



Visit to Venezuelan
Ministry of Energy and Mines,
Ministry of Environment,
And Small Scale Mine Operations

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BY

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EXECUTIVE SUMMARY

A six (6)- day visit by a Guyanese delegation to Venezuela was made during the period May 1 to May 6, 2000. The delegation includes officials from Guyana Geology & Mines Commission (GGMC), and the Guyana Gold & Diamond Miners Association (GGDMA). The visit was sponsored and facilitated by the CIDA funded Guyana Environmental Capacity Development Project for Mining (GENCAPD-Mining). The officials from the GGMC include Mrs. Diane McDonald, Manager, Mines Division (ag); Mr. Carlos Todd, Senior Environmental Officer; Mr. Zaeran Ramotar, Environmental Inspector; and Mr. Gordon Nestor, Senior Geologist. The GGDMA was represented by Mr. Anthony Shields, Executive Secretary. Diane Lorenzato, International Relations Manager of the Canada Centre for Minerals and Energy Technology (CANMET) facilitated the visit and ensured the appropriate linkages with the Venezuelan Institutions (Government and Non-Government).

The visiting delegation met with officials from different Governmental and Non-Governmental institutions: Ministry of Energy and Mines (MEM), Ministry of Environment and Natural Resources, Corporacion Venezuelano de Guayana (CVG), Placer Dome (PD) and Small Miners' Cooperatives and Associations. The main focus of the visit was to have an understanding of how the Venezuelan Government deals with the Mining Sector, specifically with respect to small-scale gold mining operations. The visit was also aimed at identifying possible areas for technical exchange between Guyana and Venezuela and determining if the Venezuelan environmental protection technologies can readily be adaptable to Guyanese conditions. The discussions with the various Venezuelan officials focused on existing mining regulations, the development and enforcement of regulations, prerequisites for mining, environmental practices and mining by indigenous community.

The most important conclusions and recommendations drawn from this trip and tour, which can foster and enhance the sustainable development of the mining industry, are as follows:

Professional exchanges need to be arranged, to promote frequently in the spheres of mining, Geology and the Environment, between countries located on the Guiana Shield, and border Countries (Suriname, Brazil and Guyana).

Establishment of pilot projects delegated between Guyana and Venezuela in the Cuyuni River drainage basin, using multi-element geo-chemical techniques to ascertain background, contamination and anomalous levels of elements (e.g. Hg which was discovered at elevated levels in the Cuyuni drainage basin on the Venezuela side), are useful points to consider. Because of the paucity of the Hg data on the Cuyuni River, and the urgency that it is so required, yearly or bi-yearly vocational projects should be implemented in this regard.

In Venezuela, areas under auctions are fully packaged with information on Mining and Geology relevant to their blocks, and that information is simultaneously released for bidding on the Internet, print or electronic media, an area fundamentally lacking in Guyana.

Reforestation of mined out areas in Venezuela was a success story in Las Cristinas (km 88) in Venezuela, but in Guyana, it is yet to be implemented, and eventually be covered under the revision of the mining act.

Finally, revision of the mining laws of Guyana to meet the modern expectations of industry is necessary.

APPENDICES

- Appendix I:** List of Participants
- Appendix II:** List of Places Visited
- Appendix III:** Photographs of Visit
- Appendix IV:** Documentation Received During the Visit

1.0 INTRODUCTION

A six (6)- day trip was made to Venezuela by a group of Guyanese officials from the Guyana Geology and Mines Commission (GGMC) and the Guyana Gold and Diamond Miners' Association (GGDMA). The trip was sponsored and facilitated by the CIDA- funded Guyana Environmental Capacity Development Project (GENCAPD - Mining). The delegation left Guyana on May 1 and returned on May 6, 2000. The visit was organized and facilitated by the Canadian Centre for Mineral Technology (CANMET).

