9.5.4 Use of environmental data for assessment of this case

After HIPASAM had shut down, they carried out an investigation of the Environmental Impact Assessment for the first time.

The data measured after HIPASAM had shut down sets an environmental standard for the investigation of EIA in the future.

The evaluation of the water quality is the most important point in the EIA investigation of Area I and Area II where the factory of HIPARSA exists judging from the following natural features.

① In this region, it is always windy, and there a lot of flying dust.

② The solid waste is of an abolition stone nature.

③ Drainage in Area I remains in Laguna Blanca and is of the closed system. Moreover, housing does not exist in the vicinity.

④ In Area II, the drainage of dehydrated slurry is saved in the pound, and the clarified liquid is discharged into the sea.

Therefore, it is forecast that the investigation of EIA concerning drainage will be the most important. The restrictions concerning the water quality is being made law in Rio Negro Province now but has yet to be clarified.

(1) Water quality

It is confirmed that the measurement value indicated in **Table-136** is the one for Area I, and is more or less the Maximum Permissible Limit (This numerical value is very severe for Area I) which the Federation Government imposes. In the investigation at the stage of re-activation, it is possible to evaluate the EIA concerning the water quality based on this value.

On the other hand, Dehydrated water and its drainage is saved in the pond in Area II where the pellet factory exists. Moreover, some of the clear liquid is discharged into the sea. Therefore, it is necessary to

clarify the Maximum Permissible Limit of "To rain conduit or water course" which is a severer standard in this case. Additionally, it is necessary to pay attention to the heavy metal ion, pH of the liquid, and phenol.

(2) Tailing disposal

Tailing separated by mineral processing the abolition stone, which is the natural rock excavated from Area I, piled up in Laguna Negro. Their solids do not go out outside because Laguna Negro is a closed system.

Therefore, it is thought that the numerical value measured when HIPASAM is closed is an environmental standard, and is sufficient enough to evaluate the EIA.

(3) Air pollution.

Data concerning air pollution does not exist at all. In Area II, NOx, SOx, and CO gas exhausted when burning should give the combustion method and the gas processing which should not exceed the standard value.

The distinction with flying sand is not pounded easily from the particulate matter (PM) because this region is very windy.

Chapter 10

SALES PROGRAM

10.1 MARKET AND VOLUME OF HBI SALES

Following the various meetings and interviews with different mills in Argentina and Brazil, CIS (Argentina) and trading firms, the estimation of the annual HIPARSA HBI sales are planned as **Table-142**, which is equivalent to total full production quantity 750,000 t per year.

Table-142   Annual HBI sales plan

(kilo-t)

Domestic market		
ACINADAR	250	
ACERO BRAGADO	120	
ACERO ZAPLA	25	
SIDERCA	100	
SIDERAR	50	
Total Argentina		545
Export market		
Brazil	205	
Total Brazil		205
Grand Total		750

First priority for sales is the domestic market at 545,000 t/year and the balance to be for export (for Brazil), because net income for the domestic market is better than for export at FOB Punta Colorada (not considered Patagonia export rebate system).

HBI is consumed as;

  ① substitute for scrap at EAF

   :ACINDAR, ZAPLA, ACERO BRAGADO, SIDERCA, Brazilian mills

  ② substitute for pig iron:ZAPLA, Brazilian mills

  ③ new demand (higher productivity at BOF):SIDERAR, Brazilian mills

Due to the limitation of charcoal pig iron supply in Brazil in the future, the Brazilian market will have sufficient capacity to absorb any quantity of HIPARSA HBI.

At present the Brazilian market is more feasible than the USA market in incentives for import tax and payment terms, as long as the Mercosur Agreement exists.

10.2 SELLING PRICE OF HBI

(1) Forecast average HBI price

Considering HBI market price in USA for this year, average of HIPARSA HBI sales price (CIF or delivered) is forecast as US$ 138/t.

Table-143 HBI price in 1998

(US$ /t)

Jan. 1998	142-146
Feb. 1998	140
Mar. 1998	138
Apr. 1998	136
May 1998	135-138
Jun. 1998	135-138
Jul. 1998	135-138
Average	US$ 138.21/t = US$ 138/t

(Source; MBR, January-July, 1998)

(2) Freight from Punta Colorada to each client

Freight from Punta Colorada to each client is estimated as follows.

Table-144   Estimated freight

Clients	CIF/Delivered	Freight	FOB Punta Colorada
ACINDAR	138/t	11/t by sea	US$ 127 /t
ACERO BRAGADO	144/t	17/t by truck	US$ 127 /t
ACERO ZAPLA	144/t	17/t by sea/railway	US$ 127 /t
SIDERAR	138/t	11/t by sea	US$ 127 /t
SIDERCA	138/t	11/t by sea	US$ 127 /t
Brazil	138/t	12/t by sea	US$ 126 /t
USA(Gulf)	138/t	20/t by sea	US$ 118 /t

- Due to inland truck transportation (BRAGADO) and vessel/railway combined transportation (ZAPLA), HBI sales price for both companies have been based on FOB Punta Colorada US$ 127/t.

- If it is available to consider Mercosur tax incentive, selling price of HBI for Brazil it may be able to apply 5% higher than the market price, of which import cost is equivalent to it from outside of Mercosur.

- Ocean freight from Punta Colorada to USA(Gulf) is approx. US$ 20 /t.

(3) Total annual sales amount of HIPARSA HBI (FOB Punta Colorada)

Table-145   Estimated annual sales

Domestic market	545 kilo-t × US$ 127/t	= US$ 69,215,000
Export market	205 kilo-t × US$ 126/t	= US$ 25,830,000
	750 kilo-t	= US$ 95,045,000

(average US$ 126.73/t)

10.3 ANNUAL SALES AMOUNT OF HIPARSA HBI

Total annual sales quantity is based on **Table-142** and sales price (FOB Punta Colorada) are applied in **Table-144**. Therefore total annual sales amount for 750,000 t/year of HIPARSA HBI is estimated as "say" US$ 95-million.

Table-146   Yearly estimated sales

Year	Production	Sales quantity (kilo-t) (domestic/export/stock)	Sales amount (FOB Punta Colorada)
1st year	510,000 t	430/0/80	US$ 54,610,000
2nd year	750,000 t	545/205/0	US$ 95,045,000
3rd year	750,000 t	545/205/0	US$ 95,045,000

- Production for the first year is 510,000 t/year and first quarter production a quantity 80,000 t is reserved as stock therefore first year sales is commenced from the second quarter onwards, of which the quantity is 430,000 t.

- Domestic sales is to be given first priority (maybe max. 545,000 t/year) over export, because of better net income (not considered Patagonia export rebate system for export lots).

- Production of full operation and its sales will be on stream from the second year onwards.

Chapter 11

FINANCIAL ANALYSIS

11.1 BASES OF FINANCIAL CALCULATION

In this excercise for FIRR calculation, the price was set as of the end of 1998, and no escalation/inflation was considered. Manpower cost, Operation cost, investment, and pre-operation cost are based on the data mainly in Chapter 9. Sales quantities and prices are taken from Chapter 10.

(1) Investment

In this calculation, the transfer value of HISPARSAs existing assets is set at zero(0).

The rehabilitation and renovation of the existing mine, plant and facilities, plus construction of the new plant and facilities are estimated to take four(4) years from award of the contracts to the commencement of commercial production of HBI, which is the starting point of year 1.

Investment cost for renovation of the existing facilities of HIPARSA and new facilities such as the HBI plant, Water Pipeline and Natural Gas Pipeline is estimated for each year as follows.

