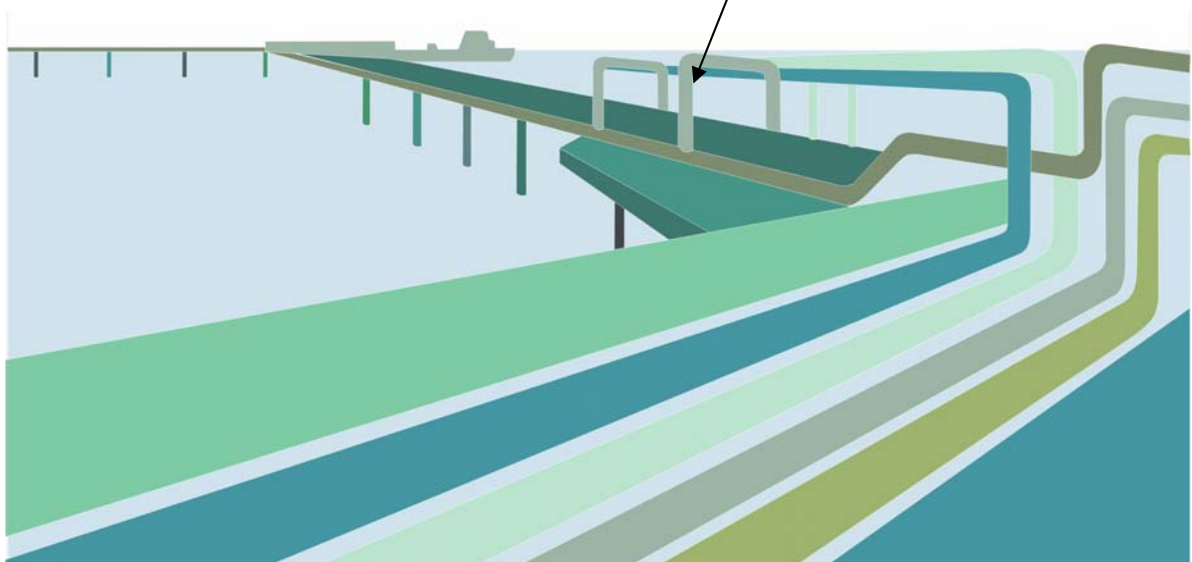
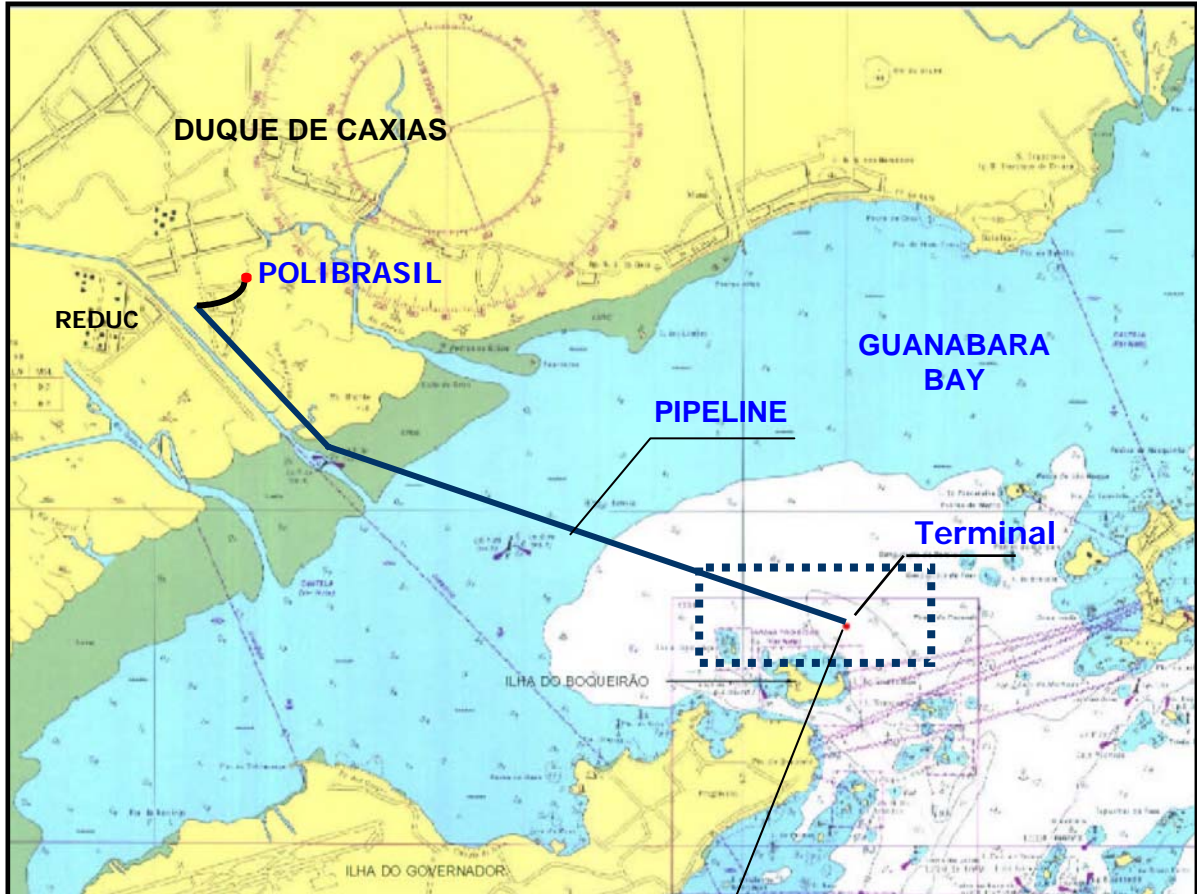
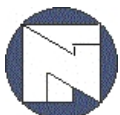


SUMMARY OF ENVIRONMENTAL STUDIES



August, 2005



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1. WHO IS RESPONSIBLE FOR THE ENTERPRISE?

POLIBRASIL RESÍNAS is a Brazilian company actually formed by the association of two large groups, Suzano Petroquímica S.A, enterprise of the Suzano Group and Basell Brasil, fully controlled of Basell International Holding (association of Basf and Shell groups), holders of equal parts of the company's capital.

Polibrasil began its activities in 1978 when it inaugurated the first factory of polypropylene of Latin America, in Mauá, in the state of São Paulo. The following year, the Camaçari unit, in Bahia, started its activities. The production of composite polypropylene begun after the acquisition of Norcon Dupont's unit, in Camaçari, in the year of 1993.

Polibrasil was the pioneer in the production of polypropylene and is presently the market leader in Brazil and in Latin America, and The group Suzano is present in several industrial enterprises in Brazil, has pioneered the development of technology for cellulose and has a significant participation in the petrochemical sector in Brazil since 1974.

In September of 2005, by means of a shareholders' agreement already disclosed by the press, Polibrasil totally belongs to the group Suzano Petroquímica.

In Duque de Caxias, in Rio de Janeiro, the unit directly responsible for the maritime terminal, begun the industrial operations in September of 1992, with the denomination Braspol Polymers S.A. Production capacity was then 110.000 tons of polypropylene per year, using propylene from REDUC, petroleum refinery of Petrobras Group.

The resins possess wide use in packing, in the production of domestic artifacts, textile industry and, given its non-toxic characteristics, are also used in the pharmaceutical industry, among others. The polypropylene composite has its chief market in the automobile industry.

Polibrasil possesses a corporate office in the city of São Paulo and the three industrial units, strategically located, have the following production capacities.

Unit

Capacity of Production (t/ano)

	Resins	Composite
Mauá-SP	300,000	0
Camaçari-BA	125,000	24,000
Duque de Caxias-RJ	200,000	0
Total	625,000	24,000

The total work force of the three industrial units has 465 employees, been that 83 of them were allocated in Duque de Caxias Unit. This Unit also has 79 third parties employees.

The product of Polibrasil are thermoplastics resins of polypropylene, with commercial name of "Prolen" and polypropylene composites. The products are marketed in the national market for about 550 customers and exported for more than 40 countries, with gross revenue, in 2004, over R\$ 2,4 billion.

Among the main equipments of the productive chain, are included: reactors, purification and distillation columns, filters, scales, boilers, pumps and compressors.

The production of resins is continuous and that of composites is in batches. The specification of the products is defined according to their application.

Special attention is given to environmental issues and safety, in all the units. The company has thus achieved certified excellence, as described below. In the same way, the commitment to socially responsible action has been placed at the top of the hierarchy of management policies.

The Integrated Management System for Quality, Environment and Health & Safety of Polibrasil possesses the certifications ISO 9001, ISO 14001, ISO/TS 16949 and OHSAS 18001 as a way to demonstrate its compromise with sustainability and continuous improvement of performance.

- ✓ Certificate ISO 9001, for Quality Management System for all company operation since of year 1993;
- ✓ Certificate ISO 14001, for Environmental Management System since of year 2000 for the three units Camaçari, Duque de Caxias and Mauá;
- ✓ Certificate OHSAS 18001, Occupational Health and Safety Assessment Certificate. Polibrasil it was one of the first Brazilian companies to receive this certificate.

Polibrasil develops processes as well as internal and external procedures to assure the identification, interpretation and application of applicable regulations and standards with all interested parts. It also guarantees the preparedness of the industrial units, the integrity of their assets and the proper maintenance and calibration of dosing and measurement equipment, the monitoring of the critical processes, the preventive, predictive and corrective maintenance schedules, and the development of engineering projects following best methods and practices.

Some highlights of the activities developed by Polibrasil are in place.

Environment, Health and Safety

All the units operate with the due environmental licenses and other pertinent legal authorizations. The unit of Polibrasil in Duque de Caxias possesses the License of Operation no.177/2002 (valid for 5 years starting from referred date issued by the State of Rio de Janeiro environmental authority (FEEMA - State Foundation of Environmental Engineering). A copy of this License is enclosed.

The environment and the safety of employees, collaborators and communities deserve special attention in the units of Polibrasil. As the provisioning of the inputs and raw materials to guarantee the continuous production of resins require the storage of toxic and inflammable products as well as fuels inside the industrial plants, possible impacts from Polibrasil's operations are controlled and minimized by means of the application of an integrated management system – Quality, Environment, Health& Safety and by implementation of Responsible Actuation Program.

The liquid effluents and atmospheric emissions are controlled with the application of more rigorous standards than those of Brazilian regulations. The solid residues are selectively collected and stored and have proper destination in all the units.

The products generated by the customers from the polypropylene are not toxic and their eventual impacts are limited to material accumulation and visual pollution. Polibrasil also participates in the Plastivida recycling program, of the Plastics Environmental institute, that seeks to motivate recycling in the society.

Polibrasil is also a member of the program for Socially Responsible Action, ABIQUIM - Brazilian Association of the Chemical Industry. This program seeks the execution of a wide set of health, safety and environmental conservation actions.

Polibrasil also relates directly to the communities. The communities' needs are mainly identified by means of the Advisory Community Council and the Managerial Associations: Group Synergy located in Mauá (APOLO), COFIC - Committee of Industrial Fomentation of Camaçari, ASSECAMPE - Association of Campos Elíseos's Companies, in Duque de Caxias and National Advisory Council of ABIQUIM.

All received requests are analyzed in accordance with the company's policies of socially responsible action. Acting in partnership with local authorities, Polibrasil also offers support in the implementation of socially relevant projects.

The employees' and collaborators' well-being is one of the bases of the operational efficiency of Polibrasil. Programs of Health, Safety and Environmental Conservation are priority areas just as the programs for personal and professional development.

All the applicable special requirements for the safety of direct employees and the work force of the companies which render services to Polibrasil are established by means of careful analysis of the risks of all activities in the work environment, for the definition of control and protective measures. Safety's special requirements include: collective and individual protection, process safety, emergency control, radiological protection, and intense training activities defined in the "Program of Training & Development".

Technology

Using the most modern technologies, Polibrasil always acts in the vanguard of the sector. Technological development is used as an important means to keep the leading position in the expansion of the polymers markets. Pioneer in the production of polypropylene in Latin America, Polibrasil was also the first plant in the world to produce random co-polymers, with LIPP technology, in the unit of Duque de Caxias in the State of Rio de Janeiro. All its units - Camaçari, Duque de Caxias and Mauá - use state-of-the-art technology in the production of the several polypropylene varieties.

Innovation

The polypropylene of Polibrasil is present in the whole range of final products of the market. The company also fosters new applications, acting as a development agent. To innovate is always the slogan that orients Polibrasil's performance in the most different levels and activities. But it has special importance for the body of engineers and technicians who act in close partnership with customers in the research and in the development of products.

Products

Polypropylene of Polibrasil is formed basically by three groups of products:

Homopolymers (homo)

Obtained exclusively by polymerization of the propylene, with excellent brightness and rigidity characteristics.

Heterophases Copolymers (heco)

Incorporating, in a specific way, ethylene molecules to the production process, a product with excellent rigidity, malleability and impact resistance is obtained, which is used extensively in the production of automobile parts, rigid packing and industrial applications.

Random Copolymers (race)

Incorporating, in a random way, ethylene molecules to the production process, a material is produced that allies excellent visual properties, as brightness and transparency, and lower fusion temperature. The Random copolymer is used in the production of domestic utensils and other products that demand high transparency.

Polypropylene Composites

The composites are obtained by the addition of minerals, impact modifiers and pigments to the polypropylene. They enlarge the range of applications, serving specific functions that demand different properties. For that, Polibrasil offers total technical support to the customers, allowing the development of products with exclusive characteristics and designed for specific applications.

All the units operate with pallets and big-bags. For the customer, the system provides for cost optimization as well as for the automation of the handling processes and of the storage of the resin.

Below are some examples of manufactured products using polypropylene produced by Polibrasil:



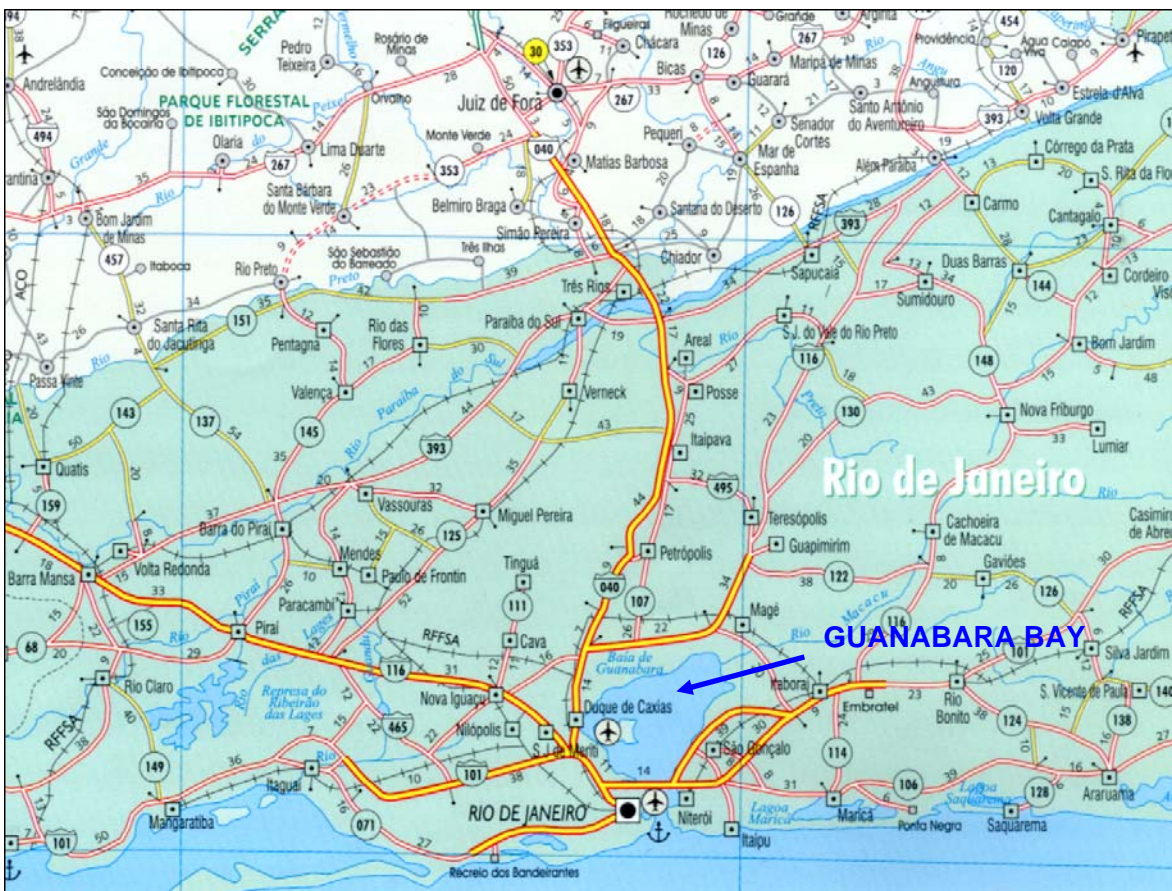


2. WHERE IS LOCATED THE ENTERPRISE?

The enterprise is located in the Bay of Guanabara, shown in the following Illustration 2.1 as part of the State of Rio de Janeiro context. The Bay of Guanabara possesses a perimeter of 131 km occupying about 16% of the total 800 km coast extension of the State of Rio de Janeiro.

In a regional context¹ the Bay of Guanabara receives an hydrographic contribution area of about 4.080 km² where about 8.2 million inhabitants distributed in 15 municipal districts presently live. The hydrographic area includes the totality of the territories of the Municipal districts of Duque de Caxias, São João de Meriti, Belford Roxo, Nilópolis, São Gonçalo, Magé, Guapimirim, Itaboraí and Tanguá and, partially, those of Rio de Janeiro, Niterói, Nova Iguaçu, Cachoeira de Macacu, Rio Bonito and Petrópolis.

Figure 2.1 – Location of the enterprise in the macro regional context



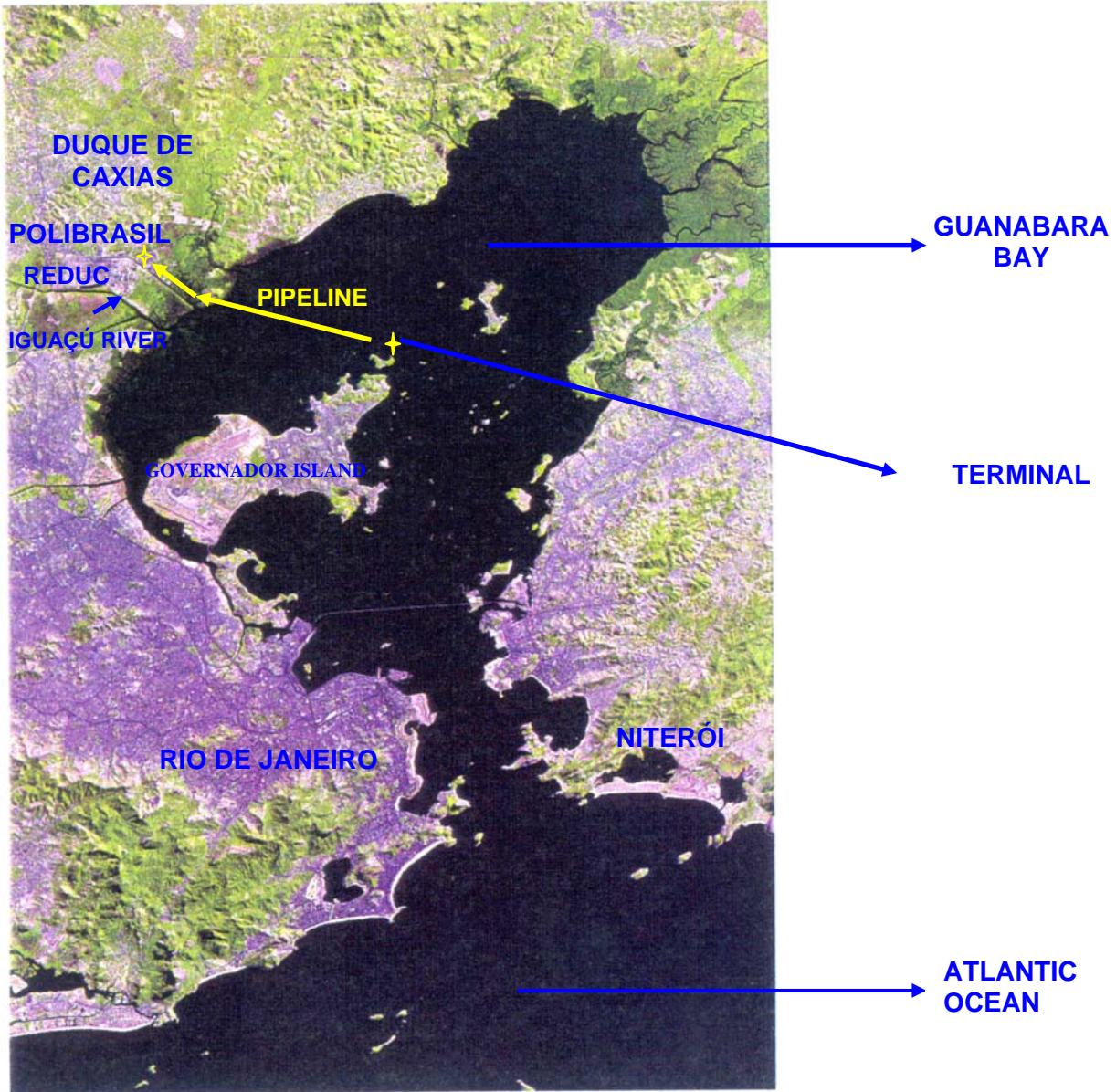
Main Characteristics of the Bay of Guanabara

The Bay of Guanabara, represented ahead in the Figure 2.2, possesses a total surface of 389 km², from which 328 km² is water surface and 56 km² are referred to the surface of the 42 existing islands. Its estimated water volume is 2 billion of m³.