The Guyana delegation includes officials from the Guyana Geology and Mines Commission (GGMC) and the Guyana Gold and Diamond Miners' Association (GGDMA). The GGMC officials included Mrs. Dianne McDonald, Manager, Mines Division (ag); Mr. Carlos Todd, Senior Environmental Officer; Mr. Zaeran Ramotar, Environmental Inspector; and Mr. Gordon Nestor, Senior Geologist. The GGDMA was represented by Mr. Anthony Shields, Executive Secretary. The Canadian delegate, Diane Lorenzato, International Relations Manager, CANMET ensured appropriate linkages with the Venezuelan officials.

During the six (6) day visit, the delegation met both governmental and private individuals involved in small-scale mining and environmental controls in Venezuela. Field visits were also made to mine operations. This report details these meetings and visits.

The visiting delegation first met with officials from the various organizations at the Ministry of Energy and Mines (MEM). The officials at the meeting included Dr. Alvaro Silva Calderon, Vice-Minister, Ministry of Mines and Energy and Ms. Zonia Osorio de Fernandez, President, National Institute of Geology and Mines (INGEOMIN). Other officials at the meeting included the Director of Mining Concessions, Angel Franco; Director General of Mine Planning, Gustavo E. Sorondo; and representatives from the Ministry of Environment and Natural Resources, Ministry of Foreign Affairs, Ministry of Defence; Mine Manager, Corporacion Venezolano de Guayana (CVG) and President of CVG.

The delegation also toured medium and small-scale gold operations in the Bolivar state.

Officials from the CVG and a representative from the Ministry of Foreign Affairs accompanied the delegation to these operations.

The discussion with the Venezuelan officials focused on the mining legislation, prerequisites for mining, environmental practices, problems caused by mining and indigenous rights.

The name and contacts of the officials at the meeting are given in Appendix I. A series of photos are also included in the Appendix III.

2.0 OBJECTIVES

The Government of Guyana and the Government of Canada have been working under the Guyana Environmental Capacity Development Project (GENCAPD -Mining) in the mineral sector, in Guyana since 1998. This visit to Venezuela was done as part of the project's activities to allow Guyanese mining industry personnel (GGMC and GGDMA), to see how environmental management with respect to mining, is done in other neighbouring countries.

The main aim of this project is to strengthen the managerial and technical capabilities of key mining sector institutions of Guyana in areas of improved productivity and reduced environmental impact.

The objectives of the visit were:

- To examine the Venezuelan Government structure as it relates to the mining and the mineral and metals sector, with emphasis on small-scale gold mining
- To identify possible areas of cooperation
- To determine if the Venezuelan environmental controls and technologies are readily adaptable to Guyanese conditions.

Visits were also made to small and large scale mine sites, and meetings were held with some officials for a better appreciation of mining methods and environmental practices in Venezuela.

3.0 Activities

3.1 Completed Itinerary - Monday, May 1, 2000

Time	Activity
3:30 a.m.	Depart Georgetown for airport
5:40 a.m.	Depart Georgetown for Caracas, Venezuela via Trinidad
11:20 a.m.	Arrive Caracas, Venezuela - Simon Bolivar Airport
1:15 p.m.	Arrive at hotel
3:30 p.m.	Depart hotel for visit to El Latijo.
7:30 p.m.	Dinner at the invitation of Guyana's Ambassador to Venezuela - Mr. Bayney Karran

3.1.1 Visit to the Residence of the Guyana's Ambassador to Venezuela

The joint delegation was hosted for dinner by Guyana's Ambassador to Venezuela, Mr. Bayney Karran (Photo 2, App. III). Mr. Karran indicated his appreciation for the opportunity being given to the Guyanese team to see the mining industry 'close-up' in Venezuela and wished the entire delegation a successful visit.

