OCCASION

This publication has been made available to the public on the occasion of the 50th anniversary of the United Nations Industrial Development Organisation.

DISCLAIMER

FAIR USE POLICY

CONTACT

Please contact publications@unido.org for further information concerning UNIDO publications.

For more information about UNIDO, please visit us at www.unido.org

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION
Vienna International Centre, P.O. Box 300, 1400 Vienna, Austria
Tel: (+43-1) 26026-0 · www.unido.org · unido@unido.org

RK/RV

PROJECT REPORT
FOR THE ESTABLISHMENT OF
A PILOT MULTIPURPOSE PLANT
FOR
THE MANUFACTURE OF PHARMACEUTICAL CHEMICALS
IN
NICARAGUA

(PROJECT NO. DP/NIC/83/004)

15386-E

PREPARED FOR
THE GOVERNMENT OF NICARAGUA
THROUGH
UNITED NATIONS INDUSTRIAL
DEVELOPMENT ORGANISATION, VIENNA
ACTING AS EXECUTIVE AGENCY FOR
THE UNITED NATIONS DEVELOPMENT PROGRAMME

PREPARED BY

VISHWAKARMA PROCESS TECHNIK (INDIA) PVT. LIMITED

9/4, SARVAPRIYA VIHAR, NEW DELHI - 110 016

I N D I A

ACKNOWLEDGEMENT

The consultants wish to acknowledge the help, assistance and co-operation extended by the officials of Minstries of Industry, Health, Planning, Construction, FIR of the Government of Nicaragua.

We also thank various Government institutions, SOLKA, CO-FARMA, PROISA, IMEP as well as the Directors and officials of various private laboratories and Associations for their valuable suggestions for development of pharmaceutical industry in Nicaragua.

Our special thanks are to H.E. Mr. Gilberto Guzman C, Vice Ministro Director de Industria/COIP and Mr. Orlando Rays, Direcion General Rama Farmaceutica, for various suggestions and guidance.

We are also indebted to the Mr.Henry Meyer, Resident Representative amd Ms.A. Vallisa of UNDP, Nicaragua.

Our most sincere thanks are to Dr. Miksa S. Almasi, Chief Technical Adviser, UNIDO for his valuable data, informations about local conditions.

We are also indebted to Mr. Leonel Castellan Juerez, Director, Ministry of Industry as well as Mrs.M. Guerrero for their liaison with various authorities in Nicaragua, without which we could not have got all the information

Last but not the least, we would like to express our sincere thanks and gratitude for the valueable services and advice given by Dr. Mrs. Tcheknovorian - Asenbauer and Mrs. M.Quintero in the UNIDO Head quarters in Vienna.

Without the assistance of all above mentioned persons, this project report would not have been possible.

SUMMARY AND RECOMMENDATIONS

After the Revolution in 1979, the Government of National Reconstruction of the Republic of Nicaragua has granted top priority to the establishment of Unified national health system calling for free health services to its citizens.

Per capita of consumption of drugs in Nicaragua is high and almost same as in European countries.

National consumption of formulations at retail prices of US$ 94.85 million in 1985 shall go up to US$ 235 million by 2000 A.D.

At present, only twenty percent of the requirement of formulations is being met by the eleven laboratories engaged in the production and they are utilising on the average 30 percent of installed capacity.

There is 30 percent foreign exchange savings for the additional formulations produced.

Quality control facilities in some of the laboratories are lacking. It is recommended to have self-reliance in formulation production raising the same from the present level of US$ 24.45 million to US$ 252 million by 2000 A.D. at retail prices. This includes US$ 40 million for export to neighbouring countries.

US$ 60 million capital investment is needed by 2000 A.D. to achieve this plan.

WHO/UNDP/UNIDO should assist in providing experts for rationalisation of drug list, setting up of quality control and improvement of production technology of production of formulations.

The import of basic drugs in Nicaragua by 2000 A.D. is estimated at US$ 77 million from the present US$ 10 million.

Bulk drugs production technology is more sophisticated and create technological capability in chemical industry inducing the production of basic chemicals, solvents etc. It also results in better utilisation of technical and managerial

manpower. It is recommended that by 2000 A.D., about 30 percent of country's need should be produced indigenously.

In the absence of availability of technology and trained and experienced manpower, a first step to create infra-structure in the shape of multipurpose pilot plant for synthetic drugs is established in Nicaragua with the active assistance of UNDP/UNIDO.

Such multipurpose pilot plant producing Ten synthetic drugs can be established with the capital investment of US$ 4.5 million producing drugs worth about US$ 1.7 million at internationa prices.

It is also recommended that Government should give incentives to the existing formulators to go in for basic production of one or more basic drugs.

CONTENTS

LIST OF ANNEXURES

1. INTRODUCTION

Health is one of the basic needs of all living beings. The drugs and pharmaceuticals are utilised in the prophylaxis, diagnosis and treatment of diseases endangering human health. The drug and pharmaceutical industry is one of the most important industries, which is having a strong impact on social welfare, economy and technological capabilities in both developed and developing countries.

The Government of National Reconstruction of the Republic of Nicaragua has granted top priority to the establishment of a Unified National Health System which calls for an adequate supply of medicaments to large segments of the population and since then the demand for pharmaceuticals has steadily increased. The per capita consumption of drug in Nicaragua is US$ 40, corresponding approximately to the average European level. There are 11 small and medium scale units engaged in the production of pharmaceutical formulations meeting about 20 to 25 percent of the country's requirements. All raw materials in terms of bulk drugs, auxiliary materials and to some extent packaging materials are being imported at present.

The Government of Nicaragua spent about US$ 50 million (1982) on import of bulk drugs and pharmaceutical formulations. Should the present import/local production system continue and due to population growth, the foreign exchange requirements shall be US$ 100 million by 1990. However, the same could be limited to US$ 60 million provided the production capacity of pharmaceutical formulations units is raised to 60 percent.

The drug priority of the Republic of Nicaragua have been identified in two areas :-

- rationalisation of the formulation of finished dosage forms; and
- later on production of bulk drugs either by synthesis or from medicinal plants.

Further, it is not possible to start manufacturing programme of bulk drugs due to lack of technologies, experience and expertise needed. At present, it is also not possible to have any joint venture or technology straight from any other country. The only way to achieve the national aspiration and

fulfilment of objective is to take the assistance of UNDP /UNIDO for setting up of the manufacturing facilities for bulk drugs.

The economic constraints of the country together with the market size do not justify the establishment of single industrial production units. Therefore, the Government is interested in establishing a pilot multipurpose plant, where several pharmaceutical chemicals can be manufactured either sequentially or simultaneously using a single or double series of equipments. Such a plant is ideally suited to produce a group of pharmaceutical chemicals required in small quantities based on the similarity of the production technologies with respect to unit operations and processes.

THE AIM OF THE PROJECT

The aim of the project is to assist the Government of Nicaragua to prepare a programme for the future development of the pharmaceutical sector in the country.

Objective of the Multipurpose Plant

The main objectives of the Multipurpose plant will be the following :

- Development, adaptation and updating of technologies for the production of active ingredients (bulk drugs) to be used for the production of finished pharmaceutical products.
- Research on the utilisation of locally available raw materials and national resources.
- Manpower and technical skill development through in-plant training.
- Screening of technologies for scale up programmes.
- Preparation of appropriate designs for the establishment of a larger scale production.
- Co-operation with the national industry in the tests of new syntnetic drugs technologies and their further implementation at a larger scale.

In the initial stage of its operation, financial viability would not necessarily

be the main criteria for evaluation. After some years, however, the pilot multi purpose plant should be expected to become self financial.

THE SCOPE OF INDUSTRIAL FEASIBILITY STUDIES

The industrial feasibility studies should include the following aspects :

- Identification of the groups of drugs to be manufactured in the pilot multi purpose plant according to the essential drug list prepared by the Government.
- Definition of plant capacity, production programme and starting raw materials and inputs (considering availability of technology and technical similarities).
- Location and site.
- Project Engineering (including preliminary list of technological and service equipment).
- Plant organisation and overhead costs.
- Manpower.
- Implementation schedule.
- Financial and economical evaluation.

2. PRESENT STATUS OF HEALTH CARE

The population of Nicaragua was around 2.7 million in 1980 and life expectancy 53 years. The growth in populatien is expected 88.88 percent by 2000 as compared to 41 percent average growth rate of the world population during the same period and shall be around 5.1 million by 2000 A.D.

The birth and death rates are high particularly in case of infant, child and maternal mortality. The mortality rate in Nicaragua is 16.4 persons per thousand as compared to 14 persons per thousand on average world

mortality rate. Infants mortality, being a good indicator of health, economic and social condition of a country, is as high as 88.2 infants per thousand.

The main groups of diseases prevalent in the country are:

Infectious diseases/diarrhoea/prenatal infection, circulatory system diseases/digestive system diseases/respiratory, bacterial infections/malaria etc. and their percent incidents are given in the Annexure 1 and 2.

After the revolution in 1979, the Government of National Reconstruction of the Republic of Nicaragua has granted top priority to the establishment of Unified National Health System/SNUS/calling for :

- Health is the responsibility of the STATE,
- Every individual has the right to have free health services consisting of consultations, diagnosis, hospitalization and free medicaments.

Further, the Ministry of Health has initiated National Health Programme for 15 years calling :

- To reduce morbidity and mortality,
- To raise the standard of health of population,
- To provide an integrated system of all the medical services,
- To improve research in the field of public health.

To fulfil the above programme, following infrastructure targets have been set :

	1981	1986	1996
Population/mill.	2,8	3,3	4,6
Hospital beds	4.729	5.100	8.000
Inpatients	178.000	224.000	389.442
Physicians	1.541	1.800	5.000
/Foreign/	180	500	-
Nurses and Aux.	4.884	7.140	15.000
Health expenditure mill. CS	1.058 = 1.055, 6	1.351 = 420	1.653 = 600
Total number of consultations	5.411.432	8.364.200	24.322.100

The public health expenditure accounts for about 4.79% of GNP and in 1981 has been 1058 million CS out of which 62 million US $ was in foreign exchange. The above programme envisages sizeable contribution from abroad. It is in this regard that the Government of National Reconstruction of Nicargua has approached friendly countries and UN Agencies for assistance. Various UN Agencies - UNICEF, WHO, UNDP / UNIDO have following programmes to improve health standards and assistance in improving technologies in the distribution and production of pharmaceutical formulations and chemicals.

I. The UNICEF Programmes are :-

- prevention and control Diarrhoea,
- immunization,
- breast-feeding,
- child disabilities,
- rural medical care for children,
- basic education,
- water supply, sanitation, nutrition,
- urban development,

II. The WHO programmes are :

- co-operation with competent ministries to improve the health system ,
- preparation of the basic drug list for Nicaragua,
- training of professionals and health technicians,
- assistance in the establisnment of a National Drug Quality Control Laboratory,
- assistance in the preparation of "Lista Basica",
- fulfilment of the plan "Health for all by the year 2000 AD".

III. The UNIDO-UNDP programmes are for :-

- agriculture,
- energy plan,
- support for the planning system,
- feasibility study for establishment of pilot multipurpose plant for the production of pharmaceutical chemicals,
- study for the unit for the production of drugs from medicinal plants,
- assistance in improving technology in the distribution and production of pharmaceutical formulations and chemicals.

Drugs and pharmaceuticals, which are used in the prophylaxis, diagnosis and treatment of diseases endangering human health, forms the integral part of the health planning. Their availability, distribution and production shall be discussed in the following chapters.

3. DRUGS AVAILABILITY, DISTRIBUTION, CONSUMPTION AND PRODUCTION

Basic List of Drugs and Pharmaceuticals

The pattern of drug consumption in the Central American countries has been influenced by the North American and European practices of using of expensive specialities prescribed by medical practioners and distributed by the private pharmacies.

After the Revolution, the Government of Nicaragua with the assistance of WHO and UNIDO has simplified and rationalized the list of drugs and pharmaceuticals to be used in the country. Top priority was given in the preparation of model list of essential drugs **"Lista Basica Del SNUS Por Orden De Prioridades"**. Basically, this list contains various formulations in different dosage forms and consists of three categories - Periodad A,B,C having 75,249 and 159 formulations respectively. It may be added

that same drug appears in all the three Periodad list in different dosage form as given below :-

Codego (Code)	Nombre (Product)	Presentation (Dosage Form)		Prioridad (Priority)
1010100	Pencilina Crystalina	1,000,000 u	FAM	A
1010111	Pencilina Procaina	400,000 u	FAM	A
1010140	Pencilina Benzatinica	600,000 u	FAM	B
1010150	Pencilina Benzatinica	240,000 u	FAM	B
1010110	Pencilina Procaina	480,000 u	FAM	C
1010120	Pencilina Proc.Cry.6.3.3	400,000 u	FAM	C
1010130	Penciliina Benz. Proc.			
1010151	Pencilina Benzatimica	120,000 u	FAM	C

Ministry of Health has prepared further **"Lista Basica de Medicamentos"**, Dr. M.S. Almasi, Advisor : UNIDO has submitted revised **Lista Basica.**

Prior to Revolution, there were 6000 different drugs items mostly under proprietory names registered, produced and imported into Nicaragua. In 1984, these reduced to 1200 including 97 popular drugs sold over the counter. Under the present war conditions constraining the economy, the Government of Nicaragua is considering further rationalization of basic and essential drug lists.

Procurement and Distribution

Various studies carried by UNIDO experts regarding procurement and distribution of drugs/survey programme for socio-economic development of Drug procurement, Quality Control of Local industry, Pharmaceutical industry in Nicaragua DP/NIC/83/004/11-512/52 and 53/32 LD, Nicaragua has highlighted the problems facing the country and has made valuable recommendations to improve the quality control, purchase and distribution

aspects. So far, private importers and distributors have been playing predominant role in the imports, stocking and distributions of drugs and pharmaceuticals.

There has been marked change in the Government policy in going more for generic product and planning most of the imports (both bulk drugs and formulations) through public sector. The bulk drugs are imported by M/S. SOLKA, under the control of Ministry of Industry, whereas CO-FARMA, a Government undertaking, under the Ministry of Health, imports most of the residual requirements of formulations. Procurement, production and distribution functionsin mid-1985 are shown in Annexure - 3.

More than 80 percent requirements of drugs and pharmaceuticals are from imported sources depending upon credit, barter, donation and from export earnings.

Source of Imports		**Imports (80% requirement)**		
Barter	Credit lines	Credit Lines	Donation	Export earning
Pfizer	Holand	D P R Korea	Internatinal Organisation	
Merck	France	Cuba		
	F R G	Bulgaria	Scandinavian	
	Spain	Argentina	and Socialist countries.	
	Finland	U.S.S.R.		

Due to economic constrains and managerial problems, present system is not working very satisfactorily. The Government of Nicaragua is constantly reviewing the existing system of imports and distribution and considering a creation of new single trading company to look after imports, exports and distribution of both bulk drugs and formulations.

The Government should also take advantage of various suggestions and recommendations made by UNIDO experts during their studies from 1983 to mid 1985 regarding :

- Drug Administration (overall organisational structure lines of authority, policies, operational guidelining procedures),
- Information system,
- Supply and distribution system,
- Quality control assurance and training.

Co-Farma, Solka and International agencies are assisting the Government in evolving national policies and the following aspects are under the consideration of the Government :-

- All anti-malarial drugs should be distributed free to the people,
- Anti-T.B. drugs and specialized products like anti-cancer drugs should be distributed through the Pharmacy outlets of the Government.
- Popular (common) medicines may be freely sold through the private pharmacy outlets, however, their numbers should be reduced to 63 only,
- All drugs should be under price control.

Registration and Quality Control

There is a system of compulsory registration with the Ministry of Health by the companies desiring to export drugs or pharmaceuticals to Nicaragua. A number of companies in various countries including Hungary, Bulgaria, Yugoslavia, USA, Holland, France, FRG etc. and their units in other countries are registered. The imported product must conform to the pharmacopoeal specifications (U.S.P/ B.P./I.P.) (International Pharmacopoea). National Formulary is under preparation

There is no rigid Quality Control System at present. Imported drugs and pharmaceutical are tested by the laboratory in the University of Leon. The testing is obligatory. Whereas, all popular drugs can be manufactured without having qualified chemist/pharmacist.

The Government is planning to set up a National Laboratory for quality control in close co-ordination with WHO to achieve quality essurance.

Consumption - Production Forecast

Consumption

The demand for pharmaceuticals in the Republic of Nicaragua has been steadily increasing due to establishment of the Unified National Health System/SNUS/making drugs available free for larger segment of its population. Moreover, due to better socio-economic conditions prevailing after the Revolution, larger percentage of the people have been able to go in for private consultations and purchase of drugs.

On the advice of Ministry of Health, Corporacion Farmaceutica CO-FARMA has prepared Estimate for National Consumption of Medicines, 1985 (Estimado del Consumo Nacional de Medicamentos, 1985) - Annexure - 4, indicating the requirements of formulations of institutions, Ministry of Health and private sector at a value of US $ 49.4 million. This gives per capita consumption of US $ 15.44 at Imported Prices and US $ 29.65 at Average Retail Prices or US $ 33 at Specialities Retail Prices Level.

The above figures of per capita consumption of drugs in Nicaragua is high as compared to around US $ 13 in the whole world, US $ 50 in the Western Europe and US $ 24 in the Eastern Europe.

Keeping in view the world and other country's comparative figures of per capita consumption of drugs, rationalization programme of drug list and 3 percent growth rate per annum due to increase in G.N.P. as well as population growth, the progressive national consumption of pharmaceuticals in Nicaragua by 2000 A.D. shall be US $ 236 million as per details given below :-

Particulars	1985	1990	2000
Population (million)	3.2	3.7	5.1
Per Capita consumption at retail price(US$)	29.65	34.37	46.19
National consumption of formulations Retail Price (US $ in million)	94.85	124.18	235.57

Local Production

There are eleven laboratories in Nicaragua engaged in the production of pharmaceutical formulations in various dosage forms e.g. tablets, capsules, injectibles, liquids, suppositories and ointments.

The UNIDO Mission[1] has assessed the annual capacities of the local pharmaceutical laboratories as follows :-

Name of Unit	Dosage Form (Qty. in '000s)					
	Tablets	Cap-sules	Inject-ibles	Liquids	Ointments	Suppositories
BENGOECHEA	11,404	—	2,112	264	—	—
CEGUEL	44,352	—	—	3,960	—	—
DIVINA	253,440	—	—	—	792	—
FRECH	24,000	1,896	—	1,584	—	—
LAFANISA A.	126,720	—	—	2,640	—	—
B.	316,800	—	—	528	—	—
PANZYMA	—	—	1,320	900	600	—
RAMOS	105,388	2,736	600	—	—	—
RAPRE	372,556	6,336	5,808	7,596	—	—
RACIPE	7,392	23,232	1,848	1,320	—	2,640
SOLKA	139,960	39,912	7,920	6,442	11,520	8,448
UNAN	36,828	—	—	1,476	—	—
TOTAL	1,122,040	74,112	19,608	26,710	12,912	11,088

Further, the capacities of the above units in terms of value of production have a wide range as is indicated below :-

Production Capacity (US $ Million)	No. of Units
More than 25	1
More than 15	1
More than 5	1

1. Comprehensive Development Programme for the Pharmaceutical Sector - Terminal Report (Page 35-36) prepared by UNIDO based on the work of Dr. Miksa S. Almasi et al.

Production Capacity (US $ Million)	No. of Units
More than 2.5	2
More than 1	3
Less than 1	3

The installed capacities of these laboratories can meet about 90 percent requirement of the country, but due to constraints of raw materials, spare parts, labour and managerial problems, only 25 to 30 percent of the requirements is being met by these laboratores.

SOLKA, a Government Undertaking, has sufficient installed capacity to meet about 50 percent of the country's present demand. This unit was established in 1934. Inspite of latest and most modern machines and equipment, it is working at 6 to 10 percent capacity which is partly due to raw materials, managerial and labour problems. A large Glucose Infusion unit with a capacity of 14000 bottles per day was being set up with French collaboration. The Multi-purpose Pharmaceutical Chemicals plant is sophisticated in nature and handles danagerous and hazardous chemicals. The labour has to be careful and discipline should be of very high standard. Therefore, present labour condition and discipline should be improved.

This issue was discussed with the representative of the Government. It was noted that the Government was aware of the situation and determined to set it right. The Government is also determined to make SOLKA as a model Pharmaceutical Plant among the Central American countries and following measures have been taken to achieve this objective :

- Dialogue with the labour union.
- Induction of new management,
- Handling over technical management to Argentinian experts,
- Training of workers and supervisors, and
- Assessing to relieve SOLKA from present procurement activities for public and private pharmaceutical industry in Nicaragua.

Rest of the ten private laboratories are also monitored and controlled

by the Ministry of Industry for production and procurement and allocation of raw materials etc.

Most of the private laboratories have outdated machinery which require immediate replacement. Process and quality control, in some of these laboratories is missing. At present, they send the samples to University Analytical Laboratory at Leon for testing and approval. It is recommended that every formulation manufacturing unit must have its own process and quality control facilities.

Imports and Retail Prices

Hitherto most of the imports were made by private importers and distributors mostly of proprietory specialities, whereas today, the drugs are being imported in generic forms by the Government Agency. The retail prices of various categories of imported drugs in Nicaragua are worked out taking into account the customs duty, transport and other charges as per details given below :-

Particulars	Range (%)	Private Sector (Mostly Specialities) (%)	Institutional (Mostly Generic) (%)	
Customs Duty	3 - 26	20		10
Transport	3	3		3
Handling Tax	1.5 - 2.5	2.5		2
Importer or Wholesaler Profit	30 - 38	35	Pharmacy	30
Retailer Commission	25	25	25	Govt
Pattern of Consumption		50	25	25
Ratio (Retail/CIF)		2.14	1.8	1.5

The average retail prices have been estimated by assuming that 50 percent of the drugs still will continue as specialities and 25 percent supplied by the public sector will be through pharmacies and 25 percent shall be through Government institutions including Defence and the ratio of average retail price to CIF price comes to 1.92.

Self Reliance and Formulations

Most of the developing countries started their drug industry initially by producing formulations and subsequently basic drugs from the penultimate stage. The production of formulations has the potential benefits of :-

- reducing the foreign exchange element,
- better control over quality of medicines,
- quicker and easier availability of medicines to a larger segment of society,
- creation of additional jobs, and
- creation of ancillary units for the production of packaging materials.

The first pharmaceutical manufacturing unit in Nicaragua was established more than 50 years ago and thus Nicaragua as such has the basic process know-how and long experience in this industry.

Keeping the above in view, it is recommended that the country should be made self-reliant in meeting its own requirements of formulations. This process has to be carried in phases and by the year 2000 A.D., Nicaragua would be able to produce 90 percent of its own requirements and only 10 percent of such formulations which are latest specialities and are uneconomical to be produced should be imported. Besides this, it is also recommended that by 1990 A.D., Nicaragua should be able to export part of its formulations to the neighbouring Central American Countries.

The benefits which would accrue by taking up additional production

of formulations for achieving the self-reliance in terms of saving in foreign exchange would be substantial as is shown below :-

Cost Element	Product	
	Proprietory	Generic
Direct Foreign Exchange Expenditure		
a) Bulk Drugs and Excipients	40 - 45 %	50 - 75 %
b) Part of Freight and Packaging Materials *	15 - 25 %	10 - 25 %
Savings in Foreign Exchange		
Processing charges, profits, freight etc.	35 - 40 %	15 - 25%

* At present, most of the packaging materials are being imported.

The indigenous production of formulations on the average shall save about 30 percent of the proportionate foreign exchange requirement.

The estimated consumption, local production, imports and exports of formulations at retail prices for the years 1985, 1990 and 2000 A.D. are given below :-

(US $ in millions)

S.No.	Particulars	1985	1990	2000
1.	Total consumption	94.85	127.18	235.57
2	Production Value :-			
	a) for internal consumption	28.45	89.02	212.01
	b) for exports	-	20.[illegible]	40.00
	Total Production	28.45	10[illegible].02	252.01
3.	Imports	66.40	38.16	23.56

The estimated requirement of foreign exchange for imports of bulk drugs, auxiliary materials, packaging materials for indigenous production of formulations and for the imports of finished formulations are given below :-

(US $ in million)

S.No.	Particulars	1985	1990	2000
1.	For indigenous production :-			
	a) Bulk Drugs	10.37	32.46	77.29
	b) Packaging materials	-	7.29	14.58
	T o t a l	10.37	39.75	91.87
2.	For import of finished formulations	34.58	19.88	12.27
3.	Export Earnings	-	10.41	20.83
4.	Net Foreign exchange required	**44.95**	**49.22**	**83.31**

By 2000 A.D., it would be necessary to have installed capacity for production of formulations at retail prices in Nicaragua at US $ 252 million as compared to US $ 85 million at present in the eleven existing laboratories. This would mean that there has to be expansion of the existing units as well as setting up of new units to meet the above plan. The new units could be located in other parts of the country also.

Besides the capital investment for expansion and for new units, it would also be necessary to invest for replacement and renovation of the existing units. The requirement of capital, both in local as well as in foreign exchange to achieve the above plan is indicated below :-

S.No.	Particulars	Till 1985	1985-90	1990-2000
1.	Local (in terms of US$ in million)	-	3.20	20.40
2.	Foreign exchange (US$ in million)	1.00	5.80	30.60
	T o t a l	**1.00**	**9.00**	**51.00**

4. PRODUCTION PLANNING FOR BASIC DRUGS (Pharmaceutical Chemicals)

The production of pharmaceutical specialities involves comparatively a simpler technology consisting of mostly physical operations of mixing of various ingredients and presenting them in various dosage forms, e.g. tablets, capsules, oral liquids, ointments, injectibles etc. As compared to this, production of basic drugs involves complicated technology of transformation of various chemicals into new chemical having drug activity. This involves large number of intricate and complex unit operations and unit chemical processes requiring sophisticated technology and infrastructure. The development of basic drug industry is also inter-related with the development of chemical, especially organic chemical industry as a whole and is a real break-through of any country's industrialisation programme.

Keeping in view the estimated requirement of basic drugs of Nicaragua to be about US $ 32.46 million by the year 1990 A.D. and US $ 77 million by 2000 A.D., it is in the national interest that part of this requirement is taken up for production in the country. At present, there is no facility and experience to manufacture basic drugs in the country and the requirement is met fully by imports. The production of basic drugs shall have the following advantages :-

- better availability of finished drugs,
- create technological capability in chemical industry,
- giving country a take-off stage from agriculture base,
- induces the production of basic chemicals, solvents etc.,
- better utilisation of technologists, engineers and managerial power as well as creation of additional jobs,
- less dependence on foreign exchange, and
- Self reliance to a large extent.

Even a smaller country can be self-reliant in the pharmaceutical specialities

because same manufacturing facilities (plant and machinery) can be utilised for their production, but in case of basic drugs, every drug/ product requires a specific scheme of production needing specific equipment and machinery, which may or may not be useful for the production of another drug. Therefore, specific plants are required to be built up for production of antibiotics involving fermentation, production of enzymes, alkaloids and active ingredients from medicinal plant etc. However, in case of synthetic drugs, due to common unit operations and processes, multipurpose type of plants can be set up to produce simultaneously or sequentially one or two products. Hence, the production of synthetic basic drugs as a group instead of antibiotics, enzymes, etc. is recommended due to the following reasons :-

- the capital cost for synthetic drugs plant is lower than basic antibiotic fermentation unit,
- the plant can be a multipurpose unit,
- even smaller unit meeting the aspirations of smaller countries can be set up,
- even small units are economically viable,
- new product can be taken up by certain modifications in the layout as well as addition and deletion of certain equipment and machinery.

For a small country, it is not possible and economical to produce all the basic drugs indigenously and hence one cannot stretch the self-reliance too far. However, it is possible to produce about 30 to 40 percent of the basic drugs requirement locally. The suggestion regarding the product-mix and number of units to be established for the production of basic synthetic drugs is given in later paras.

5. NEED FOR SETTING UP OF A MULTIPURPOSE PILOT PLANT

Before taking up the commercial production of basic synthetic drugs for the first time, it is advisable first to set up infrastructure of a

pilot plant. This has the following advantages :-

- man-power and technical skill development through in-plant training

  The pilot plant simulates the operation conditions that are present on a large scale plant, thus affords good opportunity in imparting training in various unit operations and processes, which are of intricate and complex nature and thus, the trainee acquires the manufacturing skills for producing the pharmaceutical chemicals in the plant. Operation of various equipments and machines is itself a technology and part of the training programme.

- experience in handling various chemicals and raw materials

  For the production of 1 kg of a synthetic drug, invariably more than 1 kg to 50 kg or more of chemicals are required. Some of them are toxic, inflammable and dangerous. The pilot plant facilities affords initial training in handling such chemical raw materials.

- development, adaptation and up-dating of technology

  In most developing countries, chemical raw material industry is simultaneously under the stage of development. Under such circumstances, one may not be able to meet the exact specifications of raw materials required for the borrowed technology and studies are needed for adaptation of those raw materials.

- screening in of technology for scale-up programme

  Some .e technology may be available from the labor..y scale or smaller unit. One has to evaluate the same on a definite proportionate scale in the pilot plant.

- evaluation of product coming out of research laboratories Obsoloscence is a very important factor in the drug industry as a whole and in synthetic drugs in particular. There is continuous effort to develop new chemicals having drug activity in the laboratory. One has to carry out pilot plant trails to evaluate their processes.

Keeping the above in view, a multi purpose pilot plant is a must for countries which are for the first time planning to venture the commercial production of basic drugs.

6. SELECTION OF PRODUCT-MIX FOR MULTIPURPOSE PILOT PLANT

Most of the developed countries are in production of basic drugs for a long time and due to high rate of inflation, the capital cost requirement in the developing countries for the same size plant will be manifold. Thus, products which are required in smaller quantities and of low values are not economical to start with in the developing countries. Keeping this in view, production of high value items is more remunerative. The ratio between cost of production and the market price of drugs which are of recent discovery is quite high as compared to the drugs which are under production for long time. Thus taking up production of a latest drug, if technology is available, is more feasible.

About 300 basic drugs (pharmaceutical chemicals) form the active ingredients of about one thousand pharmaceutical specialities available and used in Nicaragua for the medical care. Out of these 300 drugs, 49 items constitute about 70 percent of the total value of drug bill of country (Annexure - 5). The UNIDO Experts in their Terminal Report recommended that the multipurpose pilot plant should produce the following commonly used active substances :-

- Acetyl Salicylic Acid
- Chloramphenicol
- Diazepam
- I N H
- Mebendazole
- Metronidazol
- Paracetamol
- Phenylbutazone

This list has been reviewed and taking into account that the use of INH, Phenylbutazone and Chloramphenicol are on the decline as well as some countries have discouraged their use, these drugs have not been considered.

The demand of synthetic derivatives of pencillines e.g. ampicillin, amoxycillin etc. is on the increase, however, these products are associated with the risk of allergic reaction and hence have to be produced and formulated in isolated areas. Due to the risk of cross contamination, ampicillin/amoxycillin have not been included in the product mix of this multipurpose plant. In case of erythromycine, critical equipments have been isolated.

Recommended product-mix with annual capacities is given below :-

S.No.	Name of the Drug	Capacity/Annum (MT)
1.	Acetyl Salicylic Acid	40.00
2.	Diazepam	0.25
3.	Drythromycin Estolate	16.50
4.	Mebendazole	6.00
5.	Metronidazole	10.00
6.	Nalidixic Acid	3.00
7.	Paracetamol	10.00
8.	Propranolol	0.20
9.	Sulphamethoxazole	20.00
10.	Trimethoprim	4.00

The following points have been taken into consideration while selecting the above product-mix.

- availability of technology,
- the process is as simple as possible,
- the production is started from the penultimate intermediate
- The intermediates are freely available at competitive prices in the international market,
- the product has future prospect and is not going to be obsolete in the near future.

- the product is selected based on ABC analysis
- to meet total requirement of one or two products, if needed.