¹ Project PLANAGUA SEMA/GTZ of Brazil-Germany Technical Cooperation – FEMAR, 1998

The average depth is of 5.7m, reaching the maximum value of 58m in the proximities of the entrance section. The main channel, along the north-south direction, is approximately 20 km long with 15 to 20m depth and 3km width.

Figure 2.2 – Macro Location of the enterprise in the Bay of Guanabara



For its physiographic characteristic the Bay of Guanabara constitutes a main entrance portal for the coastal zone and the sea. The Bay of Guanabara shelters the second sea port of the country with 16 petroleum terminals, 2 military naval bases and 32 shipyards of small, medium and large tonnage. It currently presents an annual movement of more than 6,000 ships and 5 fishing colonies.

The Bay of Guanabara is also used as a waterway interconnecting the cities of Rio de Janeiro, Niterói, Paqueta and São Gonçalo, with a movement of 100,000 people a day.

The management of the Department of Hydrograph and Navigation (DHN) of the Brazilian Navy measured maximum water stream velocities around 1.5 m/s at the first 5 m from the surface of the water in the main channel during the high tide and during the *sizígia* tide conditions. As the Bay enlarges in the south-north direction the velocities of inflowing tide decay to values between 0.4 and 0.6 m/s to the east and north of the Governador Island. In the most interior areas close to the mangroves regions, to northwest and east, the speeds can drop below 0.3 m/s in the periods of low tide where low circulation occurs.

Pollution Sources and Quality of the Waters

The hydrographic contribution area of the Bay of Guanabara, where presently live and operate about 8,2 million inhabitants and 6.000 industries shelters 25 basins and more representative sub-basins, whose main water courses serve as a way of transportation of most of the pollution generated in the continent that flows to the bay through each respective stream's mouth.

The main source of pollution in the Bay of Guanabara is generated by the disposition of several treated and non treated industrial effluents. Based on studies accomplished between 1991 and 1993 (Agreement between FEEMA and JICA (Japan International Cooperation Agency), it has been estimated a load of domestic organic effluent of 383 t/d of BOD and about 80 t/d of industrial effluent distributed within the municipalities of the contribution basin. The western and northwestern areas of the Bay generate about 78% of the total domestic organic load and 70% of the industrial organic contribution.

The results contained in the FEEMA/JICA study previously mentioned show that most of the important parameters of water quality of these of fresh water bodies presented violations in terms of Class 2 standards, considering as reference Res. CONAMA 20/86 (presently substituted by the Res. CONAMA 357/05, which maintained similar parameters for most regulated parameters). The Dissolved Oxygen - DO, for example, presented values lower than 1.0 mg/l against a reference of 5 mg/l, while the Biochemical Oxygen Demand - BOD reached 24 mg/l, against a reference of 5 mg/l.

Since 1994 the Anti Pollution Program of the Bay of Guanabara – PDBG, financed by IDB (Interamerican Development Bank) and OECF (Overseas Economic Cooperation Fund of Japan) has entered in course for investments in infrastructure of basic sanitation, involving projects, construction and expansion of treatment stations, emissaries, collecting network, as well as projects and systems for urban solid residues until the year of 2010. The program has helped to improve areas of larger urban concentration of the bordering municipal districts of the Bay of Guanabara. However, the program has had successive construction delays and most of the collecting network as well as projects associated to urban solid residues have not been built.

The waters of the Bay of Guanabara at the station GN-20 located in the vicinity of the terminal under consideration, the average concentrations petroleum hydrocarbons (measured as oils and greases), Kjedadhl nitrogen, ammonia, phosphorus and heavy metals also presented several violations in relation to reference parameters.

The low circulation allied to the daily load of pollution and sediments, has induced the existence of areas without biological activity (dead area) in regions of the Bay of Guanabara mainly at its western/northwestern portion.

Due to the delay of construction of the collecting network and treatment stations planned by the PDBG we can consider that the current situation, without new publishing, is similar to the FEEMA and JICA studies developed between 1991 and 1993, meaning that only 15% of the sewage produced by the population of the Bay of Guanabara contributing basin is treated.

Superficial Sediments

In relation to sediments several studies have been accomplished by FEEMA² (1980/1986, 1997) and FEEMA/JICA³ (1991/1993) for the area of the Terminal and Transfer Pipeline Plan represented by the sampling station of GN20 (between the Governador Island and Iguaçú River–close REDUC). They showed maximum concentrations of 0.004 mg/g (Cadmium); 0.55 mg/g (total chromium); 2.4 mg/g (zinc); 0.12 mg/g (lead); 0.12 mg/g (copper) and 0.0025 mg/g (mercury) in anthropogenic fraction (<200 mesh), fraction of present metal in sediments with more facility of being absorbed by the aquatic life, reaching the man through the alimentary chain.

The accomplished studies concluded that in spite of the non existence of quality patterns for sediments with relation to heavy metal and of its high concentrations observed, particularly at the western/northwestern regions of the Bay when compared with the remaining, it can be affirmed, through analyses accomplished in fish and mollusks, that such contents are still below the advisable limits for the World Organization of the Health – WOH and the Food and Drug Administration – FDA.

Mangroves

Mangroves are ecosystems of arboreal formation, characteristic of the sheltered coasts of the inter-tropical strip, located in soils of recent formation and conditioned to the tide variations. The distribution of this vegetation is controlled mainly by the climate, tidal regime, salinity and substratum type, to which it has been adapted in morphologic, physiologic and reproductive terms. They are better developed in low energy environment, with muddy soil containing high organic matter content. Its degree of structural development is a function of the answer of the species to a sum of environmental factors, which can vary in intensity and occurrence frequency.

The vegetable species occurring in mangroves are typically tolerant to salted waters, being developed at the protected coastal zones, plains or muddy beaches and at the margins of rivers in several parts of the world. To these vegetable species other components of the flora and of the microscopic and macroscopic fauna are associated. They are adapted to a substratum periodically flooded by the tides and with great salinity variations.

The mangroves are considered natural nursery so much for the characteristic species of this environment, as for fish and other animals that migrate for the coastal areas during at least a phase of their life cycle, as for spawning. Its function as natural nursery for several species of this ecosystem as fish and others animals' shellfishes derives of its structural organization: its intricate radicular system offers shelter and food for larvas of fish and others. Oysters and eatable crabs stay in mangroves during all its vital cycle,

The mangroves are natural sources of renewed nutrients that have an important role in the ecology of the coastal area, including the protection and stabilization of the coastal line. They are adapted with high temperatures during the whole year and high precipitation. They are the most prominent coastal ecosystems in tropical and subtropical areas of Caribbean, Latin America and Africa. From mangroves are obtained products such as wood, charcoal, honey, oil, tannin, animal protein, etc., which are explored by the population that live nearby.

² One Evaluation of the Quality of the Rio de Janeiro's Coastal Waters – Project PLANAGUA SEMA/GTZ of Brazil-Germany Technical Cooperation – FEMAR, 1998

³ Idem

These mangrove systems have found in the Bay of Guanabara an ideal place for their development because of the large areas of swamps. In the 18th century mangroves reached⁴ a surface of 257 km² from a total surface of the Bay of Guanabara of 454 km², meaning 57% of the total surface.

Large sections of the original mangrove ecosystem have been destroyed. A map of the Guanabara Bay in the beginning of the 20th century shows that many downtown areas of the City of Rio de Janeiro itself were built on mangrove and swamp ecosystems. The largest regional sanitary landfill, Metropolitan Sanitary Landfill, is located in Duque de Caxias, lies a few kilometers to the Northwest of the maritime terminal, receiving 6,000 tons of garbage per day, and was built on original mangrove.

The anthropic action during the urban expansion to habitation for low income population, including vegetation suppression for landfill for quarter construction and carcoal production until the present time took to a devastation not only of the surface of the Bay of Guanabara, reduced in 15% - from 454 km² to 389 km² - but mainly the mangroves that were reduced from 257 km² to 80 km² - about 69%.

As the urban expansion was developed in the west and northwest region of the Baía de Guanabara, are in these regions where located the main degraded mangrove area.

The Terminal is located in the northwest of the Bay of Guanabara, where practically do not exist fishing activities. In the mangrove swamp region (where existing the tide's influence) the unique activity is related with crabs' hunter.

Around of 70% of 80 km² of existing mangrove area is concentrated in its majority in the eastern area of the Guanabara Bay - Area of Environmental Preservation of Guapimirim.

In spite of the recognized importance of the mangrove only since 1975 this ecosystem has been considered as permanent preservation of the vegetation by federal law that it instituted the National Forest Code.

⁴ Amador, E.S - Bay of Guanabara and Peripheral Ecosystems: Men and Nature. -Reproarte Editora; 1997

3. WHAT IS THE ENTERPRISE?

It is a maritime private terminal for receiving propylene for the unit of Duque de Caxias of Polibrasil, with a frequency of 8 ships/month and a transfer pipeline with about 12 km of extension, linking the terminal to the Polibrasil Unit in Campos Elíseos, district of Duque de Caxias.

The maritime terminal is located to the north of the Island of Boqueirão, in the Bay of Guanabara and the pipeline crosses that portion of the Bay in the Northwest direction until arriving at the propylene storage area of Polibrasil, according to Figure 3.1 below, that presents the location of the enterprise in the context of its area of influence. Between the water in-take channel of REDUC and the Iguaçu River to the right of the figure, lies to REDUC, Petrobras oil refinery in Rio de Janeiro.

Figure 3.1 – Location of the enterprise in the context of its area of influence

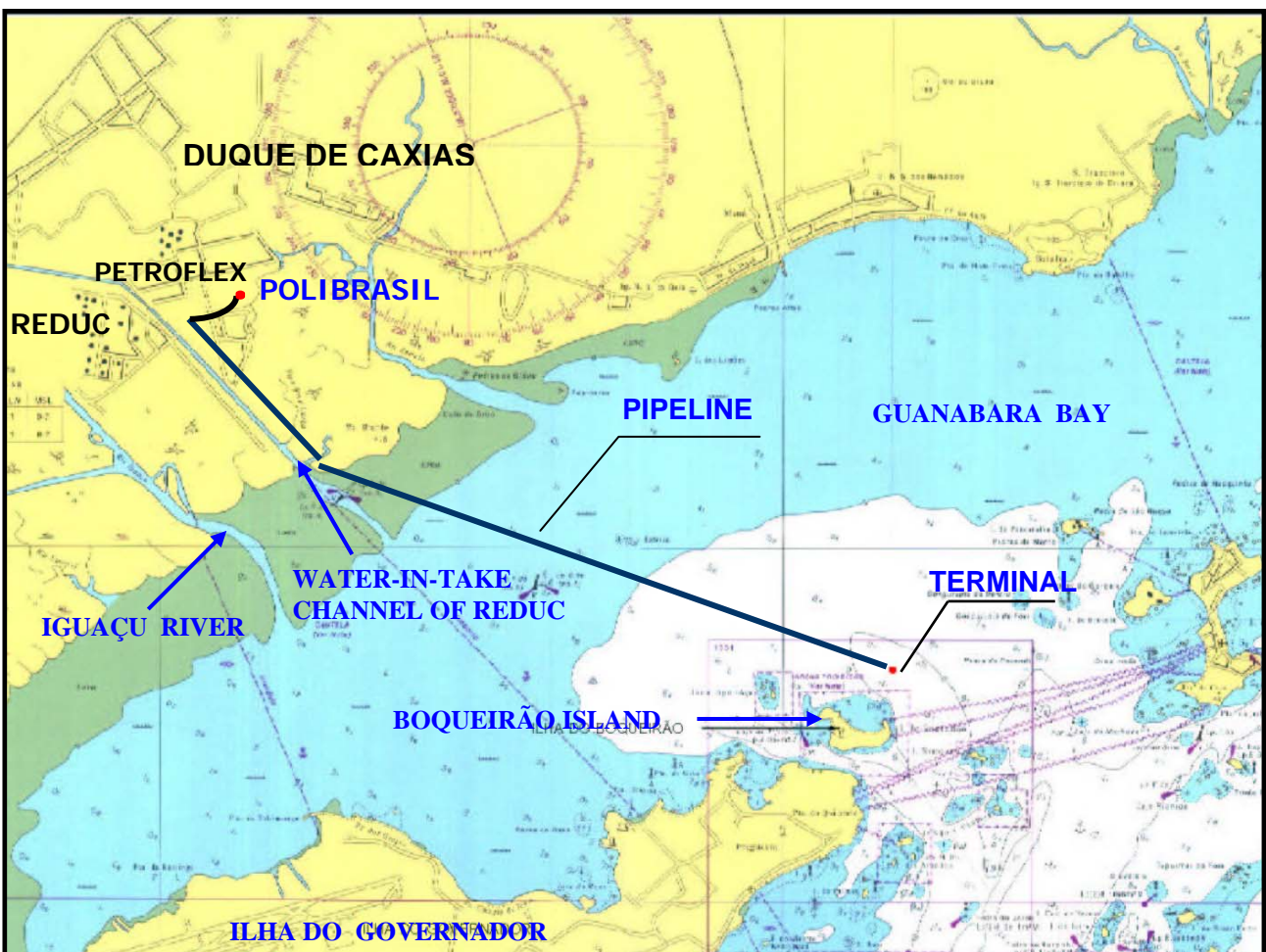


Figure 3.2 ahead presents the aerial view of the area of the enterprise shown the transfer pipeline, parallel to the left of the water intake channel of REDUC, crossing the Bay, the vegetation area and Petroflex industrial area. Looking towards the bay waters, above and to the left of the area lies to the channel São José/River Estrela, and in the upper right corner, part of the Governor's Island can be seen. Figure 3.3 presents in the upper side the overall view of the transfer pipeline crossing the industrial area of Petroflex in the direction to the Polibrasil industrial area and in the lower side, highlights view, in enlarged scale, the actual area of Polibrasil's industrial plant in Duque de Caxias and above and to the left, the transfer pipeline arriving.

