1. Introduction

This section covers general information on the Technical, Economic, and Environmental Feasibility Study (EVTEA) of a port facility for the movement and storage of container cargo in an area located in the Suape Port Complex (Governador Eraldo Gueiros Industrial Port Complex), municipality of Ipojuca, State of Pernambuco, Brazil, called **SUA05** lease area within the scope of the Federal Government planning.

Feasibility studies of port leases aim to evaluate projects and can be the basis for bidding procedures. In general terms, the initial estimate of payment values is identified for the exploration of the asset for bidding, considering, for that end, several legal, technical, operational, economic, financial, accounting, tax, and environmental variables.

Thus, in this study, the values, terms, and other parameters related to the **SUA05** project were defined, which are necessary to subsidize a bidding procedure, in order to provide adequate payment to the Port Authority, as well as to allow the adequate return to potential investors.

The study was originally prepared by the Port Authority of the Suape Port Complex through the hiring of specialized consulting under the Technical Responsibility Annotation – Article # 14201800000004255723 (CREA-MG). After elaboration, the study was sent to the Government to subsidize the bidding process of the **SUA05** area.

In this context, the *Empresa de Planejamento e Logística* (EPL) was urged by MTPA to carry out the review and update of the study, including the parameterization with the other studies of the Federal Government.

In general, the process of reviewing and updating these studies consists of reviewing the information and assumptions previously adopted, especially the following verifications:

- Update of the legal and contractual situation of the areas/facilities of the bidding process;
- Update of the current situation of the area, such as: size of area, layout, type of cargo, accesses, inventories of existing goods, operation, etc.;
- Update of the operational assumptions of the study: demand, prices, costs, investments, capacity, exchange, taxes, lease value, environmental licensing, etc.;
- Incorporation of determinations/contributions of intervening agencies that occurred in the first rounds of port auctions, such as: TCU, Brazilian Institute of Environment and Renewable Natural Resources (IBAMA), National Agency of Petroleum, Natural Gas and Biofuels (ANP), among others; and
- Incorporation of supervening standards/rules to the original elaboration of the studies.

As contextualization, it should be mentioned that the **SUA05** lease area has already been studied in two other opportunities. In 2012, the Port Authority itself developed a study with specialized consultancy. Subsequently, in the context of the Port Lease Program - PAP (2013), the area was also object of study by the Federal Government.

Regarding the procedures adopted in reviewing and updating the studies, the rules and regulations that establish the guidelines for the elaboration of port leases are considered, as well as the main instruments of sectoral planning of the government, in particular:

- Law No. 12,815, of June 5, 2013;
- Decree No. 8,033, of June 27, 2013, amended by Decree No. 8,464, of June 8, 2015 and by Decree No. 9,048, of May 10, 2017;
- Normative Resolution No. 7-ANTAQ, of May 30, 2016;
- Resolution No. 3,220-ANTAQ, of January 8, 2014;
- National Port Logistics Plan (PNLP), published in 2017;
- Preliminary Data (demand) of the Suape Port Complex Master Plan (2018);
- Suape Port Complex Master Plan (2012); and
- Development and Zoning Plan – PDZ – of Suape Port (2010).

2. The Study

The feasibility study of the **SUA05** lease area is structured in sections, as explained below:

- Section A – Presentation;
- Section B – Market Studies;
- Section C – Engineering;
- Section D – Operational;
- Section E – Financial; and
- Section F – Environmental.

From the feasibility evaluation based on a multiplicity of variables, statements of the behavior of the project in relation to the market can be obtained, which allows greater security and transparency in the investment decisions for those interested in the event.

The valuation methodology used to price port leases is the Discounted Cash Flow (DCF), according to which operational flows are projected for a certain time horizon, and the net wealth denominated in current (present) currency is calculated from this structure of revenues and expenses with the application of the discount rate called Weighted Average Capital Cost (WACC).

It is important to note that in the case of the **SUA05** feasibility study, the version originally made available was referenced on the database of December/2017. After the updating process, the study related to the **SUA05** lease area starts using the database of **February/2018**.

The contract duration expected for the lease area is 25 years, with the execution of a contract provided for 2020, with beginning of operations in 2023 and ending in 2044.

Regarding the justification for the feasibility study of the **SUA05** lease area, which aims to meet the storage and movement of container cargo, it should be noted that the implementation of the **SUA05** project has the

objective of expanding the supply of port services to the Suape hinterland promoting competition and reduced prices and seeking greater availability and quality of services.