7. SELECTION OF SITE

The Expert Team visited various proposed sites for the multipurpose pilot plant. Brief comments on each of the site is given below :-

a) **Elfar** (Elaboradors Farmaceutica S.A./Site/in Jiloa)

This site is situated opposite to Recipe Laboratory on Managua-Leon Highway. There is a 15 x 15 m of shed with wooden structure and galvanised sheets roof top. It has one water tank and electric connection. The building is not of much use and other infrastructures are missing. The transportation for staff would have to be provided. The site is not suitable for the proposed plant.

b) **Cerveceria El Aguila** (Corretera Norte-Managua)

This factory was a brewery unit and is lying idle for a few years. The tall building along with equipment and machinery as well as utilities system only suitable for production of beverages, solvent extraction or medium scale fermentation industry. The equipments are not suitable for research and development . Infrastructure for synthetic basic drugs require different environmental conditions.

c) **Industrias Quimica des Nicaragua S.A.**

This unit has been set-up with French collaboration and is producing industrial alcohol and potable liquors.

During the discussions, the management explained the problem about the water and effluent system. Except land, rest of infra-structures facilities as well as enviornment are not suitable.

As the plant is busy with its own expansion and due to reasons mentioned above, the site is not preferred.

d) **Granada**

There is planned industrial zone around Granada. At present, cement

pipes and food processing units have been set-up. Most of the infra-structures required for drug industry are missing. The raw materials, finished products as well as factory personnel have to be transported to the site. Since this a round the clock working unit, we do not consider this as an ideal site for this unit.

e) **UNAN** (Universido Nacional Autonoma de Nicaragua)

A few hectares of land has been reserved as industrial zone very near to the University. The area has not provided eletricity and water supply on the site. However, considering the presence of University having pharmaceutical department as well as chemical research laboratories and quality control facilities, it could be given some consideration. In any case, this site will also be quite expensive because the raw materials as well as finished products have to be transported.

f) **SOLKA**

It is the only public sector unit having latest and modern machinery and equipment facilities for the production of about 50 percent of the pharmaceutical specialities required for Nicaragua.

The Government is determined to make it modern unit amongst the Central American countries. There is industrial zone around SOLKA plant and have all the facilities which are needed for setting up industrial units. Besides above, following additional advantages shall be available for setting up of multipurpose pilot plant next to SOLKA :-

- availability of infrastructure of Laboratory and Library,
- common utilities services can be used in case of failure, shut down or expansion
- trained manpower - technical and managerial
- Consumer of the products next door minimising the inventory and transportation problem,

- reduce overhead expenses for certain common facilities.

Keeping above in view, it is recommended that the proposed multi-purpose pilot plant for the production of synthetic drugs should be located near SOLKA, in Managua.

Trained Manpower and Executing Agencies

Nicaragua has got very good educational facilities required for technical man power. The University of Leon has faculties of Science, Pharmacy and Chemistry well equipped with library, laboratories and staff who have received their higher education in reputed American and European Universities. The Department of Pharmacy has modern pilot plant forming a good base for practical training. Similarly, the University laboratory, at present is catering the quality control facilities to the Pharmaceutical Industry. Besides, there is technical University at Managua in the engineering disciplines. Since the pilot plant is an experimental-cum-research unit designed to evolve standardize, scaleup and stablize the technology and know-how developed in the laboratory or procured from elsewhere, it gives excellent facilities of employment and training of technical man-power.

Regarding capacity and capability of executing the project, the Project and Design Organisation of the Ministry of Industry (PROISA) was established in 1982 and has the capacity to handle 2-3 projects at a time. A Hosiery Unit costing about US$ 2 millions and a paper caton project at a cost of US$ 5.5 millions with French collaboration have so far been completed by this organisation. Other six projects for the manufacture of ICE, Tins for food industry, Glucose infusions, Ampules, Foundary and a Fibre Spinning unit are under various stages of completion. PROISA therefore, shall be a good executing agency.

8. PROJECT SUMMARY

According to the Detailed Feasibility Report appended hereunder in Section 9, the total estimated cost of the project is US$ 4.50 million comprising of US $ 3.07 million as foreign exchange and US$ 1.43 million in equivalent local currency. US $ 3.07 million

foreign exchange component comprises of :-

- US$ 1.93 million for imported equipment and machinery,
- US$ 0.48 million for technology transfer,
- US$ 0.25 million as margin money,
- US$ 0.41 million towards miscellaneous expenses for telephone/ telex fire protection/vehicles/interest during construction start-up expenses etc.

The local expenses in equivalent to US$ 1.43 million are mainly for civil works and locally available/fabricated equipments various other items and overheads during the construction.

The estimated cost of production excluding depreciation and interest for these ten drugs works out to US$ 3.0 million as compared to the landed value of US $ 2.7 million (based on the prices of these drugs imported by SOLKA during 1984).

The multi-purpose pilot plant loses its production capacity to the extent of 25-30 percent for changing over from one product to another. Moreover, in such a small unit, the efficiency, particularly of solvent recovery is likely to be low, mainly due to handling losses.

As the plant is having certain facilities for carrying adaptation, traning and research functions, additional equipment has to be provided raising the capital cost thereby.

It is expected that the economics of cost of production shall improve for some of the synthetic drugs for which exclusive production units are set up. However, it is also a general practice that most of the producers of intermediates price their products, in such a way that production of bulk drugs from these intermediates is not profitable. Thus, denying the developing countries to go in for the production of basic drugs. It is a universal fact that most of the developing countries have gone first for the production of formulations and then for the production of bulk drugs to increase the

technological capability alround.

The Governments of these countries have also protected their bulk drug industry in the initial stages by raising the import duty. In fact, the local prices of bulk drugs as well as chemicals are almost 50 - 300 percent higher as compared to the imported prices. For example, in India, the international prices and the local prices for some of the drugs and chemical are given below :

S.No.	Product	International price/kg (US$)	Local price/kg (US $) (in India)
	DRUGS		
1.	Ampicillin Trihydrate	60.00	135.00
2.	Vitamin B_1	30.00	82.00
3.	Vitamin B_2	45.00	120.00
4.	Tetracyline HCl	25.00	68.00
5.	Niacinamide	7.50	13.00
	CHEMICALS		
1.	Acetic Acid	0.60	1.32
2.	Toluene	0.37	0.85
3.	Methanol	0.29	0.60

It may be observed from Annex.25 to 27 showing financial results, if the import duty on basic drugs is raised the multi-purpose pilot plant shall become economically viable unit. This will stabilize the drug and pharmaceutical industry and by 2000 A.D., Nicaragua shall be able to produce about 40 percent of its bulk drug demand locally.

It is suggested that this multi-purpose pilot plant should be put up as infra-structure, Research and Development facility by COIP and PROISA, which are organs of the Ministry of Industry.

9. FEASIBILITY REPORT

9.1 Product-Mix and Capacity

The basis for the product-mix has been discussed earlier. The annual capacity alongwith the project capacity and sales turnover (at 100%) is given in Annenxure : 6

9.2 Section-wise capacities

Since this is a pilot plant, it is not attempted to rigorously fix the sectionwise capacities. In fact, lot of flexibilities has been kept. It may be emphasised that, the changeover period from one product to another product, in the same stream of eqiuipments has been considered as 25 - 30 percent of the annual production time. Annually 300 days working have been taken, but acutal production, excluding changeover time, shall be only 200 - 225 days.

On the basis of the selected capacities of various basic drugs, and also changeover period, capacities of the equipments and machinery have been fixed. This pilot plant is capable to produce ten basic drugs, from the various stages as shown in the process flow diagram and chemistry of the processes presented in Annexures 7 and 8 respectively. But as per the usual characteristics of a pilot plant, it is capable to produce/establish processes for many other synthetic drugs and chemicals.

9.3 Philosophy of design and equipments selection

A pilot plant is designed for particular product(s), at the same time it should have the facilities for various unit processes and operations. Similar principles have been followed here and the salient features and specific considerations are narrated below:-

i) Starting stages of synthesis

Almost all the inputs have to be imported. Moreover, this is the first kind of industry in the Republic of Nicaragua,

so input raw materials and intermediates, which are easily available in international market and are less dangerous to transport have been chosen.

Highly dangerous unit processes, like nitrations, which requires highly trained manpower and also transport of dangerous chemicals like fuming nitric acid have been avoided. On the other hand, quite sophisticated processes and operations (in Erythromycin, Trimethoprim, Sulphamethoxazole) have been included and most of the industries are following the same starting stages, atleast to start with. From the above considerations, the starting raw materials of the ten basic drugs are as follows :-

S.No.	Name of the Drug	Starting Material/ Intermediate
1.	Acetyl salicylic acid (ASP)	Salicylic acid
2.	Diazepam (DZP)	5-chloro-2-methyl amino benzophenone
3.	Erythromycin Estolate (EE)	Erythromycin thiocyanate
4.	Mebendazole (MBZ)	Thiourea
5.	Metronidazole (MND)	2-methyl 5-nitromidazole
6.	Nalidixic acid (NA)	2-methyl-6-amino pyridine
7.	Paracetamol (P)	p-Amino phenol
8.	Propanolol (PR)	-naphthol
9.	Sulphamethoxazole (SMZ)	5-methyl-3-amino isoxazole
10.	Trimethoprim (TMP)	3,4,5-Trimethoxy benzaldehyde

ii) Streams Selection

From the number of stages, type of unit processes and unit operations, the ten products, have been grouped into three steams viz.

Stream I : DZP, EE, SMZ, PR

Stream II : TMP, MBZ,NA

Stream III : P,SA,MND

These basic drugs shall be produced in the respective streams of equipments and appropriate changeover periods have been considered.

Solvent Recovery

The plant shall use nearly 300 cubic meters of solvents annually, which are quite expensive and these have to be recovered and re-used. The solvents have various characteristics - high boiling to low boiling, some form azeotropes, some require azeotropic drying and most of them are inflammable. The solvents are benzene, pyridine, dimethyl sulphoxide (DMSO), methyl isobutyl ketone (MIBK) etc.

Adequate facilities with flexibilities for solvent recovery have been provided.

Storage of Solvents

Solvents have to be imported and stored in bulk quantities as well as recovered solvents also have to be stored. To prevent losses of low boiling solvents during storage, cooling provision are also required. Further, due to dangerous properties of some of the solvents, adequate safety measures have to be followed. All these aspects have been considered and accordingly storage facilities provided.

iii) Equipment sizing and selection

Following principles have been adopted in sizing and selection of equipments :-

a) From the capacities of the products and groupings, the capacities of the equipments have been derived in the respective streams.

b) From the characteristic of the unit processes and corrosiveness of the chemicals,materials of construction have been selected. However, universality of the materials have been kept.

c) For the respective streams, optimum sizing has been derived. However, rigorous optimisation can be done during actual project work.

d) This is a pilot plant and various types of unit processes and operations should be carried out. Adequate flexibilities and facilities have been considered in sizing and selection of equipments.

e) This plant is capable to carryout various unit processes like acetylation, amination, condensation, reduction etc. as well as any medium pressure (upto 15 kg/cm^2) reactions and unit operations like various types of distillation, reflux, absorption, evaporation, seperation, solvent extraction, drying etc.

iv) Flow Characteristics

Rational approach has been adopted in the flow characteristics. The stagewise flows are linear as far as possible and gravity flow has been considered wherever possible.

v) Space and volume utilisation

While selecting equipments vis-a-vis sizing of building, adequate considerations have been given for optimal utilisation of the space and volume of the costly buildings.

vi) Materials Handling

Solid materials shall be transferred manually and liquids by pumping or by vaccum. Because of the explosive and inflammable nature of the solvents, transfer by air pressure is strictly prohibited. In such a small plant, inert gas facilities have been avoided.

vii) Storage of inputs and finished products

Various characteristics like self-life, explosive/flammable nature, etc. have been considered in recommending storage facilities for raw materials and finished products.

9.4 Brief Process of the recommended Basic drugs

Brief processes have been described by flow diagrams (Annexure:7) and process chemistry (Annexure 8).

9.5 Specifications of Raw Materials and Finished Drugs

i) **Raw Materials**

The raw materials and intermediates shall be as per the standard practice and process requirements and shall be specified while providing the technical know-how.

ii) **Finished Drugs**

Nicaragua does not have any Pharmacopoeia of its own. It follows International United State, British - Pharmacopoeias, and pharmacopoeia of some European countries. The basic drugs, produced in this plant, shall conform to the international pharmacopoeial standard.

9.6 Location and Land

The site selection has been described earlier in this report. The selected site is SOLKA, due to certain distinct advantages. Brief comments and considerations are enumerated below :

i. Land : This plant requires nearly 10,000 sq.mt. of land - to create all the necessary infrastructures.

i. Characteristics of the Land

a) **Soil** : The soil is soft, Load bearing capacity is 4000 Kg/M^2. In SOLKA, soft rock is available at about 1.5 meter depth. Compacting/pile foundations/rafting are necessary.

b) **Seismological Data** : The area is under highly seismic zone. In 1972, there was a devastating earthquake, the frequency level was 6.0 - 6.6 on Reicht Scale.

c) **Water Table** : Nearby 100 meters. Water contains lot of minerals - nearl y 800 perts per million solid content. The water has to be treated before use.

iii. Location : The site is located in Managua, the capital city of Nicaragua and naturally have many advantages like - transport, trained manpower, health care etc. Moreover, since it is adjacent to SOLKA, it will have a very good industrial atmosphere.

9.7. Buildings and Civil works

i) **Buildings**

The main factory building is 24 x 24 m.

Annexie building shall have the raw materials store on the ground floor and laboratory, library and production office on the first floor. The details have been shown in the general layout plan (Annexure : 9 & 10). The construction features of the main building are :-

- load 4000 kg/m^2
- two storeyed building to facilitate gravity flow
- raft foundation, since soil near the site has low load bearing capacity and Managua falls under higher seismic zone.
- RCC construction.

Similarily, the utilities and other auxiliary buildings shall have adequate spacing and RCC roofing wherever required. In case of steam generator, workshp and compressor room, sheds have been provided.

ii) **Miscellaneous Civil Works**

Miscellaneous civil works like water supply and storage system, storm water drainage, chemical effluent system, fire hydrant system have also been provided.

Costs : The construction rates of C$ 4000/m^2 for single storey and C$ 8,500/m^2 for higher load bearing and double storey buildings have been taken into account while working out the cost of buldings. These are based on the prevailing rates in Managua, Nicaragua.

The total cost of complete civil works is C$ 26.7 millions which is equivalent to US$ 0.534 millions (C$ 50 = US$ 1). The list of buildings alongwith the cost is given at Annexure: 11

9.8. Plant and Machinery

The list of plant and machinery alongwith cost has been shown in Annexure - 12&13. The Government of Nicaragua is having one fabrication unit, M/s.IMEP, located at Managua. M/s.IMEP can take-up many items for the fabrication. However, pressure vessels having drive and medium pressure operations shall have to be imported. M/s.IMEP is doing the fabrication work as per various codes like ASME/DIN/GOST etc. The prices for indigenous manufcturing items have been derived based on the data provided by M/s.IMEP during the visit of Expert Team to their factory.

- fabrication cost of carbon steel with materials is C$ 220 per kg.
- fabrication cost for SS-AISI-316 is C$ 170 per kg without materials.
- landed cost of SS-AISI-316 has been taken as US$ 4 per kg. The list of indigenous fabricated equipments given in Annexure:13

The exchange rate for this has been taken 1 US$ = 50 C$ which was given by the Minstry of Industry as well as by M/s.IMEP.

Imported Items

For imported items, the leading Indian prices from reputed equipment manufacturers have been considered. The prices shown here are CIF

Nicaragua.The landed costs as well as the installed costs have been shown in the Annexure ;12

The total cost of installed plant and machinery is US$ 2.2 millions.

9.9. Technical Know-how fees

The know-how fees consist of licensing of technology and engineering. Since this is the first type of industry in Nicaragua, complete detailed engineering has to be imported. The fees for this has been taken as US$ 350,000.

9.10. Training and Foreign Technicians

It has been assumed that a team of technical staffs consisting of engineers and chemists shall be trained abroad in operations, engineering, process and quality control and industrial safety as given in Annexure: 15 . Some foreign technicians shall also be at site during construction, installation, testing and commissioning. Total expenses for this has been considered as US$ 130,000.

9.11. Miscellaneous fixed assets

The cost of miscellaneous fixed assets like furnitures, transport, office equipments, safety equipments etc. has been considered as US$ 109,000. Details are shown in cost of the Project (Annexure: 16)

a) **Safety**

Since this plant shall handle dangerous solvents and gases, special emphasis has been given in safety equipments and installations. Provisions for fire hydrants, installation of fire extinguishers, special mobile vans for water and chemicals have been kept. Total capital expenditure for safety purposes is US$ 42,000.

b) **Effluent treatment and disposal**

This plant shall evolve substancial quantity of liquid, solid

and gaseous effluents. Adequate provisions have been kept to combat air and water pollution. Solid disposals shall be incinerated, gaseous pollutants shall be scrubbed through ventilation system and liquid effluents shall be treated before disposal. Liquid effluents shall consist of highly chemically polluted, mildly polluted and acid effluents. For liquid effluents, total capital expenditure has been taken as US$ 20,000.

9.12 Preliminary Expenses

Provision of US$ 25,000 have been kept as preliminary expenses-for legal expenses, visits in and abroad.

9.13 Pre-operative Expenses

Pre-operative expenses consists of [illegible] like establishments, general miscellaneous expenses, start-up expenses and interest during construction. The basis and amounts has been given in cost of the Project. The amount kept for this is US$ 472,300 most of which shall be spent in local currency.

9.14 Provision for Contingency

All the cost elements have been considered as non-firm, since nothing has been spent so far. Provision for contingency and cost escalation has been taken as US$ 386,000 out of which local currency spending is C$ 6.4 millions. Details are shown in Annexure: 17

9.15 Margin Money on Working Capital

The amount of margin money for Working Capital is US$ 263,300 Details are shown in Annexure : 18

9.16 Financial Pattern

It has been assumed that out of total project cost of US$ 4.5 millions, the contribution from grants and aids from different countries including International Organisations shall be US$ 2.3 millions and from Government of Nicaragua shall be US$ 2.2 millions (equivalent). Part of the expenses by government of Nicaragua shall be in local currency (Cordobas C$). The amount to be spent in local currency is C$ 71.44 millions which is equivalent to nearly US$1.43 millions.

Exchange Rate :

Various exchange rates are prevailing in Nicaragua against US$. We have taken 1 US$ = 50 C$ in this report unless and otherwise mentioned.

The total project cost is US$ 4.5 millions. Break-up shown in Annexe. 16

10. FINANCIAL RESULTS

10.1 Raw Materials

Almost all the raw materials have to be imported. The costs of raw materials have been taken from prevailing international prices. The prices taken are CIF-Managua and 6 percent has been taken towards handling charges and internal freight. Annual requirement of raw materials is US$ 2.56 million as shown in Annexure : 19.

Costs of packaging materials, operating, supplies and laboratory chemicals has been taken as 0. 5 percent of raw materials cost.

Total material cost at 90 percent capacity is US$ 2.42 million.

10.2 Utilities

The amount of Electric Energy and Furnance oil consumed annually at 100 percent capacity utilisation has been given in Annexure 20. The costs of steam water supply, deionised water, chilled brine, cooling water, compressed air, vacuum etc. has been included in electric energy, furnance oil and operating costs. Cost of two major components taken as below :-

a) Electric Energy

The unit (KWH) cost of electric energy as given by Ministry of Energy is C$ 2.98 and the same has been taken here.

b) Furnance Oil

Coal is not available in Nicaragua and all industrial units are using furnance oil for steam generation. The cost of

furnance oil is C$ 29 per cubic meter.

Cost of utilities at 90 percent capacity is C $ 11.48 m. annually. which has to spent in local currency. (equivelent US $ 229,600)

10.3 **Manpower and Salary**

Total manpower required for the project is 120 Since it is a pilot plant where process have to be simulated, highly qualified technical personnels are required. Provisions has been kept to have atleast one qualified person in every discipline. However, this is essentially organic synthetic plant, number of chemical engineers and chemists required are more and appropriate provisions have been kept for this.

The monthly salary are presented here in line with the norms fixed by the Government of Nicaragua. Over and above the salary. 15 percent provision has been kept for various benefits and perks. Annually 10 percent increment has been considered. (Annexure :21)

It has been assumed that in the first year of operation, nearly 80 percent of the staff should be recruited and during second year, full strength are required. It is recommended that recruitments should be made well in advance so as to facilitate training and participation in plant erection.

10.4 **Cost of Production**

Annual cost of production at 90 percent capacity is US$ 3.05 millions (in third year). The details are shown in Annexure : 22 & 24.

10.5 **Administrative Expenses**

Administrative salaries has been taken as US$ 290,000/year and General and Miscellaneous expenses taken as 25 percent of the salaries.

10.6 Marketing and Sales

At present, procurment and distribution of drugs as well as terminals are centralised and controlled by Government Institutions. No special efforts are required for this. Hence, sales commission, promotional expenses etc. are not required. Only 0.5 percent of the cost of production has been kept for handling charges and other related expenses. Annually, the amount is US$ 0.1 million at 90 percent capacity.

10.7 Product Cost and Sales Value

During third year of operation, the product cost including depreciation and interests workout to be US$ 3.670 millions as compared to CIF value of the products US$ 2.686 millions, based upon the import prices in Nicaragua by M/s. SOLKA during 1984-85.

In any case, as explained earlier, in most of the developing countries, cost of indigenously produced drugs are nearly 50-300 percent higher than the import prices. The selling price of the products could be fixed in the developing countries either on actual cost of production with certain profit margin, so that the plant in due course of time can become self financing. Alternatively, one can strike a balance by imposing import duty to anable the indigenous industry to survive and at the same time strive for improvement.

In view of above, various rates of customs duties have been taken to find the selling prices and alternative financial results have been worked out in Annexures 25,26 and 27.

In Annexure 25, the value of sales taking various rates of customs duties on drugs on the CIF value have been shown. In case, the plant is exclusively used as a pilot plant, the annual sales value at 90 percent capacity utilisation and at the rates of 50 percent,

75 percent and 100 percent customs duties shall be US$ 4.029, 4.565 and 5.372 millions respectively. In case, the unit is used as a commercial plant there shall be saving of 20 percent annual working days and consequently, the annual sales at 90 percent capacity utilisation and at the rate of 50 percent, 75 percent and 100 percent customs duties shall be US$ 4.835, 5.479 and 6.447 millions respectively.

10.8 **Profitability**

The financial results for the proposed pilot plant are shown in Annexures 22,26 and 27. At the prevailing CIF prices of drugs, in the first year of operation at 60 percent capacity utilisation, the loss is US$ 1.13 millions, during second year at 80 percent capacity utilisation, the loss is US$ 1.28 millions and during third year at 90 percent capacity utilisation, the loss is US$ 1.357 millions. Details are shown in Annexure 22.

In Annexure 26 the financial results for the pilot plant during third year at 90 percent capacity utilisation have been shown. In this case, the sales value at various rates of customs duties as shown in Annexure 25 have been taken. It is found that at the rate of 75 percent customs duty, the plant shall earn US$ 0.537 million during third year and at 100 percent customs duty, the profit shall be US$ 1.342 millions.

In Annexure 27 the financial results for the commercial plant during third year at 90 percent capacity utilisation have been shown. The sales value at various rates of customs duties from Annexure 25 have been considered. It is found that at the rate of 75 percent customs duties, the plant shall give US$ 1.008 millions profit during third year and at 100 percent customs duty, the profit shall be US$ 2.012 millions.

10.9 **Interests**

a) It has been assumed that the expenses by the Government of Nicaragua shall attract 22 percnet interest per annum.

For the expenses, equivalent to US$ 2.2 millions, the annual interest is US$ 0.484 million.

b) Similarly, for working capital borrowings, the interest rate is 15 percent. The borrowed capital has been shown in Annexure 23 and annual interest during first, second and third years of operations are US$ 0.08, 0.10 and 0.12 millions respectively. Details have been shown in cost of Production and Financial Results (Annexures : 22 & 23).

10.10 **Depreciation**

Straight line method has been followed in deriving depreciation. Annually 10 percent has been taken as depreciation on various assets, including know-how fees and training expenses.

11. **IMPLEMENTATION SCHEDULE**

The implementation time for the project has been taken as 30 months. The PERT Chart showing various activities and dependences given as Annexure 25.

Note: The foreign exchange rates in Nicaragua are different for dififerent commodities and is fluctuating abnormally from time to time due to war condition and economic constraints. The feasibility report prepared is only indicative one and helpful in deciding investment for this infrastructural purpose. Keeping above in view the sensitivity analysis has not been presented.

Annexure : 1

PRESENT INCIDENTS OF VARIOUS TYPE OF DISEASES TREATED IN 1980

Type of Disease	No. of Cases	Left	No. of Deaths	Percentage of Total
Perto Normal	45.178	45.170	8	25.38
Infectious intestinal	15.080	14.542	538	8.47
Respiratory	15.729	15.058	671	8.83
Tumor	4.206	3.965	241	2.36
Obstetric disease	11.728	11.704	24	6.59
Digestive disease	10.623	10.020	243	5.76
Abortion	8.442	8.443	9	4.74
Urinary disease	9.497	9.379	118	5.35
Tuberculosis	2.178	2.009	169	1.22
Bacterial disease	1.258	0.721	537	0.71
Glandular disease	2.594	2.370	224	1.46
Nutritional disease	1.577	1.410	161	0.88
Preinatal disease	3.226	2.365	861	1.81
Heart disease	2.140	1.683	457	1.20
Cerebrovascular disease	614	419	195	0.34

Source : DP/NIC/83/004/11-51 p-15

Annexure : 2

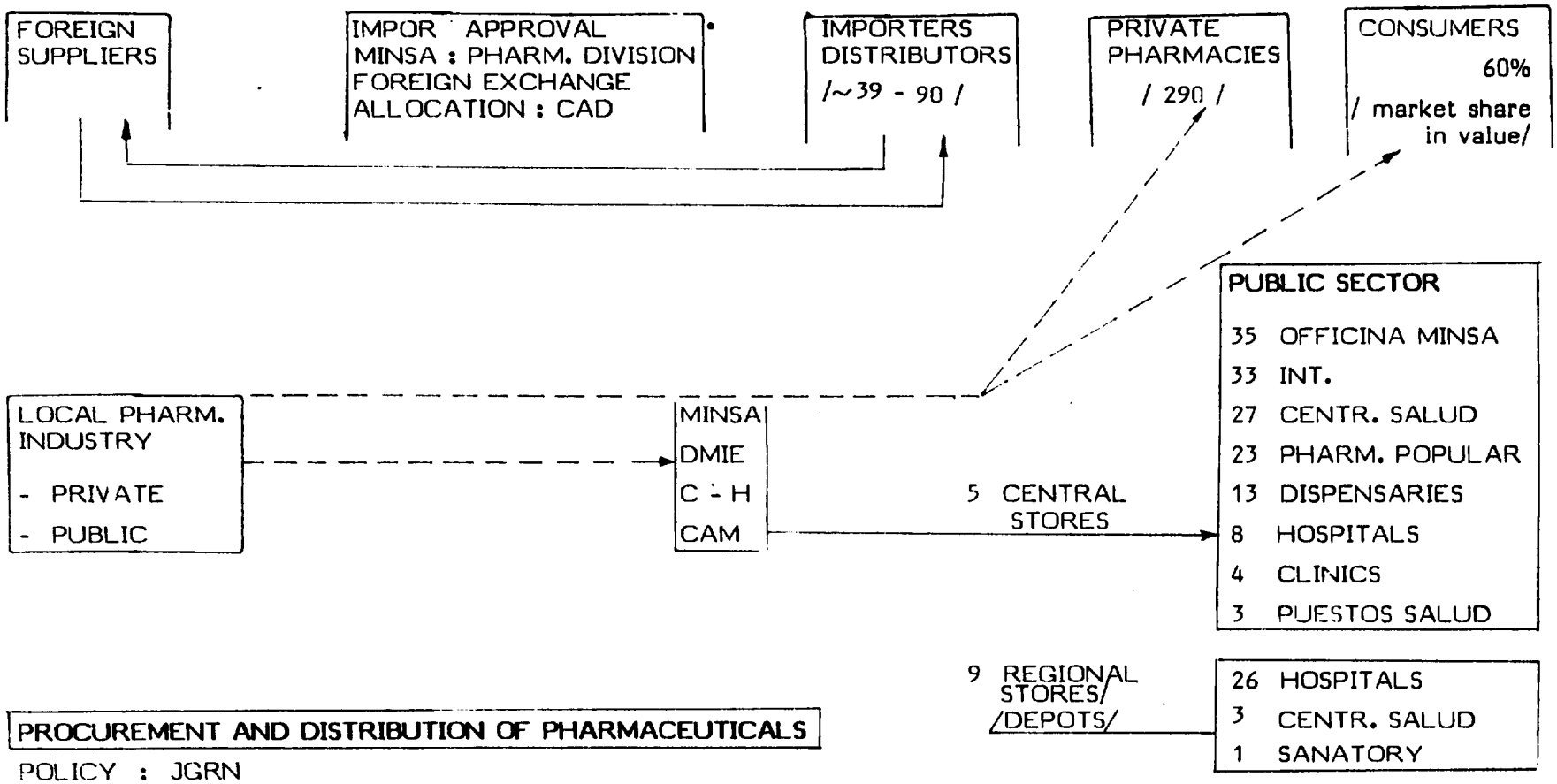
PERCENTAGE INCIDENTS OF VARIOUS DISEASES REGISTERED FOR CONSULTATIONS DURING 1978

Type of Disease	No. of cases	Percentage of total
Helminthiasis	32.744	17.34
Diarrhoea	16.994	8.99
Influenza	17.235	9.12
Genitourinary disease	14.439	7.64
Ill-defined disease	9.330	4.94
Respiratory disease	9.044	4.78
Bronchitis	11.193	5.92
Disentery	6.071	2.21
Not specified disease	3.620	1.74
Paludism	4.254	2.25
Anaemia	6.484	3.43
Subcutaneous cellular	6.682	3.53
Parasitic disease	4.403	2.35
Gonorrhoeal disease	3.082	1.63
Digestive disease	2.719	1.43

Source : DP/NIC/83/004/11-51 p-16

Annexure : 3

PROCUREMENT, PRODUCTION AND DISTRIBUTION FUNCTION IN MID-1985



PROCUREMENT AND DISTRIBUTION OF PHARMACEUTICALS

POLICY : JGRN
MIPLAN, MICE, FIR
BCN, MINSA/MIND MICOIN etc./

Annexure : 4

ESTIMADO DEL CONSUMO NACIONAL DE MEDICAMENTOS, 1985

CORPORACION FARMACEUTICA

CODIGO ACTUAL	NOMBRE GENERICO	CONCENTRACION	PRESENTACION	UNIDAD MED	CLA-SIF.	USO POR NIVEL Y PRIORIDAD	CONSUMO INSTITUCIONAL	MINSA	CONSUMO PRIVADO	CONSUMO NACIONAL
01010100	Penicilina G. Cristalina	1.000.000 U.I.	Polvo Liofilizado	FAM	B	3-3-2-0-0-3-3	51,000	1,875,390	208,376	2,134,766
01010110	Penicilina Procainica	4.800.000 U.I.	Polvo Liofilizado	FAM	B	2-2-3-3-0-3-3	143,100	58,290	6,487	207,877
01010111	Penicilina Procainica	1.400.000 U.I.	Polvo Liofilizado	FAM	B	3-3-3-3-3-3-3	163,500	2,417,345	1,035,147	3,613,992
01010130	Penicilina Benzatinica Procainica Cristalina	(600x300x 300) 1.000	Polvo Liofilizado	FAM	B	0-0-2-2-0-0-0	115,500	900,000	225,000	1,240,500
01010150	Penicilina Benzatinica	2.400.000 U.I.	Polvo Liofilizado	FAM	B	2-2-3-3-0-0-0	276,600	236,325	41,704	554,629
01010151	Penicilina Benzatinica	1.200.000 U.I.	Polvo Liofilizado	FAM	B	3-3-3-3-0-3-3	63,000	45,570	19,550	128,100
01010160	Ampicilina	250 Mg. x 5 cc.	Suspension 60 cc	FCO	A	2-2-3-3-2-3-3	72,240	1,200,000	514,285	1,786,525
01010170	Ampicilina	500 Mg.	Capsula	CAP	A	3-3-3-3-2-3-3	3,045,000	23,000,000	9,857,142	35,902,142
01010180	Ampicilina	1 Gmo.	Polvo Liofilizado	FAM	A	3-3-2-0-0-0-3	36,300	625,035	110,300	771,635
01010191	Dicloxacilina	125 Mg. 5 cc.	Suspension 60 cc.	FCO	B	3-3-3-0-0-0-0	41,300	522,870	130,717	694,887
01010192	Dicloxacilina	500 Mg.	Capsula	CAP	B	3-3-2-2-0-0-0	2,455,000	4,325,000	1,081,250	7,861,250
01010193	Dicloxacilina Sodica	500 Mg.	Polvo Liofilizado	FAM	B	3-3-2-2-0-0-3	54,500	83,610	14,754	152,864
01010194	Carbenicilina Sodica	1 Gmo.	Polvo Liofilizado	FAM	B	3-0-0-0-0-0-0	20,100	90,000	5,555	75,655
01010199	Cafalotina Sodica	1 Gmo.	Polvo Liofilizado	FAM	B	3-3-0-0-0-0-3	20,100	60,210	6,690	87,000
01010250	Eritromicina	250 Mg. x 5 cc	Suspension 60 cc.	FCO	B	2-2-3-3-2-3-3	1,016,000	952,200	408,085	2,376,285
01010260	Eritromicina	500 Mg.	Capsula	CAP	B	3-3-3-3-3-3-3	850,000	6,632,000	2,842,285	10,324,285
01010280	Clindamicina Fosfato	600 Mg.	Solucion 4 cc.	FAM	C	3-2-0-0-0-0-3	-0-	14,700	1,633	16,333
01010300	Tetraciclina	500 Mg.	Capsula	CAP	B	3-3-2-2-0-3-3	2,490,000	9,250,000	2,312,500	14,052,500
01010320	Cloranfenical	250 Mg.	Capsula	CAP	B	2-2-2-2-0-3-3	2,046,400	2,000,000	857,142	4,903,542