3.2 Completed itinerary - Tuesday May 2, 2000

Time	Activity
6:30 - 7:15 a.m.	Breakfast
7:30 a.m.	Depart hotel for MEM
8:20 a.m.	Briefing by Mrs. Z. Osorio, President of INGEOMIN
9:00 a.m.	Open address by Vice Minister of Mines, Dr. Alvaro Silva Calderon - to begin round table discussion
9:20 a.m.	Presentations on the organisation of the Mining Sector of Energy and Mines & the Mining Legislation by Angek Franco, Jose Fernandez and Carlo Fernandez.
10:00 a.m.	Presentation on the Ministry of Environment and Natural Resources by Dr. Pedro Romero
10:30 a.m.	Presentation on CVG Joint project with USFS by Joaquin Lezame and Castor Navas
11:15 a.m.	Presentation on the evaluation and contribution of small-scale mining in Venezuela by Mr. Luis Herrera, Cruz Briceno Sanchez of CVG-MINERVEN OFFICE
1:10 - 2:00 p.m.	LUNCH
2:30 - 3:15 p.m.	Presentations on the <ul style="list-style-type: none"> • Use of Cyanidation Plants in Small-Scale Mining, and • Gold Recovery Centres and Water Management in Small-Scale Mining by Joaquin Lezama and Franqui Patines CVG-MINERVEN
3:15 - 4:00 p.m.	Presentations of the Joint CVG – USFS Project for Restoration Recovery of Degraded Areas by Joaquin Lezame and Castor Navas, CVG-MINERVEN
4:00 - 4:45 p.m.	Presentations on the use of mercury in mining areas, in the Las Cristinas Concessions and Rio Caroni by Manuel Navas and Oswaldo Montero MEM
5:30 p.m.	Depart for hotel

At the end of each presentation there was a period for questions and answers.

3.2.1 Briefing Session with Ms. Zonia Osorio Fernandez, President of INGEOMIN

The visiting delegation arrived at the Ministry of Energy and Mines (MEM) at about 8:20 am and was welcomed by the President of the National Institute of Geology and Mines (INGEOMIN), Ms. Zonia Osorio de Fernandez (Photo 3, App. III).

- INGEOMIN has similar functions to those of the GGMC, which promote and regulate mining activities. The institute is an autonomous agency responsible for conducting geological research to provide background information, which can lead to the development of mines. Article 117 of the Mining Law states that "*the purpose of the National Institute of Geology and Mining (INGEOMIN), shall be to carry out research, mainly of interdisciplinary nature, in the areas of geology, mineral resources, geophysics, geochemistry, geotechnica and other similar areas. To plan, make, direct and coordinate the programmes of geosciences in general, as well as appraisal of the non conventional sector and to contribute in the generation and spreading knowledge on scientific and technical information in its field of competence.*" Article 118 states that "*The National Institute of Geology and Mining (INGEOMIN) shall:*"
 - *Make and maintain the inventory of the mineral resources existing in the national territory.*
 - *Make geological and research surveys, appraisal of mining resources, provide technical assistance, laboratory and advisory services in the different areas of its activity to public or private individuals or corporations.*
 - *Coordinate and provide, together with institutions of superior education or with national or foreign, public or private persons, research and technical cooperation programmes required for the development of its objectives.*
 - *To deal with the petition of the Ministry of Energy and Mines, concerning the survey of drafts, maps and other technical documents submitted by petitioners of mining concessions, and to issue its decision, or any other technical matter of its competence*
 - *To carry out, collect, systematize and publish the reports of surveys made.*
 - *To provide and develop capacity and training in the areas related to the Institute's functions; To prepare geological map of the country at different scales.*
 - *To conduct research in technologies applicable to different scale of mining and for environmental mitigation.*
 - *The other matters stipulated in the mining legislation.*" Its functions are purely technical and non-committal to political mix.

The institute has embarked on several joint-venture projects to share experts, technology, and produce information necessary for the development of INGEOMIN. Three such projects are:

- The study of the age of kimberlite on the Guiana Shield in the Guayana Region of Venezuela with cooperation from the University of Sao Paulo in Brazil,
- preparation of geological maps of the frontiers (Columbia-Venezuela) with the assistance of INGEOMIN of Columbia,
- and the agreement to be ratified with Chile for the exchange of Technology. During these familiarization talks, the Ministry of Foreign Affairs was represented by Maria De Los Angeles Vargara-Geographer.

