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MARINE PROJECT IDEAS  
FOR THE HAITIAN PORT OF MIRAGOANE \*/

\*/ Provisional text, subject to changes in both substance and style.

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The following table shows the results of the regression analysis. The dependent variable is the log of the number of employees. The independent variables are the log of the number of sales, the log of the number of assets, and the log of the number of liabilities. The R-squared value is 0.85, indicating that the model explains 85% of the variance in the dependent variable.

Variable	Coefficient	Standard Error	t-statistic	p-value
Log Sales	0.85	0.05	17.0	< 0.001
Log Assets	0.15	0.03	5.0	< 0.001
Log Liabilities	0.05	0.02	2.5	0.012
Constant	1.2	0.1	12.0	< 0.001

The regression results show that the log of the number of sales is the most significant predictor of the log of the number of employees, with a coefficient of 0.85. The log of the number of assets is also a significant predictor, with a coefficient of 0.15. The log of the number of liabilities is a significant predictor, with a coefficient of 0.05. The constant term is 1.2. The R-squared value is 0.85, indicating that the model explains 85% of the variance in the dependent variable.

PREFACE

Based upon a notification by Reynolds Haitian Mines, Inc., to the Government of Haiti that it will cease bauxite mining and related port activities at Miragoane by 31 December 1982 and as part of the SEP/BID/ILPES project entitled "Fortalecimiento del sistema de planificación y de proyectos de Haiti" (ATN/SF-1729-HA), a request was made by the Minister of Planning to the Latin American Planning and Statistical Institute (ILPES) for assistance in the development of marine project ideas which would utilize existing port infrastructures and generate new economic activities at the port. In response to this request, ILPES sought collaboration from the Transport and Communications Division of the United Nations Economic Commission for Latin America (CEPAL). Thereafter, terms of reference (see annex I) were prepared for a maritime transport specialist of that Division which encompass, inter alia, an on-site evaluation of the port of Miragoane and preparation of this document.

During the preparation of this document, which took place in Haiti from 21 November to 12 December 1982, the following organizations and persons made important contributions:

Direction de Promotion des Projets (DPP) - Messrs. Grand Pierre, Hypolite and Lindor.

Inter-American Development Bank (IDB) - Mr. Thévenot

Reynolds Haitian Mines, Incorporated - Messrs. Reynoso and Prosper.

Secrétaire d'Etat du Plan (PLAN) - Mr. Blanchard

## I. INTRODUCTION

### (a) General characteristics of the port

The port of Miragoane is located on the North Coast of the Haitian Southern Peninsula approximately 90 kilometres from the capital city of Port-au-Prince. (see diagramme at annex II). The port is unique in that it has two protected natural harbours; from seaward, the first or outer harbour is between the reef and the narrow peninsula which comes out from the coast and two small uninhabited islands, and the second or inner harbour is between the peninsula and islands and the Haitian coast (see diagramme at annex III).

While the inner harbour is small, vessels of up to 50 000 dwt have loaded bauxite at its facilities thereby making it Haiti's only true deep-water port. On the other hand, the outer harbour is large enough for at least ten similar-size vessels to anchor safely. The entrance channel through the reef and outer harbour has two places which have a maximum water depth of 41 feet, while the water depth alongside the dock is 47 feet. To guide vessels safely through the reef and outer harbour to the dock, two sets of lighted ranges, which indicate when a vessel is in the middle of the entrance channel, and six lighted channel buoys have been installed. Finally, the tidal range is only one foot.

### (b) Port infrastructure

The entire port infrastructure was constructed exclusively for the export of bauxite under licenses 1/ granted by the Government of Haiti to Reynolds Haitian Mines, Incorporated. The export of bauxite from Miragoane was begun in 1957 and continued until September 1982. During October 1980 Reynolds notified the Government of Haiti that the remaining deposits have, in its opinion, less than 2% of the desired mineral and that operations would be terminated. Thereafter, at the beginning of 1982 Reynolds informed the Government of Haiti that the mining and related port activities would be definitely terminated by 31 December 1982.

While the exact items of the existing port physical infrastructure that will revert to the Government of Haiti are subject to negotiations currently being conducted between representatives of that country and Reynolds, as most of the equipment has been in use for 25 years, it is expected that the majority will remain in Haiti. As a consequence, it would appear useful to briefly evaluate certain

/major fixed

major fixed items of that infrastructure which possess a certain degree of flexibility thereby permitting their possible application to other activities and areas which create special problems.

The dock forms an inverted "L" with its leg connected to the beach (see diagramme at annex IV). The part of the dock utilized by deep-sea vessels, which is the top or cap of the "L", is 17 by 37 metres. Further, the usable docking space is extended to an overall length of 230 metres by means of dolphins and winch platforms at each end. The base of the dock or that part which joins the beach is 8 by 160 metres and might be utilized, with only limited changes, by vessels of the coastal fleet. For example, due to the distance between the water and dock surface, cargo booms might be installed on the dock to permit a vessel's hoisting equipment to be attached thereby facilitating cargo loading and discharge operations.

The conveyorbelt utilized for moving bauxite from the covered storage area to vessels is composed of three different sections of approximately 350 metres in length, and is covered to protect the bauxite from rain. It should be understood that as the conveyorbelt system was installed only for the loading of vessels, the system cannot, at present, be reversed. However, as the conveyorbelt is propelled by electric motors, a simple change in the wiring for starting such motors would permit the system to be utilized in both directions. Further, the bauxite drop-chute, utilized for the loading of vessels, might be modified to accept a screw unloader and related equipment thereby permitting the conveyorbelt to carry appropriate bulk cargoes from vessels to the covered storage area.

The covered area for the storage of dry bauxite is 150 metres long and 24 metres wide, is without walls and has support members for the roof only along the outer edge thereby providing a completely unobstructed work area. Nonetheless, in order to protect dry bauxite from wind-blown rain, the roof has a maximum height of approximately 25 metres at the centre of the storage area and decreases to approximately 5 metres in height along the outer edge. While there are many alternative uses for the covered storage area, it would seem to merit an evaluation for the construction of pleasure craft and vessels for the Haitian coastal fleet.

/For this

For this use, a cement floor would have to be installed and a small railway constructed from the beach to the covered storage area to permit the movement of boats between the water and work area.

