

## 付 属 資 料

1. ミニッツ（Minutes of Meeting）
  - 1-1 合同評価レポート本文（英語）
  - 1-2 Appendix I：PDM1.0及び、改訂版 PDM2.0
  - 1-3 Appendix II：Plan of Operation（PO）1.0及び、改訂版 2.0
  - 1-4 Appendix III-1：Project Inputs 携行機材
  - 1-5 Appendix III-2：Project Inputs 供与機材
  - 1-6 Appendix III-3：Project Inputs ボリビア側ローカルコスト
  - 1-7 Appendix III-4：Project Inputs 専門家派遣
  - 1-8 Appendix III-5：Project Inputs 研修員受入
  - 1-9 Appendix IV：Project Outputs
2. 改訂版 PDM2.0（和文）
3. 投入実績一覧
  - 3-1 日本人専門家
  - 3-2 本邦研修
  - 3-3 日本・チリパートナーシッププログラム（JCPP）
  - 3-4 供与機材
  - 3-5 携行機材
  - 3-6 現地業務費
  - 3-7 調査団派遣
  - 3-8 カウンターパート職員の配置
4. 機材リスト（携行機材・供与機材）
5. 主なプロジェクト成果品リスト
6. 一連の協議議事録



1. ミニッツ (Minutes of Meeting)

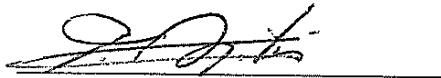
**MINUTES OF MEETING OF  
THE JOINT COORDINATION COMMITTEE BETWEEN  
JAPAN INTERNATIONAL COOPERATION AGENCY AND  
THE AUTHORITIES CONCERNED OF THE REPUBLIC OF BOLIVIA ON  
JAPANESE TECHNICAL COOPERATION FOR  
THE MINING ENVIRONMENTAL RESEARCH CENTER PROJECT**

Based on the Joint Final Evaluation Report (hereinafter referred to as "the Report") presented on February 8, 2007, by the Joint Evaluation Committee, the members of the Joint Coordination Committee (hereinafter referred to as "the JCC") discussed on the achievements of the Project to date, and the necessary recommendations made by the Joint Evaluation Committee, as shown in Appendix I.

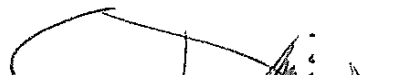
As the result of discussions, the Chief Advisor of Japanese experts of Japan International Cooperation Agency (hereinafter referred to as "JICA") and Bolivian authorities concerned, acknowledged the Report and agreed to recommend to the respective Governments the matters referred to in the document attached hereto.

Done in duplicate in Spanish and English languages, each text being equally authentic. In case of any divergence of interpretation, the English version shall prevail.

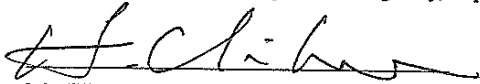
Potosi February 8, 2007



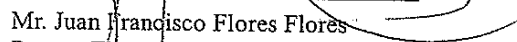
Mr. Tsunekazu Ajiki  
Chief Advisor of Japanese experts  
Japan International Cooperation Agency, Japan



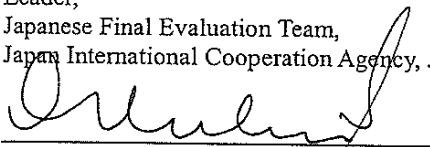
Mr. Mario Virreira Iporre  
Governor, Potosi Prefecture,  
The Republic of Bolivia



Mr. Hiromi Chihara  
Leader,  
Japanese Final Evaluation Team,  
Japan International Cooperation Agency, Japan



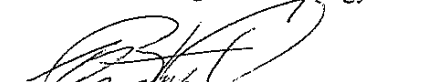
Mr. Juan Francisco Flores Flores  
Rector, Thomas Frias Autonomous  
University, The Republic of Bolivia



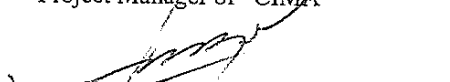
Mr. Jose Guillermo Dalence  
Minister of Mining and Metallurgy



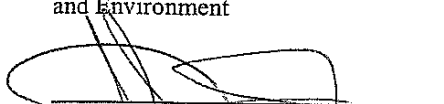
Mr. Hugo Arandó Z.  
Project Manager of "CIMA"



Mr. Sandro Rodríguez Ramos  
Vice Minister of Biodiversity, Forest Resources,  
and Environment



Mr. John Vargas Vega  
Vice Minister of Territory Planning  
and Environment



Mr. Walter Valda Rivero  
Vice Minister of River Basins and Resources Hydric



Mr. Toshiyuki Ezuka  
Resident Representative  
Bolivia Office  
Japan International Cooperation Agency



Mr. Luis Fernando Baudoin  
Vice Minister of public Investment And  
External financing

## ATTACHEHD DOCUMENT

The final evaluation of the Project has been conducted by the Joint Evaluation Team, and the Report was prepared as shown in Appendix I. The Report was discussed and approved by the JCC, held on February 8, 2007.

The essential matters discussed during the JCC are noted as follows;

### 1. Result of the Joint Final Evaluation of the Project

The most of the outputs of the Project have been successfully produced. It is worth mentioning that the fields of the environmental research, wastewater treatment and the productivity improvements in the concentration plants bore practical accomplishments.

- In the environmental research field, Bolivian counterpart personnel can, by themselves, conduct monitoring, mapping, analyzing simulation data as well as managing piled data.
- In the Wastewater Treatment field, the transfer of the technology has been completed by having acquired data on wastewater treatment through iron oxide bacteria technology and on continuous neutralization examination equipment suited for Potosi's acid mining wastewater. The "Comprehensive Plan on Acid Mining Wastewater Treatment in Potosi" is expected to be completed by June, 2007, in which a method for conceptual design using the data will be summarized.
- In the field of productivity improvements in the concentration plants, the transfer of technology has been completed. The Bolivian counterpart personnel are now able to understand the conditions of the concentration plants, carry out various concentration tests, propose measures to improve productivity, and conduct financial analysis by themselves.

However, the following two subjects are yet to be completed.

- The Institutional Development Plan on CIMA with the articles of association foreseeing a long term operational vision has not been fully established yet, which would undermine the sustainability of the Mining Environmental Research Center (hereinafter in referred to as "CIMA").
- In the chemical analysis field, it is unlikely to achieve the planned project purpose by June, 2007 because the achievement of the related outputs is far

behind the schedule due to insufficient inputs of Japanese experts mainly caused by recruiting difficulties and health problems, local expense by Bolivian side, provision of proper space for chemical analysis, and a delay of procuring chemical analysis equipment.

## 2. Institutional Development Plan

Having recognized the importance of the Institutional Development Plan and the articles of association of CIMA for securing the continuity of qualified environmental activities to be followed by the JICA Project, the Bolivian side promised to elaborate and to submit them to JICA by the end of March, 2007.

In this connection, at the request of the Bolivian side, the Japanese side will dispatch a short-term expert in assisting to make the Institutional Development Plan more concrete and viable such as to stipulate the following matters:

### (1) Nature and Characteristics of the Institution

- Mission and Role
- Research and development functions
- Social services functions in the environmental administration
- Legal justification on the Bolivian laws and regulations
- Organization structure
- Date of Establishment

### (2) Financial Status of the Institution

- Financial resources and procurement methods of operation and maintenance costs
- Estimation of the cost
- Financial Analysis

### (3) Human Resources of the Institution

- Recruitment method of qualified staff
- Human resource promotion and training system

### (4) Technical Qualification of the Institution

- Sustaining the Technologies gained through JICA Project
- Maximum Utilization of the granted equipment and materials
- Functioning Research and Development
- Rendering Social Services in Environment Field

With the presentation of the Institutional Development Plan to the satisfaction of the Japanese side, the Japanese side will consider an extension of the Project, specifically in the field of chemical analysis to catch up the delay caused during the

Project.

### 3. Chemical Analysis Field

Capacity in analysis of metal ions in water samples has been much augmented, especially in setting up a system in which a sample from the Environmental Research Section /the Wastewater Treatment Section of the Project is assayed. CIMA received requests of chemical analysis from the Potosi Prefecture and others, and positive impact appeared.

However, the capacity development on chemical analysis area has not been completed yet to the planned schedule. The Bolivian side presented a list of the chemical analysis as shown in Appendix-2 yet to being subjected to the transfer of technology. As the result of discussions, the Japanese side would consider the dispatch of experts to recover the delay of chemical analysis area as listed below;

- (1) ore analysis
- (2) soil analysis
- (3) general environmental analysis
- (4) treatment of waste fluid disposal of laboratory

The numbers, periods and methods of recruiting of the experts will be investigated based on the above list together with the final agreement for the extension of the Project. The experts would be dispatched from Japan and/or Bolivia's neighbor countries. However, the dispatch of the experts would only be considered after the Institutional Development Plan is accepted by JICA.

Since the adequate space for the chemical analysis has not been established yet, the Bolivian side would complete the remaining construction with safe facilities for chemical analysis as soon as possible.

### 4. Gas Chromatography

Gas Chromatography was introduced at the end of 2004 for the purpose of analyzing organic mercury compound conforming to the environmental law 1333 and other organic compound as an additional activity. However, insufficient input of the equipment for preconditioning, facilities for proper management of disposal, as well as a Japanese expert caused an untouched state in technical assistance due to unavailability of the related chemicals in the course of the Project. And it was found extremely difficult to obtain standard samples and chemical reagents within Bolivia, even very difficult to bring them in from foreign countries due to possible

complex of the procedure. Under these circumstances, the Bolivian side suggested that they could utilize the Gas Chromatography with financial resource by the Potosi Prefecture or Thomas Frias Autonomous University, according to a plan of operation, training and maintenance, based on the above-mentioned purpose, and promised to submit a proposal of the plan to JICA by the end of April, 2007.

The proposal should include the affordability for provision of equipment and space for preconditioning and of securing safe waste disposal, for bearing the cost for operation and maintenance, and for staff training for proper handling of Gas Chromatography.

Appendix I

*[Handwritten mark]*

*[Handwritten mark]*

*[Handwritten mark]*

*[Handwritten mark]*

*[Handwritten mark]*

*[Handwritten mark]*

*[Handwritten marks]*



**MINUTES OF MEETINGS  
BETWEEN  
THE JAPANESE FINAL EVALUATION TEAM  
AND  
THE BOLIVIAN FINAL EVALUATION TEAM  
ON  
JAPANESE TECHNICAL COOPERATION  
FOR  
THE MINING ENVIRONMENTAL RESEARCH CENTER PROJECT**

The Japan International Cooperation Agency (hereinafter referred to as "JICA") dispatched the Project Final Evaluation Team, headed by Mr. Hiromi Chihara, to Bolivia from 18 January to 10 February 2007, for the purpose of conducting the joint final evaluation on Japanese technical cooperation for the Mining Environmental Research Center Project (hereinafter referred to as "the Project") based on the Record of Discussions signed on May 7 2002.

The Joint Evaluation Committee, which consists of members from JICA and members from the Government of Bolivia, was jointly organized for the purpose of conducting the final evaluation and preparation of necessary recommendations.

After the intensive study and analysis of the activities and achievements of the Project, the Joint Evaluation Committee prepared the Joint Final Evaluation Report (hereinafter referred to as "the Report"), under the mutual agreement on the matters referred to in the document attached hereto. The Report is to be presented to the Joint Coordinating Committee, held on February 8, 2007.

Done in duplicate in Spanish and English languages, each text being equally authentic. In case of any divergence of interpretation, the English version shall prevail.