3.2.2 Round Table Discussions with Venezuelan Officials

After a brief meeting with the President of INGEOMIN, the delegation was invited to meet other high-ranking officials of the Ministry of Energy and Mines (MEM) and other government agencies that oversee mining in Venezuela. This session comprised various presentations and was opened by the Vice Minister of the Ministry of Energy and Mines, Dr. Alvaro Silva Calderon (Photo 4, App. III).

Other officials present at this session included, the Director of Concession, the General Mining and Planning Director, a representative from the Ministry of Environment and Natural Renewable Resources, a representative from the Ministry of Foreign Affairs, a representative from the Ministry of Defence, Mining Manager of the Corporacion Venezolana de Guayana (C.V.G) and the President of C.V.G. (Photo 4: App. III)

3.2.2.1 Opening Address by the Vice-Minister

This session was held to provide insight to the visiting delegation on the work of the various agencies responsible for promoting and regulating mining, and ensuring that the national environmental standards are adhered to.

The Vice-Minister emphasized that Venezuela's good geological and geographical position is ideal for mining. The petroleum industry, which has been strong since the turn of the last century, generated a dependency on the sector with agriculture and mining taking second place, but in the current climate it will not restrict the development of the mining sector. Clear rules will be set to enhance the mining potential of the country. Due to the difficulty in finding a compromise, cooperation will be established with other countries with knowledge in similar mining situations to establish a common and unified action in this situation. The lessons learnt over the years in the mining industry should be highlighted and shared to prevent unnecessary damage to the environment. The Venezuelan Government is willing to learn from Guyana's experience in the mining sector.

Some of the other main points in the presentation were:

- New mining Law replaced the old law that was enacted in 1944. The new law takes into consideration the knowledge and technology developed over the years.
- This new law gives clear social and economic guidelines to investors.
- Security of the investment is guaranteed.
- New laws eliminate mining concessions that are received by force and prevent mining claims from going to persons who lack knowledge, technological and financial resources.
- The mining sector is open for private investment, except for iron ore, which is controlled by the state.
- Concessions are mineral rights.
- Mineral rights belong to the state and the state can exploit the minerals as it sees fit.
- Obligation of the state under this new mining law is to quantify natural resources and to offer to private companies for development.
- Development of mining property can be done by the state, through the granting of permits or through authorizations to private companies.

- Revenue from mining, legal and enforceable tax, 1 - 3% royalty on minerals with the exception of gold and diamond. Royalties on gold and diamond are 3% and 4%, respectively.
- Looking at ways to mitigate the impacts of small-scale mining on the environment.
- Small mining – looking at safe mining practices and a common unifying body to deal with such issues, to avoid corruption and uncertainty in granting licences to small miners in a climate of different organisations with varying opinions.
- Working towards the granting of a single permit that will represent all the regulatory authorities.
- Small mining is the backbone to the strength of large operations.
- A new Constitution under Article 308 recognizes large scale operations are not final but small-scale operations are important too and it gives protection to small and medium scale operations, micro enterprises and family cooperatives.
- Ministry of Energy and Mines (MEM) gives technical and timely financial assistance to miners, grants formal concessions and exploration rights to miners.
- A proper feasibility plan, and an application can be made to the Ministry of Mines.
- The aim of the government is to make the inspectors of mines, trainers rather than being tax collectors.
- Exploration rights to small miners do not exceed ten (10) hectares.
- Assigning of certain areas for small-scale mining.
- Small mining serves as a building block for large mines.
- Programs will be implemented to reverse the social ills created by mining and make it a success story.