The three maintenance buildings with their fully equipped machine shops and a power plant with three diesel-electric generators of 625 kilowatts have been operated and maintained entirely by Haitians since the bauxite mine was opened. In this sense, there are a wide range of important skills possessed by the Haitians working in these areas which may be transferred to other related industries. For example, since the diesel engines utilized to generate electricity are large enough to be employed as main propulsion plants for deep-sea vessels of approximately 3 000 dwt and as diesel generators on larger vessels, appropriate engine repair and maintenance services might be offered to all future vessels calling at the port of Miragoane. Moreover, these skills and equipment might be utilized to form the basis of a mobile repair shop which could provide services to vessels calling at other ports such as Port-au-Prince and Cap-Haïtien.

With reference to areas which create special problems, the most pressing is access by land to the port of Miragoane (see diagramme at annex V). While Reynolds paved the 12 kilometre road between the mine and port to facilitate the movement of trucks, this road is approximately 3 kilometres from the village, at its closest point. As a result, to reach the port one must pass through the narrow lightly-graveled streets of Miragoane. Further, once leaving the modern two-lane all-weather road which extends from Port-au-Prince to Les Cayes, the same road conditions exist to the village of Miragoane. In this sense, if the port is to be fully incorporated into the national economy, the 5 kilometres access between the principal highway and port would require improvement.



## II. GENERAL CONSIDERATIONS FOR EVALUATING ALTERNATIVE PROJECT IDEAS

While there are many factors which should be taken into consideration when evaluating marine project ideas for the port of Miragoane, some of the more important are (a) the demand for port services, (b) inherent advantages, (c) external factors and (d) the nature of port infrastructure investments.

### (a) The demand for port services

It should be understood from the outset that a port is not an entity which can be viewed in isolation. Its successful development depends on factors such as geography, the international economic situation, economic policies of major trade partners, the size and extent of its hinterland, the activities of other ports, the establishment of industries, agricultural production, the efficiency of its cargo handling facilities, and political factors, particularly the politics of investment. While not readily apparent, it should be highlighted that a port is not an industry in itself, but rather provides services to industries. As the demand for port services does not arise directly, it has often been referred to as a derived demand. In this sense, where economic activities within the hinterland of a port create a demand for its services, the possibility of making investments in infrastructure should be carefully evaluated to ensure the unobstructed growth of such activities.

Until the early 1950s port facilities were generally divided into those for liquid cargoes such as petroleum products and those for dry cargoes which included bulk, break-bulk and heavy-lift. It was the advent of container transport systems and large dry-bulk vessels that created a need for specialization in the handling of dry cargoes. Today, entire ports and docks within ports have been specially constructed to load and discharge vessels carrying specific dry cargoes. For example, Port-au-Prince has specialized facilities for the handling of unitized cargoes, i.e., a container crane and two RO-RO ramps. Furthermore, Haiti has specialized ports for bauxite and cement.

The principal reason why port infrastructure specialization has gained such broad acceptance is that it permits ships to be loaded and discharged more rapidly and efficiently than at a general cargo port, with a corresponding reduction in overall cargo handling costs. As a result of the specialization required of port

/facilities for

facilities for the handling of dry cargoes, careful consideration must be given to the services the port of Miragoane is to provide to ensure that they respond fully to specific demands and are complementary to those of other Haitian ports.

(b) Inherent advantages

Since Haiti has a limited range of natural resources for export and as inputs for national industries, the port of Miragoane becomes a most important asset in itself and thus suggests that future economic growth of the port must be planned with marine activities as the prime motor. In order to determine what marine activities might be most beneficial to the national economy, the Government of Haiti is faced with the question, "what inherent advantages do we have that other countries cannot easily imitate for the development of the port of Miragoane?" In response to this question, it is interesting to note that Haiti possesses, inter alia, the following advantages (a) a large and able population with the lowest wage rates in all of the Americas, (b) a favourable geographic location in relation to major trade routes utilizing the Panama Canal, (c) proximity to major markets of North and South America, (d) twenty hectares of undeveloped space to create a small industrial park at the port of Miragoane, (e) a natural deep-water harbour which does not require dredging, (f) functioning infrastructures for the export of bauxite, and (g) a nucleus of 195 highly skilled technicians in fields such as welding, lathe operation and large diesel engine repair and operation, who have worked for periods up to 25 years with Reynolds at Miragoane.

While Haiti is quite close to the United States of America (USA), such proximity does not seem to create any special advantages for the establishment of marine activities at the port of Miragoane. However, when such proximity is combined with the lowest skilled wage rates in all of the Americas, i.e., US\$ 2.70 per day, numerous marine activities could be attracted to that port. For example, many boatbuilding yards in the USA, which specialize in the construction of various types of pleasure craft, have had to either terminate their operations due to high wage rates in that country or face a reduced market due to the high prices they must charge for their boats. Since Haiti is only 36 hours by ship from Miami, Florida, joint ventures could be established with such boatbuilders to import needed infrastructures and raw materials from the USA

/for construction

for construction of pleasure craft at the port of Miragoane with subsequent exportation of the final product to that country or to other demand areas.

The utilization of the port of Miragoane should be viewed not only from the short-term goals of creating employment opportunities and generating receipts of foreign exchange but also from the overall goal of establishing a basis which permits that port and its hinterland to attain a certain degree of economic self-reliance. In this sense, there are two broad categories of uses; that is, the port can be utilized for the movement of goods to and from its natural hinterland and/or to provide an industrial basis for various marine activities.

With reference to the use of the port of Miragoane as an industrial basis, numerous project ideas have already been advanced. As examples, it has been proposed to use the port for the repair and maintenance of deep-sea merchant vessels, for a 30 000 kilowatt coal-burning thermo-electric plant which would utilize the port for coal import requirements, for a stone industry to export granite, basalt, limestone and marble, and for fertilizer and glass plants which would import raw materials and export finished products through the port of Miragoane. While each of these ideas appears to have merit, as the port services required for each and, hence, infrastructure investments vary greatly, it would seem important to adopt a multi-sectoral approach -i.e., with specialists from agriculture, industry, energy and transport- for their evaluation to ensure that the projects selected provide maximum benefit to the Haitian economy as a whole.

(c) External factors

While there are many external factors which influence the demand for port services, it should be highlighted that for most Caribbean countries the success of domestic port investments is closely related to the economic policies of their major trade partners in Europe, and North and South America. As a result, port investment planning for many Caribbean countries requires continuous study in the light of the trade policies of those nations. For example, as the proposed Caribbean Basin Initiative (CBI) of the USA is to permit the import of Haitian products, except for textiles and sugar, into that country for a period of 12 years free of all duties, careful consideration must be given to the CBI when evaluating any future use for the port of Miragoane.