It is also worth mentioning the possibility of the Suape Port Complex becoming, within an optimistic scenario, a Brazilian hub for the transport of containers, able to receive vessels allocated to the main long-haul navigation lines for Brazil. In this scenario, the new **SUA05** terminal would play a key role in the movement of container cargo.

3. Description of the Suape Port Complex

The Suape Port is part of the Governador Eraldo Gueiros Industrial Port Complex which occupies a total area of approximately 13,500 hectares in the municipalities of Ipojuca and Cabo de Santo Agostinho. The Complex is divided into Industrial Port Zone, Industrial Zone, Ecological Preservation Zone, Central Service Zone, and Cultural Preservation Zone. Within the Complex, there are more than 100 companies in operation and several others in the installation phase.

The Suape Port can be considered as a potential port and cargo hub, because its location is privileged, close to the northern hemisphere and to main international sea routes, and it also has a large area available for expansion.

In this context, the Complex has been attracting large domestic and foreign investment, especially in the oil, gas, and naval industries. Its area of influence covers the entire state of Pernambuco and extends to the States of Paraíba, Alagoas, Rio Grande do Norte, Ceará, and within Maranhão.

The Suape Port is located on the southern coast of the State of Pernambuco between the mouths of the Ipojuca and Massangana rivers and between Cabo de Santo Agostinho and Pontal do Cupe, approximately 40 km south of the city of Recife.

The following figure illustrates the location and the polygonal that delimits the area of the Organized Suape Port.

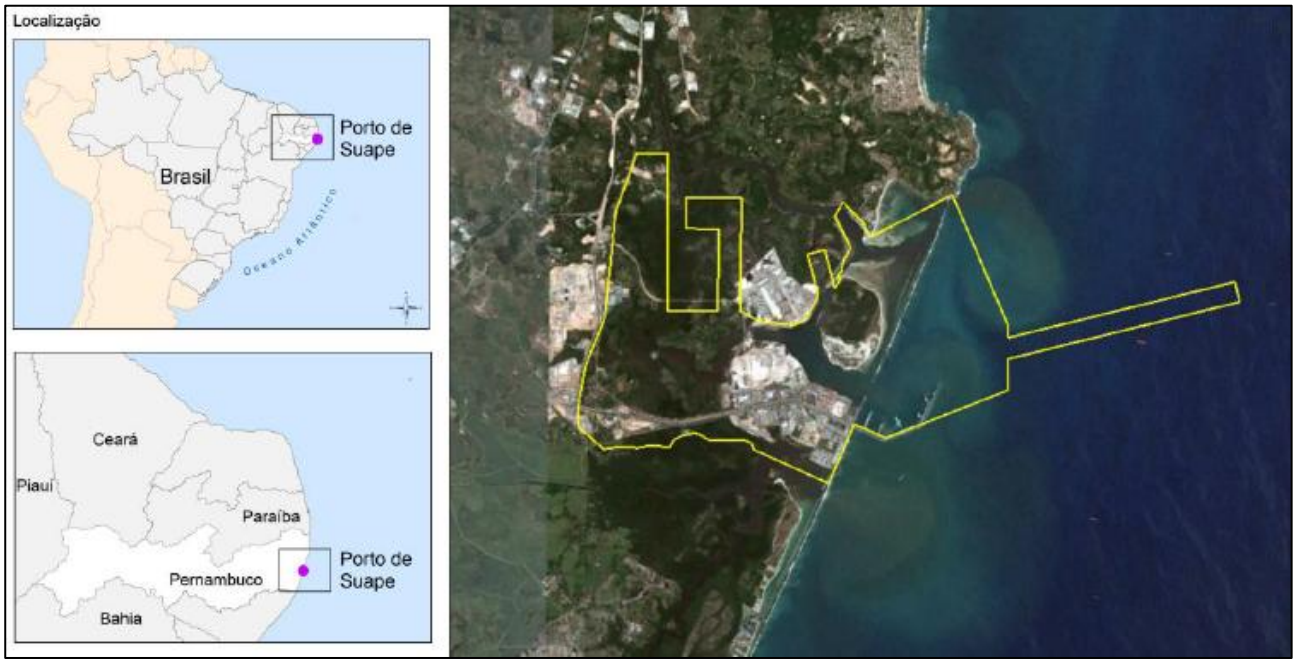

Figure 1: Location of the Suape Port Complex
Source: Own elaboration, from the Master Plan (2012)

The Suape Port is divided into two distinct areas: external and internal.