CODIGO ACTUAL	NOMBRE GENERICO	CONCENTRACION	PRESENTACION	UNIDAD MED	CLA-SIF.	USO POR NIVEL Y PRIORIDAD	CONSUMO INSTITUCIONAL (1)	MINSA (2)	CONSUMO PRIVADO (3)	CONSUMO NAVIONAL (1+2+3)
01010330	Cloranfenicol Succinato	1 Gmo.	Polvo Liofilizado	FAM	B	3-3-2-0-0-3-3	2,300	138,075	24,366	164,741
01010400	Sulfato de Estreptomicina	1 Gmo.	Polvo Liofilizado	FAM	B	0-0-3-3-0-3-3	3,400	837,270	93,030	933,700
01010410	Estreptomicina Sulfato	5 Gmo.	Polvo Liofilizado	FAM	B	3-0-0-0-0-0-0	5,350	10,800	-o-	16,150
01010430	Gentamicina Sulfato	80 Mg. x 2 cc.	Solucion 2 cc.	FAM	B	3-3-2-0-0-0-3	194,900	1,043,730	260,932	1,499,562
01010440	Gentamicina Sulfato	10 Mg. x 1 cc.	Solucion 2 cc.	FAM	B	3-3-2-0-0-0-3	28,700	462,405	115,601	606,706
01010450	Neomicina Sulfato	500 Mg.	Tableta	TAB	B	3-3-0-0-0-0-3	100	150,000	16,666	166,766
01010480	Amikacina Sulfato	100 Mg. x 2 cc.	Solucion 2 cc.	FAM	B	3-2-0-0-0-0-0	-o-	44,325	7,822	52,147
01010490	Amikacina Sulfato	500 Mg. x 2 cc.	Solucion 2 cc.	FAM	B	3-3-0-0-0-0-0	49,800	45,000	5,000	99,800
01010500	Trimetoprin y Sulfametoxazol	80 x 400 Mg.	Tableta	TAB	B	3-3-3-3-0-3-3	2,290,000	12,136,695	5,201,440	19,628,135
01010520	Trimetoprin y Sulfametoxazol	40 x 200 Mg.5 cc	Jarabe 120 cc	FCO	B	3-3-3-3-0-3-3	758,400	633,465	271,485	1,663,350
01010530	Sulfadiazina	500 Mg.	Tableta	TAB	A	2-2-2-2-3-3-3	1,000	100,000	100,000	201,000
01010534	Sulfadiazina de Plata	1%	Crema 200 Gms.	PTE	B	3-3-0-0-0-3-3	500	30,000	3,333	33,833
01010540	Sulfizoxazol	500 Mg.	Tableta	TAB	B	3-3-2-2-0-3-3	200	1,000,000	250,000	1,450,000
01010550	Sulfaz crema vaginal	10% a 15%	Crema 78 a 100 Gms.	TBO	B	3-3-3-3-0-0-0	1,150	167,000	29,470	197,620
01010560	Sulfacetamida Sodica Colirio	4% a 15%	Solucion Gotas	FCO	A	3-3-2-2-2-0-3	26,000	237,645	59,411	323,056
01010600	Nitrofurantoina	100 Mg.	Tableta	TAB	B	3-3-0-0-0-0-0	405,200	813,495	203,373	1,422,068
01010610	Nitrofurantoina	25 Mg. x 5 cc.	Suspension 120 cc.	FCO	B	3-3-2-2-0-0-0	300	144,000	36,000	180,300
01010620	Nitrofurazona	0.2%	Pomada 1 Libra	FCO	A	2-2-3-3-2-3-3	4,295	37,500	4,166	45,961
01010630	Nitrofurozana	0.2%	Solucion 463 cc.	FCO	A	2-2-3-3-2-0-0	1,560	37,500	4,166	43,226
01010640	Nitrofurazana	0.2%	Ovulo	OVU	B	3-3-3-3-0-0-0	5,900	1,702,500	189,166	1,897,566
01010700	Anfotericina B.	50 Mg.	Polvo Liofilizado	FAM	C	3-0-0-0-0-0-0	100	16,800	-o-	16,900

CODIGO ACTUAL	NOMBRE GENERICO	CONCENTRACION	PRESENTACION	UNIDAD MED	CLA-SIF.	USO POR NIVEL Y PRIORIDAD	CONSUMO INSTITUCIONAL (1)	MINSA (2)	CONSUMO PRIVADO (3)	CONSUMO NAVIONAL (1+2+3)
01010710	**Nistatina**	100.000 U.I.x 1cc.	Suspension 22 cc.	FCO	B	2-3-3-3-0-3-3	2,050	263,835	113,072	378,957
01010720	**Nistatina Vaginal**	100.000 U.I.	Ovulo	OVU	B	2-2-3-3-0-0-3	31,500	11,528,800	655,200	2,215,500
01010721	**Nistatina**	1 Gmo.+ 10000000	Crema 30 Gmos.	TBO	B	2-3-3-3-0-0-0	45,500	297,690	127,581	470,771
01010730	**Griseofulvina Ultrafina**	500 Mg.	Tableta	TAB	B	3-3-2-2-1-3-3	1,381,400	2,041,125	874,767	4,297,292
01010740	**Clotrimazol**	1%	Soluc. gotas 20cc.	FCO	A	3-3-2-2-1-0-0	122,010	333,780	143,048	598,838
01010750	**Clotrimazol**	1%	Crema	TBO	B	2-3-3-3-0-3-3	35,750	181,000	77,571	294,321
01010760	**Clotrimazol**	100 Mg.	Ovulo	OVU	A	2-2-3-3-0-0-3	18,500	500,340	214,431	733,271
01010770	**Solucion Fungicida (YAS)**		Solucion 30 cc.	FCO	A	2-2-3-3-3-3-3	189,750	1,933,515	483,378	2,606,643
01010770	**Fungicida**		Polvo 15-456 Gmos	FCO	A	2-2-3-3-3-3-3	201,750	181,495	77,779	642,499
01010800	**Cloroquina**	120 Mg. x 3 cc.	Solucion 3 cc.	AMP	B	3-3-2-0-0-0-3	117,250	166,410	71,318	354,978
01010810	**Cloroquina**	50 Mg. x 1 cc.	Solucion 1 cc	AMP	B	3-3-2-0-0-0-3	183,800	75,180	32,220	291,200
01010820	**Fosfato de Cloroquina**	250 Mg.	Tableta	TAB	A	3-3-3-3-3-3-3	2,890,550	7,858,905	3,368,102	14,117,557
01010830	**[illegible]uina**	5 Mg.	Tableta	TAB	A	3-3-3-3-3-3-3	8,100	2,427,495	269,755	2,705,350
01010840	**[illegible]quina**	15 Mg.	Tableta	TAB	A	3-3-3-3-3-3-3	2,853	2,433,765	270,418	5,557,183
01010850	**[illegible]stamina**	25 Mg.	Tableta	TAB	A	3-3-3-3-1-3-3	100	17,400	3,070	20,570
01010900	**Antimonio Polivalente trivalente pirocatequina disulfato sodico**	6.3%	Solucion 5 cc.	AMP	B	2-2-3-3-1-0-3	52,100	96,000	-o-	148,1000
01010901	**Gulcantime Polivalente**		Solucion 5 cc.	AMP	B	3-3-2-2-2-3-3	-o-	96,000	-o-	96,000
01010000	**Espiramicina**	250 Mg.	Tableta	TAB	C	3-3-0-0-0-0-0	3,000	13,950	2,461	19,411
01020100	**Aluminio y Magnesio Hidroxido**	150x150 Mg. 5cc	Suspension 175cc.	FCO	A	3-3-3-3-2-3-3	184,900	848,295	363,555	1,396,750
01020110	**Aluminio y Magnesio Hidroxido**	150 x 150 Mg.	Tableta	TAB	A	2-2-2-2-2-3-3	722,000	12,770,000	5,472,857	18,964,857

CODIGO ACTUAL	NOMBRE GENERICO	CONCENTRACION	PRESENTACION	UNIDAD MED	CLA-SIF.	USO POR NIVEL Y PRIORIDAD	CONSUMO INSTITUCIONAL (1)	MINSA (2)	CONSUMO PRIVADO (3)	CONSUMO NAVIONAL (1+2+3)
01020130	Cimetidina	150 Mg. x 1 cc.	Solucion 1 cc.	AMP	B	3-3-0-0-0-0-3	15,050	67,000	16,750,000	98,80[illegible]
01020150	Cimetidina	300 Mg. x 1 cc.	Tableta	TAB	B	2-2-3-3-0-0-3	123,000	2,000,000	857,142	2,980,142
01020160	Leche Magnesia		Suspension 120 cc.	FCO	A	2-2-3-3-0-0-0	78,000	157,410	157,500	392,910
01020240	Carbon con belladona Fenobarbital	60 x 5 x 20 Mg.	Tableta	TAB	B	2-2-3-3-0-0-0	761,000	5,995,440	2,569,474	9,325,914
01020310	Diocyil Sulfosuccinato Sodico Estimulador del Peristaltismo	100 x 30 Mg.	Capsula	CAP	B	2-2-3-3-0-0-0	100	365,070	156,458	521,628
01020320	Glicerina Simple	96%	Suspension 30 cc.	FCO	B	2-2-3-3-0-0-0	150	38,955	14,123	47,228
01020330	Glicerina Infantil		Supositorios	SUP	A	3-3-2-2-1-0-0	-0-	158,940	68,117	227,057
01020340	Agar y Fenolftalcina Acetie Mineral	31.8% Aceite	Suspension 180 cc.	FCO	B	2-2-3-3-0-3-3	79,250	104,000	44,571	227,821
01020350	Enema Fosfato y Bifosfato Sodico	6x16 Gmos. 100 cc	Solucion 135 cc.	FCO	B	3-3-2-2-0-0-0	3,330	68,265	12,046	83,641
01020360	Aceite Mineral		Aceite 120 cc.	FCO	A	2-2-2-2-2-0-0	14,550	29,805	12,773	57,128
01020400	Enzimas Digestivas		Tableta	TAB	B	1-1-2-2-0-0-0	842,000	5,000,000	2,142,857	7,984,857
01020500	Dimemhidrinato	50 Mg.	Tableta	TAB	B	3-3-3-3-3-3-3	294,000	6,500,000	2.785,714	9,579,714
01020510	Dimenhidrinato	50 Mg. x 1 cc.	Solucion 5 cc.	TAB	B	3-3-2-2-0-0-0	60,700	396,075	99,018	555,793
01020520	Dimenhidrinato	50 Mg.	Supositorios	SUP	B	3-3-2-2-0-0-0	175	225,000	96,428	321,603
01020600	Dehidrometina	60 Mg. x 2 cc.	Solucion 2 cc.	AMP	C	2-2-0-0-0-0-0	210	21,915	3,867	25,992
01020640	Dehidrometina	30 Mg. x 1 cc.	Solucion 1 cc.	AMP	C	2-2-0-0-0-0-0	100	525	131	756
01020600	Hidroxiquinolinas Halogenas	250 Mg.	Tableta	TAB	B	2-2-2-2-0-0-0	1,046,000	19,000,000	4,750,000	24,796,000
01020611	Hidroxiquinolinas Halogenas	200 Mg.	Suspension 120 cc.	FCO	B	2-2-2-2-0-0-0	5,000	9,480	4,062	18,542

CODIGO ACTUAL	NOMBRE GENERICO	CONCENTRACION	PRESENTACION	UNIDAD MED	CLA-SIF.	USO POR NIVEL Y PRIORIDAD	CONSUMO INSTITUCIONAL (1)	MINSA (2)	CONSUMO PRIVADO (3)	CONSUMO NAVIONAL (1+2+3)
01020620	Metronidazol	125 Mg. x 5 cc.	Suspension 120 cc.	FCO	A	2-2-0-0-2-3	11,800	344,730	147,741	504,271
01020630	Metronidazol Oral	250 Mg.	Tableta	TAB	A	3-3-3-3-2-3	1,635,000	14,024,700	3,506,175	19,165,875
01020631	Metronidazol Oral	500 Mg.	Tableta	TAB	A	3-3-3-3-2-3	1,000	1,500,000	375,000	1,876,000
01020700	Medemdazole	100 Mg.	Tableta	TAB	A	2-2-3-3-3-3	1,921,000	-o-	2,000,000	3,921,000
01020701	Medemdazole	100 Mg. x 5 cc.	Suspension 30 cc.	FCO	B	2-2-3-3-3-3	2,600	1,280,070	320,000	1,602,670
01020702	Paperazina Sales		Jarabe 120 cc.	FCO	A	3-3-3-3-3-3-3	58,000	639,765	274,185	972,750
01020710	Niclosamide	500 Mg.	Tableta	TAB	B	2-2-3-3-0-0-0	5,500	300,000	75,000	380,500
01020720	Pamoato Pirantel/Oxantel	100x100 Mg.	Tableta	TAB	B	2-2-3-3-3-3-3	24,000	7,492,095	1,873,023	9,389,118
01020800	Corticoide Hexaclorofeno									
y anestesico	y anestesico		Supositorio	SUP	B	2-2-0-0-0-0-0	49,500	450,000	192,857	692,357
01020900	Metoclopramida	10 Mg.	Tableta	TAB	A	3-3-3-3-2-3-3	737,000	3,600,000	1,542,857	5,879,857
01020910	Metoclopramida	10 Mg. x 2 cc.	Solucion	AMP	B	3-3-2-2-0-3-3	61,250	831,270	146,694	1,039,214
01030100	Metaproterenol	20 Mg.	Tableta	TAB	B	3-3-2-2-0-0-0	3,000	858,000	151,411	1,012,411
01030110	Salbutamol Sulfato	2 Mg. x 5 cc.	Jarbe 150 cc	FCO	B	3-3-2-2-1-3-3	17,500	487,665	208,999	714,164
01030120	Metapreotarenol o Isoproterenol Salbutamol	0.75 mg . 0.08 100	Nebulizador 15 cc.	FCO	B	3-3-3-2-0-0-3	3,590	193,500	1,782,928	1,980,018
01030130	Aminofilina	100 Mg.	Tableta	TAB	B	3-3-3-3-2-3-3	330,200	4,161,000	1,783,285	6,274,485
01030140	Aminofilina	250 Mg. x 10 cc.	Solucion 10 cc.	AMP	B	3-3-2-1-0-3-3	23,760	306,660	54,116	384,536
01030150	Teofilina		Jarbe 120 cc.	FCO	B	2-2-3-3-0-0-0	50,300	342,000	146,571	538,871
01030200	Codeina Expectorante y Bromcodilatador	10 Mg. de Codeina	Tableta	TAB	TAB	2B2-3-3-0-3-3	585,000	4,300,000	1,842,857	6,727,857
01030310	Dextrometorfano	15 Mg x 1 cc.	Solucion 15 cc.	FCO	B	2-2-3-3-0-0-0	52,800	676,000	289,714	1,018,514

CODIGO ACTUAL	NOMBRE GENERICO	CONCENTRACION	PRESENTACION	UNIDAD MED	CLA-SIF.	USO POR NIVEL Y PRIORIDAD	CONSUMO INSTITUCIONAL (1)	MINSA (2)	CONSUMO PRIVADO (3)	CONSUMO NAVIONAL (1+2+3)
01030225	Formula Expedtoranta		Jarbe 120 cc	FCO	B	3-3-3-3-3-3-3	145,200	600,000	257,142	1,002,342
01030227	Dextrometorfano Compuesto		Jarbe 120 cc.	FCO	B	3-3-3-3-0-3-0	293,900	316,445	135,619	745,564
01030400	Hidracidadelasido Inosicotinico(INH)	100Mg.	Tableta	TAB	B	0-0-3-3-2-0-3	27,000	2,712,270	478,635	3,217,905
01030410	Isoniazida y Tiacetazona	300x150 Mg.	Tableta	TAB	B	3-3-2-2-1-0-3	40,075	645,195	71,688	756,958
01030420	Rifampicina Isoniazida	300x150 Mg.	Capsula	CAP	B	3-3-2-2-1-0-3	93,020	544,980	96,172	734,172
01030430	Itambutol	400 Mg.	Tableta	TAB	B	3-3-2-2-1-3-3	6,800	372,480	65,731	445,011
01030440	Refimpicina	100 mg x 5 cc.	Suspension 60 cc.	FCO	B	3-3-2-2-1-3-3	150	6,195	1,548	7,893
01030441	Refimpicina	300 Mg.	Capsula	CAP	B	3-3-2-2-1-3-3	17,000	150,000	37,500	804,500
01030450	Pirazinamida	500 Mg.	Tableta	TAB	B	3-0-0-0-0-0-3	100	75,000	8,333	83,433
01030500	Diciclobramina	4 Mg. x 2 cc.	Solucion 2 cc	AMP	B	3-2-0-0-0-0-0	10,650	20,105	22,526	123,281
01030510	Diciclobramina	4 Mg. x 5 cc.	Sarabe 120 cc.	FCO	B	3-2-0-0-0-0-0	30,000	495,000	222,142	747,142
01030600	Cromoglicato Sodico	20 Mg.	Capsual	CAP	B	2-2-2-2-0-0-3	3,000	173,925	74,539	251,464
01040100	Lanatocido "C"	0.4 Mg. x 2 cc.	Sulcion 2 cc.	AMP	B	3-3-2-2-0-3-3	900	34,425	8,606	43,931
01040110	Digoxina	0.25 Mg.	Tableta	TAB	B	3-3-2-2-0-3-3	28,500	1,273,635	545,843	1,847,978
01040120	Digoxina	0.75 Mg. x 1 cc.	Gotas Solucion 10 cc.	FCO	B	3-3-2-2-0-0-0	75	45,495	8,028	53,598
01040130	Digoxina	0.25 Mg x 1 cc.	Solucion 2 cc.	AMP	B	3-3-2-0-0-0-3	650	41,280	4,586	46,516
01040200	Procainamida	250 Mg.	Capsula	CAP	A	3-3-2-2-0-0-3	33	32,085	3,565	35,683
01040210	Quinidina Simple	200 Mg.	Tableta	TAB	C	3-3-0-0-0-0-3	33	114,750	49,178	163,961
01040220	Propanolol	40 Mg.	Tableta	TAB	C	3-3-0-0-0-0-3	87,500	1,000,000	428,571	1,516,071
01040221	Propanolol	10 mg.	Tableta	TAB	B	3-3-2-2-0-0-0	750	450,000	192,857	643,670
01040230	Amiodarone	200 Mg.	Tableta	TAB	C	2-2-2-0-0-0-0	100	131,865	56,513	188,478

CODIGO ACTUAL	NOMBRE GENERICO	CONCENTRACION	PRESENTACION	UNIDAD MED	CLA-SIF.	USO POR NIVEL Y PRIORIDAD	CONSUMO INSTITUCIONAL (1)	MINSA (2)	CONSUMO PRIVADO (3)	CONSUMO NAVIONAL (1+2+3)
01040300	Acido Nicotinico	50 mg.	Tablea	TAB	B	3-3-2-2-1-0-0	4,500	1,345,185	237,385	1,587,070
01040310	Nafthidrofuril	100 Mg.	Capsula	CAP	B	2-2-2-2-0-0-0	45,000	1,667,415	714,606	2,427,021
01040400	Dopanida Clorhidrato	200 Mg. x 5 cc.	Solucion 5 cc.	AMP	C	3-2-0-0-0-0-0	15	20,025	1,053	41,093
01040410	Nor-Adrenalina	8 Mg. x 4 cc	Solucion 4 cc.	AMP	B	2-2-0-0-0-3-3	45	3,525	185	3,755
01040420	Adrenalina Acuosa	1 x 1000	Solucion 1 cc	AMP	B	2-2-2-2-0-3-3	4,045	145,305	16,145	165,495
01040421	Adrenalina Oleosa	2 Mg. x 1 cc.	Solucion Oleosa 1cc.	AMO	B	2-2-0-0-0-0-0		810	810	1,620
01040500	Nitroglicerina	0.5 Mg.	Tableta	TAB	B	3-3-2-2-0-3-3	10,500	375,000	66,176	451,694
01040510	Isosorbide Suligual	6 Mg.	Tableta	TAB	B	3-3-2-2-0-0-0	1,500	375,000	160,714	537,214
01040520	Isosorbide	10 mg.	Tableta	TAB	B	3-3-0-0-0-0-0	1,700	691,230	296,241	989,170
01040700	Dipiridamol	75 Mg.	Tableta	TAB	B	3-2-0-0-0-0-0	18,500	500,000	142,857	661,357
01040800	Alfa Metil Dopa	250 Mg.	Tableta	TAB	B	2-2-3-3-0-3-3	131,800	3,048,795	1,306,626	4,487,221
01040810	Alfa Metil Dopa	500 Mg.	Tableta	TAB	B	3-3-2-2-0-3-3	153	2,909,700	1,247,014	4,310,464
01040820	Guanetidina	"£ Mg.	Tableta	TAB	B	2-2-1-0-0-0-0	4,012	46,800	5,200	56,012
01040830	Reserpina	2.5 Mg. x 1 cc.	Solucion 1 cc.	AMP	B	2-2-1-0-0-0-3	105	30,285	3,365	33,765
01040850	Propanolol	1 Mg. x 1 cc.	Solucion 1 cc.	AMP	B	2-2-1-0-0-0-3	18	6,945	365	7,328
01040860	Hidralazina	50 mg.	Gragea	GRG	B	3-3-2-0-0-0-3	140,600	362,220	90,590	559,370
01040870	Hidralazina	20 Mg. x 1 cc.	Solucion 1 cc.	AMP	B	2-2-0-0-0-0-3	100	30,960	5,463	36,523
01040880	Diazoxido	300 Mg. x 20 cc	Solucion 10 cc	AMP	B	2-2-0-0-0-0-3	109	5,085	267	5,461
01040890	Reserpina, Hidralazine, Hidro clorotiazida	0.1 x 10 x 10 Mg.	Tableta	TAB	B	2-2-0-0-0-0-0	100	139,425	34,856	174,381

CODIGO ACTUAL	NOMBRE GENERICO	CONCENTRACION	PRESENTACION	UNIDAD MED	CLA-SIF.	USO POR NIVEL Y PRIORIDAD	CONSUMO INSTITUCIONAL (1)	MINSA (2)	CONSUMO PRIVADO (3)	CONSUMO NAVIONAL (1+2+3)
01050100	Acido Folico	5 Mg.	Tableta	TAB	B	3-2-2-2-0-0-0	500,500	10,590,495	1,176,721	12,267,716
01050110	Gluconato Ferraso o Fumarato Ferroso	70 Mg,60 o 65 Mg.	Gragea	GRG	A	3-2-2-2-2-0-0	758,000	15,500,000	2,735,294	18,993,294
01050120	Hierro Dextran	100 Mg. x 2 cc.	Solucion 2 cc	FAM	B	2-2-2-0-0-0-0	9,000	178,680	31,531	219,211
01050130	Hiero Sales	0.6 cc - 7 FE	Solucion 30 cc	FCO	B	2-2-3-3-3-0-0	3,000	846,000	362,571	1,211,571
01050132	Hieroo Sales	50 Mg. x 5 cc.	Jarbe 120 cc	FCO	B	2-2-3-3-2-0-0	13,500	354,930	152,112	520,542
01050140	Vitaminas B-12	1000 Mg. x 1 cc.	Solucion 10 cc.	FCO	B	2-2-1-1-0-0-0	101,000	391,305	167,702	660,007
01050200	Heparina	25000 U.I.x3cc	Solucion 5 cc.	FAM	C	3-2-0-0-0-0-3	100	17,235	1,915	19,250
01050210	Warfarin Sodico	5 Mg.	Tableta	TAB	C	2-2-0-0-0-0-3	100	21,585	5,396	27,081
01050300	Globolina Antihemofilica	200 U. FAH	Bolsa	BSA	C	2-2-0-0-0-0-0	20	1,045	-o-	1,065
01050310	Vitamina K	10 Mg. x 1 cc.	Solucion 1 cc.	AMP	B	3-3-3-2-0-0-3	34,910	149,175	37,278	221,363
01050320	Protamina Sulfato	10 Mg. x 1 cc.	Soluction 5 cc.	AMP	C	3-2-0-0-0-0-0	50	1,595	155	1,600
01050330	Fibrinogene Humano	1 Gmc.	Polvo Liofilizado	FCO	C	2-2-0-0-0-0-0	3	1,110	58	1,171
01050400	Aprotinina	100.000 U.I.K.	Solucion 10 cc	AMP	B	3-2-0-0-0-0-3	50	2,400	266	2,716
01060100	Vitamina C	500 Mg. x 5 cc.	Solucion 5 cc.	AMP	B	2-2-0-0-0-3-3	59,000	211,845	52,961	323,806
01060110	Vitamina C	500 Mg.	Tableta	TAB	A	3-3-3-3-2-3-3	1,530,000	7,400,000	3,171,428	12,101,428
01060120	Alfa Tocofarol Acetato	100 Mg.	Gargea	GRG	B	2-2-2-2-0-0-0	61,000	1,453,635	622,986	2,137,621
01060130	Complajo B		Solucion 1o cc.	FAM	B	3-3-2-2-0-0-3	172,000	1,270,155	317,538	1,759,693
01060150	Piridoxina	100 Mg. x 2 cc.	Solucion 2 cc.	AMP	B	2-2-2-2-0-3-3	70,000	365,000	40,555	475,555
01060151	Piridoxina	40 Mg.	Tableta	TAB	B	2-2-2-2-0-0-0	300,100	270,000	150,714	685,814
01060160	Tiamina	100 Mg. x cc	Solucion 10 cc	FAM	B	3-3-2-2-0-0-0	335,000	186,000	79,714	600,714
01060170	Tiamina	100 Mg.	Tableta	TAB	B	3-3-3-3-0-0-0	498,000	2,195,655	2,195,655	4,889,310
01060180	Vitamina y Minerales		Tableta	TAB	A	3-3-3-3-2-3-0	1,545,000	18,980,530	8,130,227	28,645,757

CODIGO ACTUAL	NOMBRE GENERICO	CONCENTRACION	PRESENTACION	UNIDAD MED	CLA-SIF.	USO POR NIVEL Y PRIORIDAD	CONSUMO INSTITUCIONAL (1)	MINSA (2)	CONSUMO PRIVADO (3)	CONSUMO NAVIONAL (1+2+3)
01060190	Vitamina A	50.000 U	Gragea	GRG	B	2-2-0-0-0-0-3	447,500	2,870,205	717,551	4,035,256
01060191	Vitamina & Palmitato	25.000 x 1 cc.	Gotas Solucion 50 cc	FCO	B	3-3-0-0-0-0-0	1,500	95,000	16,764	113,264
01060200	Polivitaminas		Gotas Solucion 15cc.	FCO	A	3-3-3-3-3-0-3	47,250	851,200	212,800	1,111,250
01060300	Edulcorante Sintetico	10 Mg.	Tableta	TAB	B	2-2-2-2-0-0-0	75,000	8,000,000	2,000,000	10,075,000
01060400	Dextrosa en Agua	5%	Solucion Acuose,1000c.	FCO	B	3-3-3-2-0-3-3	37,250	462,420	115,605	615,275
01060410	Dextrosa en Agua	5%	Solucion 500 cc,	FCO	B	3-3-2-2-0-0-3	65,500	444,135	111,003	623,668
01060420	Dextrosa en Agua	50%	Solucion 50 cc.	FCO	B	2-2-0-0-0-3-3	168	71,325	7,925	79,418
01060430	Dextrosa en Agua	10%	Solucion 50cc.	FCO	B	2-2-0-0-0-0-3	5,050	80,790	8,976	94,810
01060431	Dextrosa en Agua	10%	Solucion 3 cc.	AMP	B	2-2-0-0-0-0-3	-o-	10,000	526	10,526
01060440	Ringer Solucion	10%	Solucion 500 cc	BCO	B	3-3-2-0-0-3-3	17,165	318,960	35,440	371,565
01060450	Hartman Solucion		Solucion 500 cc.	FCO	B	3-3-2-0-0-3-3	12,200	141,210	15,690	169,100
01060460	Normal Salina Solucion Fisiologica	0.9%	Solucion 1000 cc	FCO	B	3-3-2-2-1-3-3	38,500	493,000	87,000	618,500
01060461	Normal Salina Solucion Fisiologica	0.9%	Solucion 500 cc.	FCO	B	3-3-2-2-0-0-3	1,200	376,000	66,352	443,552
01060462	Sodio Lactato	1/6 Molar	Solucion 500 cc	FCO	B	3-3-2-0-0-0-3	6	31,000	632	31,638
01060470	Dextrosa en Solucion Salina	5% en 0.9%	Solucion 1000cc.	FCO	B	3-3-2-0-0-0-3	13,450	150,000	26,470	206,920
01060480	Solucion Hipertonica Cloruro de Sodio	20%	Solucion 20 cc.	AMP	B	3-3-1-0-0-0-3	150	120,000	13,333	133,483
01060500	Dextran 6% Solucion Salina Fisiologica	6%	Solucion 500 cc	FCO	B	3-3-0-0-0-3-3	-o-	232,605	25,845	258,450
01060510	Fraccion Protainica del Plasma		Solucion 250 cc	FCO	B	3-2-0-0-0-0-3	5,003	11,160	1,240	17,403
01060600	Agua Bidestilada	5 cc.	5cc.	AMP	A	3-3-3-3-3-3-3	778,000	3,750,000	937,500	5,465,500
01060610	Agua Bidestilada	10 cc.	10 cc	AMP	A	3-3-3-2-1-3-3	220,000	1,270,995	317,750	1,808,745