/Other external

Other external factors which must be given careful consideration when evaluating investments in infrastructure for the port of Miragoane include the international economic situation, sources of competition, route decisions of shipowners, exporters and importers, and the policies of container leasing companies with respect to equipment repairs and of liner conferences concerning base and out-ports as well as freight rates. As examples of the above factors, it should be noted that while shiprepair is a labour intensive undertaking, large investments are nonetheless required for floating dry docks and other related infrastructures. In order to justify such investments for a shiprepair facility at the port of Miragoane, a careful evaluation would have to be made of the competition created by ship-repairers in other countries, especially those located at Curaçao, Mexico, Panama, Puerto Rico, Trinidad and Tobago, Venezuela and the Gulf Coast of the USA, to determine what part of the shiprepair market is not served by them or might be more adequately served at a Haitian facility. Similarly, while container leasing companies might be willing to allow damaged container to be repaired in Haiti, they have a general policy of effecting such repairs at the facility closest to the point where the damage occurred thereby avoiding unremunerative transport costs for empty containers. As almost all containers in Haitian trade flows utilize the port facilities at Port-au-Prince, it would appear advisable to evaluate the feasibility of establishing a container repair enterprise as close as possible to that port.

(d) The nature of port infrastructure investments

While the installation of specialized port facilities for each type of dry cargo has permitted vessels to dramatically reduce cargo handling costs and port-stay times, it has also created numerous problems for planners. Of these problems, possibly the most pressing is the lack of flexibility and mobility of investments.

Even though technological advances have been made which permit the use of, for example, specialized container cranes for loading and discharge of general cargo vessels, such use normally creates unnecessary additional costs. The principal reason for this is that a general-cargo crane and related handling equipment usually can be acquired at prices inferior to those for a specialized container crane. Further, due to the flexible nature of general cargo handling equipment, it is normally employed for a greater number of productive hours per year than specialized container handling equipment thereby reducing the cost per hour of operation. In this sense, it is interesting to note that port planners

/in countries

in countries such as Australia and Germany have responded to the inflexibility of specialized ports by developing combi-facilities.<sup>2/</sup> At these facilities there is a well-thoughtout combination of break-bulk and specialized cargo handling equipment. As a result, combi-facilities permit multi-purpose vessels which transport container, RO-RO and break-bulk cargoes to complete all loading and discharge operations without moving between specialized docks in the same port for each type of cargo.

Once an investment has been made in specialized docks and cranes, it is generally considered that such equipment cannot be relocated. As a consequence, it is not common for large semi-fixed installations such as container cranes to be moved from one location to another. The reason for this is the high cost to disassemble such cranes, which are normally permanently assembled by welding, for transport and then to reassemble the components at another location. Since port infrastructure investments are largely irreversible, it is imperative that a careful evaluation be made of the economic and technical feasibility of project ideas for the port of Miragoane.

### III. MARINE PROJECT IDEAS

Based upon the ideas advanced in the terms of reference to utilize the existing infrastructure at the port of Miragoane, e.g., establishment of a ship repair facility with a dry-dock and a container repair and maintenance enterprise, on-site visits were made to the port, discussions held with various persons and a review made of pertinent studies, reports and articles. As a consequence of these efforts, it became apparent that the project ideas presented for further study must utilize not only such infrastructure but also the inherent advantages and special market access arrangements of Haiti. Of the many project ideas which might satisfy these requirements, some of the more important are (a) vessel construction and repair, (b) transshipment of dry-bulk commodities and (c) ship breaking.

#### (a) Vessel construction and repair

Based upon the fundamental role maritime transport plays in Haitian commercial movements, there are a wide range of vessel construction and repair activities which could be undertaken. Nonetheless, in an effort to utilize the earlier mentioned inherent advantages Haiti possesses and the existing infrastructure at the port of Miragoane, it would appear advisable that the following ideas be considered for further study: (i) establishment of a boatbuilding facility for the construction of pleasure craft, (ii) establishment of a boatbuilding facility for Haitian coastal fleet needs and (iii) establishment of a mobile repair service for deep-sea vessels.

#### (i) Boatbuilding facility for the construction of pleasure craft

While commercial vessels employed in the domestic trade of many countries must be constructed in those countries as well as owned and crewed by their respective citizens, pleasure craft are normally not subject to such requirements. For example, pleasure craft which are constructed in foreign countries may be imported into the United States after payment of appropriate duties. Moreover, it is interesting to note that due to the high wage rates for skilled workers in the United States, many boatbuilders of pleasure craft in that country have had to terminate operations or face a reduced demand for their products. While this might not seem to create any special opportunity for Haiti, such is not the case. Based upon Haiti's low wage rates for skilled workers, proximity to the United States and possible duty-free access to that country for Haitian products under the CBI, a

/relationship could

relationship could be established with a boatbuilder of pleasure craft in that country. Further, similar arrangements might also be made with boatbuilders in Europe and Latin America to service their domestic as well as export markets. The relationships with boatbuilders of those countries should include elements such as the import of needed infrastructures and raw materials and export of the final product to the countries involved or other demand areas. As a consequence, efforts might be made to contact all appropriate boatbuilders in Europe, Latin America and the United States in order to discuss the advantages of establishing a boatbuilding facility at the port of Miragoane.

It should be understood that the CBI, as currently structured, not only provides duty-free access to the United States but also provides various incentives for the private sector of that country to establish factories in Caribbean countries. Therefore, it would appear that the CBI, when combined with the inherent advantages Haiti possesses, could provide boatbuilders of the United States sufficient incentive to establish an appropriate facility at the port of Miragoane.

(ii) Boatbuilding facility for Haitian coastal fleet needs 3/

It is necessary to understand that due to Haiti's mountainous geography, extensive coastline and four inhabited islands, the coastal fleet, composed of 418 vessels from one to 550 dwt, ensures needed mobility for many persons and their goods. Moreover, as the construction of roads is not only costly but results in a continuing outflow of foreign exchange due to the need to import everything from road building and maintenance equipment to trucks, spare parts and fuel, the role of the coastal fleet should increase in importance in the future. While the coastal fleet plays a pivotal role in domestic commercial movements, vessels are largely constructed by their owners at artisan facilities without adherence to modern boatbuilding standards or utilization of appropriate equipment and techniques. For example, since vessel ribs and planks are only rough cut by hand tools, the necessary close fitting of hull joints and subsequent caulking to ensure watertight integrity is made extremely difficult if not impossible. As a result, coastal vessels have lifetimes of approximately 12 years which is one-half the lifetime of similar wood-hull boats constructed and maintained to accepted standards.

