoenia stokesii, Ircrina sp. and *Acropora palmata*.
The western channel slope has less coral colonization than the eastern slope. Again, algae is the dominant colonizer and sponges are far more abundant than coral species. The slopes of the channel wall are not as steep overall as along the eastern slope. The corals as on the eastern side of the channel are primarily found in the upper 5 meters. There are larger *Orbicella faveolata* on the westerns slope and all are within 3 meters of the top of the channel cut. While several *Acropora* recruits were noted on the western reef, none were found in the channel per se. On the western side of the channel the abundance of corals and sponges are as follows; *Aplysina cauliformis, Siderastrea siderea, Palythoa caribbaeorum, Diploira strigosa, Desmapsamma anchorata, Porites astreoides, Madracis decactis, Orbicella faveolata, Diploria labyrinthiformis, Meandrina meandrites, Callyspongia plicifera, Niphates erecta, Chondrilla nucula, Plexaura flexuosa, Plexaurella nutans, Clonia sp., Dichocoenia stokesii, Isophyllastrea rigida, Agelas conifer,* and Ircrina sp.

Several hawksbill turtles (*Eretmochelys imbricata*) were seen on both walls of the channel resting in crevices.

Drop into channel varies considerable from cut limestone to broken coral

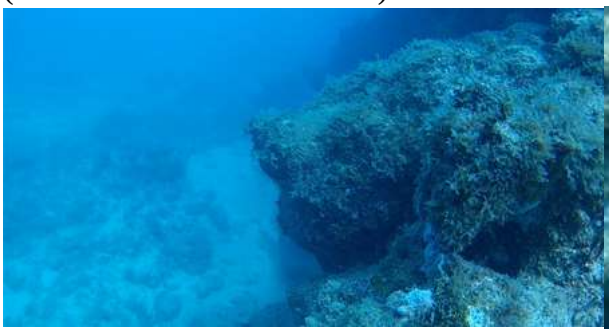
There is a notable accumulation of fine sediment on the walls of the channel.

Channel Sides			Size Range		
Easterm	Species	Relative Abundance	<1ft.	>1ft.	
	Southern Sting Ray	1		1	
	Lobster	1		1	
	sea cucumber	1		1	
	Dictyota	10%			
	Halimeda	5%	80%		
	Aplysina cauliformis	45	25	20	0.000878906
	Desmapsamma anchorata	35	27	8	0.000683594
	Siderastrea siderea	25	20	5	0.000488281
	Palythoa caribbaeorum	17	3	14	0.000332031
	Niphates erecta	13	11	2	0.000253906
	Diploira stirgosa	12	11	1	0.000234375
	Orbicella faveolata	7	1	6	0.000136719
	Madracis decactis	7		7	0.000136719
	Porites astreoides	7	6	1	0.000136719
	Chondrilla nucula	5	4	1	9.76563E-05
	Meandrina meandrites	5	4	1	9.76563E-05
	Plexaura flexuosa	4		4	0.000078125
	Plexaurella nutans	3	1	2	5.85938E-05
	Isophyllastrea rigida	3	3		5.85938E-05
	Diploria labyrinthformis	3	2	1	5.85938E-05
	Agelas conifera	2	2		3.90625E-05
	Epinephelus straitus	2	2		3.90625E-05
	Callyspongia plicifera	2	2		3.90625E-05
	Clonia	1	1		1.95313E-05
	Stichodactyla helianthus	1		1	1.95313E-05
	Dichocoenia stokesii	1		1	1.95313E-05
	Ircrina	1	1		1.95313E-05
	Acropora palmata	1		1	1.95313E-05
					0.003945313
Western	Aplysina cauliformis	23	13	10	0.000547619
	Siderastrea siderea	17	8	9	0.000404762
	Palythoa caribbaeorum	15	11	4	0.000357143
	Diploira stirgosa	14	7	7	0.000333333
	Desmapsamma anchorata	13	8	5	0.000309524
	Porites astreoides	13	13	0	0.000309524
	Madracis decactis	9	1	8	0.000214286
	Orbicella faveolata	8	1	7	0.000190476
	Diploria labyrinthformis	7	7	0	0.000166667
	Meandrina meandrites	6	4	2	0.000142857
	Callyspongia plicifera	4	2	2	9.52381E-05
	Niphates erecta	3	3	0	7.14286E-05
	Chondrilla nucula	3	3	0	7.14286E-05
	Plexaura flexuosa	3		3	7.14286E-05
	Plexaurella nutans	3	1	2	7.14286E-05
	Clonia	3	2	1	7.14286E-05
	Dichocoenia stokesii	3	3		7.14286E-05
	Isophyllastrea rigida	2	2		4.7619E-05
	Agelas conifera	1	1		2.38095E-05
	Epinephelus straitus	1	1		2.38095E-05
	Stichodactyla helianthus	1		1	2.38095E-05
	Ircrina	1	1		2.38095E-05
					0.003642857

Table 6.05.3 Results of transects on the channel walls. There are approximately 0.0039 corals per square foot on the eastern walls and 0.0036 corals per square foot on the eastern wall. On

both walls most the corals are within 5m of the top of the channel.


There is a buildup of fine sediments on a narrow rock ledge found near the bottom of the channel (note the lack of colonization).

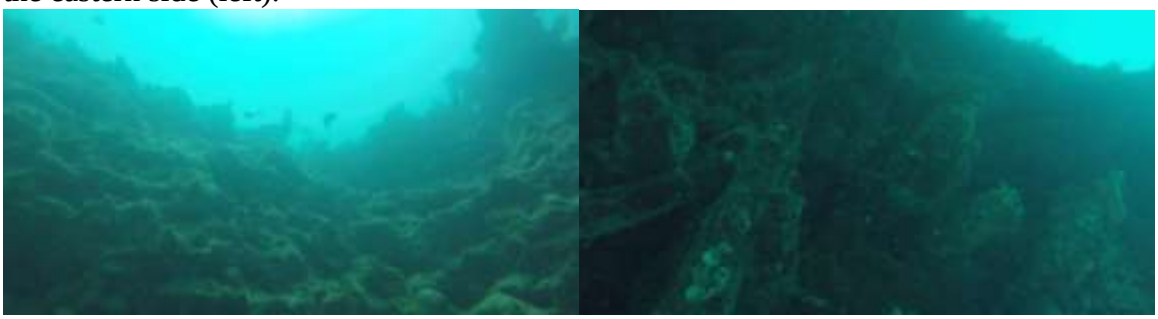



Algae and sponges are the primary colonization near the channel floor.


Near the top on both sides corals are more abundant.


Turtles were noted on most dives during the survey, and Hawksbills were found the be using the crevices on the channel sides to rest.

The *Orbicella* colonies on the western side of channel (right) tended to be larger than those on the eastern side (left).

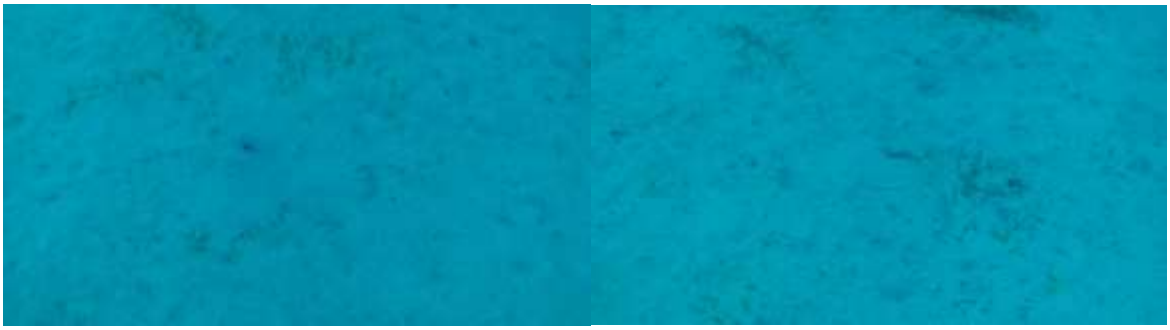


The coral structure is clearly visible in the cut slopes.

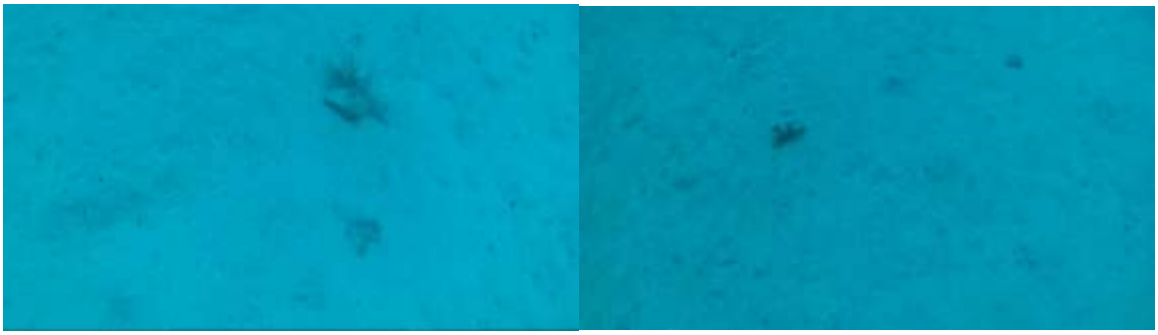
This *Acropora* is located near the end of the jetty on the edge of the channel.

The Channel Floor

The channel floor is composed of soft silty clay and sand. The bottom is easily disturbed and creates large plumes when disturbed. At the edge of the floor there are scattered boulders, rock and coral cobble which have tumbled down from the channel walls. There are invertebrate mounds across the floor of the channel, but they are not very abundant. Hydriods were present on rocks and conch shells. Seen were *Parazoanthus tunicans, Macrorhynchia robusta, Macrorhynchia philippia, Halopteris carinata, Dentithec dendritica, Pennaria disticha* and *Sertularella speciosa*. Two feather dusterworms, *Bispira variegate*, were found on a conch shell in the channel. A very small patch of *Halophila decipiens* was noted near the edge of the channel wall, it sparsely covered an area of about 5 sq. meters. This was at a depth of 60'. There is also an occasional *Halimeda*.



Halophila decipiens within the channel.



Conch shells are common in the channel and they provide habitat to hydroids and occasionally feather duster worms.

Westside of Channel

Reef/Algal and Sand Plain/Colonized Pavement

On the western side of the channel the reef crest is approximately 2300' off the western jetty. There are dense *Thalassia testudinum and Syringodium filiforme* beds to the south of the cross channel, north of the reef crest. These beds have slowly encroached into the channel over time. The beds also contain a lesser abundance of *Halodule beaudettei*. The reef crest is composed primarily of the skeletons of *Acropora palamata* and broken coral rubble, the area is heavily colonized by algae. *Dictyota* is the dominant colonizer. The reef is sparsely colonized by scattered hard coral species. Corals and sponges are found in the following abundance; *Siderastrea siderea, Diploria strigosa, Porities astreoides, Plexaurella nutans, Millepora complanata, Plexaura homomalla, Pseudoplexaura sp., Desmapsamma anchorata, Agaricia fragilis, Amphimedon compressa, Plexaura flexuosa, Diploria labyrinthiformis, Diploria clivosa, Eunicea spp., Callyspongia plicifera, Muriceopsis spp., Palythoa caribbaeorum, Meandrina meandrites, Orbicella faveolata, Aplysina cauliformis, Gorgonia flabellum, Siderastra radians, Favia fragum, Ircinia sp., Niphates erecta, Montastrea cavernosa, Dichocoenia stokesii, Porites, Pterogorgia citrina, Calyx podatypa, Stephanocoenia michilini, Haliclona vansoesti, Mycale laevis, Cliona caribbaea, Acropora palmata, Eusmilia fastigiata, Ectyoplasia ferox*, and *Chondrilla nucula*. While *Diploria strigosa* had been the most dominant on the eastern side of the channel *Siderastrea siderea* was more abundant on the western reef. The corals on the western reef were more patchily distributed and there were large areas with no coral or sponge colonization.