3.2.2.2 Organization of the Mining Sector of the Ministry of Energy and Mines - Legal Regime for Small-Scale Mining

Presenters: Jose Fernandez, Carlos Arnandez and Angel Franco of the Ministry of Energy and Mines.

Article 12 of the Constitution Bolivariana and Article 2 of the Mining Regulation state that the mines and minerals reservoirs present on national territory belong to the Republic of Venezuela.

The arms of the state competent in mineral matters are:

1) Ministry of Energy and Mines (Article 156 of the Constitution, Article 6 of the Mining Laws and Article 49 of the organic laws of Central Administration).

Article 6 of the Mining Law 1999 states that *'the Ministry of Energy and Mines is for all intent and purposes, the competent government body with regards to this law with the responsibility to plan, secure and preserve the mining resources, as well as the foreign investment regime in this sector and perform or make to perform the mining activities set forth in this law.'*

2) The state that form the Republic (Article 164 of the Constitution and Article 11 ordinance 2 of the organic Laws of Decentralization).

Organization of the Mining Sector

1) Organization of the Ministry of Energy and Mines (Article 54 L.O.A.C and Decree # 378, Organic Regulation of MEM published in the Official Gazette #36,867 of 11/01/2000).

- 2) National Institute of Geology and Mining (INGEOMIN) (Article 116 of the Mining Laws and Decree # 707 published in the Official Gazette (G.O # 36.898 of 23/02/2000)

Legal Aspects of Mining Activities

- In 28/09/1999, based on Decree #295, which came into force, with the scope and strength of the Mining Laws annulled the Mining Law of 18/01/1995.
- Five ways to exercise mining activities:
 - ✓ Direction by the National Executive
 - ✓ Exploration Concessions and Subsequent exploitation
 - ✓ Exploitation authorizations (small mining)
 - ✓ Miners' Unions; and
 - ✓ Artisanal mining
- Create exploration concession and subsequent exploitation that may award the concessionaire the exclusive right to explore and exploit, given that the substances that are found in the area are granted.
- The maximum duration of a concession is 40 years.
- Reduce significantly the lapses and the bureaucratic procedures for the granting of mineral rights.
- Establish a process to convert contracts (medium and large) sign by the C.V.G into concessions.
- Create a permanent Inter-ministerial Commission (a "*one stop shop*").
- Create the Institute of Geology and Mining (INGEOMIN).

Fiscal Aspects (based on Decree #295)

- Eliminate the exploration tax.
- Relieve the miner of the superficial tax paid for the first three (3) years on granting the mineral rights.
- Establish an exploitation fee of 3% for gold, 4% for diamond and as much as 3% for other minerals.

- The National Executive can reduce these amounts to as low as 1% in order to make the company viable.

Fiscal Incentives Foreseen in Other Fiscal Laws

- Award a tax reduction of 20% on rent for new investment.
- Mining companies during the pre-operation period and in the first two (2) years of operation are exempted from the payment of corporation tax, equivalent to 1% the value of the tangible and intangible assets of the property.
- Rental fee of mining operation increases as exploration advances.
- Approval must be sought from the MEM before the transfer of the concessions.

3.2.2.3 Organization of the Ministry of Environment and Natural Resources - Mining and Environmental Legislation

Presenter: *Dr. Pedro Romero*

Ministry of Environment and Natural Renewable Resources

The Ministry of Environment and Natural Resources work jointly with the Ministry of Energy and Mines (MEM) and the Ministry of Defence and Foreign Affairs to ensure proper planning, monitoring and control of all mining operations. The Ministry of Environment and Natural Resources tries to ensure that there is sustainable development of the mining sector without compromising the environmental guidelines established by the government. The first authorization for a mining project is occupancy, which is granted by the MEM, state organizations and regional institutions. A developer of a mining project must have the approval from the MEM before a permit can be granted by the Ministry of Environment. The MEM needs to present certain documents to the Ministry of Environment (including 56 Questions under a

Decree of March 1996), which would decide whether the project is feasible with minimal impact on the ecosystem.