If vessels of the Haitian coastal fleet were replaced at the end of their current economic lives, a boatbuilding facility would have to construct

$\frac{418 \text{ vessels}}{12 \text{ year life}} = 35 \text{ vessels per year}$ . Since it is anticipated that the coastal fleet

/will continue

will continue to grow, any extra production would probably be absorbed into the existing fleet. Due to the labour intensive nature of boatbuilding and the lack of international competition for an enterprise of this nature, it would appear that the feasibility of establishing a boatbuilding facility at the port of Miragoane, which might utilize an intermediate technology such as ferrocement, should be the subject of further study.4/

(iii) Mobile repair services for deep-sea vessels

The need for a mobile repair service for deep-sea vessels calling at Haitian ports stems from a number of factors such as dramatic reductions in vessel crew sizes, i.e., from over 40 crew members as late as 1970 to 18 and even less today, and the length of time vessels spend in ports, i.e., from 5 days to discharge cargo to less than one day, as well as the increasing period of up to 3 years and even more between vessel haul-outs due to improved bottom paints and in-water surveys by classification societies. The reduction in the number of crew members has changed the nature of the mariner's trade from repair, maintain and operate vessels to that of operation with only limited maintenance. Moreover, the limited ports stays and extended periods of navigation for vessels have considerably reduced the opportunities for carrying out preventive maintenance procedures on, for example, one or more cylinders of the main engine at each port and to make important repairs at, what was once, an annual haul-out. In recognition of this situation a British shiprepairer has created a mobile workshop in a standard 20 foot container to provide the repair and maintenance services required of vessels while in port and during cargo loading and discharge operations.5/

As a critical mass of highly skilled technicians and equipment exists at the port of Miragoane and appears an appropriate basis for providing repair and maintenance services to deep-sea vessels calling at Haitian ports, the possibility of establishing a mobile workshop would seem to merit further study. In this sense, discussions could be held with representatives of the major shipping lines serving Haiti -Sea-Land, Norwegian Caribbean Line, Hapag-Lloyd, KNSM, CGM, CAROL, Concorde, Saguenay and Kirk Line- to determine their repair and maintenance needs and the possibility of having such needs fulfilled at Haitian ports.



(b) Transshipment of dry-bulk commodities

Based upon the advantageous geographical proximity of the Caribbean to important markets in North and South America as well as major trade routes utilizing the Panama Canal, numerous islands offer transshipment services for container and bulk-liquid cargoes. For example, Curaçao, Jamaica and Puerto Rico are major transshipment centres for containers, with the Bahamas, Cayman Islands, Curaçao, Santa Lucia, Trinidad y Tobago, and the Virgin Islands providing similar services for petroleum products. Moreover, in order to provide a full range of services to transshipment cargoes as well as participate in their elaboration, many Caribbean countries have established free zones and others have constructed refineries.

While Haiti's geographical location appears equally advantageous for the transshipment of containers as that of Jamaica, it should be understood that the port infrastructure at Miragoane was especially designed for loading vessels with the dry-bulk mineral bauxite. Further, it is interesting to note that, as yet, no major transshipment centre has been established in the Caribbean for dry-bulk commodities. Since all Caribbean island nations have continuing import needs for dry-bulk commodities such as wheat and other cereals as well as fertilizers, it would appear opportune to consider the feasibility of modifying the port infrastructure at Miragoane to permit transshipment of the principal dry-bulk commodities presently imported individually by those nations. In this sense large dry-bulk vessels could discharge their cargoes at the port of Miragoane into silos or the covered storage area, with transport to final destinations effected either in sacks as general cargo on break-bulk vessels or as bulk cargo in small dry-bulk vessels.

It is instructive to note that other countries have recognized the advantages of regional transshipment centres for dry-bulk commodities. For example, in 1982 Taiwan established the Kaohsiung Bulk Transshipment Terminal. The port infrastructure for that terminal encompasses two berths capable of receiving 60 000 dwt Panamax-type vessels and 110 000 tons of grain silo capacity.<sup>6/</sup> In a similar manner, representatives of the Government of Brazil have undertaken discussions with their counterparts in Japan to establish a transshipment centre in the latter country for Brazilian cereals and iron ore.<sup>7/</sup>

As the existing port infrastructure at Miragoane appears to provide a suitable basis for the establishment of a Caribbean dry-bulk commodity transshipment centre, further study might be directed towards determining the major suppliers of such

/commodities, the

commodities, the import requirements of individual Caribbean countries, needed port investments and the possibility of forming a joint venture with a major commodity supplier for the establishment of such a centre.

(c) Shipbreaking

Maritime transport has been described as a frontier activity which reflects global economic trends at an early stage. In this sense, it is interesting to note that due to the rapid escalation of oil prices beginning in 1973, the adoption of energy conservation measures by major consuming nations and the current world economic recession, approximately 200 million dwt of vessels have almost no prospect of finding profitable employment and are, therefore, considered surplus. In response to this situation many shipowners have temporarily laid up their vessels,<sup>8/</sup> while others have sold surplus vessels to shipbreakers in countries such as India, Pakistan, South Korea and Taiwan. For example, during 1982 approximately 28 million dwt of vessels were sold to shipbreakers for scrap.<sup>9/</sup>

As the shipbreaking industry is labour intensive and requires only minimal skills, it would appear that the port of Miragoane should be considered for the establishment of a shipbreaking enterprise. Nonetheless, prior to establishing such an enterprise, it is necessary to carefully study the market demand for scrap, needed infrastructures and the maximum size vessels which might be reduced to scrap at the port of Miragoane.

It should be understood that the shipbreaking industry is based almost entirely upon the price for scrap -in effect upon consumer demand, and such demand takes little cognizance of the availability of vessels for breaking. As scrap is utilized in the production of steel, the demand for scrap from the steel industry determines its price. Due to the current world economic recession and its effect on steel production, the demand for scrap is low. Nonetheless, there are various ways a shipbreaker can stabilize the demand for his scrap. For example, a shipbreaker might enter into an exclusive supply arrangement with a steel mill to meet its scrap needs at a mutually convenient price. Since there are numerous steel mills in countries close to Haiti -i.e., Brazil, Mexico, Trinidad and Tobago and Venezuela- and as Haiti has the lowest skilled wage rates in all of the Americas, a joint venture might be formed with one of those steel mills to establish an appropriately dimensioned shipbreaking enterprise for the exclusive supply of its scrap requirements.