Figure 3.2 – Aerial View of the enterprise region

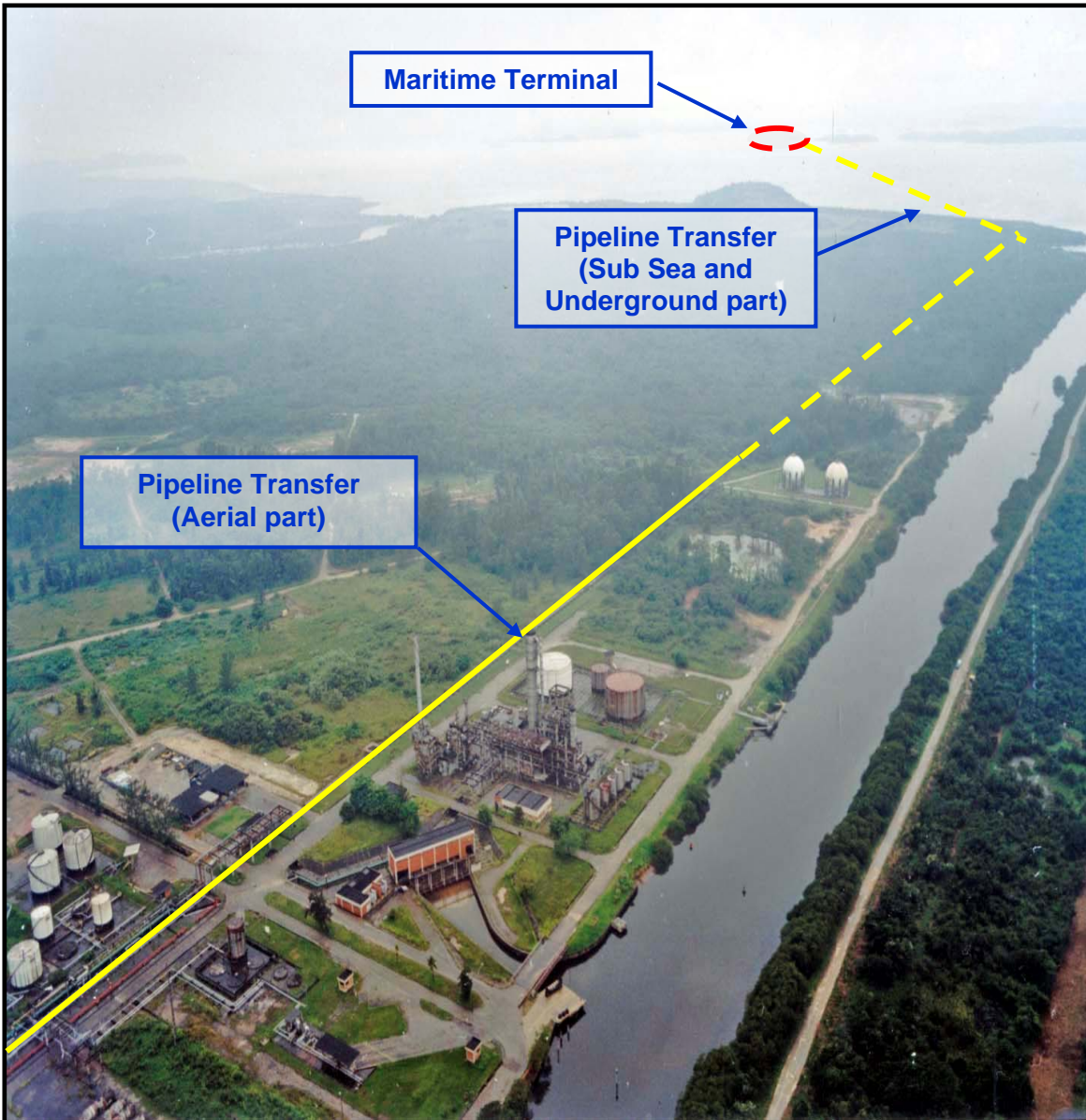
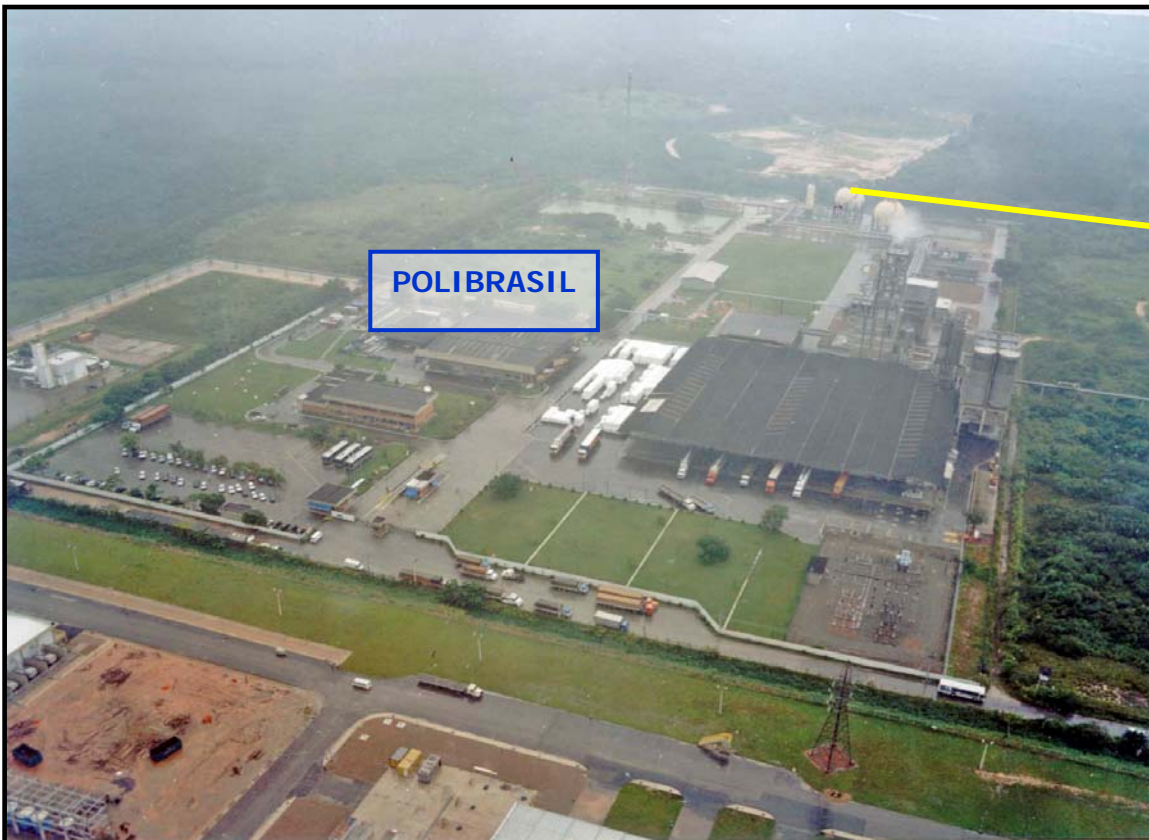
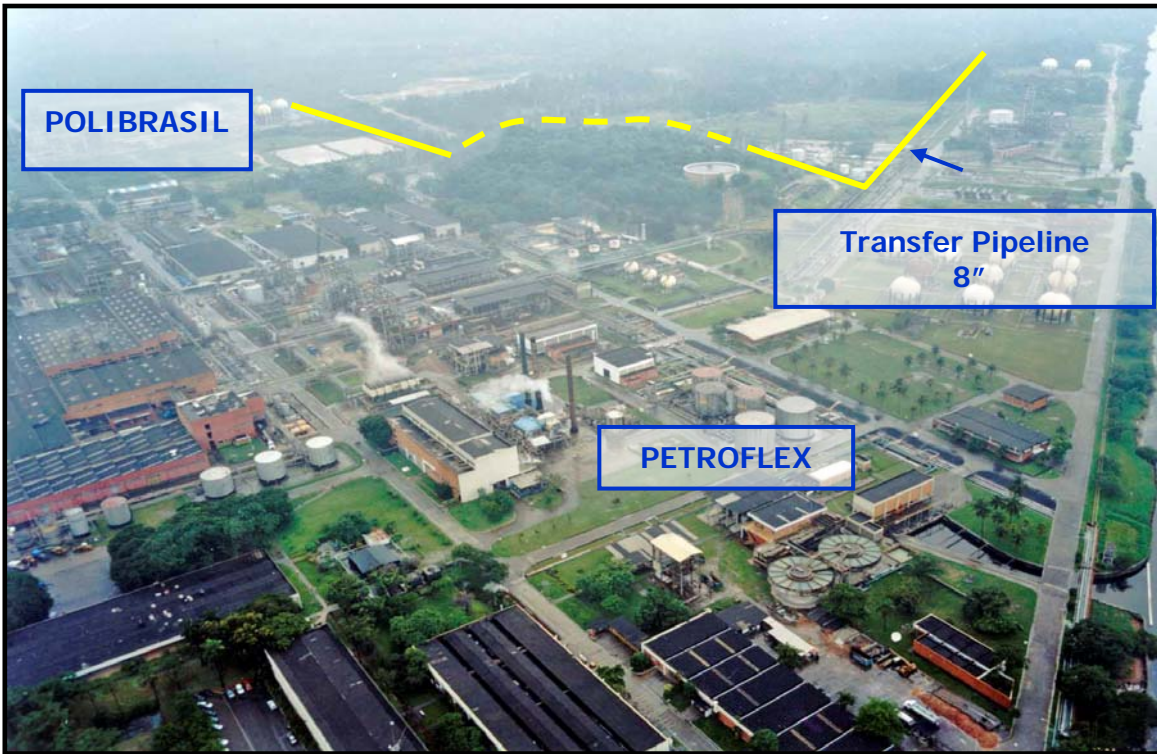


Figure 3.3 – Transfer pipeline crossing Petroflex area in the direction of Polibrasil’ industrial plant and highlights view, in enlarged scale, the actual area of Polibrasil´s industrial plant



4. WHICH ARE THE PURPOSE AND THE OBJECTIVES OF THE MARITIME TERMINAL?

Presently, the supply of propylene is accomplished by three ways. The directly supplying from REDUC, through a multi-purpose Petrobras pipeline shared by REDUC, Petroflex, Transpetro, and Polibrasil companies, that originates in the Maritime Terminal of Redonda Island in the Guanabara Bay and trucks loaded at the Petroquímica União - PQU, located in Mauá, São Paulo. These trucks carry propylene for more than 500 km and cross areas densely inhabited to reach the unit of Polibrasil in Duque de Caxias.

The supply by multi-purpose Petrobras pipeline which also carries LPG and others products, on the other hand, causes frequent problems of contamination of the polymer grade propylene necessary to Polibrasil production. In addition to this problem, there is also the need to maintain safe stocks for the continuous production of polypropylene, which, given the priorities of pipeline operation by PETROBRAS, is not always met.

The current logistics of road supply, in spite of Polibrasil's safety measures, presents social risks - propylene is a dense, flammable gas, with hazardous characteristics similar to LPG – as this risk growth if the supply of propylene by trucks will be made in order to support the expansion production capacity to 360,000 tons/year of polypropylene. This expansion carries out an increase of trucks trips/month from the actual 109 to 417, growth of 380%.

The implementation of the maritime private terminal and of the propylene transfer pipeline, under Polibrasil's operation and maintenance certificate standards, will allow the direct and safe supply of significant amounts of propylene by sea, without increase of the current risks, allowing better control of the quality of the raw material and ensuring a more reliable supply. These are essential prerequisites for the sustainable expansion of polypropylene production in Duque de Caxias, which will generate more qualified jobs as well as more taxes for the municipal district, the State and the Union.

The Terminal and the Transfer Pipeline are essential for increasing the safety and reliability of propylene supply and, therefore, essential for the increase of the capacity of polypropylene production to 360.000 ton/year in Duque de Caxias. This increase will meet market growth in its fullness and will enlarge the direct and indirect social and economic benefits of Polibrasil.

5. HOW WAS THE LOCATION OF THE MARITIME TERMINAL AND PROPYLENE TRANSFER PIPELINE DEFINED?

For the definition of the location of the maritime terminal and transfer pipeline, the following factors were taken in consideration:

- ✓ Ship type - defines the necessary local depth, the access characteristics, and the maneuver areas; the maximum draft of 8.5 m leads to a necessary depth of 9.5 m for access, sailing, maneuvers, and docking;
- ✓ Proximity to Polibrasil;
- ✓ 8 " pipeline route for transfer of the propylene to Polibrasil; and
- ✓ Qualitative differential environmental aspects related with transfer pipeline route.

Maritime Terminal

Location Alternatives

Four alternatives locations were pre-selected as shown in the Figure 5.1 ahead. Alternatives A and B due to its proximity to Polibrasil, no land area with community crossed by pipeline (safety and environmental aspects) and alternatives C and D due to proximity of maritime operations, shown viability of new terminal regarding ship approach and docking maneuvers aspects.

Alternative A

This is the location closest to the plant and of the existing right-of-way of PETROBRAS' pipelines. However, it doesn't present necessary natural depth, requesting dredging for the implementation of the terminal. As it is an area of low energy in the back of Bay, it is subject to sedimentation processes, requiring a permanent maintenance dredging program, with high operational costs. This alternative was therefore discarded.

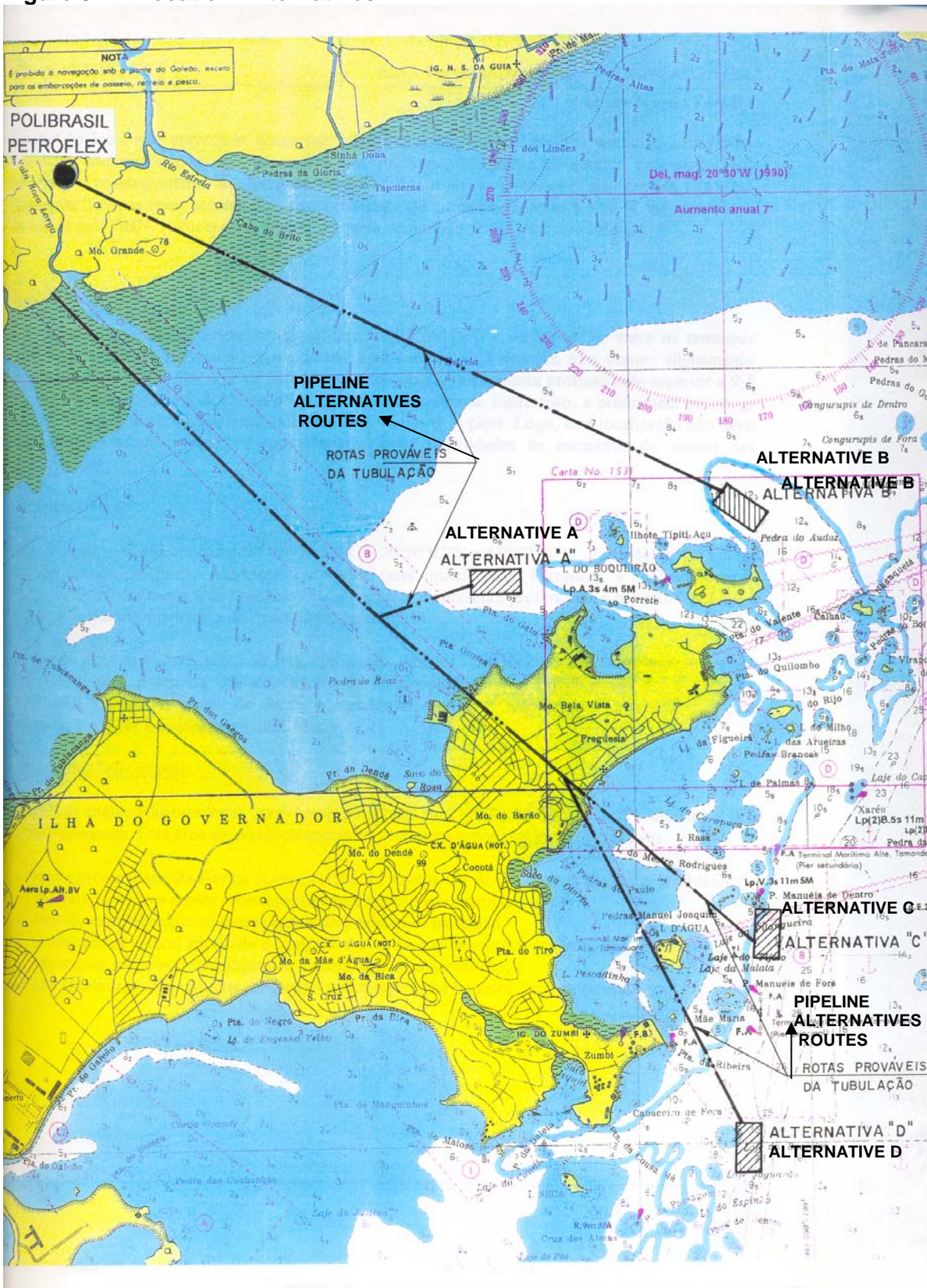
Alternative B

This location is to the north of the Island of Boqueirão (about 1 km), immediately above the restricted area defined by the Navy (forbidden area to civilian activities, fishing, navigations, etc...) and is 8.5 km straight line distance from the area occupied by Polibrasil and Petroflex. The depth is greater than 9.5 m, the minimum necessary to accommodate the largest ship expected to use the terminal.

Docking alignment was determined considering the regime of winds in the area and the indications of the currents contained in the "charts of tide currents" of the Bay of Guanabara, published by DHN – Hydrographic and Navigational Management Department, of the Ministry of the Navy.

In spite of the lack of normal commercial maritime operations and conditions this alternative allows for easy access by large ships, as confirmed by the Association of Bay "Praticos" (i.e. Official Ship Captains Association - who take control of ships entering Guanabara Bay in order to guarantee safe navigation and docking). The necessary nautical signs to define the extension of the existing navigation channel (which serves the Navy terminal Admiral Tavares, second pier) in an extension of approximately 8 km, has already been studied and analyzed by DHN. Signs for both the area for maneuvers and the zone of anchoring of the ships will also be implemented.

Figure 5.1 – Location Alternatives



Alternative C

This area is located between the terminals Admiral Tamandaré - main and secondary pier - of PETROBRAS, and would have the same alignment of the said. This location is of easy access, and presents depth greater than 9.5 m. However, the Association of Bay "Praticos" informed that ships dock both in the external and internal sides of the two Petrobras piers, than this location was abandoned due to difficulties of maneuvers and access.

Alternative D

This area is 1.5 km from to the south of the terminal Admiral Tamandaré (main pier) of Petrobras, and would be aligned with the same. This location is of easy access and presents depth greater than 9.5 m, the minimum necessary to accommodate the largest ship.

Polibrasil' plant is approximately 15 km in a straight line from this location, and the pipeline would have to cross 1.5 km of dense population land in the Governor's Island. In case the pipeline were to avoid the safety and institutional restriction, this extension would reach 18 km.

Selected alternative

Alternative B was selected as the most appropriate. This area presents the following advantages over the other alternatives:

- ✓ greater proximity to the plant (except for alternative A, discarded due to natural depth), causing the smallest investment in pipeline and construction;
- ✓ lack of interference with existing facilities and terminals;
- ✓ appropriate and compatible natural depth;
- ✓ doesn't require permanent dredging; and
- ✓ Doesn't require land crossing of densely inhabited areas, therefore causing smaller social and environmental risks.

Alternative Port Facilities

Four alternatives were studied for the port facilities, to know:

- ✓ single floating buoy;
- ✓ four floating buoys;
- ✓ fixed platform with docking dolphins and floating buoys for ship alignment; and
- ✓ fixed platform with docking and ship alignment dolphins.

For the selection of the terminal type to be installed, a multi-criteria matrix was applied. It consisted of scores and weights for each criterion, in accordance with its relative importance, obtaining a total score for each alternative. This analysis allows the hierarchization of the alternatives, reflecting an integrated technical, economic and safety aspects point-of-view.

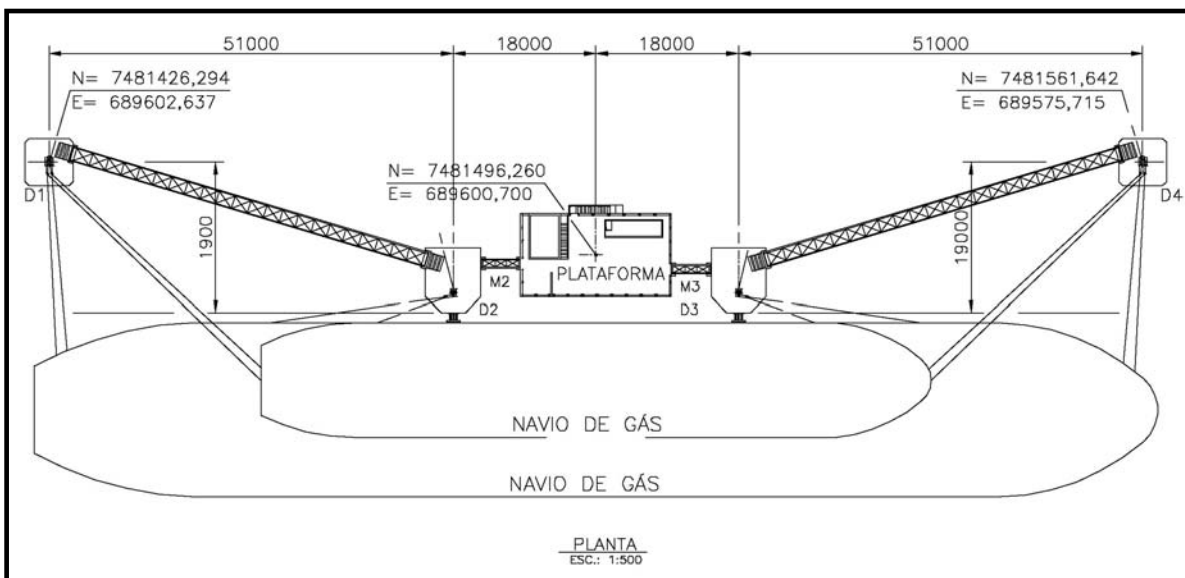
The Evaluation Alternative Matrix was established with the parameters: Safety, Operational easiness, Construction easiness, Time Schedule, Investments Cost and Maintenance aspects.

The alternative with a fixed platform and dolphins scores higher due to the weights given to safety and operational easiness.

The positive safety aspects regarding platform and dolphins are related with great resistance to ship movement caused by Bay's water movement, reducing the efforts of coupling devices between ship and propylene pipeline and installation of safety system against fire, independently of ship facilities, reduce the accident risk and if happen, mitigation of consequences. The platform will have permanent vigilance even without operation.

The operational easiness is associated with support infrastructure area regarding safety equipment and activities, operation and maintenance, besides the lower maintenance cost. The dolphins allow faster and safer docking operations and product transfer than single floating buoy or four floating buoys. This advantages associated with the investment cost level, were determinant in the results of the multi-criteria matrix evaluation. The Figure 5.2 below shows the basic layout of the platform and docking system.

