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# U.S. TRADE AND DEVELOPMENT AGENCY



## EXECUTIVE SUMMARY

### LOTA PORT INTEGRAL DEVELOPMENT PROJECT, PHASE 1

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## EXECUTIVE SUMMARY

### Introduction

The Port of Lota was built in stages. It started operating in the early 1900s, handling bulk shipment of the coal produced in the Lota mines, which at that time were privately owned. Subsequently, the mines were transferred to the State, and the Empresa Nacional del Carbón -- ENACAR [National Coal Company], which reported to the Corporación de Fomento de la Producción -- CORFO [Corporation for the Development of Production]. In 1995, the System for the Administration of Public Companies (SAE) was created, and ENACAR was one of the companies for which it was responsible. The mines were closed by SAE/CORFO in 1996.

The company had grown to employ approximately 4.000 workers. When the mines were closed down, SAE/CORFO set in motion a development plan to promote the installation of other regional industries in the area and at the same time provide training for the former mine workers.

One of the main components of this development plan is the transformation of the Port into a multipurpose facility to serve a more diversified local economy, generating additional jobs as a result of this increase in regional trade. The transformation of the existing port will require a considerable amount of investment to reconstruct the existing facilities and/or construct new docks or quays, improve support areas, and add new facilities. The result will be an upgraded, renovated port ready for development in Region VIII, in the CenterSouth part of Chile.

The Port of Lota is strategically located on the coast of Region VIII, toward the south of a group of bays, which boast a number of ports along a 50-km. stretch. Thanks to its natural conditions and strategic location, Lota could become a port with a role to play in attending to the needs and the economic growth of Region VIII.

At present, the Port of Lota is out of service, its existing facilities were designed specifically for coal, and have been allowed to fall into disuse. In its present condition the port could not be commercially run to handle the cargo transferred in the area.

### Objectives of the Study

The main objective of this study is:

To assess the possibility of developing the facilities of the Port of Lota as a means of promoting an economic **opportunity and a chance** to diversify the economy in an area which has previously depended on the coal mines.

Lota Port Integral Development Study  
PHASE 1: MARKET ANALYSIS

The study is being carried out in two stages. In this first stage of the study, the prime objective is to make an analysis of the potential market of the Port of Lota. This analysis covers the users of the ports of Chile's Region VIII, who currently use other alternatives, and also the additional demand that could arise as a result of the following:

- Cargo from the provinces of Argentina that are near the border passes with Chile.

Transshipment of cargo with origin or destination in other regions of southern Chile (coastal navigation),and

The industrial development of the area close to the Port of Lota, where the Corporation for the Development of Production (CORFO) and the System for the Administration of Public Companies (SAE) are offering incentives for the development of industrial estates. In this way CORFO and SAE are promoting new economic activities in the area.

The main objective of Stage 11 of this study is to determine the types of facilities required and their feasibility based on the projections of cargo under different economic, commercial and infrastructure scenarios.

To this effect, Stage I, the Study of the Demand, considers the different types of cargo, including bulk, breakbulk (loose cargo), containerized, and the different types of vessels that carry it. The users of the ports are also considered, as well as their requirements, to gain a good understanding of what is needed to bring the Port of Lota into a position where it can compete with other nearby ports. Stage I of this study analyzed the different market segments, the potential of each one and the industrial sectors that have the greatest potential to use the new facilities to be developed in Lota. Realistic demands projections were developed, based on the analysis of the market, so that later, in Stage 11, it will be possible to define the type of new facilities to be developed in Port of Lota and determine how to attract users and satisfy their needs fully, taking into account that Lota will be competing with other ports in the region.

Stage II will provide a conceptual definition of the facilities required, the operational and environmental standards that should govern the development of such facilities, and the financial possibilities of implementing them. The product of this Stage will be a financial analysis that will show potential investors and/or port operators how the port can be developed through private investment. It is therefore important that the analysis provided in the study contain the type of information required by financial institutions and potential investors.