CODIGO ACTUAL	NOMBRE GENEPICO	CONCENTRACION	PRESENTACION	UNIDAD MED	CLA-SIF.	USO POR NIVEL Y PRIORIDAD	CONSUMO INSTITUCIONAL (1)	MINSA (2)	CONSUMO PRIVADO (3)	CONSUMO NAVIONAL (1+2+3)
01060700	Proteinas Orales		Polvo Liofilizado	PTE	B	3-2-2-0-0-0-3	9,000	110,895	47,526	127,431
01060701	Soluc. Aminoacid.p/Hiper-Alimentacion		Soluc. Parenteral	FCO	C	3-0-0-0-0-0-3	-o-	7,500	394	7,894
01060800	Cloruro de Potasio	2 MEQ = 1 cc.	Solucion 10 cc.	AMP	B	3-3-2-0-0-0-3	15,725	271,590	67,897	355,212
01060810	Gluconato de Potasio	20 MEQ - 15 cc.	Eliuxir/80cc.	FCO	B	2-2-3-3-0-0-3	450	59,010	25,290	84,750
01060820	Sodio Bicarbonato	8.5%	Solucion 10 cc.	AMP	B	3-3-2-0-0-0-3	10,045	68,580	7m620	86,245
01060830	Electrolios Orals Infantil p/1 Lit. de Agua	20x3.5x1.5x2.5 gm	Sobre 10 Gms.	SBE	A	3-3-3-3-3-3-3	53,300	2,189,190	938,224	3,180,714
01070100	Acetazolamida	250 Mg.	Tableta	TAB	B	2-2-0-0-0-0-3	25,100	220,740	11,617	257,457
01070110	Acetazolamida	500 Mg.	Solucion 5 cc	FAM	B	2-2-0-0-0-0-3	50	13,000	684	13,734
01070120	Furosemida	40 Mg.	Tableta	TAB	B	2-2-3-3-0-03	137,000	2,965,905	741,476	3,844,381
01070130	Furosemida	20 Mg. x 2 cc	Solucion 2 cc.	AMP	B	3-3-2-0-0-3-3	15,850	350,790	38,976	405,616
01070140	Hidroclorotiazida y Amilor	50 Mg. x 5 cc.	Tableta	TAB	B	3-3-2-2-0-0-3	42,000	1,684,485	721,922	2,448,407
01070150	Manitol	20%	solucion 500 cc.	FCO	B	3-2-0-0-0-0-3	3,020	15,180	798	18,998
01070160	Espirinolactone	25 Mf.	Tableta	TAB	B	2-2-0-0-0-0-3	51,200	207,000	51,750	309,950
01070200	Fenazopiridine	100 Mg.	Tableta	TAB	B	2-2-3-3-0-3-3	1,140	3,361,260	1,440,540	5,941,800
01070310	Metenamina Mandelato	500 Mg.	Gragea	GRG	B	2-2-3-3-0-3-3	676,000	3,350,000	1,435,714	5,460,714
01070330	Metanamina Mandelato	250 Mg. x 5 cc.	Suspension 120 cc.	FCO	B	2-2-3-3-0-3-3	650	76,000	13,411	90,061
01070400	Probenecid	500 Mg.	Tableta	TAB	B	2-2-3-3-2-0-0	100	308,000	16,210	324,310
01070410	Colchicina	500 Mg.	Tableta	TAB	B	2-2-0-0-0-0-3	750	274,590	68,647	343,987
01070420	Alopurinol	100 Mg.	Tableta	TAB	B	3-3-2-2-0-0-3	72,500	634,000	271,714	978,214
01070500	Solucion Dialisis Paritoneel en Glucosa	1.5% Dextrose	Solucion 100 cc	BSB	B	3-2-0-0-0-0-3	20	43,110	-o-	43,130

CODIGO ACTUAL	NOMBRE GENERICO	CONCENTRACION	PRESENTACION	UNIDAD MED	CLA-SIF.	USO POR NIVEL Y PRIORIDAD	CONSUMO INSTITUCIONAL (1)	MINSA (2)	CONSUMO PRIVADO (3)	CONSUM NAVIONA (1+2+
01070510	Diazol Concentrado/Hemodialisis	120	Solucion	GLN	C	3-0-0-0-0-0-3	750	-o-	-o-	7
01070520	Dializador CD	1000	Solucion	FCO	C	3-0-0-0-0-0-3	437,415	-o-	-o-	437,4
01080100	Fenobarbital	100 Mg.	Tableta	TAB	B	3-3-3-2-0-3-3	165,200	4,700,000	829,411	5,694,6
01080110	Fenobarbital	10 Mg.	Tableta	TAB	B	3-3-3-0-0-3-3	20,600	2,400,000	423,529	2,844,1
01080120	Fenobarbital	4 Mg. x 1 cc.	Jarabea 120 cc.	FCO	B	3-3-3-2-0-3-3	150	91,710	16,194	108,1
01080130	Difenilhidantoina	100 Mg.	Capsula	CAP	B	3-3-3-2-0-3-3	131,500	6,665,880	1,666,470	8,332,3
01080140	Difenilhidantoina	2.5 %	Suspension 120cc.	FCO	B	3-3-3-2-0-3-3	225	58,755	14,652	75,6
01080150	Primidona	250 Mg.	Tableta	TAB	B	3-3-2-2-0-0-3	6,000	4,082,760	1,020,690	5,109,4
01080160	Primidona	250 Mg. x 5 cc.	Suspension 150 cc.	FCO	B	3-3-2-2-0-0-3	60	27,060	6,765	33,8
01080170	Carbamazepina	200 Mg.	Tableta	TAB	B	3-3-2-2-0-0-0	155,000	15,000,000	1,666,666	16,821,6
01080180	Clonazepan	2 Mg.	Tableta	TAB	B	3-3-2-2-0-0-0	5,100	54,135	13,533	72,7
01080190	Clonazepan	2.4 Mg. x 1 cc.	Gotas Solucion 10cc.	FCO	B	3-3-2-2-0-0-0	50	4,140	460	4,6
01080191	Etosuccidina	250 mg.	Capsula	CAP	B	3-3-2-2-0-0-0	-o-	16,491,600	1,832,400	18,324,0
01080192	H Idrato de Cloral	250 Mg.	Jarabea 120 cc.	FCO	B	3-2-1-0-0-0-0	-o-	4,710	247	4,9
01080200	Sulfato de Magnesio	10 Mg.	Solucion 10 cc.	AMP	C	3-3-0-0-0-3-3	10	50,670	1,034	51,7
01080210	Fenobarbital Sodico	130-200 Mg.	Solucion 1 cc.	AMP	C	3-3-0-0-0-3-3	45	45,300	7,984	53,7
01080220	Diazepan	10 Mg. x 2 cc.	Solucion 2 cc.	AMP	B	3-3-2-2-0-3-3	9,250	297,915	33,101	340,2
01080230	Difenilhidantoina	250 Mg. x 55	Solucion 5 cc.	FAM	B	3-3-2-2-0-0-3	60	40,545	4,505	51,1
01080240	Clonazepan	1 Mg. x 1 cc.	Polvo Liofilizado	FAM	B	3-3-2-0-0-0-0	20	2,205	245	2,4
01080300	Biperideno	5 Mg. x 1 cc.	Solucion 1 cc.	AMP	B	3-3-2-2-0-0-3	15	13,965	1,551	15,5
01080310	Levodopa y Carbidopa	250 Mg. x 25 Mg.	Tableta	TAB	C	2-2-0-0-0-0-3	100	258,765	64,691	323,5
01080320	Trihexefenidilo	5 cc.	Tableta	TAB	B	3-3-2-2-0-0-0	35,100	1,064,250	118,250	1,217,6
01080400	Neostigmina	0.5 Mg. x 5 cc.	Solucion 1 cc.	AMP	B	3-3-2-1-0-0-3	15	22,710	2,523	25,2

CODIGO ACTUAL	NOMBRE GENERICO	CONCENTRACION	PRESENTACION	UNIDAD MED	CLA-SIF.	USO POR NIVEL Y PRIORIDAD	CONSUMO INSTITUCIONAL (1)	MINSA (2)	CONSUMO PRIVADO (3)	CONSUM NAVIONA (1+2+3
01080410	Piridostigmina	60 Mg.	Tableta	TAB	C	3-3-1-1-0-0-3	100	103,275	11,475	114,85
01080500	Pralidoxoima Sulfato	200 mg.	Solucion 10 cc.	AMP	C	3-3-0-0-0-0-3	50	20,000	-o-	20,65
01080600	Metocarbamol	1 Gmo. 10 cc.	Solucion 10 cc.	AMP	B	3-3-2-1-0-0-3	947,500	329,055	36,561	1,313,11
01080610	Metocarbamol	350 Mg.	Tableta	TAB	A	3-3-3-3-1-3-3	1,489,500	6,273,330	1,568,332	9,331,16
01080700	Vitamina B-1, B-6, B-12	10.000 U.I.	Solucion 3cc.	AMP	B	3-3-2-2-0-0-3	123,000	371,865	159,370	654,23
01080800	Ergotamina y Cafeina	1 x 100 Mg.	Gragea	GRG	B	3-3-3-2-0-3-3	97,900	2,896,410	724,102	3,718,41
01080810	Dimetotiazina o Pizotifeno	20 Mg., 0.5 Mg.	Tableta	TAB	B	3-3-3-2-0-0-0	91,500	462,135	115,533	669,16
01090100	Bemzodiazepina Hipnotica		Tableta	TAB	B	3-3-1-3-0-3-3	108,400	549,060	96,892	754,35
01090200	Diazopan	10 Mg.	Tableta	TAB	B	3-3-2-2-0-3-3	390,000	10,545,975	1,861,054	12,797,02
01090210	Clorodiazepoxido	10 Mg.	Gragea	GRG	B	3-3-2-2-0-3-3	-o-	6,875,895	1,213,393	8,089,28
0109020	Clorodiazepoxido	100 Mg.	Ampollas	AMP	B	2-1-0-0-0-0-0	150	25,620	1,348	27,11
01090221	Probezepan	2 Mg.	Capsula	CAP	B	3-2-2-2-0-0-0	-o-	38,475	-o-	38,47
01090222	Probezepan	5 Mg.	Capsual	CAP	B	3-2-2-2-0-0-0	38,700	-o-	-o-	38,70
01090241	Lorazepan	2 Mg.	Tabletas	TAB	B	3-2-0-3-0-0-0	-o-	2,575,200	1,103,657	3,648,85
01090300	Levomepromazina	25 Mg. x 1cc.	Solucion	AMP	B	3-2-1-2-0-0-3	5,100	19,815	2,201	27,11
01090310	Levomepromazina	25 Mg.	Tableta	TAN	B	3-3-2-2-0-0-3	78,023	514,435	57,215	649,67
01090320	Promazina	500 Mg. x 10cc.	Solcuon 10 cc.	AMP	B	3-3-3-2-0-0-3	30	58,065	1,579	59,67
01090330	Clopromazina	100 Mg.	Tableta	TAB	B	3-3-2-2-0-0-3	100	2,300,000	405,900	2,706,00
01090350	Tioridazina	0.5%	Suspension 10 cc.	FCO	B	3-2-0-2-0-0-3	600	135,000	25,588	171,18
01090360	Tioridazina	100 Mg.	Tablea	TAB	B	3-3-2-3-0-0-3	700,750	818,400	144,423	1,033,57
01090370	Propericiazina	4%	Gotas Solucion 1cc.	FCO	B	3-2-0-2-0-0-3	50	6,000	666	6,71
01090380	Prometazina	50 Mg. x 2 cc.	Solucion 2 cc.	AMP	B	3-2-1-1-0-0-3	157	21,630	2,403	24,18

CODIGO ACTUAL	NOMBRE GENERICO	CONCENTRACION	PRESENTACION	UNIDAD MED	CLA-SIF.	USO POR NIVEL Y PRIORIDAD	CONSUMO INSTITUCIONAL (1)	MINSA (2)	CONSUMO PRIVADO (3)	CONSUMO NAVIONAL (1+2+3)
01090400	Parpanazina	8 Mg.	Gargea	GRG	B	3-3-1-3-0-0-3	100	788,175	197,041	985,316
01090410	Parpanazina	4 Mg.	Gargea	GRG	B	3-2-0-2-0-0-3	100	563,355	662,606	626,061
01090420	Fluofenazina Decaonato	25 Mg. x 1 cc.	10 cc.	AMP	B	3-3-1-3-0-0-0	100	6,330	-o-	6,430
01090500	H Alopiridol	25 Mg. x 1 cc.	Gotas Solucn. 15cc.	FCO	B	3-3-1-2-0-0-3	75	15,900	1,766	17,741
01090510	H Alopiridol	5 Mg. x 1 cc.	Solucion 1 cc.	AMP	B	3-2-1-2-0-0-3	3	44,235	4,927	49,165
01090520	H Alopiridol	5 Mg.	Tableta	TAB	B	3-3-1-2-0-0-3	150	720,405	127,130	847,685
01090530	Carbonato de Litio	300 Mg.	Tableta	TAB	C	3-3-0-0-0-0-0	38	134,625	14,969	149,632
01090600	Amitriptilina	75 Mg.	Capsula	CAP	B	3-3-0-2-0-0-3	3,750	664,110	117,195	785,055
01090610	Amitriptilina	15 Mg.	Gragea	GRG	B	3-3-2-2-1-0-0	183,000	1,440,045	317,647	1,940,692
01090630	Imipramina	10 Mg.	Tableta	TAB	B	2-2-1-1-0-0-3	1,000	924,765	163,370	1,089,135
01090640	Clorimipramina	25 Mg. x 2 cc.	Solucion 2 cc.	AMP	B	2-1-0-0-0-0-3	50	6,000	315	6,365
01090641	Clorimipramina	25 Mg.	Tableta	TAB	B	2-1-0-0-0-0-3	-o-	100,000	17,647	117,647
01090700	Metilfenidato	10 Mg.	Tableta	TAB	B	2-1-0-0-0-0-0	100	162,870	8,572	171,542
01100100	Oxitocina Sintetica	5 U.I. x 1 cc.	Solucion 1ccc.	AMP	B	3-3-3-0-0-0-3	900	283,695	31,521	316,116
01100110	Ergonovina o Metilergonovina	0.2 Mg. x 1 cc.	Solucion 1 cc.	AMP	B	3-3-3-0-0-3-3	5,650	220,755	24,528	250,933
01100120	Ergonovina o Metilergonovina	0.2 Mg.	Tableta	TAB	B	3-3-3-2-0-0-3	18,000	1,200,000	300,000	1,518,000
01100240	Metronidazol	500 Mg.	Ovulo	OVU	B	2-2-3-3-0-0-3	37,750	2,551,657	450,292	3,039,699
01100250	Bextametazona con Nistatina	25 Mg.x 100.000U.I.	Ovulo	OVU	B	2-2-3-3-0-3-3	80,000	3,598,965	635,111	4,314,076
01100251	Duchas Vaginales						-o-	51,945	22,262	74,207
01100300	Estradiol	1.25 Mg.	Tableta	TAB	B	2-2-2-2-0-0-0	295	24,660	2,740	27,655
01100350	Etinilestradiol	0.05 Mg.	Tableta	TAB	B	2-2-2-2-0-0-0	100	2,250	250	2,600
01100400	Hidroxiprogesterona Lenta	250 Mg. x 1 cc.	Solucion 1cc.	AMP	B	3-3-2-2-0-0-0	1,550	35,625	8,906	35,531
01100410	Hidroxiprogesterona y Estradioal	250 x 10 Mg.	Solucion 1 cc.	AMP	B	3-3-2-2-0-0-3	1,000	45,457	5,050	51,507

CODIGO ACTUAL	NOMBRE GENERICO	CONCENTRACION	PRESENTACION	UNIDAD MED	CLA-SIF.	USO POR NIVEL Y PRIORIDAD	CONSUMO INSTITUCIONAL (1)	MINSA (2)	CONSUMO PRIVADO (3)	CONSUM NAVIONA (1+2+
01100420	Amilistrenol	5 Mg.	Tableta	TAB	B	3-3-1-1-0-0-0	100	1,245	100	1,4
01100451	Progesterona	100 Mg.	Ampolla	AMP	B	3-3-2-2-0-0-3	1,100	120	2,000	3,2
01100500	Estradiol y Testosterona	4 x 65 Mg.	Solucion 1 cc.	AMP	C	3-3-0-0-0-0-0	2,000	37,845	9,461	49,3
01100510	Nor-Etisterona y Etinil Estradiol	2x0.01 Mg.	Tableta	TAB	B	2-2-0-0-0-0-0	100	50,000	18,508	62,6
01100520	Di-Norgestrel y Etinilestradiol	0.25Mg x 0.5 Mg	Sobre	SBE	B	3-3-3-3-1-0-0	4,500	10,874,265	1,000,000	11,878,7
01100550	Noritendrona y Mestranol	1 Mg. x 0.05 Mg.	Sobre	SBE	B	2-2-3-3-1-3-0	4,000	11,012,010	1,000,000	12,016,0
01100600	Isoxieuprina	10 Mg. x 2 ML.	Solucion	AMP	C	3-2-1-0-0-0-3	5,500	47,920	1,995	45,4
01100620	Fenoterol	0.5 Mg x 10 cc.	Solucin	AMP	C	3-3-0-0-0-0-3	50	8,085	428	8,5
01100630	Fenoterol	5 Mg.	Tableta	TAB	B	3-3-3-0-0-0-3	100	120,840	6,365	127,3
01100700	Inmunoglobulina Anti D	250 Mg. x 2cc.	Solucion 2 cc	FAM	C	3-2- -0-0-0-3	150	30	-o-	1
01100800	Papaverina	100 Mg.	Solucion 5 cc.	AMP	B	3-2-0-0-0-3-3	150	48,150	5,350	53,6
01100900	Podofilina Solucion Alhblica	25%	Solucion 100 cc.	FCO	B	1-2-3-3-0-3-3	1,150	26,032	6,508	33,6
01100000	Descongestioantea Antihistaminico		Jarabe 90 cc.	FCO	B	2-2-3-3-0-3-3	58,500	306,960	131,554	496,0
01110110	Descongestioantea Nasal Antihistaminico		Tableta	TABN	B	2-2-3-3-0-3-3	635,000	1,444,605	361,151	2,440,7
01110200	Bifenidol	40 Mg. x 2 ML.	Solucion 2 cc.	AMP	B	3-3-0-0-0-0-0	2,030	5,235	2,243	9,5
01110210	Difenidol	25 Mg.	Tableta	TAB	B	3-3-0-0-0-0-0	50	50,000	21,428	71,4
01110300	Nafazolina	1 x 1000	Gotas Solucion 15cc.	FCO	A	3-3-3-3-3-3-3	118,600	408,870	175,230	702,7
01110310	Mafazolina	0.25 x 1000	Gotas Solucion 15 cc.	FCO	A	3-3-3-3-3-0-0	18,000	184,355	79,009	281,3
01110400	Cloranfenicol	50 Mg. x 1 cc.	Solucion Otica 15cc.	FCO	B	3-3-3-3-0-3-3	49,250	119,295	83,800	4,940,3
01110410	Antibiotico y Corticoide	50 Mg. x 1 cc.	Solucion Otica 5.8cc	FCO	B	2-0-0-0-0-3-3	5,500	150,885	64,665	221,0
01110420	Corticoide		Solu. Acuosa 5-15 cc.	FCO	B	2-0-0-0-0-3-3	1,600	87,555	37,523	126,6

CODIGO ACTUAL	NOMBRE GENERICO	CONCENTRACION	PRESENTACION	UNIDAD MED	CLA-SIF.	USO POR NIVEL Y PRIORIDAD	CONSUMO INSTITUCIONAL (1)	MINSA (2)	CONSUMO PRIVADO (3)	CONSUMO NAVIONAL (1+2+3)
01120100	Cloranfenicol	1% 5 Gmo.	Unguento Oftalm	TBO	B	3-3-2-2-0-3-3	20,000	200,805	86,059	306,864
01120105	Oxitetracyclina	1% 3.5 Gmo.	Unguento Oftalmico	TBO	B	3-3-2-2-0-3-3	9,000	35,000	23,333	67,333
01120110	Cloranfenicol e Hidrocortisona	0.5% 2 Gmo.	Unguento Oftalmico	TBO	B	3-3-2-2-0-3-3	1,500	60,390	25,881	87,7771
01120130	Idoxiuridina-cloranfenicol	0.1% x 0.5%	Pomadas 5 Gmos.	TBO	B	2-2-0-0-0-0-0	2,000	1,875	-o-	4,343
01120160	Nitrato de Plata	1% - 15 cc.	Solucion Oftalmico	FCO	B	3-3-2-3-3-3-3	15	16,320	-o-	16,335
01120200	Atropina	1%	Colirio 15 cc.	FCO	B	3-3-0-0-0-3-3	59	8,000	2,000	10,059
01120210	Tropicamida	1% - 5 cc.	Solucion Oftalmico	FCO	B	3-2-0-0-0-0-3	59	3,500	71	3,630
01120300	Pilocarpina	2% - 15 cc.	Solucion Oftalmico	FCO	B	3-3-2-2-0-3-3	60	4,500	1,928	6,488
01120400	Proparacaina	0.5% - 15 cc.	Solucion Oftalmico	FCO	B	3-3-0-0-0-3-0	10	2,000	105	2,105
01120500	Zinc Sulfato Fenilefrina	0.25 x 12%	Colirio 15 cc.	FCO	A	2-2-3-3-3-3-3	4,500	25,000	32,142	111,642
01120510	Antozolina Tetrahidrozolina	0.05% x 0.04%	Colirio 15 cc.	FCO	A	2-2-3-3-0-3-0	12,010	43,935	50,000	105,945
01120600	Rosa de Bengala	1%	Colirio 15 cc.	FCO	B	2-0-0-0-0-0-0	10	30	-o-	40
01120610	Fluoresceina Sodica	2%	Colirio 15 cc.	FCO	B	2-2-0-0-0-0-0	2	345	-o-	347
01120185	Prednisolona y Sulfacetamida	0.5% x 10%	Colirio 15 cc.	FCO	B	2-2-3-3-0-0-0	-o-	30,000	7,500	37,500
01120188	Cloranfenicl + Sulfacetamida	0.5% + 10%	Colirio 15 cc.	FCO	B	2-2-3-3-0-0-0	-o-	5,355	1,338	6,6934
01130100	Paota Lassar	Pasta 120 Gmos.		POMO	A	2-2-2-0-0-0-0	2,635	41,970	17,987	62,592
01130110	Calarina	Solucion 120 cc.		FCO	A	0-0-3-3-3-3-3	-o-	100,000	42,857	142,857
01130120	Eoxina Hidroalcolica		Solucion 30 cc.	FCO	A	2-2-3-3-0-0-0	100	3,000	333	3,433
01130130	Pasta al agua (Glicoro. Agua.Talco, Ox. Zinc)		Pasta 40 Gmos.	PTE	A	3-3-2-0-0-0-0	225	11,190	1,243	12,658
01130140	Genuiana y Verde de Metil		Solucion 30 cc.	FCO	B	3-3-2-0-0-0-0	-o-	9,855	1,095	10,950
01130150	Azul de Metileno		Solucion 30 cc.	FCO	B	2-2-2-2-1-3-0	2,800	31,635	20,000	62,435

CODIGO ACTUAL	NOMBRE GENERICO	CONCENTRACION	PRESENTACION	UNIDAD MED	CLA-SIF.	USO POR NIVEL Y PRIORIDAD	CONSUMO INSTITUCIONAL (1)	MINSA (2)	CONSUMO PRIVADO (3)	CONSUMO NAVIONAL (1+2+3)
01130160	Permanganato de otasio 0.10 Gmo.		Sobre	SBE	B	2-2-1-1-0-0-0	150	35,000	-o-	35,150
01130170	Subacetato de Plomo		Solucion 30 cc.	FCO	B	3-0-0-0-0-0-0	-o-	1,000	-o-	1,000
01130300	Corticoide-Yodoclorohidrixiquinolinas		Pomada 15 Gmos	TBO	B	3-3-2-2-1-3-3	53,000	344,100	147,471	544,571
01130400	Metoxaleno	0.75%	Tintura 15 cc.	FCO	B	2-2-3-3-0-0-0	300	11,280	4,834	16,414
01130410	Metoxaleno	5 Mg.	Tableta	TAB	B	2-2-3-3-0-0-0	100	3,120	1,337	4,557
01130500	Pixide Enebro		Shampoo 120 cc.	FCO	A	2-2-3-3-0-0-0	43,000	86,355	37,009	166,364
01130510	Brea de Hulla e Hidroxiquinolina	Crema 15 Gmos.	150 Gmos.	TBO	B	2-2-3-3-0-0-0	60,500	104,655	26,163	191,318
01130520	Brea de Hulla e Hidroxiquinolina		Locion 15 cc.	FCO	B	2-2-3-3-0-0-0	4,000	75,000	18,750	97,750
01130530	Sulfuro de Solenio, Piritionato de zinc		Solucion	FCO	B	2-2-3-3-0-0-0	10,000	19,155	4,788	33,943
01130540	Sulfato de Cobre		Solucion	FCO	B	3-0-0-0-0-0-0	-o-	1,000	-o-	1,000
01130550	Solucion Burow		Solucion 120 cc.	FCO	B	3-0-0-0-0-0-0	100	62,610	15,667	78,437
01130560	Aliboor		Solucion 120 cc.	FCO	AQ	3-2-2-0-0-3-0	-o-	25,815	2,868	28,683
01130570	Hiposulfito de Sodica		Solucion 120 cc	FCO	B	2-2-3-3-0-0-0	58,975	47,850	20,507	127,332
01130580	Benzoato de Bencilio o Pieretrinas		Solucion 120 cc.	FCO	B	2-2-3-3-3-3-3	9,780	250,000	150,000	409,780
01131000	Heparinoides		Pomada 14-20 Gmos.	TBO	B	2-2-3-3-0-3-3	85,050	345,030	147,870	577,950
01131010	Corticoide		Crema 15 Gmos.	TBO	B	3-3-3-3-3-3-3	15,500	377,190	166,652	559,342
01131020	Corticoide		Pomada 15 Gmos.	TBO	B	3-3-3-2-0-3-3	4,800	296,070	126,887	427,757
0113110	Clofazimine	100 Mg.	Capsula	AP	B	3-3-0-0-0-0-0	100	7,500	-o-	7,600
0113120	Sulfona de Deposito	150 Mg.	Solucion 4,5 cc.	AMP	B	3-3-0-0-0-0-0	50	30	-o-	80-
0113130	Dapsona	100 Mg.	Tableta	TAB	B	3-3-0-0-0-0-0	100	1,950	-o-	2,050
01131300	Clorfeniramina	10 Mg. x 1 cc.	Solucion 1 cc.	AMP	A	3-3-3-2-2-3-3	79,000	225,375	56,343	360,718

CODIGO ACTUAL	NOMBRE GENERICO	CONCENTRACION	PRESENTACION	UNIDAD MED	CLA-SIF.	USO POR NIVEL Y PRIORIDAD	CONSUMO INSTITUCIONAL (1)	MINSA (2)	CONSUMO PRIVADO (3)	CONSUMO NAVIONAL (1+2+3)
01131310	Clofeniramina	4 Mg.	Tableta	TAB	A	3-3-3-3-2-3-3	1,420,000	8,000,000	3,428,571	12,848,571
01131330	Prometazina	25 Mg.	Tableta	TAB	B	3-3-2-2-2-0-0	100	146,790	62,910	209,800
01131340	P.A.B.A. Solibenzona	5%	Solucion 120 cc.	FCO	B	3-0-2-2-0-0-0	75	18,780	-o-	18,800
01131350	Acido Salicilico-Veselina	5%	Pamada 40 Gmos.	TBO	B	0-0-3-3-0-3-0	3,350	52,590	18,147	69,087
01131560	Acido Salicilico-Veselina	10%	Pamada 40 Gmos.	TBO	B	0-0-2-2-0-0-0	24,100	95,250	119,350	129,938
01131570	Acido Retinoico Hidroquina		Solucion 120 cc.	FCO	B	2-2-3-3-0-0-0	-o-	163,725	18,191	181,916
01131380	Jarabe Antihistaminico		Jarabe 60 cc.	FCO	A	3-3-3-3-0-3-3	67,500	269,955	115,695	453,150
01140100	Mercaptopurina	50 Mg.	Tableta	TAB	C	3-2-0-0-0-0-0	100	10,605	1,178	11,883
01140120	Citarabine	100 Mg. x 5cc.	Solucion 5 cc.	AMP	C	3-2-0-0-0-0-0	100	1,000	111	1,2
01140130	Methotroxate (Ametopterina)	50 mg.	Polvo Liofilizado	AMP	C	3-2-0-0-0-0-0	50	1,380	153	1,583
01140140	Methotraxate	2.5 Mg.	Tableta	TAB	C	3-2-0-0-0-0-0	100	25,230	2,803	28,133
01140150	Azatioprima	50 mg.	Tableta	TAB	C	3-0-0-0-0-0-0	100	3,150	350	3,600
01140160	Tioguanina	40 Mg.	Capsula	CAP	C	3-2-0-0-0-0-0	100	3,750	416	4,226
01140200	Bisulfan	2 Mg.	Tableta	TAB	C	3-2-0-0-0-0-0	150	12,420	1,380	13,950
01140210	Ciclofosfamida	500 Mg.	Polvo Liofilizado	FAM	C	3-2-0-0-0-0-0	15	3,720	413	4,148
01140220	Ciclofosfamida	50 Mg.	Tableta	TABN	C	3-2-0-0-0-0-0	100	28,380	3,153	31,633
01140230	Clorambucil	2 Mg.	Tableta	TAB	C	3-2-0-0-0-0-0	100	1,455	363	1,918
01140240	Mostaza Nitrogenda	10 Mg.	Polvo Liofilizado	FAM	C	3-2-0-0-0-0-0	50	120	51	221
01140250	Ciclofosfamida	100 Mg.	Polvo Liofilizado	FAM	C	3-2-0-0-0-0-0	20	200	50	270
01140270	CCNO-Lomuatina	50 Mg.	Capsula	CAP	C	3-2-0-0-0-0-0	-o-	5,000	882	5,882
01140310	Vinoristina	1 Mg.	Polvo Liofilizado	FAM	C	3-2-0-0-0-0-0	100	3,795	421	4,316
01140400	Dactinomicina o Actinomicina	0.5 Mg.	Polvo Liofilizado	FAM	C	3-2-0-0-0-0-0	50	960	106	1,116

CODIGO ACTUAL	NOMBRE GENERICO	CONCENTRACION	PRESENTACION	UNIDAD MED	CLA-SIF.	USO POR NIVEL Y PRIORIDAD	CONSUMO INSTITUCIONAL (1)	MINSA (2)	CONSUMO PRIVADO (3)	CONSUMO NAVIONA (1+2+3
01140410	Adriamicina	10 Mg.	Polvo Liofilizado	FAM	C	3-2-0-0-0-0-0	-o-	3,600	400	4,00
01140420	Bleomicina Sulfato	15 Mg.	Polvo Liofilizado	FAM	C	3-2-0-0-0-0-0	50	180	20	25
01140450	Mitomicina	5 Mg.	Solucion	AMP	C	3-2-0-0-0-0-0	50	75	8	13
01140500	Procarbazina	50 mg.	Capsula	CAP	C	3-2-0-0-0-0-0	100	5,070	563	5,73
01140510	Acido Folfnico	5 Mg.			C	2-2-0-0-0-0-0	100	675	75	85
01140520	Tamoxifen	10 Mg.	Tableta	TAB	C	3-2-0-0-0-0-0	50	25,365	4,476	29,89
01140530	L. Asparaginasa	10.000 U.I.	Polvo Liofilizado	FAM	C	3-2-0-0-0-0-0	100	300	33	43
01140550	CIS PLASTIMEN	50 Mg.	Polvo Liofilizado	FAM	C	3-2-0-0-0-0-0	-o-	390	43	43
01150210	Metil Bromuro de Homatropina	0.2 %	Gotas Solucion	FCO	B	2-2-3-3-3-3-3	3,250	85,000	79,285	267,53
01151100	Lecha Samidescromada con Carbohidrato y Vits.		Polvo 454 Gms.	PTE	B	3-3-2-2-0-0-0	75,000	77,745	77,745	230,49
01151120	Lecha Acidificada con Carbohidratos y Vitaminas		Polvo 454 Gms.	PTE	B	3-3-2-2-0-0-0	10,000	55,260	55,260	130,52
01151110	Leche Maternizada		Polvo 454 Gms.	PTE	B	3-3-2-2-0-0-0	31,500	80,895	80,985	1,026,10
01151130	Formula de Soya Hipoalergica		Polvo 454 Gms.	PTE	B	3-3-2-2-0-0-0	31,500	80,895	80,985	193,38
01160100	Morifina Sulfat	10 Mg. x 1 cc.	Solucion 1 cc.	AMP	C	3-3-0-0-0-3-3	10	30,000	1,579	31,58
01160110	Meperidina	100 Mg.x 1 cc.	Solucion 1 cc.	AMP	C	3-3-2-0-0-3-3	10,600	67,500	7,500	85,60
01160200	Acido Ace	500 Mg.	Tableta	TAB	A	3-3-3-3-3-3-3	3,012,100	26,551,515	26,551,515	56,115,13
01160210	Acido Aceti	100 Mg.	Tableta	TAB	A	3-3-3-3-3-3-3	235,000	15,954,780	15,954,780	32,144,56
01160220	Acetominofen	300 Mg.	Supositorios	SUP	B	2-2-2-2-0-3-0	17,500	1,608,285	402,071	2,027,85
01160230	Dipirona	500 Mg.	Tableta	TAB	B	1-1-1-1-0-0-0	750,000	4,500	1,928,571	7,178,57
01160240	Dipirona	1 Gmo x 2 cc.	Solucion 2 cc.	AMP	B	2-2-2-0-0-0-0	310,000	321,420	80,355	711,77