- The External Port is formed by three berths: 2 dry bulk cargo piers (PGL -1 and PGL -2) and 1 Multiple Use Pier (CMU). There are six berths, with approximately 1.6km of pier.
- In the internal port, there are three public multi-purpose piers, amounting to 1.6km in length, and 5 berths, in addition to an existing specialized container terminal.

3.1. Waterway Access

The waterway access of the Suape Port is by sea. The port entrance is located between the lighthouse at the end of the breakwater and the beacon buoy on the reefs.

Access to the External Port has a minimum depth of 16.5m and the maximum allowed depth is 14.5m in the high tide. Access to the Internal Port is made by an opening in the reefs that is 300m wide.

The turning basin of the External Port has a minimum width of 1,200m and a depth of 15.5m. In the Internal Harbor, the basin is located at the entrance of the access channel and has a minimum width of 580m and a depth of 15.5m. The figure below shows the berths of the Suape Port.

Figure 2: Berthing Infrastructure of the Suape Port
Source: Regulations for the Operation of the Port - REP - Suape Port Complex

In the external port, there are two liquid bulk piers (PGL – 1 and PGL – 2) and one Multiple Use Pier (CMU) and, in the Internal Port, there is one specialized container terminal - TECON, besides three public multi-purpose piers (Pier 1, 4, and 5).

The fenders of the Piers of the Suape Port consist of a steel panel fixed by screws to rubber structures that in turn are shaped as cones, cylinders, or modules. The side that has direct contact with the ship hull receives a UHMW sheet, which facilitates the sliding of the hull and consequently protects the panel of the fender. All this set is fixed to the Pier by screws and it also receives chains that limit the movement of the fenders.

The table below describes the physical characteristics of the berthing structures.

Area	Berth	Size of the Ship	Depth (m)	Operational destination	Condition
External Port	PGL-1 East Berth	Up to 45,000 DWT	12.7	Liquid Bulk	Public
	PGL-1 West Berth	Up to 45,000 DWT	12.9	Liquid Bulk	Public
	PGL2 East Berth	Up to 90,000 DWT	12.6	Liquid Bulk	Public
	PGL2 West Berth	Up to 90,000 DWT	13.5	Liquid Bulk	Public
	PGL3a	Up to 120,000 DWT	12.7	Liquid Bulk	Public (priority PETROBRAS)
	PGL3b	Up to 170,000 DWT	17.7	Liquid Bulk	Public (priority PETROBRAS)
	CMU West Berth	Up to 20,000 DWT	10.2	General Cargo / Liquid Bulk	Public
	CMU East Berth	Up to 80,000 DWT	14.0	General Cargo / Liquid Bulk	Public
Internal Port	Pier 1	Up to 120,000 DWT	14.7	Container / General Cargo / Vehicles	Public
	Pier 2	Up to 120,000 DWT	14.4	Container	Leased
	Pier 3	Up to 120,000 DWT	11.6	Container	Leased
	Pier 4	Up to 120,000 DWT	12.1	Solid Bulk / General Cargo / Vehicles	Public
	Pier 5	Up to 120,000 DWT	12.9	Solid Bulk / General Cargo / Vehicles	Public

Table 1: Physical characteristics of the berths of the Suape Port Complex

Source: Own elaboration, from the Regulations for the Operation of the Port - REP - Suape Port Complex

3.2. Road Access

In addition to the waterway (maritime) access, the Suape Port Complex has road access through the BR-101, BR-232, PE-060, and PE-028 highways, as shown in the figure below.

The following main highways give access to the port:

- Federal: BR-101 and BR-232;
- State: PE-60 and PE-28.

The BR-101 highway is a coastal highway that allows access to several municipalities in the state of Pernambuco, as well as neighboring states. Most of the highway is in good traffic conditions. On the other hand, BR-232 is a transverse highway that begins in the capital Recife and goes towards the countryside ending in Parnamirim. This is an important highway for Suape as it connects to the other highways that cross the state. The PE-060 and PE-028 highways form a road complex called Express Way.

Besides the highways mentioned, it is worth mentioning other highways that are also important for their connection to the port, such as the BR-408, PE-045, PE-042, PE-038, and PE-009 (Express Way).

The following image shows the main road access routes to the Suape Port.

