

## 付 属 資 料

資料1. ミニッツ

資料2. 鉱業法改正案（抄訳）

資料3. INGEOMINASの予算推移



資料1. ミニッツ

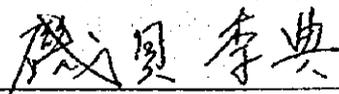
MINUTES OF DISCUSSIONS  
BETWEEN THE JAPANESE SUPPLEMENTARY STUDY TEAM  
AND AUTHORITIES CONCERNED OF  
THE GOVERNMENT OF THE REPUBLIC OF COLOMBIA  
ON JAPANESE TECHNICAL COOPERATION FOR  
THE PROJECT ON THE IMPROVEMENT OF MINERAL PROCESSING TECHNOLOGY  
CONCERNING MEDIUM AND SMALL-SCALE MINES

The Japanese Supplementary Study Team organized by the Japan International Cooperation Agency and headed by Mr. Toshinori Isogai (hereinafter referred to as "the Team") visited the Republic of Colombia from April 11, 1998 to April 23, 1998 for the purpose of working out the details of the technical cooperation regarding the Project on the Improvement of Mineral Processing Technology Concerning Medium and Small-Scale Mines.

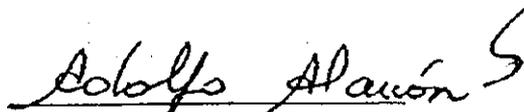
During its stay in the Republic of Colombia, the Team exchanged views and had a series of discussions with the authorities concerned of the Government of the Republic of Colombia.

As a result of the discussions, both sides came to reach a common understanding concerning the matters referred to in the document attached hereto.

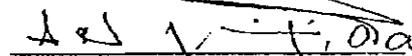
Santafe de Bogota, D.C., April 20, 1998



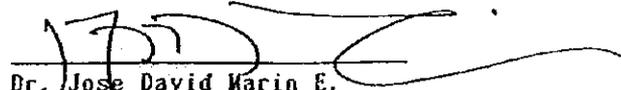
Mr. Toshinori Isogai  
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Dr. Adolfo Alarcón Guzmán  
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Dr. Francisco Jose Grijalba  
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The Republic of Colombia



Dr. Jose David Marin E.  
General Director  
Colombia International Cooperation  
Agency [ACCI]

The Republic of Colombia

THE ATTACHED DOCUMENT

1. Title of the Project

As to the title of the Project, both sides confirmed the following:

"The Project on the Improvement of Mineral Processing Technology Concerning Medium and Small-Scale Mines in the Republic of Colombia" (hereinafter referred to as "the Project").

2. Agency Responsible for the Implementation of the Project

As to the Colombian agency responsible for the implementation of the Project, both sides confirmed the following:

"The Institute for Research in Geosciences, Mining and Chemistry [Instituto de Investigaciones en Geociencias, Minería y Química] (hereinafter referred to as "INGEOMINAS") will bear overall responsibility for the implementation of the Project in cooperation with the Colombian Minerals Company [Minerales de Colombia S.A.] (hereinafter referred to as "MINERALCO") and under the supervision of the Ministry of Mining and Energy [Ministerio de Minas y Energía] (hereinafter referred to as "MINMINAS")."

The present organization chart of MINMINAS is as shown in Annex 1-1.

The present organization chart of INGEOMINAS is as shown in Annex 1-2.

The present organization chart of MINERALCO is as shown in Annex 1-3.

3. Administration of the Project

As to the administration of the Project, both sides confirmed the following assignment of the posts and establishment of the committees under the organization system as shown in Annex 2:

① General Director of INGEOMINAS, as the Project Director, will bear overall responsibility for the administration and implementation of

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the Project;

- ② Director of the Chemistry Division of INGEOMINAS, as the Project Manager in the headquarters, will be responsible for the managerial and technical support of the Project;
- ③ Chief of the Regional Operative Unit of INGEOMINAS in Cali, as the Project Manager on site, will be responsible for the managerial and technical matters of the Project;
- ④ The Joint Coordinating Committee, for smooth administration of the Project, is as shown in Annex 3; and
- ⑤ The Joint Operating Committee, for effective and successful operation of the Project, is as shown in Annex 4.

#### 4. Duration of the Japanese Technical Cooperation for the Project

Both sides confirmed that the duration of the technical cooperation for the Project by the Government of Japan would be three (3) years from the date agreed by both sides in the Record of Discussions (hereinafter referred to as "the R/D") to be concluded between JICA and the Colombian side.

#### 5. Site of the Project

Both sides confirmed that the Project would be implemented at the compound of the Regional Operative Unit of INGEOMINAS in Cali (Unidad Operativa de Cali, INGEOMINAS) (hereinafter referred to as "INGEOMINAS-Cali").

#### 6. Master Plan of the Project

As to the master plan of the Project, both sides agreed to the following:

##### (1) Objective of the Project

##### a. Overall Goal of the Project

The operational situation of the medium, small and petty-scale mining activities at the regional gold mining areas will be improved.

b. Purpose of the Project

The situation capable of receiving the technical guidance on the improvement of mill operation at the medium, small and petty-scale mines in the gold mining areas will be realized.

(2) Output of the Project

0. A project operation unit will be established.
1. Mobile milling test facilities will be installed and maintained.
2. Engineers and scientists in charge of the technical guidance on the improvement of mill operation including environmental control will be trained.
3. The guidelines on the improvement of mill operation including environmental control will be proposed to the mines and mills projected.

(3) Activities of the Project

- 0-1. Allocation of personnel and budget based on the schedule.
- 0-2. Establishment of a Joint Coordinating Committee.
- 0-3. Establishment of a Joint Operating Committee.
  
- 1-1. Planning and procurement of machinery and facilities.
- 1-2. Installation and maintenance of the machinery and equipment.
- 1-3. Preparation of the manuals necessary for operation and maintenance of the machinery and equipment.
  
- 2-1. Arrangement of a stable supply of ore samples projected.
- 2-2. Investigation of the mineral processing characteristics of the ores projected by laboratory scale.
- 2-3. Determination of the optimum conditions for effective milling operation of the ores projected by the operation of the mobile

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milling test facilities.

- 2-4. Determination of the optimum conditions concerning waste water treatment process at the mines and mills in the regional gold mining areas.
  - 2-5. Preparation of the manuals necessary for the milling and waste water treatment tests.
  - 2-6. Formulation of the materials necessary for the technical guidance on the improvement of mill operation including waste water treatment at the mills located in the regional gold mining areas.
  - 2-7. Formulation of the guidelines necessary for the technical guidance on mill operation and waste water treatment.
- 
- 3-1. Technical guidance and/or consultation to the mines and mills projected.
  - 3-2. Formulation of guidelines on the improvement of mill operation of the mines projected.
  - 3-3 Implementation of the seminars concerning the Project.

(4) Project Cycle Management

Both sides drew up the draft of the Project Design Matrix (hereinafter referred to as "PDM") as shown in Annex 5.

Furthermore, both sides agreed on the following:

- a. A project planning and concept clarification method entitled Project Cycle Management (hereinafter referred to as "PCM") will be applied to the Project to monitor and evaluate the level of achievement and enhance communication for its smooth implementation; and
- b. PDM should continue to be reviewed as the common reference/communication tool to realize the PCM and to be further discussed between the Colombian side and the Japanese experts.

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## 7. Fields of Technology Transfer

### (1) Fields of Technology Transfer

Both sides confirmed that the technology transfer from the Japanese experts to the Colombian counterpart personnel will be in the following fields:

- A. Method of investigation on the characteristics concerning mineral processing process by laboratory scale.
  - 1) Mineralogical study.
  - 2) Study by chemical analysis.
  - 3) Basic amenability study on mineral processing necessary for the operation of the mobile milling test facilities.
- B. Method of determination on the optimum conditions concerning mineral processing operation of the ores projected by the operation of the mobile milling test facilities.
  - 1) Crushing and screening process.
  - 2) Grinding and classifying process.
  - 3) Flotation process.
  - 4) Cyanidation process.
  - 5) Zinc substitution process.
  - 6) Adsorption and elution process.
  - 7) Electro-winning process.
  - 8) Smelting and refining process.
- C. Method of improvement on the operational conditions concerning waste water treatment process at the mines and mills in the regional gold mining areas.
- D. Method of formulation of the materials necessary for the technical guidance on the improvement of mill operation including environmental control at the mills located in the regional gold mining areas.

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In this connection, the Team proposed to the Colombian side and the latter agreed to the content, the draft of Technical Cooperation Program (hereinafter referred to as "TCP") and Plan of Operations (hereinafter referred to as "PO") for the Project as shown in Annex 6 and Annex 7 respectively.

(2) Methodology of Technology Transfer

Both sides confirmed that the technology transfer would be normally conducted through the following methods:

- a. Lectures and seminars at INGEOMINAS-Cali;
- b. Practical training by the operation of the Mobile Milling Test Facilities;
- c. On the job training through the implementation of the functions of INGEOMINAS-Cali; and
- d. Training in Japan.

8. Measures to be taken by the Japanese Side

The Team explained and the Colombian side understood that the Project would be carried out through JICA and according to the normal procedures of the Project-type Technical Cooperation Scheme by the Government of Japan such as the following three components.

(1) Dispatch of Japanese Experts

The following Japanese experts will be dispatched:

- a. Long-term Experts
  - 1) Chief Advisor
  - 2) Coordinator
  - 3) Expert on mineral processing technology

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4) Expert on waste water treatment technology

b. Short-term Experts

Short-term experts in specific fields will be dispatched in relation to the fields of technology transfer as necessity arises.

(2) Training of the Colombian Counterpart Personnel in Japan

A certain number of the Colombian counterpart personnel will be accepted for training in Japan during the cooperation period according to the following program:

a. Number

A certain number (about 1~2 persons) yearly.

b. Term

About three (3) weeks to three (3) months.

c. Fields

- 1) Mill operation technology.
- 2) Treatment of waste water from mines and mills.
- 3) Site survey of mines, mills and smelters.
- 4) Administration concerning mine pollution control.

(3) Provision of Machinery and Equipment

Both sides worked out jointly the list of the machinery, equipment and other materials (hereinafter referred to as "the Equipment") necessary for the implementation of the Project as shown in Annex 8 according to the flowchart of the mobile milling test facilities as shown in Annex 9-1, Annex 9-2 and Annex 9-3, and the concept agreed with both sides and composed of three (3) conditions, that is, ① Effective utilization of the Equipment provided during the Project Phase-I, if possible, ② No consideration on the unfeasible process economically such as a autoclave leaching process, and ③ Application of the cyanidation process including a conventional process, a CIP process and a CIC process.

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Based on the results of the classification, that is, which side is to provide those items as described in Annex 8, the Colombian side requested the provision of the Equipment which is classified into the Japanese side from the Government of Japan, in condition that the specific gravity separators with an appropriate capacity in the circuit of the mobile milling test facilities should be considered in the course of the Project.

The Team agreed to convey the request from the Colombian side on this matter to the Japanese authorities concerned, stating that the actual provision will be subject to the budget appropriation of the Government of Japan.

The Team explained and the Colombian side agreed that the costs and responsibility necessary for domestic transportation, installation and maintenance of the Equipment as well as the customs duties and the bonded warehouse charge of the Equipment should be borne by the Colombian side.

In relation to the provision of the Equipment requested by the Colombian side, both sides discussed and formulated jointly the provisional specifications of that equipment as shown in Annex 10.

In this connection, the Team requested the Colombian side to submit the estimation of the equipment listed in Annex 10 to the JICA Colombia Office by the end of July 1998 in order to examine a possibility of procurement of that equipment in Colombia.

#### 9. Measures to be taken by the Colombian Side

##### (1) Buildings and Facilities for the Project

The Colombian side confirmed that the renovation works of the buildings and facilities necessary for the implementation of the Project would be completed before the arrival of the Equipment provided by the Japanese side at the site of the Project.

Both sides discussed and drew up jointly the space plan for the installation of the Equipment as shown in Annex 11 and the necessary conditions for utilities of the mobile milling test facilities as shown in Annex 12.

The Colombian side explained that the office for the Japanese experts equipped with office equipment properly would be prepared before the arrival of the Japanese experts.

(2) Machinery, Equipment and Materials

The Colombian side confirmed that the machinery, equipment, instruments, vehicles, tools, spare parts and any other materials necessary for the implementation of the Project other than those provided by the Government of Japan through JICA would be supplied or replaced at its own expenses.

(3) Assignment of Counterpart Personnel

For the successful implementation of the Project, the Colombian side explained that they would provide the services of the counterpart personnel and administrative personnel as listed in Annex 13-1 and Annex 13-2.

The Team stated that the stability of the counterpart personnel is the most important key for the success of the Project, and thus the counterpart personnel should be the permanent staff if possible.

(4) Local Costs

The Colombian side explained a tentative plan for the appropriation of local costs to implement the Project under the basic understanding that the necessary amount of the local costs by the Colombian side will be indispensable for the successful implementation of the Project as shown in Annex 14.

(5) Supply of the Ore Samples and Management of the Products

The Colombian side confirmed that a stable supply of the ore samples is necessary for the implementation of the Project and the strict management of the products including concentrates, middlings, tailings, sludges, chemical solutions etc. produced at the site of the Project would be carried out under the responsibility of the Colombian side.

The outlines of the ores samples projected tentatively are described in Annex 15.

(6) Privileges, Exemptions and Benefits to the Japanese Experts

In accordance with the provisions of Articles V and VI of the Agreement on the Technical Cooperation between the Government of Japan and the Government of the Republic of Colombia, effective as of December 12, 1978 (hereinafter referred to as "the Agreement"), the Government of the Republic of Colombia will grant in Colombia privileges, exemptions and benefits to the Japanese experts and their families.

(7) Security of the Japanese Experts

The Colombian side confirmed that they should take necessary measures for the security of the Japanese experts during their stay in the period of the Project as follows:

- 1) to provide permanent security personnel at the site of the Project;
- 2) to provide chauffeured vehicles for the Japanese experts to commute from and to their residences and offices;
- 3) to provide vehicles, counterpart personnel and guards when the necessity for official trips of the Japanese experts arises;
- 4) to prohibit holiday and night time duties of the Japanese experts;
- 5) to take other necessary measures in connection with the security of the Project.

In this connection, the Team proposed to the Colombian side and the latter agreed to the content, the draft of a Joint Security Committee as shown in Annex 16.

(8) Sustainability of the Project

The Colombian side will take necessary measures to ensure that the self-reliant operation of the Project will be sustained during and after the period of the Japanese technical cooperation, through the full and active involvement in the Project by all related authorities such as MINERALCO, beneficiary groups and institutions so that the technology and knowledge acquired by the counterpart personnel through the Project will ultimately contribute to the economic and social development of the Republic of Colombia.

10. Joint Evaluation

As to the joint evaluation of the Project, the Team explained as follows:

The final evaluation of the Project will be conducted jointly by both sides through JICA approximately six (6) months before the termination of the cooperation period in order to examine the level of achievement of the objectives of the Project.

Other evaluations may be conducted as and when necessary during and after the cooperation period to better monitor the progress and sustainment of the objectives of the Project.

In this regard, the Team proposed and the Colombian side agreed that the monitoring report on the progress of the Project prepared by the Japanese experts and the Colombian counterpart personnel jointly would be submitted to the Project Director and the Resident Representative of the JICA Colombia Office every six (6) months.

Furthermore, the Team explained the methodology of evaluation, especially the five (5) basic evaluation components as shown in Annex 17.

## 11. Schedule of the Project

Both sides formulated the Tentative Schedule of Implementation (hereinafter referred to as "TSI") for the Project as shown in Annex 18.

Furthermore, both sides formulated the Annual Plan of Operations (hereinafter referred to as "APO") for the first year of the Project as shown in Annex 19, and agreed that the APO should be reviewed and revised as soon as possible after the commencement of the Project by the Japanese experts and the Colombian counterpart personnel jointly in line with the said TCP and TSI in the framework of the R/D.

## 12. Other Matters

### (1) Cooperation between the Agencies Concerned

The summary of the agreement between INGEOMINAS, MINERALCO and the Regional Mining Associations concerning medium, small and petty-scale gold mining activities on the cooperation toward the successful implementation of the Project is as described in Annex 20.

### (2) Common Language

Both sides confirmed that the common language used in any activities of the Project should be English.

### (3) Scheme of the Japanese Technical Cooperation

The Team explained and the Colombian side understood the nature and scheme of the Project-Type Technical Cooperation by the Government of Japan, including the request forms such as Form A-1, Form A-2/A-3, Form A-4 and the R/D.

A sample of the R/D is attached for reference as Annex 21.