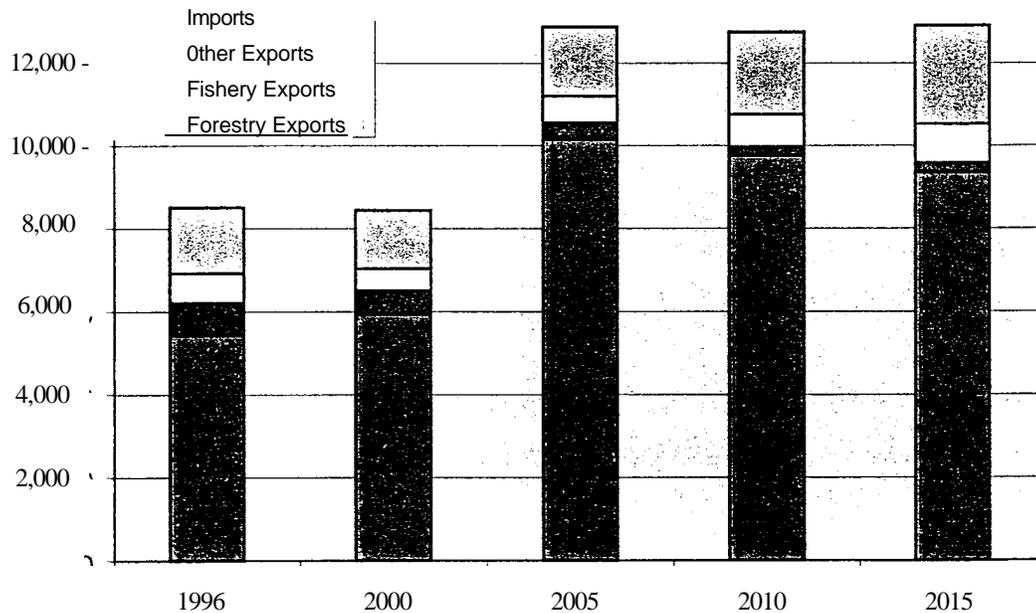
### **Economic and Foreign Trade Scenarios**

Best-case, Probable and Worst-case scenarios were defined for growth in production and foreign trade, and these were used for the projections of demand for the public ports of Region VIII.

We should not lose sight of the fact that the principal market for Region V111's ports are the exporting forestry and fishery industries. For this reason, a deeper analysis was made of the characteristics of these industries and specific projections were prepared for their future production and sales to domestic markets and export markets. Although in theory it is possible that other industries may develop in Chile's Region V111 over the coming 15 years, at the present time it is not reasonable to consider other possible cargo in this evaluation of the feasibility of building port facilities to be developed with private capital.

Subsequently an analysis of the other economic sectors, which are relevant for the Region's public ports was added, to obtain total projections for regional foreign sea trade and coastal navigation. Figure ES. I summarizes the foreign sea trade projections.

**Figure ES.1**  
**Foreign Sea Trade - Region V111**  
**Probable Scenario**



As we may deduce from the Figure, it is expected that in the period 2000-2005 the most important increase in the demand for port services to meet the Region's foreign trade requirements will be seen in the volume of forestry products exported. The forestry industry at present produces most of the cargo handled in the Region's ports (50% of the cargo moved through the ports of Region V111 in 1999 were cellulose, wood chips and finished wood). The projected increase in cargo is mainly due to a significant short-term increase in the availability of bolts of timber for industrial use. The slight reductions in export figures after 2005 reflect two factors: a leveling off of the quantities of timber

available; and the impact of the implementation of a series of industrial projects that will have the effect of boosting exports of manufactured products (lighter-weight freight) as opposed to primary products such as bolts of timber and wood chips.

The best-case scenario is similar to the probable scenario up to the year 2010, but then it shows a significant new increase in the volume of tons exported. This increase is based on the assumption that the forestry companies plant 80.000 additional hectares per year, and that these plants will have a maturing period of 13 years.

### **Analysis of the Requirements for Land Infrastructure**

Generally speaking, Region VIII is equipped with a good road and rail transport system, with direct connections between most of the main centers of production and the different ports. At present, the Government is using a concessions system to increase the capacity and quality of the Region's highways and railroads, and no restrictions are anticipated in this context.

Where there are urgent requirements is in the access to Lota. At present the Port of Lota does not have an adequate access road or rail connection. In order for Lota to be able to compete with the other regional ports under equal conditions, it must be adequately connected to the highway and railroad systems. It is essential that the government commit itself to carrying out these access projects before calling for bids from companies and private investors to develop the port facilities.

### **Analysis of Competing Ports and Lota's Strategic Position.**

An analysis was made of the competition in the context of new facilities for the Port of Lota. It was concluded that Lota's principal competitors would be the multipurpose ports of Lirquén, San Vicente and Coronel. The other ports in Region VIII are smaller and specialized.

At present all the port facilities of Region VIII are underutilized, because while their capacity is estimated at approximately 13,9 million, the total volume of cargo handled in 1999 amounted to only 8,8 million.