Potosi February 8, 2007

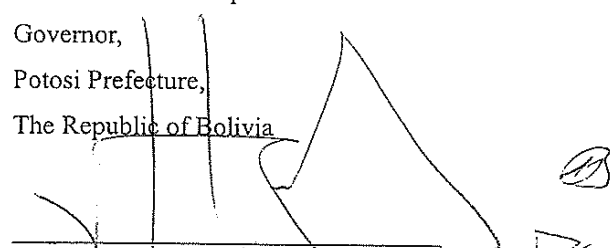


Mr. Hiromi Chihara  
Leader,  
Japanese Final Evaluation Team,  
Japan International Cooperation Agency,  
Japan

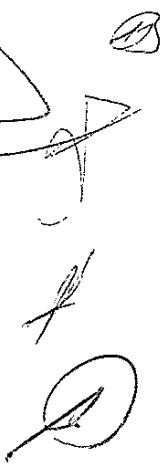
---



Mr. Mario Virreira Iponze  
Governor,  
Potosi Prefecture,  
The Republic of Bolivia



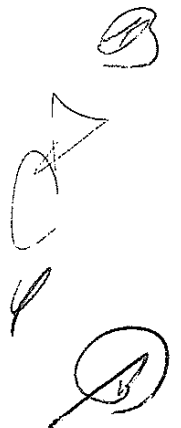
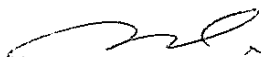
Dr. Juan Francisco Flores Flores  
Rector,  
Thomas Frias Autonomous University,  
The Republic of Bolivia



ANNEX-1

JOINT EVALUATION REPORT  
OF  
THE TERMINAL EVALUATION STUDY  
ON  
THE MINING ENVIRONMENT RESEARCH CENTER PROJECT  
IN  
THE REPUBLIC OF BOLIVIA

Potosí February 8, 2007



**FISCAL YEAR**

Fiscal year of the Japanese Government (JFY): April 1 – March 31

Fiscal year of the Bolivian Government (BFY): January 1 – December 31

**CURRENCY EQUIVALENTS**

1 Japanese Yen (JPY) = 0.06963 Bolivian Boliviano (BOB)

1 Bolivian Boliviano (BOB) = 14.36169 Japanese Yen (JPY)

1 US Dollar = 8.28690 Bolivian Boliviano

1 US Dollar (US\$) = 119.111 Japanese Yen (JPY)

*Handwritten mark*

*Handwritten mark*

*Handwritten signature*

*Handwritten mark*

*Handwritten mark*

*Handwritten signature*

*Handwritten signature*

*Handwritten signature*

**ABBREVIATIONS AND ACRONYMS**

**LIST OF ABBREVIATION AND ACRONYMS USED**

AAPOS	Autonomous Administration for Sanitary Works (Administración Autónoma de Obras Sanitarias)
BFY	Bolivian Fiscal Year
BOB	Bolivian Bolivianos
CENMA	National Center for the Environment (Centro Nacional del Medio Ambiente, Chile)
CBIMA	National Center for the Environment of Bolivia
CIMA	MINING ENVIRONMENT RESEARCH CENTER (Centro de Investigaciones Minero Ambiental)
COMIBOL	Bolivian Mineral Corporation
C/P	Counterpart Personnel
DAC/OECD	Development Assistance Committee in the Organisation for Economic Co-operation and Development
DAF	Internal Committee on the Institutional Development Plan
DANIDA	Danish International Development Agency
DRNMA	Department of Natural Resources and the Environment in the Prefecture of Potosí
EOJ	Embassy of Japan
EU	European Union
JCC	Joint Coordinating Committee
JFY	Japanese Fiscal Year
JPY	Japanese Yen
GTZ	Deutsche Gesellschaft für Technische Zusammenarbeit
JICA	Japan International Cooperation Agency
KfW	Deutsche Kreditanstalt für Wiederaufbau
MDS	Ministry of Sustainable Development (Ministerio de Desarrollo Sostenible)
M/M	Minutes of Meetings
MMH	Ministry of Mining and Metallurgy
M/Mt	Man Month
NGO	Non-Governmental Organization
OBA	Bolivia's certification organization: Organización Boliviana de Acreditación
ODA	Official Development Assistance
OJT	On-the-Job Training
PDM	Project Design Matrix
PGDES	General Economic and Social Development Plan
PO	Plan of Operation
PRSP	Poverty Reduction Strategy Paper
R/D	Record of Discussions
SERGEOTECMIN	National Geologic, Mineral and Mining Engineering Service
UATF	Tomas Frías Autonomous University

*[Handwritten signatures and initials are present at the bottom of the page, including a large signature on the left, a stylized 'B' on the right, and several other initials and marks.]*

TABLE OF CONTENTS

1. Introduction.....1  
 (1) Objectives of the Evaluation Study .....1  
 (2) Joint Evaluation Team Members.....1  
 (3) Study Schedule.....1  
 2. Project Outline .....4  
 (1) Background .....4  
 (2) Project Summary .....4  
 (3) Project Design Matrics (PDM).....5  
 3. Methods of Evaluation.....5  
 4. Inputs.....6  
 (1) Inputs by the Japanese side.....6  
 (2) Inputs by the Bolivian Side.....7  
 5. Implementation Process.....8  
 6. Project Achievements.....23  
 (1) Super Goal and Overall Goal .....23  
 (2) Project Purpose .....25  
 (3) Outputs.....26  
 (4) Progress Made on the Recommendations by the Mid-Term Evaluation Team 34  
 (5) Inputs.....36  
 6. Evaluation Results.....36  
 (1) Relevance.....36  
 (2) Effectiveness.....40  
 (3) Efficiency .....43  
 (4) Impact.....46  
 (5) Sustainability .....49  
 7. Conclusion .....52  
 8. Recommendations .....54  
 (1) Short term Recommendations .....54  
 (2) Mid- and long-term recommendations ( By the end of December, 2009).....55  
 9. Lessons learned.....57

- APPENDIX I Project Design Matrics (PDM 1.0 and 2.0)
- APPENDIX II Plan of Operation (PO for PDM 1.0 and 2.0)
- APPENDIX III Project Inputs
- APPENDIX IV Project Outputs
- APPENDIX V Organization Charts

## 1. Introduction

### (1) Objectives of the Evaluation Study

The terminal evaluation of the Project was conducted with the following objectives:

- To confirm the process, progress and achievement of the Project.
- To estimate the feasibility that the Project Purpose will be accomplished within the implementation period of the Project.
- To confirm the current status of the issues cited in the mid-term evaluation.
- To distill effective recommendations for the sustainability of the Project's effect.
- To clarify in the logical framework the route for the achievement of the Overall Goal.

### (2) Joint Evaluation Team Members

The evaluation and the recommendations on the Project were done by the following members, which form the Joint Evaluation Team (hereafter referred to as "the Team").

Name	Assignment	Title/Organization
<b>Bolivian Side: Representative of;</b>		
Mr. José Guillermo Dalence		Minister of Mining and Metallurgy
Mr. Sandro Rodríguez Ramos		Vice Minister of Biodiversity, Natural Resources, Forestry and Environment
Mr. Lic. Jhon Vargas Vega		Vice Minister of Territorial Planning and Environment
Mr. Walter Valda Rivero		Vice Minister of Watershed Basin and Water Resources
Mr. Mario Vireina Iporre		Governor and General Commander of Potosí Department
Mr. Juan Francisco Flores Flores		Rector U.A.T.F.
Mr. Luis Fernando Baudoin (observer)		Vice Minister of Public Investment and External Finance
<b>Japanese Side</b>		
Mr. Hiromi CHIHARA	Leader of the Study Team	Senior Advisor, Institute for International Cooperation in JICA
Mr. Tsuyoshi KAMIJOH	Pollution Control Policy	Deputy Director, Nuclear and Industrial Safety Agency, Mine Safety Division, Ministry of Economy, Trade and Industry
Mr. Yosuke SUZUKI	Technical Advisor	Executive Director, International Cooperation Department, Japan Mining Engineering Center for International Cooperation
Mr. Tadashi SUZUKI	Cooperation Plan	Program Manager, Environmental Management Team, Global Environment Department in JICA
Mr. Hiromi OSADA	Evaluation Analysis	Senior Consultant, IC-Net Limited
Ms. Setsuko OTAKI	Interpreter	Japan International Cooperation Center

### (3) Study Schedule

The Team conducted documentary reviews, interviews and site visits during the period between January 18 and February 10, 2007. Based on these studies, the meeting of the Joint Evaluation Committee was held on February 8, 2007. In the evaluation process, the Team members held discussions with governmental

authorities and institutions relevant to the execution of the Project. The detailed schedule is attached in the following table.

Schedule of the Joint Evaluation Team

DATE	Bolivian members	Mr. CHIHARA, Mr. Kamijo, Mr. Y.SUZUKI, Mr. T.SUZUKI		Mr. OSADA and Ms. OOTAKI	
		Activity	Place	Activity	Place
January 17th (Wed)	—	—	—	—	—
18th (Thu)	—	—	—	—	La Paz
19 (Fri)	—	—	—	—	La Paz
20 (Sat)	—	—	—	—	La Paz-Sucre
21st (Sun)	—	—	—	—	Sucre
22 (Mon)	—	—	—	—	Sucre-Potosí
23 (Tue)	—	—	—	—	Potosí
24 (Wed)	—	—	—	—	Potosí
25 (Thu)	—	—	—	—	Potosí
26 (Fri)	—	—	—	—	Potosí
27 (Sat)	—	—	—	—	Potosí
28 (Sun)	—	—	—	—	Potosí
29 (Mon)	—	La Paz	Arrival to La Paz Visit to VIPFE Visit to JICA Bolivia	Mondragón Potosí	Visit to inhabitants in Mondragón village Visit to Laguna Pampa tailing dams
30 (Tue)	—	La Paz	Visit to Ministry of Mining and Metallurgy Visit to Ministry of Rural development, Agriculture and Livestock and environment Visit to COMIBOL environment office	Potosí	Complementary interview and inspection at the Project sites
31 (Wed)	—	La Paz-Sucre Sucre-Potosí	—	Potosí	Trip from Potosi to Sucre
1 (Thu)	The 1st Joint Evaluation Committee	Potosí	Meeting with CIMA Experts Visit to the President of U.A.T.F. Visit to Potosí governor The 1st Joint Evaluation Committee	←	←
2 (Fri)	→	Potosí	The 2nd Joint Evaluation Committee The 3rd Joint Evaluation Committee	←	←
3 (Sat)	—	Potosí	Document elaboration	←	←
4 (Sun)	—	Potosí	Ditto	←	←

Terminal Evaluation Report

5 (Mon)	—	Potosí	Meeting with the President of U.A.T.F Meeting with Potosí governor	←	←
6 (Tue)	→	Potosí	The 4th Joint Evaluation Committee (Workshop) The 5th Joint Evaluation Committee	←	←
7 (Wed)	→	Potosí	The 6th Joint Evaluation Committee (Discussion about minutes)	←	←
8 (Thu)	→	Potosí Of. CI MA- JICA Potosí – Sucre	Joint Coordination Committee Signing of minutes Move to Sucre	←	←
9 (Fri)	—	Sucre – La Paz La Paz La Paz	Move to La Paz Inform to JICA Bolivia Inform to Japanese embassy	←	←
10 (Sat)	—	LA Paz-Narita	Trip from La Paz to Narita	←	←
11 (Sun)	—	Ditto	Transit at Los Angeles	←	←
12 (Mon)	—	Ditto	Arrival to Narita	←	←

*fu*

*(W)*  
*ml*

*n*

*g*

*B*  
*A*  
*P*  
*(B)*  
*Heli*



## 2. Project Outline

### (1) Background

Mining has been Bolivia's main industry since it was governed by Spain, but until now the focus has been solely on development with almost no attention given to the prevention of pollution caused by mining. However, washouts from tailing dams in Polco have caused pollution of the Pilcomayo River in recent years, instigating international disputes with its downstream neighbor Argentina, which has called attention to the pollution of the environment. In September 1999 JICA development study entitled "Evaluation and Study of the Mining Sector's Pollution of the Environment in Potosi Prefecture" examined mining's environmental impact in Potosi Prefecture, revealing that the water pollution was severe.

In these conditions, the Bolivian government realized the importance of establishing the "Mining Environment Research Center" (CIMA) to conduct study and research on both technology and policies and to disseminate these research results in order to implement measures to prevent pollution caused by mining in Potosi and throughout Bolivia. Therefore, the Bolivian government requested the Japanese government a project-type technical cooperation, and in July 2002 the "Mining Environment Research Center Project" was initiated.