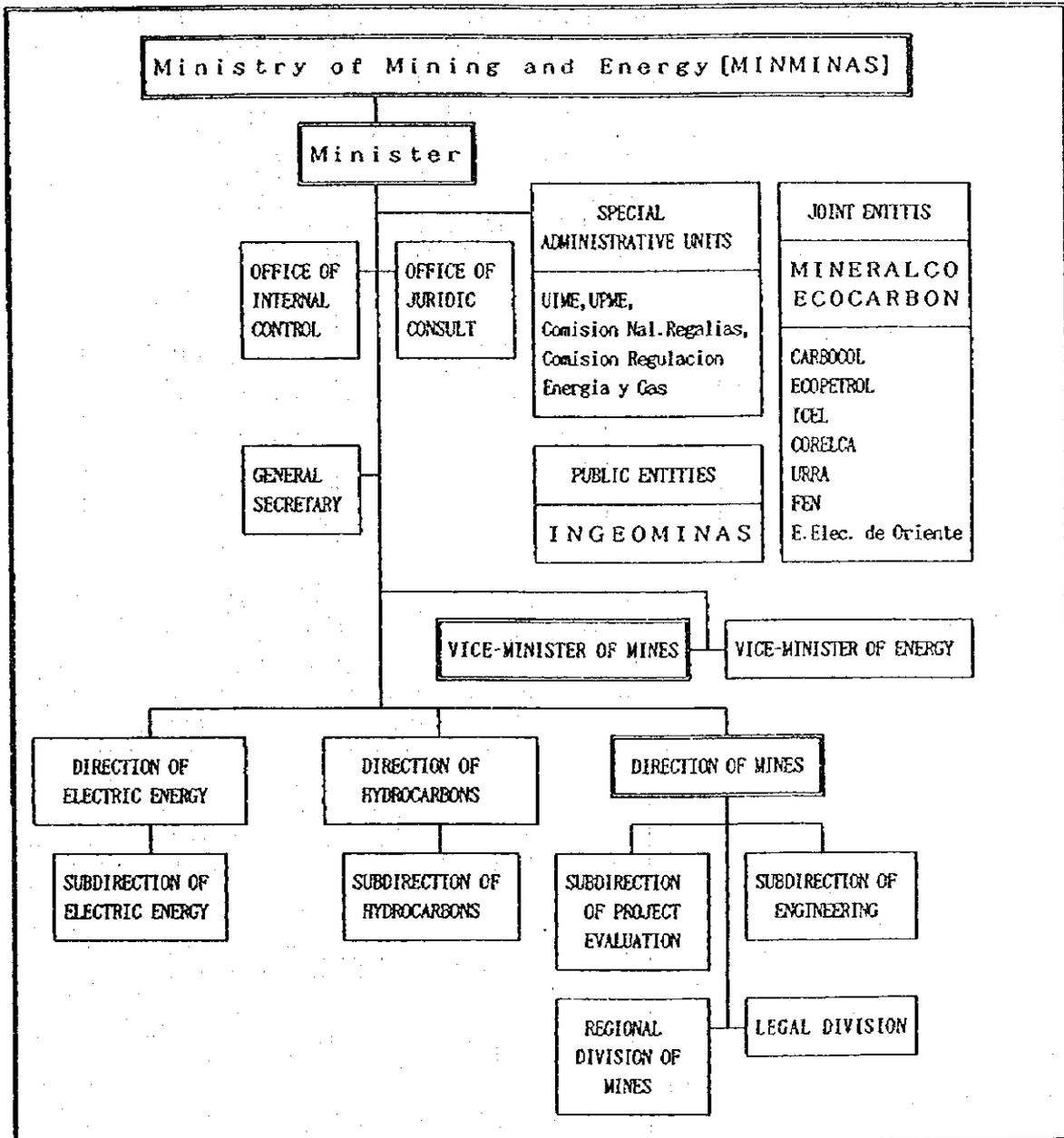
(4) Attendance

A list of those in attendance at the discussions is shown in Annex 22.

(5) The Annexes below are attached to this document:

- Annex 1-1 Organization Chart of the Ministry of Mining and Energy;
- Annex 1-2 Organization Chart of the Institute for Research in Geosciences, Mining and Chemistry;
- Annex 1-3 Organization Chart of the Colombian Minerals Company;
- Annex 2 Provisional Organization Chart for the Administration of the Project;
- Annex 3 Joint Coordinating Committee;
- Annex 4 Joint Operating Committee;
- Annex 5 Tentative Project Design Matrix (PDM);
- Annex 6 Technical Cooperation Program (TCP);
- Annex 7 Plan of Operations (PO);
- Annex 8 The Machinery and Equipment necessary for the Implementation of the Project;
- Annex 9-1 Flowchart of the Mobile Milling Test Facilities;
- Annex 9-2 View-Diagram of the Mobile Milling Test Facilities;
- Annex 9-3 Plan and Elevation of the Mobile Milling Test Facilities;
- Annex 10 The Provisional Specification of the Machinery & Equipment by Request of the Colombian Side;
- Annex 11 Space Plan for the Installation of the Mobile Milling Test Facilities;
- Annex 12 Conditions necessary for Utilities;
- Annex 13-1 Tentative Assignment Program of the Colombian Staff;
- Annex 13-2 Proposed Colombian Staff for the Project;
- Annex 14 Tentative Schedule of the Budget Allocation for the Project;
- Annex 15 Description of the Ores Projected Tentatively;
- Annex 16 Joint Security Committee;
- Annex 17 Five Basic Evaluation Components;
- Annex 18 Tentative Schedule of Implementation (TSI);
- Annex 19 Annual Plan of Operations (APO);
- Annex 20 Outline of the Agreement on the Cooperation between the Agencies Concerned;
- Annex 21 Sample of the Record of Discussions; and
- Annex 22 Attendance at the Discussions.

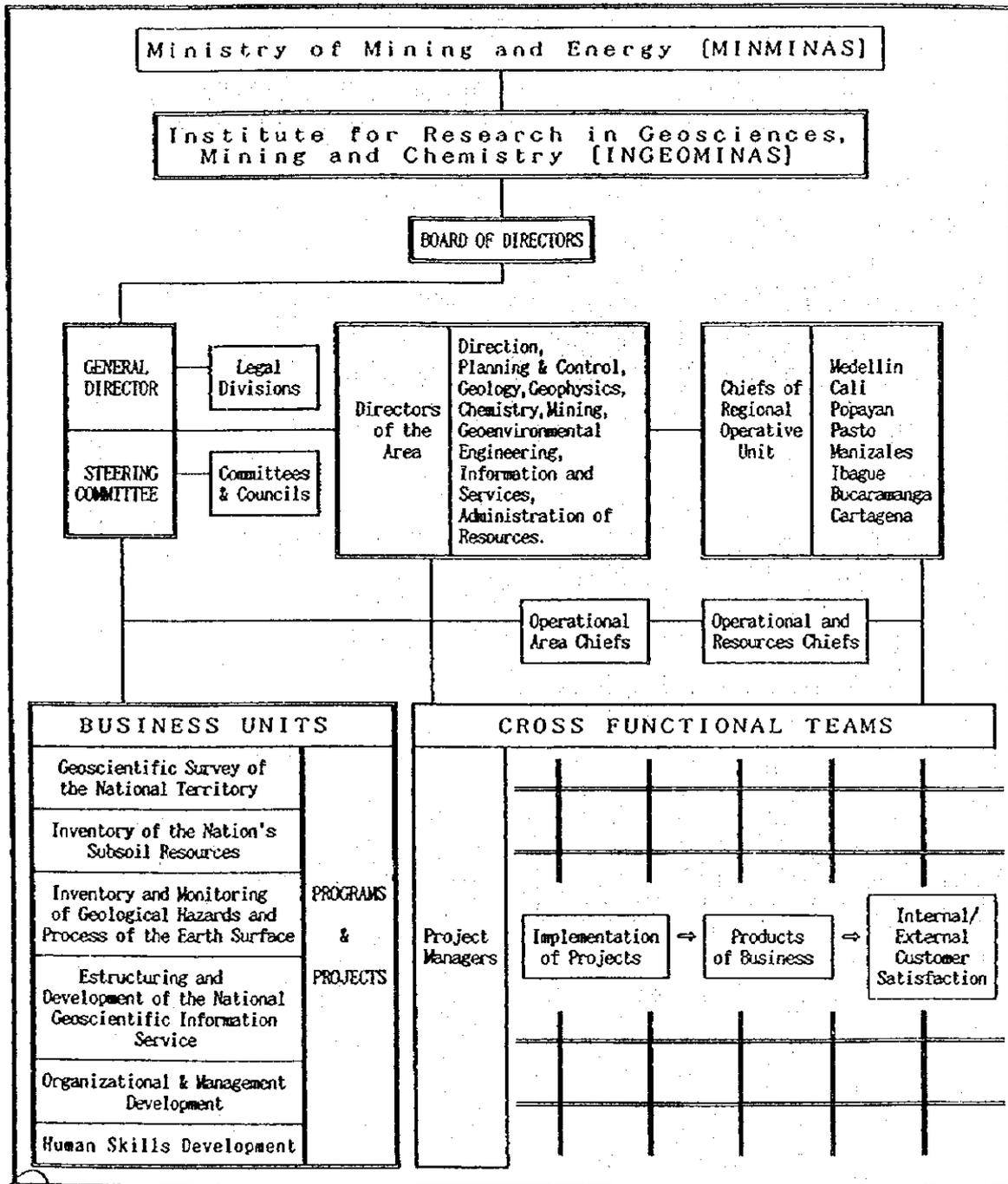
Annex 1-1  
 Organization Chart of  
 The Ministry of Mining and Energy



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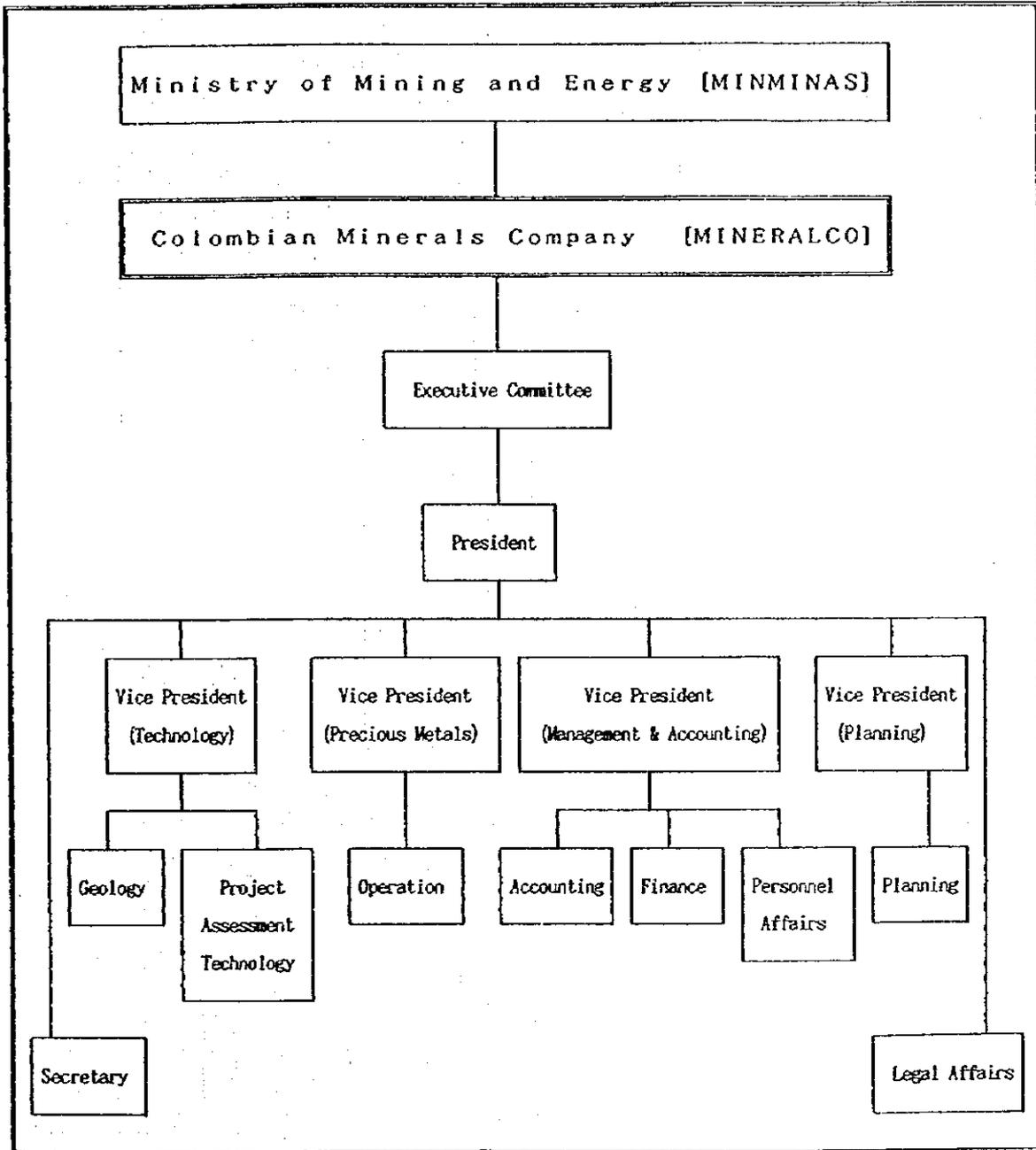
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# Annex 1-2 Organization Chart of the Institute for Research in Geosciences, Mining and Chemistry



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Annex 1-3  
Organizational Chart of  
the Colombian Minerals Company

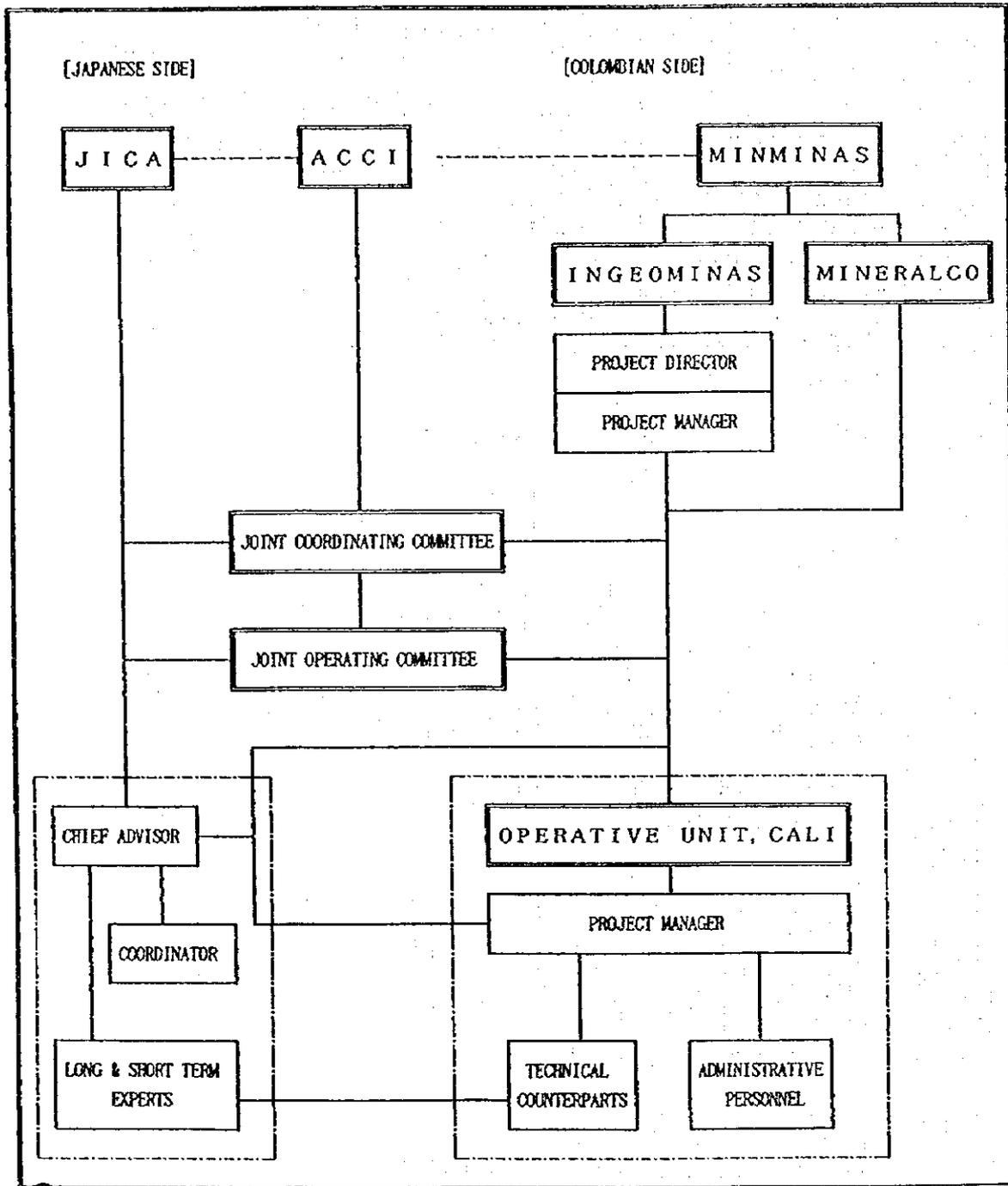


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## Annex 2 Provisional Organization Chart for the Administration of the Project



## Annex 3 Joint Coordinating Committee

### I. Functions of the Joint Coordinating Committee for the Project

- (1) Approval of the Annual Plan of Operations (APO) of the Project in line with the Tentative Schedule of Implementation (TSI) and the Technical Cooperation Program (TCP) under the framework of the Record of Discussions (R/D).
- (2) Review of the overall progress of the Technical Cooperation Program (TCP) as well as the achievement of the APO of the Project.
- (3) Review and exchange of views on the major issues arising from or in connection with the Project.