Table-147 Yearly investment cost

(Unit: $1,000)

Year	-4	-3	-2	-1	Total
Mine Equipment/Facilities	0	6,080	6,080	3,040	15,200
Concentration Plant	0	0	1,800	900	2,700
Pellet Plant	0	0	6,850	6,850	13,700
HBI Plant	0	29,400	58,800	58,800	147,000
Water Pipeline	0	0	16,150	16,150	32,300
Natural Gas Pipeline	0	0	0	8,800	8,800
Total	0	35,400	89,680	94,540	219,700

Table-149   Production volume

(Unit: kilo-t)

	-1	1	2 onward
Iron Ore	460	1,695	2,600
Concentrate	160	707	1,100
Pellet	101	715	1,100
HBI	0	510	750

HBI is sold in the domestic and export markets. In the first year, a part of the initial production is used to build up the stock. The sales amount is shown in the following **Table-150**.

Table-150   HBI production and sales

	Year 1		Year 2 onward	
	HBI Tonnage (1,000 t)	HBI Sale ($1,000)	HBI Tonnage (1,000 t)	HBI Sale ($1,000)
Stock Building	80,000	0	0	0
Domestic Sales	430,000	54,610	545,000	69,215
Export Sales	0	0	205,000	25,830
Total	510,000	54,610	750,000	95,045

(4) Production cost

Production cost consists of Salary and Wages, Utilities, Auxiliary and Consumable Materials, and Maintenance, spare parts and repair costs. Details are as shown in Chapter 9.

Stope development and drilling cost down to the level ML-620 is summarized, and distributed to ore mined. ($ 2.43/t)

(5) Depreciation and amortization

Depreciation and amortization are the cost items without cash outflow. They are included in cost items to be deducted from gross income to calculate the gross profit, which is the basis for calculation of Income Tax. For IRR calculation, cashflow is obtained by adding depreciation and amortization, and interest paid, to the Profit after Tax.

1) Depreciation

Depreciation is taken over 20 years, straight line, salvage value 0.

2) Amortization

Amortization of Pre-production Cost and Intangible Assets is to be taken in 5 years, straight line, residual value 0.

There is a scheme to accelerate depreciation and amortization for the mining industry in Argentina. This project, having a lower profit prospect, is considered unable to enjoy the privilege due to lower cash flow in early years, and the calculation is made on 20 years depreciation and 5 years amortization.

(6) Taxes and Rebates

1) Taxes

In this exercise, Provincial Mining Tax, Provincial Gross Income Tax, and Federal Income Tax were taken into consideration. Export and Import duties are not applicable to this project, and not taken into account.

Provincial Mining Tax

Provincial Mining Tax is levied at the rate of $ 2 /t of Iron Ore mined.

Provincial Gross Income Tax

Provincial Gross Income Tax rate is 3% of industrial product sales; in this project, sales amount of HBI.

National Income Tax

National Income Tax rate is currently 33%, and expected to be 35% of the Gross Profit. In this exercise, the rate was taken at 35%, applicable when cumulative loss disappears.

There are other taxes and charges on the Federal, Provincial and Municipal levels. IVA is basically imposed on consumption of goods in Argentina, and can be considered neutral to profit/loss of the project. IVA is, therefore, not included in the calculation in connection with sales and profit/loss.

The only case IVA may affect the project IRR is the plant cost. IVA is imposed, but Argentina has a provision for early refunding, and therefore IVA is not included in this evaluation.

Another federal tax is the one levied on foreign exchange transactions, the rate of which is maximum 0.3% of the transaction, and could be small compared with other taxes separately handled.

Provincial taxes other than Mineral Tax and Gross Income Tax are, Real Estate Tax, Vehicle Tax and Stamp Tax. All of these taxes are less significant in amount, and considered covered by Sales and Administration Cost.

Municipal taxes in Sierra Grande are Household Tax and Safety Tax. Both are relatively small in amount, it was supposed to be absorbed by Sales and Administration Cost.

2) Patagonia Export Rebate System

There is an incentive system to promote Patagonia export. The system is to give rebate to the products exported from ports in Patagonia. The rate of rebate given are shown in **Table-151.**

Table-151   Patagonia Export Rebate Rate Schedule

Year	Rate of rebate
1999	7% of exported value
2000	6
2001	5
2002	4
2003	3
2004	2
2005	1
2006 on	nil

This rebate system has no significant impact on the project, due to the small percentage of export and the low rebate rate when the project comes on-stream in the year 2003 when everything goes smoothly.

Due to relatively small and temporary impact on the IRR, the rebate on the export from Patagonian Ports were not considered. If everything goes smoothly, the year 1999 would be the year -4. The present rebate system gives rebates for the export of 2nd year, 2%, and 3rd year, 1%.

If the present scheme of the rebate system is changed to give more incentives to new projects in Patagonia, for instance, to grant rebates to exports from Patagonian Ports starting from the year of the commencement of the export, with gradually decreasing percentage like the present system, the positive impact would be much more effective.

The present sales program plans to export 205,000 t of HBI at $ 126, and sell in the domestic market 545,000 t at $ 127. Rebate may induce the change of the sales program to export the whole quantity of HBI produced.

(7) Sales and administration cost

General expenses are set at $ 2,000,000 per year, inclusive of contingencies and small cost items such as Municipal/vehicle taxes, general office expenses. This cost was considered to incur from the year -4, considering the need for engineering, supervision, environmental costs, testing, training, technical assistance, various minor taxes and levies, jetty and port charges etc. which may incur during preparation and construction stages.

(8) Loan and Interest

In this exercise, the financial structure was supposed to be 30% of the investment to be covered by equity, the rest by long term loan.

1) Equity

Equity is taken as 30% of Fixed Investment.

2) Long Term Loan

Long Term Loan is taken as 70% of Fixed Investment.
  Interest: OECD current US dollar rate plus 1%=7.66%
  Interest during Construction: added to the principal at the start of operation
  Repayment: in 15 equal yearly installment

3) Working Capital

6 months of full scale production cost is taken as working capital.

4) Short Term Loan

Working Capital plus shortage of net cash flow after repayment and interest payment of long term loan.

Interest: 12%

Repayment: to be made as cash flow allows

(9) Profit and Cash Flow

1) Gross Profit

Gross Profit (Profit before Tax) is calculated by subtracting Production Cost, Mining and Sales Taxes, Depreciation and Amortization, and Interests from Revenue; in this project, Sales revenue.

2) Federal Income Tax

Income Tax is levied on the Gross Profit. The current rate is 33%, and there is a plan to increase the rate to 35% in the near future. In this exercise, the rate was taken as 35%.

3) Profit after Tax

Profit after Tax is obtained by subtracting Income Tax from Gross Profit, and shows the basis for dividends and other accounting transactions. The cash flow is obtained by adding depreciation and amortization to the Profit after Tax. To calculate IRR, interest is also to be added to show the real cash on hand, to compare with external interest for loan financing.

4) IRR

All the cash outflow as Investment cost and Pre-operation Cost and the net cash flow as calculated above are sorted in the corresponding year of outflow and inflow, and IRR is calculated by finding the discount rate to equate all the discounted cash outflow and in flow.

5) Financial IRR

Financial IRR (FIRR) analysis evaluates a project on the standpoint of a private company, and it indicates basically a profit rate in case of covering all the necessary equity, loans and working capital by own money. Depreciation items which do not require outflow of cash are added to the profit after tax, and loans and interests are also added to calcualte the inflow of cash. However, taxes are treated as outflow of cash because FIRR is the evaluation of profit rate on the basis of the private company.

Table-154 shows three cases, the base case and two cases with improved frameworks. Bases for the three cases are shown in **Table-152**.

Table-152   FIRR calculation for 3 cases

	Base Case	Case A	Case B
HBI Price	$126.7/t	$126.7/t	$126.7/t
Mining/Sales Taxes	Levied	Exempted	
Water/Gas Pipelines	By the project	By third party	
Income Tax	Levied	Levied	Exempted
FIRR	7.4%	12.56%	13.71%

In this project, the IRR is 7.4% for the base case. This rate is lower than the prevailing interest rates in Argentina, and the project may be unattractive to any commercial entity. Cases A and B shows the IRR above the interest rates, and could be attractive to some potential investors.