### (2) Project Summary

The Project's objective is to establish the administrative system and the technology necessary to prevent water pollution caused by mining wastewater in a manner suited to Potosi. The output is composed of three technical fields: environmental monitoring, wastewater treatment and chemical analysis; as well as dissemination activities and the establishment of CIMA's organizational structure. Currently, four long-term experts—a chief adviser, an expert in environmental studies, an expert in wastewater treatment and a coordinator have been dispatched.

The table below outlines the Project's basic information.

Project name	Mining Environment Research Center Project
Related organizations	Potosi Prefecture's Department of Natural Resources and the Environment (Implementing organization)
	Ministry of Rural Development, Agriculture, Livestock and Environment (Supervising organization)
	Tomas Frías Autonomy University (Cooperative organization)
Administrative system	Project Supervisor:
	Vice Minister of Biodiversity, Forestry Resources and Environment
	Vice Minister of Mining and Metallurgy
	Vice Minister of Rural Development, Agriculture and Livestock
	Vice Minister of Territorial Planning and Environment
	Project Director: Governor and General Commander of Potosi Department
	Project Manager: Director of Mining Environment Research Center
Date of signing (R/D)	May 7, 2002
Cooperation period	From July 2002 to June 2007
Cooperation scheme	Technical cooperation project
Related cooperation by	• Development study entitled "Evaluation and Study of Mining Sector's

JICA	<ul style="list-style-type: none"> <li>• Pollution of the Environment in Potosi Prefecture," 1997- September 1999</li> <li>• Two individual short-term experts</li> </ul>
Other donors and related cooperation	<ul style="list-style-type: none"> <li>• Deutsche Kreditanstalt fur Wiederaufbau (Kfw) (Germany), San Antonio Project to Construct Sediment Dam for Mineral Ore Waste (Not realized)</li> <li>• Danish Development Agency (DANIDA), Danish Cooperation Program in the Environmental Sector (PCDSMA)</li> <li>• European Union (EU), Program to Support Sustainable Economic Development in the Impoverished Mine Areas in Western Bolivia (APEMIN II)</li> </ul>

### (3) Project Design Matrics (PDM)

PDM 2.0, which is used for analysis on this evaluation study, indicates the current framework of the Project.

Two versions of PDMs have been formulated since the beginning of the Project. Major contents of PDM1.0 had been approved by both the Bolivian and Japanese sides in discussions held on May 7<sup>th</sup>, 2002. However, PDM 1.0 was modified into PDM 2.0 on February 3<sup>rd</sup>, 2005 with some amendments on its Narrative Summary and Indicators. All the versions of the PDMs are attached in "APPENDIX II: Project Design Matrix (PDM 1.0, and PDM 2.0).

### 3. Methods of Evaluation

The Evaluation was conducted based on the Project Cycle Management (PCM) method. The Evaluation Team (the Team) examined the PDM 2.0 and the related documents on the Project. The Team visited the Project site and conducted a series of interviews and discussions with the Japanese experts, counterparts and other relevant organizations. Consequently, the Team confirmed the actual status of the Project's achievement in terms of inputs, activities, outputs and project purpose as stated in the PDM. The Team also conducted an evaluation of the Project in the light of the five evaluation criteria by DAC/OECD: Efficiency, Effectiveness, Impact, Relevance and Sustainability. These criteria are defined as follows.

#### Five criteria for evaluation

Evaluation criteria	Descriptions
Relevance	Relevance refers to the validity of the Project purpose and the overall goal in connection with the development policy of the recipient governments as well as the needs of the beneficiaries.
Effectiveness	Effectiveness refers to the extent to which the expected benefits of the Project have been achieved as planned, and examines if the benefit was brought about as a result of the Project (not of external factors).
Efficiency	Efficiency refers to the productivity of the implementation process, examining if the input of the Project was efficiently converted into the output.
Impact	Impact refers to direct and indirect, positive and negative impacts caused by

	implementing the Project, including the extent to which the overall goal has been attained.
Sustainability	Sustainability refers to the extent to which the Project can be further developed by the recipient country, and the benefits generated by the Project can be sustained under the recipient country's policies, technology, systems, and financial state.

#### 4. Inputs

##### (1) Inputs by the Japanese side

##### 1) Inputs of Japanese Experts Long-term (as of December 2006)

Fiscal year		2002*	2003	2004	2005	2006	2007**	Total
No of experts	R/D	5	5	5	3	3	3	—
	Actual	4	5	5	5	5	4	—
Total M/M	R/D	30	60	48	36	36	18	228
	Actual	24	57	50.5	57	58	18	264.5
	Difference * **	CA:-6	CA:-3	CA:+3 ER:+4 CL:-4.5	CA:+9 ER+12	CA:+10 ER:+12	ER:+3 CL:-3	CA:+13 ER:+31 CL:-7.5

Note: \*Since July 1<sup>st</sup>, \*\* Planned by June 30<sup>th</sup>, \*\*\*CA: Chemical Analysis, ER: Environmental Research, CL: Chief Advisor

Does not include the liaison and transition term between 2 experts in the same field.

The Inputs of Experts in ER and CA have been expanded by application for further technical transfer.

##### Short-term (as of December 2006)

Technical Field	2002*	2003	2004	2005	2006	2007**	Total
Environmental Policy	—	1.00	2.33	—	—	—	3.33
Chemical Analysis	0.33	—	—	1.45	1.00	—	2.78
Environmental Research	—	1.67	6.00	4.50	—	—	12.17
Wastewater treatment	—	0.75	1.67	2.76	2.00	—	7.18
Mining productivity	—	3.00	4.00	1.50	—	—	8.50
Total	0.33	6.42	14.00	10.21	3.00	—	33.96

Note: \*Since July 1<sup>st</sup>, \*\*By June 30<sup>th</sup>

##### 2) Provision of Donated Machineries and Equipments

(Amount as of December 2006, Unit: 1,000 Japanese Yen)

Fiscal year	2002	2003	2004	2005	2006	2007**	Total
Planned	N.A	N.A	N.A	N.A	N.A	N.A	120,000
Actual	44,921	51,240	4,097	8,366	4299	—	112,923

Note: \*Since July 1<sup>st</sup>, \*\*By June 30<sup>th</sup>

##### 3) Number of Counterparts Trained in Japan

Fiscal year	2002	2003	2004	2005	2006	2007**	Total
			6				

Terminal Evaluation Report

Actual	2	4	4	1	1	2	14
--------	---	---	---	---	---	---	----

Note: \*Since July 1<sup>st</sup>, \*\*By June 30<sup>th</sup>

4) Training in Third Countries (as of December 2006)

Fiscal year	2002	2003	2004	2005	2006	2007**	Total
Actual	2	2	1	—	2	—	7
Host countries	Chile	Chile	Chile	Chile	Chile	—	

Note: \*Since July 1<sup>st</sup>, \*\*By June 30<sup>th</sup>

5) Allocation of Local Costs by the Japanese Side

Local costs

General costs specified in the R/D and actual expenditure (As of December 2006)

(Unit: 1,000 Japanese Yen)

	2002	2003	2004	2005	2006	2007**	Total
R/D	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	
Actual	6,485	6,485	7,635	7,924	10,655	3,000	42,184

Note: \*Since July 1<sup>st</sup>, \*\*By June 30<sup>th</sup>

6) Dispatch of Missions from Japan

Name of the mission	Dispatched term
The 1 <sup>st</sup> Project Administrative Mission	March, 2003
The 2 <sup>nd</sup> Project Administrative Mission	March, 2004
Mid-term Evaluation Mission	January, 2005
Terminal Evaluation Mission	January, 2007

(2) Inputs by the Bolivian Side

1) Allocation of Counterpart Personnel (C/Ps)

Number of personnel assigned as C/Ps. (As of December 2006)

Title	2002	2003	2004	2005	2006	2007**
Project Supervisor	1	1	1	1	1	1
Project Director	3	3	3	3	3	3
Environmental Chemical Analysis	3	3(1)	2(2)	2(3)	2(5)	2(5)
Environmental Research	3	3	3	3	3	3
Wastewater Treatment	3	3	3	3	3	3

Note: \*Since July 1<sup>st</sup>, \*\*By June 30<sup>th</sup>

2) Buildings and Facilities

a) Renovation of the Project Office Building: Achieved

b) Renovation of the Laboratory Building: The 2<sup>nd</sup> renovation shall be finished by March 2007

3) Allocation of Local costs by the Bolivian side

Local cost specified in the R/D and actual expenditure (As of December 2006)

(Unit: Thousand Bolivianos)

		2002	2003	2004	2005	2006	2007**	Total
R/D	US\$	157,548	273,804	213,800	213,800	213,800	127,548	1,200,300
	Bs*	1,218,602	2,193,061	1,760,664	1,721,090	1,761,297	9,946,766	17,897,161
	Bs/US\$	7.7348	8.0096	8.2351	8.0500	8.2869	8.2869	
Actual (Bs)	(a)Approved	725,852	204,890	5,209,080	2,242,695	2,242,695	N.A	9,517,422
	(b)Executed	362,200	181,100	1,744,000	1,007,290	1,184,992	N.A	3,635,300
	(b)/(a)	49.90%	88.34%	33.48%	44.91%	52.84%	N.A	38.20%
R/D /Actual Executed		29.72%	8.26%	99.05%	58.52%	67.28%	N.A	20.31%

*[Handwritten signatures]*

*[Handwritten notes and signatures]*

Activities	Project Administration	Environmental Monitoring	Chemical Analysis	Wastewater Treatment
	<p>Note e: The planned activity has been completed. Δ: The activity has not yet been completed; however it is expected to be completed by the end of the project. Δ: The activity will not be completed by the end of the project. —: There is no activity applicable</p>			
1.3 Budget plan is made.	<p>1) Budget execution rate of local costs            FY 2002 362,200 (49.90%)            FY 2003 181,000 (88.34%)            FY 2004 1,744,000 (33.48%)            FY 2005 1,007,290 (44.91%)            FY 2006 1,184,992 (52.84%)            2) There have been no problems with the allocation of local costs in the Japanese side.</p>	—	<p>analysis field will increase by            2. The reason for this is that the request by the project was accepted.</p>	—
1.4 Joint Coordinating Committee is held regularly.	<p>e To the present, 8 JCC have been held. The main topics of each meeting have been the following:            First JCC: 2002/10/30            • Request from the Japanese side to the Bolivian side the disbursement of local costs.            • Verification of the needs to review the PDM            Second JCC: 2003/03/31            • Verification of the issues discussed on the First Project Administrative Mission            Third JCC: 2004/03/26            • Verification of the issues discussed on the Second Project Administrative Mission            Fourth JCC: 2005/02/01            • Verification of the issues discussed by the Mid-Term</p>	—	—	—

1 Dirección Administrativa de Financiera. DAF

*(Handwritten signatures and initials)*

Terminal Evaluation Report

Activities	Project Administration	Environmental Monitoring	Chemical Analysis	Wastewater Treatment
	<p>Note e: The planned activity has been completed. Δ: The activity has not yet been completed; however it is expected to be completed by the end of the project. Δ: The activity will not be completed by the end of the project. —: There is no activity applicable</p> <p>Evaluation Mission</p> <ul style="list-style-type: none"> <li>• Modification of the PDM 1.0 to PDM 2.0</li> </ul> <p>Fifth JCC: 2006/03/17</p> <ul style="list-style-type: none"> <li>• Verification of the achievements for FY 2005</li> <li>• Verification of the objectives for FY 2006</li> </ul> <p>Sixth JCC: 2006/06/04</p> <ul style="list-style-type: none"> <li>• Verification of the Institutional Development Plan</li> <li>• Announcement of the establishment of the new organization (prefectural governor)</li> </ul> <p>Seventh JCC: 2006/07/04 (La Paz)</p> <ul style="list-style-type: none"> <li>• Establishment of a working group to examine the administration of CI/MA for 3 years after the completion of the Project</li> </ul> <p>Eighth JCC: 2006/10/05 (La Paz)</p> <ul style="list-style-type: none"> <li>• Explanation of CB/IMA's agreement between the prefecture of Potosi and UATF</li> <li>• Explanation of the draft of the article of CB/IMA</li> </ul> <p>• During FY 2006 the 5th~8th JCC meetings were held. The reason for this is that the Japanese side urged for the establishment of the DAF' (Internal Committee on the Institutional Development Plan) in the preliminary meeting on sustainability held in January 30<sup>th</sup>, and as a result the JCC was held in Potosi. Furthermore, the newly appointed Director of</p>			