CODIGO ACTUAL	NOMBRE GENERICO	CONCENTRACION	PRESENTACION	UNIDAD MED	CLA-SIF.	USO POR NIVEL Y PRIORIDAD	CONSUMO INSTITUCIONAL (1)	MINSA (2)	CONSUMO PRIVADO (3)	CONSUM NAVIONA (1+2+
01160250	Dipirona	300 Mg. x 1 cc.	Solucion 1 cc.	AMP	B	3-3-3-2-0-3-3	6,800	457,650	114,412	578,8
01160260	Dimetil Oxiquinazina	0.400 x 0.6 Gmos.	Tableta	TAB	B	3-3-3-3-0-3-3	830,000	5,785,875	1,446,468	8,062,3
01160270	Dimetil oxiquinazina	2 Gmos x 5 cc	Solucion 5 cc	AMP	B	3-3-3-2-0-3-3	108,500	425,220	182,237	715,9
01160280	Acetaminofen	100 mg. x 5 cc	Jarabe o gotas	FCO	B	3-3-3-3-2-3-3	67,400	541,035	231,872	840,3
01160290	Acetaminofen	500 mg.	Tableta	TAB	B	3-3-3-3-2-3-3	765,500	4,630,210	1,877,232	7,272,9
01160300	Indometacina	100 mg.	Supositorios	SUP	B	3-3-2-2-0-0-0	13,050	375,000	93,750	481,8
01160310	Indometacina	25 mg.	Capsula	CAP	B	3-3-2-2-0-3-0	660,000	8,000	2,000,000	10,660,0
01160320	Oxifenbutazona	100 mg.	Tableta	TAB	B	3-3-2-1-0-0-0	995,100	5,992,620	2,568,265	9,555,9
01160330	Ibuprofeno	400 mg.	Gragea	GRG	B	3-3-2-2-0-3-3	440,000		2,142,257	7,582,8
01160340	Sulindac	100 mg.	Tableta	TAB	B	3-3-2-1-0-0-0	188,250	1,646,775	705,760	2,540,7
01160400	Eapasmolitico y Analgesico		Solucion 5 cc	AMP	B	3-3-2-2-0-3-3	125,250	1,539,052	384,763	2,049,0
01160410	Eapasmolitico y Analgesico		Tableta	TAB	B	3-3-3-3-0-3-3	7,10,000	10,000,000	2,500,000	13,210,0
01160420	Eapasmolitico y Analgesico Infantio		Supsitorio	SUP	B	2-2-2-2-2-0-0	2,750	1,000,000	428,571	1,431,3
01170100	Dexametasona	0.5 Mg.	Tableta	TAB	B	3-3-3-2-0-0-3	543,000	2,830,695	1,213,155	4,586,8
01170110	Dexametasona	4 Mg. x 2 cc.	Soluscion 2cc.	AMP	B	3-3-2-2-0-0-3	92,500	468,045	117,011	677,5
01170120	Hidorcortisona Succinato	500 Mg.	Polvo Liofilizado	FAM	B	3-2-1-0-0-0-3	7,550	97,620	10,846	116,0
01170130	Hidrocortisona Succinato	100 Mg.	Polvo Liofilizado	FAM	B	3-3-1-0-0-0-3	150	80,430	14,193	94,7
01170140	Prednisona	5 Mg.	Tableta	TAB	B	3-3-3-2-1-0-3	29,500	1,590,210	397,552	2,013,2
01170150	Eataroides Accion Prolongada		Ampolla	AMP	B	3-3-2-1-0-0-3	400	78,570	19,642	98,6
01170160	Prednisona	50 mg.	Tableta	TAB	C	3-2-0-0-0-0-3	50	34,050	8,512	42,6
01170171	ACTH Liofilizado	1 Gmo.	Solucion 2 Ml.	AMP	C	3-0-0-0-0-0-3	4,500	90	120	4,7
01170200	Tetosterona de Depsoito	250 Mg. x 1cc.	Solucion Oleosa	AMP	C	3-0-0-0-0-0-0	7,600	32,010	8,250	47,8
01170210	Nandrolone Decanoato o Mentenolona Enantato	50 Mg. x 1 cc.	Solucion Oleosa	FAM	B	3-2-1-1-0-0-0	100	19,650	4,912	24,6

CODIGO ACTUAL	NOMBRE GENERICO	CONCENTRACION	PRESENTACION	UNIDAD MED	CLA-SIF.	USO POR NIVEL Y PRIORIDAD	CONSUMO INSTITUCIONAL (1)	MINSA (2)	CONSUMO PRIVADO (3)	CONSUMO NAVIONAL (1+2+3)
01170220	Oximetolona	50 Mg.	Tableta	TAB	C	2-2-0-0-0-0-0	100	1,500	375	1,975
01170230	Oximetolona	2.4 Mg.	Tableta	TAB	C	3-0-0-0-0-0-3	-o-	150	50	180
01170300	Insulina Accion Rapida	80 U.I. x 1cc.	Solucion 10 cc.	FAM	B	3-3-2-0-0-3-3	1,112	20,000	3,529	24,691
01170300	Insulina N.P.H.	80 U.I. x 1cc.	Suspension 10cc.	FAM	B	3-3-2-2-0-3-3	1,118	20,000	5,000	26,118
01170320	Insulina Accion Lanta	80 U.I. x 1cc.	Suspension 10cc.	FAM	B	3-3-2-2-0-3-3	250	36,615	9,154	46,019
01170410	Cloropropamida	250 Mg.	Tableta	TAB	B	3-3-2-2-0-3-3	61,500	8,201,000	2,050,250	10,312,750
01170420	Tolbutamida	1 Gmo.	Tableta	TAB	B	3-3-2-2-0-0-3	1,000	813,000	203,250	1,017,250
01170500	Tiroglobulina	16 Mg.	Tableta	TAB	B	3-2-0-0-0-0-3	-o-	86,475	37,060	123,535
01170510	Tiroglobulina	65 Mg.	Tableta	TABN	B	3-3-1-0-0-0-0	900	334,020	143,151	478,071
01170530	Levotiroxina	0.2 Mg.	Tableta	TAB	B	3-3-1-0-0-0-0	100	24,600	10,542	35,242
01170540	Triyodotironina	25 Mg.	Tableta	TAB	B	3-3-1-0-0-0-3	3,023	158,595	67,969	229,587
01170560	Levotiroxina	0.5 Mg.	Tableta	TAB	B	3-3-1-0-0-0-3	5,600	90,000	38,571	134,171
01170570	Triyodotironina	5 Mg.	Tableta	TAB	B	3-3-1-0-0-0-3	100	1,620	694	2,414
01170600	Metimazol	5 Mg.	Tableta	TAB	B	2-1-1-0-0-0-3	3,000	586,500	103,500	693,000
01170610	Propiltiuracilo	50 Mg.	Tableta	TAB	B	3-3-1-0-0-0-3	1,200	70,000	17,500	88,700
01170630	Iodo Ioduro de Potasio	5 Mg x 10 Ml.	Suspension	FCO	B	3-3-1-0-0-0-3	100	3,000	333	3,433
01170700	Vasopresina Tanato	5 U.I. x 1cc.	Solucion Oleosa	AMP	B	3-0-0-0-0-0-0	50	1,380	28	1m458
01170810	Gluconato de Calcio	1 Gmo. x 10 cc.	Solucion 10 cc.	AMP	B	3-3-1-0-0-3-3	30,300	96,405	24,101	150,806
01170800	Ergocalciferrol	15 Mg. x 2 cc.	Solucion 2 cc.	AMP	B	3-3-1-0-0-3-3	2,000	18,390	7,881	28,271
01190100	Sulfato de Atropina	0.5 Mg. x 1 cc.	Solucion 1 cc.	AMP	C	3-3-2-0-0-0-0	12,750	113,040	19,948	145,738
01190200	Tiopental Sodico	500Mg.	Polvo Liofilizado	FAM	C	2-2-0-0-0-0-0	2,575	35,000	6,176	43,751
01190201	Tiopental Sodico	1 Gmo	Frasco Ampolla	FAM	C	3-3-2-0-0-0-0	75	2,850	502	3,427

CODIGO ACTUAL	NOMBRE GENERICO	CONCENTRACION	PRESENTACION	UNIDAD MED	CLA-SIF.	USO POR NIVEL Y PRIORIDAD	CONSUMO INSTITUCIONAL (1)	MINSA (2)	CONSUMO PRIVADO (3)	CONSUM NAVIONA (1+2+
01170210	Ketamina Cloruro	50 Mg. x 1 cc.	Solucion 10 cc.	FAM	C	3-3-2-0-0-0-3	2,575	20,000	3,529	26,1
01190220	Halotano		Liquido 250 cc	FCO	C	3-2-0-0-0-0-3	30	6,690	1,180	7,9
01190240	Eter 1/4 Libra Anestesico		Polvo	FCO	C	2-2-2-0-0-0-3	2,000	15,000	2,647	19,6
01190250	Oxido Nitroso Cilindrico			UND	C	3-3-2-0-0-0-3	-o-	6,000	1,058	7,0
01190300	Lidocaina	2%	Solucion 20-25cc.	FAM	A	3-3-3-3-0-3-3	14,600	18,000	20,000	1,14,6
01190310	Lidocaina	2%	Jalea 30 Gms.	TUBO	B	3-3-2-0-0-0-0	750	12,585	2,220	15,5
01190320	Lidocaina	10%	Spray	FCO	A	3-3-2-0-0-0-0	45	10,450	1,932	12,4
01190330	Lidocaina	5%	Solucion 2 cc.	FAM	A	3-3-2-0-0-3-3	45	18,930	2,103	21,0
01190340	Lidocaina con Epinefrina	2%	Solcuion 20-25cc.	FAM	a	3-3-2-0-0-0-0	725	14,850	8,742	19,2
01190350	Lidocaina con Epinefrina	2%	Cartucho 1.8 cc	UND	B	3-3-3-3-0-0-3	60,300	50,000	8,823	119,1
01190360	Bupicaina con Epinefrina	0.5%	Solucion 20 cc	AMP	A	2-2-0-0-0-3-3	6,000	10,000	526	16,5
01190370	Tetracaina	20 Mg. x 1 cc.	Solucion 1 cc.	AMP	A	2-2-0-0-0-3-3	-o-	6,240	328	6,5
01190400	Succinilcolina	500 Mg. x 1 cc.	Polvo Liofilizado	AMP	C	3-3-0-0-0-0-3	4,010	50,000	5,555	59,5
01190410	Tubocurarina	15 Mg. x 1 cc.	Solucion 1 cc.	AMP	C	2-2-0-0-0-3-3	50	10,500	1,852	12,4
01190411	Tetra-Yoduro de Gallamina	1 Mg. x 1 cc.	Solucion Injetable	AMP	C	2-2-0-0-0-0-0	-o-	8,000	888	8,8
01190500	Droperidol	2.5 Mg. x 1 cc.	Solucion 10 cc.	AMP	B	3-3-0-0-0-0-3	2,550	25,000	4,411	31,9
01190510	Fentanyl	0.05 Mg x 1 cc.	Solucion 10 cc.	AMP	B	3-3-2-0-0-0-3	2,550	30,000	5,294	37,8
01190900	Naloxone	0.4 Mg. x 1 cc.	Solucion 1 cc.	AMP	B	3-3-2-0-0-0-0	2,050	12,000	2,117	16,1
01200100	Diatrizoato Sodico y Meglumina	75%	Solucion 20 cc.	FAM	B	3-2-0-0-0-0-3	50	14,500	3,625	18,1
01200110	Iodotalamato de Sodio	66%	Solucion 50cc.	FAM	B	3-2-0-0-0-0-3	4,600	20,000	5,000	29,6
01200120	Iodopamida Meglumina	50%	Solucion 20 cc.	AMP	B	3-2-0-0-0-0-3	600	1,600	400	2,6

CODIGO ACTUAL	NOMBRE GENERICO	CONCENTRACION	PRESENTACION	UNIDAD MED	CLA-SIF.	USO POR NIVEL Y PRIORIDAD	CONSUMO INSTITUCIONAL (1)	MINSA (2)	CONSUMO PRIVADO (3)	CONSUM NAVIONA (1+2+3
01200130	Acido Iopanoico	500 Mg.	Tableta	TAN	B	3-2-0-0-0-0-3	61,500	150,000	37,500	249,00
01200140	Iofendilato Solucion		Solucion 3 cc.	AMP	B	3-2-0-0-0-0-3	50	1,800	200	2,05
01200150	Acaitolodizado		Solucion 10 cc.	FAM	B	3-3-2-0-0-0-3	50	750	83	88
01200160	Sulfato de Bario		Polvo	KLO	B	3-3-3-2-0-0-3	10	20,000	5,000	25,01
01200170	Enema de Sulfato de Bario		Bolsa	BSA	B	3-3-3-2-0-0-3	3,010	4,5000	1,125	8,63
010200180	Iodotalamato de Meglumina	60%	Solucion 30 cc.	FAM	B	3-3-0-0-0-0-0	4,010	17,000	4,250	25,26
01200100	Versanato Calcio Disodico	500 Mg.	Tableta	TAB	B	3-2-0-0-0-0-0	1,000	39,630	-o-	40,63
01210110	Versanato Calcio Disodico	200 Mg. x 1 cc.	Solucion 5 cc.	AMP 1/8	B	3-2-0-0-0-0-0	100	6,075	-o-	6,17
01210170	D-Penicilamina	250 Mg.	Tableta	TAB	C	3-2-0-0-0-0-0	100	510	-o-	61

Annexure : 5

COFARMA - PROGRAMA DE COMPRAS 1985

NOMBRE GENERICO	UNIDAD	US $
1. Above 5 million US Dollors each		
NORITENDRONA Y MESTRANOL* 1 mg.-0.05 mg	Sobre	5,535,355. 1x11%
2. 2.5 - million US Dollors each		
LECHE MATERNIZADA	Pote	2,541,267. 1x5%
3. 1 - 2.5 million US Dollors each		
xERITHROMICINA 250 mg 15 ml	Fco	1,616,000
xTRIMETOPRIN Y SULFFAMETOXAZOLE	Fco	1,099,095
xDIMENIDRINATO 50 mg*	Tab	1,037,945
xMEBENDAZOLE 100 mg 15 cc	Fco	1,011,924
D'NORGESTROL y ETINILESTRADIOL* 0.25 x0.05 mg	Sobre	1,711,421
xDEXTROMETORFAN COMPUESTO JARABE**	Fco	1,354,860
		7,831,245 . 6x15.6%
4. 0.5 - 1 million US Dollors each		
PENICILINA PROCAINICA 400.000 U	Fam.	528,923.
DICLOXACILINA 125 mg. 15 cc	Fco.	583,670.
xERITHROMICINA 500 mg.	Cap.	766,500.
xTETRACICLINA 500 mg.	Cap.	777,326.
xGENTAMICINA SULFATO 80 mg.x 2 cc	Fam	640,823.
xPOMOATO PIRENTAL/OXANTEL 100x100 mg	Tab.	580,140
xSALBUTAMOL 15 ml	Fco.	595,947.
HIERRO SALES Grag.	Grag.	643,224.
HIERRO Y SALES SOLUCION 30 mgs**	Fco.	643,710.
xCOMPLEJO B SOLUCION 10 ml**	Fam.	726,583.
xDEXTRAN 6% XOLUCION SALINA 500ml	Fco	646,640.
xPROTEINA ORALES 454gr.	Pote	591,250.
xDEXAMETAZONA CRIST. 25 mg. 100,000U**	Ovulos	828,800.
SOLUCION FUNGICIDA (YAS)**	Fco.	671,600.
		9,228,146. 14x18.4%

NOMBRE GENERICO	UNIDAD	U.S. $	
5. 0.25 - 0.5 million US Dollars each			
PENICILINA BENZATINICA PROCAINA CRIS	Fam.	281,187	
xAMPICILINA SUSP. 250 Mg x 5 cc 60 ml	Fco	412,004	
xAMPICILINA 500 mg.	Cap.	498,000	
DICLOXACILINA 500 Mg.	Cap	277,200	
xCLORANFENICOL 250 mg.	Cap	347,987	
AMIKACINA SULFATO 500 mg.	Fam	352,800	
xTRIMETOPRIN Y SULFAMETAXAZOLE	Tab.	461,760	
xGRISEOFULVINA ULTRAFINA 500mg.	Tab.	310,033	
CLOTRIMAZOL 1% SOL.	Fco.	351,755	
HIDROXIQUINOLINAS HALOGENAS 250 mg.	Tab.	283,040	
xMEBENDAZOLE 100 mg.	Tab.	470,820	
DEXOMETORFANO 15 mg. 15 cc.	Fco.	388,788	
DICICLOBRAMINA 4 mg. 15 cc.	Fco.	373,500	
ACIDO NICOTINICO 50 mg.	Tab.	301,350	
xDEXTROSA EN AGUA 5% 1,000 cc.	Fco.	309,800	
xRINGER SOLUCION 500 ml.	Fco.	285,535	
xSOLUCION DE AMINOACIDOS	Fco.	262,500	
xELECTROLITOS ORALES	Sobre	394,484	
ETOSUCCINIDA 250 mg.	Cap.	495,000	
xMIORRELAJANTE 1 gmo. 10 ml**	Amp.	330,300	
xVIT. B_1, B_{12}, B_6 10,000 U**	Amp.	267,679	
xAMITRIPTILINA 75 Mg.	Cap.	446,833	
HEPARIONIDES	Tab.		
xDIMETIL OXIQUINOZINA 2 gm x 5cc	Tab.	409,258	
xESPASMOLITICO Y ANALGESICO	Tab.	518,400	
xDEXAMETOSONA 0.5 mg.	Tab.	399,827	
LECHE DE MAGENSIA 8%	Fco.	464,536	
		10,143,200	27 x 20.2%
		=========	
GRAND TOTAL (1 to 5 : 49 products)		**35,252,413**	**70.5%**

x Included in the Emergency List
* Not justified ** Not fully justified.

CAPACITY AND SALES TURNOVER OF MULTIPURPOSE PILOT PLANT

Annexure - 6

S.No.	Product	Requirement 1985* (MT)	Requirement 1990**(MT)	Proposed Capacity (MT)	Rate/Kg*** (US $)	Total Turn-over (US$)
1.	Acetyl salicylic acid	31.27	41.9	40.00	3.70	148,000
2.	Diazepam	0.131	0.175	0.250	35.00	8,750
3.	Erthromycin Estolate	12.29	16.47	15.00	85.00	1,275,000
4.	Mebendazole	5.51	7.38	6.00	50.50	303,000
5.	Metronidazole	8.80	11.79	10.00	38.50	385,000
6.	Nalidixic acid	2.50	3.35	3.00	64.00	192,000
7.	Paracetamol	10.00	13.40	10.00	4.10	41,000
8.	Propanolol	0.063	0.085	0.20	25.00	5,000
9.	Sulphamethoxazole	15.80	21.71	20.00	14.00	280,000
10.	Trimethoprim	3.20	4.29	4.00	44.50	178,000
			Total	108.45		1,815,750
			Add 5% handling charges and 1% transport			168,950
			Grand Total			**2,984,700**

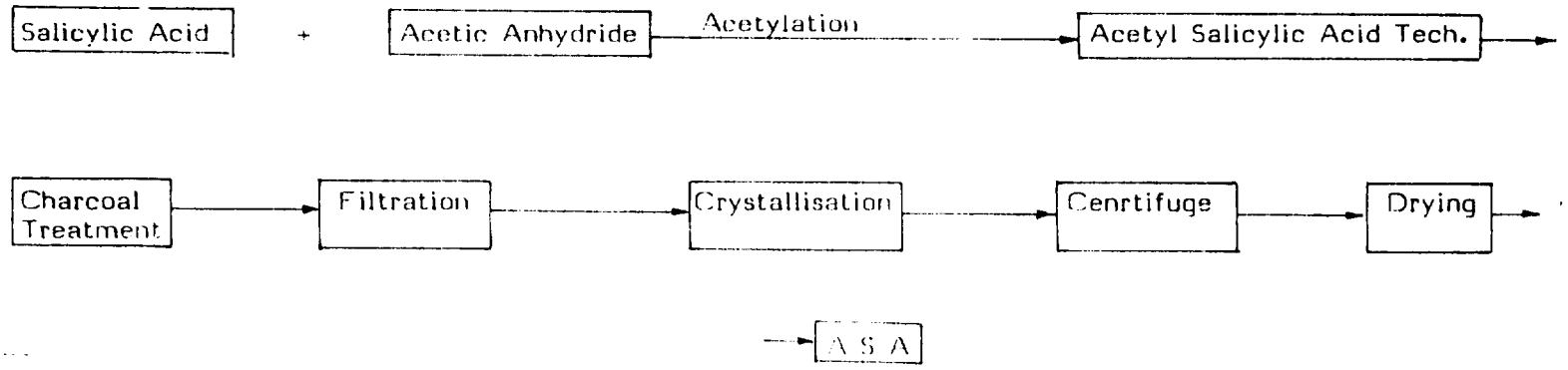
NOTE:

* Calculated from finished drugs requirements during 1985 provided by Ministries de Sadude (MINSA)

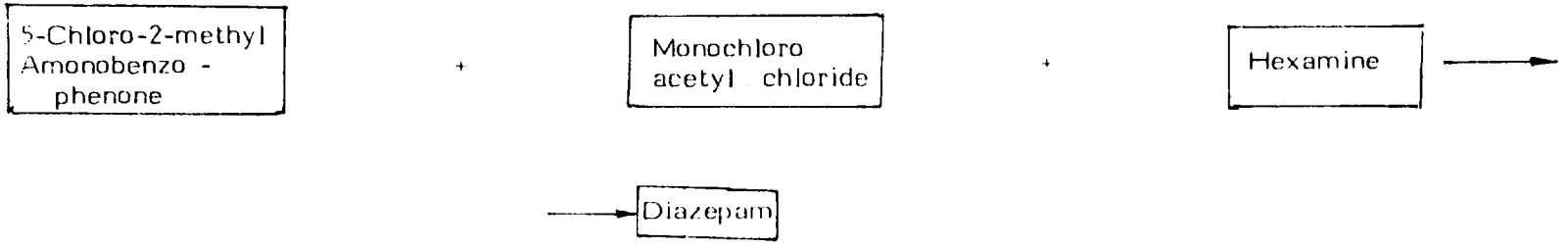
** Projected at 6% compounded annual growth.

Basis: *** The prices taken here are the imported prices CIF - Managua, 1984, as given by M/S. SOLKA.

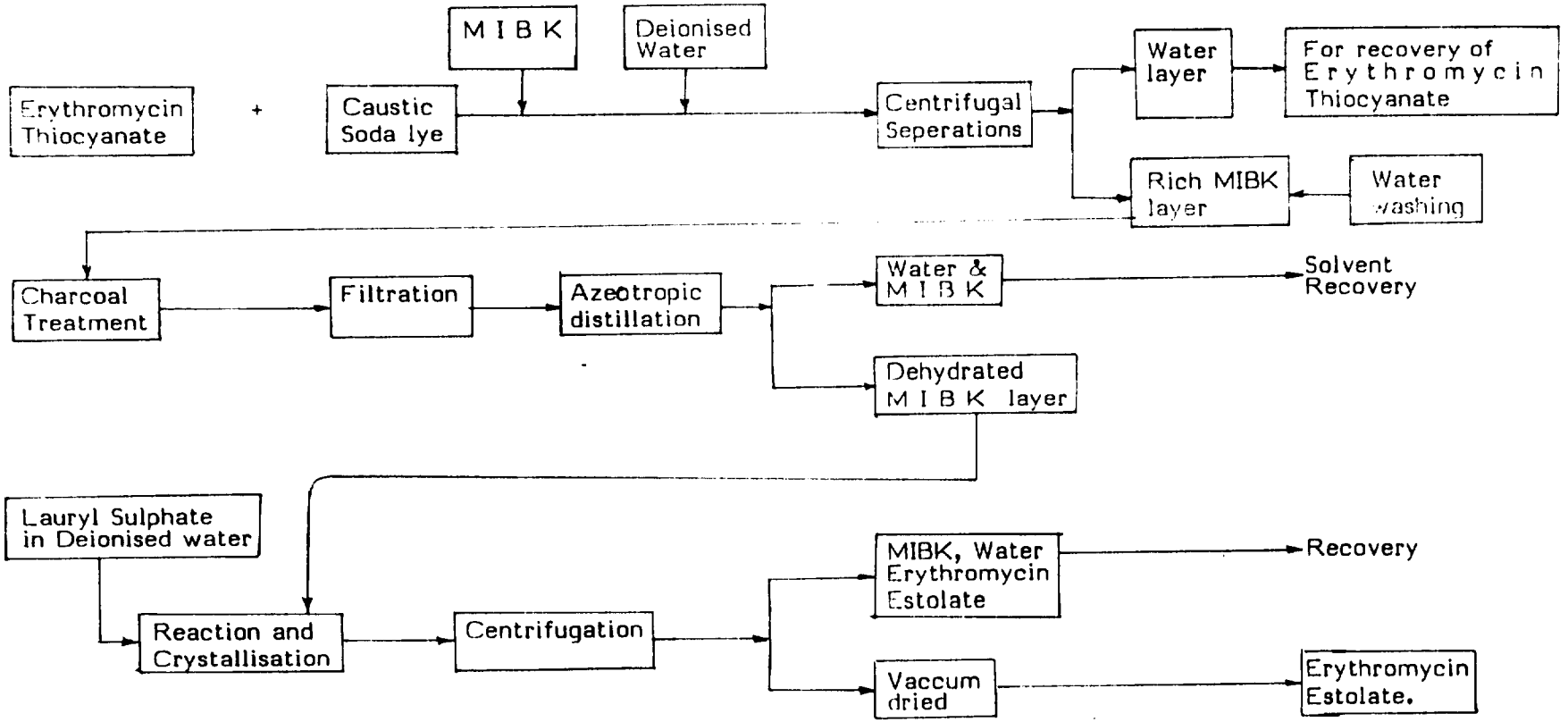
1 **Acetyl Salicylic Acid (ASA)**



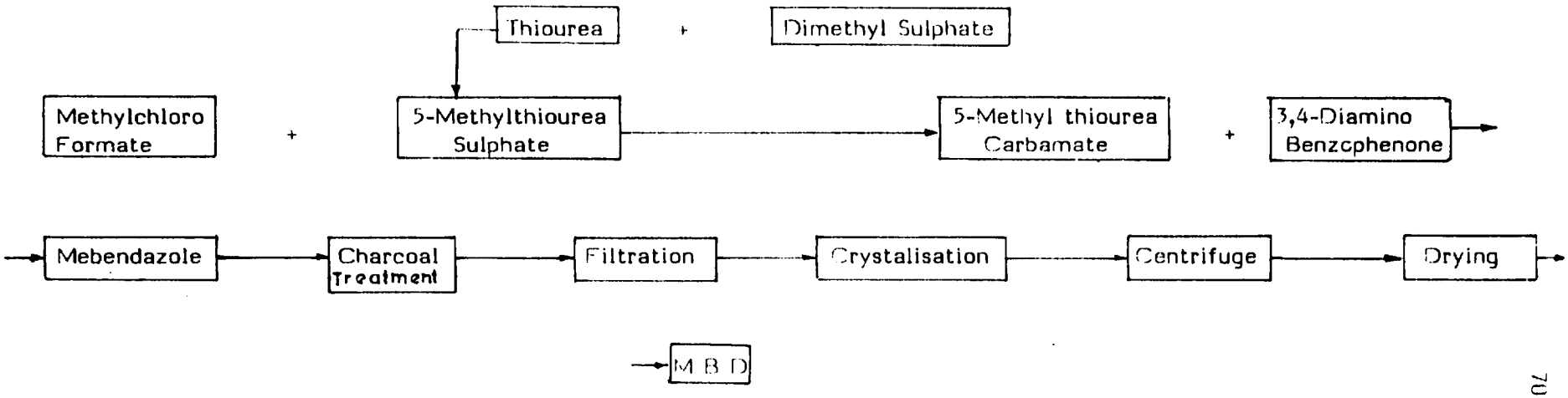
2 **Diazepam**



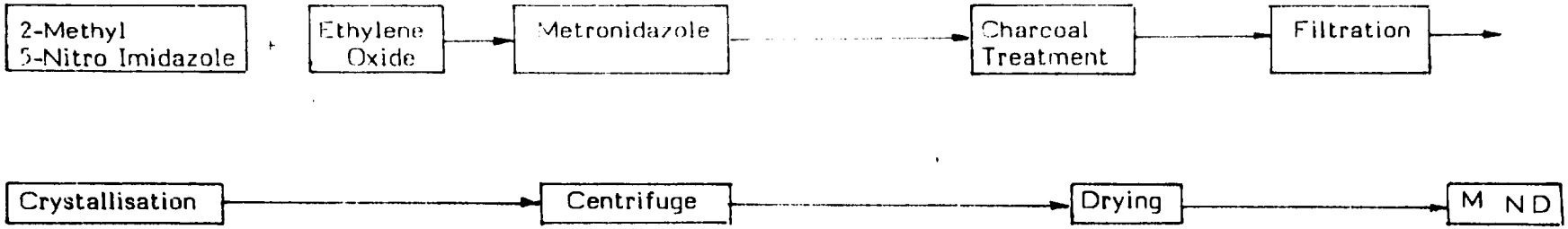
3. Erythromycin Estolate



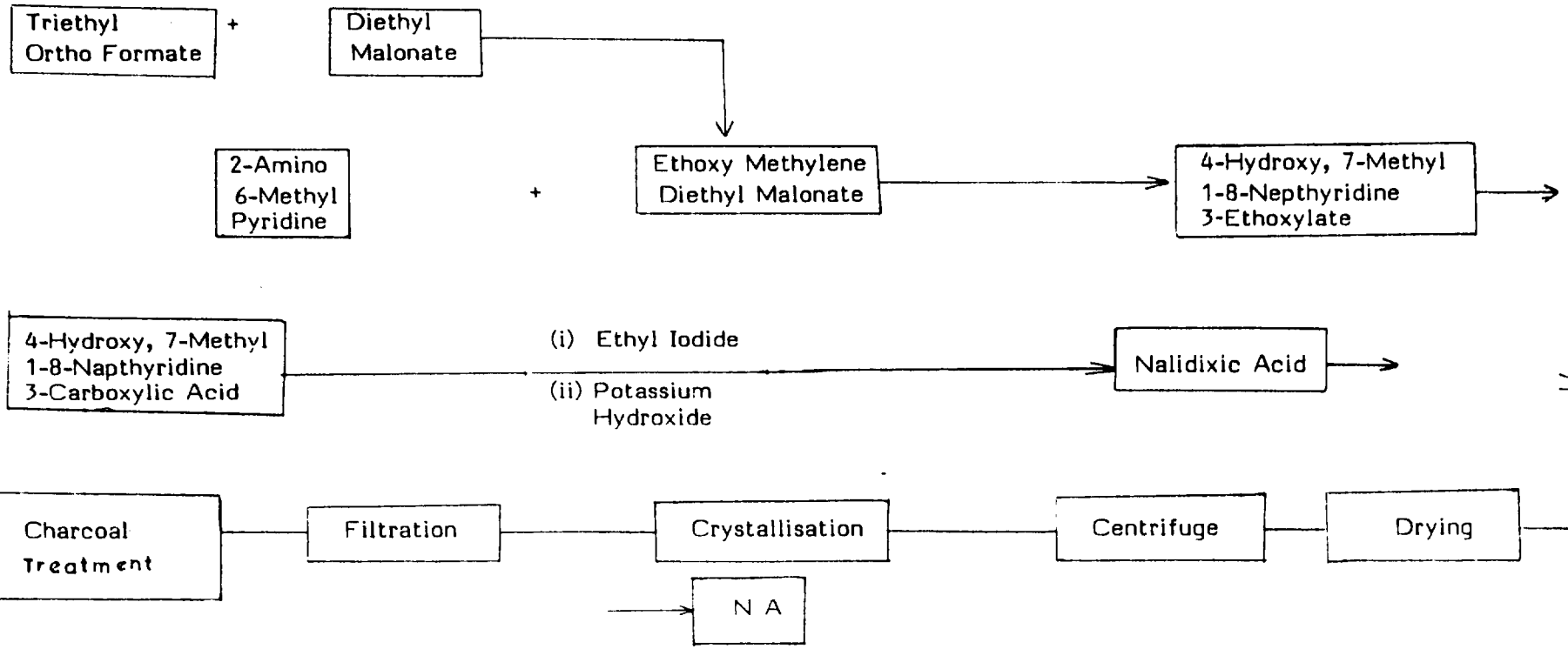
4. **Mebendazole (M B D)**



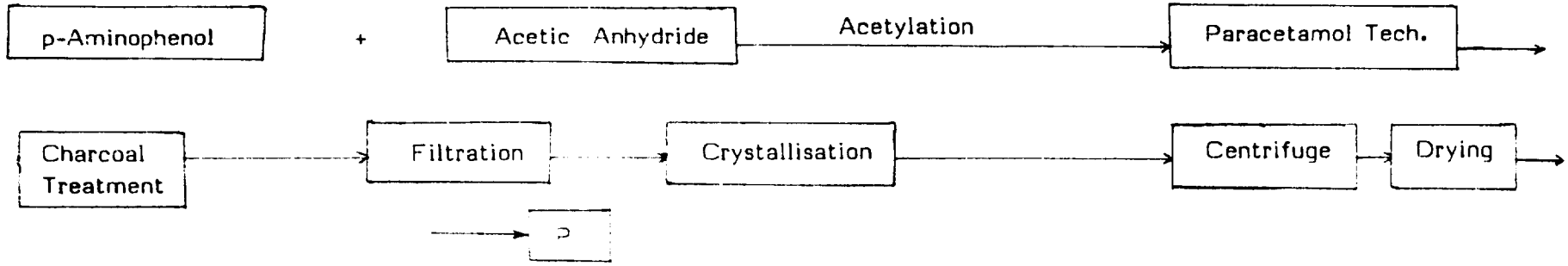
5. **Metroniadazole (M N D)**



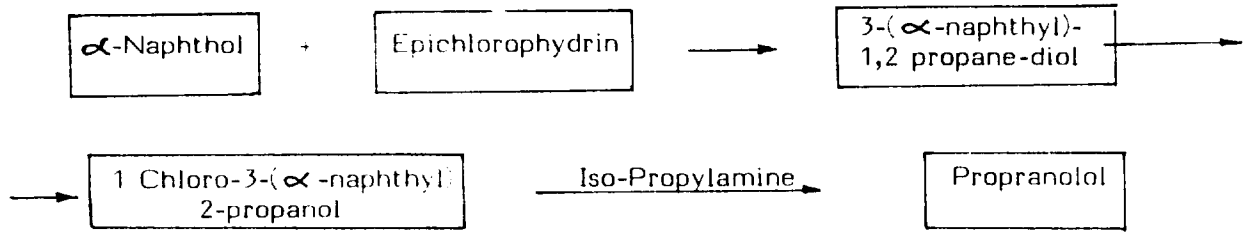
6. Nalidixic Acid (N A)