#### IV. CONCLUSION

As indicated in the terms of reference for the preparation of this document, marine project ideas were to be developed which utilize the existing skills, equipment and infrastructure at the port of Miragoane to generate new economic activities. In compliance with these terms of reference five project ideas were presented in section III of this document and are summarized in the following table with various elements of the port infrastructure to demonstrate the extent to which such ideas make use of those elements.

Marine project ideas	Infrastructure					
	Skills	Shops and equipment	Electric plant	Dock	Covered storage area	Conveyor-belt
Pleasure craft	X	X	X		X	
Coastal fleet vessels	X	X	X		X	
Mobile repair unit for deep-sea vessels	X	some tools				
Transshipment center	X	X	X	X	X	X
Shipbreaking	X	X	X	X		

It is instructive to note that while a transshipment centre for bulk grains and other cereals would require the construction of silos, a similar centre for appropriate dry-bulk industrial commodities such as fertilizers could make use of the covered storage area. However, it should be understood that the construction of pleasure craft and vessels for the coastal fleet would make use of the covered storage area as well. While that area has 60 000 cubic metres of storage space and 3 600 square metres of floor space, it might be found that an active transshipment traffic of such commodities would utilize the entire covered storage area. As a result, careful study must be given not only to the feasibility of each marine project idea but also to determine the compatibility among such ideas.

It is most important to understand that the critical mass of skills, equipment and infrastructure which presently exist at the port of Miragoane has taken many years to create. As much of the equipment and infrastructure is expected to revert to the Government of Haiti 31 December 1982, every effort must be made to replace the mining and related port activities of Reynolds with other activities which

/utilize this

utilize this critical mass and Haiti's inherent advantages. If other activities are not created to utilize the port of Miragoane, the Government of Haiti runs the very real risk that in a short period of time the skills, equipment and physical infrastructure will no longer be an employable unit.

During the preparation of this document it became apparent that there is a vast gammut of ideas in discussion to utilize the infrastructures at the port of Miragoane as well as the surrounding hinterland. Since ports provide a service to other sectors, i.e., agriculture, industry and energy, it would appear important that the project ideas for each of these sectors as well as those proposed in this document be jointly evaluated not only to ensure their compatibility but also to determine priorities and linkages among such ideas.

#### Notes

1/ Moniteur No. 16 of 24 February 1944; Moniteur No. 67 of 9 September 1949; Moniteur No. 73 of 9 October 1980.

2/ Cargo Systems, May 1982, p. 20.

3/ For additional information on Haitian boatbuilding needs, see CEPAL, An evaluation of and projects for the Haitian coastal transport sector (E/CEPAL/R.319), June 1982.

4/ Ibid., annex 2 of E/CEPAL/R.319 contains a project document entitled "An evaluation of boatbuilding technologies in the light of Haitian coastal transport needs".

5/ Fairplay International Shipping Weekly, 11 March 1982, p. 39.

6/ Fairplay International Shipping Weekly, 25 September 1980, p. 35.

7/ Seatrade, December 1980, p. 93.

8/ Fairplay International Shipping Weekly, 26 August 1982, p. 19.

9/ Fairplay International Shipping Weekly, 4 November 1982, p. 9.

Annex

SOLICITUD DE UN EXPERTO EN TRANSPORTE MARITIMO

A. Antecedentes

1. Entre los días del 8 al 10 de noviembre del presente se efectuaron reuniones entre la Secretaría de Estado del Plan de Haití (SEP) y el ILPES en vistas a la programación de las actividades de Fortalecimiento del Sistema de Planificación y de Proyecto de Haití que la SEP y el ILPES, con la colaboración de la CEPAL, vienen desarrollando desde marzo de 1981.
2. En esas reuniones la SEP estuvo representada por el Sr. Claude Augustin y el ILPES por el Sr. Francisco León.
3. El período de programación fue de noviembre de 1982 a agosto de 1983.
4. En el curso de dichas reuniones el Sr. Augustin, por encargo expreso del Ministro del Plan Sr. Claude Weil, solicitó la colaboración de un experto en transporte marítimo. Los términos de referencia de la misión de este experto se detallan en el punto B.

B. Términos de referencia de la misión del experto en transporte marítimo

1. El experto, en el marco de las orientaciones recibidas de la Dirección del ILPES y la Dirección de Transporte de la CEPAL, colaborará con la SEP en la identificación y evaluación de ideas de proyectos que permitan el uso de la infraestructura física y vial y los excedentes minerales entregados al Gobierno de Haití por la Compañía Reynolds, al cesar las actividades de ésta en ese país.
2. En particular, el experto analizará la viabilidad de utilizar: el puerto de aguas profundas de Miragoane para la instalación de un dique seco (cale sèche) para la reparación de barcos de transporte marítimo internacional; el excedente de mineral para la fabricación de ferrocemento o materiales similares de uso en la construcción de barcos de cabotaje y construcciones civiles; y la maestranza de la Compañía Reynolds para la construcción y reparación de barcos y contenedores.
3. En la identificación y la evaluación de las ideas de proyectos debe darse una alta prioridad a la reactivación de la actividad económica y el bienestar social de la región de Miragoane que ya ha sido y será afectada aún más en el futuro por el próximo término de actividades de la Compañía Reynolds.
4. El experto recibirá la colaboración de al menos dos técnicos nacionales y podrá trabajar en español o inglés.