Another fact to be considered is that the three ports, which would be Lota's main competitors, have expansion plans to add new berthing places with their respective support facilities. Table ES.1 presents a summary of this situation. Only in these three ports were expansion plans identified, because the other ports are likely to continue operating as specialized ports, and no development plan was detected for any of them.

Taking into account this highly competitive port situation, the following scenarios were analyzed for the development of infrastructure in the Port of Lota:

1. Maximum development of Lota for the long-term handling of an ample variety of cargo, mainly containerized.

2. Gradual development of Lota to focus on certain specific products.
3. Minimum development of Lota with a maximum development of the other ports.

The first of these alternatives entails an investment cost (without equipment) of approximately US\$ 62 million. The cost of the other two scenarios depends on the way in which they would be carried out.

**Table ES.1**  
**Expansion Potential of Competing Ports - Region V111**

Port	Present Berthings	Present Capacity (in thousands of tons/year)	Potential Future Berthings	Estimated Investment
San Vicente	3	3,800	2	US\$15,5 million
Lirqu6n	6	4.500	2	US\$36,5 million
Coronel	2	2.200	3	US\$18,0 million

**Projections of Demand**

It was concluded that Lota has the potential to move the following main products: cellulose/paper, sawn lumber, other forestry products; and coastal navigation in fishmeal. This analysis was based on the foreign sea trade projections for the Region described earlier, to which were added estimates of the potential demand for coastal navigation and combined land freight from Argentina.

It was determined that while we can expect to see a considerable increase in the shipments of fishmeal to the salmon farms in the southern area by coastal navigation, it is unlikely that land-combined cargo from Argentina will reach significant levels.

On analyzing the different products, their classification per type of cargo, and the different competing ports in the Region with their respective specializations, the area of action of the Port of Lota became quite clearly defined. It was determined that Lota should basically project its cargo handling activities to breakbulk forestry products, with some participation of containerized cargo and little or no bulk cargo.

It is always possible that a private company may become interested in developing special facilities for a particular type of bulk product. Such facilities typically come into being to meet the specific demand of the owners of the cargo or of a particular exporter or importer. At this time, based on the information available, it is not possible to forecast the demand for this type of specialized facility.

For this reason, projections for Lota's potential market were prepared only for breakbulk cargo and containerized cargo, under the best-case, probable, and worst-case scenarios. Table ES.2 summarizes these projections. It was concluded that the potential of the Port of Lota to attract containerized cargo in the immediate future is relatively small, taking the following into account:

- the recent concession of the port of San Vicente and its emphasis on increasing its efficiency to attract containerized cargo.
- the additional capacity of Lirquén Port and its competitiveness on the market to attract the shipping lines with containerized cargo services, and
- the expansion plans of these two competing ports to add berthing places and equipment to attract containerized cargo.

### **Projections for Vessels**

An analysis was made of the vessels currently used in Region VIII for sea transport. Considering the main products handled in the Region's ports, the associated sea transport and the destination of the exports, we can conclude that the vessels being used apply the latest technology and make for great port efficiency in both the ports of origin and ports of destination, for which reason no substantial change is foreseen in the medium term in the use of these vessels.

### **Conclusions**

The analyses presented in this report lead to the following main conclusions:

1. The natural advantages of the competing ports and the lower marginal cost of their expansion projects mean that Lota will be able to become a competitive port only if it manages to establish certain cargo niches, taking into account its relative advantages of having a natural bay and available adjacent land. This implies the following:
  - That Lota should be developed as a multipurpose port, with the flexibility required to handle different types of cargo to meet the needs of the users of ports in Region VIII. A multipurpose port requires a design that can be adapted to different types of cargo and to the vessels carrying them.
  - That the required highway and railroad access must be constructed.
  - That Lota's tariffs and services should be the same as those offered in the other ports of the Region.