In Chapter 12, some recommendations for further improvement is made regarding governmental incentives/actions to improve IRR and attract more attention of potential investors.

6) Sensitivity

Sensitivities of IRR for changes of Sales Price, Investment Cost (Water and Natural Gas Pipeline) and Mining/Sales/Income Taxes were calculated and shown in **Table-153**. The percentage under the IRR of each case shows the change of IRR from that of the base case.

Table-153   FIRR sensitivity chart

HBI price	$120	$126.7	$130	$140	$150
IRR	5.47%	7.4%	8.13%	10.57%	12.65%
	-1.93%	0	+0.73%	+3.17%	+5.25%
Mining/Sales Taxes	Fully levied			Exempted	
IRR	7.4%			10.10%	
-Case 3				+2.7%	
Income Tax	Fully levied			Exempted for 20 years	
	7.4%			8.26%	
-Case 1				+0.86%	
Water/Gas Pipelines	Included			Excluded	
	7.4%			9.28%	
-Case 2				+1.88%	

Graph-21 FIRR sensitivity chart

Base Case: No incentives
Case 1   : Income Tax exempted
Case 2   : Water/Gas Pipelines detached
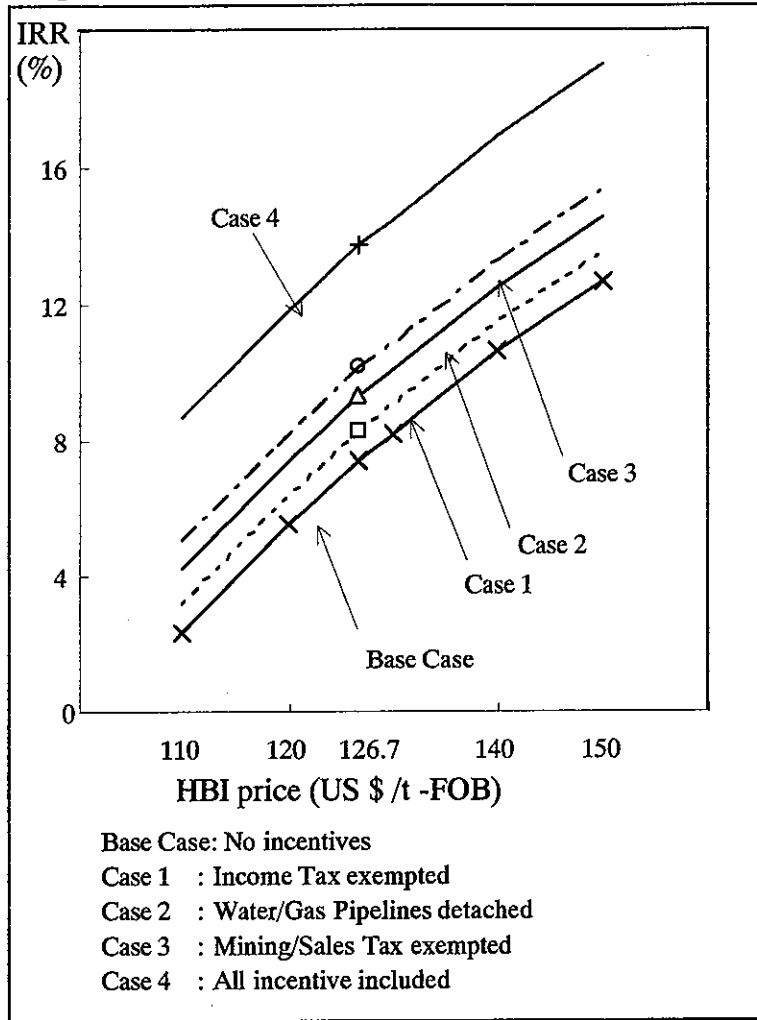Case 3   : Mining/Sales Tax exempted
Case 4   : All incentive included

Table-154-1 FIRR Calculation for Base Case
Base Case FIRR = 7.4%
1 Investment=$219,700,000
2 HBI Price-$126.7/t

(Unit: $1,000)

Items (variable name)	Code	Reference	-4	-3	-2	-1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Total
Plant & Equipment	a	sum of a = 219,700		-35,480	-89,680	-94,540																					-219,700
Pre-operation Cost	b	sum of b = 26,284	-2,704	-4,328	-5,086	-14,166																					-26,284
Sales	c						54,610	95,045	95,045	95,045	95,045	95,045	95,045	95,045	95,045	95,045	95,045	95,045	95,045	95,045	95,045	95,045	95,045	95,045	95,045	95,045	1,860,465
Rebate	c'							517	258																		
Production Cost	d						-43,414	-55,500	-55,500	-55,500	-55,500	-55,500	-55,500	-55,500	-55,500	-55,500	-55,500	-55,500	-55,500	-55,500	-55,500	-55,500	-55,500	-55,500	-55,500	-999,000
Depreciation	e	1 to 3yr a/3 each					-73,233	-73,233	-73,233																		-219,700
Amortization	f	100% of b in 1st yr					-26,284																				-26,284
Interest	g						-14,708	-13,727	-12,747	-11,766	-10,788	-9,805	-8,825	-7,844	-6,864	-5,883	-4,903	-3,922	-2,942	-1,961	-981						-117,665
Taxes																											
Mining Tax	h	$2/ton of ore mined					-3,390	-5,200	-5,200	-5,200	-5,200	-5,200	-5,200	-5,200	-5,200	-5,200	-5,200	-5,200	-5,200	-5,200	-5,200	-5,200	-5,200	-5,200	-5,200	-102,190
Gross Income Tax	j	3% of HBI Sales					-1,638	-2,851	-2,851	-2,851	-2,851	-2,851	-2,851	-2,851	-2,851	-2,851	-2,851	-2,851	-2,851	-2,851	-2,851	-2,851	-2,851	-2,851	-2,851	-55,814
Sales/Administration Expenses	k						-2,000	-2,000	-2,000	-2,000	-2,000	-2,000	-2,000	-2,000	-2,000	-2,000	-2,000	-2,000	-2,000	-2,000	-2,000	-2,000	-2,000	-2,000	-2,000	-40,000
Profit before Tax	m=c-(d~k)						-110,058	-56,950	-56,228	17,728	18,706	19,688	20,669	21,649	22,630	23,610	24,591	25,572	26,552	27,533	28,513	29,494	29,494	29,494	29,494	29,494	201,673
Cumulative Profit before Tax								-167,008	-223,236	-205,509	-186,803	-167,115	-146,446	-124,796	-102,166	-78,556	-53,965	-28,393	-1,841	25,691	54,205	83,698	113,192	142,685	172,179	201,673	
Income Tax	n=m*0.33	33% on m																		-9,086	-9,409	-9,733	-9,733	-9,733	-9,733	-9,733	-67,160
Profit after Tax	p=m-n						-110,058	-56,950	-56,228	17,728	18,706	19,688	20,669	21,649	22,630	23,610	24,591	25,572	26,552	18,447	19,104	19,761	19,761	19,761	19,761	19,761	134,513
Depreciation adjustment	+e	1 to 3yr a/3 each					73,233	73,233	73,233																		219,700
Amortization adjustment	+f	100% of b in 1st yr					26,284																				26,284
Interest adjustment	+g						14,708	13,727	12,747	11,766	10,788	9,805	8,825	7,844	6,864	5,883	4,903	3,922	2,942	1,961	981						117,665
Adjusted Cash Flow	q=p+e+f+g		-2,704	-39,808	-94,766	-108,706	4,168	30,010	29,752	29,494	29,494	29,494	29,494	29,494	29,494	29,494	29,494	29,494	29,494	20,408	20,084	19,761	19,761	19,761	19,761	19,761	498,163