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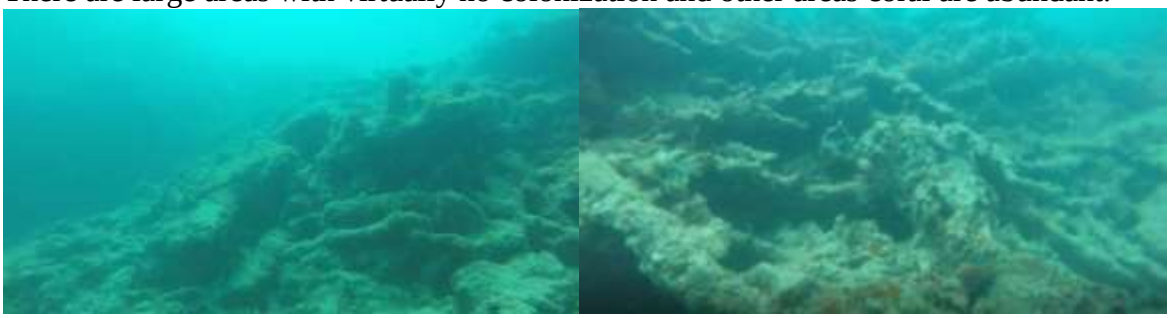
Seagrass beds composed of *Thalassia* and *Syringodium* lie to the south of the cross channel.

There are large areas with virtually no colonization and other areas coral are abundant.



Acropora palmata skeletons make up the vast majority of what remains of the linear reef structure.

On the western channel slopes corals are most abundant in the upper 5 meters and scattered *Orbicella* are present.

The old Acropora skeletons serve as substrate to corals recolonizing the area.

There are some large *Orbicella*s near the top of the wall north of the pipeline crossing.

The upper slope of the channel is less distinct on the western side of the channel beyond a depth of 50'.

To the south there is rock pavement out beyond the reef crest that has sparse coral colonization. Beyond the pavement, the area gives way to a sand veneer, which covers the pavement from a few inches to several feet deep. There are large areas of uncolonized sand and areas with sparse to dense seagrass and areas with large expansive algal beds. *Halimeda* is by far the most abundant algae followed by *Dictyota, Pennicillus, Laurencia, Hypnea Udotea*, and *Avrainvillea*. *Caulerpa* is found in scattered abundance. In the areas of extremely dense Halimeda opuntia, the bottom is composed of their fragments. There are occasional pieces of rock or dead coral which were encountered in the algal beds, where these were present there was a small blowout in the bed. Most are completely uncolonized, but sundial anemones were found on several and sundial anemones were found in "knocked" conch shells. Drift algae (*Acanthophora spicifera*, and *Dictyota*) is present in moderate abundance caught on the Halimeda and other algae and accumulating in depressions. Within the depressions and blowouts in the algal beds where rocks are found some of the rocks are colonized by coral species, rocks with *Porites astreoides* and *Agracia agaricities* were found. A triton snail (*Charonia tritonis*) and milk conch (*Strombus*

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costatus) were noted foraging within the algal beds. Around a depth of 50' there are scattered *Syringodium filiforme* beds which vary from very sparse beds to beds that are moderately dense. There is still an abundance of *Halimeda* in these beds. A large number of queen conch (*Strombus gigas*) were seen in this area.

There dense expansive *Halimeda* beds, some mixed with sparse *Syringodium* and others mixed with other macro algal species.

The dense *Halimeda* beds are having a stabilizing effect on the bottom and are often raised 3-6" above the surrounding seafloor.

Patches of Caulerpa and Thalassia are found scattered across the plain.

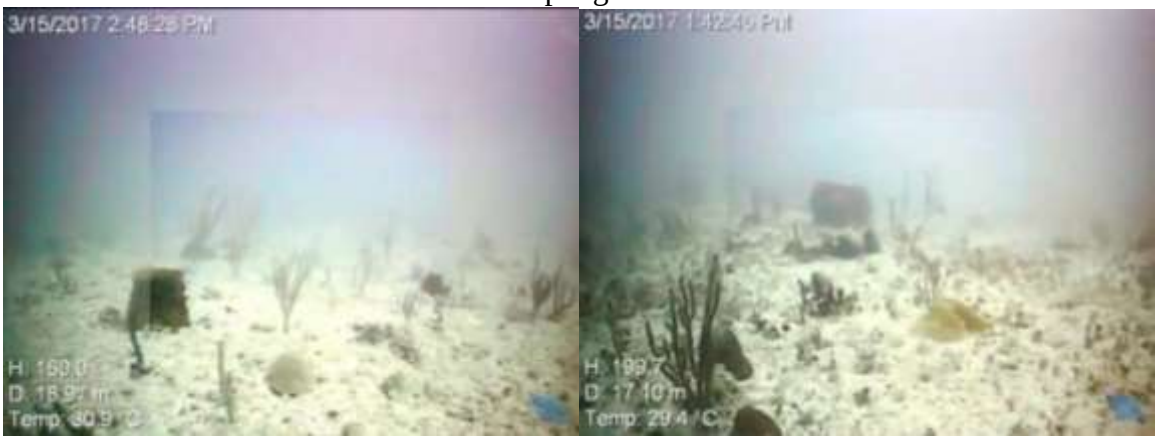
The denser *Syringodium filiforme* beds are slightly elevated above the surround seafloor.

As depth increases overall colonize decreases.

Between 50’ and 150’ the seafloor gradually slopes and shifts between emergent pavement to expansive sand flats with varying degrees of algal colonization. *Xestospongia muta* is the most common colonizer of the emergent pavement and was found on all patches of emergent pavement. Sponges and soft corals are the most abundant colonizer of the emergent pavement seen were *Xestospongia muta, Aplysina cauliformis, Plexaurella nutans, Cinachyrella alloclada.,Eunicea spp., Ircinia felix, Pseudoplexaura spp., Neofibularia nolitangere, Callyspongia plicifera, Amphemedon compressa, ,Pseudopterogorgia bipinnata, Ircinia strobilina, Oceanapia bartschi*, and *Plakortis angulospiculatus*.

Xestospongia muta on emergent rocks within the sand plain at 12.21 meters (40').

The pavement is evident beneath the sand veneer due to the colonization of soft corals and sponges.



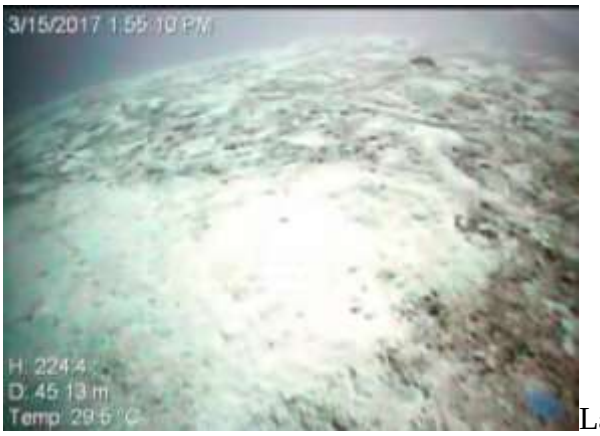
There is a large area of emergent pavement at 56' with scattered sponges and soft corals. Very few corals are found within this area as shown above.

The abundance of species varied between emergent patches of pavement but hard corals were extremely sparse and only a very few were noted on the emergent pavement. Hard corals noted on the emergent pavement included *Siderastrea siderea, Diploria strigosa, Solesnastrea bournoni*, and *Madracis decacti.*

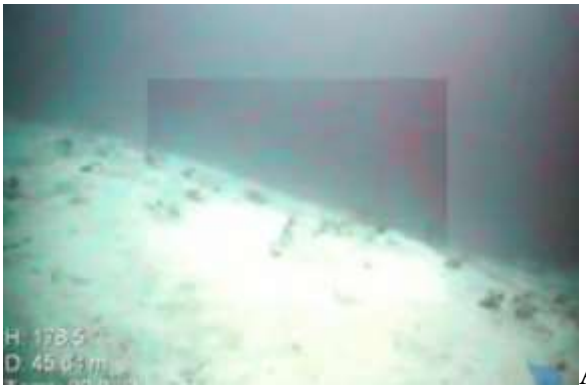
At 150’ the slope increases significantly; the slope is inconsistent and there are long steep sand slopes and emergent rock where the slope increases. The areas of emergent rock are colonized by *Xestospongia muta*, and black coral, *Cirrhipathes leutkeni*, rope sponges, *Amphimedon compressa, Callyspongia vaginalis, Oceanapia bartschi, Agelas conifer, Aiolochroia crassa*, *Ellisella barbadensis* and *Neofibularia nolitangere.* There is an occasional black coral on the sand slope, but in most areas the sand is uncolonized. At a depth of 350’ the amount of colonization on the occasional emergent pavement lessens. At 460’ the last of the black corals was seen and below 500’ only an occasional hydroid was noted. Scattered emergent rock was noted between 600’ to 650’ but it was heavily sediment coated and uncolonized.

The one thing in common noted on the entire slope below 150’ was the amount of sediment on the emergent rock and sponges.

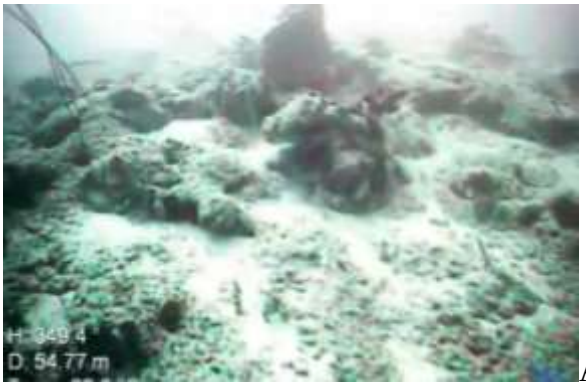
At 128’an occasional rock was found exposed, sponges were the primary colonizing species.



Large area of open sand at 148’ just before the start of the steeper slope.



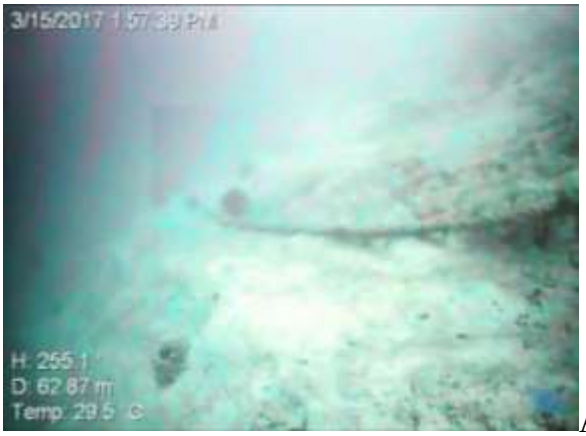
A rolling drop at about 150’ shows underlying hardbottom as evidenced by the scattered sponges.