*Handwritten mark*

*Handwritten signature*

*Handwritten mark*

*Handwritten mark*

*Handwritten mark*

*Handwritten signature*

*Handwritten signature*

Activities	Project Administration	Environmental Monitoring	Chemical Analysis	Wastewater Treatment
<p>1.5 Institutional Development Plan is made.</p>	<p>CIMA urged the governor of Potosi the need for sustainability.</p> <p>● From July the following 4 ministries were part of the supervising organizations, having as members the Vice-Ministers of each ministry.</p> <p>1) Ministry of Planning and Coordination, 2) Ministry of Water Resources, 3) Ministry of Mining and Metallurgy, and the 4) Ministry of Agriculture, Livestock and Rural Development.</p> <p>● The DAF was established in February 2006, after recommendations made by the Japanese side regarding the creation of a working group for the future sustainability of CIMA, during the preliminary meeting on sustainability held on January 30<sup>th</sup> 2006 at the meeting room of the university's president. As of October 20<sup>th</sup>, it has held 8 meetings.</p> <p>● In response to the recommendations in "CIMA Sustainability Plan Study" implemented by local consultants, the DAF was established in February 2006.</p> <p>● In September 20<sup>th</sup> 2006 the CBIMA agreement was subscribed between Potosi prefecture and the UATF for 3 years after completion of the</p>			

Note ●: The planned activity has been completed. △: The activity has not yet been completed; however it is expected to be completed by the end of the project. ▲: The activity will not be completed by the end of the project. —: There is no activity applicable



Activities	Project Administration	Environmental Monitoring	Chemical Analysis	Wastewater Treatment
	<p>Note ①: The planned activity has been completed. △: The activity has not yet been completed; however it is expected to be completed by the end of the project. ▲: The activity will not be completed by the end of the project. —: There is no activity applicable</p> <p>Project.</p> <ul style="list-style-type: none"> <li>① Currently the Institutional Development Plan is being elaborated between the CIMA's general affairs' staff and the planning division of the prefecture</li> <li>② The study on the legal justifications has already been conducted by the legal advisors of the university and the prefecture.</li> <li>③ The following activities are expected to be completed by the end of the Project.</li> <li>④ Taking into account the recommendations from the 8 meetings of the DAF, the first draft of the Institutional Development Plan was completed on September 20<sup>th</sup> and the UATF and Potosi Prefecture subscribed the agreement. The organizational status of CBIMA is expected to be decided through discussions between the UATF and the Prefecture.</li> </ul>			
1.6 Article of CIMA is elaborated.	<ul style="list-style-type: none"> <li>① The first draft of CIMA's article was presented at the 8<sup>th</sup> JCC meeting.</li> <li>② Hereafter the Project Team is expected to support the activities of the 8<sup>th</sup> working group (DAF), and the DAF will finish the final draft of the article and the Institutional Development Plan.</li> </ul> <p>▲ The certification on ISO 17025</p>			

Terminal Evaluation Report

Activities	Project Administration	Environmental Monitoring	Chemical Analysis	Wastewater Treatment
<p>1.7 Monitoring of Technological transfer is carried out.</p>	<p>of the chemical analysis field which is key to secure CIMA's own revenue is carrying out preparations to acquire certification by October 2008.</p> <p>● To the present, the results of the monitoring of 9 technological transfers have been distributed every half a year in each field. The 5 evaluation criteria for 6 evaluation items are being implemented.</p> <p>● In the future, 1 more monitoring is expected to take place.</p>	<p>It is being implemented regularly every 6 months. (Spanish and Japanese Reports).</p> <p>The long-term expert is expected to return to Japan in March.</p>	<p>It is being implemented regularly every 6 months. (Spanish and Japanese Reports).</p>	<p>It is being implemented regularly every 6 months. (Spanish and Japanese Reports).</p>
<p><b>Output 2</b></p>	<p><b>Facilities and equipment necessary for the activities of the Center are introduced and maintained properly.</b></p>			
<p>2.1 Necessary equipment is procured.</p>	<p>—</p>	<p>● All the planned equipment was procured.</p>	<p>● All the planned equipment has been completed with the installation of the laboratory on December 15 and the procurement of the wastewater treatment equipments.</p>	<p>● All the planned equipment was procured.</p> <p>● All are being utilize.</p>
<p>2.2 Equipment maintenance and adjustment are taken.</p>	<p>—</p>	<p>● Technological transfer on equipment maintenance has taken place and the maintenance system including subcontracting has been established.</p>	<p>△ Technological transfer on equipment maintenance has taken place and the maintenance system including subcontracting has been established.</p> <p>△ It will be necessary to consider the maintenance of some of the equipment and the continuous acquisition of test reagents, gas, etc.</p>	<p>△ Technological transfer on equipment maintenance should take place and the maintenance system including subcontracting should be established.</p>
<p>2.3 Facilities installation/renovation is completed.</p>	<p>—</p>	<p>● Renovations of the building necessary to carry out this field's activities have been completed.</p>	<p>△ There is a lack of experimental space for gravimetical analysis, soil dissolution test, wastewater treatment analysis test, etc. However, alternative space will be acquired once</p>	<p>● Renovations of the building necessary to carry out this field's activities have been completed.</p>

*Handwritten mark*

*Handwritten signature*

*Handwritten mark*

*Handwritten mark*

*Handwritten signature*

*Handwritten initials/signature*

*Handwritten initials/signature*

Terminal Evaluation Report

Activities	Project Administration	Environmental Monitoring	Chemical Analysis	Wastewater Treatment
	<p>Note e: The planned activity has been completed. Δ: The activity will not be completed by the end of the project. Δ: The activity will not be completed by the end of the project. —: There is no activity applicable</p>		<p>construction (the first phase began in November 2006 and the second phase begins in FY 2007) finishes. For this construction budgetary measures have been adopted.</p>	
<p>Output 3 3.1 Chemical analysis equipment is set up.</p>	<p>—</p>	<p>Environmental chemical analysis technology is acquired by the C/PS</p>	<p>⊙ All the planned equipment was procured                  ⊙ To the present, the laboratory has been displayed twice to people related to the university                  Δ The installation of some of the bio-chemical analysis equipment was delayed, waiting for completion of the renovation of the laboratory.                  Δ The Gas chromatography has not yet been installed.</p>	<p>—</p>
<p>3.2 Technology of the environmental chemical analysis is acquired by Caps.</p>	<p>—</p>	<p>—</p>	<p>⊙ Technological transfer on the below mentioned items has been conducted;                  1) Related laws on pollution control                  2) Sample collection, transport, coordination and storage technology                  3) Basic technology on measurement of toxic substances in concentrated wastewater.                  Δ Technology transfer on the items mentioned below has not been carried out;                  1) Heavy metal analysis                  2) Wastewater concentration analysis                  3) Soil waste analysis                  4) Treatment of cyanogens</p>	<p>—</p>

Handwritten signatures and initials are present at the bottom of the page, including a large signature on the left, a signature in the middle, and several initials on the right.

Terminal Evaluation Report

Activities	Project Administration	Environmental Monitoring	Chemical Analysis	Wastewater Treatment
<p>Note e: The planned activity has been completed. Δ: The activity has not yet been completed; however it is expected to be completed by the end of the project. Δ: The activity will not be completed by the end of the project. —: There is no activity applicable</p>			<p>5) Environment components analysis</p>	
<p>3.3 Environmental chemical analysis is carried out.</p>	—	—	<p>⊙ Including the analysis above, the performance of analysis is the following: 270 samples, 2215 elements utilizing 6 analysis methods. In total 270 elements.                      ▲ Some analysis of the above mentioned items that were not completed cannot be started.</p>	—
<p>Output 4</p>	<p>Environmental research technology is acquired by the C/Ps.</p>			
<p>4.1 Environmental map is elaborated.</p>	—	<p>After the mid-term evaluation the current situation is the following:                      ⊙ The structure where elaboration of environmental maps utilizing monitoring data by using mapping hardware and software has been established.                      ⊙ From May to June 2005 a short-term expert conducted a study on heavy metal content in Potosi city and the Pilcomayo basin. The actual conditions of Potosi and the movement of heavy metal content along the Pilcomayo river were understood.                      ⊙ It is expected that the study on the damages to farmland will be implemented by C/Ps with the soil measuring instruments acquired with their own resources.                      ⊙ It was decided that the</p>	—	—

Activities	Project Administration	Environmental Monitoring	Chemical Analysis	Wastewater Treatment
	<p>Note ◉: The planned activity has been completed. △: The activity has not yet been completed; however it is expected to be completed by the end of the project. ▲: The activity will not be completed by the end of the project. --: There is no activity applicable</p>			
4.2 Monitoring Plan is elaborated.	-	<p>improvement of the hydrological structure model is not needed since the study data accumulated up to now does not affect much the model. However in the future, in the case of a new model idea, or the need to change a large barometer, the C/Ps will be capable of doing it by themselves.</p> <p>◉ Approximately 26 points have been selected in the environmental monitoring point in the upper stream of the Pilcomayo basin. A structure has been established in which twice a year environmental monitoring points are planned, implemented and improved.</p> <p>◉ Furthermore, from the field studies, send samples to the chemical analysis laboratory, administrate the results utilizing "the environmental monitoring data entry form" taking into consideration the sharing of data with other organizations and take into account the discussions with COMIBOL and other organizations.</p>	-	-
4.3 Hydro-geological structural model is established.	-	<p>◉ The long-term expert and the 4 geology experts were dispatched and carried out technological transfer. Geological and hydrological studies were carried out, as well as simulations were implemented utilizing the hydrologic simulation software. Also</p>	-	-

Terminal Evaluation Report

Activities	Project Administration	Environmental Monitoring	Chemical Analysis	Wastewater Treatment
<p>Note ◉: The planned activity has been completed. △: The activity has not yet been completed; however it is expected to be completed by the end of the project. ▲: The activity will not be completed by the end of the project. —: There is no activity applicable</p>		<p>preliminary surveys on pollutant sources were carried out.                      ◉ Furthermore, the structure regarding the display of pollutant sources and contamination conditions utilizing the GIS software has been established.</p>		
<p>4.4 Environmental data control system is operated.</p>		<p>◉ As a result of the dispatched of the long-term expert and the short-term expert on information system, technology transfer was carried out. C/Ps are able to input and correct data, make data back-ups, accumulate data, and utilize it. A manual was also elaborated.                      ◉ Furthermore, instruction in computer security and data security took place.                      ◉ Regarding the application of software, C/Ps are able to utilize technical software such as GIS, hydrological simulation, etc.</p>		
<p>Output 5</p>				
<p>5.1 Batch and continuous neutralization equipment are installed</p> <p>5.2 Lectures on mining wastewater treatment are held</p>				<p>◉ Equipment were installed in February 2004, and trial runs were completed</p> <p>◉ The following lectures were given by the long and short-term experts according to the APO. The C/Ps are now able to conduct lectures in all fields.</p> <p>1) Mining wastewater treatment: completed in September 2004</p> <p>2) Selection of suitable technology for mining wastewater in Potosi: Completed in September</p>

Terminal Evaluation Report

Activities	Project Administration	Environmental Monitoring	Chemical Analysis	Wastewater Treatment
<p>Note e: The planned activity has been completed. Δ: The activity has not yet been completed; however it is expected to be completed by the end of the project. Δ: The activity will not be completed by the end of the project. -: There is no activity applicable</p> <p>5.3 Practical laboratory equipment training (batch and continuous neutralization equipment) is held.</p>	-	-	-	<p>3) Iron oxide bacteria technology: Completed in October 2006</p> <p>⊙ Technological transfer completed in July 2005.</p> <p>⊙ The validation of the optimum condition is also expected to be completed.</p> <p>Δ Progress has been made regarding the cooperation with COMIBOL such as the presentation of technology in seminars and the introduction of new technologies. However, the cooperation structure to be developed is still being explored.</p>
<p>5.4 Acid mining wastewater treatment plan in Potosi is elaborated.</p>	-	-	-	<p>Δ Elaboration began in November 2006, and as of December 2006, the 3 following items are underway;</p> <p>1) Feasibility analysis on sustainability of technology based on subjects such as construction costs.</p> <p>2) Analysis of environmental improvement effect</p> <p>3) Technical conceptual design. They are expected to be completed before the completion of the Project.</p>
<p><b>Output 6</b></p>				
<p>6.1 Japanese administration on mining pollution control is introduced and understood.</p>	<p>Environment regulation guideline for mining industries in Potosi is proposed.</p> <p>⊙ In March 2003 and from February to May 2004 it was implemented by a short-term expert and it was completed.</p>			
<p>6.2. Outline of pollution prevention technology in mining industry in Japan is introduced and understood.</p>	<p>⊙ "Pollution prevention technology in the non-iron metal mining industry" was</p>			

Handwritten signatures and initials are present at the bottom of the page, including a large signature on the left, a signature in the middle, and several initials on the right side.