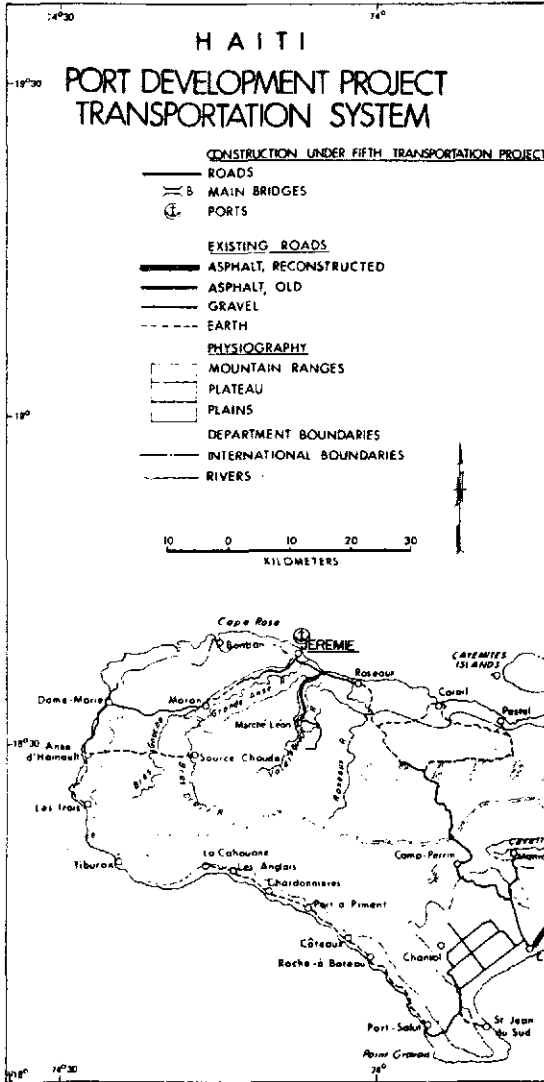
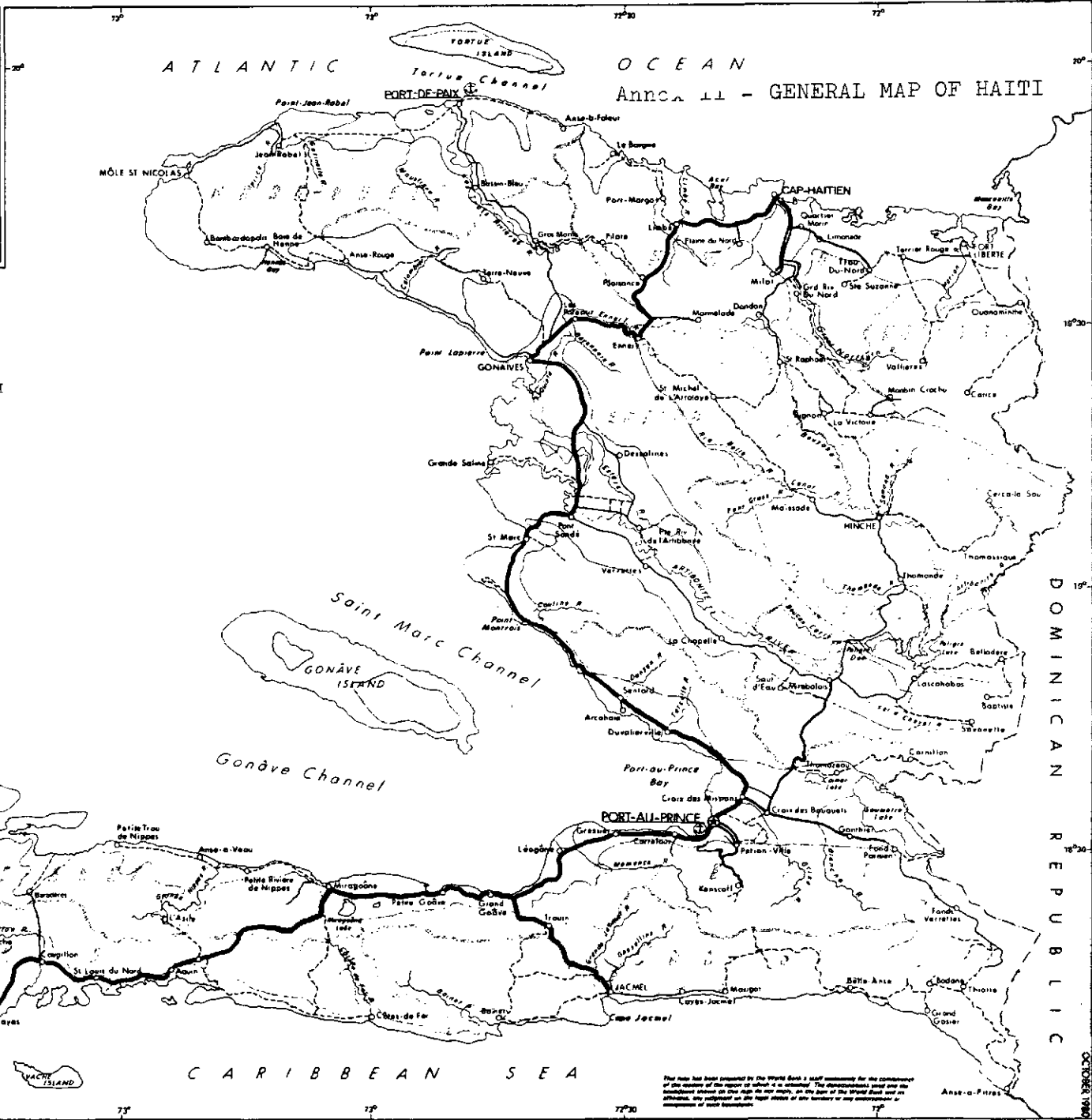
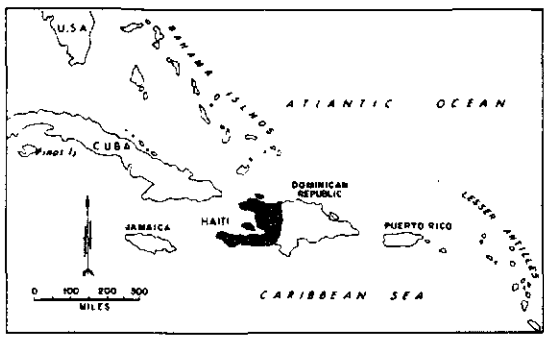
C. Solicitud de ILPES a CEPAL

1. El representante del Gobierno de Haití hizo ver la conveniencia de que esta misión pudiese ser realizada por el experto de la División de Transporte de la CEPAL, Sr. Larry Burkhalter, quien ha estado a cargo del apoyo que se ha prestado a la SEP y el Ministerio de Obras Públicas de Haití en materia de transporte marítimo en el marco de la asesoría del ILPES.
2. La Dirección del ILPES considera que el pedido de asistencia de parte de la SEP del experto Sr. Burkhalter, se justifica plenamente ya que fue él quien introdujo las ideas de la utilización del ferrocemento en la construcción de barcos de cabotaje

en Haití y de la instalación de una planta de reparación de contenedores. En tal sentido su misión vendría a culminar y complementar su trabajo anterior.