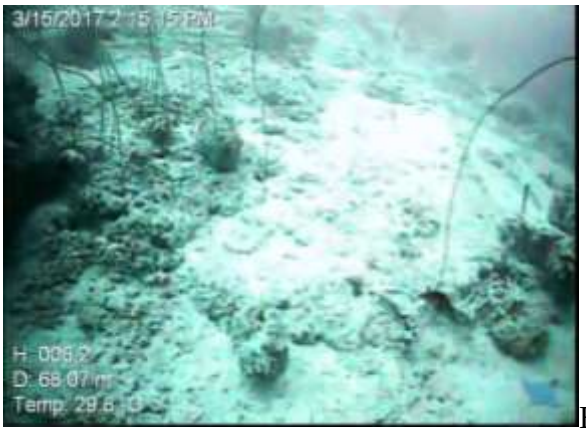
A very rocky exposure along a section at 175’. This is primarily colonized by sponges and black corals.

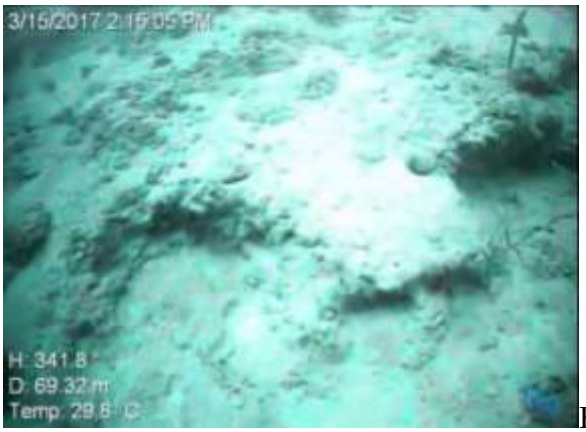


An emergent area of pavement at 182’ and 195’ are both colonized by sponge species.


A rope was encountered on the steep slope at 206’

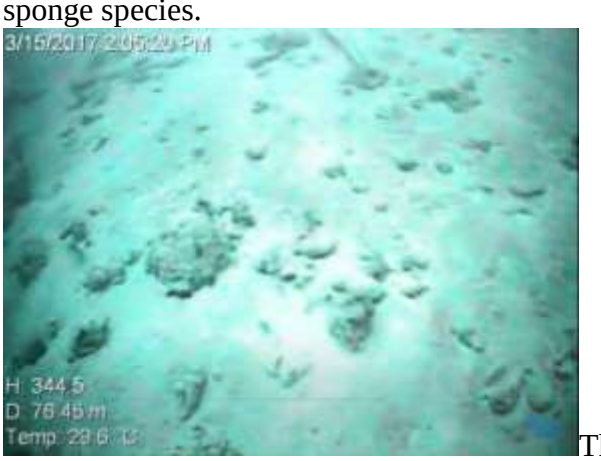
Xestospongia were the primary colonizer on some areas of expose hardbottom


Black corals were abundant in some areas of exposed pavement



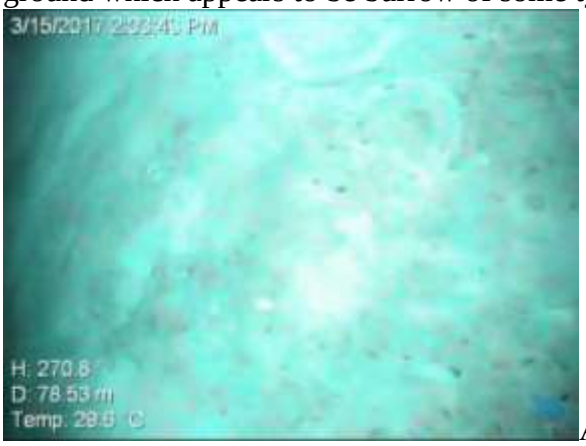
But in other areas only a few hydroids and sponges are present.

At 232’ a rope acts as substrate to a variety of sponge species.

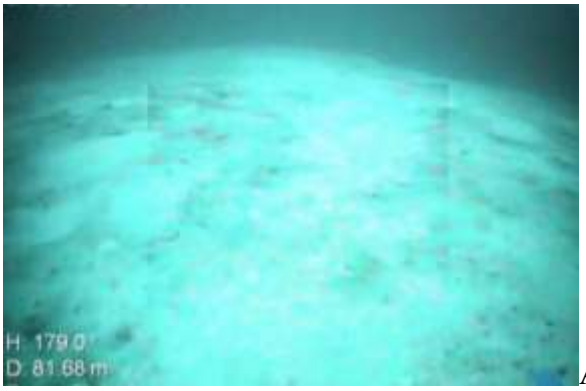


The slope is variable and on one transect run a large area of coral rubble and rock was found on the slope.

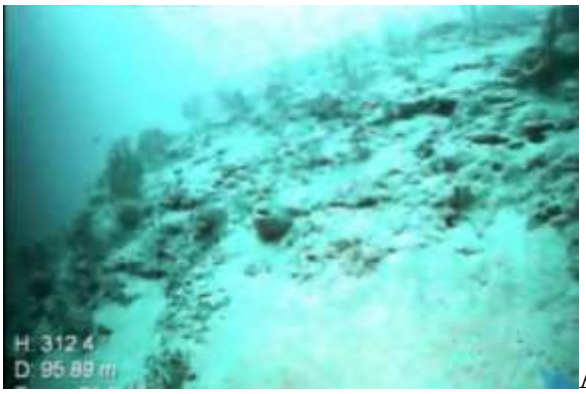
Sponges and black corals were found on most pieces of hard bottom on the slope between 150-350'. A coral rubble mound is seen in the back ground which appears to be burrow of some type.



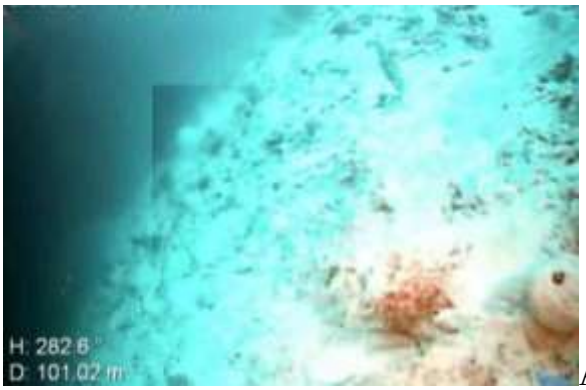
At 257' the seafloor is a very soft sediment, impressions from the ROV cable are evident.



Approaching 250' a large uncolonized sand slope with a steeper drop is present ahead.

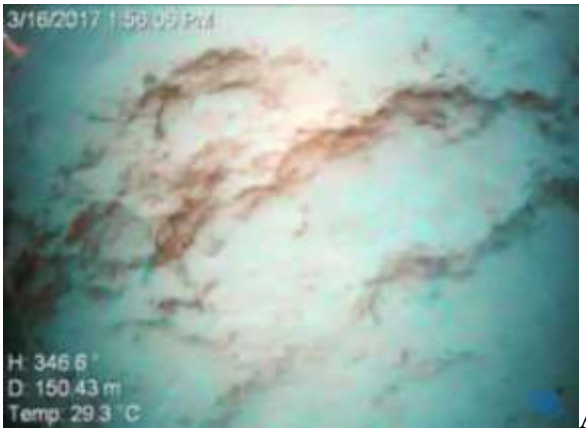


A steep drop at 300', the emergent rock is colonized by sponges, soft corals and black corals.



A very steep drop at just over 320', again sponges are the primary colonizer.

At 473' there are rolling mounds of sand.



At 493’ there was an area of exposed sediment cover pavement.

At 511’ an occasional black coral was encountered.


At 582’ the seafloor is uncolonized and no colonization was found at this depth on any of the transects.

At 611’ a buried tire was found, no colonization was noted at this depth on any of the transects.

At 670’ several black corals were seen.

An occasional empty conch shell as found at 670’.

The ROV videos transects were analyze and observations of all the transect lines at relative to depth area presented below.

Depth (m)	Substrate	Comment	Object	Ft	Species
9.68		5% algal colonization		31.76008	Virgularia spp.,Ellisella barbadensis,Cirrhipathes leutkeni
10.62		some exposed rock		34.84422	sponges, Xestospongia muta, Amphimedon compressa
11.79		sand plain, level		38.68299	Xestospongia, rope sponges
12.15		Halimeda		39.86415	Plexaurella spp, Cirrhipathes leutkeni
12.35		15% exposed rock/open sand		40.52035	Xestospongia muta
13.16				43.17796	Halimeda caulerpa prolifera,
15.3		sand plain		50.1993	Syrindodium, Halimeda algae
15.4		pavement sand veneer		50.5274	Siderastrea sidera
15.66		sand plain		51.38046	Halimeda, conch
15.7		sand plain		51.5117	sparse Syringodium, Halimeda, algae
15.75		sand		51.67575	moderate Syringodium, Halimedia algae, queen conch
15.75		sand veneer over pavement		51.67575	Xestospongia muta,Pseudopterogorgia bipinnata, Psedoplexaura spp., Amphemedon compressa
15.8		sand plain, level scattered rocks		51.8398	Halimdea, sponges/algae on rocks
15.98		pavement with sand veneer		52.43038	Siderastrea sidera, Xestospongia
16.08		sand plain		52.75848	Halimedia
16.13		sand plain		52.92253	sparse Syringodium, Halimeda, algae
16.14		sand plain, level		52.95534	Halimeda , widely scattered Xestospongias
16.15		pavemet under sand veneer		52.98815	Xestospongia, Plexaurella, Plexaurella homomalla, Pterogorgia
16.17		sand plain		53.05377	queen conch
16.18		sand plain/10% rock	coral rubble	53.08658	Xestospongia, Halimeda
16.23		sand, emerging pavement		53.25063	Xestospongia, Plexaurella natans,Plexaurella,Eunicea spp.,Aplysina cauliformis,Amphimedon compressa
16.25		pavement		53.31625	Pseudopterogorgia spp, Diploria strigosa, Cirrhipathes leutkeni
16.39		sand plain, level		53.77559	Xestospongia, halimeda, Cirrhipathes leutkeni
16.39		pavement, sand veneer		53.77559	Pseudopterogorgia, Millepora
16.47		sand plain		54.03807	Syringodium filiforme, Penicillus, Halimeda
16.54		sand plain, level scattered rocks		54.26774	Halimeda, Xestospongia
16.6		sand veneer over pavement		54.4646	Xestospongia muta, Eunicea spp.,Plexaurella spp.
16.88		pavement sand veneer		55.38328	Xestospongia, Diploria strigosa, Porites astreoides, Plexaurella flexuosa, Plexaurella spp.,Ircinia strobilina
16.91		pavement		55.48171	Xestospongia, Diploria strigosa, Porites astreoides, Plexaurella flexuosa, Plexaurella spp.,Ircinia strobilina
17.01		pavement		55.80981	Xestospongia, Amphimedon compressa, Plexaurella natans
17.1		pavement		56.1051	Diploria strigosa <2
17.98		pavement		58.99238	Meandrina meandrites,Amphimedon compressa, Plexaurella natans
18.06		pavement		59.25486	Meandrina meandrites,Amphimedon compressa, Plexaurella natans
18.97		sand veneer over pavement		62.24057	Xestospongia, 1 Diploria strigosa, Amphimedon compressa, Plexarella sp.
18.91		Xestosoongia		62.04371	Pavement with sand veneer some scattered Xestos, soft corals, hydroids, scattered rocks/conch shells, realatively level
20.03		soft bottom	conch shells	65.71843	uncolonized
20.45		sand/silt veneer		67.09645	colonization drops significantly
20.53		emergent rock at break		67.35893	Xestospongia muta, Amphimedon compressa, Plexaurella natans
20.69		rock pavmenet		67.88389	Solesnastrea bournoni, Plexaurella spp.,Pseudopterogorgia spp,. Amphimedon compressa
20.73		To west of route, rock at break		68.01513	Orbicella faveolata, Pseudopterogorgia spp Porties astreoides, Plexaurella flexuosa, Plexaurella natans
20.8		Emergent rock pavement		68.2448	Xestospongia, Plexaurella natans,Plexaurella,Eunicea spp.,Aplysina cauliformis,Amphimedon compressa
21.16		sand		69.42596	Amphimedon compressa, Plexaurella, Psedoplexaura spp
21.33		uncolonized silty sand		69.98373	