The first such document is a map of the location of activities to determine the suitability of condition(s) of issuance. Modification of land use in Special Administrative Region(s) (rivers, cities etc.) such as the Imatacas Forest Reserve has created problems for environmental monitoring and enforcement. The Ministry of Environment and Natural Resources has two offices, which determine the feasibility of natural resources, that is the forest and planning. The Environmental Authorization requested by the various proponents is only granted at the Head Office of this Ministry.

Before an environmental authorization is given for a specific project, the developer needs to conduct an Environmental Impact Assessment (EIA); the cost of which is borne by the developer. The consultants for the EIA must be registered and approved by the Ministry of Environment; and the EIA should include possible impacts of the project on the environment and measures to mitigate these impacts. The EIA study is divided into three (3) phases, viz:

- 1) Exploration phase - generally low impact and needs no large studies.
- 2) Exploitation phase - certificate of exploitation is required. This would indicate the location of the project, surface area, proven reserves, type(s) of minerals, etc., to clearly demarcate the area and delineate the ore bodies.
- 3) Environmental quality - developers of mining concessions present possible impacts of their respective operations on the environment and corrective measures to mitigate these impacts.

After granting concession, the EIA where necessary needs to address problems associated with the protection of rivers, dams, mangroves, the use of mercury, air pollution, forest laws for soil and water and systems of follow-up and

control of activities in the area. The MEM and Ministry of Environment work closely to ensure the terms of EIA are adhered to:

- To avoid conflict between land uses (mining, forestry etc.), fifty percent of the areas applied for are returnable to the state or supervising bodies
- An environmental bond is applicable for one (1) year calculated as a percentage of estimated cost of the project to mitigate possible impacts on the environment.

3.2.2.4 Project Of the Corporacion Venezolano de Guayana (C.V.G) and the United Forestry Service (USFS) for the Reclamation Of Degraded Areas

Presenters: Joaquin Lezama and Castor Navas of CVG - Minerven

The Corporacion Venezolano de Guayana (CVG) under a bilateral Venezuelan Cooperative Project with the USFS sought technical assistance for the reclamation of sites degraded by mining. The general objectives of the project were to develop a mine with the least impact on the environment and to reclaim areas worked by small miners. In 1991, the USFS presented a course on environmental considerations and reclamation in mineral development for Tecnia Minera (TECMIN), the branch of the CVG that deals with mining in eastern Venezuela.

The USFS gives technical assistance to CVG in order for the sustainable use of its natural resources. Scientific technical cooperation between the CVG and the USFS was realized in the areas of: 1) mercury contamination, 2) technology transfer, and 3) reclamation of areas contaminated by mining activities.

In 1993, a symposium on mercury in the tropical ecosystems was held in Puerto Ordaz, Bolivar State, Venezuela. Various resource persons from the CVG, the USFS, the USEPA and the USGS participated in the discussions that

focused on the extent of available information on the release of mercury into the environment by mining.

In April 1994, five persons were trained to conduct laboratory analyses for the determination of mercury in the environment. In May 1995, a mercury conference was held and the same five people made presentations about what was learnt during the training course. On December of year 2000, the Venezuelan Government acquired equipment for mercury analysis.

The total cost expended on bilateral cooperation on mercury research in Venezuela was US\$823,790. CVG contributed US\$501,160 of this amount, with the balance being from USFS.

Some of the recommendations of the project are:

- 1) To get companies to contribute to mercury research, which has already started;
- 2) Create a laboratory outside of any influence of atmospheric pollution;
- 3) Establish a working relationship with USFS;
- 4) Start reclaiming areas degraded by mining.

The project also sought to train professionals in the areas mentioned, i.e., for mercury contamination, mineral technology and the reclamation of degraded areas.

General Conclusion of the Project

The first stage of the project was completed, i.e., accomplishing the first three recommendations. The final report recommends the establishment of a working group and training of personnel in mercury reclamation. A pilot study needs to be conducted on contaminated areas to ascertain the best and most cost effective ways to reclaim these sites.