Figure 5.2 – Lay-out of docking system

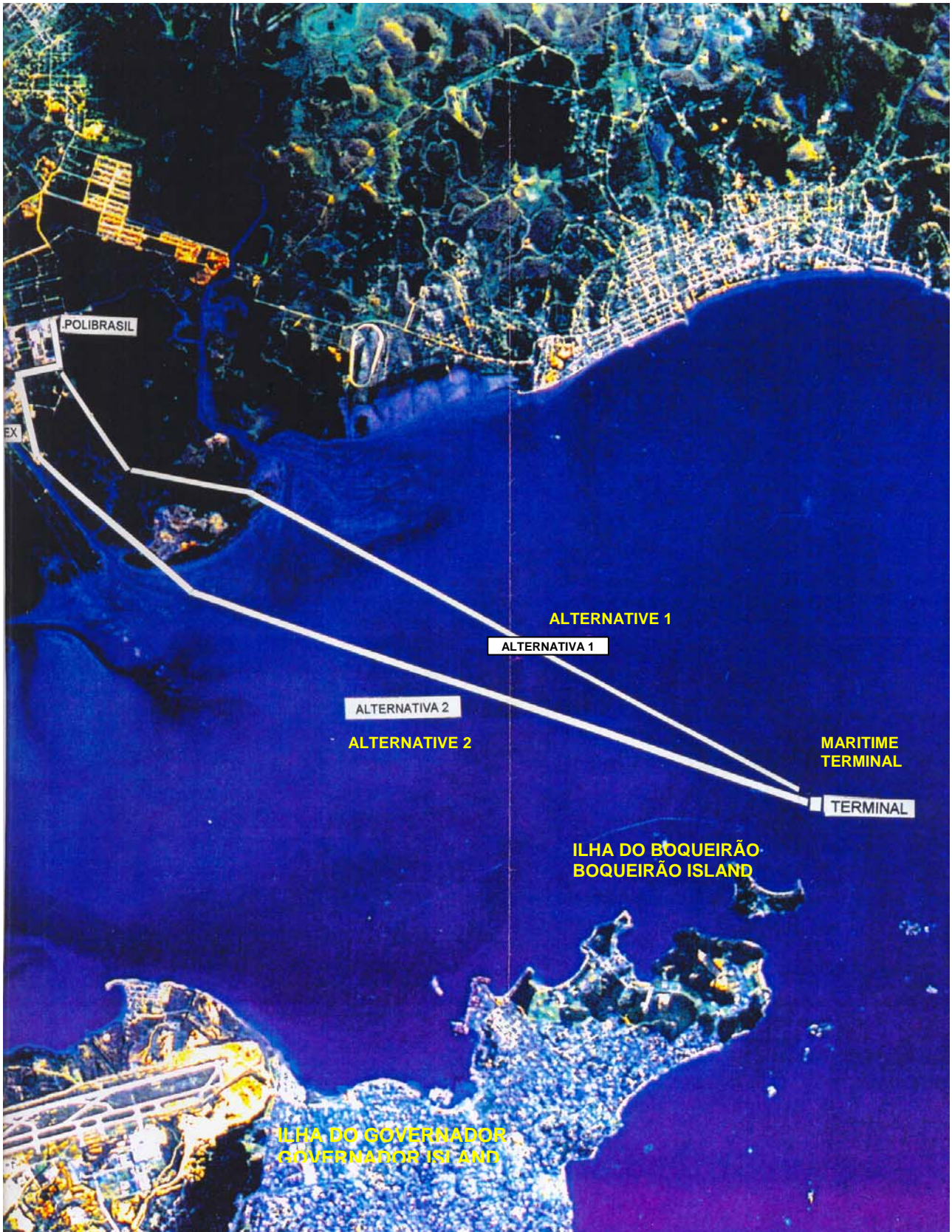


Propylene Transfer Pipeline

Alternatives Routes

Two alternative routes were analyzed. Alternative 1, is the Straightforward Route, uses the central portion of the mangrove area between REDUC's water-intake channel and the river Estrela. The Alternative 2, is near of the REDUC's water-intake channel, crosses the mangrove area in Petroflex's site, in a parallel line to REDUC's water-intake channel, some 200 meters east of same. Figure 5.3 ahead shows the two alternatives routes using a recent SPOT satellite image.

Figure 5.3 – Propylene Transfer Pipeline Alternatives Routes



Alternative 1 - Straightforward Route

This alternative was analyzed considering the conventional construction of the pipeline crossing in the central area of the mangrove, assuming that the soil would offer adequate support, allowing conventional road access by trucks and equipment. This alternative would be economically attractive given the use of conventional equipment and techniques. There would be no need for special off-shore support and specialized equipment.

This route would compensate its longer length with reduced conventional construction costs, but the mangrove area does not support such techniques, whilst a flooded ditch solution would face severe construction problems, due to the lack of sufficient flow in permanent water channels.

Besides such problems, this alternative would also divide the mangrove area in two separate portions, and would interfere with a dense micro drainage system in the central part of the mangrove as well as with rock outcrops close to the elevation of Island of Morro Grande, with greater environmental impact.

As shown in the pictures below, this alternative would have to cross several intermittent drainage channels which are the very arteries of the mangrove ecosystem, as well as two streams which start close to REDUC's water-intake channel and flow in the direction of the river Estrela. The *in loco* verification of land support conditions demonstrated the impossibility of conventional construction methods, later confirmed by specific tests. One can only cross the area on foot where there are trees, using their horizontal roots and branches. As one approaches the drainage channels it is only possible to advance using wood planks or tree branches.

In the swamp-areas, with lower vegetation, it is not possible to walk.

Picture 5.1 – Alternative route 1 – crossing the central portion of the mangrove



Alternative 2

The Alternative 2 considers the pipeline route close of to the channel, with a distance of the 200 m of the margin of the channel in the Petroflex' side. This alternative for the method of construction of the *release in flooded ditch*, doesn't need access route for construction or inspection when in operation, what reduces the area of deforestation to the minimum, limited the technique of opening of the ditch where the tube will be seated. This distance of the margin of the channel allows avoiding the inconvenience of the periodic dredging of the channel (what can take to collapses and the traffic of embarkations in the channel).

In this alternative the pipeline has a total length of 12 km, being 10.2 km buried, 7.9 km in the marine part and 2.3 km in the terrestrial part, including 1.8 km in growth of mangroves area. In the other 1.8 km final until Polibrasil, the pipeline follows aerial road for the industrial area of Petroflex.

Selected alternative

Alternative 2 was selected on the basis of its technical feasibility and smaller environmental impact on the mangrove ecosystem.

6. WHAT IS NECESSARY TO IMPLEMENT THE MARITIME TERMINAL AND PROPYLENE TRANSFER PIPELINE?

Terminal and Auxiliary Facilities

As described previously, the type of selected terminal was Platform with Dolphins for docking operations and will be built in the area whose central coordinates are 22°46'20"S and 43°10'55"W. Dredging won't be necessary since the area presents appropriate depth, compatible with the ships which will dock at the terminal.

The Maritime Terminal, represented by the Drawings 6.1 (lay-out) and 6.2 (sections) ahead, it will be constituted by an operation platform with a total area of 288 m² (12m x 24m), two fastening dolphins and two mooring dolphins. The following facilities will be installed on the platform: substation, administrative room with bathroom and sanitary treatment, propylene unloading mechanical arm, transfer pumps, small tank (0.7 m³) of diesel oil - with respective contention dike - for the emergency generator that feeds one of the fire extinguisher pumps, fire extinguisher pump with electric motor and installation for sending/receiving the instrumented PIG device (Figures 6.1.A,B,C). When in operation through the pipeline this device develops measurements of corrosion, geometry, wall thickness, haul of internal cleaning avoiding the need of permanent access for maintenance and inspection activities. Human intervention is not required for inspection and for maintenance the human intervention access will be temporary and locally defined by the PIG operation.

Figure 6.1A - Corrosion PIG

Figure 6.1 B - Cleaning PIG

Figure 6.1 C - Geometric PIG



Construction will follow the sequence of activities below:

- ✓ Stakes will be hammered by specialized boats
- ✓ Pylons and platform floor will be formed and receive concrete on-site
- ✓ Arms and inserts will be placed;
- ✓ Office and other facilities will be erected;
- ✓ Docking and ship handling equipment will be installed; and
- ✓ Pipeline work, pumps and instrumentation will be placed.

Construction and commissioning is expected to be completed within 11 months.

Propylene Transfer Pipeline

Construction and placement of the pipeline of 8 inch diameter and 12 km length will be based on API (American Petroleum Institute) 5L GRB and in DNV (Det Norske Veritas) - Rules for Submarine Pipeline Systems. The carbon steel pipes will have cathodic protection by imprinted current. The selection of the material for the pipe took in consideration the physical and chemical characteristics of the propylene and PIG use.

The pipe will be simply placed on the bottom of the Bay, launched from specialized support boats capable of welding the pipeline segments. A polyethylene anti-corrosive coating with 3.0 mm is specified for the total pipeline length.

The pipeline in both, submarine and terrestrial sections will be built in 12 months, in parallel with the construction of the maritime terminal.

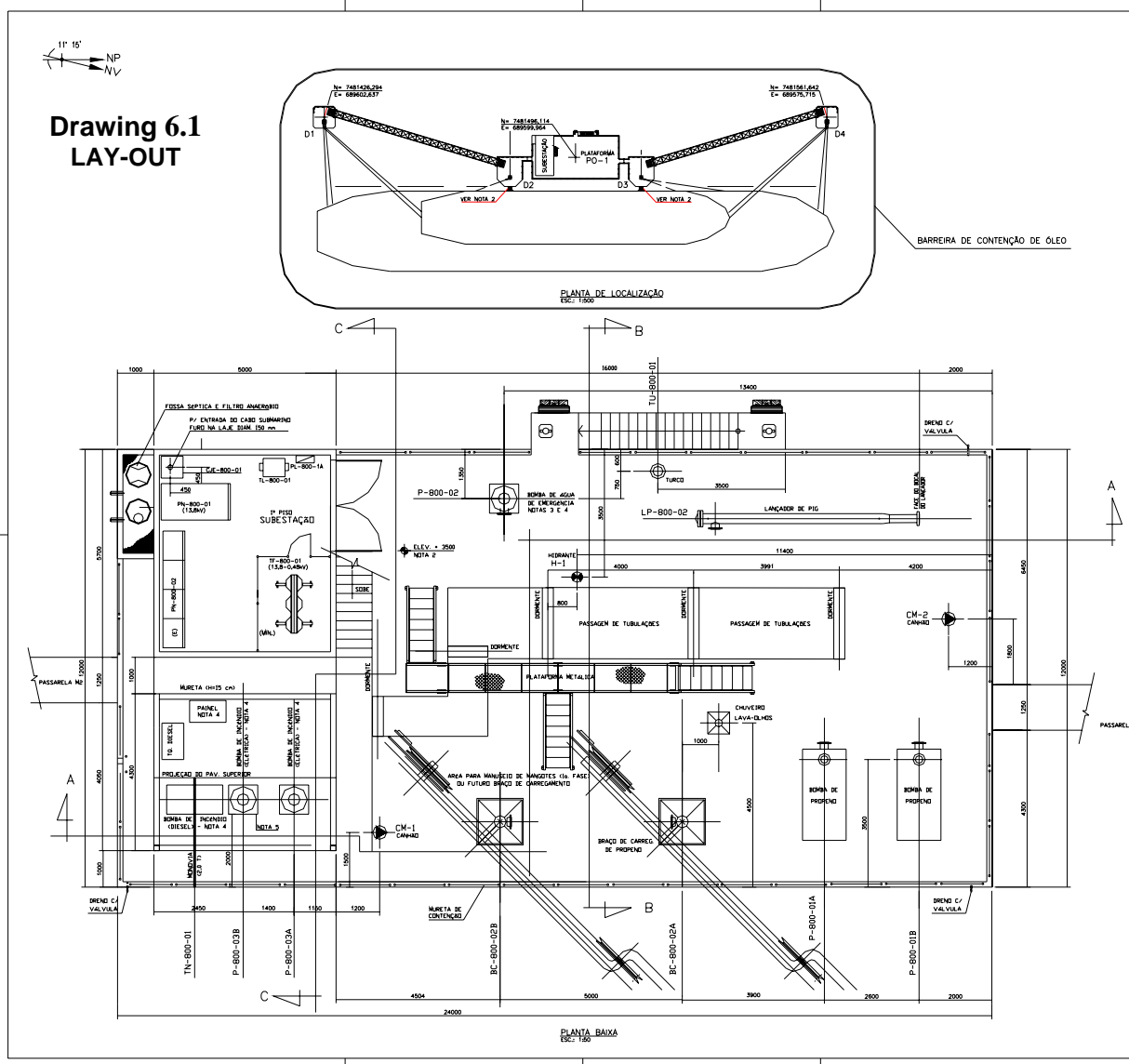
A general sketch of the release of the pipe in the mangrove area is presented in the Figure 6.2 ahead.

Investment Cost and Direct Job

The total investment cost to Terminal and Propylene Transfer Pipeline was estimated in US\$ 7.0 millions dollars and some 200 qualified direct jobs will be created for the construction stage.

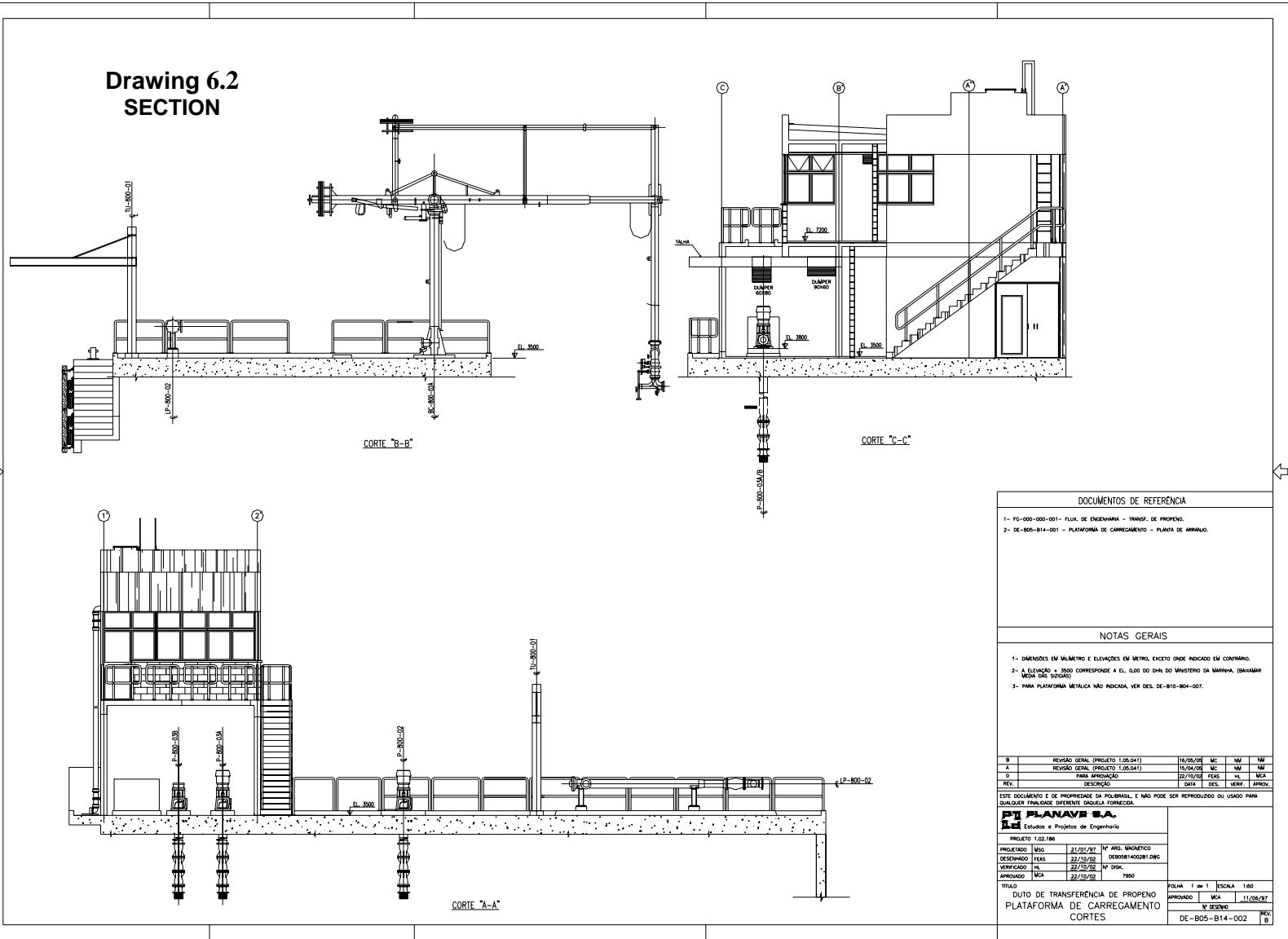
Considering inter-sectorial relationships, construction and operation will have significant direct, indirect and acceleration effects on local and regional economic activities.

**Drawing 6.1
LAY-OUT**



DOCUMENTOS DE REFERENCIA	
1-	FD-000-000-001 - FLUXO DE ENERGIA - TRANSF. DE PROPENO.
NOTAS GERAIS	
1-	DIMENSÕES EM MILÍMETRO E ELEVACIONES E METROS, EXCETO ONDE INDICADO EM CONTRÁRIO.
2-	A ELEVACÃO + 3000 ESTÁ RELACIONADA À EL. + 0,00 DO BHN DO MINISTERIO DA MARINHA - BARRAGEM NUNCA DAS SÉCULO.
3-	FURTO NA L.A.E. # 500 A SER CONFIRMADO QUANDO DA DEFINIÇÃO DO FORNECEDOR DAS BOMBAS.
4-	AS DIMENSÕES DAS BASES E PAINÉIS DAS BOMBAS DEVERÃO SER CONFIRMADAS QUANDO DA DEFINIÇÃO DO FORNECEDOR DAS BOMBAS.
C	REVISADA POR: DAS BOMBAS DE INCENDIO E BOMBA DE AGUA 16/09/02 MC NV NV
B	REVISÃO GERAL (PROJETO 1.0/04/01) 16/09/02 MC NV NV
A	ALTERADA POSIÇÃO DO HIDRANTE H1, PASSARELA E ONDE INDICADO 16/12/02 JBRFO HL MCA
D	PARA APROVAÇÃO 22/10/02 FEAS HL MCA
REV	PROJEÇÃO 1/04/02 DEBZ KREFF APPROV
ESTE DOCUMENTO É DE PROPRIEDADE DA POLIBRASIL, E NÃO PODE SER REPRODUZIDO OU USADO PARA QUALQUER FINALIDADE SEMPRENTES DA EMPRESA FORNECEDORA.	
PLANNING S.A. Estudos e Projetos de Engenharia	
PROJETO 1.02.188	
PROJETADO	DIV/ARG 21/01/97 Nº ARO, MAGNETICO
DESENHADO	FEAS 22/10/02 DEB0581400181280
VERIFICADO	HL 22/10/02 Nº DISK.
APROVADO	MCA 22/10/02 7990
TÍTULO	PLANTA 1 de 1 ESCALA: INDICA
DUTO DE TRANSFERENCIA DE PROPENO	
PLATAFORMA DE CARREGAMENTO	
PLANTA DE ARRANJO	
APROVADO	Nº DES/200
DE - B05 - B14 - 001	
REV: C	

**Drawing 6.2
SECTION**



DOCUMENTOS DE REFERÊNCIA

- 1- FG-000-000-001- FLUXO DE ENGENHARIA - TRANSF. DE PROPENO.
- 2- DE-B05-B14-001 - PLATAFORMA DE CARREGAMENTO - PLANTA DE ARRANJO.

NOTAS GERAIS

- 1- DIMENSÕES EM MILÍMETRO E ELEVACIONES EM METRO, EXCETO ONDE INDICADO EM CONTRÁRIO.
- 2- A ELEVACIONES = 8000 CORRESPONDE A EL. 0,00 DO DHA DO MARINHA (BAHIA MAR MEIA DAS SUCOAS)
- 3- PARA PLATAFORMA METALICA NÃO INDICADA, VER DES. DE-B10-804-007.

B	REVISÃO GERAL (PROJETO 1.05.041)	18/08/07	MC	NM	NM
A	REVISÃO GERAL (PROJETO 1.05.041)	15/04/07	MC	NM	NM
0	PARA APROVAÇÃO	22/10/05	FEAS	HL	MCA
0	REVISÃO	1 DATA	1 DES.	1 VERIF.	1 APROV.