Table-154-2 FIRR Calculation for Case A
Case A FIRR = 12.6%
1 Investment=$178,600,000
2 HBI Price-$126.7/t
3 Water/Gas Pipelines invested by third party
4 Mining/Gross Income Taxes exempted

(Unit: $1,000)

Items (variable name)	Code	Reference	-4	-3	-2	-1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Total
Plant & Equipment	a	sum of a = 178,600		-35,480	-73,530	-69,590																					-178,600
Pre-operation Cost	b	sum of b = 26,284	-2,704	-4,328	-5,086	-14,166																					-26,284
Sales	c						54,610	95,045	95,045	95,045	95,045	95,045	95,045	95,045	95,045	95,045	95,045	95,045	95,045	95,045	95,045	95,045	95,045	95,045	95,045	95,045	1,860,465
Rebate	c'							517	258																		
Production Cost	d						-43,414	-55,500	-55,500	-55,500	-55,500	-55,500	-55,500	-55,500	-55,500	-55,500	-55,500	-55,500	-55,500	-55,500	-55,500	-55,500	-55,500	-55,500	-55,500	-999,000
Depreciation	e	1 to 3yr a/3 each					-73,233	-73,233	-73,233																		-219,700
Amortization	f	100% of b in 1st yr					-26,284																				-26,284
Interest	g						-14,708	-13,727	-12,747	-11,766	-10,788	-9,805	-8,825	-7,844	-6,864	-5,883	-4,903	-3,922	-2,942	-1,961	-981						-117,665
Taxes																											
Mining Tax	h	exempted																									0
Gross Income Tax	j	exempted																									0
Sales/Administration Expenses	k						-2,000	-2,000	-2,000	-2,000	-2,000	-2,000	-2,000	-2,000	-2,000	-2,000	-2,000	-2,000	-2,000	-2,000	-2,000	-2,000	-2,000	-2,000	-2,000	-40,000
Profit before Tax	m=c-(d~k)						-105,029	-48,899	-48,177	25,779	26,757	27,740	28,720	29,701	30,681	31,662	32,642	33,623	34,603	35,584	36,564	37,545	37,545	37,545	37,545	37,545	359,677
Cumulative								-153,928	-202,105	-176,326	-149,569	-121,829	-93,109	-63,408	-32,727	-1,065	31,577	65,200	99,803	135,387	171,952	209,497	247,042	284,587	322,132	359,677	
Income Tax	n=m*0.33	33% on m															-10,772	-11,096	-11,419	-11,743	-12,066	-12,390	-12,390	-12,390	-12,390	-12,390	-119,045
Profit after Tax	p=m-n						-105,029	-48,899	-48,177	25,779	26,757	27,740	28,720	29,701	30,681	31,662	21,870	22,527	23,184	23,841	24,498	25,155	25,155	25,155	25,155	25,155	240,632
Depreciation adjustment	+e	1 to 3yr a/3 each					73,233	73,233	73,233																		219,700
Amortization adjustment	+f	100% of b in 1st yr					26,284																				26,284
Interest adjustment	+g						14,708	13,727	12,747	11,766	10,788	9,805	8,825	7,844	6,864	5,883	4,903	3,922	2,942	1,961	981						117,665
Adjusted Cash Flow	q=p+e+f+g		-2,704	-39,808	-78,616	-83,756	9,196	38,062	37,803	37,545	37,545	37,545	37,545	37,545	37,545	37,545	26,773	26,449	26,126	25,802	25,479	25,155	25,155	25,155	25,155	25,155	604,281

533

Table-154-3 FIRR Calculation for Case B
Case B FIRR = 13.7%
1 Investment=$178,600,000
2 HBI Price-$126.7/t
3 Water/Gas Pipelines invested by third party
4 Mining/Gross Income Taxes exempted
5 Federal Income Tax exempted

(Unit: $1,000)

Calculation sheet for Case B FIRR=13.7%

Items (variable name)	Code	Reference	-4	-3	-2	-1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Total
Plant & Equipment	a	sum of a = 178,600		-35,480	-73,530	-69,590																					-178,600
Pre-operation Cost	b	sum of b = 26,284	-2,704	-4,328	-5,086	-14,166																					-26,284
Sales	c						54,610	95,045	95,045	95,045	95,045	95,045	95,045	95,045	95,045	95,045	95,045	95,045	95,045	95,045	95,045	95,045	95,045	95,045	95,045	95,045	1,860,465
Rebate	c'							517	258																		
Production Cost	d						-43,414	-55,500	-55,500	-55,500	-55,500	-55,500	-55,500	-55,500	-55,500	-55,500	-55,500	-55,500	-55,500	-55,500	-55,500	-55,500	-55,500	-55,500	-55,500	-55,500	-999,000
Depreciation	e	1 to 3yr a/3 each					-73,233	-73,233	-73,233																			-219,700
Amortization	f	100% of b in 1st yr					-26,284																					-26,284
Interest	g						-14,708	-13,727	-12,747	-11,766	-10,788	-9,805	-8,825	-7,844	-6,864	-5,883	-4,903	-3,922	-2,942	-1,961	-981							-117,665
Taxes																												
Mining Tax	h	exempted																										0
Gross Income Tax	j	exempted																										0
Sales/Administration Expenses	k						-2,000	-2,000	-2,000	-2,000	-2,000	-2,000	-2,000	-2,000	-2,000	-2,000	-2,000	-2,000	-2,000	-2,000	-2,000	-2,000	-2,000	-2,000	-2,000	-2,000	-40,000
Profit before Tax	m=c-(d-k)						-105,029	-48,899	-48,177	25,779	26,757	27,740	28,720	29,701	30,681	31,662	32,642	33,623	34,603	35,584	36,564	37,545	37,545	37,545	37,545	37,545	359,677
Cumulative								-153,928	-202,105	-176,326	-149,569	-121,829	-93,109	-63,408	-32,727	-1,065	31,577	65,200	99,803	135,387	171,952	209,497	247,042	284,587	322,132	359,677	
Income Tax	n=m*0	0% on m																										0
Profit after Tax	p=m-n						-105,029	-48,899	-48,177	25,779	26,757	27,740	28,720	29,701	30,681	31,662	32,642	33,623	34,603	35,584	36,564	37,545	37,545	37,545	37,545	37,545	359,677
Depreciation adjustment	+e	1 to 3yr a/3 each					73,233	73,233	73,233																			219,700
Amortization adjustment	+f	100% of b in 1st yr					26,284																					26,284
Interest adjustment	+g						14,708	13,727	12,747	11,766	10,788	9,805	8,825	7,844	6,864	5,883	4,903	3,922	2,942	1,961	981							117,665
Adjusted Cash Flow	q=p+e+f+g		-2,704	-39,808	-78,616	-83,756	9,196	38,062	37,803	37,545	37,545	37,545	37,545	37,545	37,545	37,545	37,545	37,545	37,545	37,545	37,545	37,545	37,545	37,545	37,545	37,545	723,326

11.2   ECONOMIC IRR CALCULATION

Argentina peso ($) is linked to U.S.Dollar (US$), and there is no need to adjust the actual exchange rate to shadow exchange rate.

Argentina is a member country of Mercosur, with basically free trade environment. Considering the free market policy of the government, it is considered that the adjustment by shadow price is not necessary and the trial may not worth bringing about considerable differences.

In view of the relatively high unemployment rate, consideration on the employment impact of the project is important. Calculation of marginal productivity and wage of unskilled labour was considered of little worth in the presence of the high unemployment rate (more than 10%). Considering the high unemployment rate is affecting skilled and staff/engineer level, shadow wage of skilled labour level was set at zero, in addition to unskilled labour.