Depth (m)	Substrate	Comment	Object	Ft	Species
21.46		uncolonized silty sand		70.41026	
22.13		emergent rock		72.60853	Pseudopterogorgia spp., Xestospongia muta, Plexaurella, Amphimedon compressa, Verongula, Oceanapia bartschi,
22.26		small emergent rock area		73.03506	Amphimedon compressa, Xestospongia muta, Plexaurella natans, Neofibularia nolitangere
22.61		Xestosoongia		74.18341	10% to 15%
22.61		Soft Corals		74.18341	
22.61		Rope sponges		74.18341	Oceanapia bartschi, Cinachyrella alloclada, Amphimedon compressa,Aplysina cauliformis. Aplysina fulva
23.33		cobbly area		76.54573	Xestospongia muta, amphimedon cmpressa
23.6		reef ends		77.4316	Xestospongia muta, Amphimedon compressa, Plexaurella natans, Ircinia strobilina, Plexaurella spp. Pseudopterogorgia spp.
23.62		soft sediment with scattered coral rubble.		77.49722	
24.47		coral rubble		80.28607	Xestospongia Amphimedon compressa
24.87		cobbly area ends		81.59847	
25.74		pavement	rope	84.45294	Xestospongia muta, Amphimedon compressa
25.92		sand scattered cobble		85.04352	rare sponge (Amphimedon compressa)
27.24		sand plain, with scattered small coral rubble, occasional sponge		89.37444	Amphimedon compressa, Xestospongia muta
28.28		soft sediment with scattered coral rubble.		92.78668	Amphimedon compressa 1%
29.95		sand scattered cobble		98.26595	Xestospongia muta
30.68		soft sediment with scattered coral rubble.		100.66108	coral rubble mound for tile fish
31.51		soft sediment with scattered coral rubble.		103.38431	Amphimedon compressa 1%
32.46		rubble lessens, occassional sponge		106.50126	Amplimedon compressa, Xestospongia muta, Oceanapia bartschi, Cinachyrella alloclada, Amphimedon compressa,Aplysina cauliformis. Aplysina fulva
32.49		soft sediment with scattered coral rubble.		106.59969	Xestospongia compressa, Amphimedon compressa
32.76		Xestosoongia		107.48556	
32.76		Soft Corals		107.48556	
32.76		Rope sponges		107.48556	
32.76		Siderastrea		107.48556	
32.84		rubble mound		107.74804	Xestospongia muta, Amphemedon compressa,
33.34				109.38854	Amplimedon compressa, Callispongia pacificera
33.4		patch reef to west		109.5854	Amplimedon compressa, Xestospongia muta. Orange ball sponge, Madracis decactis, Callispongia pacificera, Antipathes pennacea, Antipathes atlantica
33.72				110.63532	colonization lessens but still present 1 %
33.9		rubble mound		111.2259	Amphemedon compressa,Porites porites Xestospongia , Ircinia felix, Plakortis angulospiculatus, Oceanapia bartschi
34.89		sand, scattered rubble		114.47409	amphimedon compressa
35.2		Xestosoongia		115.4912	
35.2			Doctor fish	115.4912	
35.21		sand, scattered rubble		115.52401	Xestospongia muta
35.24		sand, scattered rubble		115.62244	scattered Xestospongia muta
35.4				116.1474	colonization drops furtern
35.67		sand		117.03327	Xestospongia muta, Amphimedon compressa scattered
36		sand		118.116	Amphimedon compressa
36.54	sand	widely scattered		119.88774	Xestospongia muta, Amphimedon compressa
39.24	lumpy sand	scattered conch shells, broken sponges		128.74644	
39.6	sand	uncolonized		129.9276	
40.78				133.79918	orange ball, rough tube sponge
40.9	sand	uncolonized	tire	134.1929	
41.39		Xestosoongia	on boulder	135.80059	
41.48	sand	sponges		136.09588	Amphimedon compressa, Xestospongia muta

Depth (m)	Substrate	Comment	Object	Ft	Species
41.52	sand	uncolonized		136.22712	
42.66				139.96746	colonization less than 0.1%
42.79		sponges	rubble	140.39399	orange ball, rough tube sponge
43.59		Rope sponges		143.01879	
44.41	sand	very minimal colonization		145.70921	Amphimedon compressa
44.42				145.74202	first black sea rod
44.52	sand	minimal		146.07012	Amphimedon compressa
44.97	soft sand	no colonization		147.54657	loose sponges, conch shell
45.15	soft sand	no colonization		148.13715	
45.27				148.53087	slope break very steep between 150 and 260
45.51	sand	scattered cobble, sponges		149.31831	Xestospongia muta, Amphimedon compressa
46.63	sand	minimal colonization		152.99303	Xestospongia muta, Amphimedon compressa
48.19				158.11139	Callyspongia vaginalis
48.29	top of ridge	goes to sand colonization drops		158.43949	Xestospongia muta, Amphimedon compressa
57.47	sand	scattered sponges	rope	188.55907	
59.51	sand, rock on ridge	moderate colonization		195.25231	Xextospoingia muta, Agelas conifera
61.65	sand	moderate colonization	ropes	202.27365	Xestospongia muta, amphimedon compressa
62.68	sand, rock on ridge	moderate colonization		205.65308	Agelas conifera
62.69	sand, rock on ridge	spares	ropes	205.68589	Cirrhipathes leutkeni, Xestospongia muta, Aiolochroia crassa
63.42	sand, rock on ridge	drop is steep from 150',ropes		208.08102	Xestospongia muta, the torny vase sponge, Amphimedon compressa
63.57	sand levels out	few sponges on open sand	ropes	208.57317	Xestospongia muta, blackcoral rod, and curly ones
67.14	slope	scattered basket rope sponges,black coral sparse		220.28634	Xestospongia muta, Ellisella barbadensis, amphimedon compressa, Cirrhipathes leutkeni
68.7	sand slope	uncolonized silty sand		225.4047	
70.76	slope	colonization on rope	ropes	232.16356	Xestps[pmgoa muta, Amphimedon compressa, Neofibularia nolitangere
70.92	steep sand slope	rubble		232.68852	Cirrhipathes teutkeni
71.09	sand slope	Rope continues down, colonized by sponges		233.24629	Xestospongia muta, Ircinia, Amphimdaon compressa, Callyspongia spp.
73.22	steep sand slope	rope ends by Xestospongia		240.23482	number of Xestospongia muta on steep slope.Amphimedon compressa
74.14	moderate sand slope		ropes	243.25334	
75	steep sand slope	uncolonized silty sand		246.075	
75.55	steep sand slope			247.87955	black coral rods, Xestospongia
76.46	scattered cobble/debris			250.86526	conch shells, loose sponges, Xestospongia muta, Cirrhipathes leutkeni
77.2	steep sand slope	partially buried ropes	ropes	253.2932	
77.39	steep sand slope			253.91659	Xestospongia muta - may be loose
77.49		no colonization		254.24469	
77.98	steep sand slope	no colonization		255.85238	broken sponge pieces
78.53	steep sand slope	no colonization		257.65693	invertebrate burrows
78.93	steep sand slope	no colonization		258.96933	
80.14	steep sand slope	minimal colonization		262.93934	Cirrhipathes leutkeni
81.09		no colonization		266.05629	
87.37		hydroids		286.66097	slope break, colonization on upper lip
87.37		black corals		286.66097	xestospongia, rope corals
87.37		sponges		286.66097	
88.4			Barracuda	290.0404	
90.16				295.81496	into sand, rock buries, no colonization
91.89		hydroids		301.49109	
95.89		sponge/hydroids		314.61509	top of drop
102.25		sponges/hydroids		335.48225	
102.38		sponges/hydroids		335.90878	
105.38		sponges		345.75178	
107.17			colonization increases	351.62477	
110.03			no change	361.00843	
112.2				368.1282	colonization lessens but still present
114.08		???		374.29648	
117.05	rock face eroded coral stone	hydroids	conch shell	384.04105	realitively steep
128.02	rock face eroded coral stone	Hydroids	conch shell	420.03362	realitively steep
128.07			nothing	420.19767	
130.84		black corals		429.28604	levels out, moderately colonized, has to be underlying pavement
130.84		sponges		429.28604	

Depth (m)	Substrate	Comment	Object	Ft	Species
130.84		hydroids		429.28604	
134				439.654	
141.73	Exposed Eroded Coral Rock			465.01613	Seawhips, hydroids, no fish below around 550', limited exposed eroded sand(coral)rock, rolling dunes down slope indications of buried rock
144.56	Ripples of Sand down slope			474.30136	
151.28				496.34968	
155.94		Black Coral		511.63914	
157.02	slope apparently with underlain rock, stepping down	Hydroids		515.18262	
175.92	Rolling sand slope			577.19352	
182.7			conch shell	599.4387	
182.95	exposed rock/sand veneer			600.25895	
189.09		Hydroids		620.40429	
191.74			Buried Tire	629.09894	
202.84				665.51804	
203.52		????		667.74912	
203.82				668.73342	
203.87		Hydroids		668.89747	
204.31		Hydroids	Buried Tire	670.34111	

No changes are proposed that will impact the offshore marine environment. Refining operations and ship traffic are expected to be lower than historical averages prior to 2011.

6.7 Terrestrial Resources

The terrestrial portion of the facility includes uplands and areas of fill with varying topography. All of the land has been disturbed or altered previously in connection with development and operation of the facility.

The property includes over 1000 acres of highly altered land most of it asphalt or concrete pavement. A portion of the land is filled, and all of the land has been graded. There are areas where some opportunistic growth of weedy species has occurred in areas of open soil.

Multiple unvegetated jetties composed of fill material are used by shorebirds for nesting, including the Least Tern (*Sternula antillarum*). The Least Terns primarily nest during the summer months. Limetree staff monitors avian activity at the facility.

The environmental personnel mark the nest to protect the eggs and chicks.