### II. Composition of the Joint Coordinating Committee

#### (1) Chairman

General Director of INGEOMINAS [Project Director]

#### (2) Members

##### \* The Colombian Side

- ① Representatives of ACCI
- ② Representatives of MINMINAS
- ③ General Manager of MINERALCO
- ④ Project Managers
- ⑤ Project Coordinators
- ⑥ Other personnel nominated by the Chairman

##### \* The Japanese Side

- ① Chief Advisor
- ② Coordinator
- ③ Experts nominated by Chief Advisor
- ④ Representatives of the JICA Colombia Office
- ⑤ Other personnel concerned to be dispatched by JICA

#### (3) Observers

- ① Officials of the Embassy of Japan in the Republic of Colombia
- ② Other personnel accepted by the Chairman

### III. Opening of the Committee Meeting

It is requested to hold the Joint Coordinating Committee Meeting at least once a quarter for the first year and twice a year from the second year of the Project for smooth and successful implementation of the Project.

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# Annex-4 Joint Operating Committee

## I. Functions of the Joint Operating Committee

- 1) Practical responsibility for the implementation of the Project.
- 2) Coordination and arrangements for the manpower and expenses concerning the Project.
- 3) Planning and operation of the APO based on the PO, TSI, TCP and R/D.
- 4) Review and discussion on the progress of the APO.
- 5) Arrangements for the periodical meetings such as weekly, monthly and quarterly meetings concerning the Project.

## II. Administrative Members of the Joint Operating Committee

- 1) Director, Chemistry Department, INGEOMINAS [Project Manager]
- 2) Chief of Operative Unit, Cali, INGEOMINAS [Project Manager]
- 3) Project Coordinators who are in charge of the coordination of every matter concerning the implementation of the Project :
  - ① Officials from the headquarters of INGEOMINAS;
  - ② Officials from Operative Unit, Cali, INGEOMINAS;
  - ③ Officials from MINERALCO; and
  - ④ Coordinator dispatched by JICA.
- 4) Leader of the Colombian Counterpart Personnel
- 5) The Japanese Chief Advisor dispatched by JICA

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Annex 5 (1/2)  
Tentative Project Design Matrix (PDM)

Narrative Summary	Verifiable Indicators	Means of Verification	Important Assumptions
<p><u>Super Goal of the Project</u> The Colombian mining industry will be promoted in consideration of environment protection in the mining areas.</p>	<p>1. Ratio of mining in GDP. 2. Gold production rate. 3. Comparison of contamination of waste water from mines and mills.</p>	<p>1. Statistics of DNP. 2. Statistics of MINMINAS. 3. Statistics of Industry. 4. Interview and questionnaire survey with/to the parties concerned.</p>	<p>a. Continuation of the regional mining promotion policy by the Government &amp; mining industry.</p>
<p><u>Overall Goal of the Project</u> The operational situations of the medium, small and petty-scale mines in the gold mining areas will be improved.</p>	<p>1. Comparison of gold recovery in the regional gold mining areas. 2. Improvement of the waste water treatment process in the above areas.</p>	<p>1. Results of mill operation. 2. Results of analysis of waste water from mills. 3. Interview &amp; Questionnaire with/to the industry</p>	<p>a. Business be declined sluggishly. b. Wages be stabilized. c. Economic infrastructures be sustained.</p>
<p><u>Purpose of the Project</u> The situation capable of receiving the technical guidance on the improvement of mill operation at the medium, small and petty-scale mines in the gold mining areas will be realized.</p>	<p>1. Number of staff who are in charge of technical guidance services. 2. Number of technical guidance to the mills projected.</p>	<p>1. Results of guidance by the staff concerned. 2. Progress reports of the Project. 3. Interview &amp; Questionnaire survey with/to the parties concerned.</p>	<p>a. The mobile test mill will be utilized effectively. b. Establishment plan on central cooperative mills in the regional mining areas will be progressed.</p>
<p><u>Output of the Project</u> 0. Project operation unit will be established. 1. Mobile test mill will be installed and maintained. 2. Engineers in charge of the technical guidance on the improvement of mill operation will be trained. 3. The guidelines on the improvement of mill operation will be proposed to the mines projected.</p>	<p>0. Situation on the staff, budget and management. 1-1. Mobile mill management 1-2. Operation manuals. 1-3. Maintenance manuals. 2-1. Ability &amp; number of engineers/instructors. 2-2. Milling test manuals. 2-3. Basic design manuals. 2-4. Guidelines on mill operation improvement. 3-1. Comparison of old and new mill operation/tests. 3-2. Number of guidance.</p>	<p>0. Documents on the management of the Unit. 1-1. Documents on the management of mobile mill. 1-2. Results of the manuals on operation/maintenance. 2-1. Results of training. 2-2/3. Results of manuals on testing &amp; designing. 2-4. Results of guidelines on mill operation. 3-1. Results of testing. 3-2. Results of technical guidance.</p>	<p>a. The assignment of the counterparts will be continued at INGEOMINAS/MINERALOG.</p>

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Annex 5 (2/2)  
Tentative Project Design Matrix (PDM)

Narrative Summary	Input of the Project		Important Assumptions
	From the Japanese Side	From the Colombian Side	
<p><u>Activities of the Project</u></p> <p>0-1. Allocate the staff and budget based on schedule.</p> <p>0-2. Establish a Joint Coordinating Committee.</p> <p>0-3. Establish a Joint Operating Committee.</p> <p>1-1. Make plan and procure the machinery &amp; facilities.</p> <p>1-2. Install and maintain the machinery and equipment.</p> <p>1-3. Prepare the manuals on operation &amp; maintenance.</p> <p>2-1. Arrange the stable supply of the ore samples.</p> <p>2-2. Investigate the milling properties by the laboratory tests.</p> <p>2-3. Determine the milling condition by mobile mill.</p> <p>2-4. Determine the treatment conditions of waste water from mills.</p> <p>2-5. Formulate the manuals on the milling and waste water treatment tests.</p> <p>2-6. Formulate the manuals on cooperative mill design.</p> <p>2-7. Formulate the guidelines on mill operation &amp; waste water treatment guidance.</p> <p>3-1. Implemente the study to the mines projected.</p> <p>3-2. Formulate the guidelines on improvement of mill operation of the mines projected.</p> <p>3-3. Implementation of the seminars concerning the Project.</p>	<p>1. Dispatch of Experts</p> <p>1-1. Long-term experts</p> <p>① Chief Advisor : 1 person</p> <p>② Coordinator : 1 person</p> <p>③ Mineral processing technology : 1 person</p> <p>④ Waste water treatment technology : 1 person</p> <p>1-2. Short-term experts When necessity arises.</p> <p>2. Acceptance of Counterpart personnel in Japan. 1~ 2 counterparts, yearly.</p> <p>3. Provision of Machinery and Equipment</p> <p>1 set of the mobile milling test facilities without carrying vehicles.</p>	<p>1. Allocation of Personnel.</p> <p>2. Expenditure of Operational Costs.</p> <p>3. Preparation of Buildings and Facilities at the site of the Project.</p> <p>① Office for the Japanese experts.</p> <p>② Office for the Colombian staff.</p> <p>③ Laboratories.</p> <p>④ Infrastructures concerning mobile milling test facilities.</p> <p>4. Procurement of the Machinery and Equipment.</p> <p>5. Supply of Ore Samples for the Project.</p> <p>6. Treatment and Management of the Products from the operation of the mobile milling test facilities.</p>	<p>a. The customs clearance of the machinery and equipment provided from the Japanese side will be processed smoothly.</p> <p>b. The measures concerning the security of the Japanese experts at the site of the Project will be taken properly.</p>
			Pre-conditions
			<p>a. The agreement on the cooperation to the implementation of the Project will be concluded between INGEOMINAS, MINERALCO and the owners concerning medium, small and petty scale mines.</p>

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## Annex 6 Technical Cooperation Program (TCP)

Calendar Year	1998				1999				2000				2001				2002			
Quarter	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV
Duration of the Project																				
II. Investigation on the mineral processing characteristics of the ore samples by laboratory scale. 1) Mineralogical study. <sup>1)</sup> 2) Chemical analysis. <sup>1)</sup> 3) Basic amenability study on mineral processing necessary for mobile mill tests.																				
III. Determination of optimum conditions for effective mill operation of the ore samples and waste water treatment by mobile milling test facilities. 1) Crushing & screening. 2) Grinding & classifying. 3) Flotation process. 4) Cyanidation process. 5) Merrill-Crow process. 6) Adsorption & elution (CIC/CIP) process. 7) Electro-winning process. 8) Smelting & refining. 9) Waste water treatment process.																				
IV. Formulation of materials necessary for preparation of the guidelines on the improvement of mill operation & waste water treatment at the regional gold mining areas.																				

[Notes] 1) These subjects are capable of studying by the Colombian counterpart personnel without assistance by the Japanese experts.

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## Annex 7 Plan of Operations (PO)

Calendar Year	1999				2000				2001				2002			
Quarter	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV
Duration of the Project																
0-1. Allocate the staff and budget based on the schedule.																
0-2. Establish a Joint Coordinating Committee																
0-3. Establish a Joint Operating Committee.																
1-1. Make a procurement plan and procure the machinery & facilities.																
1-2. Install, operate and maintain the machinery and facilities.																
1-3. Prepare the manuals on operation and maintenance of machinery & facilities.																
2-1. Arrange the stable supply of the ore samples.																
2-2. Investigate the milling properties of the ores projected by laboratory tests.																
2-3. Determine the milling condition of the ores projected by mobile mill operation.																
2-4. Determine the treatment conditions of waste water from mills.																
2-5. Formulate the manuals on the milling and wastewater treatment tests.																
2-6. Formulate the manuals on cooperative mill design.																
2-7. Formulate the guidelines on mill operation and waste water treatment guidance.																
3-1. Implement the study to the mines projected.																
3-2. Formulate the guidelines on improvement of mill operation of the mines projected.																
3-3. Implementation of the seminars concerning the Project.																





Annex 8 (1/3)  
The Machinery and Equipment necessary for  
the Implementation of the Project

One set of the Mobile Milling Test Facilities with the Capacity of 1.0 ton of Crude Ores per Day.					
Item No.	Name of Machinery & Equipment	Main Components	Priority	Items to be procured and implemented by Japanese side or Colombian side.	
<b>A. Ore Receiving Circuit</b>					
A-01	Ore Storage Yard	Ore Bin	I		Colombian
		Haulage Equipment	I		Colombian
A-02	Ore Feeding Equipment	Belt Conveyor with Hopper	I	Japanese	
<b>B. Crushing &amp; Screening Circuits</b>					
B-01	Primary Crusher	Jaw Crusher	I	Japanese	
B-02	Secondary Crusher	Gyratory Crusher	I	Japanese	
B-03	Screen	Vibrating Screen	I	Japanese	
<b>C. Grinding and Classifying Circuits</b>					
C-01	Primary Grinding Mill	Ball Mill	I	Japanese	
C-02	Primary Classifier	Hydrocyclone	I	Japanese	
C-03	Secondary Grinding Mill	Ball Mill	I	Japanese	
C-04	Secondary Classifier	Hydrocyclone	I	Japanese	
<b>D. Gravity Concentration Circuit</b>					
D-01	Gravity Concentrator	[Application of Phase-I Equipment]	II		Colombian
<b>E. Flotation Circuit</b>					
E-01	Conditioner		I	Japanese	
E-02	Flotation Machines	Rougher & Cleaner	I	Japanese	
E-03	Reagent Feeder	Reagent Feeding Pumps for Frother, Collector and Modifier	I	Japanese	

Annex 8 (2/3)  
The Machinery and Equipment necessary for  
the Implementation of the Project

Item No.	Name of Machinery & Equipment	Main Components	Priority	Items to be procured and implemented by Japanese side or Colombian side.	
F. Cyanidation Leaching Circuit					
F-01	Cyanidation Leaching Unit by Conventional Process	Leaching Tanks	I	Japanese	
F-02	Cyanidation Leaching Unit by CIP Process	Activated Carbon Feeder	I	Japanese	
		Adsorbed Active Carbon Separator	I	Japanese	
F-03	Cyanidation Leaching Unit by CIG Process	Adsorption Column Packed by Activated Carbon	I	Japanese	
F-04	Equipment for Zinc Substitution Process	Zinc Dust Feeder	I	Japanese	
		Filter Press	I	Japanese	
F-05	Unit for Elution Process	[Application of Phase-I Equipment]	I		Colombian
F-06	Dehydration Unit for the Pulp from Cyanidation Leach	Centrifugal Separator	I	Japanese	
F-07	Filtration Unit for Pregnant Solution	Sand Filter	I	Japanese	
F-08	Ore Pulp Storage	Thickener	I	Japanese	
		Storage Tank	I	Japanese	
G. Gold Refining Circuit					
G-01	Electrowinning Process Unit	[Application of Phase-I Equipment]	I		Colombian
G-02	Gold Smelting Process Unit	[Application of Phase-I Equipment]	I		Colombian
H. Waste Water Treatment Circuit					
H-01	Waste Water Treatment Unit	Storage Tank for Waste Water	I	Japanese	
		Waste Water Treatment Apparatus	I	Japanese	
I. Tailing Processing Circuit					
I-01	Tailing Processing Unit	Storage Tank for the Sludge from Cyanidation Leaching Circuit	I		Colombian
		Storage Tank for Flotation Tailings	I		Colombian
		Storage Tank for the Sludge from Waste Water Treatment Circuit	I		Colombian

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Annex 8 (3/3)  
The Machinery and Equipment necessary for  
the Implementation of the Project

Item No.	Name of Machinery & Equipment	Main Components	Priority	Items to be procured and implemented by Japanese side or Colombian side.	
J. Haulage and Transportation Equipment					
J-01	Haulage and Transportation Equipment for Ores		I		Colombian
J-02	Haulage and Transportation Equipment for Ore Pulps		I	Japanese	
J-03	Transporter for the Mobile Milling Test Facilities		III		Colombian
K. Equipment for Instrumentation					
K-01	Equipment for Weighing and Instrumentation	Ore Weighing Scale	I	Japanese	Colombian
		Flotation pH Meter	I	Japanese	Colombian
		Flotation Pulp Density Meter	I	Japanese	
K-02	Operation Panel	Power Control Panel	I	Japanese	
		Power Incoming Panel	I		Colombian
L. Other Related Equipment and Facilities					
L-01	Base Frame		I	Japanese	
L-02	Wiring Materials		I	Japanese	
L-03	Piping Materials		I	Japanese	
L-04	Other Materials & Facilities	Reagent Storage Facilities & Others	I		Colombian
M. Installation and Calibration Works [Under the Guidance of Japanese Experts]					
M-01	Installation & Assembling		I		Colombian
M-02	Calibration & Trial Runs		I		Colombian
N. Other Works					
N-01	Foundation and Basement		I		Colombian
N-02	Water Supply and Drainage		I		Colombian
N-03	Wiring and Piping		I		Colombian
N-04	Pit for Leak in Each Circuit	Grinding, Flotation, Leaching, etc.	I		Colombian
N-05	Lighting Facilities	Necessary for 24 Hours Operation.	I		Colombian
N-06	Roofing Works	Especially for Cyanide Handling.	I		Colombian

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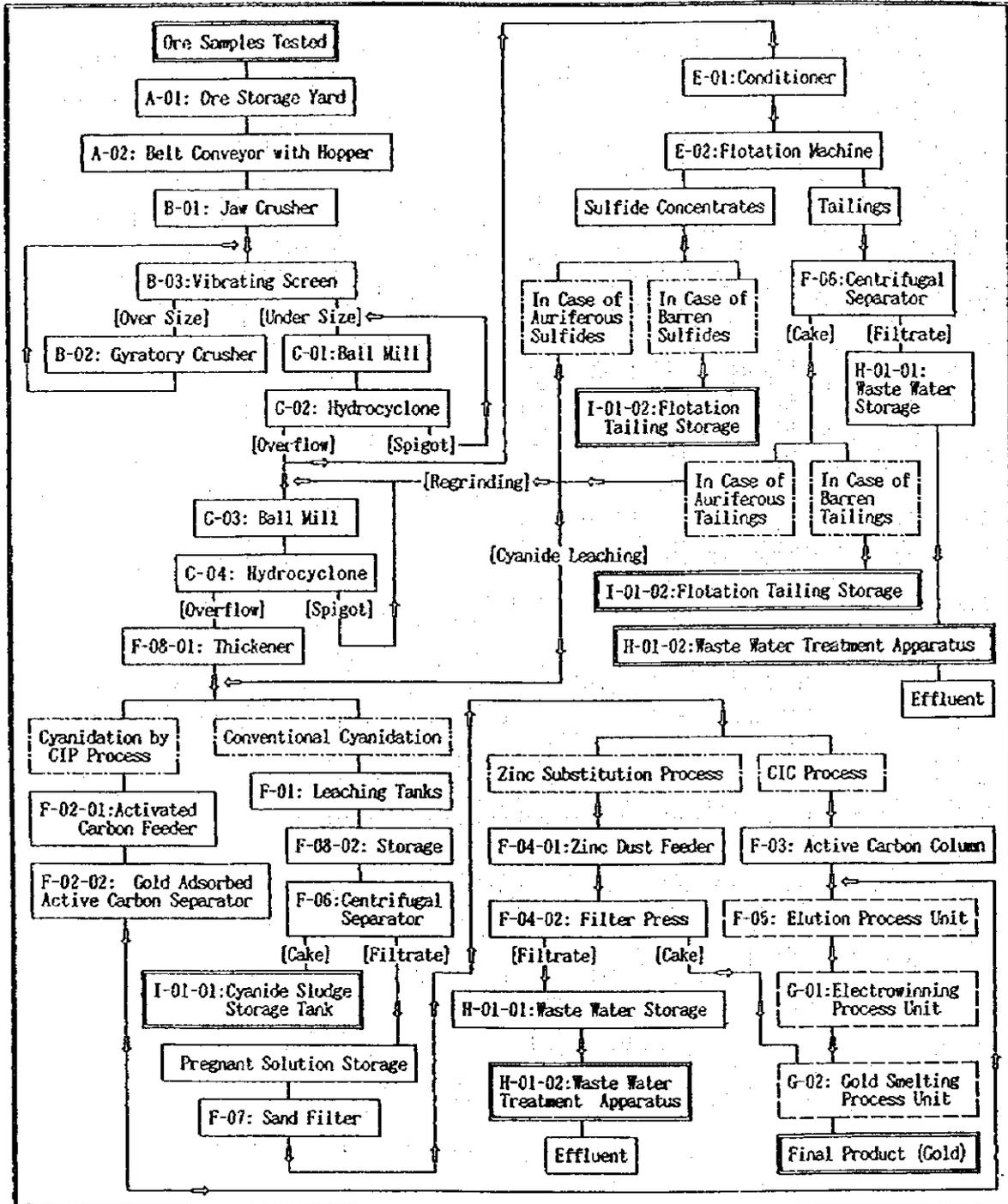
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# Annex 9-1