Skilled/Unskilled labour cost of the project is $ 7,968,400 per year and this amount was offset from production cost to obtain EIRR for the base case. Also Mining, Sales and Income Taxes were offset. Water/Natural Gas Pipeline investment is included in investment as the national economy requires this infrastructure investment whether it is done by a third party or the project itself. **Table-155** shows the yearly spread sheet for EIRR calculation.

EIRR calculated is 16.1% for the base case. This rate is above the prevailing interest rates, and justifies further steps of more detailed studies to improve the project performance. Present maintenance cost of $ 2,400,000 per year for HIPARSA, possible wastage of the existing assets of HIPARSA, and various hidden cost by the closure of HIPARSA for Rio Negro Province and Sierra Grande should also be taken into account when making a decision.

Table-155 EIRR Calculation
EIRR=16.1%
1 Investment=219700
2 Sales Price=$126.7
3 Taxes adjusted
4 Labor Cost Adjusted

(Unit:$1,000)

Items (variable name)	Code of Items	Reference	-4	-3	-2	-1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Total
Plant & Equipment	a	sum of a=219,700		-35,480	-89,680	-94,540																					-219,700
Pre-operation Cost	b	sum of b= 26,284	-2,704	-4,328	-5,086	-14,166																					-26,284
Sales	c						54,610	95,045	95,045	95,045	95,045	95,045	95,045	95,045	95,045	95,045	95,045	95,045	95,045	95,045	95,045	95,045	95,045	95,045	95,045	95,045	1,860,465
Rebate	c'							517	258																		
Production Cost	d						-43,414	-55,500	-55,500	-55,500	-55,500	-55,500	-55,500	-55,500	-55,500	-55,500	-55,500	-55,500	-55,500	-55,500	-55,500	-55,500	-55,500	-55,500	-55,500	-55,500	-999,000
Salary/Wage adjustment			704	2,328	3,086	6,916	10,777	10,777	10,777	10,777	10,777	10,777	10,777	10,777	10,777	10,777	10,777	10,777	10,777	10,777	10,777	10,777	10,777	10,777	10,777	10,777	
Depreciation	e	a/3years					-73,233	-73,233	-73,233																			-219,700
Amortization	f	b/1year					-26,284																					-26,284
Interest	g						-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1						-15
Taxes																											
Mining Tax	h																											0
Gross Income Tax	j																											0
Sales/Administration Expenses	k						-2,000	-2,000	-2,000	-2,000	-2,000	-2,000	-2,000	-2,000	-2,000	-2,000	-2,000	-2,000	-2,000	-2,000	-2,000	-2,000	-2,000	-2,000	-2,000	-2,000	-40,000
Profit before Tax	m=c+c'- ∑(d..k)						-79,545	-24,395	-24,654	48,321	48,321	48,321	48,321	48,321	48,321	48,321	48,321	48,321	48,321	48,321	48,321	48,321	48,322	48,322	48,322	48,322	692,873
Cumulative								-103,941	-128,594	-80,273	-31,952	16,370	64,691	113,012	161,334	209,655	257,976	306,297	354,619	402,940	451,261	499,584	547,906	596,228	644,551	692,873	
Income Tax	n=m*0.33	33% on Profit before Tax																									0
Profit after Tax	p=m-n						-79,545	-24,395	-24,654	48,321	48,321	48,321	48,321	48,321	48,321	48,321	48,321	48,321	48,321	48,321	48,321	48,321	48,322	48,322	48,322	48,322	692,873
Depreciation adjustment	+e	1 to 3yr 1/3 each					73,233	73,233	73,233																			219,700
Amortization adjustment	+f	100% 1st yr					26,284																					26,284
Interest adjustment	+g						1	1	1	1	1	1	1	1	1	1	1	1	1	1	1						15
Adjusted Cash Flow	q=p+e+f+g		-2,000	-37,480	-91,680	-101,790	19,974	48,839	48,581	48,322	48,322	48,322	48,322	48,322	48,322	48,322	48,322	48,322	48,322	48,322	48,322	48,322	48,322	48,322	48,322	48,322	938,872

539

Chapter 12

PROPOSAL

ON VARIOUS INCENTIVE ACTIONS AND RULES

OF FEDERAL AND PROVINCIAL GOVERNMENT

Free market system through price mechanism may, after all, be the only practical system, however inefficient, to realize economic solution of the distribution of resources. However, the invisible hands may bring about a situation which needs adjustment to realize better welfare of the society, or policy target of the government.

To realize a target in the given situation, Government guidance and incentive would be indispensable. On the other hand, incentives such as subsidy without limit could, in the long period, invite irresponsibility, inefficiency and other side effects to the parties concerned. In this study, the major target is to achieve sustainable growth by inducing industries and providing employment opportunities in Rio Negro Province through the reactivation of HIPARSA.

The project in the present study brings a rather low IRR prospect for the base case. There are many existing incentives already taken into consideration in the calculation of IRR. To increase IRR further to make the project more attractive, there are several measures the Government could take as mentioned in Chapter 11, in addition to the existing incentives.

12.1 ACTIONS BY PROVINCIAL GOVERNMENT

Provincial Government of Rio Negro is responsible to Rio Negro Province citizens including Sierra Grande inhabitants, who would be the beneficiary of the reactivation of HIPARSA through employment and various repercussion effects through commercial transactions.

In view of the state of industrialization in Rio Negro Province, it is advisable to initiate a measure to induce industries to the Province, in comparison with other provinces. Level of Mining Tax seems high if we consider $ 2/t tax is actually $ 4.56/t for 1t of Pellet, the price level of which is around $ 30/t. More than 10% of the sale price could be considered excessive when industries are to come into the Province.

The Provincial Government may choose to exempt Mining and Gross Income Taxes for the life of the present project, and enjoy employment and repercussion effects of the project through increase of trade and resulting economic prosperity, which will eventually result in the increase in revenue.

(1) Exemption of Mining Tax and Gross Income Tax for 20 years

Our recommendation is to exempt Mining Tax and Gross Income Tax for at least 20 years from the start of commercial operation. After this 20 years exemption, the Taxes may be reactivated, but the rate to be carefully negotiated on a realistic level. If the Mining Law's fiscal stability guarantee is for 30 years, the exemption period is better to be the same.

(2) Investment of Water Pipeline and Natural Gas Pipeline for future industries in Sierra Grande area including reactivated HIPARSA

Our recommendation is that Provincial Government or other party bears the responsibility for the investment of Water Pipeline and Natural Gas Pipeline of the project. The project is to share the burden of depreciation and operating cost.

There is a plan to establish a Zona Franca in Puta Colorada area. To induce industries to the area, utilities such as water, electricity, natural gas are to be ready for the area. Provincial government or other party would construct supply lines of those utilities. Combination of those utilities and the utilities required for the project would bring considerable savings in capital and operating cost.

12.2 ACTIONS BY FEDERAL GOVERNMENT

(1) Exemption of Income Tax

Our recommendation is the exemption of Federal Income Tax for 10 to 20 years. In many countries, the exemption of Income Tax for a limited period is a popular measure to induce industries to certain area. Since the basic IRR is not so high, loss in the initial years could result. The exemption is to start and effective for 10 to 20 years after the cumulative loss is wiped out.

(2) Patagonia Port Export Rebate

Existing rebate system is set to start in 1999. Our recommendation is to alter the system to start from the year of the start of commercial production or the year of the start of export sale.

(3) Other possible measures

Any expenditure or incentive would be helpful to further increase IRR. In this project, considering the importance in employment effect, the expenditure on training, salary during pre-operation/construction period could be more convincing to tax payers. In this connection, the Federal and Provincial Governments could consider subsidy. In this case, subsidy would not bring in adversary effect because the period is clearly limited.