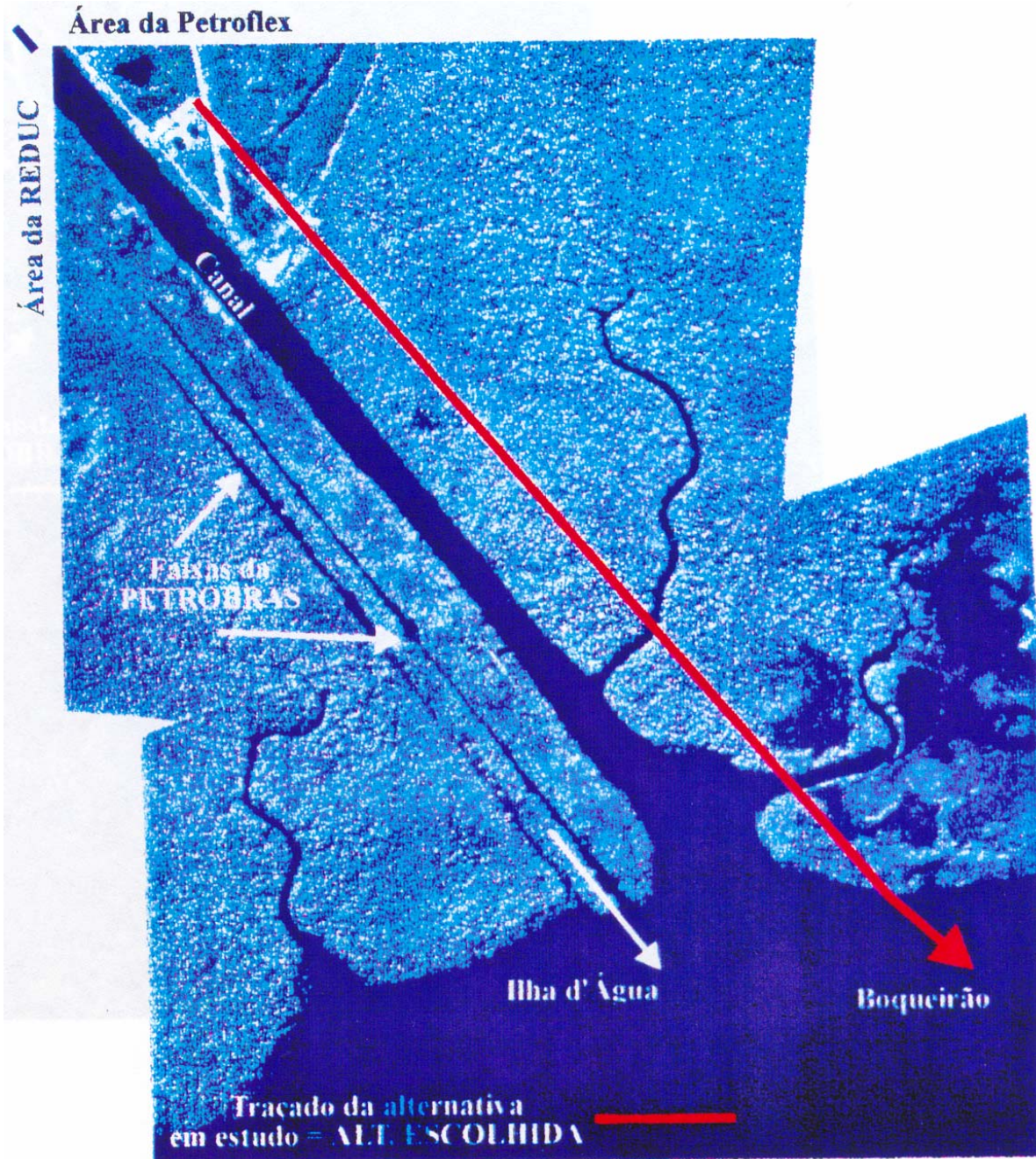
ESTE DOCUMENTO É DE PROPRIEDADE DA POLIBRASIL, E NÃO PODE SER REPRODUZIDO OU USADO PARA QUALQUER FINALIDADE DIFERENTE DAQUELA FORNECIDA.

PI PLANAVE SA.
Estudos e Projetos de Engenharia

PROJETO	1322/98
PROJETADO	18/01/97 Nº ARL. MAGREFO
DESENHADO	FEAS 22/10/02 DER0081400281.DWG
VERIFICADO	HL 22/10/02 Nº DSK.
APROVADO	MCA 22/10/02 7990

TÍTULO	DUTO DE TRANSFERENCIA DE PROPENO PLATAFORMA DE CARREGAMENTO CORTES	FOLHA	1 de 1	ESCALA	1:50
APROVADO	MCA	DATA	11/05/07		
		Nº DESENHO			
		DE-B05-B14-002			
					REV. B

Figure 6.2 - General sketch of the release of the pipe in the mangrove area



7. WHAT IS NECESSARY TO OPERATE THE MARITIME TERMINAL?

Ship Docking

The operational frequency of the Terminal will be 2 ships dockings per week, one ship at a time and only one side of the platform, as shown in the Figure 7.1 ahead. This frequency will increase only 2% of the traffic of ships in the Bay of Guanabara, actually estimate in 115 ships per week.

Table 7.1 below shows the main characteristics of the ships which will bring and unloading propylene in the Terminal.

Table 7.1 – Ship Characteristics						
NOME	LENGTH	PROW	FRONTAL LENGTH	TGW	DRAFT	STORAGE TANKS
	(m)	(m)	(m)	(t)	(m)	(m³)
METALTANQUE III	114.00	17.60	9.80	5222.00	5.50	6.118
METALTANQUE IV	123.98	17.60	9.80	8934.50	5.50	7.200
METALTANQUE V	123.98	17.60	9.80	8934.50	5.50	7.200

The following items are necessary for unloading propylene:

- ✓ a support boat of support of the type " caçapau ", for personnel's transport and small items, with the two operators responsible person unloading *in loco*;
- ✓ a barrier to avoid dispersion from oil spillage from ship as shown in Figure 7.1 ahead and communicate to contracted emergency- in- sea company that has operation in Terminal;
- ✓ a support boat for the Bay Navigation Experts and attendants, 3 (three) teams with 2 (two) attendants each, acting simultaneously in the dolphins and in the platform;
- ✓ 2 (two) tugs for mooring and demooring;
- ✓ 2 (two) platform operators.

Transfer Pipeline

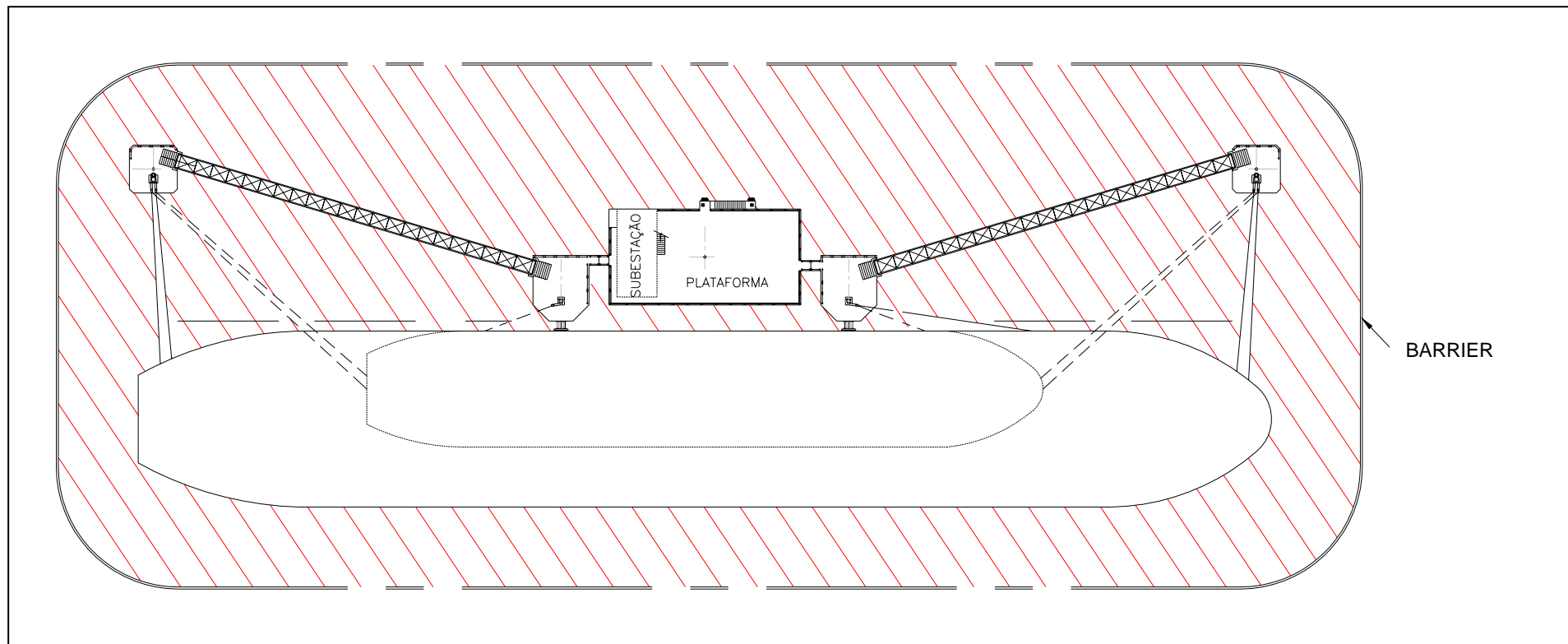
Two platform operators will assure the maintenance of all process and safety conditions necessities to carry out the transference of propylene from ship to the storage equipment in Polibrasil's plant. Standards tests of safety devices in the Platform will be developed regularly.

Communication system with radio and cellular available in the platform will contact immediately with control room in Polibrasil's plant and the internal circuit of TV will be available to monitoring the operations of ship docking, ship to platform pipeline connection and propylene transference and used as support to the vigilance monitoring.

Vigilance

- Terminal will have 24 hours guard vigilance.

Figure 7.1 – Docking ship and barrier against dispersion from oil spillage



8. WILL THE MARITIME TERMINAL AND PROPYLENE TRANSFER PIPELINE CAUSE ENVIRONMENT IMPACT?

Construction Phase

As established in section 2 of this report, - **Main Characteristics of the Bay of Guanabara**-, the enterprise will be constructed in their north/northwest region where are quiet altered by the water's quality and sediments, by heavy load from the incoming rivers draining the densely inhabited areas of the border of the Bay, by action of non controlled urban expansion with earth moving activities and vegetation destruction and slum's constructions. All these actions and activities was reduced 69% of mangrove area in the Bay of Guanabara.

The waters of the Bay are quite polluted, some portions, close to the incoming rivers Caju, Meriti, Estrela and Iguaçú, have even been declared dead (without biological activity) by FEEMA. In the areas of the terminal and transfer pipeline, where low levels of energy and renewal of the waters, silting and a heavy load of pollutants, including garbage, from the Iguacu and Estrela rivers are combined, water quality fails to meet any reasonable standard.

The rivers of this area are born in the Serra do Mar (Sea Mountain range) and reaching the Bay in the region of the maritime terminal as the Irajá, São João of Meriti, Iguaçú, Estrela, Suruí, Roncador and Guapi Açú, amongst others. These rivers crossing all the municipal districts of the periphery of the metropolitan nucleus, the suburbs of the Northern part of the municipal district of Rio de Janeiro itself amongst others such as Cachoeira de Macacu, Rio Bonito and Petrópolis. These areas have suffered intense urban and industrial growth in the last decades. Due to the poor conditions of public sanitation the rivers suffer the negative effects of this occupation, receiving in its waters all types of pollutants and common garbage that end in the waters of the Bay of Guanabara.

Several factors thus have contributed to environmental degradation, which has begun a long time before the end of the seventies introduced the processes of environmental control. Though greatly improved since this time, the problems of the Guanabara Bay remain as a major challenge. The difficulties of implementing the necessary investments in basic sanitation programs and the lack of control of urban growth in the border of the Bay, are the main causes of the current situation, in spite of the on-going (since 1994) the PDBG.

Particularly the Terminal will occupy a space relatively small and it will just demand the pylon foundations, although not having available information about the quality of the water and sediments in this space or not accomplished local environmental evaluation, and although the conditions of the natural ambient were not altered like mentioned, for that implantation they won't be necessary special works of dredging and excavations that could carry out significant damages to the aquatic ecosystem, so much in their physical aspects as biotic, or any damage to the remaining *artisanal* fishing activity of subsistence- lonely activity, without location defined, without timing, with fishing rod uses - and today, because of the environmental degradation, this activity is quite reduced in the region.

For own characteristic, the *artisanal* fishing of subsistence can be practiced in the whole area of the mirror of water of the Bay of Guanabara, about 326 km², as the terminal it will occupy about 0.000288 km² of the area of the mirror of water, it can settle down that the impact is direct, however insignificant in magnitude, because of the reduction of available area for the fishing.

The platform pylon foundations and basic working area will be concreted on site but all auxiliary components will be prefabricated and only mounted on site. Last generation equipment and

trained, certified man power will perform the construction services according to an Environmental Construction Plan adopted by Polibrasil as an integral part of the contract with the construction companies.

It is therefore clear that the main adverse impact of the construction phase will be the crossing of the mangrove area by the propylene transfer pipeline. To minimize the impacts and risks, from the project phase of transfer pipeline, two alternatives for the route in terrestrial part was evaluated, both in a total mangrove area of 5.0 millions m² as shown in the Figure 8.1 ahead and synthesized in the Table 8.1 – Comparison of Impacts and Risks.

Table 8.1 – Pipeline Routes – Impacts and Risks Comparison	
Alternative 1 Crossing the Central Portion of the Mangrove	Alternative 2 Route Close to the existing Water intake Channel
<p>The option of conventional opening of a right-of-way through the mangrove, using flooded ditch, is not technically feasible. The conditions of the natural drainage of this portion of the area preclude this possibility - few courses of water with insufficient volume for the flooding of the ditch. It might be possible to create a new channel, with more than 10 meters of width, by means of large excavation works requiring sophisticated contention, of complex and onerous execution, in order to create and maintain a strip flooded during the works. In this case the adverse environmental impacts would have high intensity and would not be reverted or mitigated in the operational phase, given type and the magnitude of the constructive interference.</p> <p>Given the high density and the load support characteristics of the area and the absence of significant channels of natural drainage, an alternative method was investigated, using special vehicles for vegetation suppression and ditch opening in soils with low pressure rate. This option was proven also unfeasible, since the soil of that portion of the mangroves only has 0.06 kg/cm² of support capacity, against a requested minimum of 0.12 kg/cm².</p> <p>The only constructive option in this route would involve the creation of an embankment strip in the growth of mangroves, with significant vegetation suppression and substitution of the soil in a width of 8 to 10 meters. This would imply, besides the adverse impacts of the constructive stage, the creation of a permanent dike preventing the circulation of the waters which is essential to the mangrove ecosystem, also besides facilitating predatory access.</p> <p>This alternative presented in the Illustration 8.1 as Alternative 1, has smaller total pipeline length than Alternative 2, however the route in the mangroves region has 2,950m of length and a width at least of 8 m, what takes an area of suppression of vegetation of 23,600 m², besides the impact to be permanent for the creation of a permanent dike preventing the circulation of the waters which is essential to the mangrove ecosystem.</p>	<p>This alternative allows the conventional implementation of the minimum strip of right-of-way for a flooded ditch, without the need of large excavation and vegetation suppression for the temporary creation of a ditch alongside the channel. The area has, besides, a less dense portion of the native growth of mangroves than that of the central area of the same.</p> <p>In this case the release of the pipes is made possible by push-on, starting from support specialized boat parked in the Bay of Guanabara. This method was been successfully used by Petrobras on the other side of the channel. This ditch would be flooded enough to guarantee the flotation of the lines during the constructive phase, given the characteristics of the natural drainage of the region close to the channel, crossed by several courses of water.</p> <p>After laying the pipes, the flooded strip - initially with about 2 meters - will be progressively clogged by sediments, which will, in time, allow for the natural regrowth of the mangrove vegetation and associated fauna. Since instrumented PIG will be used for preventive maintenance activities there should be no need for direct access to the pipes for a good many years.</p> <p>Be noticed here that the operational process foresees the use of instrumented PIG for preventive maintenance, not having need of servitude route for direct access to the pipeline for periodic inspections.</p> <p>This alternative, also represented in the Figure 8.1 as Alternative 2, has larger pipeline length than Alternative 1, however his route in the mangroves area has 2,150m of length and 2 m of width, what takes an area of suppression of vegetation of 4,300 m² at the most, besides the impact, to be temporary for the use of the technique of flooded ditch, not needing embankment for the assembly of the pipeline</p>

FIGURE 8.1 – ALTERNATIVES PIPELINE ROUTES IN THE MANGROVE ÁREA

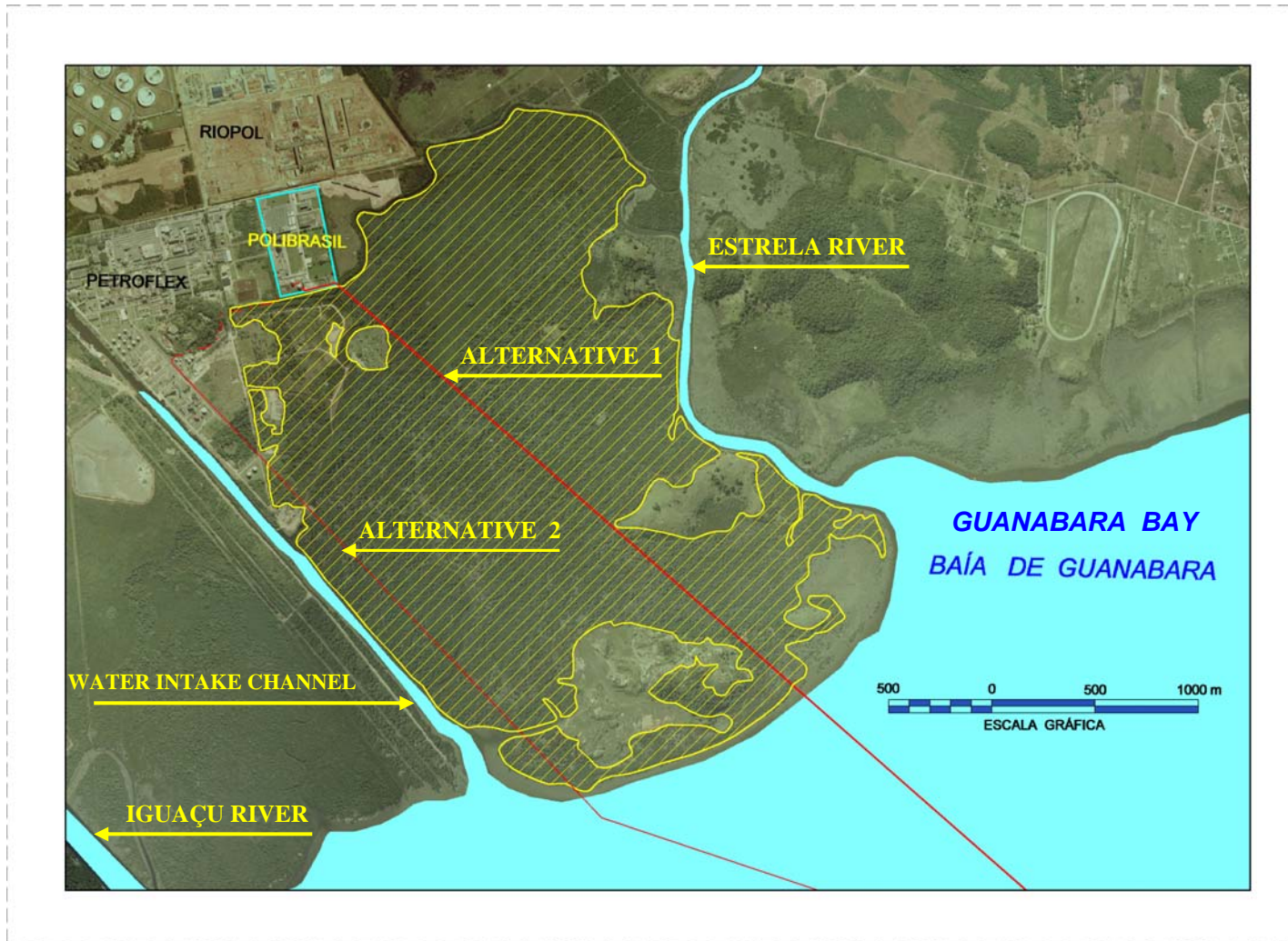


Table 8.1 above demonstrates that Alternative 1, besides greater vegetation' suppression mangrove area than Alternative 2, it carry out high intensity and irreversible permanent impacts on the mangrove ecosystem during construction and operation by the creation of a permanent *dike* of earth works for construction and maintenance inspection access. This dike prevents the circulation of the waters, which is essential to the mangrove ecosystem, also besides facilitating predatory access. This dike is not necessary for Alternative 2.

Alternative 2, using a route parallel to the existing water intake channel, carry out reduced negative impacts during construction and will allow for the gradual recovery of the mangrove ecosystem in time. The flooded ditch, after the pipeline is in place, will gradually receive sediments and will have its width reduced, allowing for the recovery of the original mangrove vegetation and fauna.