Project to reclaim areas under CVG - Minerven responsibility

The mission of CVG is to promote and develop areas under its responsibility and capture investment of private capital for the development of business downstream. CVG is responsible for twelve (12) concessions with proven reserves of 22,000 tonnes of gold. The CVG organisation tries to deal with some of the social impacts created by restructuring of companies where persons are forced out of jobs.

The specific objectives of this project are:

- 1) To minimize erosion caused by surface runoffs. Contouring and wooden support along slopes help to achieve this objective.
- 2) To accelerate the process of vegetation growth. This will be achieved through the acquisition of seeds and fertilizers from the CVG.
- 3) To incorporate workers displaced through the process of restructuring of companies, and offering them the new skills with the aim of making them self-employed and productive.

The project generates employment and help persons to use skills learned for future benefits, such as in the protection of the environment. The logistics of the project are completed, however, it is yet to be implemented.

The Decree No. 3091/98 gives CVG the responsibility for the reclamation of degraded areas. A total of 15 hectares of degraded land is to be reclaimed this year (2000).

As part of the reclamation project, samples were taken from the Caroni River to assess the state of this river. The Ministry of Energy now accredits two laboratories and Mines and some are being upgraded to obtain ISO Standards.

A list of accredited laboratories (government and private) would be provided to the Guyana Delegation by the MEM. Small mines can be defined as those

operations using hydraulic monitors and artisanal methods, which may be done by individuals or in small communities. The prerequisite for a small-scale mine is that the person(s) must be Venezuelan by birth and must have a track record in mining. The maximum size of a small-scale concession is 10 hectares.

3.2.2.5 Legal Aspects Of Small-Scale Mining in Venezuela, its Evolution and Contribution to the Mining Industry

Presenters: Luis Herreira and Cruz Briceno of CVG - Minerven

The Mining Law of 1945 gives miners free access to the land without any regulatory approval. However, by Decree No. 2,039 and Resolution No. 148 of 1977, the Ministry of Energy and Mines was given the mandate to regulate mining, and the "free hold" on land was abolished. In 1985, in accordance with Decree No. 182, the National Assembly created a commission for the regularization and exploitation of alluvial gold and diamond in the Guayana Region through the granting of concessions. Decree No. 1409 and Resolution No. 2 give CVG the right to carry out exploration and exploitation of gold and diamond in the Guyana Region. Decree Nos. 1046, 845, 1049 and 742 grant CVG the right to have areas for small-scale mining.

The roles of the CVG are to promote and regulate the mining of gold and diamond in the Guyana Region. However, its role has created some confusion, which leave some small miners landless. Most of the small-scale mining in Venezuela is done in this region.

CVG legalizes mining through the signing of contracts. Two of the requirements to enter into a contract with CVG is: 1) the person must be a Venezuelan by birth, and 2) has a proven history of mining. Contracts for areas with more than four pieces of production equipment (i.e., hydraulic monitor) according to the project plan, have to be approved by the President of CVG.

The surface area for persons with individual contracts is not more than ten (10) hectares. The new mining legislation makes it possible for the conversion of contracts into concessions.

CVG has, to date, signed 230 contracts with individuals (183), cooperatives (4) and non-profits organizations (53). These groups are responsible for the production of most of the gold and diamond from the small-scale industry. CVG encourages individual miners to form cooperatives in order to minimize problems of control, conflicts and reduce production cost. Individual contracts, however, normalize operation, offer an immediate solution to the social problem (of unemployment) and reduce disputes over property. Individual miners tend to be difficult to control since dredges are nomadic, often causing conflicts with adjoining properties. These miners generally have problems complying with provisions of their contracts.

Cooperatives and Associations on the other hand, have a better control over the mining operation and generally implement programmes to aid mineral recovery and environmental protection.