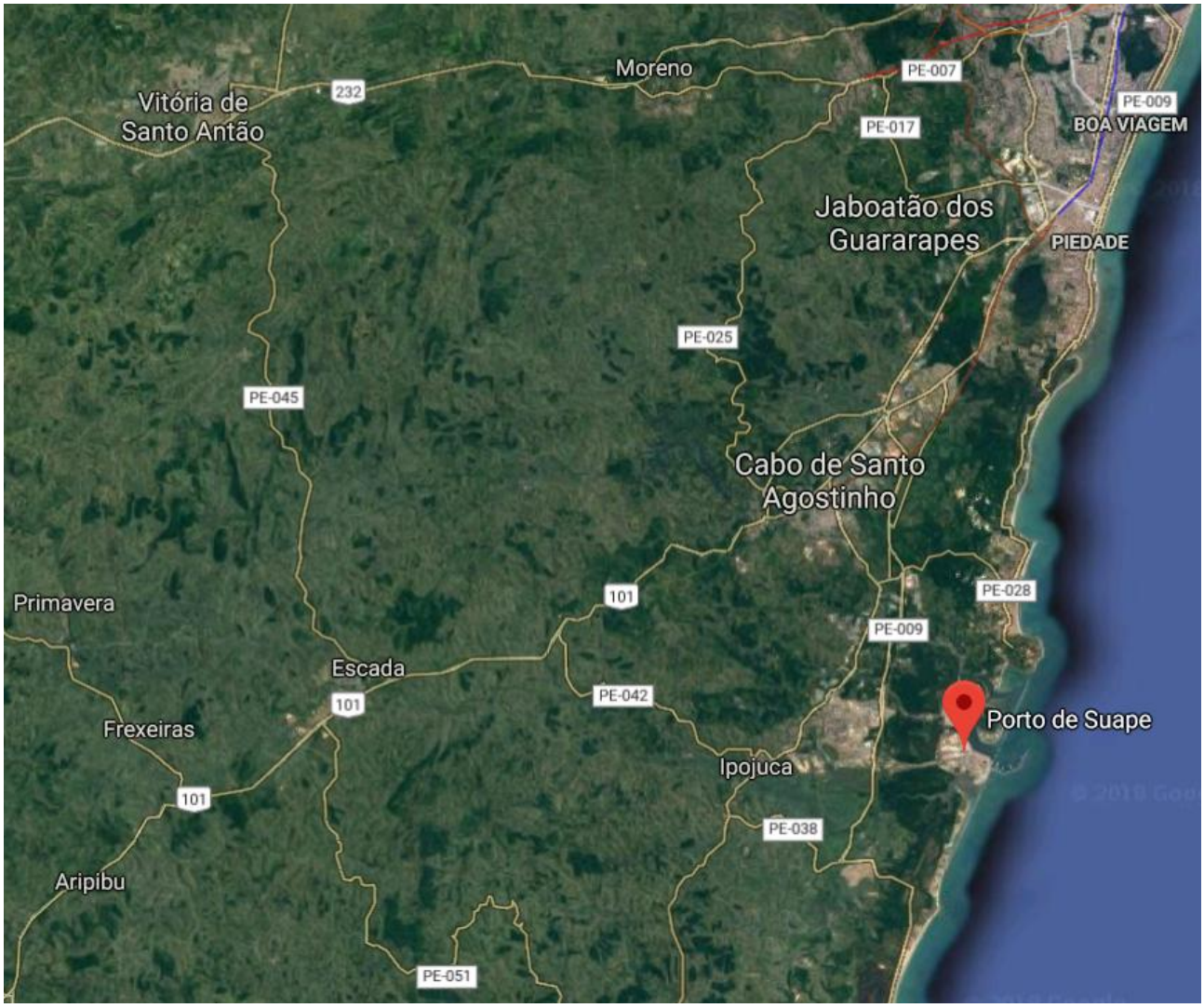

Figure 3: Road access routes to the Suape Port Complex.
Source: Own elaboration, from Google Earth

3.3. Rail Access

Rail access to the port is done by *Ferrovia Transnordestina Logística* – FTL (former CFN). Between the stations of Cabo and Ponte dos Carvalhos, there is a Rail Distributor Line (TDF) which has a 23 km long road, built using metre gauge on concrete sleepers.