## Flowchart of the Mobile Milling Test Facilities

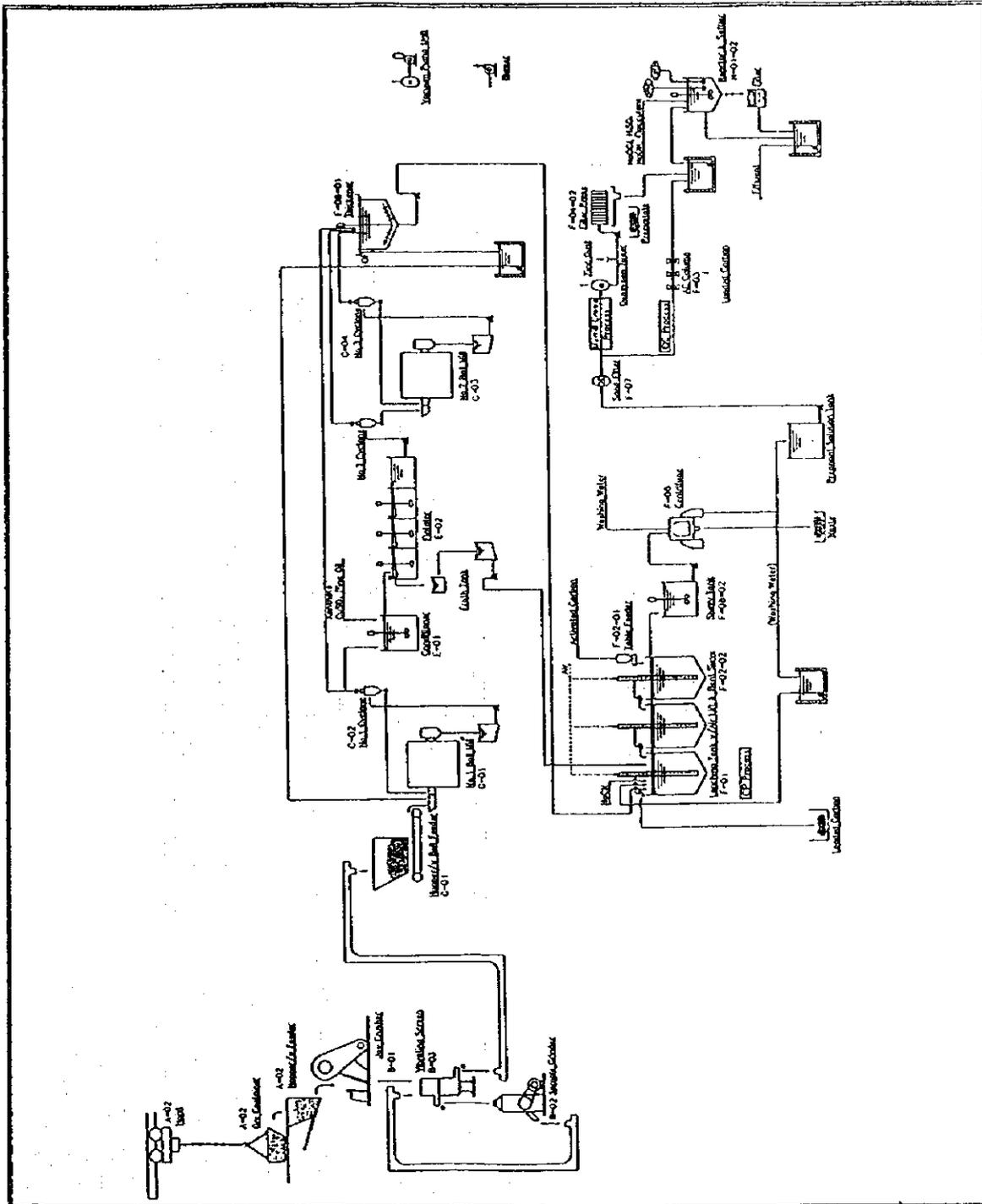
[Capacity: 1 ton of Crude Ores per Day]



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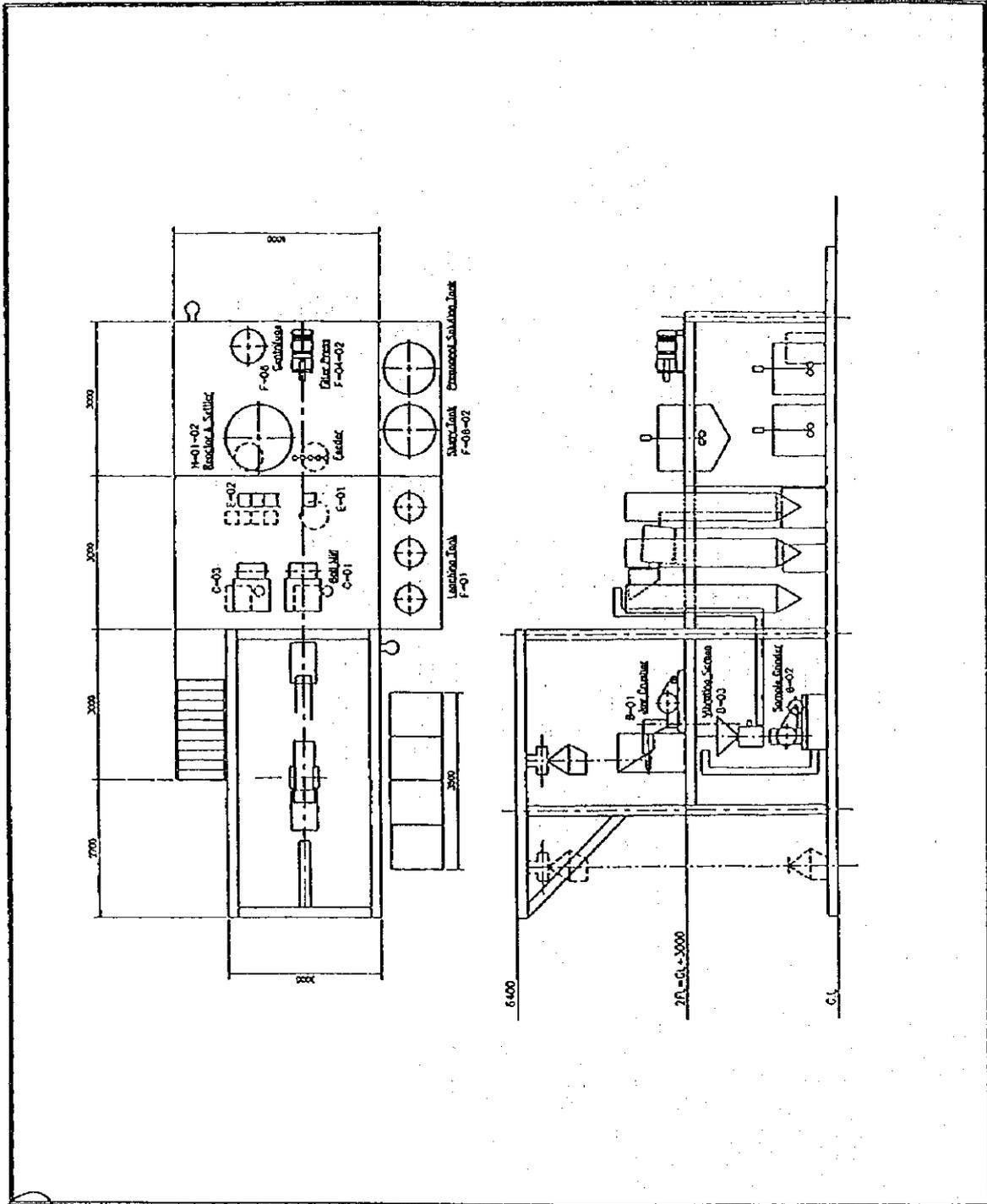
# Annex 9-2 View-Diagram of the Mobile Milling Test Facilities



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# Annex 9-3 Plan & Elevation of the Mobile Milling Test Facilities



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Annex 10 (1/3)  
The Provisional Specifications of the Machinery & Equipment by Request of the Colombian Side

One set of the Mobile Milling Test Facilities with the Capacity of 1.0 ton of Crude Ores per Day.			
No.	Name of Machinery & Equipment	Outlines of Specification	Quantity
A. Ore Receiving Circuit			
A-02	Ore Feeding Equipment	Type: Belt Conveyor with Hopper	1 Set
B. Crushing & Screening Circuits			
B-01	Primary Crusher	Type: Jaw Crusher, Capacity: 75 kg/hr	1 Set
B-02	Secondary Crusher	Type: Gyrotory Crusher, Capacity: 33 kg/hr	1 Set
B-03	Screen	Type: Vibrating Screen, Capacity: 95.4 kg/hr	1 Set
C. Grinding and Classifying Circuits			
C-01	Primary Grinding Mill	Type: Ball Mill, Capacity: 50 kg/hr, Include Hopper and Feeder.	1 Set
C-02	Primary Classifier	Type: Hydrocyclone, Size: dia. 50 mm, Capacity: 20/min	1 Set
C-03	Secondary Grinding Mill	Type: Ball Mill, Capacity: 19 kg/hr	1 Set
C-04	Secondary Classifier	Type: Hydrocyclone, Size: dia. 25 mm, Capacity: 1.20/min	1 Set
E. Flotation Circuit			
E-01	Conditioner	Conditioning Time: 3 min.	1 Set
E-02	Flotation Machines	Type: Denver Type Flotator, Flotation Time: 25 min., Size: 280/Cell x 3 Cells	1 Set
E-03	Reagent Feeder	Type: Tube Pump, Reagents: Frother, Collector & Modifier	1 Set

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Annex 10 (2/3)  
The Provisional Specifications of the Machinery &  
Equipment by Request of the Colombian Side

No.	Name of Machinery & Equipment	Outlines of Specification	Quantity
F. Cyanidation Leaching Circuit			
F-01	Cyanidation Leaching Unit by Conventional Process	Leaching Tank: 3 Units Leaching Time: 24 hours	1 Set
F-02	Cyanidation Leaching Unit by CIP Process		
F-02-01	Activated Carbon Feeder	Type: Table Feeder	1 Set
F-02-02	Gold Adsorbed Carbon Separator	Type: Fixed Type Screen	1 Set
F-03	Cyanidation Leaching Unit by CIC Process	Type: 3 Adsorption Columns Filled with Activated Carbon	1 Set
F-04	Equipment for Zinc Substitution Process		
F-04-01	Zinc Dust Feeder	Type: Table Feeder	1 Set
F-04-02	Filter Press	Filter Area: 0.079 m <sup>2</sup> , Filtration Step: 5 steps	1 Set
F-06	Dehydration Unit for the Pulp from Cyanidation Leaching	Type: Centrifugal Separator, Capacity: 50 kg/hr	1 Set
F-07	Filtration Unit for Pregnant Solution	Type: Sand Filter	1 Set
F-08	Ore Pulp Storage		
F-08-01	Thickener	Size: Dia.1.0 m	1 Set
F-08-02	Storage Tank	Capacity: About 0.4 m <sup>3</sup>	1 Set

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Annex 10 (3/3)  
The Provisional Specifications of the Machinery &  
Equipment by Request of the Colombian Side

No.	Name of Machinery & Equipment	Outlines of Specification	Quantity
H. Waste Water Treatment Circuit			
H-01	Waste Water Treatment Unit		
H-01-01	Storage Tank for Waste Water	Capacity: About 0.4 m <sup>3</sup>	1 Set
H-01-02	Waste Water Treatment Apparatus	Type: Batch Type Alkaline-Chlorine Process Include a pH-ORP Meter.	1 Set
J. Haulage and Transportation Equipment			
J-02	Haulage and Transportation Equipment for Ore Pulps	Sand Pumps, Portable Containers and Belt Conveyors.	1 Set
K. Equipment for Instrumentation			
K-01	Equipment for Weighing and Instrumentation		
K-01-01	Ore Weighing Scale	Type: Platform Scale, Capacity: 2 kg	1 Set
K-01-02	Flotation pH Meter	Type: Portable	1 Set
K-01-03	Flotation Pulp Density Meter	Type: Weight Conversion	1 Set
K-02	Operation Panel		
K-02-01	Power Control Panel	Include Power Sources for Instrumentation concerning Operation.	1 Set
L. Other Related Equipment and Facilities			
L-01	Base Frame	Type: Loading the Equipment and/or Circuit Separately into Motor Vehicles with Base Frame, if necessary.	1 Set
L-02	Wiring Materials		1 Set
L-03	Piping Materials		1 Set

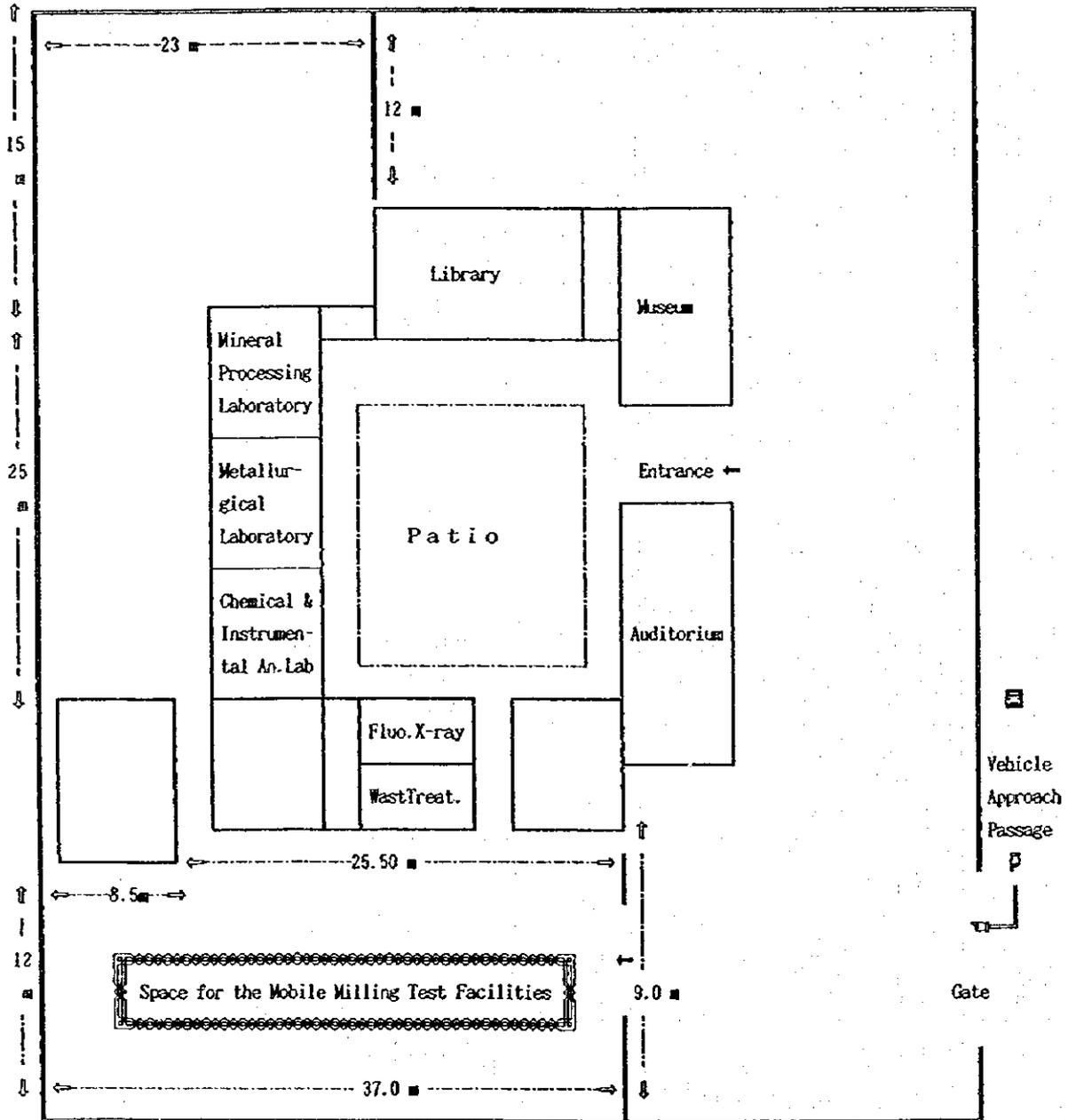
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# Annex II