**Table ES.2**  
**Summary of Potential Market -- Port of Lota**  
**(in thousands of tons)**

<i>Products</i>	<b>BEST</b>				<b>PROBABLE</b>				<b>WORST</b>			
	<b>2000</b>	<b>2005</b>	<b>2010</b>	<b>2015</b>	<b>2000</b>	<b>2005</b>	<b>2010</b>	<b>2015</b>	<b>2000</b>	<b>2005</b>	<b>2010</b>	<b>2015</b>
<b>GENERAL CARGO</b>												
<i>Exports</i>	0	708	919	1,370	0	528	738	933	0	246	411	598
Cellulose/Paper (Pulp)	0	339	493	678	0	273	416	522	0	160	263	381
Saw Lumber	0	118	164	247	0	82	125	178	0	38	62	88
Boards-Other Wood	0	22	35	58	0	15	27	44	0	2	11	20
Timber Bolts (Logs)	0	200	175	300	0	140	133	132	0	40	60	80
Fishery Products	0	0	0	0	0	0	0	0	0	0	0	0
Others	0	28	51	87	0	18	34	58	0	5	16	29
<i>Imports</i>	0	20	34	53	0	13	23	36	0	5	12	22
<i>Coastal Nav.</i>	0	22	101	131	0	8	29	38	0	1	1	2
Fish Meal	0	21	98	128	0	7	27	36	0	0	0	0
Others	0	2	3	4	0	1	2	3	0	1	1	2
<i>Lota Total Potential</i>	0	750	1,054	1,554	0	549	789	1,007	0	251	425	622
<i>Lota Participation</i>	0.0%	7.9%	10.5%	12.8%	0.0%	5.9%	8.2%	10.2%	0.0%	4.0%	7.0%	10.6%
<b>CONTAINER CARGO</b>												
Lota Total Containerized	0	99	245	376	0	58	136	216	0	0	39	90
Lota-No. of TEUS	0	10,108	24,973	38,413	0	5,917	13,927	22,034	0	0	4,007	9,199
Region-No. of TEUS	233,079	327,959	394,871	482,185	223,283	305,758	358,860	408,360	213,487	247,659	287,659	329,762
Lota Participation TEUS	0.0%	3.1%	6.3%	8.0%	0.0%	1.9%	3.9%	5.4%	0.0%	0.0%	1.4%	2.8%

That consideration should be given to attracting cargo from the areas where Lota has comparative advantages in land carriage costs for products coming from the production centers located south of the port; bearing in mind, however, that since the distance from Lota to Coronel is only 10 km., this advantage is not significant. Therefore, the Port of Lota will have to compete in all the other aspects in order to attract cargo.

2. The materialization of the potential market reported in Table ES.2 will depend basically on the Port's capacity to attract specific clients in competition with the other ports that handle general cargo in the Region. It will be particularly important to obtain:
  - Export cargo from one or more forestry companies.
  - Coastal navigation cargo from one or more companies that produce salmon feed or fishmeal.
  - At least one shipping line with regular container cargo.
  - Cargo from any other industries that may come to the area, including the industrial estate of Lota.

Taking into account these conclusions and the projection of potential cargo seen in Table ES.2, we can make a maximum investment estimate, based on the maximum tariff of US\$ 6.62 that the concessionaire of the port of San Vicente is able to charge its users.

If we subtract from this tariff the operative costs of services estimated at between US\$ 2.50 and US\$ 2.72 per ton, we are left with a net income of approximately US\$ 4.02 per ton. Applying this amount to the estimated flows of tonnage and discounting these for an estimated service life of 20 years at a minimum 10% per year, the present value of this income was estimated for different start-up dates of port operations. For this purpose, the projection of the potential market was extended lineally, resulting in the total volumes of cargo moved in the year 2025 shown in the same Table.

**Table ES.3**  
**Estimate of Maximum Investment - Lota Port**

Scenario	Port Operation starts in:		Tons in 2025
	2005	2010	
Best-case	\$43,725	\$57,877	2,358
Probable	\$29,923	\$37,865	1,465
Worst-case	\$17,264	\$23,741	994

These values are equivalent to the maximum investment that would be justified in the year 2005 and 2010 respectively, assuming that Lota manages to attract the whole of the

potential market. In the measure in which this goal is not reached, the recoverable investment would be proportionally lower.

Considering these estimates, the Consultant's recommendation is to go ahead with Stage II of the study, the goal being to design a project that can be financed with private capital for a multipurpose port with the characteristics mentioned earlier in this study, and that requires a maximum total investment of US\$30 to US\$35 million.

To move the 2,3 million tons resulting from the best-case scenario in the year 2025, a port with two berthings would be sufficient. But to be able to develop such a project realistically with the above-mentioned amounts, it is imperative that the cost of the access roads or railroads not be charged to the potential investor.

This preliminary analysis shows that it is possible to develop a port project that can be financed with private capital to handle the projected cargo demand, providing that the required facilities can be designed with a maximum investment of approximately US\$30-35 million.

The main objective of Stage II of the study will be to define the facilities and investment costs for a multipurpose port with an initial capacity sufficient to handle the projected potential demand (1-1.5 million tons per year in the year 2015 and 1.5-2.4 million tons in the year 2025); Stage II must also consider the possible stages of development, analyze at greater depth the fixed and variable operative costs, consider the environmental impact of the port development, and, in general, complete the feasibility study for the development of a multipurpose port in Lota to be financed by private investors.