Currently, the railway access is not under operation, according to the classification of the System for the Monitoring and Control of Rail Transport – SAFF (ANTT). However, there are projects for the reactivation of the railroad, although there is no provision for the resumption of operations. It is also important to note the expected implementation of a reverse loop at the entrance of the port to meet the segments of solid bulk, liquid bulk, and general cargo.

The following image shows the railway network associated to the Suape Port.

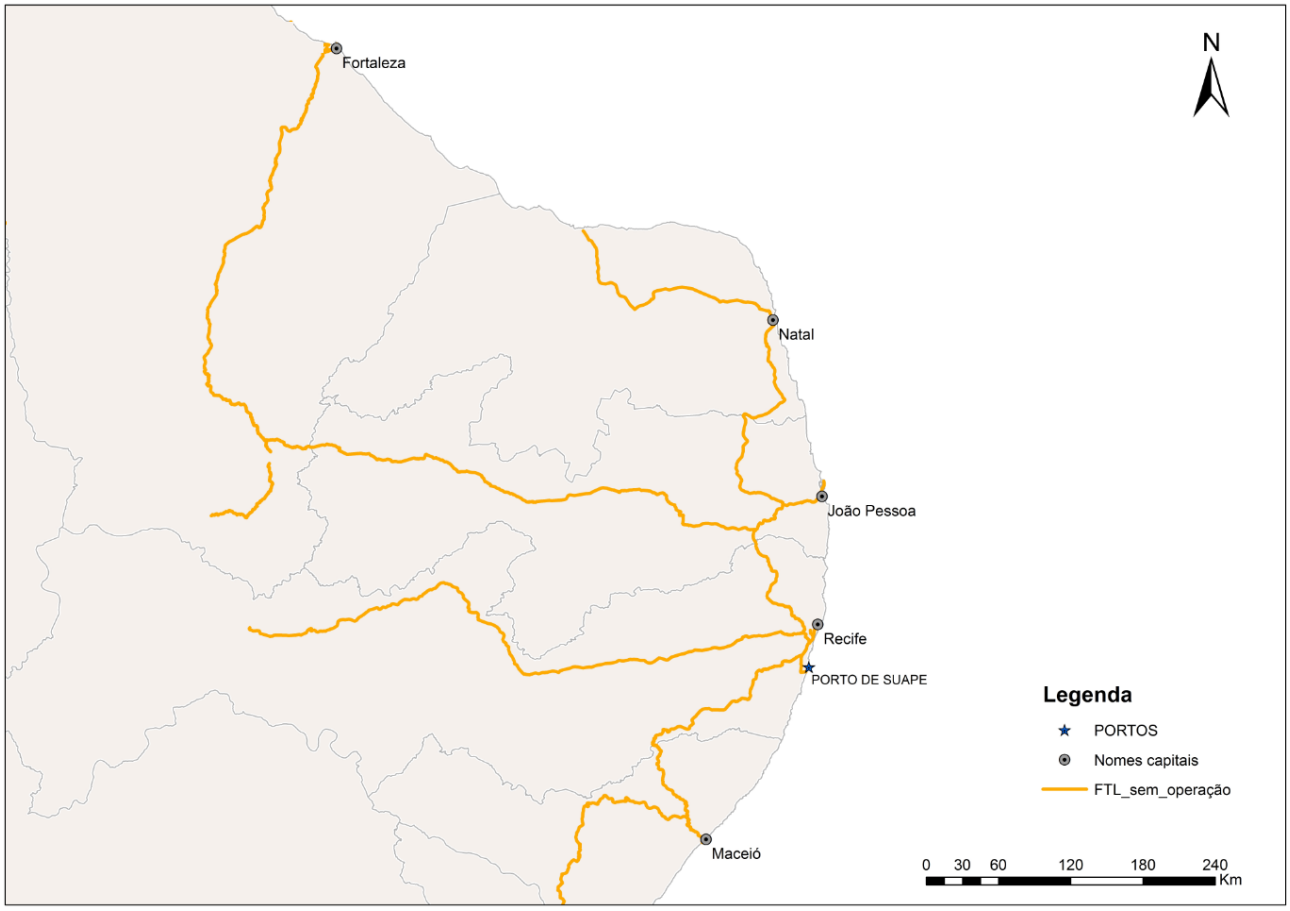

Figure 4: Rail access routes (without operation) to the Suape Port Complex.
Source: Own elaboration, from SAFF (ANTT), accessed on 13/Mar/2018.