## Space Plan for the Installation of the Mobile Milling Test Facilities



[No Scale Ratio : Top and Bottom / Right and Left]

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## Annex 12 Conditions Necessary for Utilities

Undertakings by Colombian Side	Outlines of Instructions
I. Power Supply Works 1. Conditions of Power Supply	Arrangements necessary for the stable supply of 220 V/three phase and 110 V/single phase separately from the power supply to the offices and laboratories of main building.
2. Power Incoming Panel	As usual.
3. Lighting	Lighting necessary for 24 hours operation at the circuits such as grinding, classifying, flotation, cyanide leaching, and various products storage and/or processing.
II. Water Supply Works 1. Conditions of Water Supply	Arrangement of the following individual faucets at the minimum: Crushing & Screening Circuit; 1 faucet Grinding & Classifying Circuit; 3 faucets Flotation Circuit; 2 faucets Cyanide leaching & Dehydration Circuit; 3 faucets Tailing & Sludge Storage Circuit; 1 faucet
III. Drainage Works 1. Pit for Leak in Each Circuit	Preparation of the individual pits for leak in each circuit such as raw ore storage, crushing, screening, grinding, classifying, flotation, cyanide leaching, dehydration, filtration, and tailing & sludge storage.
IV. Civil Works 1. Roofing	Roofing is necessary for the cyanide handling circuits.
2. Foundation and Basement	A concrete foundation is necessary for setting of the machinery and equipment. A special foundation for heavy equipment is not necessary.
3. Ore Storage	Capacity: Approximately 10 tons. Structure: Concrete floor, and open storage available.
4. Storage of the Sludge from Cyanidation Circuit	Capacity: Approximately 10 tons. Structure: Roofing is necessary because of the handling of cyanide contained sludges. Setting of sidewall with a detachable front wall for discharge. Pit for leak is also necessary.
5. Storage of the Tailing from Flotation Circuit	Capacity: Approximately 10 tons. Structure: Roofing is necessary in order to accept the storage of cyanide contained sludges. Setting of sidewall with a detachable front wall for discharge. Pit for leak is also necessary.
6. Storage of the Sludge from Waste Water Treatment	Capacity: Approximately 10 tons. Structure: Roofing is necessary in order to accept the storage of cyanide contained sludges. Setting of sidewall with a detachable front wall for discharge. Pit for leak is also necessary. Enough space for drying in the sun is necessary.

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## Annex 13-1 Tentative Assignment Program of the Colombian Staff

Functions in charge of	Year	Total Number of staff		Assigned by					
				MINMINAS		INGEOMINAS		MINERALCO	
		Full-time	Part-time	Full-time	Part-time	Full-time	Part-time	Full-time	Part-time
1. Administration of the Project 0) Project Director 1) Project Manager in Hdqrs 2) Project Manager on Site 3) Project Coordinators 4) Leader of Counterparts	1998		1				1		
	1999		1				1		
	2000		1		1		1		
	2001		3		1		1		1
	1998 to 2001	1				1			
2. Operation of the Project 1) Metallurgists	1998		2				2		
	1999	2				2			
	2000	2	1			2			1
	2001	2	1			2			1
	1998 to 2001	2	2			2	2		2
2) Mineralogists/Geologists	1998		2				2		
	1999	2				2			
	2000	2	1			2			1
	2001	2	1			2			1
	1998 to 2001	2	2			2	2		2
3) Chemists	1998		2				2		
	1999	2				2			
	2000	2				2			
	2001	2				2			
	1998 to 2001	2	2			2	2		2
4) Laboratory assistants	1998		4				4		
	1999	4				4			
	2000	5				5			
	2001	4				4			
	1998 to 2001	4	4			4	4		4
5) Mill operators	1998								
	1999								
	2000	2	2			2			2
	2001	2	2			2			2
	1998 to 2001	2	2			2	2		2
3. Support of the Project 1) Office assistants	1998		2				2		
	1999	1	1			1	1		
	2000	2				2			
	2001	2				2			
	1998 to 2001	1	2			1	2		
2) Drivers	1998	1				1			
	1999	1	1			1	1		
	2000	1	1			1	1		
	2001	1	1			1	1		
	1998 to 2001	1	2			1	2		
3) Laborers	1998		2				2		
	1999		2				2		
	2000		3				2		1
	2001		3				2		1
	1998 to 2001		5				4		2
Grand Total	1998	2	20		1	2	18		1
	1999	13	10		1	13	8		1
	2000	17	14		1	17	7		6
	2001	16	14		1	16	7		6
	1998 to 2001	28	48		3	38	32		14

Annex 13-2

Proposed Colombian Staff for the Project

[INGEOMINAS]

- |  |   |
|--|---|
| 1. Project Director                              | Dr. Adolfo Alarcon Guzman   |
| 2. Project Manager in the Headquarters           | Qca. Fabio Hernando Perez   |
| 3. Project Manager on Site                       | Geo. Oscar Alonso Hidalgo W.  |
| 4. Project Coordinator                           | Qca. Marcela Hernandez  |
| 5. Leader of the Colombian Counterpart Personnel | Ing. Jorge Ivan Londono Escobar   |
| 6. Metallurgists                                 | Ing. Jorge Ivan Londono Escobar<br>Diana Alejandra Ortega Segura  |
| 7. Mineralogists/Geologists                      | Geo. Jaime Mojica Buitrago<br>Qca. Marta Edith Velasquez David<br>Juan Carlos Molano Mendoza                    |
| 8. Chemists                                      | Qca. Yolanda Canon Romero<br>Qca. Maria del Carmem Gonzalez   |
| 9. Laboratory Assistants                         | Nury Oneida Perez<br>Victor Hugo Chaverra Lozano<br>Hector Fabio Bacca<br>Noel Antonio Lopez<br>Gloria Mosquera |
| 10. Mill Operators                               | [Under Consideration]   |

[MINERALCO]

< Under Consideration >

# Annex 14 Tentative Schedule of the Budget Allocation for the Project

[Unit: Million Pesos]

Items of Expenses	Calendar Year				
	1998	1999	2000	2001	2002
<b>I. INGEOMINAS</b>					
Salaries and Wages	33.0	370.0	370.0	370.0	92.5
Expenses for Machinery, Equipment and Materials	45.1	25.0	25.0	25.0	6.3
Expenses for Utilities	25.1	40.0	67.1	67.1	16.8
Miscellaneous Expenses	7.0	7.0	15.0	15.0	1.8
<b>Total Expenses for Project Operation</b>	<b>110.2</b>	<b>442.0</b>	<b>477.1</b>	<b>477.1</b>	<b>117.4</b>
Expenses for Renovation works & Infrastructures	5.0	20.0	10.0	10.0	-
<b>Grand Total of Expenses</b>	<b>115.2</b>	<b>462.0</b>	<b>487.1</b>	<b>487.1</b>	<b>117.4</b>
<b>II. MINMINAS</b>					
Salaries and Wages	10.0	18.0	21.6	26.9	7.8
<b>III. MINERALCO</b>					
Salaries and Wages	15.0	24.0	103.5	121.2	37.3
<b>IV. GRAND TOTAL OF EXPENSES</b>	<b>140.2</b>	<b>504.0</b>	<b>612.2</b>	<b>635.2</b>	<b>162.5</b>

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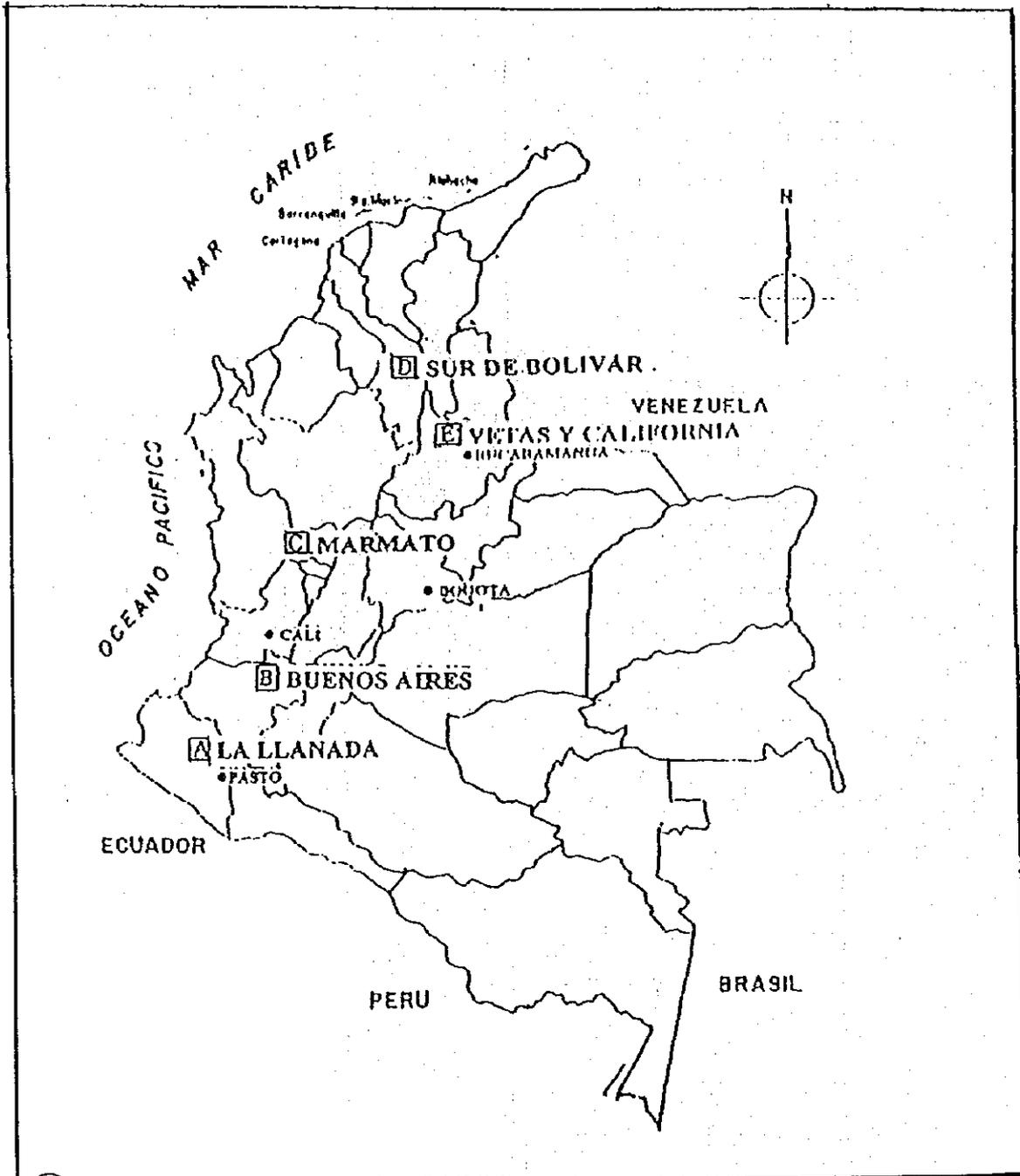
## Annex 15 Description of the Ores Projected Tentatively

Project Mark	A	B	C	D	E
Name of the Gold Mining District and its State.	La Llanada, Narino.	Buenos Aires, Cauca.	Marmato, Caldas.	Sur de Bolivar, Bolivar.	Vetas y California, Santander.
Status of the Management of Mines.	Regional Mining Association.	Regional Mining Association.	Medium and Small Scale Mining Companies.	Small Scale Mining Companies.	Small Scale Mining Companies.
Number of Mines.	Total:32 mines.	Total:10 mines.	Total:137 mines.	Total:70 mines.	Total:57 mines.
Name of Typical Mines and/or Mining Areas with Number of Mines.	El Paroma :2 El Canada :5 La Espedita :1 Palmera :6 El Cisma :2 El Retiro :3 El Manganeso :1 La Cartago :3 San Francisco :1 Don Bosco :1 La Congora :2 Santa Rosa :1 El Lucrecio :3 Santa Elena :1	La Libertad Los Helechos El Oso La Leche Las Pairas El Bavaro Mina Tapada El Guaioco Laz El Condor		Santa Rosa :30 San Martin de Loba :4 Atillo de Loba:1 Montecristo :29 Morales :1	
Gold Production.	36.5 kg/Year	79.7 kg/Year	547.0 Kg/Year	4,168.0 Kg/Year	417.6 Kg/Year
Mineralogical Characteristics of Crude Ores.	Sulfide mineralization mainly/As, Fe sulfide/Free gold /High CN consumption by As.	Sulfide mineralization mainly/ Iron sulfide/ Galena/Free gold /High CN consumption by As, Fe.	Sulfide mineralization mainly/ Iron sulfide/ Free gold / No refractory minerals.	Sulfide mineralization mainly/ Iron sulfide/ Free gold / No refractory minerals.	Sulfide mineralization mainly/ Iron sulfide/ Copper sulfide/ Free gold/High CN consumption.
Average Ore Grade.	Au 13 g/t	Au 20 g/t	Au 5 g/t	Au 20 g/t	Au 4 g/t
Method of Mineral Processing at the Mills.	Gravity Separation.	Gravity Separation/Cyanidation /Amalgamation.	Gravity Separation/Flotation/ Amalgamation.	Gravity Separation/Amalgamation/Cyanidation	Gravity Separation/Amalgamation/Cyanidation
Milling Capacity.	0.5 ~2.0 t/D	0.5 ~2.0 t/D	Mineros Nacionales:300 t/D. Others:1~40t/D.	0.5 ~4.0 t/D	Not Available.
Gold Recovery.	65 %	50 %	Mineros Nacionales:85~92%.	Not Available.	Not Available.
Quality of Waste Water from Mines and Mills.	Not Available. [Contaminated by Hg ]	Not Available. [Contaminated by Hg, As and SS.	[Marmato Area] SS:92.9 ~ 39,952 mg/l CN:0.13 ~ 3.8 mg/l pH:4.3~8.6 [Other Areas] Contaminated.	Not Available. [Contaminated]	SS:4,600 mg/l Free CN:3.0mg/l Total CN:3.7mg/l Hg:Max. 72.2mg/l Electric Conductivity:Max. 350 pH:Max. 8.8 NTU:Max. 1,200
Organization concerned in Pollution Monitoring.	Regional Autonomous Corporation of Narino.	Regional Autonomous Corporation of Cauca.	Regional Autonomous Corporation of Caldas.	Regional Autonomous Corporation of Sur de Bolivar.	Regional Pollution Control Autonomous Corporation of Bucaramanga.
Priority in the Implementing Stage of the Project.	The First Rank.	The Second Rank.	The Third Rank.	The Fourth or the Fifth Rank.	The Fifth or the Fourth Rank.

  
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Location Map of  
the Gold Mining Districts  
concerning the Project



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## Annex 16

# Joint Security Committee [Draft]

### I. Functions of the Joint Security Committee for the Project

- (1) Exchange of views on the national and local information concerning the security of the Japanese experts and the Project.
- (2) Review of the security conditions at the residence of the Japanese experts and the site of the Project.
- (3) Recommendation to the Japanese experts and the authorities concerned on the improvement of the measures for the security of the Japanese experts and the Project.

### II. Composition of the Joint Security Committee

#### (1) The Japanese Side

- ① Representative of the JICA Colombia Office
- ② Officials of the Embassy of Japan in the Republic of Colombia
- ③ Chief Advisor
- ④ Coordinator
- ⑤ Other personnel concerned to the Project

#### (2) The Colombian Side

- ① Project Managers
- ② Project Coordinators
- ③ Officers of the National Police
- ④ Officers of DAS

### III. Opening of the Committee Meeting

It is requested to hold the Joint Security Committee Meeting at least once a quarter for smooth and successful implementation of the Project.



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## Annex 17 (1/3)

### Five Basic Evaluation Components

#### I. Five Basic Evaluation Components

The five basic components defined by JICA as mentioned below are in line with those used for the evaluation works by DAC and other international assistance organizations. Introduction of these components has enabled a consistent, well balanced evaluation, which minimizes evaluator bias. Further, it allows us to share the results, knowledge and lessons with other aid organizations, since we are using common components and can discuss with them from the same viewpoints.

#### (1) Efficiency

Evaluate the method, procedure, term and cost of the project with a view to productivity.

#### (2) Effectiveness

Evaluate the results in comparison with the goals (or revised ones) defined at the initial or intermediate stage, and evaluate the attributes (factors and conditions) of the results.

#### (3) Impact

Evaluate the positive and negative effects of the project, extent of the effect and beneficiaries.

#### (4) Relevance

Preliminary evaluate whether the needs in the country have been correctly identified, and whether the design is consistent with the national and/or master plan.

#### (5) Sustainability

Evaluate the autonomy and sustainability of the project after the termination of cooperation, from the perspectives of operation, management, economy, finance and technology.