Activities	Project Administration	Environmental Monitoring	Chemical Analysis	Wastewater Treatment
<p>Note ◉: The planned activity has been completed. △: The activity has not yet been completed; however it is expected to be completed by the end of the project. A: The activity will not be completed by the end of the project. —: There is no activity applicable</p>				
<p>6.3 Activity reports of Project and CPs' reports are drawn out.</p>	<p>△ This activity continues to take place and it is expected to be completed by the completion of the Project. In March 2007 a synthesis report is expected to be elaborated and a seminar is expected to be held.</p>	<p>—</p>	<p>—</p>	<p>—</p>
<p><b>Output 7</b></p>	<p>7. Technology for mineral processing productivity is proposed</p>			
<p>7.1 Technological problem of concentration plants are analyzed.</p>	<p>—</p>	<p>—</p>	<p>—</p>	<p>◉ Completed in April 2003 under the guidance of the short-term expert.</p>
<p>7.2 Productivity of the concentration process is analyzed.</p>	<p>—</p>	<p>—</p>	<p>—</p>	<p>◉ Analysis and technological transfer was completed under the guidance of the short-term expert dispatched in July 2004 and September 2005. C/Ps are now able to conduct mineral processing, from understanding the present conditions to concentration tests utilizing the experimental planning method, as well as implementing measures to improve productivity and financial analysis.                      ◉ A total of 3 seminars were held, where not only people related to CIMA but also people from the prefecture, university, consultants, and technical personnel of concentration plants attended, being a successful event.                      ◉ Concentration plants which implemented the measures</p>

120

*[Handwritten signatures and initials]*

19  
- 110 -

*[Handwritten signature]*

*[Handwritten signature]*

*[Handwritten signature]*

*[Handwritten initials]*

*[Handwritten initials]*

*[Handwritten initials]*



Terminal Evaluation Report

Activities	Project Administration	Environmental Monitoring	Chemical Analysis	Wastewater Treatment
	<p>Note ○: The planned activity has been completed. △: The activity has not yet been completed; however it is expected to be completed by the end of the project. ▲: The activity will not be completed by the end of the project. -: There is no activity applicable</p>			<p>recommended for the improvement of mineral processing productivity, were pleased with the increase in productivity, and even after the return of the short-term expert to Japan there have been inquiries from 2 to 3 concentration plants which are being met by the long-term expert and the C/Ps.</p>
<p>Output 8</p> <p>8.1 Magazine including technical information is published.</p>	<p>Public Relations and education for environmental conservation targeted Potosi people who works for mining, concentration and the following environmental conservation activities were carried out mainly to DRNMA, mining businesses, local inhabitants and farmers, etc, to prevent water pollution caused by mining in.</p> <p>1) The magazine which includes technical information was published 3 times (1000 copies each) per field. Pamphlets were published more than twice a year on average (100 copies on average).</p> <p>2) The Project's homepage was revised and updated to Ver. 3. Furthermore, the annual report was uploaded as a PDF file</p> <p>3) Production of 1 video reporting the project's activities and publication of a CD with the homepage's contents (1000 copies).</p>			
<p>8.2 Seminars are carried out.</p>	<p>○ 8 dissemination seminars have been held, achieving an</p>			

Handwritten signatures and initials are present at the bottom of the page, including a large signature on the left, a signature in the middle, and several initials on the right.

Terminal Evaluation Report

Activities	Project Administration	Environmental Monitoring	Chemical Analysis	Wastewater Treatment
<p>Note ○: The planned activity has been completed. △: The activity has not yet been completed; however it is expected to be completed by the end of the project. ▲: The activity will not be completed by the end of the project. —: There is no activity applicable</p>				
<p>average of more than two seminars a year.</p>				
<p>8.3 Press release is carried out.</p>	<ul style="list-style-type: none"> <li>● 5 Press releases have been issued (on average more than 1 per year).</li> </ul>	<p>—</p>	<p>—</p>	<p>—</p>
<p>Others</p>	<ul style="list-style-type: none"> <li>● Regular exchange of information with the Trilateral Commission for the Development of the Riverbed of Pilcomayo, having held until now 7 meetings. Furthermore, since August 2006, 3 of their staff have been stationed at the DRNMA and have frequent contact with CIMA on the issue of water quality analysis contract and information about existing place of acid waste water.</li> </ul>	<p>—</p>	<p>—</p>	<p>—</p>

*[Handwritten mark]*

*[Handwritten signature]*

*[Handwritten initials]*

*[Handwritten mark]*

*[Handwritten signature]*

6. Project Achievements

(1) Super Goal and Overall Goal

Narrative Summary	Indicator	Summary of Achievement
<p><b>Super Goal</b> Administration and technology to decrease water pollution caused by mining industry, which are established in the Center, are disseminated to other regions in Bolivia.</p>	<p>Not defined</p>	<ul style="list-style-type: none"> <li>▲ CIMA's spill over effects have not been identified in other regions' administration systems.</li> <li>▲ There are no precedents of CIMA's technology been introduced and utilized in other prefectures or countries</li> </ul>
<p><b>Overall Goal</b> In the valley of the Pilcomayo River, environmental administrators, mining operators and communities promote the activities for the prevention of water pollution caused by the mining industry.</p>	<p>1. Administration of water pollution prevention is fortified in Potosi.</p>	<ul style="list-style-type: none"> <li>△ There are no regulations on the mining industry regarding their obligations towards the preservation of the environment</li> <li>● Both central and prefectural officials have gained understanding on scientific data on pollutions conditions and effective alternatives of mining wastewater in Potosi prefecture.</li> <li>● Easy access to environmental monitoring data became available when needed.</li> <li>● The DRNMA executed administrative control on the structural crisis of the Laguna Pampa tailing dam in November 2006</li> <li>● The DRNMA personnel's motivation on the implementation of environmental administration guidance has increased.</li> <li>● As a result of the projects commissioned by EU's APEMIN 2 and AAPOS, CIMA became able to conduct chemical analysis on water sources and now is able to support the administration's activities of other government organizations.</li> <li>▲ No countermeasures to the acidic wastewater from mine mouth in Potosi has not been taken yet.</li> </ul>

B

↓

↘

y B

Hteu

23

- 113 -

	<p>2. The water pollutants from mining activities are reduced.</p>	<p>⊙ As a result of the technical guidance of the Project, in two representative concentration plants the recovery rate and concentration improved as following table and it was successful on decreasing the amount of washouts from tailing. Those results has been gained by improvement on the crashing efficiency and PH on the flotation process.</p> <table border="1" data-bbox="869 448 1356 672"> <thead> <tr> <th rowspan="2">Name of plant</th> <th colspan="2">Maximum recovery rate</th> <th>Max. concentration</th> </tr> <tr> <th>Zn</th> <th>Pb</th> <th>Zn</th> </tr> </thead> <tbody> <tr> <td>Lambol</td> <td>83 to 87%</td> <td>-</td> <td>50 to 53%</td> </tr> <tr> <td>Thuru</td> <td>89 to 90%</td> <td>75 to 85%</td> <td>45 to 49%</td> </tr> </tbody> </table> <p>⊙ As of January 2006, 2 of the 38 concentration plants have had positive effects through the direct technological transfer by the Project.</p> <ul style="list-style-type: none"> <li>○ COMIBOL carried out the mine ceiling work in the southern part of Bolivia.</li> <li>○ From the beginning of the P/I, all the washouts from tailing where discharged directly to the Rivera River. However, the mining association constructed 2 sediment dams in which solid waste is deposited, while only supernatant water is discharged to the river.</li> <li>○ All the 29 concentration plants in Potosí area (as of January 2006) are following this method along the administrative guidance.</li> <li>○ Furthermore, with self financing by the Concentrators Association, the construction of the San Antonio tailing dam is expected to be completed by March 2007.</li> <li>○ After beginning the project, the density around the Méndez bridge has decreased as follows. It is explained by the Project that the effect of the tailing dams' operation is clearly observed.</li> </ul> <table border="1" data-bbox="861 1276 1300 1388"> <thead> <tr> <th>Time of measurement</th> <th>Name of chemical</th> <th>Density</th> </tr> </thead> <tbody> <tr> <td>August 2003</td> <td>Zn</td> <td>13.5mg/L</td> </tr> <tr> <td>June 2005</td> <td>Zn</td> <td>1.1mg/L</td> </tr> </tbody> </table>	Name of plant	Maximum recovery rate		Max. concentration	Zn	Pb	Zn	Lambol	83 to 87%	-	50 to 53%	Thuru	89 to 90%	75 to 85%	45 to 49%	Time of measurement	Name of chemical	Density	August 2003	Zn	13.5mg/L	June 2005	Zn	1.1mg/L
Name of plant	Maximum recovery rate			Max. concentration																						
	Zn	Pb	Zn																							
Lambol	83 to 87%	-	50 to 53%																							
Thuru	89 to 90%	75 to 85%	45 to 49%																							
Time of measurement	Name of chemical	Density																								
August 2003	Zn	13.5mg/L																								
June 2005	Zn	1.1mg/L																								
	<p>3. Community people become more environmentally conscious and pay enough attention to the prevention of the mining pollution.</p>	<ul style="list-style-type: none"> <li>⊙ The visit of the media, NGO's etc to the Project, and the holding of review meetings, etc, have raised the awareness of regular citizens on mining pollution.</li> <li>⊙ In September 2005, 60 people from Sucre University, and in April 2006 a total of 23 representatives from Tarija and Chuquisaca prefecture and the media visited the Project and through CIMA's activities positive approaches on mining pollution are being taken.</li> </ul>																								

**[Appearance of the Overall goal]**  
 Although concrete policies and administrative products have not been produced yet, awareness, motivation and commitment to achieve proper environmental administrative activity have been enforced by direct and indirect impact of the Project. Thus the administration of water pollution prevention has been fortified gradually (related Indicator 1). Environmental load by the mine tailing has been reduced due to indirect impact of the Project, the operation of the Tailing Dams mainly. The volume of the tail has been reduced by direct impact, improvement of concentration efficiency. Thus the pollutants have been reduced certainly (related indicator 2). The surrounding community people have more conscious than previous through the activity of the Project and current public opinion (related Indicator 3). Therefore, some part of overall goal has been appearing.

Note ⊙: Positive achievement on the indicator, △: Possible to be achieved within the project term, ▲: Difficult to be achieved within the project term, ○: Positive and indirect achievement by the Project.