The suppression of the mangrove vegetation, for both routes, but quite minimized in the Alternative 2, has been duly discussed in the environmental studies and in the permitting process. In this context was established the Mangrove Recovery Project to be developed in the area directly impacted by pipeline route with the objective of damage mitigation. This Program has the following activities:

- ✓ Inventory of the area directly impacted by pipeline construction route with identification and evaluation of vegetation and micro-drainage;
- ✓ Construction of nursery;
- ✓ Transplantation of specimens from the area directly impacted to near safety area and seed's collecting;
- ✓ Initial development of mangrove specimens from the seeds in the nursery;
- ✓ After the final pipeline construction, in the same area, plantation of specimens developed in the nursery and recovery de natural drainage;
- ✓ Maintenance and monitoring the plantation until the first flowering.

Since, the execution of the mentioned program recovery the mangrove and the impact will be temporary.

As mentioned above, in addition of the Mangrove Recovery Program and as mangrove vegetation is protected by law, Polibrasil requested and received from Instituto Brasileiro do Meio Ambiente e dos Recursos Renováveis - IBAMA the Authorization to Vegetation Suppression number 016/2005. IBAMA is the federal environmental agency with jurisdiction over mangrove areas. One copy of Authorization is in the annex.

In this Authorization also was established, as compensation measure, the project of mangrove specimen's plantation in the total area of 5 (five) times the area damaged by the transfer pipeline implantation in the mangrove region with maintenance and monitoring until the first flowering. The location area to develop the plantation will be select by Polibrasil and needs to be accepting by IBAMA.

Operational Phase

The operation of an enterprise designed and operated as per the described characteristics and procedures, in normal situation, will not cause relevant environmental impacts neither in environmental nor in fishing activities.

Regarding the fishing activities, the platform has small dimension, 288 m², with insignificant reduction of fishing area and irrelevant increase of the traffic of supply boats to/from terminal over actual traffic, less than 2%.

Regarding environmental aspects, in normal operation, the liquids effluents generated by the maintenance activities can generate cleaning waters of devices of piping, used lube oils and oil and grease slurries, which will be stored in drums and transported to Polibrasil, that will be responsible directed to proper management to final destination to companies properly qualified and authorized by the environmental agency. The same with sanitary wastes from the bathroom in the platform of the Terminal.

Solid residues won't be generated in significant amounts in the normal operations of the terminal and receiving pipeline. Best practices will ensure that maintenance activities are controlled to minimize the generation of residues containing hydrocarbons (gloves, cloths stained by cleaning of equipments, changing pump seals, etc...). These will be properly conditioned in sealed drums and managed by Polibrasil that will be responsible to proper management to final destination.

Polibrasil will not treat residues from docking ship in the Terminal. By contract each ship has a Management Residues Plan that established the classification, local ship storage and the final local destination. Since, all residues generated in the ship is transported to the navigation company office, where trough standard document (Manifesto de Resíduo Industrial – MRI) established by environmental agency are send to the environment licensed regulatory place to disposable or to recovery company in the case of oil residues.

The fugitive emissions during the transfer operation of propylene will be maintained at minimum level as requested in the project criteria, by procedures of safety operation and monitoring trough the Fugitive Emission Control Program to maintain values lower than 500 ppm.

With objective of damage mitigation accident with oil spillage in the period of platform operation, as shown previously in the Figure 7.1, the ship and platform will be enclose by a barrier to avoid oil dispersion from oil spillage and containment to fast removable. Besides barrier, Polibrasil has Individual Emergency Plan, including oil spillage accident in sea, with specialized company to immediate action by contract.

9. DOES THE IMPLEMENTATION REGION WILL BE AFECTED BY THE ENTERPRISE?

As established previously in section 8, the significant impact of construction and normal operation of enterprise are related with the suppression of the mangrove vegetation in the right-of-way for the transfer pipeline erection. Since for this adverse impact, mitigate from the project phase by selected alternative that minimize area of mangrove vegetation to direct impact, there are a Mangrove Recovery Program and compensation and mitigation measures defined in the Authorization for Suppression of Vegetation, number 016/2005, requested by IBAMA, copy in the annex, that includes plantation of mangroves specimens in areas to be approved by himself.

All adverse impacts however will be mitigate by the best practices and specific programs in the terms of Environmental Impact Study (EIA) and included in the licensing process as:

Programs	Objectives
Mangrove Recovery Program	Impact mitigation of transfer pipeline over mangrove vegetation
Environmental Compensation Program	Plantation of specimens of mangrove vegetation in the area 5(five) times great than the area impacted by pipeline implantation
Environmental Construction Program	Supervision and audit control of construction company activities to minimize negative environmental and social impacts regarding: Management programs of solids residues, Sanitary and oily effluents and atmospheric emission of equipment, machinery, cars and bus in the construction site infrastructures. Environmental control program for construction and implantation activities in mangroves areas.
Fugitive Emissions Control Program	Monitoring of the fugitives emissions in the Terminal operation
Solids Residues Control Program	Supervision and control of generation and disposables solids residues from Terminal operation
Liquid Effluents Control Program	Supervision and control of Generation e Disposables liquid effluents from Terminal Operation

During the enterprise implantation will have small increase of vehicles circulation for material and equipment transportation to Terminal and pipeline construction and erection and service boat related with activities in the Bay of Guanabara, that are acceptable when compared with actual terrestrial and maritime traffic conditions in the region. This impact, despite negative, is insignificant, the terrestrial local traffic (industrial area of Campos Elíseos in Duque de Caxias) is great than 2,000 vehicles/day, same result is established when compared the increase of two boat daily trips during terminal construction with actual maritime traffic day in the region of 115 ship/day.

The transfer pipeline erection in part of transition area between aquatic and terrestrial ecosystem in region of mangrove vegetation will be negative and significant by the damage in the vegetation in area to be erected the pipeline, even limited by the erection methodology of flooded ditch. This impact, however is temporary by execution of the Mangrove Recovery Program and specific activities of maintenance that, respectively, will create original conditions for fast and permanent growing mangrove vegetation recovered without human interference using instrumented PIG through the pipeline for technical inspection. This device is launched or recovered in the PIG station of terminal platform.

As previously mentioned, in normal operation the enterprise won't generate atmospheric pollutants, except fugitive emissions (volatile organic compounds will always be present in installation involving connecting and disconnecting pipes and devices) but will be controlled at the minimum level allowed by the best project practice and operation of terminals of liquefied gases in less 500 ppm by specific control program, while the waste waters will always be collected and treated according legislation in the Sanitary Treatment Unit installed in Polibrasil plant. Solid residues will not be generated in the normal operations of the terminal and transfer pipeline.

The fishing activities, today non commercial and reduced as already mentioned, even with the Anti Pollution Program of the Bay of Guanabara – PDBG activities and the discontinued of predatory fishing with explosive obtained by Petrobras information and educational campaign in fisherman's colonies during last years, once the enterprise will not contributed for reduction of water quality of the North/Norwest aquatic ecosystem of Bay of Guanabara.

Not hill have relevant alteration of esthetic of natural landscaping, considering the localization and the technical characteristics of Terminal, with small dimensions in a context of others maritime terminal and the storage installation of fuel in the nearby islands.

The activities of commercial navigation, sport and amusement will not suffer any damage or loss. due to the localization of the Terminal and the technical management of the Department of Hydrograph and Navigation (DHN) of the Brazilian Navy.

Therefore, except for the positive social and economic impacts, notably in what respects safety and the economic multiplier effect of the construction and operation of the project, no significant change in the physical, chemical or biological properties of the natural environment are expected.

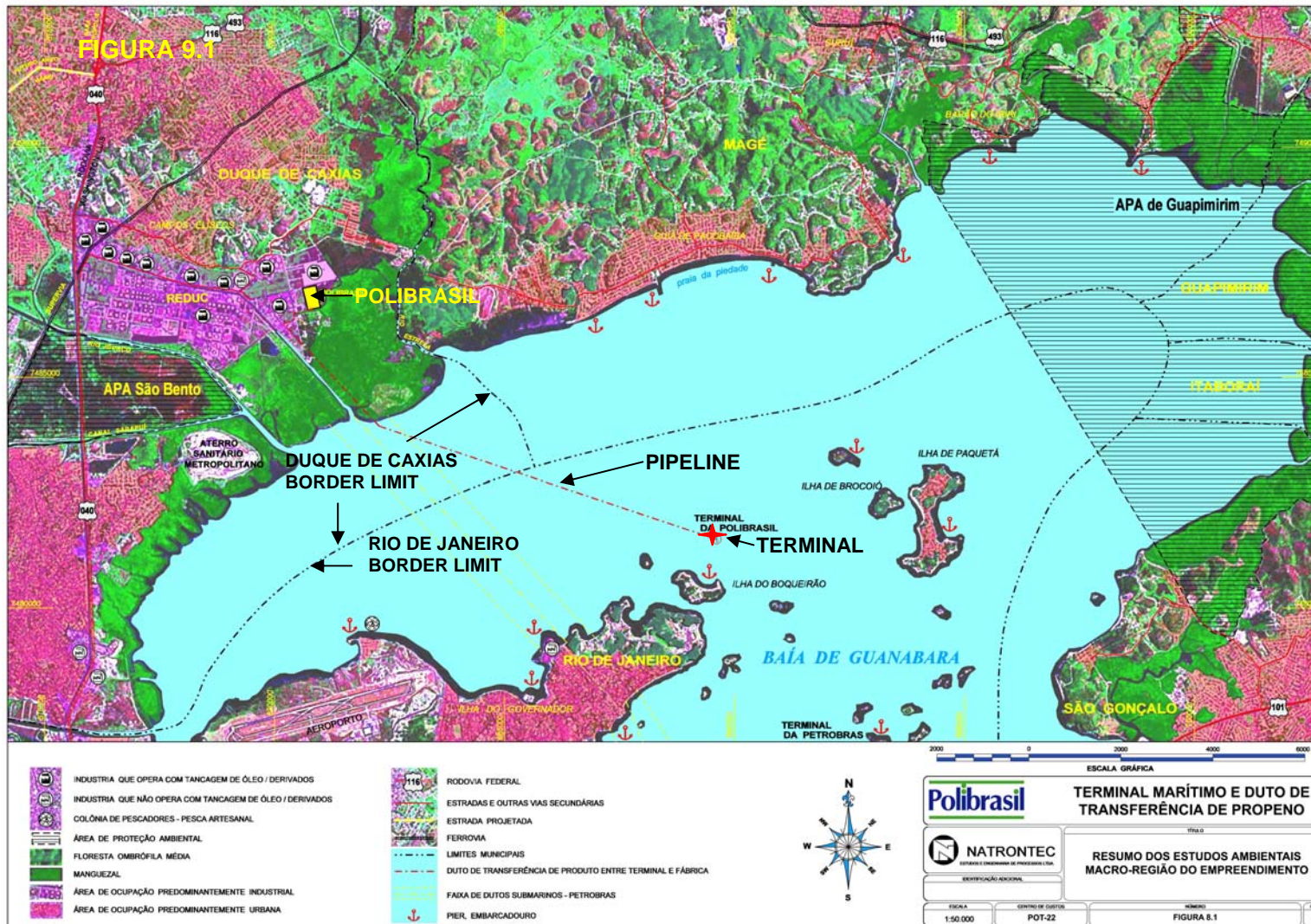
It is an investment of US\$ 7.0 million, with the direct generation of 200 jobs during the construction and erection works. Operation and vigilance will involve at least more 12 permanent jobs, all qualified at technical or university level, with monthly wages averaging of R\$ 3,000. Direct taxes during construction, calculated in a conservative way, will reach at least US\$ 950 thousand, distributed among the 3 government levels. Direct taxes at local level will reach a total of at least US\$ 100 thousand during construction, but it should also be considered, however, that state taxes (ICMS – circulation of merchandise) and national taxes (IPI – industrial production and IR – personal and corporate income) are partially redistributed to states and municipalities where they have been generated.

The Maritime Terminal is located in the municipal district of Rio de Janeiro, and the transfer pipeline to Polibrasil in the municipality of Duque de Caxias has its largest part in this municipality. This being the case these two municipalities will suffer most of the positive impacts of the enterprise, notably the economic effects seen in the light of input-output matrices - direct, indirect and induced effects. The final effect on employment and income, as well as the fiscal effect, may be multiplied by a factor of 5, depending on the degree of regional acquisition of equipment and

services. The hiring of local man-power and the acquisition of equipment from regional suppliers, whenever technically feasible, will be preferred by Polibrasil, for reasons of economy.

Figure 9.1 ahead illustrates the location of the enterprise in its regional context, highlighting land uses on a recent satellite image.

Than, could be established that are not expected significant changes in the physical, biotic and social environmental influence area of the enterprise.



10. DOES THE ENTERPRISE COMPLY WITH THE LEGISLATION, APPLICABLE STANDARDS AND LICENCING PROCESS?

Yes. Polibrasil possesses the Operating License no.177/2002 (valid for 5 years starting from referred date). A copy of this environmental License is enclosed. The company began operation in September of 1992, after complying with all pertinent legal requirements. It was then called Braspol Polymers S.A., with a capacity to produce 110,000 tons of polypropylene a year, using propylene supplied by REDUC, the Petrobras neighbor refinery.

The maritime terminal and transfer pipeline have been evaluated by a mandatory Study of Environmental Impact in 1996, which then included a capacity increase to 180,000 t/year and the construction of an additional sphere for propylene storage. The preliminary license LP was duly issued by FEEMA, after public consultation, and the LI - License of Installation, was later issued by same authority after the company presented details of environmental controls and plans, according to the regulations in place.

The maritime terminal and transfer pipeline, at that time, involved Petroflex's interest, and thus also foresaw the installation of a butadiene and styrene pipeline. The project was thoroughly discussed in a public audience requested by the District Attorney (MP) and local organizations and conducted by FEEMA (environmental authority of the State of Rio de Janeiro) with the direct participation of the MP and of its team of technical support, according to available records.

More recently and comply with the legislation the LI - License of Installation was requested considering a single propylene line to serve Polibrasil, on the basis of a review of the environmental studies in what respects the risks of the enterprise.

Given the suppression of the vegetation in the mangrove area, Polibrasil received a specific authorization of IBAMA, federal authority of the national environmental licensing system in Brazil, to whom the matter of mangrove suppression is jurisdictional. A copy of this authorization is attached to the report.

Due to the project's positive impacts in the safety transportation of propylene, the enterprise it has been declared of public interest by the Municipality of Duque de Caxias, according to decree no.4260 in April 26, 2005. A copy of this document is also attached.

It is thus a fact that the project is in full legal compliance with applicable regulations and environmental licensing process. Actually Polibrasil has gone beyond legal compliance, as shown previously in section 1, for it possesses a certified integrated management system, covering process quality / product (series ISO 9001), environmental management (series ISO 14001) and occupational health and safety (OSHAS 18001). Copies of these certificates are enclosed.

Regarding to the overall licensing process of enterprise, as information, is presented in the Figure 10.1 a simplified diagram with the stages that are in development to obtain the licenses related with the all agency listed in the Table 10.1 ahead and their integration with Installation License – LI of the environmental licensing process to be issued by state environmental agency - FEEMA.

TABLE 10.1 – Official Agencies related with the Enterprise Licensing Process

FEEMA	State of Rio de Janeiro Environmental Agency
CAPITANIA DOS PORTOS	Port Authority –Ministry of Navy
Prefeitura Municipal de Duque de Caxias	City Hall Municipality of Duque de Caxias
ANTAQ	National Agency of Aquaviary Transportation
ANP	National Agency of Petroleum
RECEITA FEDERAL –	Secretary of Incoming - Ministry of Treasury
POLÍCIA FEDERAL -	Federal Police Department - Ministry of Justice
CORPO DE BOMBEIROS –	Fireman Institution - State Secretary of Civil Defense

FIGURE 10.1 – SIMPLIFIED DIAGRAM OF OVERALL LICENSING PROCESS OF ENTERPRISE

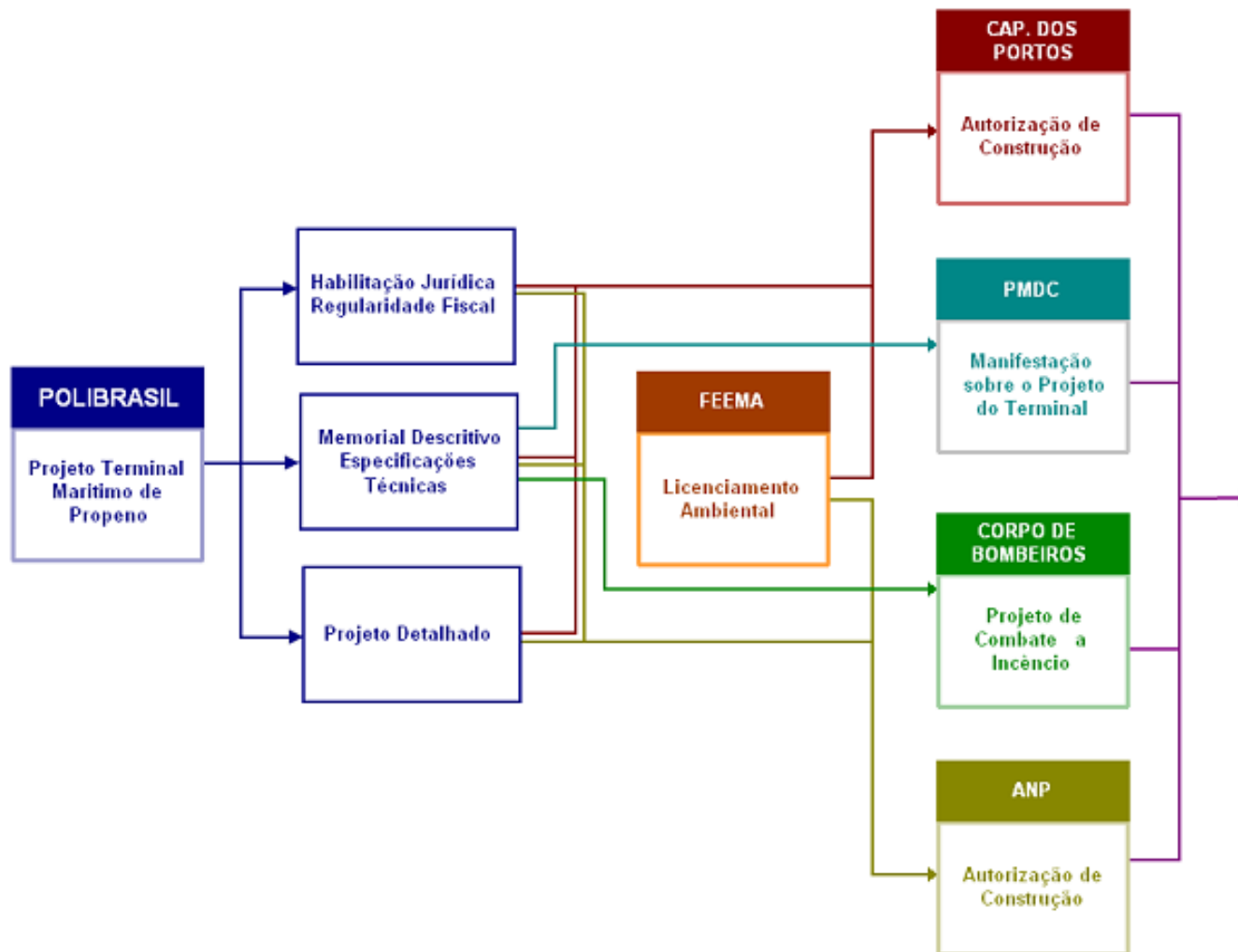
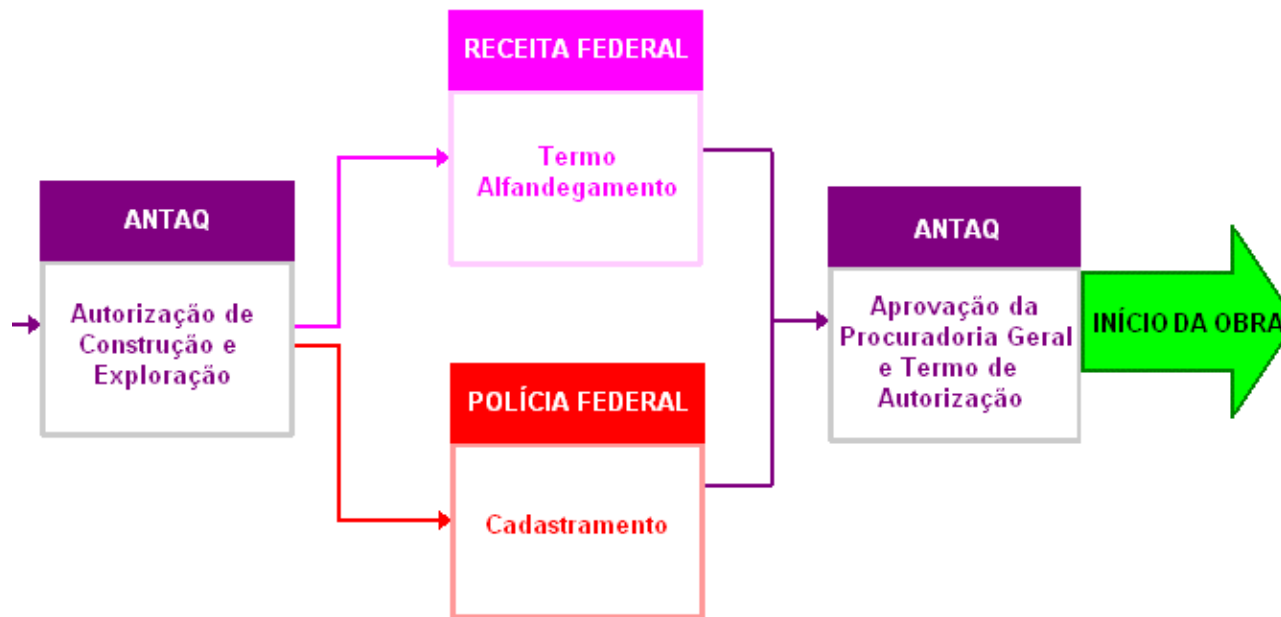


FIGURE 10.1 cont. – SIMPLIFIED DIAGRAM OF OVERALL LICENSING PROCESS OF ENTERPRISE -



11. ARE THERE RISKS IN THE ENTERPRISE OPERATION?

The risks caused by the project have been analyzed, qualitatively and quantitatively, as required by the environmental authority.