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## Annex 17 (2/3)

### Five Basic Evaluation Components

#### II. Relation between Five Basic Components and PDM

The following five components are used for the evaluation and a selection of a project.

- ① Efficiency
- ② Effectiveness
- ③ Impact
- ④ Relevance
- ⑤ Sustainability

These components are directly connected to the elements of PDM as shown in the Figure in the following page.

The component "Efficiency" is a measure to qualitatively and quantitatively compare all resource (input) to the results (output) of the project in order to evaluate the economic efficiency or conversion from input to output.

The parameter "Effectiveness" as a measure to evaluate whether the purpose has been achieved or not, or to evaluate how much the outputs contributed to the achievement of the purpose, or to evaluate whether or not the characteristics of the outputs were as expected.

The parameter "Impact" is a foreseeable or unforeseeable, and a favorable or adverse effect of the project upon society. The evaluate impact, both the goal and project purpose should be referred to in the beginning of the evaluation. Evaluation with this components could lead to more than the confirmation as whether or not the goals have been obtained. Evaluation with this component requires comprehensive surveys in many cases.

The parameter "Relevance" is to comprehensively evaluate whether or not the project meets the overall goals, politics of both the donor and recipient, local needs and given priority levels, in order to decide whether the project should be continued, reformulated or terminated.

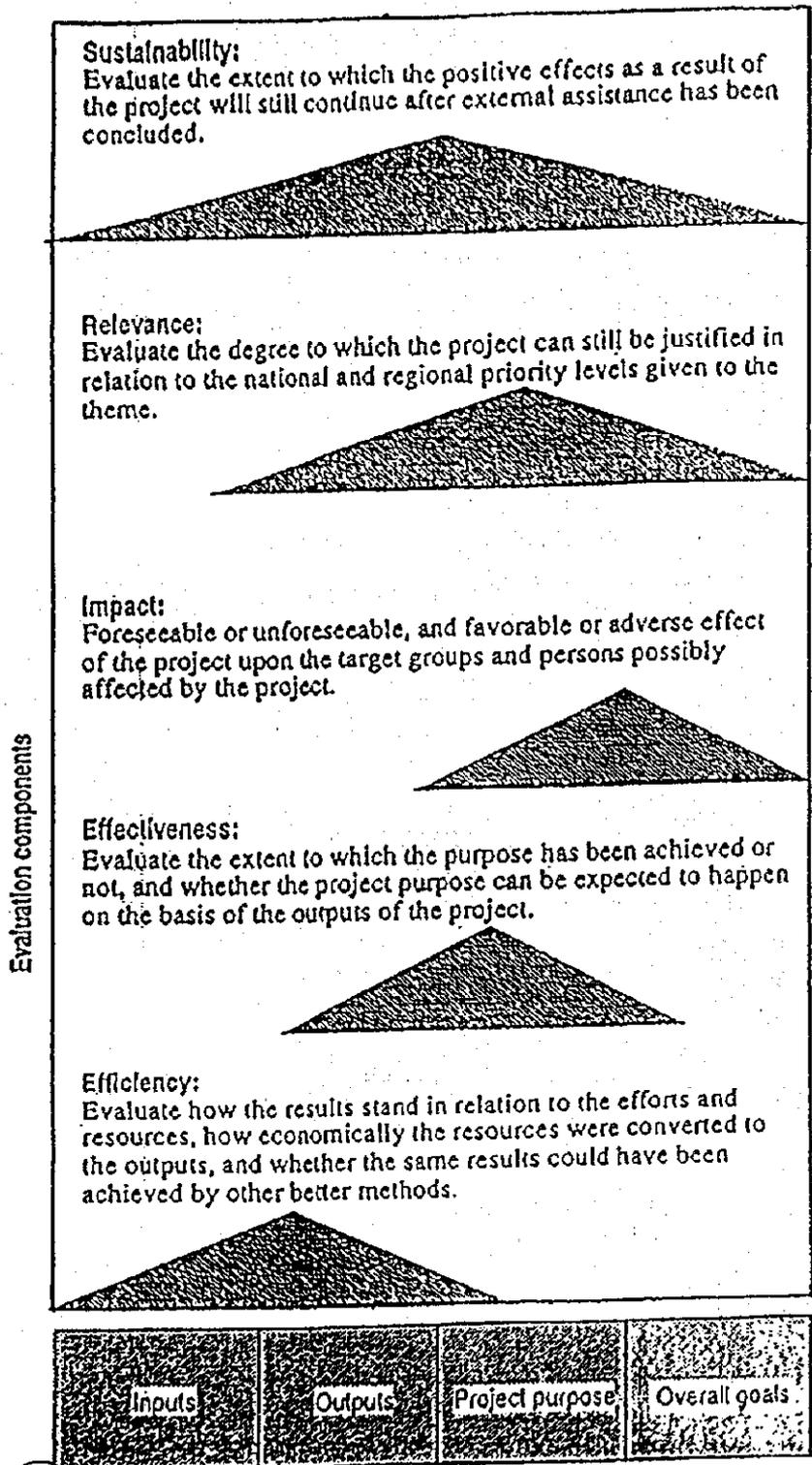
The component "Sustainability" is to comprehensively evaluate how long the favorable effect as a result of the project can continue after the project has been terminated. Evaluation with this component is required to decide how much the local resources should continue to be used for the project, and to evaluate how much the country receiving the assistance has been considering important. According to OECD (1989), "Sustainability" is the component to be used for the final test of the success of a development project.

All five components are essential for any of the projects or programs. The five components give necessary information to the decision maker so that he/she can decide how to approach the next step. Since each of the five components build on the intervention strategy, they also lay the foundation for standardization in monitoring and information handling within and among organizations and agencies.

In practice, each of the five parameters should also contain project-specific information.

# Annex 15 (3/3)

## Five Basic Evaluation Components



Goal hierarchy

Five Components vs. Goal Hierarchy

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## Annex 18 Tentative Schedule of Implementation (TSI)

Calendar Year	1997			1998				1999				2000				2001				2002		
Quarter	I	II	III	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	
Duration of the Project	----->																					
I. Undertakings of the Japanese Side																						
1.1 Dispatch of Study Teams																						
(1) Preliminary Study	=																					
(2) Supplementary Study					=	=																
(3) Implementation Study																						
(4) Technical Guidance												=										
(5) Evaluation Study																			=			
1.2 Dispatch of the Japanese Experts																						
(1) Long-term Experts																						
a. Chief Advisor	----->																					
b. Coordinator	----->																					
c. Expert in the field of Mineral Processing	----->																					
d. Expert in the field of Waste Water Treatment	----->																					
(2) Short-term Experts	[When necessity arises]																					
1.3 Provision of the Equipment																						
1.4 Training of Counterparts in Japan.								=				=							=			
II. Undertakings of the Colombian Side																						
2.1 Establishment of the Operation Units	----->																					
2.1 Assignment of Staff	----->																					
2.2 Preparation of Buildings/Facilities	----->																					
2.3 Supply of Ore Sample and Management of Products from Tests	----->																					
2.4 Procurement of the Equipment/Materials	----->																					
2.5 Allocation of the Operational Budget	----->																					
2.6 Implementation of the Items in the TCP	----->																					
III. Preparation of Joint Monitoring Reports	----->																					

[Notes] This schedule is subject to amendment based on the mutual agreement and the framework of the R/D, according to the progress of the Project.

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# Annex 19 (1/2) Annual Plan of Operations (APO)

Activities	Target	1999 (Japanese Fiscal Year)												Responsible Person in the Project*	Input*			
		1999 (Calendar Year)														2000		
		1	2	3	4	5	6	7	8	9	10	11	12			1	2	3
Output 0 : Project operation unit will be established.																		
0-1 Allocation of Personnel/Budget. 0-1-1 Make staff allocation plan. 0-1-2 Assign the C/P and staff. 0-1-3 Allocate the budget for 1999/2000. 0-1-4 Discuss the budget plan for 2000.	Secure the necessary number of C/P and amount of budget for effective progress of the Project.															PD & CA	PM, PC, LE & C/P	
0-2 Establishment of a Joint Coordinating Committee (JCC). 0-2-1 Set up JCC. 0-2-2 Open the meeting of JCC.	Approve the APO and review the progress of the TCP & TSI.			=			=			=			=			PD	PM, PC & CA	
0-3 Establishment of a Joint Operating Committee (JOC). 0-3-1 Set up JOC. 0-3-2 Execute the function of JOC.	Secure the smooth operation of the Project as scheduled.															PD	PM, CA, PC, LE	
Output 1 : Mobile milling test facilities will be installed and maintained.																		
1-1 Planning and Procurement of the Machinery and Facilities. 1-1-1 Review the plans on the machinery and facilities. 1-1-2 Procure the machinery and facilities.	Secure the tools for technology transfer.															PD & CA	PM, PC & LE	
1-2 Installation of the Machinery and Equipment. 1-2-1 Set up the facilities. 1-2-2 Install the Machinery.	Secure the stable operation of testing facilities.															PM & CA	LE, SE & PC	
1-3 Preparation of Manuals for Operation and Maintenance. 1-3-1 Prepare the operation manual. 1-3-2 Prepare the maintenance manual.	Secure the sustained management and operation of the Equipment.															PM & CA	LE, SE & PC	

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Annex 19 (2/2)

Annual Plan of Operations (APO)

Activities	Target	1998			1999 (Japanese Fiscal Year)												Responsible Person in the Project*	Input*
		1999 (Calendar Year)												2000				
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3		
Output 2 : Engineers and scientists in charge of the technical guidance on the improvement of mill operation including environmental control will be trained.																		
2-1 Arrangement of the Stable Supply of the Ore Sample Projected.	Secure the ore sample tested.																PM	PC & C/P
2-2 Investigation on Mineral Processing Characteristics of the Ores Projected by Laboratory Scale. 2-2-1 Mineralogical study. 2-2-2 Chemical analysis. 2-2-3 Amenability study on operation condition of the mobile milling test facilities.	Collect the basic data on the ores projected.																PM & CA	PC, C/P & LE
2-3 Determination of the Optimum Conditions for Milling Operation of the Ores Projected by Mobile Milling Test Facilities. 2-3-1 Operate the crushing/screening circuit. 2-3-2 Operate the grinding/classifying circuit.	Investigate the optimum milling conditions for the ores projected.																PM & CA	PC, C/P & LE MA
2-4 Determination of the Optimum Conditions for Treatment of Waste Water from Mines and Mills. 2-4-1 Studies on present state of waste water from mines and mills. 2-4-2 Basic tests on treatment of waste water by laboratory scale	Investigate the optimum treatment conditions for waste water from mines and mills.																PM & CA	PC, C/P & LE MA
2-5 Preparation of the Manuals on test procedures.																	PM & CA	PC, C/P & LE

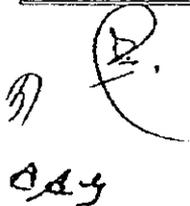
[Notes] \* Input: Person, equipment and other input necessary for implementing the activities.  
 PD: Project Director, PM: Project Managers, PC: Project Coordinators, C/P: Counterpart Personnel  
 CA: Chief Advisor, LE: Long-term Experts, SE: Short-term Experts, MA: Machinery & Equipment

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## Annex-20 Outline of the Agreement on the Cooperation between the Agencies Concerned

Major Activities in the Project.	Major Matters possible to cooperate in the Project			
	MINMINAS	INGEOMINAS	MINERALCO	Regional Mining Associations
1. Selection of the Ore Samples for the Project.	Discussion, decision, & necessary measures concerned.	Discussion, decision, & necessary measures concerned.	Discussion, decision, & necessary measures concerned.	Information offering and supply of ore samples.
2. Investigation by Laboratory Scale.	Discussions on the results of investigation.	Responsible agency for implementation on this matter.	Discussions on the results of investigation.	Discussions on the results of investigation.
3. Determination by the Operation of Mobile Milling Test Facilities.	Discussions on the results of operation by Mobile Milling Test Facilities.	Responsible agency for the operation by Mobile Milling Test Facilities. Discussions on the results of the above operation.	Responsible agency for the operation by Mobile Milling Test Facilities. Discussions on the results of the above operation.	Discussions on the results of operation by Mobile Milling Test Facilities.
4. Formulation of the Materials necessary for the Technical Guidance Services.	Discussions on the materials formulated.	Responsible agency for formulation of the materials necessary for technical guidance.	Responsible agency for formulation of the materials necessary for technical guidance.	Information offering on the present conditions of mill operation and discussions on the guidelines based on the materials formulated
5. Treatment of the Products from the Operation of Mobile Milling Test Facilities.		Responsible agency for treatment of final products from the site of the Project.		
6. Diffusion of the Outputs from the Project.	Application of the outputs to the Governmental administration in the regional mining industry	Information offering on the outputs from the Project. Technical guidance at the mines & mills	Application to the promotional activities in the regional gold mining areas.	Participation to the Governmental promotional activities and assistance to the mines & mills.
7. Realization of the Promotional Plan based on the Output from the Project.	Application of the possible measures necessary for the realization of the promotional plan.	Every possible support concerning the realization of the promotional plan.	Every possible support concerning the realization of the promotional plan.	Cooperation to the operation of the promotional plan in the regional gold mining areas.


  
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Annex 21  
Sample of the Record of Discussions

SAMPLE

RECORD OF DISCUSSIONS  
BETWEEN JAPANESE IMPLEMENTATION STUDY TEAM  
AND AUTHORITIES CONCERNED OF  
THE GOVERNMENT OF THE REPUBLIC OF COLOMBIA  
ON JAPANESE TECHNICAL COOPERATION  
FOR THE PROJECT ON THE IMPROVEMENT OF MINERAL PROCESSING TECHNOLOGY  
CONCERNING MEDIUM AND SMALL-SCALE MINES

The Japanese Implementation Study Team organized by the Japan International Cooperation Agency and headed by Mr. \*\*\*\*\* (hereinafter referred to as "the Team") visited the Republic of Colombia from \*\*\*\*\* to \*\*\*\*\* \*\*, 19\*\* for the purpose of working out the details of the technical cooperation program concerning the Project on the Improvement of Mineral Processing Technology Concerning Medium and Small-Scale Mines in the Republic of Colombia.

During its stay in the Republic of Colombia, the Team exchanged views and had a series of discussions with the Colombian authorities concerned with respect to desirable measures to be taken by both Governments for the successful implementation of the above-mentioned Project.

As a result of the discussions, in accordance with the provisions of the Agreement on Technical Cooperation between the Government of Japan and the Government of the Republic of Colombia, signed in Bogota on December 12, 1976 (hereinafter referred to as "the Agreement"), the Team and the Colombian authorities concerned agreed to recommend to their respective Governments the matters referred to in the document attached hereto.

Santafe de Bogota, D.C., \*\*\*\*\* \*\*, 19\*\*

\*\*\*\*\*

Leader  
Implementation Study Team  
Japan International  
Cooperation Agency (JICA)  
Japan

\*\*\*\*\*

General Director  
Institute for Research in Geosciences  
Mining and Chemistry (INGEOMINAS)  
The Republic of Colombia

\*\*\*\*\*

General Manager  
Colombian Minerals Company (MINERALCO)  
The Republic of Colombia

\*\*\*\*\*

General Director  
Colombia International Cooperation  
Agency (ACCI)  
National Planning Department (DNP)  
The Republic of Colombia

ATTACHED DOCUMENT

SAMPLE

I. COOPERATION BETWEEN BOTH GOVERNMENTS

1. The Government of the Republic of Colombia will implement the Project on the Improvement of Mineral Processing Technology Concerning Medium and Small-Scale Mines (hereinafter referred to as "the Project") in cooperation with the Government of Japan.
2. The Project will be implemented in accordance with the Master Plan which is given in Annex I.

II. MEASURES TO BE TAKEN BY THE GOVERNMENT OF JAPAN

In accordance with the laws and regulations in force in Japan and the provisions of article II of the Agreement, the Government of Japan will take, at its own expense, the following measures through the Japan International Cooperation Agency (hereinafter referred to as "JICA") according to the normal procedures under the technical cooperation scheme of Japan.

1. DISPATCH OF JAPANESE EXPERTS

The Government of Japan will provide the services of the Japanese experts as listed in Annex II.

2. PROVISION OF MACHINERY AND EQUIPMENT

The Government of Japan will provide such machinery, equipment and other materials (hereinafter referred to as "the Equipment") necessary for the implementation of the Project as listed in Annex III. The provisions of article IX-1 of the Agreement will be applied to the Equipment.

3. TRAINING OF COLOMBIAN PERSONNEL IN JAPAN

The Government of Japan will receive Colombian personnel connected with the Project for technical training in Japan.

III. MEASURES TO BE TAKEN BY THE GOVERNMENT OF THE REPUBLIC OF COLOMBIA

1. The Government of the Republic of Colombia will take necessary measures to ensure self-reliant operation of the Project during and after the period of Japanese technical cooperation, through the full and active involvement of all related authorities, beneficiary groups and institutions in the Project.
2. In accordance with the provisions of article IV of the Agreement, the Government of the Republic of Colombia will ensure that the technologies and knowledge acquired by the Colombian nationals as a result of Japanese technical cooperation will contribute to the economic and social development of the Republic of Colombia.
3. In accordance with the provisions of articles V and VI of the Agreement, the Government of the Republic of Colombia will grant in the Republic of Colombia privileges, exemptions and benefits no less favorable than those granted to the experts of third countries or international organizations performing similar missions to the Japanese experts referred to in II-1 above and their families.
4. In accordance with the provisions of article IX of the Agreement, the Government of the Republic of Colombia will ensure that the Equipment referred to in II-2 above will be utilized effectively for the

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implementation of the Project in consultation with the Japanese experts referred to in Annex II.