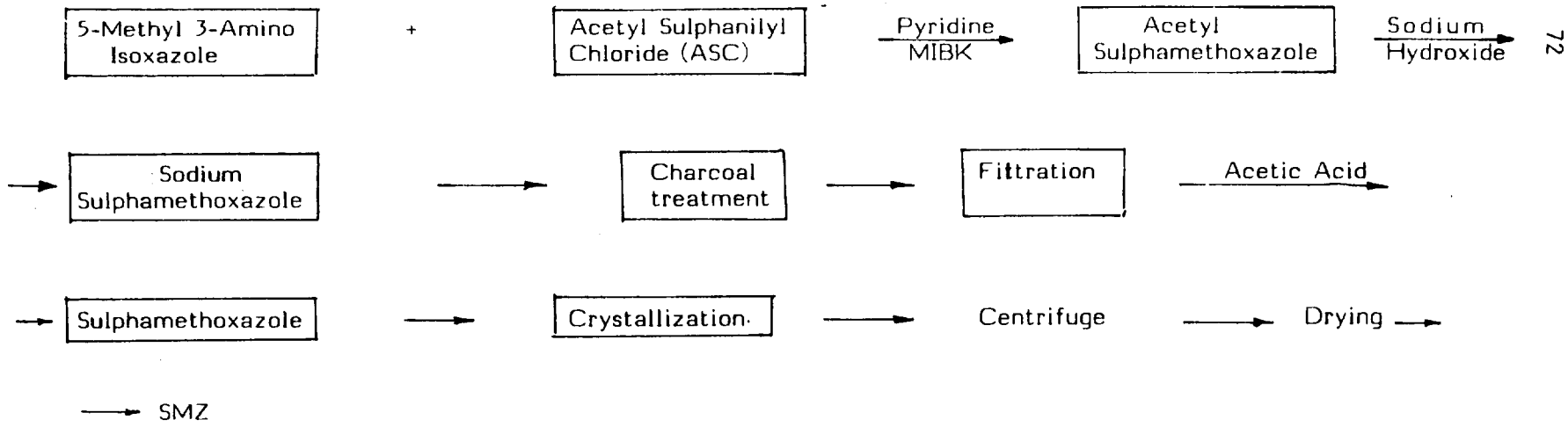
7. Paracetamol (P)



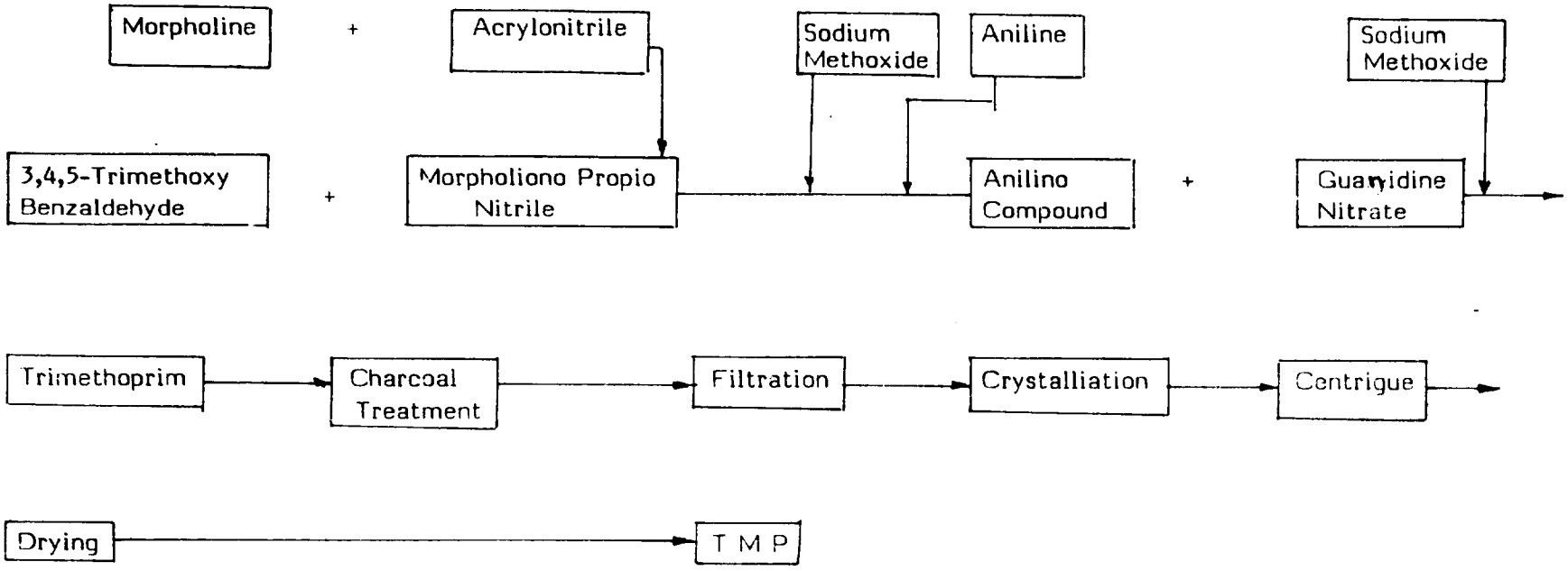
8. **Propranolol**



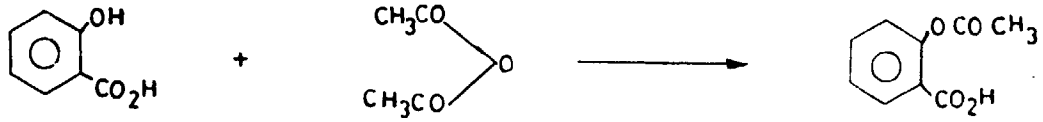
9. **Sulphamethoxazole (SMZ)**



10. Trimethoprim (T M P)

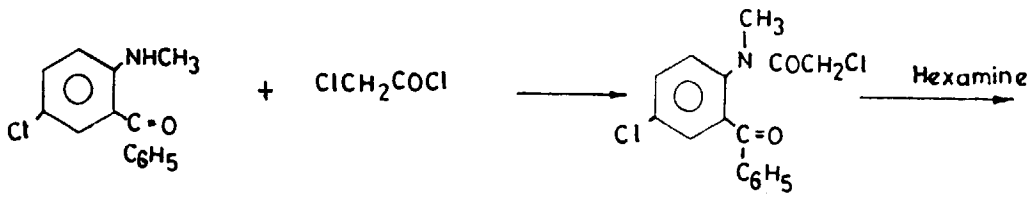


1. **Acetyl Salicylic Acid**

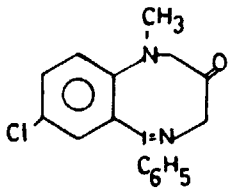


Salicylic Acid (138.7) + Acetic Anhydride (134.04) → Acetyl Salicylic Acid (180.9)

2. **Diazepam**

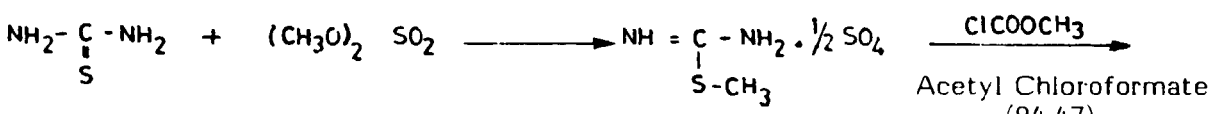


5-Chloro-2 Methyl Amino Benzophenone (245.14) + Monochloroacetyl Chloride (112.92) → (322.02) —Hexamine→

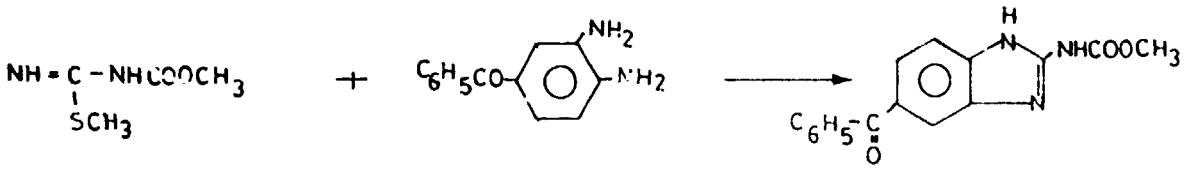


Diazepam (283.57)

3. **Mebendazale**

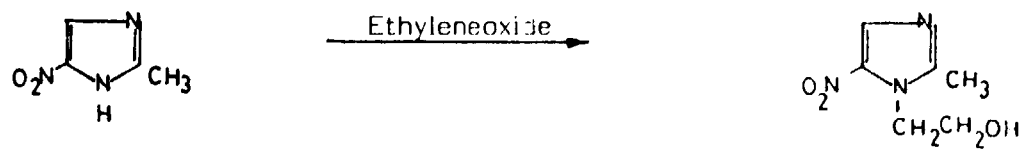


Thiourea (76) + Dimethyl Sulphate (126) → S-Methyl thiourea Sulphate → (Acetyl Chloroformate, 94.47)



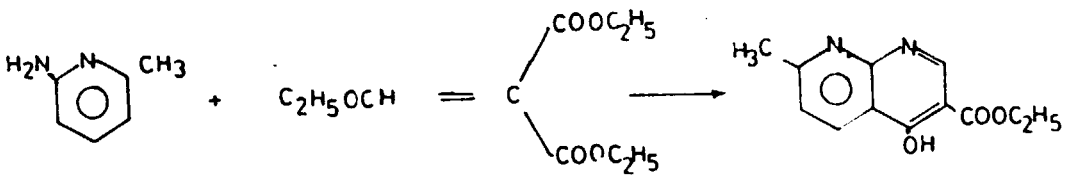
S-methyl thiourea carbamate (148) + 3,4-Diamino Benzophenone (212.13) → Mebendazole (295.16)

4. **Metronidazole**



2-Methyl-5 Nitroimidazole (127.04) —(Ethyleneoxide)→ Metronidazole (159.05)

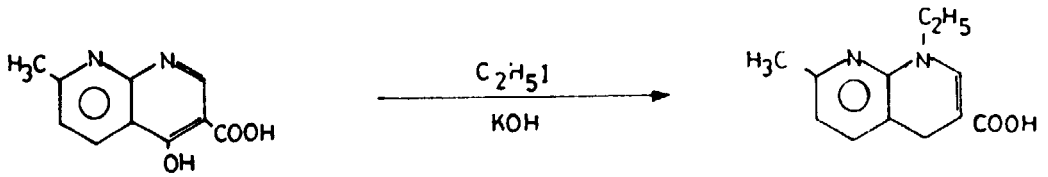
5. **Nalidixic Acid**



2-Methyl-6-amino Pyridine (108.06)

Ethoxymethylene Malonic Acid diuethyl ester (216.10)

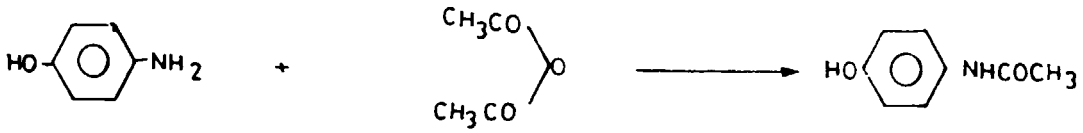
4-Hydroxy, 7-Methyl 1-8-Naphthyridine 3-Ethoxylate (232.12)



4-Hydroxy-7 Methyl-1,8-Naphthyridine 3-Carboxylic acid (206.10)

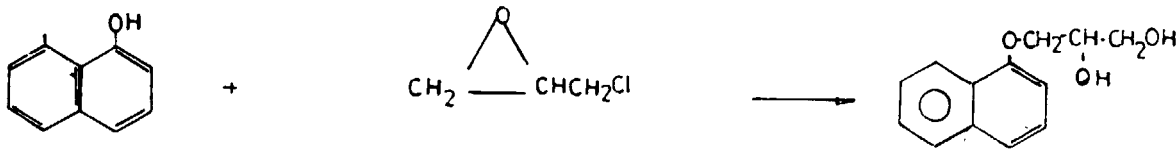
Nalidixic Acid (234.12)

6. **Paracetamol**

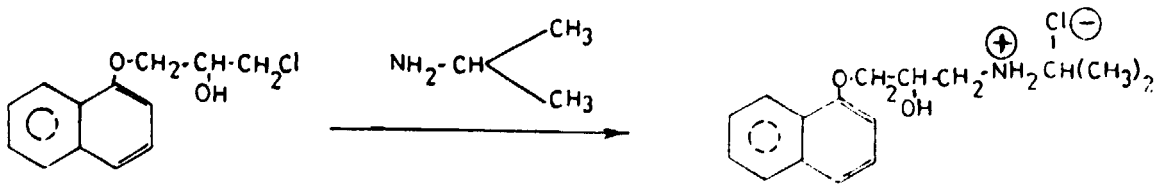


p-Aminophenol (109.06) + Acetic Anhydride (134.04) → Paracetamol (151.08)

7. **Propranolol**

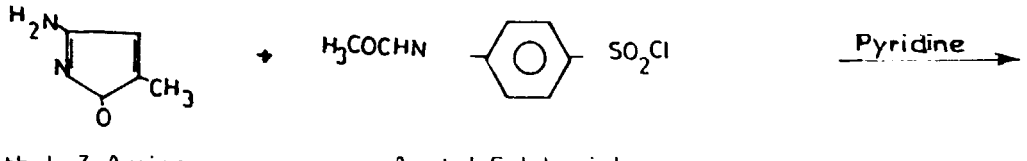


∝- naphthol (146.10) + Epichlorophydrin (92.48) → 3-(∝ -naphthyl) 1,2 Propane -diol (210.13)



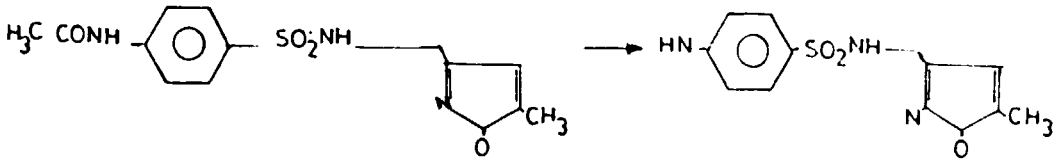
1 Chloro-3-(∝ -naphthyl) 2-Propanol (226.57) + Iso-Propylamine (59.03) → Propranolol (285.61)

8. **Sulphamethoxazole**



5-Methyl, 3-Amino isoxazole (98)

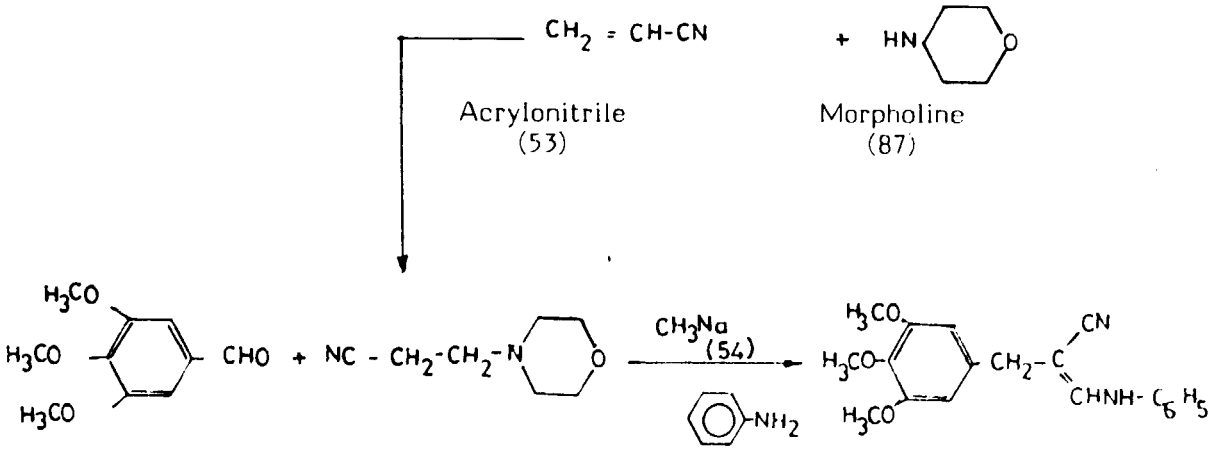
Acetyl Sulphaniyl Chloride



Acetyl Sulphamethoxazole (295.3)

Sulphamethoxazole (253.3)

9. **Trimethoprin**



Acrylonitrile (53)

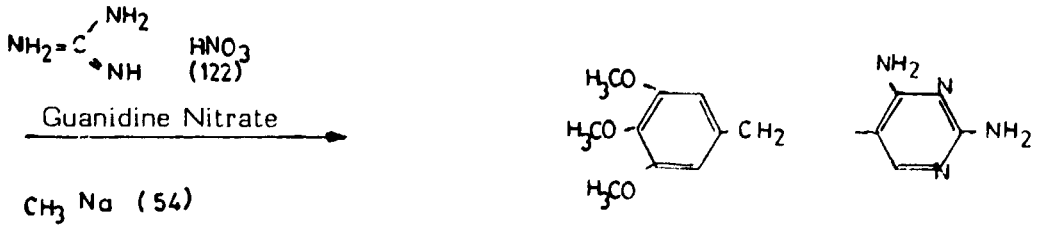
Morpholine (87)

TMB (196)

Morpholinopropio nitrile (140)

(93)

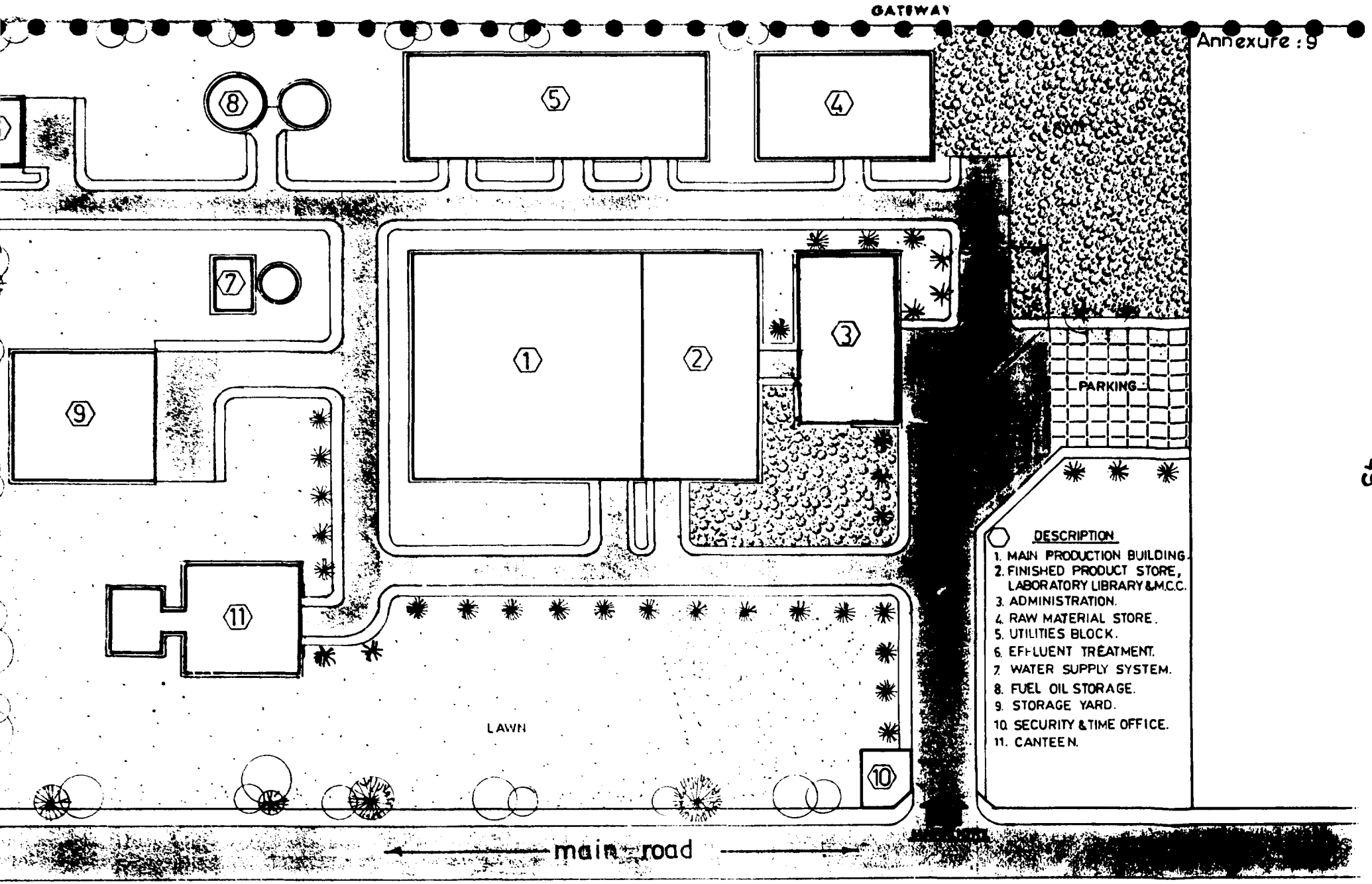
Anilino Compound (324)



Sodium Methoxide

Trimethoprim (290)

Annexure : 9



e-

PILOT PLANT(AT NICARAGUA)

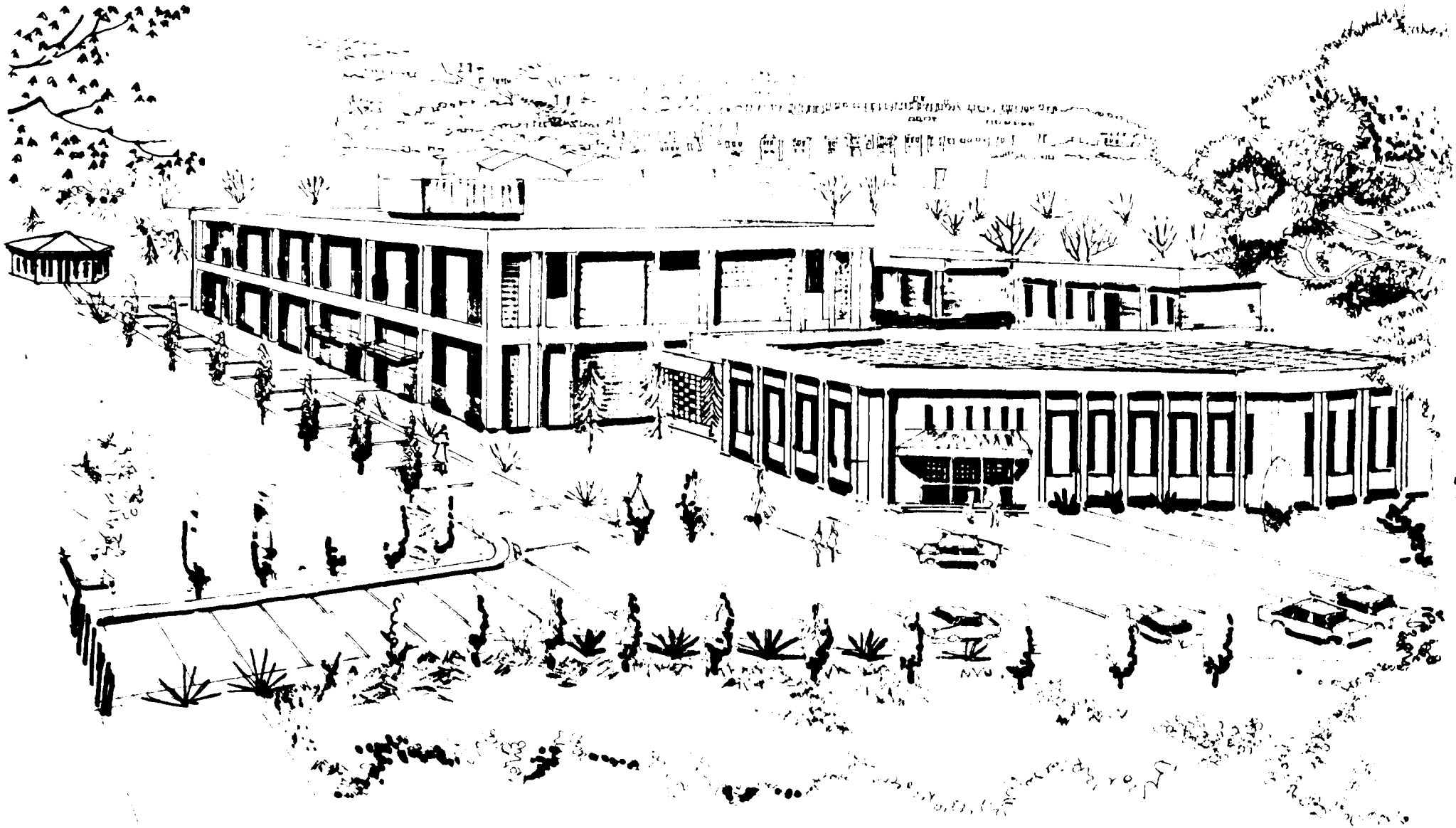
tentative master plan for proposed multipurpose.

DRN : jagjeet singh
CHKD : p. taley
APPD :
DATE : 29-9-85

Project Consultant:-
vishwakarma process technik india pvt. ltd.
9/4, sarvapriya vihar, new delhi-110016
INDIA

Architects:-
n. goyal and associates.
architects, engineers & planners.
42, defence colony mkt, new delhi-110024.
INDIA

north



Title:-

a bird's eye view of the pilot plant.
(at nicaragua.)

DRN : m.s.virdi
CHKD : p.taley
APPD :
DATE : 29-9-85

Project Consultant -
vishwakarma process technik india pvt. ltd.
9/4, sarvapriya vihar, new delhi-110016.
INDIA.

Architects -
n. goyal and associates.
architects engineers & planners
42, defence colony mkt., new delhi-1100..
INDIA.

north point

Annexure:11

ESTIMATES FOR LAND, SITE DEVELOPMENT AND CIVIL CONSTRUCTION

S.No.	Description	Unit	Quantity	Rate/ unit (C$)	Estimated cost (C$)
I.	**Land and Site Development**				
i)	Land	Sq.mt	10,000	50	500,000
ii)	Levelling and development	Sq.mt	10,000	95	950,000
iii)	Laying of Roads :				
	a) Approach road, 8 m wide and 50 running meters	Sq.mt	400	38	15,200
	b) Internal roads, 6 m wide and 500 running meters	Sq.mt	3,000	38	114,000
	c) Internal roads, 4 m wide and 600 running meters	Sq.mt	2,400	38	91,200
iv)	Fencing/compound wall/berbed wire fencing	r.m.	400	975	390,000
v)	Main gate	No.	1	22,000	22,000
vi)	Parking place	Sq.mt	324	38	12,300
vii)	Sewerage and drains :				
	a) Underground sewer for chemical effluents	-		Lumpsum	
	b) Underground sewer for acid and mildly polluted effluents	-		Lumpsum	
	c) Fecal sewer lines	-		Lumpsum	
	d) Storm water drains	-		Lumpsum	
	total of (a + b + C + d) Lumpsum				2,337,500
	Sub Total				4,432,200

S.No.	Particulars of construction	Type of Const-ruction	No. of floors	Size LxBxH (m)	Total area (sq.mt)	Rate Per m^2 (C$)	Estimated Cost (C$)
II.	**Buildings**						
	i) Factory Buildings						
	a) Main plant building, 4000 kg/m^2 load with 12m x 12m opening on first floor.	R.C.C.	2	24x24x10.5	1008	8,500	8,568,000
	b) Motor control centre, finished product stores, laboratory,library, production office.	R.C.C.	2	24x12x10.5	288	8,500	2,448,000
	ii) Utilities Buildings						
	a) Electrical substation, power cum motor control centre	R.C.C.	1	18x12x4	216	6,500	1,404,000
	b) Raw Materials stores	R.C.C.	1	18x12x4	216	6,500	1,404,000
	c) Brine chilling station, vacuum pump and compressor room	Shed	1	12x6x4	72	6,000	432,000
	d) Steam generator house	Shed	1	12x6x4	72	6,500	468,000
	e) Workshop	Shed	1	12x6x4	72	6,500	468,000
	iii) Non-factory Buildings						
	a) Administration	R.C.C.	1	24x12x3.5	288	4,000	1,152,000
	b) Security and Time office	R.C.C.	1	4 x 3 x 3	12	4,000	48,000
	c) Canteen	R.C.C.	1	24x12x3.5	288	4,000	1,152,000
	Sub Total						17,544,000

S.No.	Particulars	Unit	Quantity	Rate/ unit (C$)	Estimated Cost (C$)
III.	**Miscellaneous Civil Construction**				
a)	Storage yard for solvents etc. cemented with fencing	Sq.mt	500 (20 m x 50 m)	140	70,000
b)	Overhead tank for water, 15 m height	Cu.mt	75	34,000	2,550,000
c)	Street Lighting	-		Lumpsum	50,000
d)	Neutralisation tank	Cu.mt	20	2,500	50,000
e)	Effluent Treatment Tank	Cu.mt.	30	2,500	75,000
f)	Settling tank for treated effluents	Cu.mt	200	2,500	500,000
g)	Underground water storage tank	Cu.mt	200	2,500	500,000
h)	Pipe supports	r.m.	50	3,400	170,000
i)	Fire hydrants and safety equipment installation			Lumpsum	850,000
	Sub Total				4,815,000

Total Cost of Land, Site Development and all Civil Constructions

I.	Land and Site Development	C$ 4,432,200
II.	Buildings	C$ 17,544,000
III.	Miscellaneous	C$ 4,815,000
	Grand Total	**C$ 26,679,000**

Taken C$ 26,700,000 = US $ 534,000

Note : The civil construction rate has been derived from recent factory construction rates in Managua, Nicaragua, suitably escalated for higher loading factors required. The exchange rate considered as 1 US$ = 50 C$.