In the Preliminary Analysis of Dangers, which aims at the qualitative identification of the most critical scenarios, worthy of rigorous simulations in the quantitative analysis, 7 scenarios were selected, as shown in the Table 11.1 below.

Table 11.1 – Critical Scenarios identified by Risk Matrix Methodology	
SCENARIOS	INICIALIZING EVENTS
1.1	small leak due to a fissure in the tank of the ship (liquid propylene)
1.2	large leak due to a rupture in the tank of the ship (liquid propylene)
1.3	small leak due to a fissure in the tank of the ship (diesel)
1.4	large leak due to a rupture in the tank of the ship (diesel)
2.4	large leak due to a rupture in the piperack at the terminal - 8 " (liquid propylene)
3.2	large leak due to a rupture in the submerged pipeline - 8 " (liquid propylene)
4.2	large leak due to a rupture in the aerial pipeline reaching the spheres - 8 " (liquid propylene)

The evaluation of frequencies was followed by the simulation of the consequences of the critical accidental hypotheses, by the analysis of the vulnerability of the exposed population. The calculations of the individual and social risks of fatalities and the evaluation of their acceptability, all according to FEEMA's technical guidelines, are presented ahead.

Table 11.2 – Developed Consequences From Accidental Hypotheses and Frequencies of Occurrence			
Item	Scenario	Initializing Event	Frequency occurrence/y
1	1.1	small leak due to a fissure in the tank of the ship (liquid propylene)	3.40E-06
		· Jet fire	6.80E-07
		· Flash fire	2.69E-08
		· Unconfined Vapor Explosion	2.72E-10
		· Atmospheric Dispersion	2.69E-06
2	1.2	large leak due to a rupture in the tank of the ship (liquid propylene)	1.70E-07
		· Fire Ball	1.79E-12
		· Flash fire	4.49E-09
		· Unconfined Vapor Explosion	5.10E-10
		· Atmospheric Dispersion	4.59E-08
3	1.3	small leak due to a fissure in the tank of the ship (diesel)	1.75E-05
		Pool fire	1.1E-06
		· Flash fire	1.57E-07
		· Unconfined Vapor Explosion	1.48E-09
		· Atmospheric Dispersion	1.57E-05

Table 11.2 cont. – Developed Consequences From Accidental Hypotheses and Frequencies of Occurrence

Item	Scenarios	Initializing Event	Frequency occurrence/y
4	1.4	large leak due to a rupture in the tank of the ship (diesel)	1.00E-06
		· Pool fire	6.50E-08
		· Flash fire	9.26E-09
		· Unconfined Vapor Explosion	9.35E-11
		· Atmospheric Dispersion	9.26E-07
5	2.4	large leak due to a rupture in the piperack at the terminal - 8 " (liquid propylene)	3.02E-04
		· Fire Ball	7.55E-05
		· Jet Fire	3.78E-05
		· Flash fire	3.74E-07
		· Unconfined Vapor Explosion	3.78E-09
· Atmospheric Dispersion	3.74E-05		
6	3.2	large leak due to a rupture in the submerged pipeline - 8 " (liquid propylene)	1.85E-04
		· Fire Ball	4.63E-05
		· Jet Fire	2.31E-05
		· Flash fire	2.29E-07
		· Unconfined Vapor Explosion	2.31E-09
· Atmospheric Dispersion	2.29E-05		
7	4.2	large leak due to a rupture in the aerial pipeline reaching the spheres - 8 " (liquid propylene)	3.02E-04
		· Fire Ball	7.55E-05
		· Jet Fire	3.78E-05
		· Flash fire	3.74E-07
		· Unconfined Vapor Explosion	3.78E-09
· Atmospheric Dispersion	3.74E-05		

INDIVIDUAL RISK

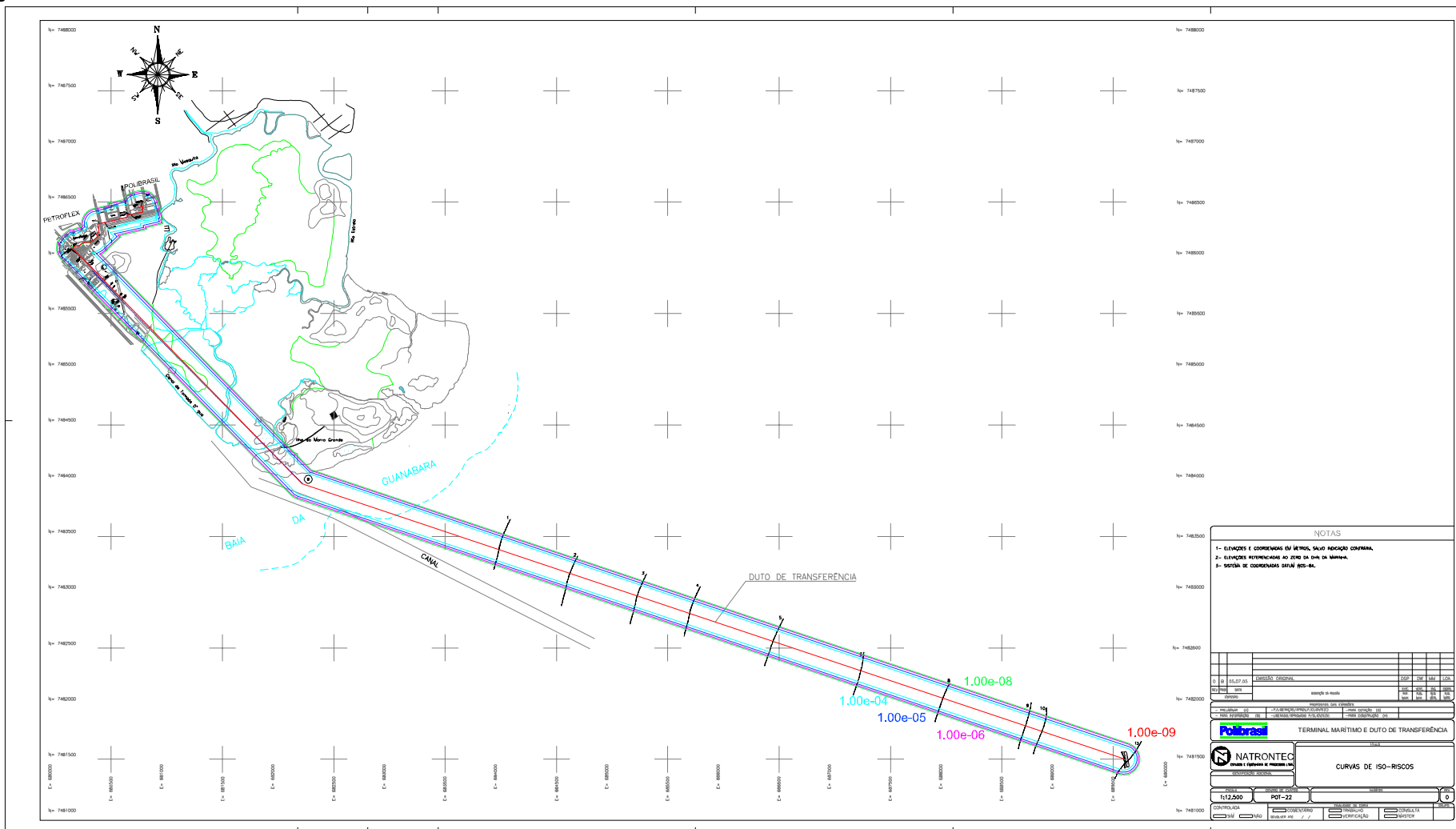
Acceptability Criteria

The acceptability of individual risk, as established by FEEMA, is defined as:

- ✓ In a new installation - the iso-risk curve corresponding to 10^{-6} fatalities a year cannot involve, partially or totally, a sensitive occupation;
- ✓ In existing installations - the iso-risk curve corresponding to 10^{-5} fatalities a year cannot involve, partially or totally, a sensitive occupation.

Plotting the project individual risk iso-curves on Figure 11.1 presented ahead, shows that the 10^{-5} fatalities/year curve doesn't reach any sensitive occupation, and therefore the maritime terminal and transfer pipeline are acceptable according to the criterion for individual risk established by FEEMA, the environmental agency authority.

Figure 11.1 – Individual Risk – Iso-risk curves



SOCIAL RISK

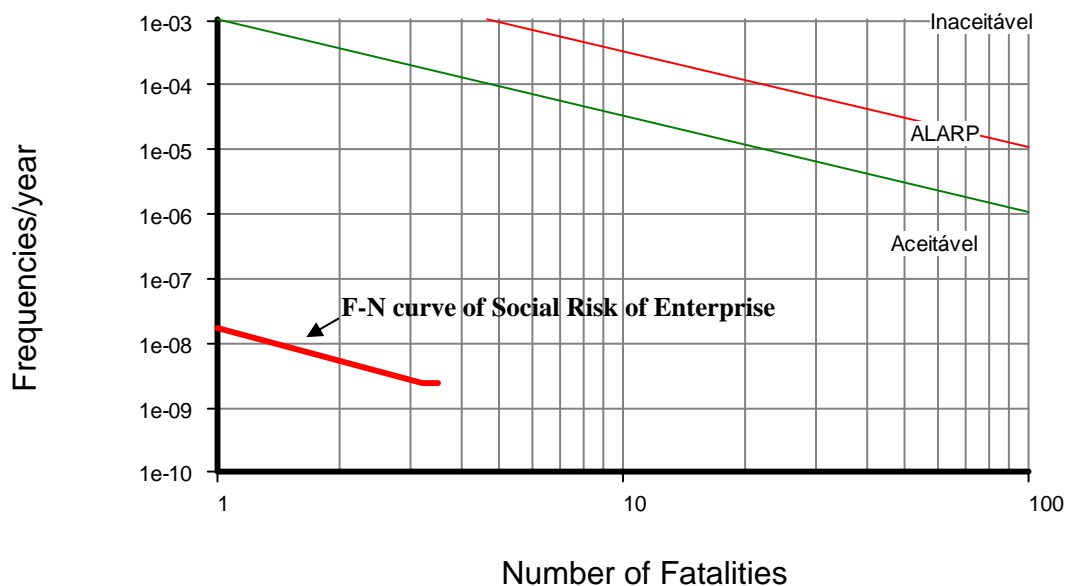
Acceptability Criteria

The acceptability of social risk, as established by FEEMA, is defined as:

- ✓ In a new installation – the F-N curve should be below or, at the most, tangent to the straight line in the lower part of the graph.
- ✓ In existing installations - the F-N curve should be below or, at the most, tangent to the straight line in the upper part of the graph.

The location of the F-N curve for the maritime terminal and transfer pipeline shown below in the figure 11.2 is clearly in the acceptable region for both new and existing installations.

Figure 11.2 –F-N Curve of FEEMA



Thus, the enterprise’s risks are acceptable according the criteria of Environmental Licensing Agency, as the individual and social risks previously presented.

The Risks Management Procedures and Safety Guaranties regarding to enterprise Maritime Terminal and Propylene Transfer Pipeline includes the maintenance and periodic inspection of equipments, instruments and pipework, by means of preventive and predictive maintenance, a Plan of Emergency Response (PAE) for the terrestrial part and a specific emergency response plan officially called Plan of Individual Emergency (PEI) for the maritime part, personnel training and the conduction of drilling exercises focusing fire fighting and oil spills in the Bay of Guanabara.

12. WHICH MEASURES SHOULD BE ADOPTED BY POLIBRASIL IN THE CONSTRUCTION WORKS AND OPERATION OF THE ENTERPRISE?

The main measures adopted by Polibrasil regarding the environmental and safety aspects are presented in this section, as programs, for the construction works and operational phases of the enterprise.

Construction Works Phase

Programs	Objectives
Mangrove Recovery Program	Impact mitigation of transfer pipeline over mangrove vegetation with plantation of specimens of mangrove vegetation and establishment of the natural micro-drainage development a natural recovery of the area impacted.
Environmental Compensation Program	Plantation of specimens of mangrove vegetation in the area 5(five) times great than the area impacted by pipeline implantation
Environmental Construction Program	Supervision and audit control of construction company activities to minimize negative environmental and social impacts regarding: Management programs of solids residues, Sanitary and oily effluents and atmospheric emission of equipment, machinery, cars and bus in the construction site infrastructures. Environmental control program for construction and implantation activities in mangroves areas.
Fugitive Emissions Control Program	Monitoring of the fugitives emissions in the Terminal operation
Solids Residues Control Program	Supervision and control of generation and disposables solids residues from Terminal operation
Liquid Effluents Control Program	Supervision and control of Generation e Disposables liquid effluents from Terminal Operation

The Environmental Plan of Construction, prepared according to international standards and to be included in the notebook of obligations of the contractors, will minimize adverse impacts during construction and assembly. It should be stressed here that the adverse impact of the suppression of mangrove vegetation by the transfer pipeline has been minimized by the selection of the alternative route with the smallest possible environmental damage.

Operational Phase

As the project doesn't alter the characteristics of the emissions, effluents and residues of Polibrasil, the current programs of environmental monitoring should be maintained, covering all discharges and pertinent means. In agreement with best practices and following the demands of DHN, special measures of marine signaling of the access channel and area of ship maneuvers will be implemented, in order to guarantee the safety of commercial ships and of sport / recreation boats in the area.

The Risk Management Plan and specifically the Emergency Response Plan of Polibrasil, important tools for the prevention of accidents and for the control of their consequences, will be updated and reinforced as a result of the more recent analysis of the risks of accidents in the terminal and in the propylene transfer pipeline.

Polibrasil will contract specialized company for sea emergency to mitigate the environmental impact caused by accident with oil spillage dispersion. As prevention measures examples, the moored ships will always receive a protecting barrier for the contention of eventual oil leaks, the pipeline will be inspected periodically by instrumented PIG for the verification of its integrity, the fire-fighting system will have the necessary resources to face all possible accidental scenarios with fire with gases and inflammable liquid and will be tested regulatory.

The Compensation Program, associated to the suppression of the mangrove vegetation, will contemplate the plantation of native species in places to be approved for IBAMA, according to a project being prepared by Polibrasil. It is to contribute towards the recuperation of critical mangrove areas of the border of the Bay, and to help revert the process of degradation of the aquatic ecosystems. With the recovery of the natural mangrove ecosystem, its important physical and biological functions will make possible the recuperation of biodiversity.

13. CONCLUSION

The significant adverse impacts will occur in the construction phase. The maritime terminal and transfer pipeline will be constructed, however, according to a rigorous Environmental Construction Plan, which follows best practices, as recommended by the World Bank (Pollution Prevention and Abatement Handbook, July, 1998), to mitigate construction impacts of projects.

The main negative impact during construction will be the suppression of mangrove vegetation in the area open for the flooded ditch to pipeline implantation. This impact however is local and temporary by execution of the Mangrove Recovery Program that with plantation of specimens of mangrove vegetation in this area and establishment of the natural micro-drainage development a natural recovery of the area impacted. Before the start-up of construction activities the mangrove vegetation area and de micro-drainages will be inventoried regarding the natural drainage, density and quality of the present specimens. Them, with this information, after the pipeline implantation will be possible to develop the plantation with the inventoried specimens to obtain the original condition for fast and permanent growing of the mangrove vegetation.

Besides Mangrove Recovery Program, was established with IBAMA as Measures of Compensation and Mitigation for the main impact mentioned above, the plantation of specimens of mangrove vegetation in the area 5(five) times great than the area directly impacted by pipeline implantation and their maintenance until the first flowering. This Compensation Measure will contemplate the plantation of native species in places to be approved for IBAMA, according to a project being prepared by Polibrasil.

The enterprise doesn't present significant impact on the environment in normal operation. The risks of the more severe hypotheses were analyzed and considered tolerable given the acceptability criteria used by environmental agency. Even in the case of the accidents with more severe consequences, only the employees of Polibrasil of the neighboring industries and of the military installation of the Brazilian Navy in the island of Boqueirão will be exposed.

The communities are not exposed to the consequences of the accidental scenarios. Polibrasil's Preventive and Predictive Maintenance Program includes the preventive measures that may avoid any sequence of flaws that characterizes an accidental scenario. Besides that, the Polibrasil's Emergency Response Plan will be revised to control and to mitigate the consequences of any accident regarding with the Maritime Terminal and the Propylene Transfer Pipeline.

It is noteworthy that any propylene leak will evaporate and disperse in the atmosphere, with remote chances of ignition, without impact in aquatic ecosystem and the impact in the atmosphere is temporary and insignificant.

In case of accident with fuel or diesel oil leaks from docked ships, Polibrasil will maintain a contract with a specialized company to combat the sea emergency with devices and equipment to containment and carry out the oil from water, avoiding the oil dispersion and mitigate the extension of environmental impact.

It is important emphasize that as prevention measures of oil spillage dispersion, the moored ships will always receive a protecting barrier for the contention of eventual oil leaks that will be contained for posterior recovery, avoiding its dispersion.

The enterprise carry-out significant positive social and economic impacts, at local level and in regional terms. The construction will have favorable economic and fiscal direct and indirect impacts given local acquisitions and the recruiting of temporary labor. The increase of the production and

the operation of the Terminal will also imply significant economic and fiscal direct and indirect effects on the regional economy, besides the reduction of risks associated with road transport of propylene. The receiving of propylene in the new marine terminal and the pipeline transfer to Polibrasil represent a significant reduction of the current risks for the communities of Duque de Caxias, as well as for the populations of the Rio-São Paulo axis.

The enterprise is perfectly compatible with the environmental and land-use legislation.

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ANNEX

- 1. Municipality Decree no 4.260/2005**
- 2. IBAMA Authorization no 016/2005**
- 3. Operational License LO no 177/2002**
- 4. Certificate ISO 14001**
- 5. Certificate OHSAS 18001**
- 6. Certificate ISO 9001**

1. Municipality Decree no 4.260/2005

ESTADO DO RIO DE JANEIRO
PREFEITURA MUNICIPAL DE DUQUE DE CAXIAS
GABINETE DO PREFEITO

DECRETO N.º 4.620, DE 26 DE ABRIL DE 2005.

EMENTA: Declara de Interesse Social do Município de Duque de Caxias projeto de construção de Terminal Marítimo para recebimento de matéria-prima.