5. The Government of the Republic of Colombia will take necessary measures to ensure that the knowledge and experience acquired by the Colombian personnel through technical training in Japan will be utilized effectively in the implementation of the Project.
6. In accordance with the provisions of article of V of the Agreement, the Government of the Republic of Colombia will take necessary measures to provide at its own expense for the Project:
  - (1) Services of the Colombian counterpart personnel and administrative personnel as listed in Annex-IV;
  - (2) Land, buildings and facilities as listed in Annex- V;
  - (3) Supply or replacement of machinery, equipment, instruments, vehicles, tools, spare parts and any other materials necessary for the implementation of the Project other than the Equipment provided through JICA under II -2 above; and
  - (4) Means of transport and travel allowances for the Japanese experts for official travel within the Republic of Colombia.
7. In accordance with the provisions of article IX of the Agreement, the Government of the Republic of Colombia will take necessary measures to meet:
  - (1) Expenses necessary for transportation within the Republic of Colombia of the Equipment referred to in II -2 above as well as for the installation, operation and maintenance thereof;
  - (2) Customs duties, internal taxes and any other charges imposed in the Republic of Colombia on the Equipment referred to in II -2 above; and
  - (3) Running expenses necessary for the implementation of the Project.

#### IV. ADMINISTRATION OF THE PROJECT

1. General Director of the Institute for Research in Geosciences, Mining and Chemistry (hereinafter referred to as "INGEOMINAS"), as the Project Director, will bear overall responsibility for the administration and implementation of the Project.
2. Director of the Chemistry Division of INGEOMINAS, as the Project Manager in the headquarters, will be responsible for the managerial and technical support of the Project.
3. Chief of the Regional Operative Unit of INGEOMINAS in Cali, as the Project manager on site, will be responsible for the managerial and technical matters of the Project.
4. The Japanese Chief Adviser will provide necessary recommendations and advice to the Project Director and the Project Managers on any matters pertaining to the implementation of the Project.
5. The Japanese experts will provide necessary technical guidance and advise to the Colombian counterpart personnel on technical matters pertaining to the implementation of the Project.

6. For the effective and successful implementation of technical cooperation for the Project, a Joint Coordinating Committee will be established whose functions and composition are described in Annex VI.

#### V. JOINT EVALUATION

Evaluation of the Project will be conducted jointly by the two Governments through JICA and the Colombian authorities concerned during the last six months of the cooperation term in order to examine the level of achievement.

#### VI. CLAIMS AGAINST JAPANESE EXPERTS

In accordance with the provisions of article VII of the Agreement, the Government of the Republic of Colombia shall bear claims, if any arises, against the Japanese experts engaged in technical cooperation for the Project resulting from, occurring in the course of, or otherwise connected with the discharge of their official functions in the Republic of Colombia except for those arising from the willful misconduct or gross negligence of the Japanese experts.

#### VII. MUTUAL CONSULTATION

There will be mutual consultation between the two Governments on any major issues arising from, or in connection with, this Attached Document.

#### VIII. MEASURES TO PROMOTE UNDERSTANDING OF AND SUPPORT FOR THE PROJECT

For the purpose of promoting support for the Project among the people of the Republic of Colombia, the Government of the Republic of Colombia will take appropriate measures to make the Project widely known to the people of the Republic of Colombia.

#### IX. TERM OF COOPERATION

The duration of technical cooperation for the Project under this Attached Document will be three (3) years from \*\*\*\*\* 1, 19\*\*.

[Note] The Annexes below are attached to this document.

- Annex I MASTER PLAN
- Annex II LIST OF JAPANESE EXPERTS
- Annex III LIST OF MACHINERY AND EQUIPMENT
- Annex IV LIST OF COLOMBIAN COUNTERPART AND ADMINISTRATIVE PERSONNEL
- Annex V LIST OF LAND, BUILDINGS AND FACILITIES
- Annex VI JOINT COORDINATING COMMITTEE

Annex I  
Master Plan

SAMPLE

- (1) Overall Goal of the Project  
The operational situation of the medium, small and petty-scale mining activities at the regional gold mining areas will be improved.
- (2) Purpose of the Project  
The public assistance such as technical guidance and consultation concerning the improvement of mill operation and the environmental control at the medium, small and petty-scale mines and mills located in the regional gold mining areas will be realized.
- (3) Output of the Project
  0. Project operation unit will be established.
  1. Mobile milling test facilities will be installed and maintained.
  2. Engineers and scientists in charge of the technical guidance on the improvement of mill operation including environmental control will be trained.
  3. The guidelines on the improvement of mill operation including environmental control will be proposed to the mines and mills projected.
- (4) Activities of the Project  
Necessary activities to achieve the said outputs will be conducted.

Annex II  
List of Japanese Experts

I. Long-term Experts

1. Chief Advisor
2. Coordinator
3. Expert on mineral processing technology
4. Expert on waste water treatment technology

II. Short-term Experts

Short-term experts in specific fields will be dispatched in relation to the fields of technology transfer as necessity arises.

Annex III  
List of Machinery & Equipment

1. One set of the mobile milling test facilities with the capacity of one (1) ton of crude ores per day except for those machinery and equipment provisioned by the Japanese side previously.
2. Other machinery, equipment and materials regarded as necessary for the effective and smooth implementation of the Project by both sides.

Annex IV  
List of Colombian Counterpart  
and Administrative Personnel

1. Counterpart Personnel
  - (1) Project Director
  - (2) Project Managers
  - (3) Technical Counterparts
2. Administrative Personnel
  - (1) Administrative Staff
  - (2) Technical Supporting Staff
  - (3) Secretaries
  - (4) Drivers

Annex V  
List of Land, Buildings and Facilities

1. Office space and necessary facilities for the Japanese experts.
2. Lecture rooms and meeting rooms necessary for the transfer of technology.
3. Buildings, facilities and space necessary for the installation and operation of the machinery and equipment to be provided by the Government of Japan.
4. Other facilities mutually agreed upon necessary for the implementation of the Project.

Annex VI  
Joint Coordinating Committee

1. Functions

The Joint Coordinating Committee will meet at least once a year and whenever the necessity arises. Its functions are as follows:

- (1) To settle the Annual Plan of Operations (APO) of the Project in line with the Tentative Schedule of Implementation (TSI) and the Technical Cooperation Program (TCP) formulated under the framework of this Record of Discussions (R/D) ;
- (2) To coordinate necessary actions to be taken by both sides ;
- (3) To review the overall progress of the TCP as well as the achievement of the APO; and
- (4) To exchange views on major issues arising from or in connection with the Project.

2. Composition

(1) Chairman

General Director of INGEOMINAS [Project Director]

(2) Members

\* The Colombian Side

- ① Representatives of ACCI
- ② Representatives of MINMINAS
- ③ General Manager of MINERALCO
- ④ Project Managers
- ⑤ Project Coordinators
- ⑥ Other personnel nominated by the Chairman

\* The Japanese Side

- ① Chief Advisor
- ② Coordinator
- ③ Experts nominated by Chief Advisor
- ④ Representatives of the JICA Colombia Office
- ⑤ Personnel concerned with the Project to be dispatched by JICA

(3) Observers

- ① Officials of the Embassy of Japan in the Republic of Colombia
- ② Other personnel accepted by the Chairman

## Annex-22 Attendance at the Discussions

### § The Japanese Side

#### \* Supplementary Study Team

Mr. Toshinori Isogai, Leader  
Dr. Kenji Tomita, Member (Technical Cooperation Planning)  
Mr. Masatoshi Murata, Member (Machinery & Equipment Planning)  
Mr. Shinichi Suzuki, Member (Project Management)  
Mr. Yasumasa Ito, Interpreter

#### \* Embassy of Japan in the Republic of Colombia

Mr. Hajime Naganuma, Councilor  
Mr. Teruhisa Yutaka, Second Secretary

#### \* JICA Colombia Office

Mr. Bunkichi Kuramoto, Resident Representative  
Mr. Yoshihisa Yoshida, Deputy Resident Representative  
Mr. Takehiko Kasama, Deputy Resident Representative  
Mr. Kimio Fukazawa, Assistant Resident Representative  
Mr. Yukinori Abe, Expert (Cali Operative Unit, INGEOMINAS)

### § The Colombian Side

#### \* Agencia Colombiana de Cooperacion Internacional (ACCI)

Dr. Jose David Marin, General Director  
Dra. Adriana Morena G., Encargo Japan

#### \* Ministerio de Minas y Energia (MINMINAS)

Dr. Orlando Cabrales Martinez, Minister

#### \* Minerales de Colombia S.A. (MINERALCO)

Dr. Francisco Jose Grijalba, Gerente General  
Ing. Armando Duarte Ramirez, Jefe, Dept. Ingenieria  
Dr. Samuel Duarte, Secretario General  
Ing. Bayron Gomez, Subgerente Comercial

#### \* Instituto de Investigaciones en Geociencias, Minería y Química (INGEOMINAS)

Dr. Adolfo Alarcon Guzman, Director General  
Ing. Jorge Martin Molina Escobar, Subdirector del Area de Minería  
Qco. Fabio Hernando Perez Gomez, Subdirector del Area de Química  
Ing. Alicia Montes Alvarez, Jefe, Proyecto E.

#### \* Unidad Operativa de Cali, INGEOMINAS

Ing. Oscar Alonso Hidalgo M., Jefe de Unidad Operativa de Cali  
Ing. Quimico Jorge Ivan Londono Escobar, Tecnico Cientifico del Area de Quimica  
Geologo Jaime Mojica Buitrago, Tecnico Cientifico del Area de Quimica  
Quimica Yolanda Canon Romero, Tecnico Cientifico del Area de Quimica  
Geologa Marta Edith Velasquez David, Tecnico Cientifico del Area de Quimica  
Quimica Maria Del Carmen Gonzalez M., Tecnico Cientifico del Area de Quimica  
Ing. Geologa Teresa De Jesus Duque D., Tecnico Cientifico del Area de  
Ingenieria Geoambiental

Victor Hugo, Tecnólogo Quimica  
Nury Oneida Perez, Tecnólogo Quimica  
Geologo Juan Carlos Molano Mendoza  
Quimico Alvaro Pinilla Torres  
Margarita Bravo, Jefe Operativa  
Diana Alejandra Ortigas

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## 鉱業法改正案

第1章：一般条項	(第1条～第14条)
第2章：鉱業権	(第15条～第21条)
第3章：探鉱と採掘のコンセッションの契約	(第22条～第25条)
第4章：探鉱と採掘のコンセッションの契約の登記手続き	(第26条～第33条)
第5章：探鉱期間中の義務	(第34条～第37条)
第6章：環境管理	(第38条～第42条)
第7章：鉱業環境計画の手続き	(第43条～第50条)
第8章：技術専門家	(第51条～第56条)
第9章：建設と採掘の段階における義務	(第57条～第65条)
第10章：懲罰	(第66条～第69条)
第11章：鉱区税	(第70条～第71条)
第12章：放射性鉱物	(第72条～第77条)
第13章：塩田	(第78条)
第14章：建材	(第79条～第81条)
第15章：石炭	(第82条～第93条)
第16章：制度面	(第94条～第97条)

第94条：MINERCOL—国家が保有する鉱床の管理を主目的として、鉱山エネルギー省傘下の法人格、経営的自立性および独自の資産をもった商工業に従事する企業であるMINERCOL社が設立される。

ボゴタ市が本社所在地となる。同公社の支所は必要な市町村に設立され、その中の2ヵ所はボリバル県のマガンゲ市とチョコ県のキブド市で運営される。

第95条：鉱床の管理—MINERCOL社は、国家が保有する鉱床を管理し、民間の鉱業権の税制面管理と監督を所管する当局である。その所轄事項の実施に際して同公社は以下の事項を実施する。

- a) 鉱床の早期の損壊や枯渇または採掘される鉱石の損失を防ぐことで、国家あるいは民間が所有する鉱床を保全し、これらを活用可能とする現実の科学的知識が保障する地質鉱山に関するシステムと方法によって探鉱と採掘が実施されることを確実にするために必要不可欠な全ての技術的措置をとる。
- b) 鉱業活動に関連した義務と権利の遵守の税制措置と監視を行う。そのために、諸活動を合法的に進捗させ、鉱業権無しあるいは該当する境界外で採掘が実施されることを防止させるために、本法に従い鉱山当局は懲罰を課し、必要な全ての措置を講じる。
- c) 領土内、そして領海または流水域のいかなる地域においても見いだされる国家が所有する鉱床に関して、本法に従って鉱業権の手続きと付与を行う。
- d) 原住民および黒人の居住地区の鉱業地域に関連した基準に従いこれを設定する。
- e) 鉱業セクターの本来の活動の展開において発生する可能性のある労働災害および職業病を防止する目的で、衛生と保安の適切な条件の鉱山作業の実施を保障するために、他の所轄当局と調整しつつ必要な措置を採択する。
- f) 行政的庇護の手続きと実施を行い、本法に定められている手続きと条件に従い、鉱業活動のために財産の接収を行う。
- g) 国家鉱業登録登記を組織し運営する。

- h) 鉱区税の清算と徴収を行う。
- i) 鉱山エネルギー省によって定められた政策を実施する。
- j) 本法および本法によって付与される特別な権限の実施に関して国家政府が付与するその他の機能を遵守する。
- k) 1994年の141号法および本法第97条で定められるところに従い、鉱業振興に充当されるロイヤリティーの資金の投資予算を承認し、配分する。
- l) 合理的な鉱山の探鉱と採掘および鉱石の経済的利用のために必要な技術的知識と実務上の規則を普及する。
- m) 鉱山当局の機能を遵守することを目的として、市民検察官の設立を推進する。
- 第96条：資産—MINERCOL社の資産は以下のものから成り立っている。
- a) 鉱業セクターの再編のために国家政府に対して本法が付与する特別権限の実施の結果としての財産と資産。
- b) 国家ロイヤリティー基金から受け取る交付金。
- c) 鉱区税の支払いの名目で徴収する金額。
- d) 鉱業権者から支払われる罰金および補償金の名目で徴収する金額。
- e) 国家予算に該当して同社に付与される金額。
- f) 本法第108条に定められるところに従い同社に支払われる料金。
- g) あらゆる名義で得られるその他の財産と料金。
- 第97条：地質鉱山研究—基礎地質情報と研究の国家プログラムの担当機関を通じて、そして鉱業振興に充当され、鉱業当局によって個々のプロジェクトを事前に考慮することで調査の作成と探査と探鉱の作業の実施に対して運用されるロイヤリティーの資金をもって、国家は、鉱業当局による名義または特別許可が必要とされない地図作成、鉱業インベントリーおよびテーマ別地図のプログラムを通じた探鉱のための基礎情報の戦略の展開に特別に方向づけられた国土全体における地質鉱山研究の作業を実施する。
- これらの作業は、鉱区が設定されていないかまたは民間の鉱区が設定されている地区で先行できる。後者の場合には、鉱業権者は該当する国家当局に対して全ての協力を行い、その機能の完璧な執行と研究の作業の正常な展開のために、当該当局が命令する作業における特別条件と制限を尊重し、これに対応する義務がある。

第17章：機能の代理と委託	(第98条～第103条)
第18章：鉱業の貢献と特別留保	(第104条～第110条)
第19章：少数民族(先住民族と黒人のコミュニティー)	(第111条～第115条)
第20章：砂金取り	(第116条～第120条)

訳者解説：第116条で砂金取りの定義付けを行い、第117条でその活動制限範囲を定め、第118条および第119条でその管理業務を市町村長に付与している。第120条で環境面での制限を定めている。この活動を特に禁止するという表現はない。

**第121条：小規模鉱業について**—小規模鉱業の規定のために、一定期間中に鉱山から採掘される有用材料（鉱石）と無価値の材料のトン数が基本的基準として採用されることになる。投資金額、雇用、鉱山の機械化の程度および技術・社会・経済的側面は、鉱石の採掘の設置能力に依存ことになる。

この概念にしたがってコロンビア政府は、小規模鉱業を規定する最高価値を設定しなければならず、コロンビア鉱業の社会経済的条件、各鉱物の商業的状況および鉱石の採掘技術の進展で正当化される状況に従って、直前の期間に設定された鉱量を毎年50%以上越えること無く、2年ごとに修正することが出来る。

**第122条：融資**—MINERCOL社は、基本的には技術移転のために、小規模鉱業に関連した諸活動への融資を行うことを目的として、IFIの産業鉱業融資農地貯金および連体金融セクターを通じて、割引可能融資枠を設定し、これを促進する。

**第123条：販売**—産業鉱業融資農地貯金は、共和国銀行と調整することで、生産者に対する販売を保障し、該当する市町村のためのロイヤリティーを定める目的で、産金地域の金の購入のための機関を開設する。

**追加条項：**本条を完全に機能させるために必要な措置は、共和国銀行の責任である。

**第124条：例外暫定措置**—コロンビア政府の支援と小規模鉱業の活発でダイナミックな参加によって、本法が発効する日から18か月間は、義務、要件および新法が定める懲罰の対象として遵守する措置を免れる猶予が与えられる。

MINERCOL社は、本法の基本的、個別のおよび一般的な方針が小規模鉱業を強化し、これが受け入れられるように、技術的および経済的メカニズムを優先的に確立しなければならない。コロンビア政府は、採掘およびその実施のために必要な面積の法的、技術的および環境的な適合性のために、均衡と平等の原則をもって本件の規制を行う。