3. En base a estos antecedentes solicitamos la colaboración del Sr. Burkhalter por un período de 4 semanas a partir del 21 de noviembre del presente.

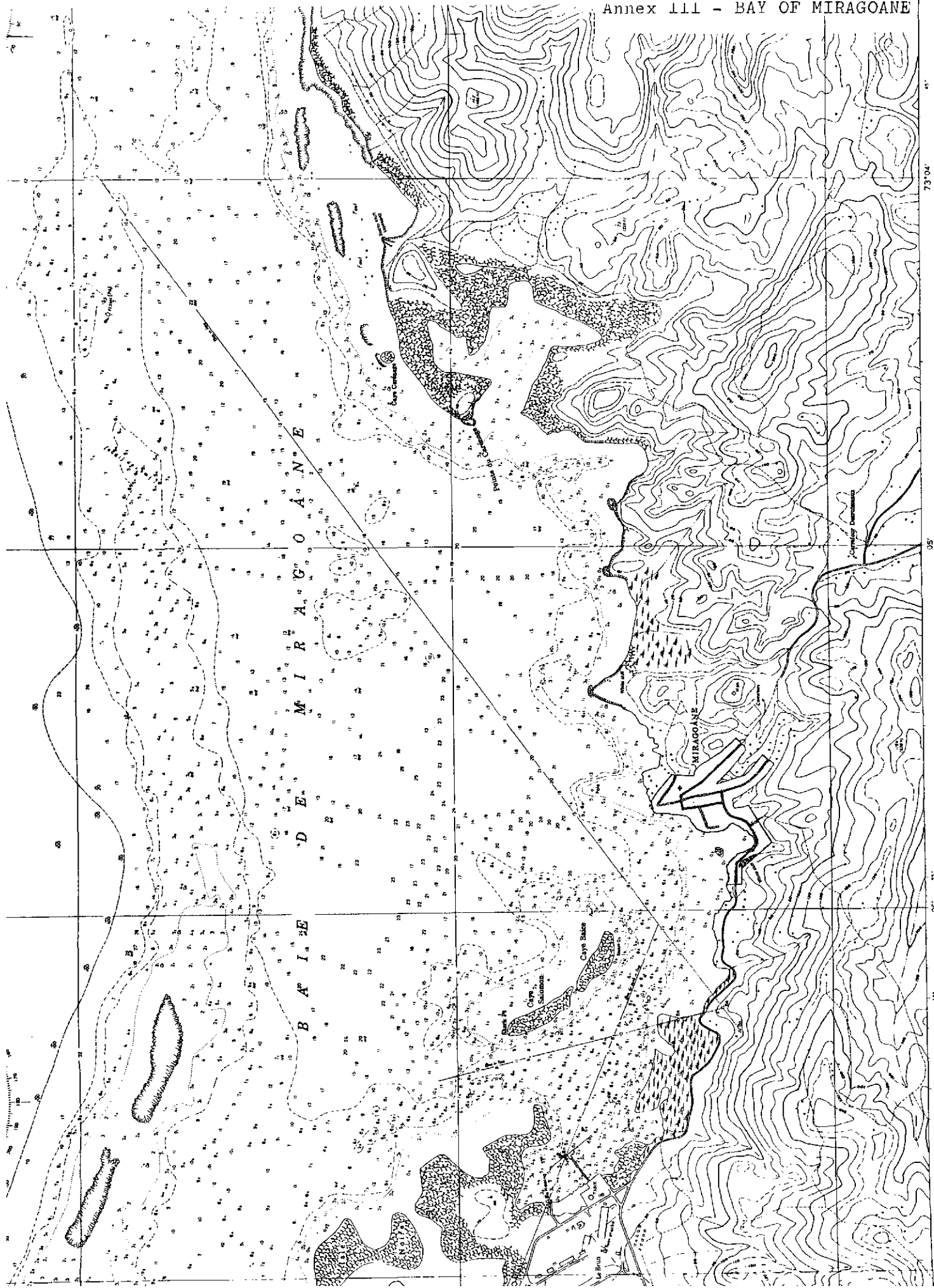
Los gastos de viaje y los viáticos serán financiados por el ILPES, con fondos del Proyecto ATN/SF-1729-HA.



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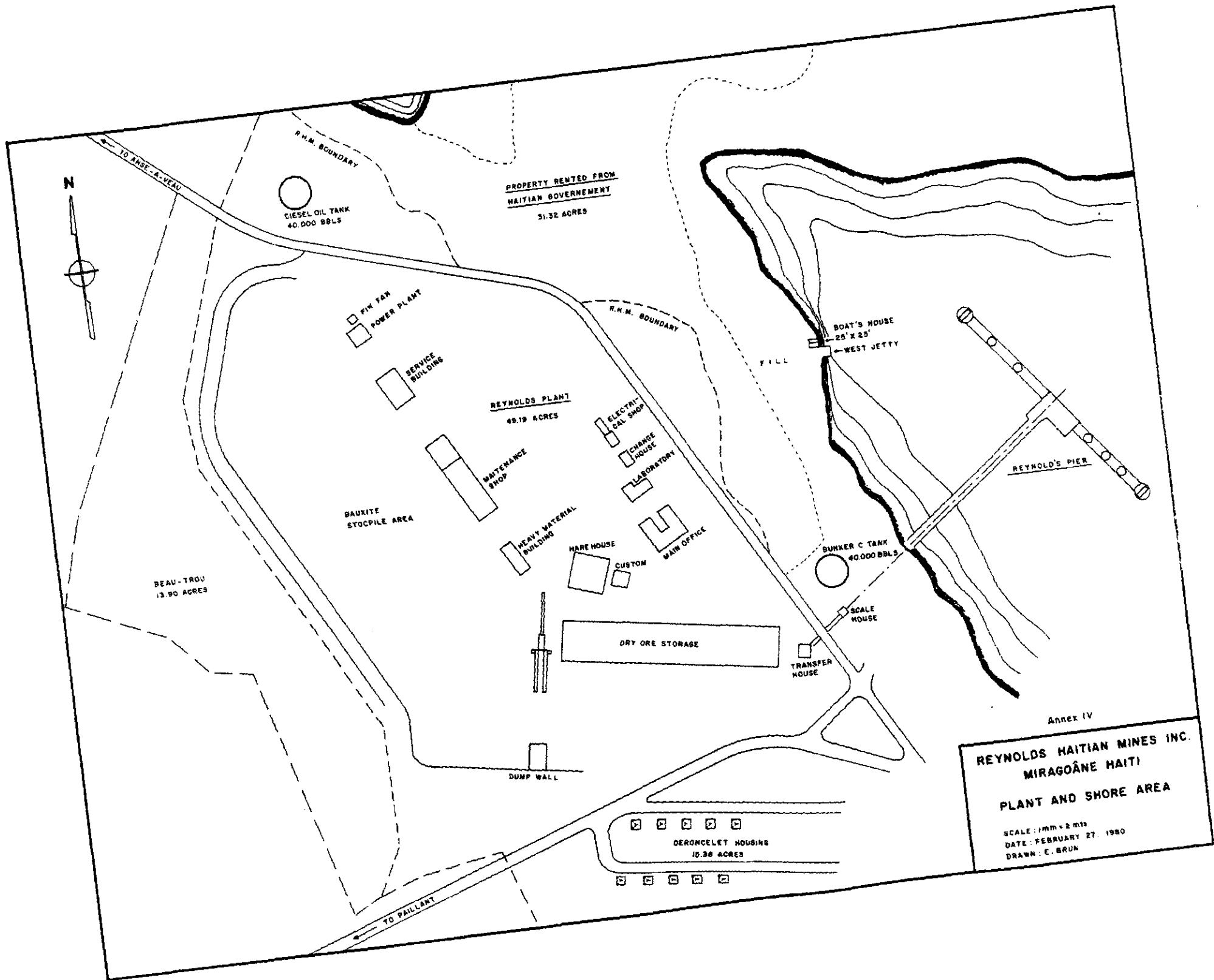
73° 37' 17" 73° 04' 05" 73° 04' 05" 73° 04' 05"