Production of HBI consumes large quantity of natural gas as reductant. Natural gas price applied to this Final Report is $ 1.32 per million BTU. This price is almost two times higher than that in Venezuela or in Trinidad Tobago. It is necessary to make natural gas price less than $ 1

per million BTU by giving "Favoured price to large quantity consumer" if it does already exist, or establish such system if it does not exist at present, in order to give competitiveness of HBI of HIPARSA at reactivation.

List of Tables, Figures, Graphs,

Attachments, and Photos

Table

No.	Chapter	Page	Title
1	2.1.2.2	27	Percentage of presumed income
2	2.1.2.2	35	Patagonia export rebate rate schedule
3	2.1.4.1	39	Two pattern of Environmental Pollution in Argentina
4	2.1.4.1	41	Selected Air Pollution Measurements
5	2.1.4.1	41	Environmental regulation of air pollution in Argentina
6	2.1.4.1	43	Ambient noise in Argentina
7	2.1.4.2	45	Percentage of discharges treated to different levels by sector
8	2.1.4.2	45	Average pollutant concentrations for industrial discharges to sewers which violate discharge standards
9	2.1.4.2	46	Effluent from iron ore mining, iron and steel manufacturing, and mini steel mill
10	2.1.4.3	55	Summary of Environmental Regulation and Institutions
11	2.1.4.3	57	Pollution control costs for U.S. industries producing traded goods
12	2.1.4.3	58	Selected environmental impacts of medium and small enterprises
13	2.1.4.4	65	Water quality of drinking water at Sierra Grande (1997/10/21)
14	2.1.4.4	66	Environment Regulations of Water in Argentina
15	2.1.4.4	68	Environmental Regulation of Soil in Argentina
16	2.2.1	73	Long term grouwth of Per-capita GDP of Argentina, Japan, UK and USA
17	2.2.1	76	Principal Economic Indicators of Argentina
18	2.2.2	77	Population Forecast for Argentina (1990-2025)
19	2.2.2	79	Population of Argentina by age group and sex (1991)
20	2.2.2	80	Population of Rio Negro by age group and sex (1991)
21	3.1.1	90	Production of crude steel in 1997 by company
22	3.1.1	90	Production of crude steel in 1997 by company and kind
23	3.1.1	91	Production of crude steel in 1997 by product and process
24	3.1.1	91	Production of crude steel in 1997 by company and process
25	3.1.1	92	Production of pig iron by blast furnace in 1997 by company
26	3.1.1	92	Production of sponge iron by direct reduction in 1997 by company
27	3.1.1	92	Production of semi-finished products in 1997 by company
28	3.1.2	93	Present situation of steel demand
29	3.1.3	94	Scrap market
30	3.1.4	95	Import of iron ore
31	3.1.4	95	Tax difference (Import of Argentina)
32	3.1.4	95	Trade balance of steel in 1995/1996/1997
33	3.2.1	100	Mill list, of those that have EAF/ blast furnace in Mercosur (Brazil)
34	3.2.2	101	Scrap market in Brazil
35	3.2.2	101	Pig iron market in Brazil
36	3.2.3	102	Import tax difference (Import into Brazil)
37	3.3.1	111	World DRI/HBI Production by Country
38	3.3.2	114	DR Project in world (~2000year)
39	3.3.2	115	DR production forecast
40	3.3.3	116	Forecasted average HBI prices
41	3.3.4	118	DRI/HBI receipts
42	3.3.4	118	World merchant HBI demand
43	3.3.5	119	Constructed plant of HBI at end of 1996
44	3.3.5	119	Demand of merchant of HBI
45	3.3.5	119	Balance of demand and offer of merchant of HBI
46	3.3.6	120	Iron ore pellet requirement for DR

Table

109	D	UBICASIO CINTAS TRANSPORTADORAS Vistos. en alzado	70-M-302
110	D	CONVEYOR DESIGN CRITERIA SHEET 3 OF 5	70-M-305
111	D	DETALLE DE RASES EDIFICIO PRINCIPAL	70-S-5
112	D	REPLANTEO DE BASES	70-S-501
113	D	DETALLE DE BASES EDIFICIO PRINCIPAL	70-S-503
114	D	DETALLE DE RASES EDIFICIO PRINCIPAL	70-S-504
115	D	DETALLE DE BASES EDIFICIO PRINCIPAL	70-S-505
116	D	FUNDACION DE HORNOS	70-S-506
117	D	BASES COMPRESORES AIRE PROCESO	70-S-507
118	D	BASES COMPRESORES AIRE ENFRIAMIENTO	70-S-508
119	D	VIGAS DE FUNDACION	70-S-509
120	D	VIGAS DE FUNDACION ARMADURA	70-S-510
121	D	COLUMNAS	70-S-511
122	D	NIVEL +8.5 ENCOFRADO	70-S-512
123	D	NIVEL +8.5 ARMADURA DE LOSAS	70-S-513
124	D	NIVEL +8.5 ARMADURA DE VIGAS SECUNDARIAS	70-S-514
125	D	ESTRUCTURA APOYO CINTA N26-HOJA1	70-S-663
126	D	ESTRUCTURA APOYO CINTA N26-HOJA1	70-S-664
127	D	Vista en Planta a la cota 40.00m	70-V-302
128	D	Name of drawing	Drawing No
129	D	Vista en Planta a la cota 25.25m	70-V-303
130	D	Seccion A-A	70-V-305
131	D	SECCION B-B	70-V-306
132	D	Seccion D-D	70-V-308
133	D	SECCION E-E	70-V-309
134	D	Seccion F-F	70-V-310
135	D	Seccion G-G	70-V-311
136	D	Vista en Planta a la cota 0.00m	70-V-315
137	D	Vista en Planta a la cota 8.50m	70-V-316
138	D	Diagrama de Control del Proceso Area 82 & Hoja 1	70-V-362
139	D	Diagrama de Control del Proceso Area 83 & Hoja 1	70-V-366
140	D	Diagrama de Control del Proceso Area 83 & Hoja 2	70-V-367
141	D	Vista en planta de la disposicion general de edpesado y tamques de almacenamiento	70-V-381
142	D	Disposicion General de la pila para almacenamiento de emergencia	70-V-383
143	D	Disposicion General de las pilas de almacenamiento de pelets quemados y especiales	70-V-384
144	D	GENERAL DE FLUJO	70-V-500 (150)
145	D	NATURAL GAS DISTRIBUTION	70M-450
146	D	PERFIL DEL TRANSPOTADOR No4	C-286-A-9
147	D	UBICACION Y PLANTA GENERAL LOCATION AND PLOT PLAN	C-286-A2
148	D	ESPECIFICACION REFRACTARIO	P 1374-F
149	D	ESPECIFICACION REFRACTARIO	P 1374-F1
150	D	OXIDE PLANT SECTION	T255-P02-6
151		Equipment lists and maintenance condition of Pre-conc., Concentration and Ferroducto plants	
152		Flow sheet of Concentration plant (correct version)	
153	D	Layout of Concentration plant	
154		Unit consumption of rod in rod mill, specification of the material for rods	
155		Unit consumption (1988 to 1990) of the re-agent for flotation, water and electricity	
156		Layout and piping of the pump room for transporting concentrate slurry	
157	D	Flow sheet and layout of Pre-Concentration plant and Crushing plant	
158		Data of Concentration tests at laboratory	
159	D	Layout of slurry pipeline	
160	D	Liner of Grinding mill(Pebble mill, Rod mill)	
161	D	Foundation of Pelletizing plant	
162	D	Layout of Pelletizing plant	
163	D	Facilities of transporting Pellet (belt conveyer, loading equipment)	
164		Ley Nro. 2952 (Codigo de Agua, restriction of water) : Provincial government	
165		Programa Control de Calidad y Proteccion de los Recursos Hidricos : Provincial government	
166		Marco Juridico Ambiental para la Actridad Minera Ley No. 24,585 : Federal government	