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LEAST TERN ACTIVITY 2016

	May		27-May					June 10, 2016						June 24, 2016							July 8, 2016							July 22, 2016						
Location	Nests	Adults	Nests: 2 egg	Nests: 1 egg	Nests: 0 egg*	Active Nests	Adults	Nests: 2 egg	Nests: 1 egg	Nests: 0 egg*	Active Nests	Adults	Chicks	Nests: 2 egg	Nests: 1 egg	Nests: 0 egg*	Active Nests	Adults	Chicks	Juvenile	Nests: 2 egg	Nests: 1 egg	Nests: 0 egg*	Active Nests	Adults	Chicks	Juvenile	Nests: 2 egg	Nests: 1 egg	Nests: 0 egg*	Active Nests	Adults	Chicks	Juvenile
Tk 7921		35										5						0	0						0									
# 3 Lagoon		1										0						0	0						0									
# 1 Lagoon		2										0						0	0						2									
#2 Lagoon												0						0	0						1									
Landfarm ii	2	25	10 brooding			10	11	5	3	1	9	22	3	5	4	3	9	15	1 (2)															
Landfarm iii		4										0																						
East Spheres																									0									
GBU/Fire Training			8 brooding			8	≥8	1			10	15	3			1	3	5	2	1					0									
TF 4 (Tk 6801-3)																									0									
Tk 7506	3	7	1 brooding		3	1	≥1	0	0	0	0	0	0												0									
Tk 7505								0	0	0	0	0	0				0	0							0									
Tk 7503-04																	0	0							0									
Tk 7502-1	8	18	4 brooding			4	≥4	0	0	5	0	0	0				0	0							0									
Tk 7430	15	26	1	0	10	1	≥4	0	0	0	0	1	0				0	5							0									
Tk 7429	4	11	6	1	1	7	12			5	2	4	1				0	0							0									
Tk 7428	2	7	4	3	0	7	16			7	3	6	0				6	11	5	1					0									
Tk 7427	6	28	13	3	10	16	22			17	2	4	0				0	0							0									
Tk 7601																									0									
Area S of TF 60			1	3		4	12	2	2	2	4	11	0	2	1		3	5	2						1	2								
TF 60	1		2			2	2	0	0	2	0	0	0				0	0							0									
East Jetty																																		
Main Outfall	5	12	4	1	4	5	11	0	4	3	4	8	1			1	0	0							0									
Docks	8	82	46	12	1	58	88	11	13	53	24	130	10	9	9	19	18	114	2	3	1	2		2	115	3	4							
Cottage Field											10	14	3				3	6	?															
Main ditch	2	3																																
not nr nest sites												12						1																
Totals	56	261			29	123	>191	13	19	94	49	190	15	16	14	24	42	162	12 (13)	5					119	5	4							

* previously marked nest w/0 eggs

6.07.1 Least Tern Activity within the facility in 2016

	5/13/2016	5/27/2016	6/10/2016	6/24/2016
American Kestrel			1	
Antillean Nighthawk		1, 1 nest, 1 egg	0	
Bananaquit				
Black-faced Grassquit				
Black-necked Stilt	7, 1 nest	8, 4 nests	26 ad, 7 juv, 6 nest	7 ad, 9 juv, 0 nest
Brown Booby	1			
Brown Pelican	2	2	2	2
Caribbean Coot	1			
Caribbean Martin	13	≥9	≥10	11
Columbid, sp.				20 (fly-by)
Common Gallinule	2		3	3
Gray King Bird	7, 1 nest	2	3	4
Great Egret	1		2	
Green Heron	1		3	1
Common Ground-Dove	7		7	13
Killdeer	9	2	5	9 ad, 1 juv ≥4/5
Little Blue Heron				2 ad
Laughing Gull		1		
Magnificent Frigatebird	1			
Northern Mockingbird	3			1
Osprey				
Red-tailed Hawk				
Royal Tern		1		
Sandpiper Species				
Lesser Yellowlegs				
Greater Yellowlegs				1
Semipalmated Plover				
Snowy Egret	2			
Sparrow (House)			1	2
White-cheeked Pintail	4	3	7	21
White-crowned Pigeon		2	24 (fly-by)	26 (fly-by, E)
White-winged Dove		22		12
Wilson's Plover				
Zenaida Dove	8	2	10	11

Figure 6.07.2 Bird Activity within the facility in 2016.

No changes to existing conditions are proposed.

6.8 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." (U.S. Army Corps of Engineers, 1986).

There are no terrestrial wetlands within the facility. Although the Soil Survey Map indicates that the old dredge soil holding pond is Aquents, 0 to 2 percent slopes, ponded, this area is isolated by berms and is at an elevation such that soil hydrology is not present.

6.9 Rare and Endangered Species

Four rare or endangered sea turtle species: hawksbill turtles (*Eretmochelys imbricata*), green turtles (*Chelonia mydas*), loggerhead turtle (*Caretta caretta*) and leatherback turtles (*Ermochelys coriacea*), occur in the offshore area. Green turtles, hawksbills and a loggerhead turtle were seen during the site surveys. Two hawksbills were resting along the channel sides. There is a small sandy beach to the eastern side of the jetty and the Limetree personnel have recorded as many as 14 turtle nests in this area at one time including nests which were laid by leatherbacks.

ESA coral species, *Acropora palmata, Orbicella annularis* and *O. faveolata* are found in the immediate facility area and all are abundant on the riprap around the jetties.

The Nassau Grouper, *Epinephelus striatus,* recently listed by ESA was also seen along the channel walls.

The Interior subspecies of Least Terns (*Sternula antillarum athalassos*) are ESA listed endangered species and are on the Virgin Islands species of Special Concern and is considered locally endangered. It is considered a Species of Concern requiring research, monitoring, and/or restorative efforts for populations and/or habitats to maintain population levels to ensure long-term sustainability. *Sternula antillarum,* which is the Least Tern subspecies native to the Virgin Islands is not endangered or threatened but is difficult to distinguish from the Interior subspecies. It has not been determined if the species within the facility are *Sternula antillarum athalassos* or *Sternula antillarum.*

All of these species currently co-exist with the operation of the facility.

6.10 Air Quality

6.10.01 General

Air quality on St. Croix is among the best in the nation and meets all air quality standards. EPA sets National Ambient Air Quality Standards (NAAQS) for the six criteria pollutants: Particulates, Sulfur Dioxide, Nitrogen Oxide, Ozone, Carbon Monoxide, and Lead. EPA does extensive research regarding the health effects of these pollutants and sets the primary NAAQS at a level to provide an ample margin of safety to protect the public health, including the most sensitive individuals. EPA then researches the effects on public welfare and sets a secondary standard to protect the public welfare from any known or anticipated adverse effect of these pollutants. St. Croix is in compliance (or is unclassified, which has the same legal effect) with all of the NAAQS standards. This determination is based either upon review of actual air

monitoring data or sophisticated air modeling that predicts the ambient air concentrations.

Applicants are subject to numerous federal and local air rules for the control of air emissions, so that air emissions from LBT and LBR are subject to stringent standards. The most relevant are summarized in the follow subsections.

6.10.01.01 New Source Performance Standards (40 CFR 60)

New and reconstructed sources subject to applicable New Source Performance Standard (NSPS) must achieve emissions control levels as specified in the applicable provisions. Modified sources must also comply with NSPS regulations if the maximum achievable emission rate (expressed in pounds per hour) after the modification exceeds the maximum achievable emission rate prior to the modification, unless the modification is either routine maintenance, repair, and replacement (RMRR), increases output without a capital expenditure, or meets other exclusions. Any source subject to a NSPS is also subject to the general provisions of NSPS Subpart A.
LBT has affected facilities that are subject to the NSPS rules. A number of these subparts apply exclusively to the refinery assets, compliance with which will need to be addressed prior to the restart of any refinery units. For terminal assets the key applicable NSPS rules include:

- 40 CFR 60 Subparts J and Ja-Fuel Gas Combustion Devices and Flares
- 40 CFR 60 Subpart Ka - Standards of Performance for Storage Vessels for Petroleum Liquids for Which Construction, Reconstruction, or Modification Commenced After May 18, 1978 and Prior to July 23, 1984.
- 40 CFR 60 Subpart Kb - Standards of Performance for Storage Vessels for Petroleum Liquids for Which Construction, Reconstruction, or Modification Commenced After July 23, 1984.
- 40 CFR 60 Subpart GG - Standards of Performance for Stationary Gas Turbines.
- 40 CFR 60 Subpart GGG - Standards of Performance for Equipment Leaks of VOC in Petroleum Refineries for Which Construction, Reconstruction, or Modification Commenced After January 4, 1983, and on or Before November 7, 2006.

The NSPS rules impose requirements for affected facilities to apply the “Best System for Emissions Reductions. “

6.10.01.02 National Emission Standards for Hazardous Air Pollutants (40 CFR 61)

New, modified, or reconstructed sources subject to the National Emission Standards for Hazardous Air Pollutants (NESHAP) must meet the requirements as specified in the applicable subparts to 40 CFR parts 61. Any source subject to a NESHAP is also subject to the general provisions of NESHAP Subpart A.
Applicants have affected facilities that are subject to the NESHAP rules. The key applicable NESHAP Part 61 rules include

- 40 CFR 61 Subpart M - National Emission Standard for Asbestos.
- 40 CFR 61 Subpart FF - National Emission Standard for Benzene Waste Operations.

Applicants are and will be in compliance with these provisions.

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6.10.01.03 National Emission Standards for Hazardous Air Pollutants for Source Categories (40 CFR 63)

The NESHAP rules in Part 63 (a/k/a MACT standards) apply to hazardous air pollutant sources that are major sources in specifically regulated industrial source categories. The MACT rules apply to new, modified, reconstructed and existing affected facilities, which must meet the requirements as specified in the applicable provisions. This differs from many rules where existing sources are not subject to the rule requirements. These rules impose extremely strict restrictions on the emission of air toxics. As a general rule, LBT and LBR must meet two types of standards (i) standards that require maximum achievable control technology, without regard to risk from emissions and (ii) residual risk standards that are applied if MACT standards do not reduce risk to an acceptable level.

Historically, the facility had a number of affected facilities that are subject to the MACT rules. A number of these subparts apply exclusively to the refinery assets. Since the 2012 idling of the refinery several key MACT regulations have been updated. The restart of the refinery will require a detailed compliance assessment of the new requirements. The following MACT rules apply to LBT/LBR:

- 40 CFR 63 Subpart R – Gasoline Distribution Facilities
- 40 CFR 63 Subpart Y – Marine Tank Vessel Loading Operations
- 40 CFR 63 Subpart CC – Petroleum Refineries
- 40 CFR 63 Subpart UUU – Petroleum Refineries: Catalytic Cracking Units, Catalytic Reforming Units, and Sulfur Recovery Units
- 40 CFR 63 Subpart EEEE - Organic Liquids Distribution (Non-Gasoline)
- 40 CFR 63 Subpart YYYY - Stationary Combustion Turbines
- 40 CFR 63 Subpart ZZZZ – Stationary Reciprocating Internal Combustion Engines
- 40 CFR 63 Subpart DDDDD - Industrial, Commercial, and Institutional Boilers and Process Heaters
- 40 CFR 63 Subpart GGGGG Site Remediation

According to the 2017 ACC, LBT is in material compliance with all applicable NESHAP requirements. It is noteworthy that the applicable MACT CC and UUU standards were revised and MACT DDDDD became effective after the refinery was idled. These rules impose even more stringent emissions limits and work practices on refinery operations, such as relief valves, flares, fugitive leaks, tank emissions and delayed coking units. It also requires fenceline monitoring for benzene. LBT will comply with these rules.

6.10.01.04 Virgin Islands Permitting and Air Pollution Control Rules

Virgin Islands air emissions control and permitting regulations are codified in 12 VIRR Parts 204 and 206. The control regulations limit air emissions of particulate matter, sulfur compounds, hydrogen sulfide and other pollutants in order to maintain air quality on St. Croix. The permitting regulations, implementing federal requirements, require permits for almost any change at the site. A permit cannot be granted unless the DPNR concludes that the change will comply with applicable laws and regulations and will not interfere with compliance with NAAQS standards.

6.10.02 Title V Air Permit

Under CAA § 502 and 40 CFR part 70, each State is required to have a program in place for issuing and revising operating permits for major sources. This program is codified in 12 Virgin Islands Rules and Regulations (VIRR) § 206-51 *et seq.* The USVI DPNR has authority to issue Part 70 Operating Permits (often called Title V Permits) as well as Permits to Operate (PTO) that must be rolled into the Part 70 Operating Permit if the facility is a major source of air emissions as defined in the rules. Part 70 Operating permits collect into one permit all the applicable air regulatory/legal requirements to a major source. As a general rule, a Part 70 Operating Permit completely displaces previously issued PTOs and other legal requirements, except for those that have been issued after the permit effective date and not yet incorporated into the permit.