本条に関連し、コロンビア政府が本法の123条第2項に定めるところに従って小規模鉱業を規定する最高価値を定めないうちは、1988年の2655号政令の第15条の規定が有効となる。

**第125条：協業組合と事前協業組合**—鉱業活動の展開が主要目的である協業組合、事前協業組合および鉱山作業合同企業は、本法および協業組合と作業合同企業に関する法制で定められている特別な特権を享受する。

**第126条：目的**—協業組合、事前協業組合および鉱山作業合同企業は、以下の目的を持つ。

a) 協業組合、事前協業組合および鉱山作業合同企業は、主要経済活動として、探鉱と採掘のコンセッションの取得を通じて、探鉱、採掘、選鉱、鉱物の加工の活動を展開する。これらの連帯的合併は、鉱業権によって発生する義務の遵守を保証するように付与された地区の取扱と管理がその定款に明記される。

b) 協業組合、事前協業組合および鉱山作業合同企業は、より良い技術開発と資源の活用のために鉱業活動を展開し統合する目的で合併する個別の鉱業権所有者である小規模鉱業によって構成される。主要目的は合併される鉱業活動の統合化である。

c) 協業組合、事前協業組合および鉱物および鉱業消費財の商業化合同企業は、商業化のチャンネルを構築し、付加価値に関連した活動を展開することを主要経済活動とする。

第127条：特別な特権－本章で述べられている合併は、以下の特権を享受する。

- a) 鉱業セクター向けの公的プログラムと訓練における優先性。
- b) 鉱業当局は、鉱業振興に充当するために、国家予算および国家ロイヤリティー基金の資金をもって、協業組合、事前協業組合および鉱山作業合同企業を特別対象とした融資プログラムを設立する。
- c) 鉱山環境関連事項の技術指導。
- d) 鉱業振興に向けられるロイヤリティー資金で実施された技術研究へのアクセス。

第128条：経済代替プログラム－鉱業活動から離職した小規模鉱山事業者を支援する目的の経済代替プログラムが設立される。 鉱業振興および環境保護に充当するために、国家予算および国家ロイヤリティー基金の資金によって本プログラムはファイナンスが行われる。 政府は本件の法規策定を行う。

第129条：訓練－鉱山エネルギー省と環境省は、県の鉱山環境当局および地域自治公社との調整のもとに共同で、現行環境規定で定められている環境インパクト調査が含まれる鉱山環境計画を、小規模鉱業の受益者が作成更新するために、訓練とオリエンテーションの戦略と効率的なメカニズムを設計する。

訓練には、鉱床の合理的な採掘、労働者の安全および再生性資源と環境の保全と回復を保障する技術条件で鉱山の活動と作業を小規模鉱山事業者が実施することを目的として、技術関連事項が含まれていなければならない。

訓練は同様に経常的に実施され、第1項で述べられている各機関の責任下で、DANCOPまたはその代わりとなる機関および現地の県当局との調整を行いつつ、鉱業のこの経済活動の連帯セクターおよび全ての様式と市民とコミュニティーの参加する機関を促進する方向を持つ。

コロンビア政府は本件の法規策定を行う。

第130条：唯一の保証－鉱山環境計画から派生する義務の遵守を保証する目的で、鉱山環境計画の年平均金額の最大10%までの金額の担保保証、銀行保証または保険会社の保証を、関心のある者は設定しなければならない。

環境当局が保証の提出後60日以内にこれを承認しない場合には、承認されたものとする。 唯一の保証が承認されると、国家鉱山登録に登録される。

第131条：計画－MINERCOL社は、特に公共秩序の問題が大きい地域における鉱山コミュニティーの社会経済条件を改善するために、国家ロイヤリティー基金の資金で、プログラムを設計し、実施する。

第22章：鉱業用益権

第23章：接収

第24章：担保

第25章：反対

第26章：行政庇護

第27章：鉱業登記

第28章：不法な採鉱、採掘および商業化

第29章：国家ロイヤリティー基金

第30章：国家貴金属基金

第31章：移行措置

第32章：最終条項

(第132条～第148条)

(第149条～第151条)

(第152条)

(第153条～第157条)

(第158条～第169条)

(第170条～第177条)

(第178条～第181条)

(第182条～第184条)

(第185条～第186条)

(第187条～第191条)

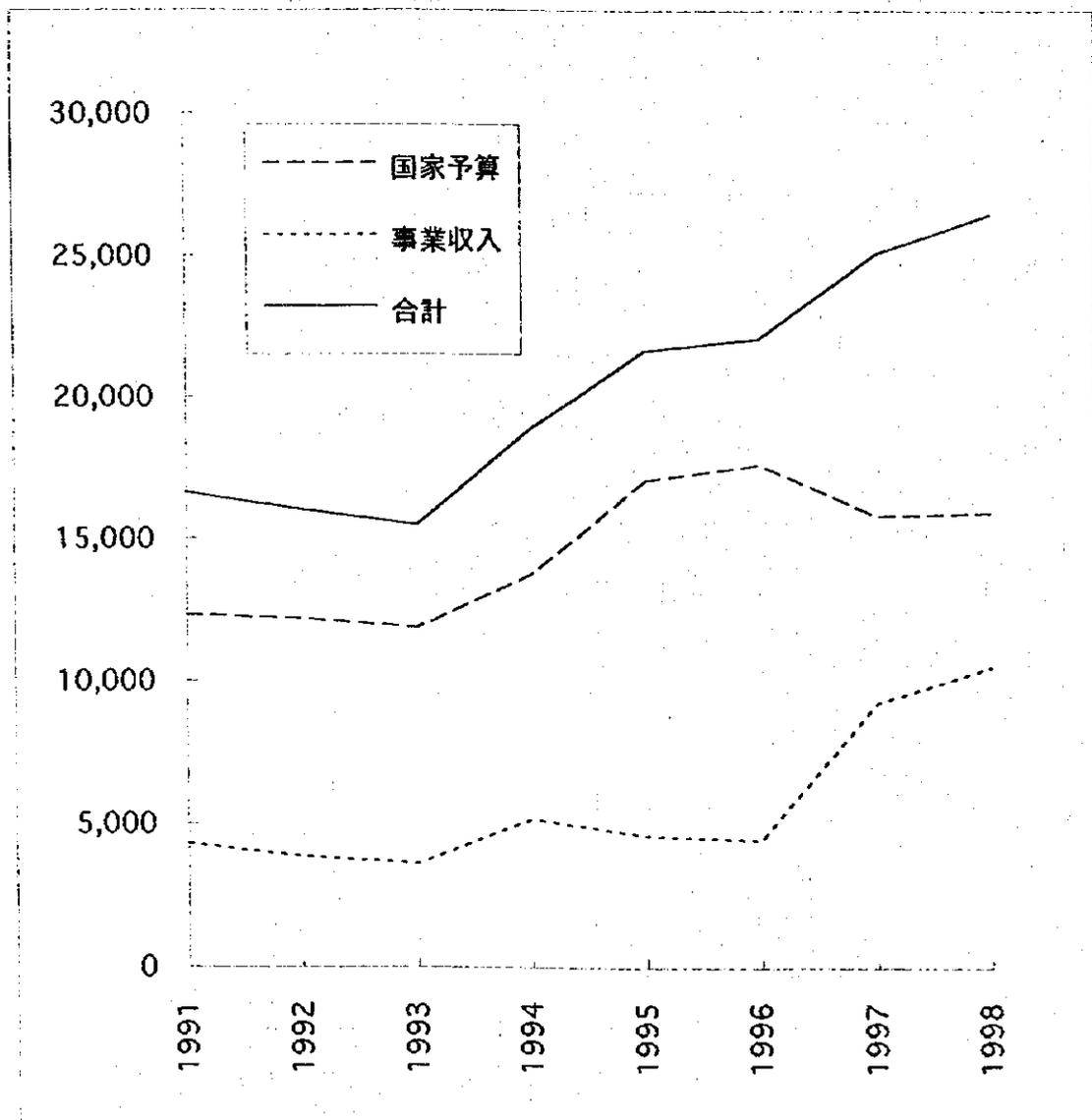
(第192条～第199条)

資料3. INGEOMINAS の予算推移

INGEOMINAS 予算の推移 (国家予算、事業収入)

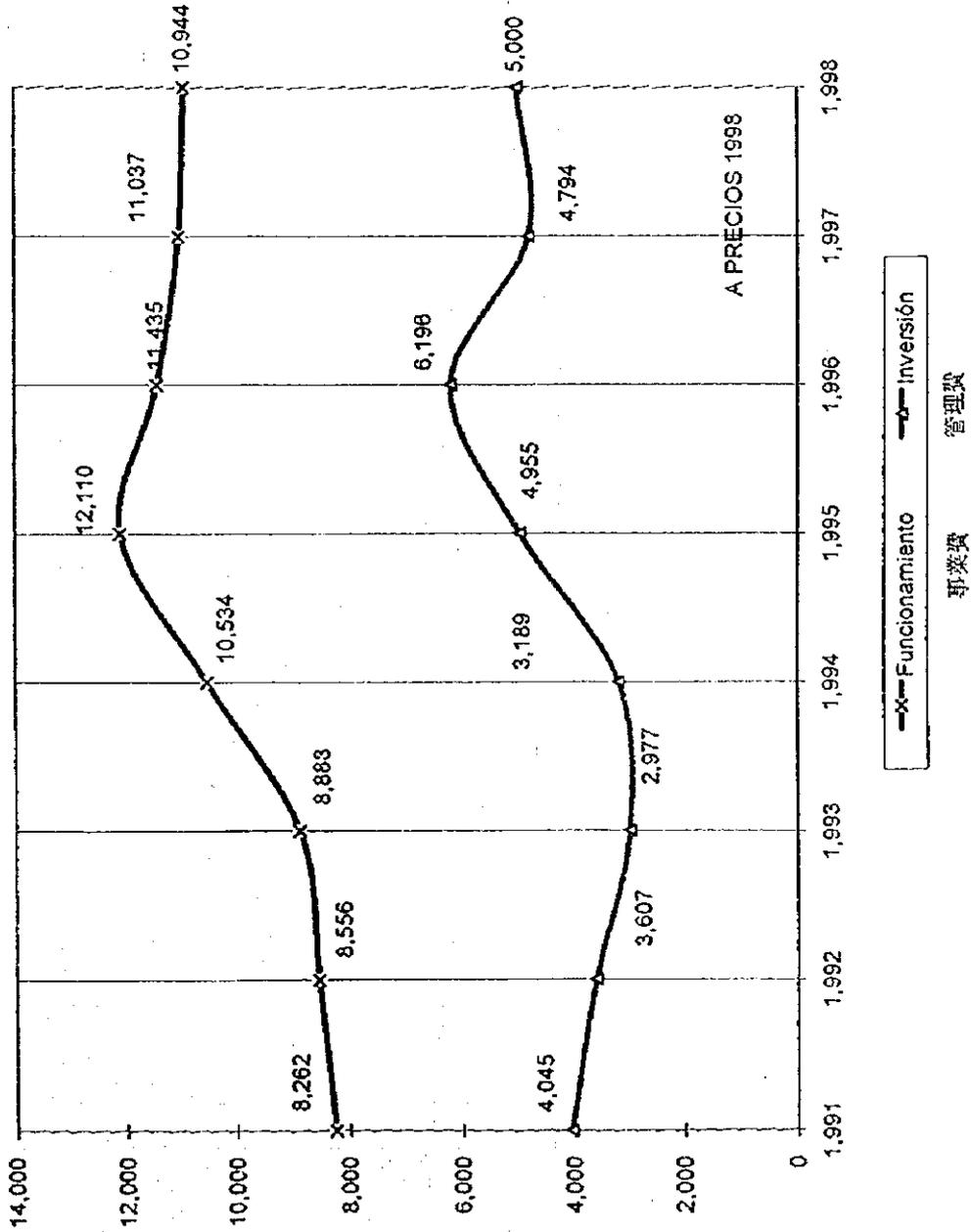
(単位: 百万ペソ)

年度	1991	1992	1993	1994	1995	1996	1997	1998
国家予算	12,307	12,163	11,865	13,723	17,065	17,631	15,831	15,944
事業収入	4,303	3,856	3,601	5,156	4,588	4,441	9,238	10,507
合計	16,610	16,019	15,466	18,879	21,653	22,072	25,069	26,451



INGEOMINAS の国家予算 (管理費・事業費 1991 ~ 1998)  
 (単位: 百万ペソ)

INGEOMINAS ASIGNACION DEL PRESUPUESTO NACIONAL  
 EN INVERSION Y FUNCIONAMIENTO 1991 -1998

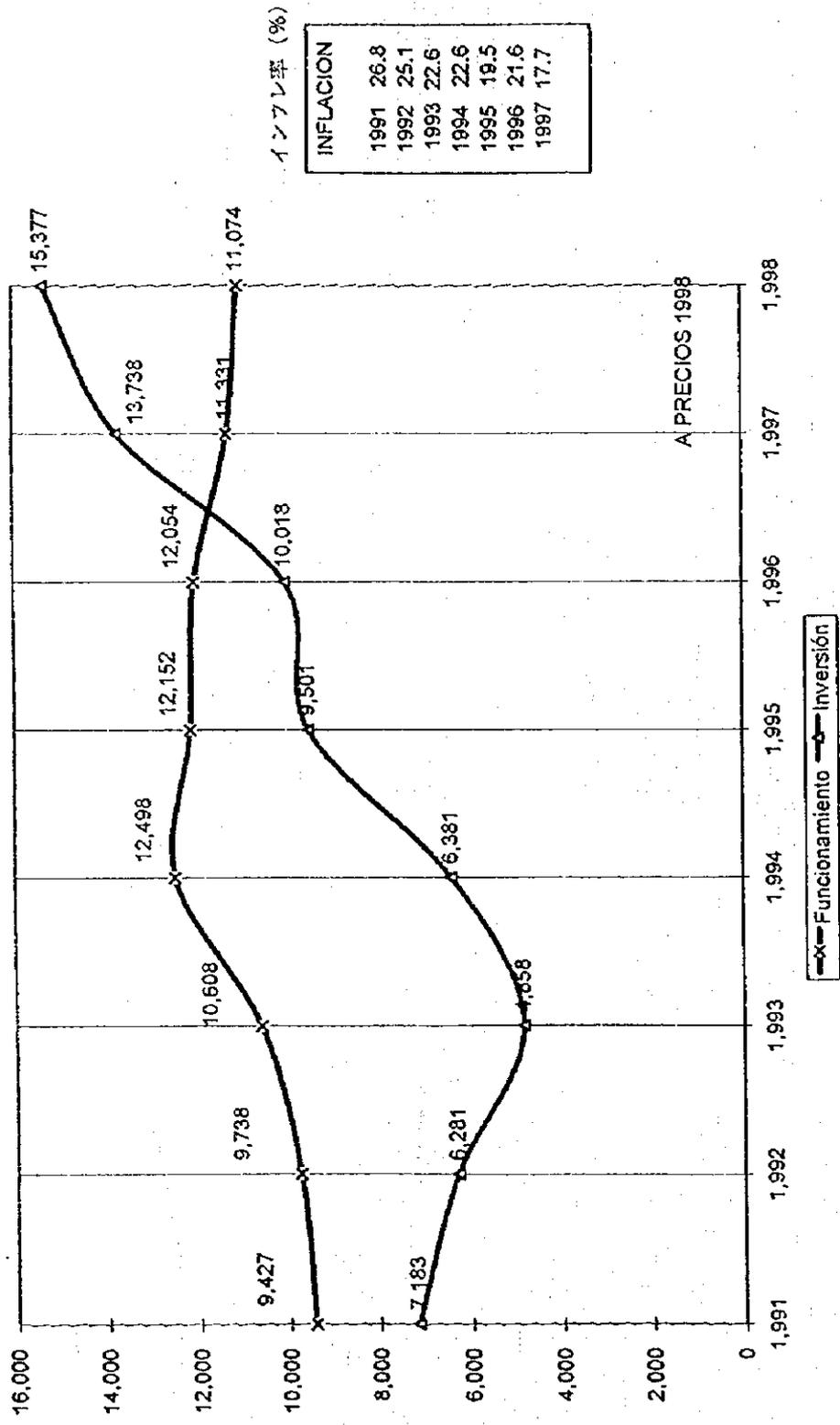


インフレ率 (%)

INFLACION	1991 26.8	1992 25.1	1993 22.6	1994 22.6	1995 19.5	1996 21.6	1997 17.7
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INGEOMINAS の国家予算と事業収入の合計額 (管理費・事業費 1991～1998)  
 (単位: 百万ペソ)

INGEOMINAS TOTAL PRESUPUESTO DE FUNCIONAMIENTO E INVERSION APORTES DE LA NACIÓN Y RAE EN EL PERIODO 1991-1998









JICA