COST ESTIMATES OF IMPORTED EQUIPMENTS

Annexure : 12

1. PROCESS EQUIPMENTS

S.No.	Description	Material of Construction	Capacity	Quantity	Price (US $) (CIF Managua)
A.	**Reactors**				
1.	Reactor with half coil limpet jacket, turbine stirrer, 2.2 KW flame proof motor 0 H P.	SS-AISI-316	1250 L	1	15,900
2.	Reactor with half coil limpet jacket, anchor stirrer, 2.2 KW Flame Proof Motor	SS-AISI-316	1000 L	1	12,600
3.	Reactor with jacket, anchor stirrer, 2.2 KW Flame Proof Motor.	SS-AISI-316	1000 L	2	26,000
4.	Reactor with jacket, propeller stirrer, 1.5 KW Flame Proof Motor.	SS-AISI-316	500 L	2	21,200
5.	Tank with inside cooling coil, propeller, 2.2 KW Flame Proof Motor, level indicator.	SS-AISI-316	1000 L	1	12,200
6.	Reactor, jacket turbine, 0.75 KW Flame Proof Motor, stirrer.	SS-AISI-316	250 L	1	7,000
7.	Reactor with jacket, turbine stirrer, 0.75 KW Flame Proof Motor.	SS-AISI-316	250 L	1	7,000
8.	Reactor with jacket, propeller stirrer, 0.75 KW Flame Proof Motor.	SS-AISI-316	250	1	7,000

S.No.	Description	Material of Construction	Capacity	Quantity	Price (US $) (CIF - Managua)
9.	Reactor with jacket, propeller stirrer, 1.75 KW Flame Proof Motor.	SS-AISI-316	400 L	1	9,300
10.	Reactor with jacket, anchor agitator, 2.2 KW Flame Proof Motor.	SS-AISI-316	400 L	1	9,500
11.	Tank with jacket, propeller stirrer, 0.375 KW Flame Proof Motor, level indicator.	SS-AISI-316	100 L	2	4,200
12.	Reactor with jacket, anchor stirrer, 3.7 KW Flame Proof Motor.	Glass lined	500 L	1	17,600
13.	Reactor with jacket, propeller stirrer, 1.5 KW Flame Proof Motor.	Glass lined	250 L	1	8,000
14.	Reactor with jacket, propeller stirrer, 2.2 KW Flame Proof Motor.	Steel	630 L	1	4,700
	Sub Total 'A'				162,200

S.No.	Description	Material of Construction	Capacity	Quantity	Price (US$) (CIF - Managua)
B.	**Tanks**				
15.	Metering Tank	SS-AISI-316	400 l	1	3,000
16.	Holding Tank	SS-AISI-316	400 l	1	3,000
17.	Metering Tank	SS-AISI-316	250 l	2	5,000
18.	Metering tank with jacket, propeller stirrer, 0.375 K.W.	SS-AISI-316	160 l	1	2,700
19.	Metering Tank	SS-AISI-316	160 l	2	4,400
20.	Metering Tank	SS-AISI-316	100 l	1	2,000
21.	Metering Tank	SS-AISI-316	63 l	2	2,800
22.	Metering tank with jacket, propeller stirrer, 0.375 KW Flame Proof Motor.	Steel	100 l	1	900
	Sub Total 'B'				23,800

S.No.	Description	Material of Construction	Capacity	Quantity	Price (US$) (CIF - Managua)
C.	**Heat Exchangers**				
23.	Heat Exchangers (1-2 pass)	Tubes SS-AISI-316 Sheel C.S.	$6m^2$	1	7,000
24.	Heat Exchanger	Tubes SS-AISI-316 Sheel C.S.	$4m^2$	1	5,200
25.	Heat Exchangers	Tubes SS-AISI-316 Shell C.S.	$3m^2$	3	14,100
26.	Heat Exchangers	Tubes SS-AISI-316 Sheel C.s.	$2m^2$	2	7,200
27.	Heat Exchangers	Tubes SS-AISI-316 Shell C.S.	$1m^2$	4	12,500
28.	Heat Exchanger	All Steel	$3m^2$	1	2,000
29.	Heat Exchanger	All Steel	$2m^2$	1	1,300
	Sub Total 'C'				49,300
D.	**Centrifuges**				
30.	Centrifuge, top driven, bottom discharge	SS-AISI-316	℄ 1200	1	17,000
31.	Centrifuge, bottom driven, top discharge.	SS-AISI-316	℄ 1200	1	16,100
	Sub Total 'D'				33,100

S.No.	Description	Material of Construction	Capacity	Quantity	Price (US$) (CIF - Managua)
E.	**Filters**				
32.	Plate and Frame Filters	SS-AISI-316	8 plates	2	5,400
33.	Nutsch Filter	SS-AISI-316	400 L	2	8,000
34.	Line Filter	SS-AISI-316	5 L	2	400
35.	Line Filter	SS-AISI-316	50 L	1	4,000
36.	Leaf Filter with jacket	SS-AISI-316	50 L	2	7,200
	Sub Total 'E'				25,000
F.	**Distillation Still/Column**				
37.	Distillation Still with jacket and heating coil.	SS-AISI-316	1600 L	1	30,500
38.	Distillation Still with jacket	SS-AISI-316	630 L	1	19,000
39.	Distillation Column, Sieve plates.	SS-AISI-316	O 400 H 5000	1	7,000
40.	Distillation Column, packed.	SS-AISI-316	O 200 H 3000	1	4,000
	Sub Total 'F'				60,500

S.No.	Description	Material of Construction	Capacity	Quantity	Price (US$) (CIF - Managua)
G.	**P u m p s**				
41.	Centrifugal pump.	SS-AISI-316	$3m^3/hr$ H = 25 M	15	30,000
42.	Centrifugal pump.	SS-AISI-316	$3m^3/hr$ H = 25 M	8	8,000
43.	Centrifugal pump.	Hastelloy-B	$3m^3/hr$ H = 25 M	2	6,600
44.	Centrifugal pump.	Steel Rubber lined	$3m^3hr$ H = 25 M	2	3,000
45.	Submersible pump.	Steel	$3m^3/hr$ H = 25 M	8	20,000
	Sub Total 'G'				67,600
H.	**Dryers**				
46.	Fluid Bed Dryer	SS-AISI-316	50 kg/hr	1	10,100
47.	Tray Dryer	SS-AISI-304	24 trays	3	10,500
48.	Vacuum dryer	SS-AISI-316	$1.3m^2$	1	13,500
	Sub Total 'H'				34,100

S.No.	Description	Material of Construction	Capacity	Quantity	Price (US $) (CIF - Managua)
I.	**Storage Tanks**				
49.	Storage Tank	Aluminium	20 m^3	1	10,000
50.	Storage Tank	HDPE	30 m^3	1	8,000
51.	Storage Tanks	HDPE	20 m^3	1	6,000
	Sub Total 'I'				24,000
J.	**Miscellaneous Items**				
52.	Absorption Tower	HDPE	Ø 250 H 4000	2	2,000
53.	Granulator with screen	SS-AISI-316		1	4,100
54.	Centrifugal separator	SS-AISI-316		1	6,700
	Sub Total 'J'				12,800
	TOTAL OF I (Imported equipments)				492,400

II. UTILITIES EQUIPMENTS AND MACHINERY

S.No.	Description	Material of Construction	Capacity	Quantity	Price (US $) (CIF - Manugua)
1.	Steam Generator : Oil fired boiler, capacity 4000 kg/hr from 100°C feed water, super heater, generation pressure 15 kg/cm^2 gauge inclusive of oil feeding systems, deionised water unit, all accessories and auxiliaries.		3000 Kg/hr at 15kg/cm^2 gauge.	1 complete unit	110,000
2.	Fuel Oil Storage Tank* : Vertical tank, made of steel.	Steel	30 m^3	1	
3.	Deionised water unit : Consisting of anion and cation exchange units, feed pumps, etc.		1 m^3/hr	1 Unit	3,800
4.	Storage Tank* : For storage of deionised water.	SS-AISI-304	5 m^3	1	
5.	Pump : Centrifugal pumps for deionised water.	SS-AISI-304 H = 30 M	1 m^3/hr	2	2,200
6.	Chilling Unit : To produce (-)5°C brine, consisting of compressors, chillers, pipes and electrical systems.		40 TR (one standby)	2 Units	64,000

S.No.	Description	Material of Construction	Capacity	Quantity	Price (US $) (CIF-Manugua)
7.	Cooling Tower : For process requirement, cooling of water from 38°C to 28°C, glass reinforced plastic (GRP) including basin, fans etc.		60 m^3/hr	1 Unit	10,800
	For chilling unit, cooling water from 33°C to 28°C, glass reinforced plastic (GRP) including basin, fans etc.	GRP	30 m^3/hr	1 Unit	3,500
8.	Pumps : Centrifugal pump for re-circulation of chilled brine.	Steel	40 m^3/hr H = 30 M	2	4,000
	Centrifugal pump for re-circulation of process cooling water.	Steel	60 m^3/hr H 40 M	2	5,200
	Centrifugal pump for re-circulation of cooling water for chiller unit.	Steel	110 m^3/hr H 30 M	2	5,600
9.	Vacuum Pump : Water ring vaccum pump.		1000 Nm^3/hr 720 mm Hg	1	9,000

S.No.	Description	Material of Construction	Capacity	Quantity	Price (US $) (CIF - Managua)
10.	Air Compressor : Reciprocating/rotary type oil free air compressor including heat exchanger, surge tank, piping etc.		750 Nm^3/hr 7.5 Kg/cm^2	1	21,000
11.	Centrifugal pump for lifting water to overhead tank.	Cast Steel	25 m^3/hr H - 30 M	2	3,200
12.	Eject pump for supplying underground water.	Cast Steel	25 m^3/hr H - 40 M	2	8,700
13.	Centrifugal pump for effluent treatment plant.		20 m^3/hr H = 30 M	2	2,600
14.	Brine Storage Tank	Steel	6 m^3	1	(Indigenous)
15.	Condensate (Steam) Holding Tank	Steel	6 m^3	1	(Indigenous)
16.	Electricals : Connected load 630 KVA. Transformers, Capacitor Bank, Battery charger, Power control and Motor Control and fixtures, Explosion proof fittings, earthing etc.		Complete system		282,000
	Total of II (Imported utilities equipments and machinery) :				**535,600**

Note : Items 2, 4, 11, 12 shall be indigenously fabricated. The rest taken under "indigenously fabricated items".

III. OTHER ITEMS (Imported)

S.No.	Description	Material of Construction	Capacity	Quantity	Price (US $) (CIF - Managua)
1.	Pipes and Fittings				
	Pipes and fittings for process inside the battery limits.				125,000
	Pipes and fittings for utilities - off side and inside.				60,000
2.	Instrumentations				
	Process and utilities systems.				145,000
3.	Insultation, Ventilation and Air Pollution Control Systems				
	Insulation for process and utilities systems, ventilation for process and laboratory buildings.				45,000
					375,000

IV. LABORATORY INSTRUMENTS AND EQUIPMENTS

	Total Installe Cost				42,000

COST OF INSTALLED EQUIPMENTS, MACHINERY AND INSTRUMENTS ETC.
(Imported)

S.No.	Description			Cost (in US $)
A.	**CIF Costs for Imported Items :**			
	I.	Process Equipments		492,400
	II.	Utilities Equipments		535,600
	III.	a)	Pipes and fittings	185,000
		b)	Instrumentation	145,000
		c)	Insulation, ventilation and pollution control system	45,000
		Sub Total		1,403,000
	Cost of spare parts for three years (except pipe fittings and insulation)			51,400
	Total of 'A' (ex-works Cost)			1,454,400
B.	**Landed Costs at Nicaragua :**			
	Handling charges in Nicaragua 5% of CIF			72,700
	Landed Cost			1,527,100
C.	**Cost of Installation :**			
	I.	Process Equipments (10% of CIF cost)		49,200
	II.	Utilities equipments (10% of ex-works) cost)		53,500
	III.	Cost of foundations and structures		52,500
	IV.	a)	Pipes and fittings	1,85,000
		b)	Instrumentation (10%)	14,500
		c)	Insulation (10%)	4,500
		Total of 'C'		359,200
D.	**Cost of Laboratory instruments and equipments**			
	Installed cost			42,000
E.	**Total installed cost of imported plant and machinery**			
	Taken			1,928,300

Note : The prices of imported equipments and machinery are based on leading Indian Prices.

EQUIPMENTS TO BE INDIGENOUSLY FABRICATED IN NICARAGUA

Tanks and Vessels Annexure : 13

S.No.	Description	Material of Construction	Capacity	Quantity	Price (C $)
1.	Holding Tank	SS-AISI-316	1000 L	1	123,300
2.	Holding Tank	SS-AISI-316	630 L	6	458,400
3.	Holding Tank	SS-AISI-316	500 L	3	194,800
4.	Conical bottom separator	SS-AISI-316	50 L	1	15,500
5.	Holding Tank	Steel	630 L	2	127,600
6.	Holding Tank	Steel	400 L	1	48,400
7.	Metering Tank	Steel	250 L	2	57,200
8.	Vacuum Reveiver	Steel	500 L	1	53,900
9.	Vacuum Trap	Steel	630 L	2	127,600
10.	Storage Tank with cooling coils	Steel	50 m^3	2	2,357,500
11.	Storage Tank	Steel	30 m^3	3	2,946,900
12.	Storage Tank with cooling coils	Steel	20 m^3	1	890,000
13.	Storage Tank	Steel	16 m^3	1	673,200
	Receivers				
14.	Receiver for distillation still with jaket.	SS-AISI-316 (jaket: steel)	1000 L	1	147,900
15.	Receiver without jacket.	SS-AISI-316	630 L	2	168,000
16.	Receiver with jacket	SS-AISI-316 (jacket: steel)	500 L	2	169,800

S.No.	Description	Material of Construction	Capacity	Quanity	Price (C $)
	Utilities				
17.	Storage Tank for vertical Furance oil	Steel	50 m^3	1	1,200,000
18.	Storage Tank for Deionised water	SS-304-3[illegible]	6 m^3	1	352,200
19.	Holding Tank for Brine	Steel	6 m^3	1	302,500
20.	Holding Tank for Condensate steam	Steel	6 m^3	1	302,500
	GRAND TOTAL				10,717,200

Installation Cost for Indigenously Fabriciiated Equipments:

Ex-Works cost for indigenously fabricated equipments	C $	10,717,200
Freight and taxes etc. (10%)		1,071,700
Cost f Installation (10%)		1,071,700
Cost of foundations and structures (10%)		1,071,700
Cost of insulation of five tanks (5% of ex-works cost)	C $	535,800
Total Installed cost of the indigenously fabricated equipments		14,468,100
	C $ 14,500,000	
	US $ 290,000	

Note : **Basis of Cost estimates :**

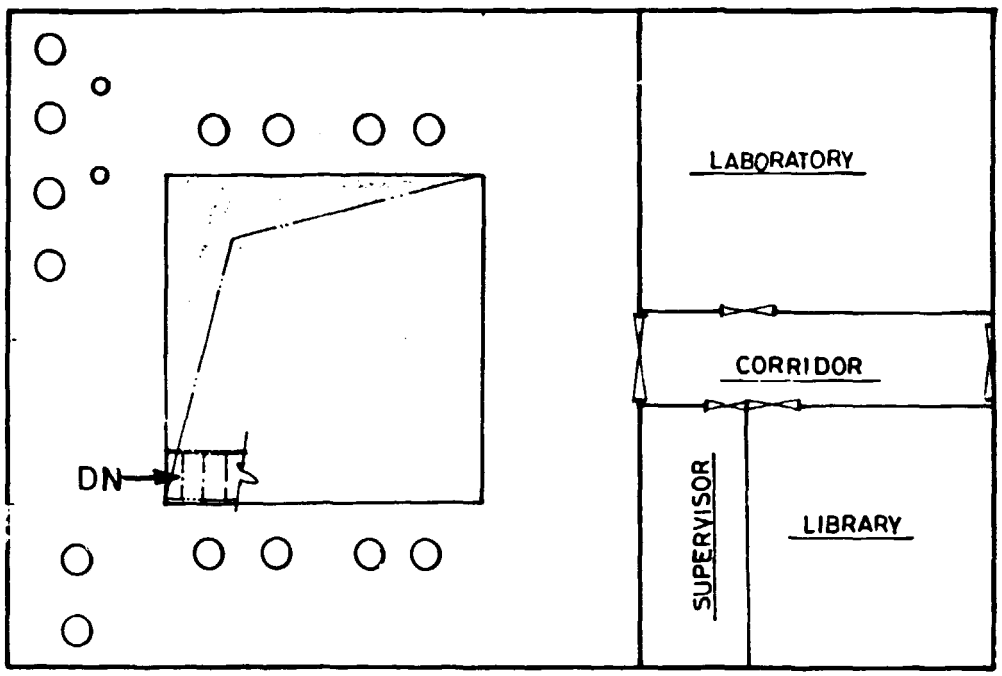
M/s. IMEP, the mechanical fabrication industry, a Government of Nicaragua Undertaking, located at Managua, provided the following data :

- Cost of SS-AISI-316 fabrication(without material) a C$ 170 per kg.
- Cost of Carbon steel fabrication (with material) as C$ 220 per kg.

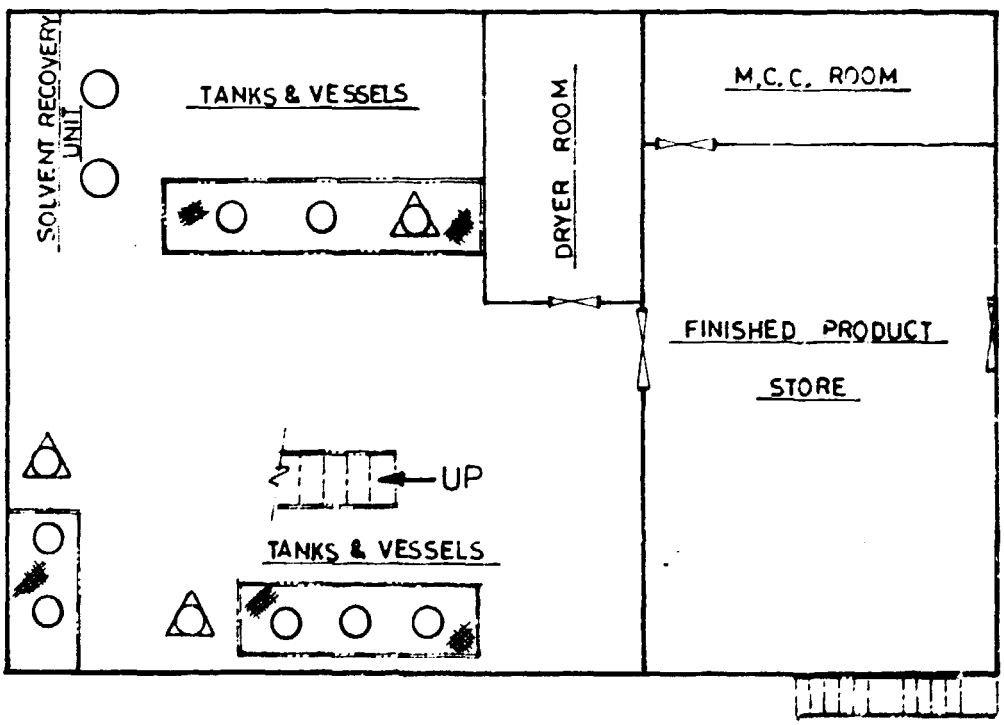
The assumed landed price of stainless steel (imported) taken as US$ 4 per kg.

The exchange rate for this,a s given by IMEP is 1 US $ = 50 C$.

Annexure:14



F.F. PLAN



G.F. PLAN

SCALE:~

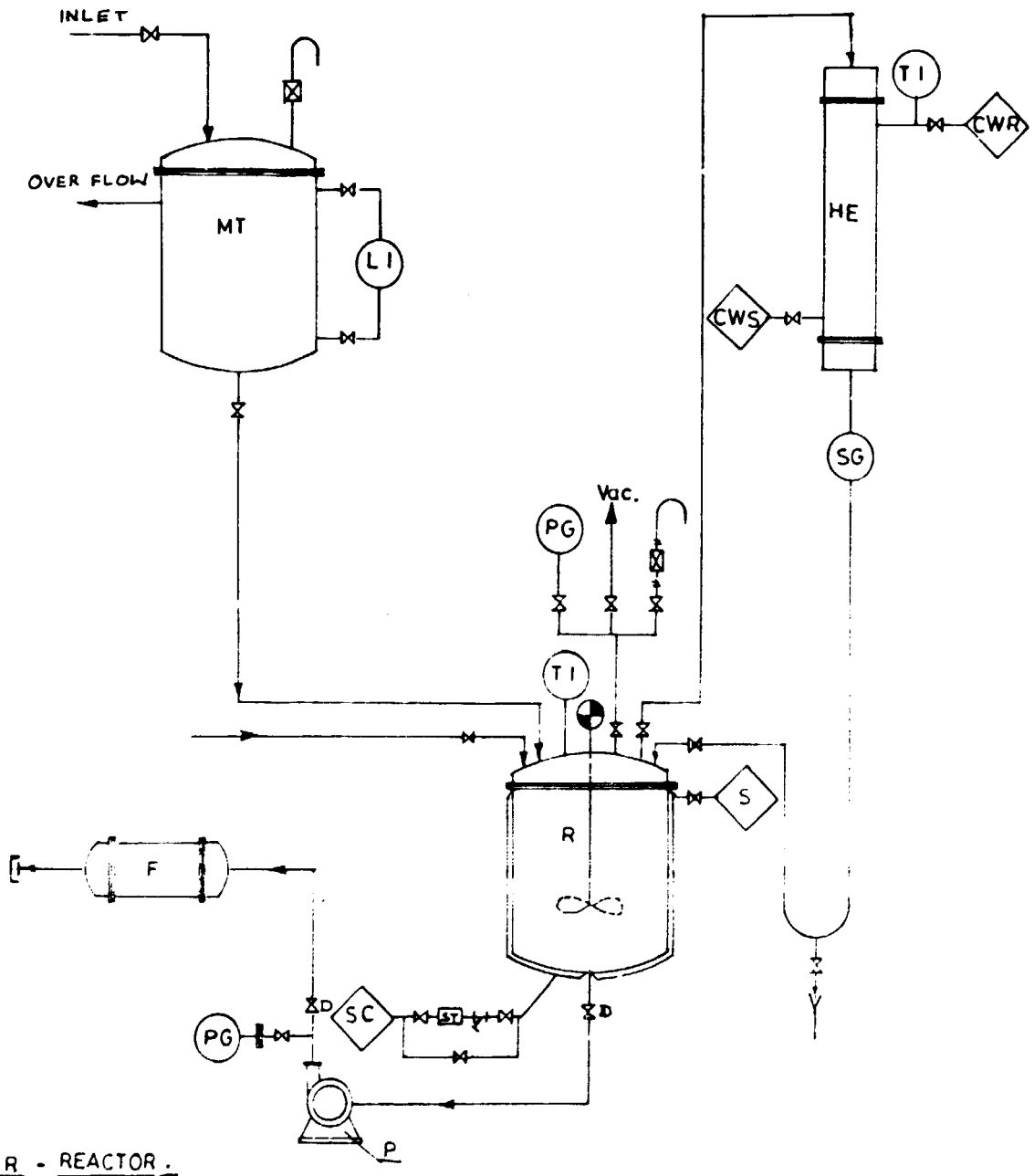
TENTATIVE EQUIPMENT LAY-OUT FOR MULTIPURPOSE PILOT PLANT IN NICARAGUA

DRN./DATE	CHKD./DATE	APPD/DATE
29.9.85		

VISHWAKARMA PROCESS TECHNIK (I) PVT. LTD.

NEW DELHI-110016, (INDIA)

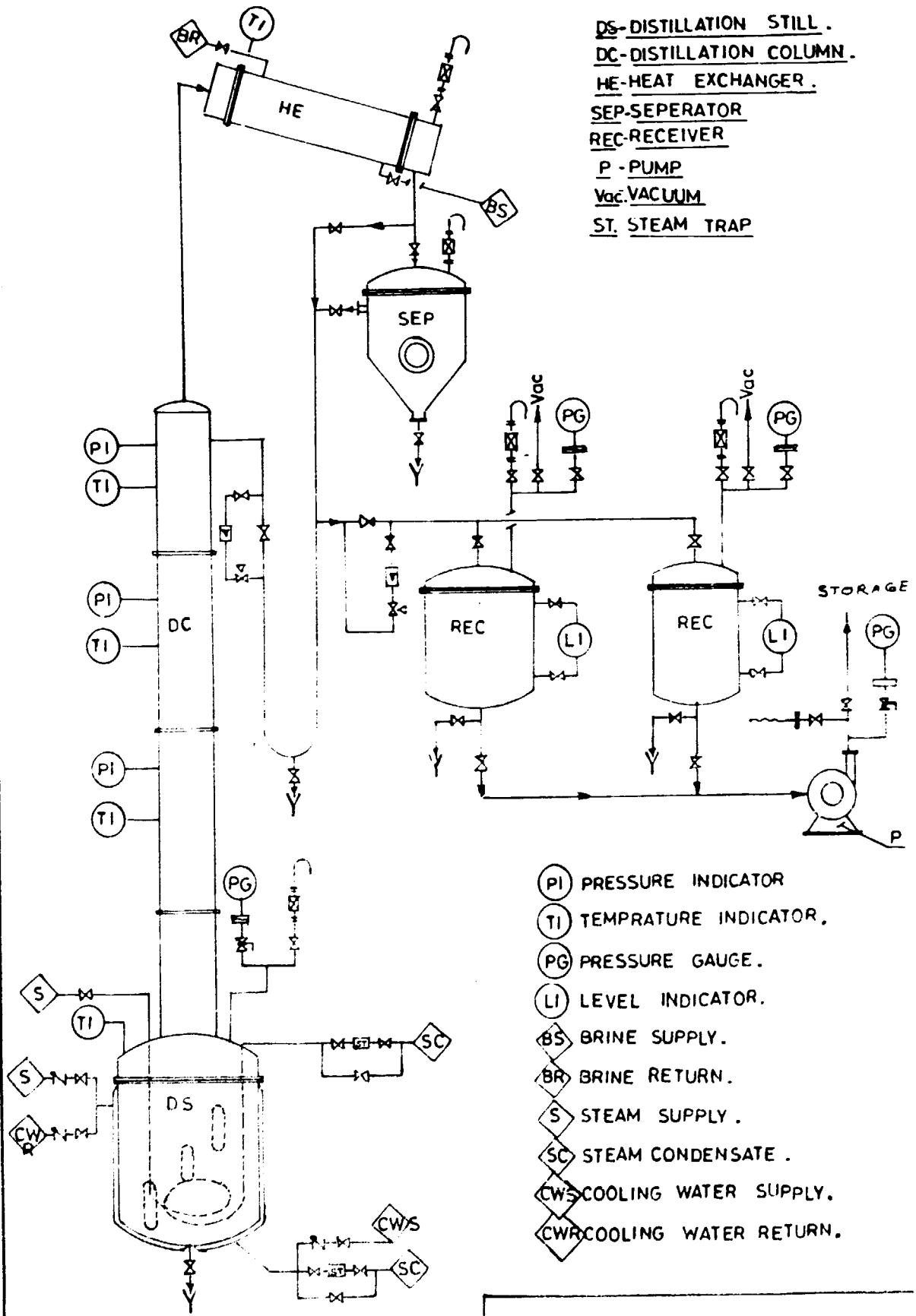
TYPICAL P & I D FOR REACTOR ASSEMBLY



R - REACTOR.
P - PUMP.
F - FILTER.
MT - MEASURING TANK.
HE - HEAT EXCHANGER.
SG - SIGHT GLASS.
TI - TEMPRATURE INDICATOR.
CWS - COOLING WATER SUPPLY.
CWR - COOLING WATER RETURN.
LI - LEVEL INDICATOR.
PG - PRESSURE GAUGE.
S - STEAM.
SC - STEAM CONDENSATE.
Vac. - VACUUM.
ST - STEAM TRAP

VISHWAKARMA PROCESS TECHNIK
(I) PVT. LTD.
NEW DELHI - 110016 (INDIA)

TYPICAL P & I D FOR SOLVENT RECOVERY UNIT



DS-DISTILLATION STILL.
DC-DISTILLATION COLUMN.
HE-HEAT EXCHANGER.
SEP-SEPERATOR
REC-RECEIVER
P - PUMP
Vac.VACUUM
ST. STEAM TRAP

(PI) PRESSURE INDICATOR
(TI) TEMPRATURE INDICATOR.
(PG) PRESSURE GAUGE.
(LI) LEVEL INDICATOR.
(BS) BRINE SUPPLY.
(BR) BRINE RETURN.
(S) STEAM SUPPLY.
(SC) STEAM CONDENSATE.
(CWS) COOLING WATER SUPPLY.
(CWR) COOLING WATER RETURN.

VISHWAKARMA PROCESS TECH (I) PVT. LTD.
NEW DELHI - 110015 (INDIA)

Annexure :5

Training Requirement Outside the Country

S.No.	Particulars	No.	Total Man-month
1.	Dy.Director (Factory Manager)	1	3
2.	Sr. Chemist	1	3
3.	Sr. Chemical Engineer	1	3
4.	Mechanical Engineer	1	3
5.	Foreman (production)	4	12
	T o t a l	8	24

Note ; Most of the operating staff shall be trained at site by the foreign experts and above personnel who have been trained abroad.

Training regarding safety, operation methods etc. can also be arranged in the educational institutions at the University of Leon or Technical Institute in Managua, whereas operational training shall be imparted at site.