*(Handwritten signatures and marks)*

(2) Project Purpose

Narrative Summary	Indicators	Summary of Achievement
<p><b>Project Purpose</b> Monitoring activities on water pollution caused by mining operations in Potosi, the implementation basis of research and technology for the pollution control is established in CIMA, and these outputs are reflected on Potosi administration.</p>	<p>1. Monitoring and analysis of water pollution in Pilcomayo River are implemented.</p>	<p><b>【Environmental Monitoring Field】</b></p> <ul style="list-style-type: none"> <li>⊙ In 26 sites within the basin, water quality monitoring is being conducted twice a year.</li> <li>⊙ The technical basis to use pollution maps and the hydrological simulation models has been almost built.</li> <li>⊙ Undertakes approximately 5 times a year the implementation of environmental studies requests from Potosi Prefecture, AAPOS<sup>2</sup>, EU's project, etc.</li> </ul> <p><b>【Chemical Analysis Field】</b></p> <ul style="list-style-type: none"> <li>⊙ C/Ps are able to conduct metal analysis in aqueous environmental sample and high density ion analysis by themselves.</li> <li>⊙ Matching the current conditions of the buildings, the main equipment has been installed and trial test have been completed.</li> <li>⊙ The technological transfer plan and the organization's draft have been completed and according to these plans part of the technological transfer has been completed.</li> <li>⊙ Already utilizes 6 analysis methods and is implementing subcontracting analysis.</li> <li>⊙ Aims to gain ISO17025 certification by October 2008.</li> <li>▲ Some of the renovations in infrastructure have been delayed, and some of the laboratories have not been finished.</li> <li>▲ The technological transfer of some of the heavy metal content analysis, wastewater treatment analysis, soil waste, environment components analysis, etc has not been completed.</li> </ul>
	<p>2. Methodology of the effective concentration and water treatment of mines and concentrators is investigated.</p>	<p><b>【Improvement of the productivity of the concentration plants】</b></p> <ul style="list-style-type: none"> <li>⊙ As a result of technology transfer, C/Ps are able to understand the current conditions of the concentration plants, various concentration tests, recommend the improvement of productivity in mineral concentration plants and carry out financial analysis.</li> </ul> <p><b>【Wastewater Treatment】</b></p> <ul style="list-style-type: none"> <li>⊙ Water treatment examination: In January 2003 the batch examination started, then in March 2004 continue neutralization began, and in July 2005 the necessary data was collected. Technological transfer to the C/Ps was completed as planned.</li> <li>⊙ Acid bacteria tests: From FY 2004 to FY 2006 a short-term expert was dispatched. He implemented from bacteria culture tests to continuous oxide neutralization tests, obtained data for the conceptual design and elaborated the conceptual design. Technological transfer regarding these activities was completed as planned.</li> <li>⊙ Currently, the acid mining wastewater treatment plan in Potosi is being elaborated. It is expected to be completed by June 2007.</li> </ul>

<sup>2</sup> Autonomous Administration for Sanitary Works

*(Handwritten signatures and initials are present in the bottom margin of the page, including a large signature on the left, a circled 'u' in the center, and several initials on the right.)*

Narrative Summary	Indicators	Summary of Achievement
	3. The administration sector considers results of the monitoring and research as feedback.	<ul style="list-style-type: none"> <li>⊙ The results of the center's environmental monitoring are feedback to the DRNMA twice a year.</li> <li>⊙ The achievements of the Center's activities are being recognized because they are being presented at meetings and seminars with government and other organizations at the national and prefectural level and at academic conferences.</li> <li>⊙ Inspections of tailing dams are carry out regularly, and if any problems are identified it provides advice to the DRNMA. The prefectural government uses this advice as reference.</li> </ul>
	4. Environmental education and publicity on the prevention of the water pollution are promoted.	<ul style="list-style-type: none"> <li>⊙ A website was set up and technical information on the Project's technology and monitoring results are being disclosed.</li> <li>⊙ CDs, pamphlets, etc on publicity and dissemination were distributed to related organizations by the Project. The C/Ps have gained the know-how to promote this material.</li> <li>⊙ C/Ps have gained the capacity to plan and manage dissemination activities and environmental education activities through the implementation of seminars in every field.</li> </ul>
<p><b>【General Achievement of the Project Purpose】</b>                      As the Indicators except in the field of Chemical Analysis have been achieved favorably, CIMA's activity on environmental research, wastewater treatment and environmental enlightenment is being on the track. However, CIMA is still based on the agreement between the prefecture and U.A.T.F and its institutional development plan has not been drawn out within 4 years (related Output 1). Therefore, the whole Project purpose has not been achieved yet.</p>		

Note ⊙: Positive achievement on the indicator, △: Possible to be achieved within the project term, ▲: Difficult to be achieved within the project term, ○: Positive and indirect achievement by the Project.

(3) Outputs

Criteria on the Grade of Achievement

Grade 5	Grade 4	Grade 3	Grade 2	Grade 1
<p><b>【Favorable】</b>                      At present 100% of scheduled tasks of each Output have been achieved. The mentioned Indicator of the Output will be certainly achieved within the Project term.</p>	<p><b>【 Behind, but sure】</b>                      At present achievement of the scheduled tasks is rather behind to the plan. However, the mentioned Indicator of the Output will be achieved within around the Project term, which needs no additional Inputs.</p>	<p><b>【 Possible, with short-term additional Inputs】</b>                      At present achievement of the scheduled tasks is obviously behind to the plan. To achieve the mentioned Indicator of the Output within around the term, countermeasures such as some additional Inputs and/or solution of the external factors in short-term are needed.</p>	<p><b>【 Difficult, mid-term solution needed】</b>                      At present achievement of the scheduled tasks is seriously behind to the plan. It will be difficult to achieve the Indicators within around the term even if with any additional Inputs. A mid-term solution will be needed.</p>	<p><b>【 Fatal, long-term and radical solution needed】</b>                      At present the Project is facing to fatal external factor or obstacles for the achievement. Radical and long-term countermeasures or analysis will be needed.</p>

Method of evaluation on achievements of Outputs

A. Verification by the Joint Evaluation Committee members

Terminal Evaluation Report

The members inspected the Project site and carried out the activities mentioned below from 1) to 5).

- 1) Confirmation of products of the Project, acquired ability test to C/P on the subject of transferred technology through a series of interview, paper test, demonstration and etc.
- 2) A series of discussions on the achievements between the members and C/P.
- 3) Confirmation of assignments to be achieved in the rest of the term.
- 4) Formulation of a general agreement among the members.

B. A series of discussions on the general meeting of the committee.

Narrative Summary	Indicator	Summary of Achievement	Grade of Progress for Achievement <sup>3</sup>																																																																														
1. The organization of the Center is established.	1.1 Administrative personnel are staffed continuously within project periods.	<p>● There have always been more than 4 people assigned as administrative personnel contracted for this Project.</p> <p>▲ Currently, the administrative assistant is the only person carrying out the management work such as equipment procurement and the maintenance of the center.</p> <p>Current No. of Administrative Personnel</p> <table border="1" data-bbox="746 824 1182 1003"> <thead> <tr> <th>FY</th> <th>MS</th> <th>AA</th> <th>ST</th> <th>DR</th> <th>Total</th> </tr> </thead> <tbody> <tr> <td>2002</td> <td>1</td> <td>-</td> <td>1</td> <td>2</td> <td>4</td> </tr> <tr> <td>2003</td> <td>1</td> <td>1</td> <td>1</td> <td>2</td> <td>5</td> </tr> <tr> <td>2004</td> <td>-</td> <td>1</td> <td>1</td> <td>2</td> <td>4</td> </tr> <tr> <td>2005</td> <td>-</td> <td>1</td> <td>1</td> <td>2</td> <td>4</td> </tr> <tr> <td>2006</td> <td>-</td> <td>1</td> <td>1</td> <td>2</td> <td>4</td> </tr> </tbody> </table> <p>MS: Management Staff AA: Administrative Assistant ST: Secretary DR: Driver</p> <p>▲ To the present the administrative assistance has changed 3 times and a new management staff has not been assigned since the last staff left the post in 2003.</p> <p>▲ For this reason the continued assignment of human resources carrying out the management and the administrative work at the center lacks stability.</p> <p>No. of changed Staff</p> <table border="1" data-bbox="746 1361 1177 1559"> <thead> <tr> <th>FY</th> <th>MS</th> <th>AA</th> <th>ST</th> <th>DR</th> <th>Total</th> </tr> </thead> <tbody> <tr> <td>2002</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> </tr> <tr> <td>2003</td> <td>1</td> <td>1</td> <td>1</td> <td>1</td> <td>4</td> </tr> <tr> <td>2004</td> <td>-</td> <td>1</td> <td>-</td> <td>-</td> <td>1</td> </tr> <tr> <td>2005</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> <td>-</td> </tr> <tr> <td>2006</td> <td>-</td> <td>1</td> <td>1</td> <td>2</td> <td>4</td> </tr> <tr> <td>Total</td> <td>1</td> <td>3</td> <td>2</td> <td>3</td> <td>9</td> </tr> </tbody> </table>	FY	MS	AA	ST	DR	Total	2002	1	-	1	2	4	2003	1	1	1	2	5	2004	-	1	1	2	4	2005	-	1	1	2	4	2006	-	1	1	2	4	FY	MS	AA	ST	DR	Total	2002	-	-	-	-	-	2003	1	1	1	1	4	2004	-	1	-	-	1	2005	-	-	-	-	-	2006	-	1	1	2	4	Total	1	3	2	3	9	3
FY	MS	AA	ST	DR	Total																																																																												
2002	1	-	1	2	4																																																																												
2003	1	1	1	2	5																																																																												
2004	-	1	1	2	4																																																																												
2005	-	1	1	2	4																																																																												
2006	-	1	1	2	4																																																																												
FY	MS	AA	ST	DR	Total																																																																												
2002	-	-	-	-	-																																																																												
2003	1	1	1	1	4																																																																												
2004	-	1	-	-	1																																																																												
2005	-	-	-	-	-																																																																												
2006	-	1	1	2	4																																																																												
Total	1	3	2	3	9																																																																												

<sup>3</sup> This grade has been evaluated by the Joint Evaluation Team under the agreement of both the Team and the Project.