List of data received from counterpert

167		Estudios Ambiental de Base PASMA II	
168		DAMES & MOORES ARGENTINA SA's document	
169		LIHUE INGENIERA's document	
170		AMBIENTAL SA's document	

＊D: Drawing

Figure

No.	Chapter	Page	Title
1	2.1.4.3	52	Organization chart of SERNAH
2	4.2.1	133	Underground Map of South Deposit
3	4.2.2	139	Preconcentration Flow
4	4.2.2	142	Original Flowsheet Constructed by Kurimoto
5	4.2.2	143	Flowsheet operated by HIPASAM
6	4.2.3	153	Plant flow from disc filter to product pile
7	4.2.3	154	Vicinity of pelletizing building
8	4.2.3	155	Furnace dimension
9	4.2.3	177	Control flow in HIPASAM
10	4.2.3	178	Required control flow
11	4.3.1	185	Organization and Number of Employees in 1989
12	4.3.2	188	Organization and manpower list of ex-HIPASAM
13	5.1.1	202	Sierra Grande Iron Ore Deposit
14	5.1.3	211	Flow Sheet
15	5.1.3	213	Flow Sheet
16	5.3.2	272	The relationship between scheduled maintenance and breakdown maintenance
17	6.2.2	293	Skelton of process flow of Marcona
18	6.2.2	294	Two stage processing with a combination of two lines
19	6.2.2	297	Primary-Secondary Screens
20	6.2.4	300	Operation test plan
21	6.2.6	307	Flowsheet of typical two stage processing plan
22	6.2.6	310	Idea of new flowsheet
23	6.2.7	314	Distribution of weight in laboratory tests
24	6.2.7	315	Distribution of iron in laboratory tests
25	6.2.7	316	Distribution of phosphorus in laboratory tests
26	6.2.7	317	Flow : HIPARSA Test 5
27	6.2.7	318	Flow : JICA Test 6
28	6.2.7	319	Flow : JICA Test 10
29	6.2.7	320	Flow : JICA Test 7
30	6.2.8	323	Distribution of weight
31	6.2.8	324	Distribution of iron
32	6.2.8	325	Distribution of phosphorus
33	6.3.1	331	Relation between P and T.Fe in Conc.
34	6.3.1	331	Relation of iron contents in Pellets, HBI and Conc.
35	6.3.1	331	Relation of P contents in Pellets, HBI and Conc.
36	6.3.1	336	Flow of cause and results
37	6.3.1	339	Tertiary phase diagram
38	6.3.1	342	Upper hot gas duct shell
39	6.3.2	346	Oxidization test of pellets
40	6.3.2	347	Pot test apparatus
41	6.3.2	352	Heating pattern
42	6.3.2	350	Pellet charging
43	6.3.2	352	1.5 minutes-temperature vs spherical pellets after heating
44	6.3.2	356	Porosity vs strength
45	6.3.3	360	Simplified shaft furnace
46	6.3.3	360	Material movement between gas and solid
47	6.3.3	360	Concept of heat transfer
48-1	6.3.3	363	Heat pattern with high heat exchange efficiency through the depth

Figure

No.	Chapter	Page	Title
48-2	6.3.3	363	Image of the status in shaft
49-1	6.3.3	363	Heat pattern with high heat exchange efficiency at only upper level
49-2	6.3.3	363	Image of the status in shaft
50-1	6.3.3	364	Heating pattern in shaft furnace (plantA)
50-2	6.3.3	364	Temperature in 3 horizontal planes
51	6.3.4	369	Dried filter cake addition
52-1	6.3.4	373	Image of isobaric curve in furnace
52-2	6.3.4	373	Definition of positions
52-3	6.3.4	373	Induration energy
53-1	6.3.4	375	Bird-eye view of index feeder
53-2	6.3.4	375	Plot plan of index conveyor
54	6.3.4	376	Soft loading of HBI
55	6.3.5	378	Relation between annual production, product rate and availability
56	6.3.5	382	Actual result of electric unit consumption
57	6.3.5	382	Estimated unit consumption
58	6.4	393	MIDREX Process Flow
59	6.4	394	HYL III Process Flow
60	6.4	395	FASTMET Process Flow
61	7.2	411	Conceptual Process Flow
62	7.2	412	Conceptual Process Flow
63	7.6	420	An approximate schedule for HIPARSA
64	9.1.4	452	750 HBI Plant
65	9.3.1	475	Mine development schedule (Final)
66	9.4	481	Reactivation schedule
67	9.4.2	488	Organization chart
68	9.5.3	508	Organization which governs environmental issues of Rio Negro Provincial Government

Graph

Attachment

No.	Chapter	Page	Title
1	2.1.4.3	53	National agencies with environmental responsibilities
2	2.1.4.3	59	EIA in Argentina
3-1	2.1.4.5	71	Resolution 242/97
3-2	2.1.4.5	71	Law 20284/73
4	3.4.2	123	IMO code for HBI transportation
5	5.2.6	256	Chart of distribution of electric power
6	5.2.6	257	General flow chart of water
7	5.2.6	258	Water consumption of each shop
8	5.2.6	259-261	Water analysis
9	5.2.6	262-264	General water supply balance
10	5.2.6	265	General flow chart of natural gas
11	5.2.6	266	Unit price of natural gas
12	5.2.6	267	Analysis of natural gas
13	6.3.5	384	Concept of the shaft furnace operation
14	6.4	396	Specification of DR Grade Pellet
15	6.4	397	Typical characteristics of HBI

Photo

No.	Chapter	Page	Title
1	6.3.2	345	Section of pellet particle
2	6.3.2	345	Part of chunk
3	6.3.2	349	Except sphere ones, all material is chips generated by bursting

List of Data

received from counterpart

List of data received from counterpert

1		Preliminary study of the project	Returned
2		Reparacion del horno IV de la Planta de peletizacion de HIPASAM	Returned
3		Agua y Enegia Electrica (1989-09,10,11,12)	Returned
4		Back up data for equipment list	
5		Introduction to MINARMCO	
6		Listado de items por consumos	
7		PLC study	
8		Price of Bentonite, dehydrated calcium and limestone **by rescos bayos**	
9		Trial of pellets for DR grade (1983 November)	
10		Cintaportadora No.10	
11		Manpower for re-start	
12		Carbones disponibles en el pais	
13		Operating Instruction Manual (1975-03.)	
14		Presupuesto Operativo 1989	
15		Estructure Organica Departmento Proceso Peletizacion	
16		Job Description	
17		Outline of present job description	
18		Outline of past hob description	
19		Destribution del personal de la empresa	
20		Indicadores de produccion	
21		Demoras operativas	
22		Horas hombre aplicades	
23		Cubierta de fax (present quality requirement)	
24		Reply to the questions	
25		Motor list	
26		Ley 24196 de Inversiones Mineras y Decreto Reglamentario No.2686.	
27		Listado de empresas inscriptas en el Registro de Inversores Mineros al 7-2-97.	
28		Listado de empresas inscriptas en el Registro de Inversores Mineros al 5-7-97.	
29		Listado de empresas internacionales con proyectos en ejecucion al23-2-98, no incluidas en la Ley 24585.	
30		Marco Juridico Ambiental para la Actividad Minera. Ley 24585.	
31		Listado de productores mineros locales en actividad almes de febrero de 1998.	
32		Listado de productores mineros foraneos en actividad a la fecha.	
33		Listado de empresas que realizan exploracion en Rio Negro.	
34		Mapa de exploracion.	
35		Ley 1274 - Promocion Industrial de Rio Negro y su reglamentacion:Decretos 939/78, 827/78, 831/82, 143/83, 1993/88.	
36		Ley 1274 y Ley 24490 - Reembolso adicional a las exportaciones que se realizan por puertos patagonicos.	
37		Ley 3174 Ingresos Brutos 1998 y Ley 3175 nInmobilieio 1998n / Ley 3177 Tasas retributivas de servicios 1998.	
38		Argentine Tax System	
39		CD - Informacion minera en la Argentine - Derectorio de Oportunidades.	
40		Proyectos de inversion de firmas con participacion de Capital extranjero.	
41		Argentina - Un compendio de inversiones extranjeras (5/97) - A compendium for Foreign Investors.	
42		Informe economico 3er. Trimestre 1997 (12/97). Versiones en Espanol y en Ingles.	
43		Prindcipales Inversiones Mineras en Argentina.	
44		Certificado de estabilidad fiscal para Minera Alumbrera Limited.	
45		CIS: Estadisticas Siderurgicas 1960-1995.	
46		CIS: Estadisticas Siderurgicas 1996 Produccion Siderrurgica Argentina.	
47		CIS: Estadisticas Siderurgicas 1997/1998.	
48		23 CIS: Estadisticas Siderurgicas 1996 Comercio Exterior Siderurgico Argentino.	
49		24 Estudio de Rentabilidad Proyecto HBI - 10/1996 - Elaborado por la Comision Asesora del Proyecto (CAP).	
50		26 Datas o DRI World Market.	
51		27 Balances de HIPASAM 1980 a 1985 y 1987/1988.	
52		28 Balances de HIPAERSA 1993 a 1996.	
53		Ley No.2342 - Ley de Medio Ambiente Provincial. Nota de la Direccion de Mineria del 13/03/98, referida a inversiones mineras, canon minero, y Ley de Inversiones Mineras Nacional.	