HOVENSA operated pursuant to Part 70 Operating Permit No. STX-TV-003-10 issued by the DPNR on July 1, 2010[1]. This permit authorized the operation of both the terminal and the petroleum refinery. It contains a permit shield provision as allowed by the regulations. The permit was scheduled to expire July 1, 2015. On December 31, 2014, HOVENSA submitted a timely renewal application to the DPNR, which included all emissions sources at the site, including all idle units.

On January 26, 2016 LBT requested the transfer of permit STX-TV-003-10 from HOVENSA to LBT. On March 9, 2016 the DPNR approved the transfer. On February 28, 2017 LBT applied to modify the Part 70 Operating Permit to surrender operating authority for certain fired sources, in order for HOVENSA to comply with the Consent Decree. The Title V permit contains all applicable requirements that were in effect in 2010 and a revised permit will include those that have been added since that date. These applicable requirements will apply to the refinery restart project.

6.10.03 New Source Review Permits

Operations for some units at Limetree are required to comply with New Source Review permits issued by EPA under 40 CFR Part 52.21. These permits impose requirements to comply with Best Available Control Technology. In addition, the permit applicant must demonstrate that the project being permitted does not cause or contribute to a violation of NAAQS. Applicants have filed with EPA for a Plantwide Applicability Limit. If EPA grants that application, it will cap emissions of many NSR regulated pollutants at the site to 2009-2010 levels and allow Applicants to make changes to the facility without triggering NSR permitting requirements, as long as emissions of PAL pollutants stay below the established caps.

6.10.04 Refinery Restart (MARPOL) Project

On April 13, 2018, LBT and LBR submitted a complete ATC application, requesting an ATC pursuant to 12 VIRR § 206-20 and authority to construct or modify pursuant to 12 VIRR § 206-31 to modify and restart some of the idled units at the St. Croix facility and make repairs necessary to restart others. The application satisfied all requirements of the ATC program. No public comments were received and on June 18, 2018, DPNR issued STX-924-AC-18 authorizing the MARPOL Project. The ATC contains a number of new limits and requirements

[1] Refer to 2015 Data Room document "05 - c - Title V Permit.pdf"

for the restarted units, many of which are referenced in this section. An application for modification to the ATC has been filed, which reflects scope changes in the restart project. This EAR reflects the information in the modification application

As part of the permitting process, Applicants were required to determine whether the MARPOL would result significant deterioration that would require a PSD Permit. Table 1-2 summarizes the results from the PSD applicability analysis performed for the MARPOL Project. This analysis has been performed using the calculation procedures prescribed by 40 CFR § 52.21(a)(2)(iv), consistent with the EPA guidance.

Table 1-2. Summary of MARPOL Project Emissions Increase Calculation

	VOC	**CO**	**NOX**	**PM**	**PM10**	**PM2.5**	**SO2**	**SAM**
Baseline Actual Emissions	3,822	2,608	4,413	252	269	266	1,243	55.2
Projected Actual Emissions (PAE)	2,377	2,087	3,982	83	196	193	661	42.8
Project Emissions Change	**-1,446**	**-521**	**-431**	**-169**	**-73**	**-73**	**-582**	**-12.5**
Significance Level	40	100	40	25	15	10	40	7
Subject to PSD Review	No	No	No	No	No	No	No	No

SAM: sulfuric aid mist
Note: PAE rates do not include the excludable emission increases.

The prescribed procedure is applied separately for each regulated PSD pollutant. Calculations are performed first for the project itself; if the total emissions increase from the project is less than the significant threshold for that pollutant, the project is not a major modification with respect to that pollutant, and contemporaneous netting calculations for that pollutant are not required. The applicability threshold levels were set by the EPA to identify projects that could cause local air quality to deteriorate, and require further study of the emissions from the projects to determine if adverse effects would result. Projects whose emissions fall below these threshold levels do not have the potential for significant deterioration of local air quality. Because the maximum potential net emissions increase from this project falls below the EPA established thresholds, this assures that air quality on St. Croix will be maintained during coker operations and that compliance with each of the National Ambient Air Quality Standards (NAAQS) will also be maintained. The project, using EPA calculation methods, reports emissions reductions for all pollutants.

Part of the reason for these emissions reductions is that the MARPOL project is expected to use much lower sulfur fuels than in the past. It is also expected to incorporate newer emissions reductions technology on some heaters, boilers and generating turbines to reduce NOx and other pollutants. Limetree is also replacing its tail gas treating unit on the East Side with a newer

technology that will eliminate routine use of tail gas incinerators.

All of the units being restarted had retained their authority to operate under the Title V. However, the issued ATC memorializes several newly applicable CAA regulatory requirements for the facility, including Subparts Ja and GGGa in 40 CFR part 60 and MACT CC and UUU. According to information provided by LBT and LBR compliance with these rules, which apply generally to all petroleum refineries, will be incorporated into the design of the refinery restart project.

Based on the PSD analysis and the application of EPA and Virgin Islands regulations and permitting, the MARPOL project will not have a significant adverse effect on air quality.

6.10.05 Demolition
Demolition will be subject to the same extensive rules and permitting requirements as the discussed above. Although an emissions change calculation has not been performed for this project at this time, it is extremely unlikely to have a significant impact on air quality. In particular, demolition is subject to a number of federal and Virgin Islands rules and regulations, which include federal rules in 40 CFR Part 61 relating to asbestos, 204-25 regulations on fugitive dust, and 204-27 prohibiting air pollution nuisances

6.10.06 Future Projects/PAFA process
Future projects approved under the PAFA process will be subject to the same extensive rules and permitting requirements as the MARPOL Project. If a project is significant for one or more pollutants, the project will be required to apply BACT to the modified or new emissions sources. The PAFA process is also designed to allow more extensive review of larger projects that have the potential for more significant impacts. This process allows DPNR to request additional information regarding any project and, for major projects, more specific impacts analysis for that project, including an Environmental Assessment Report if required by DPNR.

7.0 IMPACTS ON THE HUMAN ENVIRONMENT

7.01 Land and Water Use Plans

The Limetree Bay Terminals, LLC and the proposed project areas are within the I-1 zone, Industry – Heavy. Petroleum Refining and Related Industries are uses permitted as a matter of right as listed as permitted use number 79 in the Virgin Islands Zoning, Building and Housing Laws and Regulations. The site also falls within the South Shore Industrial Complex and is within the South Shore Industrial Area of Particular Concern Boundary. The ROA and ARTOA specifically confirm the use of the Project Site for an Oil Refinery and Related Facilities and confirm that existing use and structures comply with Virgin Islands land use and zoning requirements.

7.02 Visual Impact

No changes to the visual character of the area are being proposed except for the potential

demolition of structures that may no longer be in use.

7.03 Impact on Public Services and Utilities

7.03a Water

The permit will have no impact on public water supply. The facility produces its own potable water and water necessary for the operation of the plant. The facility's reverse osmosis plant is capable of producing more than 300 gallons per minute and will be able to produce up to 1 million gallons per minute. The facility has no impact on the public water system. The restart will have no impact on public water supply.

The current water production facilities at the plant are sized to meet the demand of the refinery at full operation. The facility is under contract with 7 Seas who provides reverese osmosis water for the facility.

7.3b Sewage Treatment and Disposal

The permit will have no impact on public sewage treatment and disposal. The facility has no impact on the public WWTP or waste water collection system. The facility operates its own WWTP and Advanced WWTP in order to handle oily and other waste and stormwaters. Waste Water Treatment Plant processes an average of 0.36M gpd. The maximum capability of the plant is 6.3M gpd. Refinery when in operation averaged 3.4Mgpd and so the restart of the refinery is expected to increase the operation of the WWTP and AWWTP, but well within the design capacity of the facilities. The Limetree Bay Terminals discharge is regulated under TPDES Permit # VI0000019, which establishes limits on conventional and non-conventional pollutants for both process water, contaminated stormwater and runoff.

7.03c Solid Waste Disposal

The permit will have no impact on solid waste disposal. Any demolition debris will be sorted based on its properties and will recycled or disposed of in an appropriate manner. This material will not be disposed of in the Anguilla Landfill. The facility generates 400lbs/day of domestic refuse which is disposed of by private hauler at the Anguilla Landfill. This may increase some because of the refinery restart but will be well below historical levels when the refinery directly or indirectly employed 2000 people or more.

7.03d Roads, Traffic and Parking

There will be a short-term increase in traffic because of construction work to restart the refinery, lasting approximately one year. It will be well below historical levels when the refinery directly or indirectly employed 2000 people or more, in part because of previously approved construction of Limetree Bay Village, which provides housing for workers immediately adjacent to the Project Site. When shifts change there is traffic along Hwy 68 and traffic backs up for short periods of time at the intersection turning west on to Melvin Evans Highway Hwy 66 and along Hess Road up to the Melvin Evans Highway intersection

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at Sunny Isle Shopping Center. Historically, during major construction, the facility has implemented traffic control measures, particularly at pedestrian crossings, such as crossing guards at peak hours.

Materials, equipment, and other necessary equipment supplies will come directly to Limetree from the "Bomba" Allick Container Port, which is located next to the refinery. Thus, the impact on the public road system during construction will be negligible. In addition, no significant deterioration of the public roads that accesses the refinery is anticipated by vehicles of construction workers or process operators.

The Facility has parking next to the Administration Building, a large parking lot to the north of the refinery and a large parking area near the west refinery. The number of cars and workers at the facility depends on events within the refinery such as turn-arounds or repairs. There are more than 500 spaces within the facility proper.

The permit consolidation will have no direct impact on traffic. The facility has adequate parking for the restart,

7.03e Electricity

The permit will have no impact on the public electrical supply. The facility produces all its own electricity with gas turbine units. The facility always has spinning reserve to guarantee no outages occur. The facility has the ability to use propane or oil as fuel. The facility maintains 40 MW with one unit on standby. Additional turbines (GT-9, 10 and 13) will be brought on line to supply power

7.03f Schools

The consolidation of permits will have no impact on public or private schools. The children of workers currently employed by Limetree are already in existing schools on St. Croix.

The restart of the refinery will have an impact on public and private schools. With the reopening of the refinery as many as 600 people will be hired at the refinery. Some of these will be re-hires of individuals who have remained on St. Croix and their children are already in schools, others will return home from the state and may bring school age children into the local school system. Others will be new hires who may move to St. Croix bringing their children. The public and private school systems should be able to absorb the children who choose to attend public school, because the closing of the refinery and the more recent exodus of people from the USVI due to the hurricanes has reduced the number of children in the public and private school systems.

Hurricanes Irma and Maria affected all elements of the education system, damaging or destroying school and university buildings and knocking out essential services like power and telecommunications. They also affected the lives of students and teachers—some left the Territory and did not return for many months, if at all, leading to a 17 percent drop in public-school enrollment, an eight percent drop in university enrollment, and a yet to be determined

drop in private school enrollment. (VI Hurricane Recovery and Resilience Task Force)

Historically, the facility has been a major contributor to education initiatives in the Virgin Islands, contributing millions of dollars to education causes. The ROA and ARTOA contain specific funding requirements for scholarships for residents and for support of UVI programs.