IRINIC IN FATHOMS AND FEET

DEFENSE MAPPING AGENCY HYDROGRAPHIC CENTER

WARNING



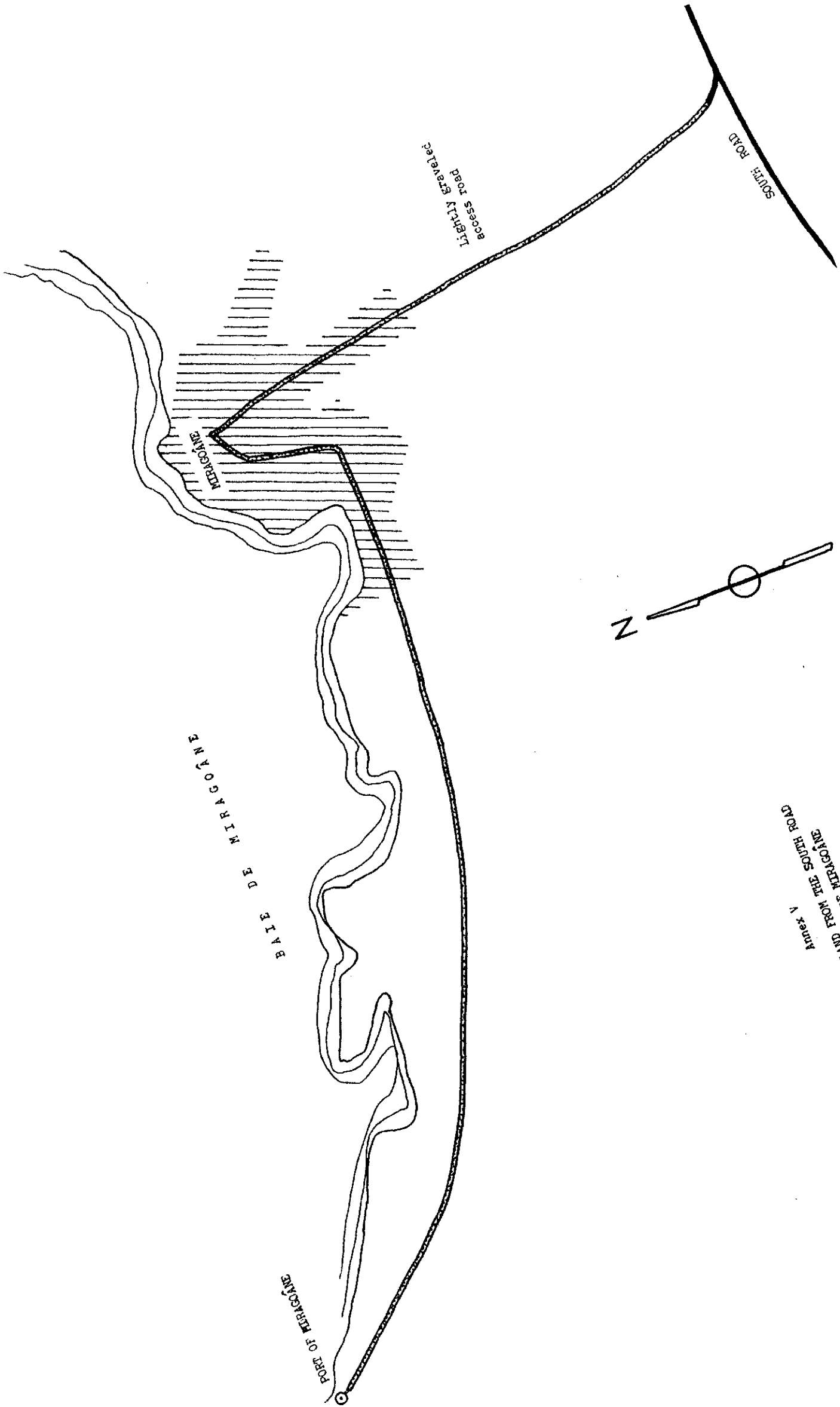


Annex IV

**REYNOLDS HAITIAN MINES INC.**  
**MIRAGOÂNE HAITI**  
**PLANT AND SHORE AREA**

SCALE: 1/8" = 2 MTS  
 DATE: FEBRUARY 27, 1980  
 DRAWN: E. BRUN





ACCESS BY LAND FROM THE SOUTH ROAD  
TO THE PORT OF KERGYLE  
MIRAGLE  
Annex V

LIGHTLY GRAVELLED  
access road

ROUTE ROAD

MIRAGLE

BAIE DE MIRAGLE

PORT OF KERGYLE