*(Handwritten signatures and marks)*

Narrative Summary	Indicator	Summary of Achievement	Grade of Progress for Achievement <sup>3</sup>																																																																														
	<p>1.2 Counterparts (C/Ps) to be transferred technology are assigned.</p>	<ul style="list-style-type: none"> <li>At the beginning of the Project there were 10 C/Ps assigned, however, from 2004 assistants on the field of chemical analysis were assigned, increasing the number to 14 staff.</li> <li>In the field of environmental monitoring and wastewater treatment there was only 1 changed in the C/P, thus there is high work stability.</li> </ul> <p>Current number of C/Ps</p> <table border="1" data-bbox="751 555 1262 725"> <thead> <tr> <th>FY</th> <th>PM</th> <th>ER</th> <th>WT</th> <th>CA</th> <th>Total</th> </tr> </thead> <tbody> <tr> <td>2002</td> <td>1</td> <td>3</td> <td>3</td> <td>3</td> <td>10</td> </tr> <tr> <td>2003</td> <td>1</td> <td>3</td> <td>3</td> <td>3(1)</td> <td>10(1)</td> </tr> <tr> <td>2004</td> <td>1</td> <td>3</td> <td>3</td> <td>2(2)</td> <td>9(2)</td> </tr> <tr> <td>2005</td> <td>1</td> <td>3</td> <td>3</td> <td>2(3)</td> <td>9(3)</td> </tr> <tr> <td>2006</td> <td>1</td> <td>3</td> <td>3</td> <td>2(5)</td> <td>9(5)</td> </tr> </tbody> </table> <p>PM: Project Manager EM: Environmental Research WT: Wastewater Treatment CA: Chemical Analysis ( ): No. of Assistants</p> <ul style="list-style-type: none"> <li>Thus far, the project manager has changed 3 times, while the chemical analysis C/P has changed 5 times.</li> <li>Thus, the management of the center and the chemical analysis field lack work stability.</li> </ul> <p>No. of change of C/Ps</p> <table border="1" data-bbox="751 1066 1171 1285"> <thead> <tr> <th>FY</th> <th>P M</th> <th>ER</th> <th>WT</th> <th>CA</th> <th>Total</th> </tr> </thead> <tbody> <tr> <td>2002</td> <td>-</td> <td>-</td> <td>1</td> <td>2</td> <td>3</td> </tr> <tr> <td>2003</td> <td>-</td> <td>-</td> <td>-</td> <td>1</td> <td>1</td> </tr> <tr> <td>2004</td> <td>1</td> <td>-</td> <td>-</td> <td>1</td> <td>2</td> </tr> <tr> <td>2005</td> <td>1</td> <td>-</td> <td>-</td> <td>-</td> <td>1</td> </tr> <tr> <td>2006</td> <td>1</td> <td>-</td> <td>-</td> <td>-(1)</td> <td>1(1)</td> </tr> <tr> <td>Total</td> <td>3</td> <td>0</td> <td>1</td> <td>4(1)</td> <td>8(1)</td> </tr> </tbody> </table> <ul style="list-style-type: none"> <li>Sometimes the disbursement of local costs was delayed.</li> </ul>	FY	PM	ER	WT	CA	Total	2002	1	3	3	3	10	2003	1	3	3	3(1)	10(1)	2004	1	3	3	2(2)	9(2)	2005	1	3	3	2(3)	9(3)	2006	1	3	3	2(5)	9(5)	FY	P M	ER	WT	CA	Total	2002	-	-	1	2	3	2003	-	-	-	1	1	2004	1	-	-	1	2	2005	1	-	-	-	1	2006	1	-	-	-(1)	1(1)	Total	3	0	1	4(1)	8(1)	<p>3</p>
FY	PM	ER	WT	CA	Total																																																																												
2002	1	3	3	3	10																																																																												
2003	1	3	3	3(1)	10(1)																																																																												
2004	1	3	3	2(2)	9(2)																																																																												
2005	1	3	3	2(3)	9(3)																																																																												
2006	1	3	3	2(5)	9(5)																																																																												
FY	P M	ER	WT	CA	Total																																																																												
2002	-	-	1	2	3																																																																												
2003	-	-	-	1	1																																																																												
2004	1	-	-	1	2																																																																												
2005	1	-	-	-	1																																																																												
2006	1	-	-	-(1)	1(1)																																																																												
Total	3	0	1	4(1)	8(1)																																																																												
	<p>1.3 Operational Project budget is carried out.</p>	<ul style="list-style-type: none"> <li>After 2004, the Bolivian side has disbursed more than 3 times the amount of 2002 for local costs. Thus, it recognizes Bolivia's disbursements efforts amid a chronic budget shortage.</li> </ul> <p><u>Amount of the Project's Local Costs of the Bolivian side</u></p> <table border="1" data-bbox="778 1563 1262 1765"> <thead> <tr> <th>FY</th> <th>Approved</th> <th>Executed</th> <th>Execution Rate</th> </tr> </thead> <tbody> <tr> <td>2002</td> <td>725,852</td> <td>362,200</td> <td>49.90%</td> </tr> <tr> <td>2003</td> <td>204,890</td> <td>181,100</td> <td>88.34%</td> </tr> <tr> <td>2004</td> <td>5,209,080</td> <td>1,744,000</td> <td>33.48%</td> </tr> <tr> <td>2005</td> <td>2,242,695</td> <td>1,007,290</td> <td>44.91%</td> </tr> <tr> <td>2006</td> <td>2,242,695</td> <td>1,184,992</td> <td>52.84%</td> </tr> </tbody> </table> <ul style="list-style-type: none"> <li>With the installation of the equipment and after technological transfer was in full operation, after FY 2004 the execution rate has been between 30% to 40%, not meeting the financial requirements of the Project's activities. Also not meeting the amount committed in the R/D.</li> </ul>	FY	Approved	Executed	Execution Rate	2002	725,852	362,200	49.90%	2003	204,890	181,100	88.34%	2004	5,209,080	1,744,000	33.48%	2005	2,242,695	1,007,290	44.91%	2006	2,242,695	1,184,992	52.84%	<p>2</p>																																																						
FY	Approved	Executed	Execution Rate																																																																														
2002	725,852	362,200	49.90%																																																																														
2003	204,890	181,100	88.34%																																																																														
2004	5,209,080	1,744,000	33.48%																																																																														
2005	2,242,695	1,007,290	44.91%																																																																														
2006	2,242,695	1,184,992	52.84%																																																																														



Terminal Evaluation Report

Narrative Summary	Indicator	Summary of Achievement	Grade of Progress for Achievement <sup>3</sup>																		
	1.4 Joint Coordinating Committee hold once a year with VMARNDF and related organizations.	<ul style="list-style-type: none"> <li>● The JCC is held more than once a year.</li> </ul> <table border="1" data-bbox="754 383 1235 622"> <thead> <tr> <th data-bbox="754 409 911 483">FY</th> <th data-bbox="919 409 1023 483">No. of JCC held</th> <th data-bbox="1031 409 1235 483">Place</th> </tr> </thead> <tbody> <tr> <td data-bbox="754 488 911 517">2002</td> <td data-bbox="919 488 1023 517">1</td> <td data-bbox="1031 488 1235 517">Potosi</td> </tr> <tr> <td data-bbox="754 521 911 551">2003</td> <td data-bbox="919 521 1023 551">1</td> <td data-bbox="1031 521 1235 551">Potosi</td> </tr> <tr> <td data-bbox="754 555 911 584">2004</td> <td data-bbox="919 555 1023 584">1</td> <td data-bbox="1031 555 1235 584">Potosi</td> </tr> <tr> <td data-bbox="754 589 911 618">2005</td> <td data-bbox="919 589 1023 618">1</td> <td data-bbox="1031 589 1235 618">Potosi</td> </tr> <tr> <td data-bbox="754 622 911 651">2006</td> <td data-bbox="919 622 1023 651">4</td> <td data-bbox="1031 622 1235 651">Potosi 2, La Paz 2</td> </tr> </tbody> </table> <ul style="list-style-type: none"> <li>● Until 2005 they were held only when the study team from JICA visited Bolivia.</li> <li>● As the Project intended to promote the ministries' positive participation to the committee, more times of the committees took place in 2006.</li> <li>● There have been no changes in the committee members as a result of personnel transfer in the UATF.</li> <li>● In 2005 the Ministry of Mining and Hydrocarbons became one of the two supervising organizations. In 2006, as a result of the re-structuring of the government's ministries and agencies the supervising organizations increased to 4.<sup>4</sup></li> <li>▲ The committee members changed with the change in administration in the central and prefectural government</li> </ul>	FY	No. of JCC held	Place	2002	1	Potosi	2003	1	Potosi	2004	1	Potosi	2005	1	Potosi	2006	4	Potosi 2, La Paz 2	4
FY	No. of JCC held	Place																			
2002	1	Potosi																			
2003	1	Potosi																			
2004	1	Potosi																			
2005	1	Potosi																			
2006	4	Potosi 2, La Paz 2																			
	1.5 Institutional development plan is drawn out within 4 years.	<ul style="list-style-type: none"> <li>● The Project contracted local consultants which conducted basic research.</li> <li>● In February 2006, the DAF<sup>5</sup> was carried out 8 times.</li> <li>● As a result, in October 2006 an agreement between the prefecture of Potosi and UATF on the new organizational framework and the administration plan of the Center was subscribed until December 2009.</li> <li>● The agreement and the first draft of article for the future CIMA were elaborated.</li> <li>▲ The final draft of the article and the Institutional Development Plan is expected to be elaborated by May 2007. However, these documents could not be finished by December 2006, the original deadline. Change of the Project Manager at May 2005.</li> <li>▲ Evaluation of the effectiveness of the Institutional Development Plan has not been carried out by the Japanese expert yet.</li> </ul>	3																		
	1.6 Monitoring of technical transfer is made continuously.	<ul style="list-style-type: none"> <li>● Monitoring of technical transfer on the 3 fields of environmental monitoring, wastewater treatment and chemical analysis is being carried out every half a year.</li> <li>▲ Monitoring of technical transfer regarding Output 1 (the organization of the center is established) has not taken place</li> </ul>	4																		

<sup>4</sup> 1) Ministry of Planning and Coordination, 2) Ministry of Water Resources, 3) Ministry of Mining and Metallurgy, 4) Ministry of Agriculture, Livestock and Rural Development

<sup>5</sup> Dirección Administrativa de Financiera, DAF

*[Handwritten signatures and initials are present at the bottom of the page, including a large signature on the right and several smaller ones on the left and center.]*

Terminal Evaluation Report

Narrative Summary	Indicator	Summary of Achievement	Grade of Progress for Achievement <sup>3</sup>
<p>2. Facilities and equipment necessary for the activities of the Center are introduced and maintained properly.</p>	<p>2.1 Facilities and equipment necessary for the activities of the Center are procured without delay.</p>	<ul style="list-style-type: none"> <li>● The renovation of CIMA's building was completed before the beginning of the project.</li> <li>▲ It was identified during the implementation of the projects that a separation of the pre-processing chamber and the laboratory for chemical analysis, and the construction of the wastewater treatment plant were needed. These constructions are expected to be completed by June 2007. Necessary financial resource has been already approved by the prefecture.</li> <li>● Equipment for the wastewater treatment field and the environmental monitoring field were generally procured smoothly, in accordance with technological transfer. They are now operational.</li> <li>▲ In the chemical analysis field, the input of equipment from both the Bolivian and Japanese side was significantly delayed. The reasons for this delay were 1) Inability to recruit a qualified expert and thus delayed in the selection of equipment, 2) Shortage of budget in the Bolivian side thus procurement of laboratory glassware materials and test reagents were delayed. 3) The illness of the 2 long term experts during their assignments created an administration blank.</li> <li>● However, between April 2005 and November 2006, the second expert input and installed the equipment. Remarkably test runs have advanced.</li> </ul>	<p>Water Treatment 5 Chemical 2 Monitoring 5</p>
	<p>2.2 Proper operation and maintenance of facilities and equipment is maintained.</p>	<ul style="list-style-type: none"> <li>● Technological transfer on the maintenance of the main equipment of the wastewater treatment field and the environmental monitoring field is expected to be completed. C/Ps are already conducting the maintenance activities.</li> <li>▲ In the chemical analysis field, with the exception of the maintenance of some equipment, technological transfer has not been completed.</li> </ul>	<p>2</p>
<p>3.Environmental chemical analysis of mining pollution are acquired out by the C/Ps.</p>	<p>3.1 Chemical analysis equipment is installed systematically</p>	<ul style="list-style-type: none"> <li>▲ Since construction work on the pre-processing chamber and the laboratory has not been completed, the equipment to carry out safe and trustful analysis cannot be lay out.</li> <li>▲ Furthermore, the treatment plant for wastewater has not been renovated.</li> <li>▲ Matching the current conditions of the building, the input, installation, and trial runs of the equipment has been completed. However, the above do not meet the fundamental requirements.</li> </ul>	<p>2</p>