Annexure :16

ESTIMATED COST OF THE PROJECT
(Multiupurpose Pilot Plant in Nicaragua)

S.No.	Description	Cost (in C$)	Cost (in US$)	Reference and Remarks
1.	Land, site development and all civil construction	26,700,000	534,000	Annexure 11. This expenditure shall be incurred in C$ except import of steel. Exchange rate taken 1 US$ = 50 C$
2.	Architect's fees		21,400	4% of 1.
3.	Plant and Machinery (Process and Utilities)			
	i) Imported	4,820,800	1,928,300	Anneuxre 12. The cost shown here are all inclusive of landed cost, erection and installation etc. The handling cost and internal freight (5%) is in C$.
	ii) Indigenous	14,500,000	290,000	Annexure : 13. The cost shown here are installed costs inclusive of all expenses.
	iii) Machinery, stores and spares		-	Included in 3(i) and 3(ii)
	Total of '3'	19,320,800	2,218,300	
4.	Technical Know-how fees		350,000	Inclusive of technology and engineering.
5.	Expenses on foreign technicians and training of Nicaraguan technicians abroad		130,000	

S.No.	Description	Cost (in C$)	Cost (in US$)	Reference and Remarks
6.	Miscellaneous Fixed Assets :			
	a) Furnitures	400,000	8,000	
	b) Office machinery and equipments		8,000	
	c) Miscellaneous tools and equipments including erection tools.		8,000	
	d) Cars, trucks, etc. (3 cars, one mini bus and one pick-up van)		30,000	
	e) Railway siding	-	-	
	f) Electrical Equipments	-	-	Cost included in 3(i) - installed cost
	g) Pipes and fittings	-	-	Erected cost included in 3(i)
	h) Laboratory equipments	-	-	ost included in 3(i)
	i) Workshop machinery	-	7,000	
	j) Fire fighting equipments	-	25,000	
	k) Effluent treatment and disposal	-	5,000	Part of the cost included 1 and 3(i
	l) Instruments, insulations and ventilations	-	-	Costs included in 3(i) and 3(ii).
	m) Telephone, telex etc.	-	8,000	
	n) Auxiliary materials for operating supplies like scoops, drums, trolleys etc.	500,000	10,000	
	Sub Total		109,000	
7.	Preliminary and Capital Issue expenses		25,000	
8.	Pre-operative Expenses			
	a) Establishments (salaries during construction)	3,500,000	70,000	
	b) General misellaneous expenses	1,000,000	20,000	

S.No.	Description	Cost (in C$)	Cost (in US$)	Reference and Remarks
	c) Start-up expenses	575,000	140,300	Cost of raw materials for 1 month and utilities 1 month at 60% capacity utilisation. The cost of utilities shall be spent in C$. Exchange rate 1 US$ = 50 C$).
	d) Interest during construction	12,100,000	242,000	Rate of interest in Nicaragua 22% for long term loan and 50% of the amount interest has been considered.
	Total of '8'		472,300	
9.	Contingency on non-firm items @ 10%	6,409,600	386,000	In the provision for escalation, wherever expenditures are in C$ has been considered. Details given in Annexure : 17.
10.	Margin Money on working capital	935,000	263,300	Annexure : 18
	Total Project Cost	71,440,400	4,509,300	
	Say		US $ 4.5 million.	

Financial Pattern

Assumed : Nicaragua Govt. expenses — US$ 2.2 million equivalent to C$ 110 million

Contributions : Sources of finance - as grants and aids from different countries including International organisations : US$ 2.3 million.

Note : It is assumed that the contribution from other sources shall not attract interest, whereas expenses from Government of Nicaragua shall attract 22 percent interest.

Annexure :17

ESTIMATION OF CONTINGENCY ESCALATION PROVISION

S.No.	Item	Cost considered US $		Reasons for considering cost as firm/non-firm.
		Firm	Non-firm	
1.	Land and site development and all civil construction	-	534,000	
2.	Architural fees	-	21,400	
3.	Plant and machinery			Since none of the items has yet been executed. All the costs elements have been considered as non-firm.
	Imported	-	1,928,300	
	Indigenous	-	290,000	
4.	Technical Know-how fees	-	350,000	
5.	Expenses on foreign technicians and training of Nicaraguan technicians	-	130,000	
6.	Miscellanous fixed assets	-	109,000	
7.	Preliminary expenses	-	25,000	
8.	Pre-operative expenses	-	472,300	
	T o t a l		3,860,000	

Contingency @ 10 percent of the non-firm expenditure totalling US$ 386,000.
Part of the contingency shall be in local currency i.e. C $ 6,409,600.

Annexure :18

WORKING CAPITAL AND MARGIN ON WORKING CAPITAL

S.No.	Items	Requirement in months	Amount at 90% capacity (US$)	Bank Finance (75%) US$	Margin (25%) (US$)	Margin (in C$)	Remarks
1.	Raw Materials	2.5	480,500	360,400	120,100		
2.	Operating supplies, laboratory chemicals and packaging materials (0.5% of the R.M.)	1.0	1,000	800	200	10,000	Expenditure in C$.
3.	Goods in process	0.5	114,300	85,700	28,600		
4.	Finished Goods	1.0	253,800	190,400	63,400	380,400	Local currency expenses in production cost is 12%
5.	Receivables	1.0	195,200	146,400	48,800	434,300	Local currency expenses cost of sales is 17.8%.
6.	Utilities	0.5	8,600	6,400	2,200	110,000	Cost of utility is in C$.
	T o t a l			790,100	263,300	934,700	

Margin money on working capital US$ 263,300

Note :/ Out of the total margin money US$ 18,700 shall be required in local currency (C$ 935,000)

Annexure : 19

CONSUMPTION OF RAW MATERIALS AND THEIR ANNUAL COSTS

S.No.	Name of Raw Material	Consumption (Kg/Kg)	Total Annual Consumption (Kg)	Price per kg US $	Total Value US $ ('000)
I.	**Acetyl Salicilic Acid (40 MT/annum)**				
1.	Salicylic Aicd	0.96	38,400	1.75	67.20
2.	Acetic Anhydride	0.95	38,000	1.06	40.28
3.	Sulphuric Acid	0.045	1,800	0.08	0.14
4.	Sodium Hydroxide lye 47%	0.035	1,400	0.22	0.31
	Sub Total				107.93
II.	**Diazepam 250 Kg**				
1.	Methyl Chloramino benzophenone	1.80	450	6.00	2.70
2.	Chloracetyl Chloride	0.81	202.5	13.25	2.68
3.	Benzene	2.16	540	0.44	0.24
4.	Acetone	0.43	107.5	0.56	0.06
5.	Hexamine	1.33	332.5	3.00	1.00
6.	Ethanol	15.75	3937.5	0.35	1.38
7.	Sodium bicarbonate	0.43	107.5	0.42	0.05
8.	Charcoal	0.27	67.5	1.00	0.07
9.	Filter Aid	0.045	11.35	1.00	0.01
	Sub Total				8.19

S.No.	Name of Raw Material	Consumption (Kg/Kg)	Total Annual Consumption (Kg.)	Price Per Kg. (US $)	Total Value US $ ('000)
III.	**Erythromycin (15 MT/annum)**				
1.	MIBK	2.94**	44,100	1.21	53.36
2.	TIOC	0.764	11,460	80.00	916.80
3.	Sodium lauryl sulphate	0.33	4,950	0.78	3.86
4.	Sodium hydroxide lye - 47%	0.22	3,300	0.22	0.73
5.	Propionic anhydride	0.18	2,700	0.64	1.73
6.	Charcoal	0.0046	69	1.00	0.07
7.	Filter	0.0046	69	1.00	0.07
	Sub Total				976.62
IV	**Mebendazole (6 MT/annum)**				
1.	Thiourea	0.48	2,880	2.00	5.76
2.	Methyl chloroformate	1.25	7,500	4.00	30.00
3.	Dimethyl sulphate	0.45	2,700	1.00	2.70
4.	3,4-Diamino benzophenone	0.87	5,220	30.00	156.60
5.	Acetic acid	0.85	5,100	0.60	3.06
6.	Charcoal	0.25	1,500	1.00	1.50
7.	Rectified spirit	4.00	24,000	0.55	13.20
8.	C.S.lye	1.50	9,000	0.22	1.98
	Sub Total				214.80
V	**Metronidazole (10 MT/annum)**				
1.	2-Methyl 5-nitroimidazole	1.30	13,000	15.00	195.00
2.	Formic acid	3.26	32,600	0.57	18.58
3.	Ethylene oxide	3.50	35,000	0.38	13.30
4.	Sodium hydroxide lye, 47%	6.75	67,500	0.22	14.85
5.	Charcoal	0.17	1,700	1.00	1.70
	Sub Total				243.43

** 60% recovery assumed.

S.No.	Name of Raw Material	Consumption (Kg/Kg)	Total Annual Consumption (Kg)	Price per Kg (US $)	Total Value US $ ('000)
VI.	**Nalidixic Acid (3MT/annum)**				
1.	2-Amino, 6-methyl pyridine	1.6	4,800	12.000	57.60
2.	Diethyl malonate	2.98	8,940	3.00	26.82
3.	Ethyl ortho formate	3.04	9,120	3.10	28.27
4.	Petroleum ether	3.30	9,900	0.30	2.97
5.	Sodium bicarbonate	0.20	600	0.42	0.25
6.	Diphenyl ther	1.00	3,000	2.68	8.04
7.	N,N-Dimethyl formamide	1.00	3,000	1.37	4.11
8.	Sodium carbonate	1.06	3,180	0.16	0.51
9.	Sodium hydroxide, flakes	0.50	1,800	0.55	0.99
10.	Hydrochloric acid, 30%	0.12	360	0.11	0.04
11.	Acetic acid	1.70	5,100	0.60	3.06
12.	Charcoal	0.02	60	1.00	0.06
	Sub Total				132.72
VII.	**Paracetamol (10 MT/annum)**				
1.	p-Aminophenol	0.8	8,000	4.70	37.60
2.	Acetic anhydride	1.00	10,000	1.06	10.60
3.	Sodium hydrosulphite	0.013	180	1.41	0.25
4.	Charcoal	0.03	300	1.00	0.30
	Sub Total				48,75
VIII.	**Propranolol (200 Kg/annum)**				
1.	α - napthol	1.21	242	10.00	2.42
2.	Epichlorohydrine	1.42	284	1.9	0.54
3.	Sodium hydroxide	0.40	80	0.55	0.04
4.	Isopropylamine	1.35	270	2.10	0.57
5.	Ethanol	5.20	1,040	0.35	0.36
6.	Henzene	1.40	280	0.44	0.12

S.No.	Name of Raw Material	Consumption (Kg/Kg)	Total Annual Consumption (Kg)	Price per Kg (US $)	Total Value US $ ('000)
7.	Charcoal	0.04	8	1.00	0.01
8.	Hydrochloric Acid, 30%	0.14	28	0.11	-
9.	Isopropyl alcohol	0.60	120	4.00	0.22
10.	Acetone*	0.80	160	0.56	0.09
11.	Filter Aid	0.04	8	1.00	-
12.	N_2 - gas	4 cm	8	-	-
	Sub Total				4.37
IX.	**Sulphamethoxazole (20 MT/annum)**				
1.	Acetyl sulphachloride	1.8	36,000	4.0	144.00
2.	5-methyl 3-amino isoxazole	0.75	15,000	22.30	334.50
3.	Benzene	0.33	6,600	0.44	2.90
4.	Charcoal	0.1	2,000	1.00	2.00
5.	MIBK	0.76	15,200	1.21	18.39
6.	Pyridine	0.97	19,400	2.00	38.80
7.	Sodium hydrosulphite	0.06	1,200	1.55	1.86
8.	Sodium hydroside flakes	0.07	1,400	0.55	0.77
	Sub Total				543.22
IX.	**Trimethoporim (4 MT/annum)**				
1.	Acetic acid	0.80	3,200	0.60	1.92
2.	Acrylonitrile	0.40	1,600	1.12	1.79
3.	Charcoal	0.10	400	1.00	0.40
4.	Ag. Ammonia	0.15	600	0.23	0.14

S.No.	Name of Raw material	Consum-ption (Kg/Kg)	Total Annual Conu-mption (Kg)	Price per Kg	Total Value US $ ('000)
5.	Dymethyl sulphoxide	1.00	4,000	1.89	7.56
6.	Guanidine nitrate	1.00	4,000	1.40	5.60
7.	Methanol	5.00*	20,000	0.29	5.80
8.	Morpholine	0.60	2,400	2.46	5.91
9.	Sodium hydroxide lye, 47%	0.41	1,460	0.22	0.36
10.	Sodium methoxide	0.60	2,400	2.00	4.80
11.	3,4,5-Trimethoxy benzaldehyde	1.00	4,000	25.17	100.68
12.	Aniline	0.5	2,000	1.25	2.5
	Sub Total				137.46

* 50% recovery asumed. ** 60% recovery assumed.

(Amount in US $)

1.	Total CIF cost (I - IX)	2,417,490
2.	Add : Handling charges in Nicaragua (5% of CIF Cost)	120,875
3.	Add : Inland freight (1% of CIF cost)	24,175
	Grand Total (1 - 3)	2,562,540
	Say :	2,562,600

ANNEXURE : 20

COST OF ENERGY

S.No.	Item	Annual requirment	Rate per unit (C$)	Annual Cost (C$)	Basis
1.	Furnace Oil	600 m^3	8,045	4,827,000	Cost of Furnace oil in Nicaragua is 29 C$ per U.S. gallon. Taken 1 m^3 = 264.2 U.S.gallon. 5% transportation cost added.
2.	Electric Energy	2,232,000 KWH	2.98	6,651,360	Cost of electric energy provided by the Ministry of Industry, Nicaragua.
	T o t a l			11,478,360	

Notes : i) It is assumed that all the power shall be drawn from main supply and no provision of diesel generator kept.

ii) For steam generation, fuel oil No. 6 shall be used.

REQUIREMENT OF UTILITIES

S.No.	Name of Utility	Unit	Average Consumption per hour					Average Load unit/hr	Peak Load unit/hr.	Annual Requirement	Selected Capacity
			Process Streams			Solvent Recovery	Utility Systems				
			I	II	III						
1.	Steam	Ton	0.3	0.2	0.6	0.4	-	1.5	2.4	10,800	3 Tons/hr
2.	Electric energy	KWH	15	20	25	-	250	310	400	2,232,000	500 KVA
3.	Chilled Brine (-5°C)	TR	3	8	6	8	-	25	35	180,000	40 TR
4.	Cooling water (28°C) (process)	m^3	4	8	8	10	6	36	50	12,960*	60 m^3/hr
5.	Cooling water (28°C) for chilled Brine	TR (m^3)	6	8	6	15	-	12	20	4,300*	30 m^3/hr
6.	Deionised water	m^3	-	1.5	-	-	3	3.5	6	32,400	6 m^3/hr
7.	Process water	m^3	-	5.5	-	-	4.5	10	10	75,000	20 m^3/hr

*Only make-up water due to drift losses (5%) has been considered.

Annexure:21

MAN POWER AND SALARY

S.No.	Category	Qualifications	Number	Salary per month (C $)	* Total Annual Salary (C $)
A.	**General Administration & Engineering Services**				
1.	Director	Chemical Engineer	1	28,000	386,400
2.	Dy. Director	M.S. (Chemistry)/ Chemical Engineer	1	25,000	345,000
3.	Senior Chemical Engineers	B.S./M.S.	1	23,000	317,400
4.	Senior Mechanical Engineer	B.S./M.S.	1	23,000	317,400
5.	Senior Electrical Engineer	B.S./M.S.	1	23,000	317,400
6.	Senior Civil Engineer	B.S./M.S.	1	20,000	276,000
7.	Senior Chemist	M.S.	1	23,000	317,400
8.	Chemical Engineer	B.S./M.S.	1	20,000	276,000
9.	Chemist	B.S./M.S.	1	20,000	276,000
10.	Finance Officer	B.S. (Commercial)/Economics)	1	20,000	276,000
11.	Commercial Officer	B.S. (Commerce)	1	20,000	276,000
12.	Administrative Officer	B.S. (Social Science)	1	20,000	276,000
13.	Office Staff	B.S./School	9	10,000	1,242,000
14.	Semi-skilled	-	3	7,500	310,500
15.	Security-in-charge		1	10,000	138,000
16.	Security Guards		4	5,000	276,000
	Sub Total		29		5,623,500

Say : C$ 5,650,000 = US$ 113,000 (C$ 50 = US$ 1)

S.No.	Category	Qualifications	Number	Salary per month (C $)	* Total Annual Salary (C $)
B.	**Production and Engineering Services**				
1.	Supervisor	B.S.(Science)	4	15,000	828,000
	Production				
2.	Skilled	B.S./School (Science)	15	10,000	2,070,000
3.	Semi-skilled	Science (school)	25	7,500	2,587,500
4.	Un-skilled	-	10	5,000	690,000
	Laboratory				
5.	Skilled	B.S./M.S.(Science)	6	10,000	828,000
6.	Un-skilled	-	3	5,000	207,000
	Utilities				
7.	Skilled	Diploma/Training (industrial) in engg.	16	10,000	2,208,000
8.	Semi-skilled	School	6	7,500	621,000
9.	Un-skilled	-	6	5,000	414,000
	Sub Total		91		10,453,500
				Say : C$ 10,450,000 =	US$ 209,000
	* The annual gross salary has been calculated by adding 15 percent for perks.	**Grand Total**			**US $ 322,000**

Annexure :22

COST OF PRODUCTION AND FINANCIAL RESULTS

(US$ '000) (US

S.No.	Operating Years	1	2	3	4	5
	Capacity Utilisation	60%	75%	90%	90%	90%
	Raw Materials	1538	1922	2306	2306	2306
	Operating supplies, packaging materials and laboratory chemicals (0.5% of raw materials)	8	10	12	12	12
A.	Total of Materials Costs	1546	1932	2318	2318	2318
	Utilities					
	Electric Energy	80	100	120	120	120
	Furnace oil	58	72	87	87	87
B.	Total of Utilities Cost	138	172	207	207	207
C.	Wages and Salaries	90-	113	124	136	150
	Over heads					
	Repairs and maintenance (@ 3% P & M)	16	32	63	63	63
	Rent, rates, taxes, insurance (1.5% of P & M)	16	32	32	32	32
D.	Total Over heads	32	64	95	95	95
E.	Cost of production (A + B + C + D)	1816	2281	2744	2756	2770
	Administrative expenses and salaries					
	Salaries	126	209	230	230	230
	General and miscellaneous expenses	40	60	60	60	60
F.	Total Administrative Expenses	166	269	290	290	290

S.No.	Operating Years	1	2	3	4	5
	Sales Expenses					
	Salaries					
	Sales Commission/discounts					
	Promotional Expenses					
G.	Total Sales Expenses (0.5% of selling price)	8	10	12	12	12
H.	Cost of Sales	1980	2560	3046	3058	3072
I.	Sales	1791	2239	2686	2686	2686
J.	Gross Profit	(-) 189	(-) 321	(-) 360	(-) 372	(-) 386
	Interest on loan	484	484	484	484	484
	Interest on working capital borrowings	79	99	118	119	118
K.	Total Interest	563	583	602	603	602
L.	Depreciation	382	382	382	382	382
M.	Operating Profit	(-) 1134	(-) 1286	(-) 1344	(-) 1357	(-) 1370

Annexure : 23

INTEREST ON LOAN AND WORKING CAPITAL BORROWINGS

(In US$ - actual expenes in C$)

Year of Production	Outstanding loan	Repayment	Interest @ 22%	Working Capital Borrowings	Interest@ 15% p.a.
1	2,200,000	-	484,000	526,700	79,000
2	2,200,000	-	484,000	658,400	98,760
3	2,200,000	-	484,000	790,100	118,500
4	2,200,000	-	484,000	790,100	118,500
5	2,200,000	-	484,000	790,100	118,500

Note ; Interest rate in Nicaragua :

Long Term Loan	22% p.a.
Short term Loan	15% p.a.

COMPARISON OF COSTS PER KG. OF DRUGS

(Production cost vs. Import prices)

Annexure : 24

(US$)

S.No.	Item	Acetyl salicylic Acid	Diazepam	Erythro mycin	Mebenda-zole	Metro-nidazole	Nalidixic-acid	Para-cetamol	Propa nolol	Sulpha-methoxa-zole	Trime-thoprim
1.	Cost of Raw Material	2.86	34.73	69.01	37.95	25.80	46.89	5.17	23.16	28.79	36.43
2.	Cost of packaging, operating supplies laboratory chemicals	0.01	0.17	0.34	0.19	0.13	0.23	0.03	0.11	0.14	0.18
3.	Cost of Utilities	0.30	2.76	6.90	4.22	3.15	5.21	0.33	1.95	1.15	3.62
4.	Salaries & Production, overheads	0.28	2.63	6.57	4.01	3.00	4.96	0.32	1.86	1.10	3.45
5.	Cost of production	3.45	40.29	82.82	46.37	32.08	57.29	5.85	27.08	31.18	43.68
6.	Administrative & selling expenses & overheads	0.39	3.62	9.06	5.54	4.14	6.84	0.44	2.57	1.51	4.75
7.	Product cost/kg before depreciation & interes	3.84	43.91	91.88	51.94	36.22	64.13	6.29	29.65	32.69	48.43
8.	Depreciation	0.50	4.58	11.46	7.00	5.23	8.66	0.55	3.25	1.91	6.01
9.	Interests	0.78	7.22	18.06	11.04	8.25	13.64	0.87	5.12	3.01	9.48
10.	Product cost/Kg after depreciation & interest	5.12	55.71	121.4	69.98	49.7	86.43	7.71	38.02	37.61	63.92
11.	C.I.F. Price/Kg.	3.70	35.00	85.00	50.50	38.50	64.00	4.10	25.00	14.00	44.50

Annexure : 25

VALUE OF SALES WITH VARIABLE CUSTOMS DUTIES

(US $)

S.No.	Customs Duty at Nicaragua	Pilot Plant Operation		Commercial Plant Operation*	
		at 100%	at 90%	at 100%	at 90%
1.	Present C.I.F. prices + 5% Handling Charges	2,984,700	2,686,230	3,581,640	3,223,476
2.	50%	4,477,050	4,029,345	5,372,460	4,835,214
3.	70%	5,073,990	4,566,591	6,088,788	5,479,909
4.	100%	5,969,400	5,372,460	7,163,280	6,446,952

* If this plant is utilised to manufacture difinite products, there may be saving of nearly 20% working days per annum which is otherwise lost for changing over and cleaning from product to product as well as Research and Development efforts in case of pilot plant.

Annexure : 26

PROJECTED FINANCIAL RESULTS ASSUMING VARIOUS SELLING PRICES

(By Adding Customs Duties) IN PILOT PLANT

Only Third Year of Operation at 90% Capacity Utilisation

(US$ in '000)

S.No.	Description	Assumed Selling Prices at Various rates of Customs Duty			
		Present Value No. Customs duty only 50% handling Charges	50% Customs Duty	70% Customs Duty	100% Customs Duty
1.	Value of Sales	2,686	4,029	4,567	5,372
2.	Cost of Sales (Selling Price)	3,046	3,046	3,046	3,046
3.	Gross Profit	(-) 360	(+) 983	(+) 1,521	(+) 2,326
	Interest on loan	484	484	484	484
	Interest on working capital borrowings	118	118	118	118
4.	Total Interes	602	602	602	602
5.	Depreciation	382	382	382	382
6.	Operating Profit	(-) 1,134	(-)1	537	1,342

Annexure 27

PROJECTED FINANCIAL RESULTS ASSUMING VARIOUS SELLING PRICES

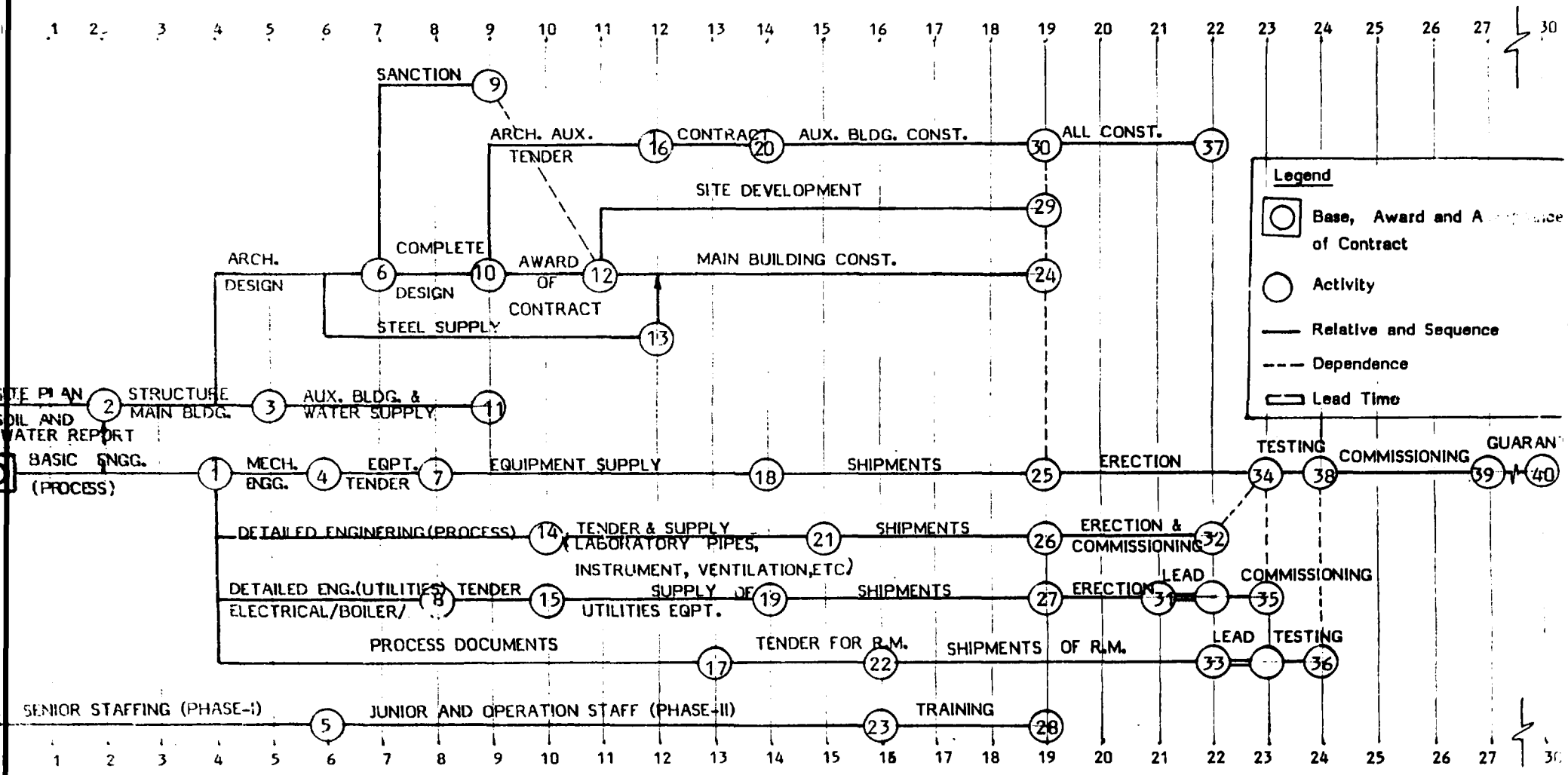
(By adding customs duties) IN COMMERCIAL PLANT

(Only third year of operation at 90% capacity utilisation)

(US$ in '000)

S.No.	Description	Assumed Selling Prices at Various rates of Customs Duty			
		Present value No. customs duty only 5% handling charges	50% Customs duty	70% Customs Duty	100% Customs Duty
1.	Sales Value	3,223	4,835	5,480	6,447
2.	Cost of Materials	2,782	2,782	2,782	2,782
3.	Cost of Utilities	248	248	248	248
4.	All other expenses	397	397	397	397
5.	Cost of Sales	3,427	3,427	3,427	3,427
6.	Gross Profit	(-)204	1,408	2,053	3,020
	Interest on Loan	484	484	484	484
	Interest on working Capital Borrowings	142	142	142	142
7.	Total Interest	626	626	626	626
8.	Depreciation	382	382	382	382
9.	Operating Profit	(-)1,212	400	1,008	2,012

PERT CHART FOR MULTI PURPOSE PILOT PLANT IN NICARAGUA



Abbreviation

A/CR : Airconditioning and Refrigeration
MECH.ENG. Mechnical Engineering
CONST. : Construction
R.W. : Raw Material
AUX. BLDG. : Auxiliary Building
ARCH. : Architecture

APPD.	
CHKD.	
DTD.	25.9.85

VISHWAKARMA PROCESS TECHNIK (I) PVT LT
9/4, SARVAPRIYA VIHAR, NEW DELHI
INDIA

Annexure 29

TEAM OF EXPERTS
OF
VISHWAKARMA PROCESS TECHNIK (I) PVT. LIMITED
NEW DELHI, INDIA
VISITED NICARAGUA IN 1985

1. Dr. L.K. Behl
   M.Sc. (Tech.), Dr. Ing.
   Director

2. Dr. J.M. Sehgal
   M.Sc., Ph.D.
   Advisor

3. Mr. G.B. Pradhan
   B.Sc. (Hons.), B. Tech., M. Tech.
   Technical Manager

4. Mr. N. Goyal
   Architect

Annexure 30

PERSONS AND PLACES VISITED

1. MINISTRY OF HEALTH/MINSA - MINISTERIO DE SALUD

   Dr. Carras Quintta, O,
   Director, Division Farmaceutica

   Mr. Baez, F.,
   Director

2. MINISTRY OF INDUSTRY (MIND - MINISTERIO DE INDUSTRIAS)

   Mr. Guzman, G.,
   Vice-Ministro - Director de Industria (COIP)

   Mr. Callejas, D.,
   Director General

   Mr. Reyes, R.,
   Direcion General de la Industria Farmaceutica

3. COFARMA - (CORPORACION FARMACEUTICA)

4. LABORATORIO SOLKA

5. PROYECTOS INDUSTRIAES S.A. - PROISA

6. INDUSTRIAS METALURGICAS DEL PUEBLO, S.A. - IMEP

7. UNIVERSIDAD NACIONAL AUTONOMA DE NICARAGUA (UNAN) - CAMPUS MEDICO - LEON.

8. LABORATORIOS RARPE

9. LABORATORIOS RECIPE

10. LABORATORIOS FRECH

11. LABORATORIOS DIVINA

12. LABORATORIOS RAMOS

13. LABORATORIOS BENGOECHEA

14. WHO/PAHO/OMS/OPS
Dr. Marquoz, M.A., Representate Residente.

15. MINISTRY OF CONSTRUCTION

16. BANCO CENTRAL DE NICARAGUA

17. UNDP - MANAGUA
Mr. Henry Meyer, Resident Representative

18. EMPRESA AGROINDUSTRIAL "CLAUDIA CHAMORRO"

- IFRUGALASA MIDINR - REGION - IV, GRANADA

Annexure 31

LIST OF REFERENCES

1. Comprehensive Development Program for the Pharmaceutical Sector in Nicaragua.
Volumes I, II and III, -
Terminal Reports, UNIDO 1985
Dr. Miksa S. Almasi et. el.

2. Comprehensive Development Program for the Pharmaceutical Sector in Nicaragua.
DP1/2NIC/831004/11 - 54,
Technical Report, UNIDO, 1985.
Dr. Miksa S. Almasi et. al.

3. AMPLIACION PROYECTO, TEXNICSA - I and II,
PROISA, Abril, 1985.

4. ADQUISICION Y DISTRIBUCION DE MEDICAMENTOS (ESTUDIO Y PROGRAMA) EN NICARAGUA. DP/NIC/83/004/11-51, 52 Y53 (32 L.D.)
Informe Terminal - UNIDO, 1983.
Dr. T. Paal.

5. GOBIERNO DE RECONSTRUCCION NACIONAL - 1980, MINISTERIO DE INDUSTRIA, Asesoria Legal, Nicaragua.

6. Banco Central de Nicaragua - NORMAS MONETARIAS, 1985, MANAGUA.

7. LEY DE IMPUESTO SOBRE LA RENTA, DECRETO NO. 662. TITULO I, Ministerio Industria, Nicaragua.

8. Norms for Wages and Salary - Ministry of Labour (MINISTERIO DE TRABAJO) - Nicaragua.

9. Final Report - Feasibility Study for the Estabilishment of International Centre for Information, Training and Development of Pharmaceutical Technology (ITPT) UNIDO Project UC/INT/82/102, 1983.

10. Manual for the Preparation of Industrial Feasibility Studies, UNIDO, 1978.