7.03g Fire and Police Protection

The permit and the refinery restart should have no impact on public fire and police protection. The facility maintains its own security and fire protection. The facility has fire trucks and pump trucks and regularly conducts drills to ensure that they can rapidly respond to any emergency which may occur. The site is fully fenced and has security systems around the perimeter

The facility also has stringent 24 hour a day security and minimizes the admittance of unauthorized personnel in the plant. Entry controls, such as manned entry points and card scanners are present at all entry points to the refinery. The facility is also subject to Homeland Security rules and regulations, such as requirements to have a security plan in place and use of Transportation Worker Identity Cards (TWIC) to control entry to the site. TWIC cards are being enhanced to require biometric identification as part of entry.

7.03h Health/Safety

The consolidation of the permit should not increase the use of the public health facilities. Existing Limetree employees are already being serviced by the existing health facilities on the island and are provided with access to employer plan health insurance.

The restart of the refinery will increase the number of employees at the refinery, some who will be hired or rehired will already reside on St. Croix, others will come to the island. This will increase the population as the employees and their family move to the island and the existing public health facilities will need to provide the necessary medical services to these individuals.

The facility has an on-site clinic and doctor. LBR will also have programs for health insurance for its employees and their families, which will significantly increase medical coverage and access to medical care on St. Croix.

Applicants have a team of professionals dedicated to safety/process safety and regularly trains its workers in safety topics. Newly added workers for the restart will receive extensive safety and operational training before restart, particularly on simulators. Limetree is also subject to extensive OSHA safety regulations on a variety of topics and is revising and updating procedures for restart. Applicants are also reviewing refining processes to be restarted for potential hazards and means to abate those hazards, as well assessing mechanical integrity and addressing identified issues.

7.04 Social Impacts

The consolidation of permits should have no social impact however the continued operation of the facility but the restart of the refinery has a large impact on the island of St. Croix and the entire Virgin Islands. The facility employs large numbers of Virgin Islanders and these employees support businesses and retailers. Applicants contribute to non-profits and engage in numerous public service programs. The ARTOA and ROA set minimums for public service contributions and provides for assistance to the UVI and other entitites, with a minimum of $500,000.

Limetree Bay Terminals has an extensively stocked wildlife trailer that was initially set up to ensure rapid response if there were ever a spill on-site with the potential to impact the local wildlife including birds and sea turtles. The trailer is also on continuous standby to assist the community and the USFWS with wildlife issues outside Limetree Bay Terminals' property.

Limetree Bay Terminals' employees are part of the Sea Turtle Assistance and Rescue (STAR) team. STAR members are permitted by the Virgin Islands Department of Natural Resources (DPNR) to assist sea turtles in trouble and brings together professionals from the National Park Service, USFWS, the DPNR, Coral World, St. Croix Environmental Association, National Marine Fisheries Service, University of the Virgin Islands, Nature Conservancy and Limetree Bay Terminals.

In 2018, Limetree Bay Terminals was a closing sponsor of the 13th International Effects of Oil on Wildlife Conference, bringing together industry, agency and wildlife professionals from around the world. The conference was held from May 7 through 11 in Baltimore Maryland and had over 140 guests from 5 continents and 2 Tribal Nations.

7.03Economic Impact

The refinery restart will have a significant positive impact on the economy of the Virgin Islands. The Virgin Islands hired an economic consulting firm, Gaffney, Cline & Associates to assess the economic impact of the restart on the economy and provide support during the Senate hearings. Portions of their presentation are quoted below:

"Indirect Benefits

- Planned $1.4 billion investment for refinery refurbishment and restart
  - Estimated 1,200 works—payroll of $450 million
- Up to 700 permanent jobs when refinery restarts
  - Hiring will begin well before restart
  - Preference to USVI residents
  - Estimated $100 million per year payroll
  - Good jobs with excellent benefits
- Economists suggest investments such as these provide a substantial multiplier effect to the local economy
- Increased support of training within the USVI
- Periodic large scale maintenance events with projected spending in excess of $200

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million per event. “

During the Senate hearings, Limetree highlighted additional benefits from the restart as follows:

“The Project would bring considerable benefits to the USVI including:

- Upfront consideration of $70.0 million to prepay taxes and purchase cottages and other property
- Carried interest of 10% of the total profit, aligning the interests of Limetree and the GVI
- Annual base refinery payments to the GVI of $22.5 million (in addition to terminal payments)”

This project will contribute significantly to revitalization of the economy of St. Croix and of Virgin Islands as a whole.

It is noteworthy that the ROA ensures that residents of the Virgin Islands will benefit from this expansion

- Must use efforts to recruit Virgin Islands residents
- Gives preferences to Virgin Islands residents
- Requires 80% of the full-time employees and 50% of senior management be Virgin Islands residents
- Encourages former employees who left St. Croix after the shutdown to return to the restarted refinery.
- Establishes training and scholarships to assist employment of residents.

Future projects at the Refinery or Terminal may also significantly enhance the economy. After the acquisition of the Project Site in 2016, Limetree Bay Terminals spent over $260 million since closing and had 800 workers on site in June 2018, well in excess of the guarantee of 80.

The purpose of the permit consolidation is to streamline the future permitting of modifications to the Limetree Bay Terminals facility. The consolidated permit will reduce the administrative burden to DPNR caused by review of proposed modifications to operations and facilities and will improve Limetree’s financial viability and ability to respond to the global marketplace by providing certainty in the permitting process applicable to future proposed plant modifications.

7.04Impacts on Historical and Archeological Resources

The Project Site is located on the south shore of the island of St. Croix within the St. Croix Industrial Complex. The area, both on and offshore has been significantly modified overtime. The area which was once a large estuary was dredged and filled to create an Alumina Refinery. Krause Lagoon Channel which lies to the west of the project area was blasted out of caliche (or limestone) in 1962 and 1963 by Harvey Aluminum. That channel is 7,000 feet long, 300 feet wide, and 36 feet deep and leads from Renaissance Parks Port facilities out into the Caribbean Sea.

Dredging of the Limetree Channel which lies to the east of the proposed SPM site began in 1965,

and the Cross Channel and the Container Port basin were dredged in 1971. The last major dredging in the area occurred in 1974.

The 1962 aerial below shows the estuary prior to the intensive industrial development in the 60's and 70's. The photograph shows a shallow estuarine system with a fringing dense shoreline mangrove with dense seagrasses in the nearshore and reefs farther seaward.

Figure 7.06.1 Krause Lagoon in 1962 prior to the industrial development of the area. There was already dumping garbage in the northern area of the lagoon in what will eventually become the alumina refinery.

Limetree Bay Terminals, LLC is proposing to permit all activities authorized in the ARTOA and ROA under a single omnibus permit, and to permit future activities pursuant to a tiered review system unique to Limetree. As the largest industrial operation in the USVI, competing in a global marketplace for the transport, storage of fuels, the long-term economic viability of the operation will be positively impacted by streamlining future permitting activities related to operations.

Potential Impacts on Archeological Resources

All of the facility is located within areas that have been previously excavated, filled and graded.

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These permits should have no impact on archeological resources.

7.05Recreational Use

The facility is a restricted area by Homeland Security for security purposes and permits related to operations will have no impact on recreational use.

7.06Waste Disposal

The consolidation of permits will have no impact on solid waste disposal. Limetree recycles metal scrap and disposes to waste and refuse according to its properties. Regular domestic garbage is collected in bins and disposed of at the Anguilla Landfill approximately 400lb is disposed of a day. The refinery restart will result in the increase in employees in the facility and therefore an increase in domestic refuse which must be taken to the Anguilla Landfill. It is probable that the amount of domestic refuse will increase to approximately1000lb per day. Industrial solid waste and hazardous wastes are either sent for recycling or for disposal off site, and these will have no impact on St. Croix solid waste facilities. Treatment and discharge of process wastewater, contaminated stormwater and runoff are discussed above in Section 7.03.

7.07Accidental Spills

Accidental spills during the operation of the facility have the greatest potential indirect, secondary and cumulative impacts to marine resources located outside the project footprint. Down current of the facility is Ruth Cay which supports the ESA listed St. Croix ground lizard (*Ameiva polops*) and Least Terns (*Sternula antillarum athalassos*), and further to the west is Sandy Point National Wildlife Refuge and its critical habitat for nesting sea turtles. In the event of a current reversal, which is rare but can occur, there are sea turtle nesting beaches to the east as well. Shallow reef systems which support corals are found through the southern coast. The entire area is colonized by ESA coral species and *Acropora* and *Orbicella* are in the vicinity of the subsea pipeline and SPM and the Nassau Grouper occurs in the immediate area and throughout the entire south shore. There are also dense seagrass beds located in shallow embayments.

Operations at Limetree Bay Terminals, which include fuel transport from vessels to shore via dock facilities have the potential to have a spill. The facility stores and transports large quantities of hydrocarbons to and from vessels and as such there is a potential for spills. There are emergency cut offs throughout the facilities pipeline systems that can help limit the volume of spills. Limetree Bay Terminals has an Integrated Contingency Plan that is in compliance with the Oil Pollution Act of 1990 (OPA-90). Limetree Bay Terminals conducted an exercise in August ,2017 with the U.S. Coast Guard and a variety of federal agencies to ensure that they can rapidly respond to a major spill and protect the sensitive environmental resources surrounding and downstream of Limetree Bay. The Integrated Contingency Plan can be provided upon request.

As a part of that plan, Limetree Bay Terminals has trained Emergency Response and Incident

Command personnel and maintains an inventory of oil spill containment boom, oil absorbent material, vacuum trucks, oil spill response vessels, oil spill skimmers, oil spill recovery pumps and oil spill containment barges. This equipment and personnel are available 24/7 and can be deployed as required by Limetree Bay Terminals and the National Response Corporation (NRC).

NRC and Marine Spill Recovery Corporation (MSRC,) another Oil Spill Removal Organization (OSRO) are both located within the facility. They are ready 24 hours a day, seven day a week, they have all the necessary oil recovery equipment, oil containment booms, sea-going recover vessels, sea-going recovery barges and trained and certified personnel on-watch. NRC is under contract with Limetree Bay Terminals and MSRC is under contract with many of the vessels who currently use the port.


NRC's spill vessels standing by on site

Ocean Boom Stored on Limetree Property

Limetree Bay Terminals		
Dock 3	2,000	24" Containment Boom
Trailer 1	2,000	24" Containment Boom
Trailer 2	2,000	24" Containment Boom
Trailer 3	2,000	24" Containment Boom
Trailer 4	2,000	24" Containment Boom
Trailer 5	2,000	24" Containment Boom
Trailer 6	2,000	24" Containment Boom
	14,000	
NRC	2,000	42" Inflatable Ocean Boom on OSRV SENTRY
	1,000	42" Inflatable Ocean Boom in compound box
	2,000	42" Inflatable Ocean Boom on 2 boom reels near Dock 8
	5,000	
	1,600	24" Containment Boom Stored in container at Dock 4
	4,000	24" Containment Boom Stored in container at Dock 9
	3,500	24" Containment Boom Stored in blue trailer at Dock 9
	2,000	24" Containment Boom Stored in open Trailer on west side
	2,000	24" Containment Boom Stored in container on west side.
	1,800	24" Containment Boom Stored in mobile Response Trailer
	800	24" Containment Boom Stored on two Quick Response Trailers
	15,700	
Total	5,000	42" Inflatable Ocean Boom
	29,700	24" Containment Boom

Values shown in feet

Table 7.9.1. Oil Boom stored at Limetree Bay Terminals.