3.4. Pipeline access

The pipeline access for cargo transport to the Suape Port occurs in specific cases, especially for crude oil operations, which arrive in the PGL-3A berth and go to the Abreu and Lima Refinery (RNEST), with right-of-way.

There are other exclusive pipeline networks from industries installed in the Suape Industrial Complex.

4. Description of the SUA05 Lease Area

The **SUA05** lease area is located within the polygon of the Suape Port Complex, in the section called "internal port", the mainland of the Port, in front of the Atlântico Sul Shipyard, located on the opposite bank of the port channel.

The Terminal is designed to move and store container cargo, and it has a projected pier of 770 meters (with two berths) and a retro area of approximately 268.967m², with possibility of area expansion.

The implement of the terminal in a green field area is expected, involving the execution of dredging, construction of berths and storage area, and the acquisition of equipment to move containers.

It should be noted that the activities developed in the **SUA05** lease area are in line with the definitions of the Development and Zoning Plan - PDZ (Feb/2010) in force at the Suape Port Complex.

The following figure shows an aerial image of the **SUA05** lease area.

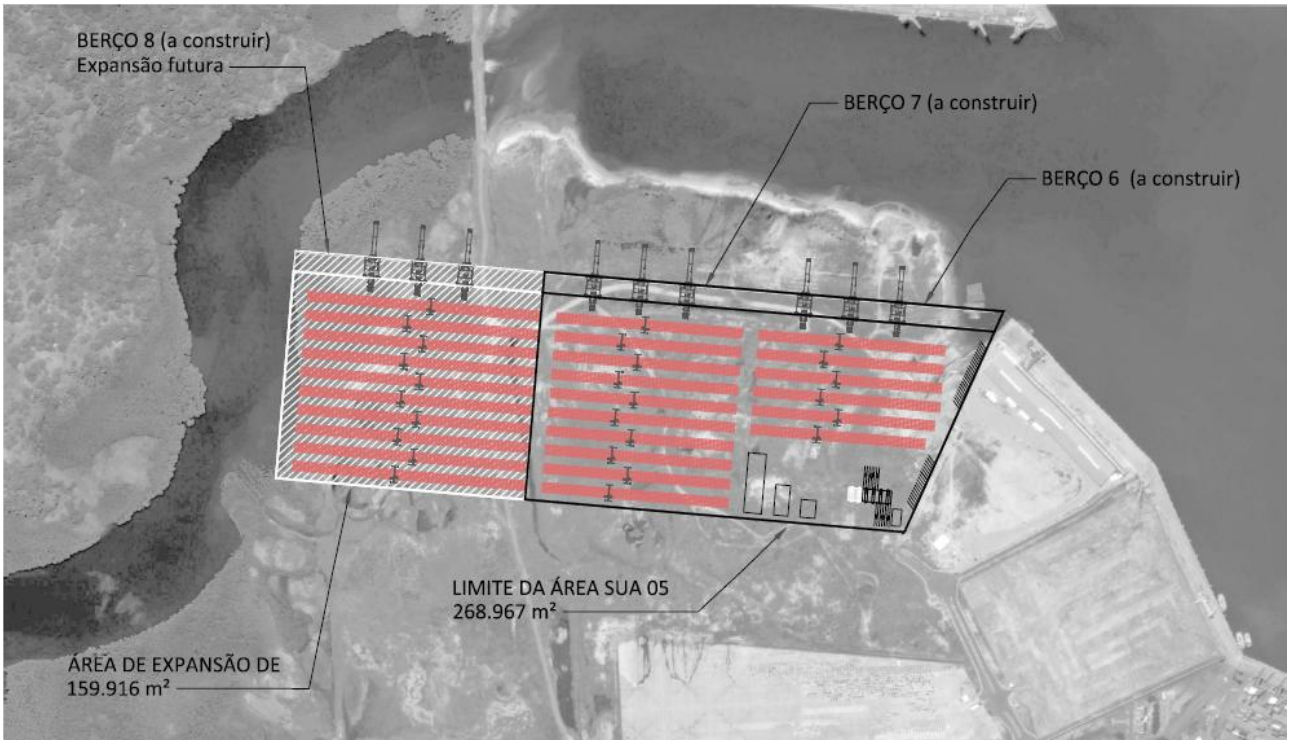

Figure 5: Location of the **SUA05** Lease Area in the Suape Port
Source: Own elaboration, from Google Earth (2018)