40  
#  
77  
⑤

20

⑤

*[Handwritten signature]*

N

*[Handwritten signature]*

Wc G

Narrative Summary	Indicator	Summary of Achievement	Grade of Progress for Achievement <sup>3</sup>
	3.2 Technical basic knowledge for chemical analysis is acquired.	<ul style="list-style-type: none"> <li>● The organizations' draft in this field, the plan to improve the facilities and the technological transfer are being finished by the expert.</li> <li>● C/Ps that received technological transfer has steadily gained skills. There are some C/Ps that are even able to instruct their subordinates.</li> <li>● The following subcontracting analysis work has been undertaken under the guidance of the expert.               <ol style="list-style-type: none"> <li>1) Analysis of contaminated materials of sources on the public water supply by DRNMA : 7 samples , 42 elements</li> <li>2) Including the above analysis, the performance of analysis is the following: 270 samples, 2215 elements utilizing 6 analysis methods. In total 270 elements.</li> </ol> </li> <li>▲ Technological transfer on part of the heavy metal analysis, wastewater concentration analysis, soil waste analysis, treatment of cyanogens and environment components analysis have not been completed yet, and chemical analysis utilizing this technology has not taken place.</li> </ul>	2
4.Environmental research technology is acquired by the C/Ps.	4.1 Environmental situation map in Potosí is developed, within 3 years.	<ul style="list-style-type: none"> <li>● Since 2004 environmental maps in every field have been elaborated. Through the regular monitoring of activities, updates and improvements are being carried out.</li> <li>● C/Ps are able to elaborate environmental maps and manage them by themselves.</li> <li>● A system was established to plan, implement and improve the environmental monitoring in 26 sites, twice a year.</li> <li>● CIMA receives approximately 10 requests a year from the DRNMA, the Autonomous. Administration for Sanitary Works (AAPOS), EU's project to support the small and medium mining businesses (APEMIN 2), the Trilateral Commission for the Development of the Riverbed of Pilcomayo, etc., to conduct studies, having reached the technical level to manage these requests.</li> <li>● Results of the technological transfer were divulged in the following activities:               <ol style="list-style-type: none"> <li>1) Published twice the project's activities report.</li> <li>2) Presentation at an international seminar</li> <li>3) 5 Internal seminars</li> <li>4) 4 Joint announcements with other organizations.</li> </ol> </li> <li>● Because the free software Google Earth was disclosed on the internet, it is easier to verify monitoring positions and the surrounding geography.</li> </ul>	5
	4.2 Environmental Monitoring plan of mining wastewater in Potosí is made up, within 3 years.	<ul style="list-style-type: none"> <li>● The first draft of the environmental monitoring plan was elaborated in December 2003, and the actual environmental monitoring has started.</li> <li>● While the monitoring plan is being carried out, the plan is being modified to elaborate the final draft.</li> <li>● At the beginning, 50 sites were selected for monitoring, but as the result of testing and improvements, 26 sites were selected.</li> <li>▲ It will be necessary to create a framework in the future to reduce the obligations of the main engineers when sampling in the monitoring sites.</li> </ul>	4

*[Handwritten signature]*

*[Handwritten signature]*

*[Handwritten mark]*

*[Handwritten signature]*  
*[Handwritten signature]*  
 Cte. C.

Narrative Summary	Indicator	Summary of Achievement	Grade of Progress for Achievement <sup>3</sup>
	4.3 Hydrological Structure Model is established, within 4 years	<ul style="list-style-type: none"> <li>● In 2004 a simulation model was developed and an amplified analysis on pollution was carried out.</li> <li>● A framework has been established in which the results of simulation are being managed with the GIS software, so as to use it when needed.</li> <li>△ The support of an expert is still needed to carry out simulations.</li> <li>○ Technological transfer took place efficiently because an expert with expertise in geology was assigned.</li> </ul>	4
	4.4 Environmental monitoring equipment is distilled and its software is properly managed within 5 years.	<ul style="list-style-type: none"> <li>● It is possible to input data into the database, make corrections, make data backups, collect and utilize the data.</li> <li>● It is possible to use the software on GIS and hydraulic simulation, etc. donated by Japan.</li> <li>● The operation manual was elaborated and based on this manual management of equipment and software takes place.</li> <li>● Technology transfer on computer security and data security also was carried out.</li> <li>● A format to share monitoring data with external organizations such as chemical analysis laboratories and COMIBOL has been created and is irregularly being operated.</li> <li>△ In it hoped that in the future a safe and low cost system is improved as needed.</li> </ul>	4
5. Wastewater treatment technology is acquired by the C/Ps.	5.1 Batch examination equipment and continuous neutralization examination equipment are installed.	<ul style="list-style-type: none"> <li>● By the end of March 2003, the installation of examination equipment was completed and operational.</li> <li>● Although there was a delay in the custom procedures, during that time other activities were carried out and thus there was no delay in technology transfer.</li> </ul>	5
	5.2 The examination of Batch and Continuous Neutralization data allow to find the optimum condition for wastewater treatment, within 5 years.	<ul style="list-style-type: none"> <li>● From March 2004 the optimum conditions in 7 acid mining wastewater were decided utilizing the examination batch and continuous neutralization equipment. With the optimum condition of the batch examination equipment seek the optimum condition and carried out verification tests while doing technology transfer. It was completed in July 2005.</li> <li>● The technology identified by the aforementioned results has confirmed that Bolivia's water standards can be cleared for the six kinds of heavy metal elements. It was also verified that the specifications for the continuous neutralization test equipment are appropriate.</li> <li>● The C/Ps positive attitude to their tasks and the wastewater samples provided by the mining businesses, allowed the achievements of results in an efficient manner.</li> </ul>	5
	5.3 Iron oxide bacteria technology is acquired.	<ul style="list-style-type: none"> <li>● From FY 2004 to FY 2006 short-term experts were dispatched 5 times to conduct technological transfer. As a result, currently the C/Ps are now able to implement follow up tests (9K, medium culture, test on bacteria refinement, counting of bacteria, Fe analysis, etc).</li> <li>● Those results were divulged in the following events:                             <ol style="list-style-type: none"> <li>1) 7 seminars carried out by the project in 2005 and 2006.</li> <li>2) International seminar carried out in October 2006.</li> </ol> </li> </ul>	5

*Handwritten mark*

*Handwritten signature*

*Handwritten mark*

*Handwritten mark*

*Handwritten initials/signature*

*Handwritten initials/signature*

Terminal Evaluation Report

Narrative Summary	Indicator	Summary of Achievement	Grade of Progress for Achievement <sup>3</sup>
	5.4 Plan for mining acid wastewater treatment made up within 5 years.	<ul style="list-style-type: none"> <li>● Based on the data from the activities for indicators 5.1 to 5.3, currently the expert and the C/Ps are elaborating the "Acid mining wastewater treatment plan in Potosi". It is expected to be completed by June 2007.</li> <li>● According to this document, C/Ps will do the conceptual design of wastewater treatment facilities. Thus, it does not include the system design for the utilization of treatment technology.</li> <li>△ C/Ps have not yet reached the level to do the conceptual design.</li> </ul>	4
6. Environment regulation guidelines for mining industries in Potosi are proposed.	6.1 Japanese administration for the mining pollution prevention is understood.	<ul style="list-style-type: none"> <li>● The indicator described on the left were presented to people involve in the project through the following activities:               <ol style="list-style-type: none"> <li>1) Technological transfer by the short-term expert on the administration on mining pollution prevention (0.5 months).</li> <li>2) Technological transfer by the short-term expert on the mine environmental conservation plan</li> <li>3) Dispatched of C/Ps to Chile for a seminar on environmental administration (2 people, 0.5 months).</li> <li>4) C/P training in Japan for CIMA's Director and the Dean of the university (3 people for a total of 1.3 months)</li> </ol> </li> </ul>	5
	6.2 Outline of technology to prevent mining pollution is understood.	<ul style="list-style-type: none"> <li>● The indicator described on the left is the introduction to technology used in the Project. Thus, in the early stage of technological transfer, the technology mentioned on the left was explained and understood.</li> </ul>	5
	6.3 Activity reports of CIMA and C/Ps are submitted to the Potosi Prefecture and supervising/cooperative organizations.	<ul style="list-style-type: none"> <li>● The environmental monitoring reports were sent twice a year to the DRNMA and supervising/cooperative organizations.</li> <li>● Though C/Ps has not gained the capacity to recommend environmental administrative guidelines, they recommends technical advice in the monitoring reports.</li> </ul>	5
7. Technology for mineral processing productivity is proposed.	7. Improvement Plan for mineral processing production in order to obtain the environmental protection expenses is made up within 3 years.	<ul style="list-style-type: none"> <li>● The short-term expert (1 person for 9 months) carried out technological transfer on technology for mineral processing productivity from FY 2003 to FY 2005. As a result, concrete measures to increase productivity in concentration plants to cope with environmental costs were proposed.</li> <li>● That technology was taught in 2 concentrating plants (ingenios)<sup>6</sup>, and in one them quantitative results were obtained.</li> <li>● C/Ps are now able to understand the conditions of concentration plants, carry out various concentration tests, propose measures to improve productivity in concentration plants and implement financial analysis.</li> <li>● It has recently begun to carry out dissemination activities such as answering requests from other concentration plants.</li> </ul>	5

<sup>6</sup> In both concentration plants (ingenio) of Lambol and Comzinc of Potosi.

*[Handwritten signatures and initials are present at the bottom of the page, including a circled 'u', a signature, and several other initials and marks.]*

Terminal Evaluation Report

Narrative Summary	Indicator	Summary of Achievement	Grade of Progress for Achievement <sup>3</sup>																																			
<p>8. Public relations and education for environmental conservation targeted Potosi people who works for mining concentration and the people related to the mining activity are conducted</p>	<p>8.1 Magazine including technical information is published more than twice a year.</p>	<ul style="list-style-type: none"> <li>● FY 2004: production of 500 CDs on educational activities</li> <li>● FY 2005: Production of 500 CDs on the Homepage (ver1)</li> <li>● FY 2005: Publication of 100 copies of the magazine "Revista Técnica Informativa 2005"</li> <li>● FY 2006: Publication of 100 copies of the magazine "Revista Técnica Informativa 2006"</li> <li>● The C/Ps were able to plan and carry out the above mentioned technical information by themselves.</li> </ul> <p>△ Regular publication, twice a year of the press releases is to be achieved.</p>	5																																			
	<p>8.2 Seminars are carried out more than twice a year</p>	<ul style="list-style-type: none"> <li>● The following seminars were held.</li> <li>● C/Ps acquired the ability to plan and manage seminars.</li> </ul> <p>1) Number of Seminars' presentations carried out by the C/P's themselves が独自に発表したセミナー開催回数</p> <table border="1" data-bbox="810 824 1193 1019"> <thead> <tr> <th>FY</th> <th>ER</th> <th>WT</th> <th>CA</th> <th>Total</th> </tr> </thead> <tbody> <tr> <td>2002</td> <td>1</td> <td>-</td> <td>-</td> <td>1</td> </tr> <tr> <td>2003</td> <td>6</td> <td>4</td> <td>-</td> <td>10</td> </tr> <tr> <td>2004</td> <td>2</td> <td>6</td> <td>-</td> <td>8</td> </tr> <tr> <td>2005</td> <td>6</td> <td>6</td> <td>1</td> <td>13</td> </tr> <tr> <td>2006</td> <td>2</td> <td>3</td> <td>2</td> <td>7</td> </tr> <tr> <td>2007</td> <td>17</td> <td>19</td> <td>3</td> <td>39</td> </tr> </tbody> </table> <ul style="list-style-type: none"> <li>2) Lecture and exhibition in an international seminar held on October 2006: The coordination committee has reported to the media every year</li> <li>3) Introduction of technology through exhibitions in the chemical analysis laboratories (twice in 2006).</li> <li>● Subscription of agreement with the UATF for the training of students in chemical analysis in August 2006. It is planned to hold 2 courses with 2 students per course, twice a year for 5 months.</li> </ul>	FY	ER	WT	CA	Total	2002	1	-	-	1	2003	6	4	-	10	2004	2	6	-	8	2005	6	6	1	13	2006	2	3	2	7	2007	17	19	3	39	5
	FY	ER	WT	CA	Total																																	
2002	1	-	-	1																																		
2003	6	4	-	10																																		
2004	2	6	-	8																																		
2005	6	6	1	13																																		
2006	2	3	2	7																																		
2007	17	19	3	39																																		
<p>8.3 Press release is made more than once a year</p>	<ul style="list-style-type: none"> <li>● The Project's individual website which provides information related to the Project has been made.</li> <li>● So far, there have been a total of 20 news stories reported in El Potosi and La Razón newspapers and a total of 25 television broadcasts.</li> <li>● 2 types of pamphlets and 2 types of videos were produced to explain the Project.</li> </ul>	5																																				

Note ●: Positive achievement on the indicator, △: Possible to be achieved within the project term, ▲: Difficult to be achieved within the project term, ○: Positive and indirect achievement by the Project.

P

B

CR

Ⓟ

h # P

W

W

K

Del.