54		Informacion sobre Transporte de Energia Electrica.	
55		Listado de empresas de fumisteria y Montaje Industrial, posibles proveedores para modificacion de Instalaciones de Sierra Grande.	
56		Mineracao Corumbaense Reunida S.A. - General Technical Information1991.	
57		Informacion sobre escala salarial (personal de convenio y fuera de convenio) de HIPASAM.	
58		Informacion sobre Gas Natural Planta Condor.	
59		Informacion referida al calado del Puerto de Sierra Grande.	
60		Informacion sobre legislacion vigente en materia de contribuciones patronales sobre remuneraciones.	
61		Repertorio Siderurgico Latinoamericano - 1993 - Empresas Brasilenas.	
62		Informacion sobre situacion arancelaria para exportacion de productos de hierro.	
63		Situacion arancelaria para importacion de productos de hierro, y de equipamiento, asi como la forma de pago.	
64		Organization sheet of 1989.	
65		Mine output of crude ore (from 1972 to 1991).	
66		Drifting length (from 1971 to 1991).	
67		Length of fan drilling (from 1976 to 1991).	
68		History of mining facilities.	
69		Specification of mining facilities.	
70		Drill steel list.	
71		Life of drill steel.	
72		Cycle time of drifting.	
73		Cycle time of fan drilling.	
74		Manpower for each operation.	
75		Power consumption of 1990.	
76		Rate of drifting.	
77		Rate of fan drilling.	
78		Ore reserves of south deposit.	
79		Underground map.	
80		Geological map of south and east deposit.	
81		Flow sheet of primary crushing plant.	
82		Map of central shaft and inclined shaft.	
83		Time schedule of development for the central shaft when HIPASAM started.	
84		The plan of 410ML (including crusher station and others).	
85		The plan of main level drift and sub-level drift.	
86	D	PERSPECTIVA EMBARCADERO PUNTA COLORADA	1649
87	D	VILLA HIPASAM	05-A-1501
88	D	VERTICAL SHAFT FURNACE FEEDER SYSTEM	255-1-01-5
89	D	VERTICAL SHAFT FURNACE FEEDER SYSTEM	255-1-01-5
90	D	STOCK LINE FEEDER INTERCONNECTIONS DIAGRAM FIELD TO MACC ROOM	255-E3-02
91	D	VERTICAL SHAFT FURNACE SOUTH ELEVATION	255-F01-1
92	D	VERTICAL SHAFT FURNACE EAST ELEVATION	255-F01-2
93	D	FEEDER SYSTEM	255-F01-5
94	D	FEEDER DRIVE ARRANGEMENT	255-F01-6
95	D	VERTICAL SHAFT FURNACE AIR INLET SECTIONS	255-F04-4
96	D	PELLET COOLER	255-F04-59
97	D	REFRACTORY PLAN SECTION	255-F07-1
98	D	REFRACTORY LONG WALL SECTION	255-F07-2
99	D	REFRACTORY LONG WALL SECTION	255-F07-2
100	D	REFRACTORY SHORT WALL SECTION	255-F07-3
101	D	LONG BELT CONVEYOR	255-F10-5
102	D	FEEDER SECTIONS	255-F10-6
103	D	FEEDER SECTIONS	255-F10-7
104	D	ELEVATION LOCKING WEST GENERAL PIPING ARRANGEMENT EL(25.25M) & ABOVE	255-G3-06
105	D	PLANT AIR PIPING SCHEMATIC	255-M02-07
106	D	INDURATION CONTROL SCHEMATIC	255-P-01
107	D	INDURATION CONTROL SCHEMATIC	255-P-01
108	D	ARMADURA VIGAS DE PORTICOS	70.S.515

Table

No.	Chapter	Page	Title
79	5.2.2	241	The power consumption of a similar complex
80	5.2.2	243	Power demand of the second industrial area
81	5.2.3	246	Water consumption in the passed five years
82	5.2.3	247	Actual water consumption for concentration plant
83	5.2.3	249	Water balance
84	5.2.3	250	Water demand
85	5.2.5	252	The actual consumption of natural gas
86	5.2.5	253	Natural gas demand
87	5.4	276	Iron ore mining and concentration cost study by HIPARSA project advisory committee
88	5.4	277	Yearly Spreadsheet
89	6.2.5	302	Record of work index
90	6.2.5	304	Estimated grinding mill performance in the past
91	6.2.6	308	Expected grinding preformance of typical two stage processing
92	6.2.6	311	Grinding mill performance expected
93	6.2.7	313	Property of final concentrate
94	6.2.7	313	Size distribution of final concentrate
95	6.2.8	321	Operation performance -Preconcentration plant
96	6.2.8	321	Operation performance - Concentration plant
97	6.2.8	322	Estimated concentration operation -1
98	6.2.8	322	Estimated concentration operation -2
99	6.2.9	326	Grinding result estimation in fine grinding
100	6.3.1	332	Size distribution of concentrate
101	6.3.1	335	Time analysis of actual result and estimation
102	6.3.2	344	Analysis of the samples
103	6.3.2	353	Bursting detection
104	6.3.2	354	Burn through result
105	6.3.4	372	Induration comparison
106	6.3.4	372	The results of fuel change
107	6.3.5	379	Estimation of operation time for the study
108	6.3.5	380	Raw material and chemistry of product pellets
109	6.3.5	383	Unit consumption
110	6.4	388	Iron Making Process
111	6.4	391	Comparison of MIDREX, HYL III and FASTMET
112	6.4	392	Comparison of MIDREX, HYL III and FASTMET
113	6.4	399	Required Utility (Quantity)
114	6.4	400	Required Utility (Quality)
115	6.4	401	Comparison of Capital Cost and Operation Cost (Preliminary)
116	6.5	403	Required Utilities in Normal Operation
117	7.1	409	Expected Quantity and Quality of Product
118	7.3	413	Major production facilities and nominal capacity
119	7.4	414	Additional investment cost estimation
120-1	7.5	416	Production Cost Estimation (Iron ore mine)
120-2	7.5	417	Production Cost Estimation (Concentration plant)
120-3	7.5	418	Production Cost Estimation (Pelletizing plant)
120-4	7.5	419	Production Cost Estimation (HBI plant)
121	8.1	428	Comparison of Reactivation Scenarios
122	8.2	429	Result of comparative study of scenarios
123	9.1.1	434	Operation conditions of 2,600,000 t/y production

Table

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