O PREFEITO MUNICIPAL DE DUQUE DE CAXIAS,
no uso de suas atribuições legais,

considerando que o transporte marítimo é meio eficaz e seguro para o deslocamento constante de grande volume de matéria-prima;

considerando que a instalação de um terminal irá fomentar a indústria naval, deflagrando uma crescente atividade econômica, com significativa elevação da receita tributária, bem como a criação de novos postos de trabalho, diretos e indiretos, no Município; e

considerando que o Município tem interesse na melhora da infraestrutura local, no sentido de viabilizar a ampliação do Pólo Gás-Químico e a instalação de outras unidades industriais, para fins de desenvolvimento sustentável da região,

DECRETA :

Art. 1.º - Fica declarado de Interesse Social do Município o projeto da Polibrasil Resinas S/A para a instalação de um Terminal Marítimo para recebimento de matéria-prima.

Art. 2.º - Este Decreto entrará em vigor na data de sua publicação.

Prefeitura Municipal de Duque de Caxias, em 26 de abril de 2005.

WASHINGTON REIS
Prefeito Municipal

2. IBAMA Authorization no 016/2005

Serviço Público Federal
Ministério do Meio Ambiente
Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais Renováveis –
IBAMA

AUTORIZAÇÃO PARA SUPRESSÃO DE VEGETAÇÃO Nº 016/2005.

O Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais Renováveis – IBAMA, no uso das atribuições que lhe são conferidas pela Lei nº 7.735, de 22 de fevereiro de 1989, publicada no Diário Oficial da União em 23 de fevereiro de 1989, pela Lei nº 4.771/65, que institui o Novo Código Florestal, modificado pela Medida Provisória nº 2166-67, de 24 de agosto de 2001, considerando o Processo nº 02022.011710/02-11, e considerando o Decreto de nº 4620, de 26 de abril de 2005, que declara de interesse social, a instalação de terminal marítimo para o recebimento de matéria prima para a Polibrasil Resinas S.A.;

RESOLVE:

Autorizar a Empresa Polibrasil Resinas S.A – Indústria Petroquímica, com sede no Pólo Gás Químico do Rio de Janeiro, Distrito Industrial de Campos Eliseos, Duque de Caxias - RJ, proprietária do imóvel situado no mesmo endereço, a proceder supressão de vegetação nas margens da Baía de Guanabara, abrangendo uma área de 0,3 ha.

Áreas de Preservação Permanente: 0,3 hectare (vegetação de mangue)

Demais Formações Florestais: xxxxxxxxxxxxxxxxxxxxxx

Esta Autorização é válida por um período de 01 (um) ano, e pressupõe a observância das condições discriminadas no verso deste documento.

Rio de Janeiro, 17 de maio de 2005.

Edson Bedim de Azeredo
Gerente Executivo do IBAMA/RJ

CONDICIONANTES DESTA AUTORIZAÇÃO

1 - Condições Gerais

1. O não cumprimento das condicionantes desta Autorização implicará em sua revogação, bem como, na aplicação das sanções e penalidades previstas na legislação vigente, na Lei de Crimes Ambientais de nº 9.605/98, sem prejuízo de outras sanções e penalidades cabíveis;
2. O **IBAMA**, mediante decisão motivada, poderá modificar as condicionantes, bem como, suspender ou cancelar esta Autorização, caso ocorra:
 - i. violação ou inadequação de quaisquer condicionantes ou normas legais;
 - ii. omissão ou falsa descrição de informações relevantes que subsidiaram a expedição da autorização;

2 - Condições Específicas

1. Considerando que a interessada desenvolveu todo um projeto, segundo a solicitação apresentada relativa ao processo IBAMA/MM nº 02.022.0011710/2002-11, visando a instalação do Terminal Marítimo na Baía de Guanabara e de um duto próprio para o transporte de matéria-prima até a sua Fábrica em terreno localizado no município de Duque de Caxias, com plena justificativas técnico-locacional, sócio-econômica e de segurança, estabelecidas na execução de Estudo de Impacto Ambiental- EIA e respectivo Relatório, RIMA, assim como na realização de Audiência Pública, pois permite investimentos para expansão do empreendimento, mantendo a sua competitividade, gerando emprego e renda e aumentando a segurança, reduzindo o risco de acidentes, com a redução do transporte rodoviário de propeno;
2. Considerando que a Lei nº 6938 de 31 de agosto de 1981, que dispõe sobre a Política Nacional do Meio Ambiente, regulamentada pelo Decreto nº 99274 de 6 de junho de 1990, prevê o licenciamento ambiental como sendo um de seus instrumentos de atuação, exigindo-o para o funcionamento de atividades consideradas efetivas ou potencialmente poluidoras, de acordo com os requisitos estabelecidos nas Resoluções CONAMA nº 1 de 23/01/86 e nº 237, de 19/12/97;
3. Considerando que foi constatada a existência de vegetação de mangue – considerada vegetação de preservação permanente, nos termos do art. 3º da Lei nº 4771/65 – na área a ser ocupada pelo lançamento do duto, razão pela qual a interessada propôs-se a apresentar ao órgão ambiental federal, o IBAMA, medidas mitigadoras e compensatórias advindas da supressão de vegetação a ser realizada, conforme estabelecido na medida provisória nº 2166-67, de 24/08/2001, § 4º do artigo 4º;
4. Considerando que a Interessada, sendo sensível à necessidade da preservação do meio ambiente e do combate à poluição, tem total e amplo interesse em contribuir na melhoria da qualidade ambiental do país, notadamente na recuperação de áreas degradadas, prontificando-se a expandir o programa de compensação ambiental, realizando, além do Programa de Recuperação do Manguezal previsto no EIA/RIMA, constante do processo

IBAMA/MM nº 02.022.0011710/2002-11, o plantio de espécies vegetais características de mangue, na forma de compensação, em área equivalente, no mínimo, a 5 vezes a área de 3.000 m² a ser impactada pelo lançamento do duto, ou seja, o equivalente a 15.000 m²;

5. Considerando o indiscutível interesse público e social do Empreendimento, pois certamente irá submeter à população local a um menor risco de acidentes rodoviários, melhorando a qualidade e o bem-estar social para toda comunidade local; Notadamente, foi declarado pelo próprio poder municipal de Duque de Caxias, através do Decreto de nº 4620 de 26 de abril de 2005, o projeto de construção do terminal marítimo para recebimento da matéria prima, o propeno, constituindo-se de interesse social.

6. DAS MEDIDAS MITIGADORAS

I. Como *Medidas Mitigadoras*, deverá a Interessada promover no período de até 18 (dezoito) meses a contar do prazo da assinatura da autorização de corte do presente Instrumento;

II. O desenvolvimento de detalhamento do projeto técnico (doravante designado como *Projeto*), envolvendo o plantio de espécies características de mangue (doravante designadas *Mudas*), em locais propostos pela Interessada e aprovados pelo Ibama.

7. DAS MEDIDAS COMPENSATÓRIAS

I. Como *Medida de Compensação* ambiental, fica estabelecida a manutenção e o acompanhamento do desenvolvimento das mudas plantadas, de acordo com o projeto de recuperação de área de manguezal submetido ao Ibama;

II. A Interessada deverá fazer a manutenção das áreas após o plantio até a primeira floração, conforme previsto no projeto, a contar da efetiva implantação do projeto, ficando, desde já, estabelecido que ao final desse período, o Ibama deverá emitir uma declaração do cumprimento das medidas mitigadoras e medidas compensatórias, estabelecidas nas referidas condicionantes.

8. DOS PRAZOS

I. O Ibama terá o prazo de 30 (trinta) dias, a contar da entrega do projeto, para examinar e comunicar à Interessada a aprovação do projeto ou as exigências técnicas que por ventura existam, devendo a aprovação estar concluída no prazo máximo de 15 (quinze) dias, a contar do atendimento às eventuais exigências;

II. O início da implantação do projeto de recuperação da área de manguezal deverá ocorrer em até 30 (trinta) dias após a comunicação da aprovação do mesmo pelo Ibama;

III. A implantação do projeto pela Interessada deverá estar concluída no prazo de até 12 (doze) meses.

9. DO ACOMPANHAMENTO

O acompanhamento da manutenção das áreas a serem objeto de compensação será feito através de vistorias a serem realizadas por técnicos do Ibama, logo após a apresentação pela Interessada de relatório bimensal de atividades.

10. DO DESCUMPRIMENTO

No caso de descumprimento, por fato imputado à Interessada e que a mesma poderia prever ou evitar dentro do conceito de homem probo, de qualquer das condicionantes da presente Autorização, o procedimento administrativo seguirá o seu curso normal com a possibilidade de propositura das medidas cabíveis pelo Ibama;

11. Fica proibida a queima do material oriundo da limpeza;

12. Haverá rendimento de material lenhoso quando da realização da limpeza da ordem de 15,0 stereos da área objeto da limpeza.


Rio de Janeiro, 17 de maio de 2005.



Edson Bedim de Azeredo
Gerente Executivo do IBAMA/RJ

3. Operational License LO no 177/2002

Governo do Estado do Rio de Janeiro
Secretaria de Estado de Meio Ambiente e Desenvolvimento Sustentável
Comissão Estadual de Controle Ambiental

 Fundação Estadual de Engenharia do Meio Ambiente
LICENÇA DE OPERAÇÃO LO Nº 177/2002

Conforme Deliberação nº 003 de 28/12/77 da Comissão Estadual de Controle Ambiental - CECA a Fundação Estadual de Engenharia do Meio Ambiente - FEEMA, no uso das atribuições que lhe são conferidas pelo Decreto-Lei nº 134, de 16 de junho de 1975, Artigo 8º e de acordo com o Sistema de Licenciamento de Atividades Poluidoras, instituído através do Decreto nº 1633, de 21 de dezembro de 1977, expede a presente Licença de Operação, que autoriza a

Empresa: POLIBRASIL RESINAS S/A
CNPJ/CPF: 59.682.583/0004-73
Endereço: Rua Marumbi nº 1.400 – Campos Eliseos
Reg. Adm./Distrito: 2º Distrito – Campos Eliseos
Município de Duque de Caxias, no Estado do Rio de Janeiro, registrada na FEEMA sob o código 02406007/20.21.10, a operar a instalação relativa à(s) atividade(s) de produção de polipropileno. -x-x-x-x-x-x-x-x-x-

localização da atividade: Rua Marumbi nº 1.400 – Campos Eliseos, município de Duque de Caxias.


com as seguintes restrições:

- 1- Atender, no prazo de 30 (trinta) dias a contar da data de emissão desta Licença, à NA-052 Regulamentação para Publicação das Licenças Obrigatórias e Estudo de Impacto Ambiental do Sistema de Licenciamento das Atividades Poluidoras, aprovada pela Deliberação CECA nº 2538, de 12/11/91 (D.O. R.J. de 06/12/91), enviando cópia das publicações à FEEMA, no mesmo prazo;
- 2- Esta Licença diz respeito aos aspectos ambientais e não exime o empreendedor do atendimento às demais exigíveis por lei;
- 3- Esta Licença não poderá sofrer qualquer alteração, nem ser plastificada, sob pena de perder sua validade;

continuação no verso

Esta LO é válida até 04 de abril de 2007, a contar da presente data, conforme Processo FEEMA nº E-07/200.639/00, observadas as condições deste documento e seus anexos que, embora não transcritos, são partes integrantes do mesmo.

Rio de Janeiro, 04 de abril de 2002.


ISAURA FRAGA
Presidente da FEEMA

A Construção, reforma, ampliação, instalação, ou funcionamento, de estabelecimentos, obras ou serviços potencialmente poluidores, contrariando normas legais e regulamentares pertinentes ou não cumprimento de obrigação legal ou contratual de relevante interesse ambiental podem configurar os crimes previstos nos artigos 60 e 68 da lei 9.605 de 12.02.98, sujeitando o infrator, pessoa física ou jurídica, à pena de detenção ou multa.

RESTRIÇÕES DESTA LO

- 4- Requerer a renovação desta Licença de Operação no mínimo 120 (cento e vinte) dias antes do vencimento do seu prazo de validade, com vistas a facultar o uso da prerrogativa do artigo 18, parágrafo 4º, da Resolução nº 237/97 do CONAMA;
- 5- Atender à NT-202.R-10 - Critérios e Padrões para Lançamentos de Efluentes Líquidos, aprovada pela Deliberação CECA nº 1007, de 04.12.86, publicada no D.O.R.J. de 12.12.86;
- 6- Atender à DZ-205.R-05 - Diretriz de Controle de Carga Orgânica de Origem Industrial, aprovada pela Deliberação CECA nº 2491, de 05.10.91, publicada no D.O.R.J de 24.10.91;
- 7- Atender à DZ-942.R-07 - Diretriz do Programa de Autocontrole de Efluentes Líquidos PROCON-ÁGUA, aprovada pela Deliberação CECA nº 1995, de 10.10.90, publicada no D.O.R.J. de 14.01.91;
- 8- Atender à DZ-1310.R-06 - Sistema de Manifesto de Resíduos, aprovada pela Deliberação CECA nº 4.013, de 29.05.01, publicada no D.O.R.J. de 22.08.01;
- 9- Atender à DZ-1311.R-04 - Diretriz de Destinação de Resíduos, aprovada pela Deliberação CECA nº 3327, de 29.11.94, publicada no D.O.R.J. de 12.12.94;
- 10- Atender à Resolução nº 001/90 do CONAMA, de 08.03.90 publicada no D.O.U. de 02.04.90, no que se refere à poluição sonora;
- 11- Apresentar, anualmente, o Inventário de Resíduos Industriais, em atendimento à Resolução nº 006 do CONAMA, de 15.06.88;
- 12- Promover a limpeza da caixa separadora de água/óleo na frequência necessária para garantir que o efluente final atenda aos padrões estabelecidos;
- 13- Promover a limpeza periódica da fossa séptica, através de empresa licenciada pela FEEMA, mantendo os comprovantes à disposição da fiscalização;
- 14- Cumprir o que prescreve a Norma Regulamentadora NR-13 do Ministério do Trabalho para caldeiras, vasos de pressão e válvulas de segurança;
- 15- Atualizar o Plano de Ação para Emergências, no máximo, a cada 30 meses;
- 16- Manter disponível e prontos para uso os equipamentos de proteção individual e os materiais e equipamentos de atendimento à emergência;
- 17- Treinar periodicamente o pessoal incumbido da operação normal e o de ação em emergência, mantendo o registro dos treinamentos (pessoal treinado, instrutor e conteúdo programático);
- 18- Inspeccionar periodicamente tubulações, acessórios e equipamentos que operam com substâncias perigosas, mantendo o registro das verificações feitas, em especial os dados relativos à corrosão e medições de espessura;
- 19- Realizar a manutenção preventiva e corretiva de tubulações, acessórios e equipamentos que operam com substâncias perigosas, mantendo o registro dos trabalhos realizados;
- 20- Inspeccionar e testar periodicamente os sensores de gás e de incêndio, mantendo-os operacionais, conforme o respectivo projeto, registrando os trabalhos realizados;

Continuação em anexo



Governo do Estado do Rio de Janeiro
Secretaria de Estado de Meio Ambiente
Comissão Estadual de Controle Ambiental

Fundação Estadual de Engenharia do Meio Ambiente

LICENÇA DE OPERAÇÃO

CONTINUAÇÃO DA LO Nº 177/2002

EMPRESA: POLIBRASIL RESINAS S/A

LOCALIZADA: Rua Marumbi nº 1400 – Campos Elíseos, município de Duque de Caxias.


RESTRIÇÕES DESTA LO

- 21- Manter os dispositivos de segurança nas condições operacionais definidas no respectivo projeto;
- 22- Comunicar imediatamente ao Serviço de Controle de Poluição Acidental da FEEMA, Plantão de 24 horas, pelos telefones (0xx21) 3891-3415, 2295-6046 ou 2541-1993, qualquer anormalidade que possa ser classificada como acidente;
- 23- Evitar todas as formas de acúmulo de água que possam propiciar a proliferação do mosquito "*Aedes aegypti*", transmissor da Dengue;
- 24- Eliminar métodos de trabalho e ambientes propícios à proliferação de vetores (insetos e roedores nocivos);
- 25- Submeter previamente à FEEMA, para análise e parecer, qualquer alteração na atividade;
- 26- FEEMA exigirá novas medidas de controle, sempre que julgar necessário. -x-x-x-x-x-x-x-x-x-x-

Rio de Janeiro, 04 de abril de 2002.

Presidente da FEEMA

5. Certificate OHSAS 18001



DET NORSKE VERITAS
OCCUPATIONAL HEALTH AND SAFETY
MANAGEMENT SYSTEM CERTIFICATE

Certificate No. 242-2001-HSO-SPA-DNV

DET NORSKE VERITAS CERTIFICADORA LTDA.
certifies that the Occupational Health and Safety Management System of

POLIBRASIL RESINAS S/A

Office: Av. Dr. Chucri Zaidan, 80 - 10º/11º andar - São Paulo, SP - Brazil
Mauá Unit: Av. Ayrton Senna da Silva, 2.700 - Mauá, SP - Brazil
Duque de Caxias Unit: Rua Marumbi, 1.400 - Duque de Caxias, RJ - Brazil
Camaçari Unit: Rua Hidrogênio, 1.404 - Camaçari, BA - Brazil

Has been found to conform to the Occupational Health and Safety Management System Standard:

OHSAS 18001:1999

This Certificate is valid concerning all activities related to:


**DESIGN, DEVELOPMENT AND MANUFACTURE OF
POLYPROPYLENE, POLYPROPYLENE COMPOUNDS AND SERVICING.**

Place and date:
São Paulo, 2004-04-16


This Certificate is valid until:
2007-03-04

For the Certification Organization:
DET NORSKE VERITAS CERTIFICADORA LTDA.
BRAZIL

Original Certification date:
2001-06-08



Mauricio Venturin
Certification Manager



Conformity to the standard is verified by
Lead Auditor
Silvio Hirata
registered at DNV Certificadora Ltda

Lack of fulfillment of conditions as set out in the Appendix may render this certificate invalid.

DET NORSKE VERITAS - Rua Sete de Setembro, 111 - 12º/14º andares - Rio de Janeiro, RJ - Brasil - CEP 20050-006

6. Certificate ISO 9001



DET NORSKE VERITAS

MANAGEMENT SYSTEM CERTIFICATE

Certificate No. 1322-1993-AQ-SPA-RvA, Rev. 1

*This is to certify that
the Quality Management System
of*

POLIBRASIL RESINAS S/A

at

Av. Dr. Chucri Zaidan, 80 - 10/11º andar - Bloco C - São Paulo, SP - Brazil
 Unit Mauá : Av. Ayrton Senna da Silva, 2700 - Mauá, SP - Brazil
 Unit Duque de Caxias : Rua Marumbi, 1400 - Duque de Caxias, RJ - Brazil
 Unit Camaçari : Rua Hidrogênio, 1404 - Camaçari, BA - Brazil

has been found to conform to the Quality Management System Standard:

ISO 9001:2000

This Certificate is valid for the following product or service ranges:

**DESIGN, DEVELOPMENT AND MANUFACTURE OF
POLYPROPYLENE, POLYPROPYLENE COMPOUNDS AND SERVICING.**

<p><i>Original Certification date:</i> 1993-11-20</p>	<p><i>Place and date:</i> São Paulo, Brazil, 2003-08-21</p>
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<p><i>This Certificate is valid until:</i> 2005-09-20</p>		<p><i>for the Accredited Unit:</i> DNV CERTIFICATION B.V., THE NETHERLANDS</p>
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Compliance to the Standard in respect to the indicated scope is verified by the DNV approved registered Team Leader:

<p>André Alessandro R. B. de Oliveira <i>Lead Auditor</i></p>	 <p>Maurício Venturin <i>Management Representative</i></p>
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Lack of fulfillment of conditions as set out in the Appendix may render this Certificate invalid.

DNV CERTIFICATION B.V. Haasrechtstraat 7, 3079 DC Rotterdam, The Netherlands, TEL.INT.:+31 10 2922 688, FAX:+31 10 4796

DET NORSKE VERITAS - Rua Sete de Setembro, 111 - 12º/14º andares - Rio de Janeiro, RJ - Brasil - CEP 20050-006