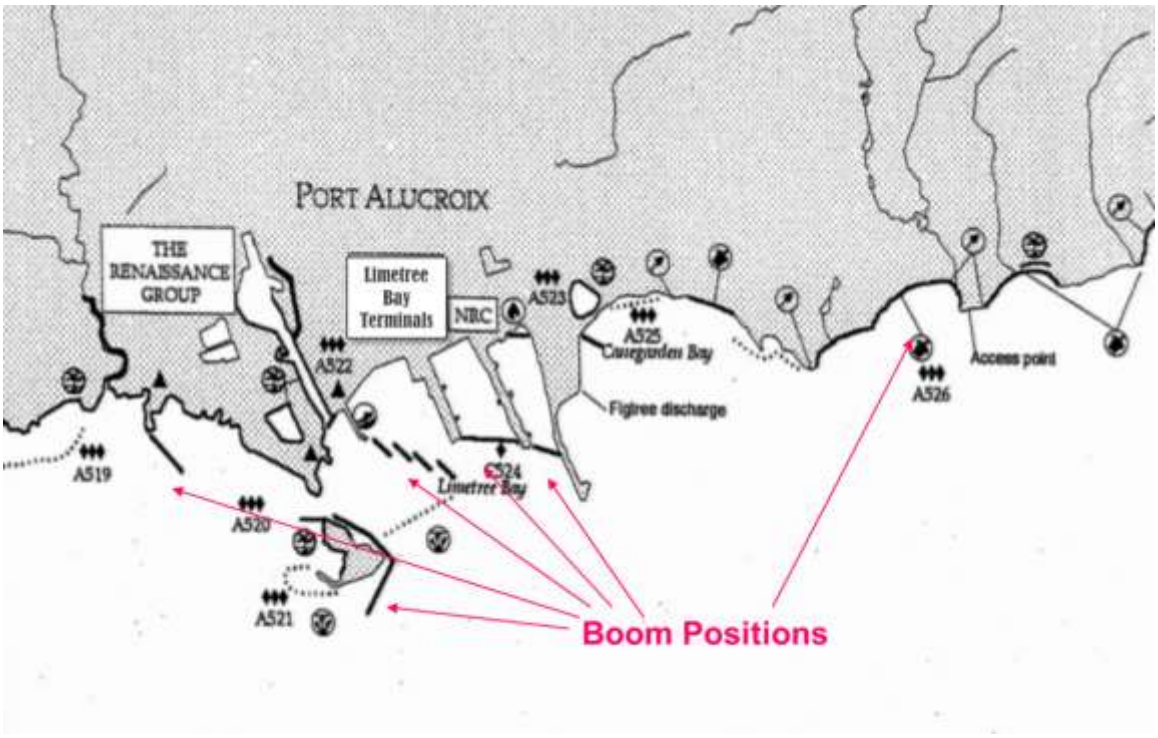

Figure 7.9.1. Booming strategies in the event of a significant spill to protect important environmental resources down current.

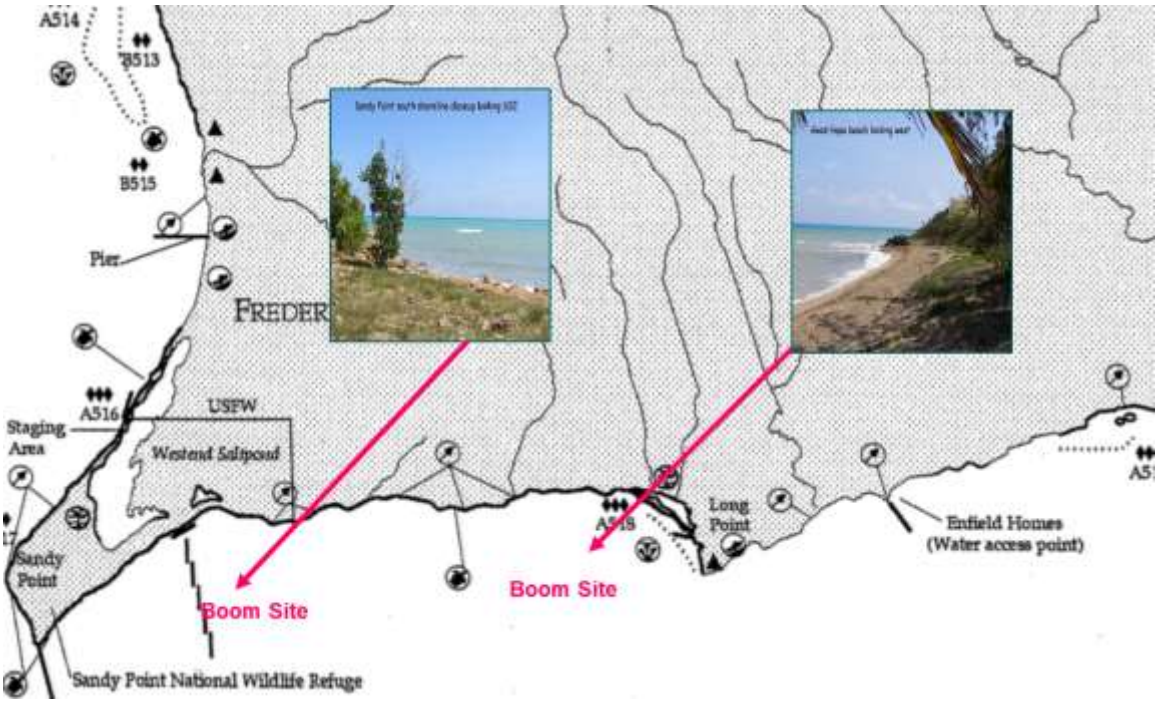

Figure 7.9.2. These booming strategies include protection of the important resources at Sandy Point.

Response, containment, and recovery are taken very seriously and with two response organizations on site, this gives the terminal the best chance to address any incident which might

occur. The presence of these two organizations within the facility also provides a rapid response to other spills which might occur with other vessels unrelated to the terminal facility.

Limetree Bay Terminals, LLC has a fully stocked 40 Ft Wildlife Response Trailer, considered by many response agencies to be the most well-equipped single Wildlife Response supply in the world. Limetree is a sponsor of the 13th International Effects of Oil on Wildlife Conference the only international conference that brings together a diverse group of industry, agency, and wildlife professionals from around the world. Limetree is also a partner with Tri-State, one of only two organizations in the country that can professionally manage a wildlife response to a major spill.

7.10 Potential Adverse Effects Which Cannot Be Avoided

The refinery restart project does not add new facilities other than replacing an outmoded tail gas treatment unit with newer and cleaner technology. It restarts only a portion of the facilities idled in 2012. Thus, there are no new potential adverse effects from the restart project that differ from the effects of the refinery as previously operated Some adverse effects of prior operations on the environment are expected to be mitigated, as explained in Section 8.00.

8.00 MITIGATION PLANS

Overall, air and water emissions from the restarted refinery will be significantly lower than the previous refinery operation. Specifically:

- The refinery historically burned higher-sulfur residual fuel oil. The restarted refinery will burn primarily low-sulfur refinery fuel gas and propane. High-sulfur residual fuel will not be used as a fuel.
- Modifications to the fuel gas treating system will be made to reduce the amount of sulfur in the fuel gas and analyzers will be installed to ensure compliance.
- The refinery will install controls to remove most of the sulfur contained in the streams burned in the flares and analyzers will be installed to ensure compliance. The refinery will also implement new operational measures and process unit improvements to reduce the number and size of flaring events.
- Routine sampling of the air quality at the refinery fence line will monitor compliance with EPA standards, minimizing the potential for offsite impacts.
- The terminal has installed a unit that controls air emissions when loading gasoline onto ships. This unit will be on-line in 2019/
- Controls to reduce air emissions will be installed on a number of the gas turbines and (potentially) boilers.
- The refinery is revamping the existing sulfur recovery units to improve reliability and reduce sulfur emissions.
- Limetree will continue to work with the Government of the Virgin Islands and the US EPA to complete the work on the proposed Consent Decree.
- The facility will continue to implement and enhance its existing equipment integrity programs to prevent leaks and reduce emissions.
- Refinery wastewater will be treated in the modern advanced wastewater treatment systems at

the site. Historically, the refinery met its DPNR permit limits, with an ample margin for compliance

- The facility will install new controls on flares, vents and valves that can release pollutants into the atmosphere, particularly during upset conditions.

Any restart will be protective of the environment and take care of Limetree employees and neighbors. Please also see Section 7.03 regarding safety.

9.00 ALTERNATIVES to PROPOSED ACTION

The alternative to the refinery restart application would be to make no changes that constitute development. This would cause the project to be impractical from an engineering and financial perspective, because needed changes to produce MARPOL and other fuels efficiently and cost effectively could not be made. Thus, the restart project would not proceed.

As to consolidation and future permitting processes, because this application only seeks to consolidate previously permitted activities under one permit and streamline the permit issuance process, the only available alternative is to leave the existing permitting structure unchanged and assign and/or issue multiple permits to Limetree consistent with the requirements of the Operating Agreement.

10.00 RELATIONSHIPS BETWEEN SHORT TERM AND LONG TERM USES OF MAN'S ENVIRONMENT

Long-term this will allow the refinery to stay competitive in the oil market and allow for the potential expansion of operations and future revenues and jobs for the island of St. Croix.

11.00 LITERATURE CITED

Bowden, M.J. et. al., 1969. Climate, water balance and climatic change in the north-west Virgin Islands. Caribbean Research Institute, CVI, St. Thomas, Virgin Islands.

Brown and Root, Inc., 1973. Environmental Impact Assessment Report for Construction of a Single Point Mooring Terminal and Submarine Pipeline System, Vol. II, Submitted to Hess Oil Virgin Islands Corp.

Bucher, K. E., D.S. Littler, M. M. Littler, J. N. Norris. 1989. Marine Plants of the Caribbean A Field Guide From Florida to Brazil. Smithsonian Institution Press, Washington, D.C.

Donnelly,T. 1966. Geology of St. Thomas and St. John, U.S. Virgin Islands. In: Hess, H. (ed.) Caribbean geological investigations. Geol Soc. Amer. Mem. 98:85-176.

Donnelly, T., et al. 1971. Chemical evolution of the igneous rocks of the Eastern West Indies. In: Donnely, t. (ed.) Caribbean geophysical, tectonic and petrologic studies. Geol. Soc. Amer. Mem. 130:181-224.

Gill, Ivan P. and D.K. Hubbard. 1986. Subsurface Geology of the St. Croix Carbonate Rock

System, Technical Report No. 26, Caribbean Research Institute, College of the Virgin Islands, 71 pp.

Howard, Needles, Tamen, and Bergendoff. 1975. Environmental Impact Assessment Report Proposed Offshore Crude Oil and Submarine Pipeline, Submitted to Hess Oil Virgin Islands Corp., 242 pp.

Humann, Paul. 1992. Reef Creature Identification. New World Publications, Inc., Jacksonville, FL.

Humann, Paul. 1993. Reef Coral Identification. New World Publications, Inc., Jacksonville, FL.

Humann, Paul. 1989. Reef Fish Identification. New World Publications, Inc., Jacksonville, FL.

Island Resources Foundation. 1977. Marine environments of the Virgin Islands. Technical Supplement No.1 1976. Prepared for the Virgin Islands Planning Office.

Prince-Tams Joint Venture. 1984. Environmental Assessment Report for Third Port Project, Vol. I and II, Submitted to Virgin Islands Port Authority.

Rees, Brian J. and Associates. 1991. Environmental Assessment Report for St. Croix South Shore Power Plant Sites, Submitted to Virgin Islands Water and Power Authority, 122 pp.

University of the Virgin Islands: Eastern Caribbean Center. 1994. UVI Wetlands Reserve Management Plan, 31 pp.

U.S. Department of Agriculture Soil Conservation Service. 1970 Soil Survey Virgin Islands of The United States. U.S. Govt. Printing Office, Washington, D.C.