3.2.2.6 Use Of Cyanidation Plants, Gold Recovery Centres And Water Use In Small Scale Mining

Presenters: Joaquin Lezama of CVG and Franqui Patines of CVG - Minerven

The mining method use depends on the structure of the area, and the depth and type of the ore body. Small shaft mining is done in the Guyana Region. In this type of mining, the gold-bearing material (quartz stringer) is drilled and blasted or fragmented by a jackhammer underground, then loaded into bags to be lifted to the surface by a manually operated winch. Here the material is stockpiled after which it is loaded into vehicles to be transported to the gravity plant. Some gold is recovered in the gravity plant.

The concentrate from the gravity plant is then transported to an Amalgamation Centre where mercury is used to recover "free" gold. The main source of mercury lost in the amalgamation centre, around 1 per cent, occurs when the

amalgamation tailings are discarded. However, these tailings, which contain some amount of gold and mercury, are not discarded but are sold to cyanidation plants.

The gold recovery of the gravity processing plant is approximately 70%. Gold particles less than 200 mesh (#) are difficult to recover in the gravity circuit; however, they can easily be recovered by cyanidation. Tailings from the gravity plant and amalgamation centre are sent to be processed in the cyanide plants.

In the cyanidation process, tailings are ground and placed in tanks where reagents, such as sodium cyanide and lime are added. Gold cyanide solution is formed and subsequently gold is precipitated from this solution (gold cyanate) by zinc or activated carbon.

The use of cyanide is not allowed in the small mining sector. The one cyanide plant visited, El Caratal, with a capacity of 700 tonnes of ore per day can be considered as a medium scale operation. This plant conducts environmental monitoring on a monthly basis. Inspectors from the Ministry of Environment and Natural Resources make frequent visits to the plant, sometimes more than once a month.

3.2.2.7 The Study of Mercury in Mining Areas of Las Cristinas Concession and the Caroni River

Presenters: Oswaldo Montero and Manuel Navas of the Institute of Geology and Mines.

This work is part of a study done by the Ministry of Energy and Mines on the rules applied to the exploitation of alluvial gold and diamond in a concession known as Km. 88. This concession encompasses a surface area of approximately 36 km², and is crossed by the Amarilla Creek. This creek has

the major exploitation of alluvial gold in the zone. Various methods of extraction are employed such as removing gold bearing materials with tractors and transporting them to processing plants, using hydraulic monitors, and manual exploitation by small groups or individuals.

Mercury is used in small-scale mining to recover free gold from its ore. However, for every kilogram of gold produced, one (1) kg of mercury is lost to the environment. Eighty percent of this mercury is lost due to inappropriate and or poor practices, while the other 20% is lost due to the direct use of mercury on the ground. The inappropriate use of mercury over the years has caused environmental damage in certain areas of Brazil.

The scope of this study is to determine the level of mercury in the Amarilla Creek and its influence on the mouth of the Cuyuni River, due to the mobility of the sediments in this creek. Mercury levels in sediments as documented (in Estudio Sobre Contaminacion Mercurial) in La Zona Aurifera Dol Km 88, Estado Bolivar Venezuela, (Navas, et al, 2000; App. IV, 3) reaches levels of 3000 $\mu\text{g}/\text{kg}$ (QACU) and 45,000 $\mu\text{g}/\text{kg}$ (5ACT-5 TOLVA). These mercury levels for creeks/rivers flowing into the Cuyuni River in recognition should pave the way for joint surveys for multi-element geochemical environmental baseline data for the drainage basin of the Cuyuni River which is located in both Guyana and Venezuela. Microorganisms play a very important part in the movement of mercury in the natural environment, especially in soils, sediments and water.

Microorganisms act as reducing agents by converting metallic mercury into ionic mercury or compounds of methyl mercury into metallic mercury. Bacteria produce methyl mercury, which is soluble in water, can methylate mercury ion. Some bacteria can later change methyl mercury and convert it to dimethyl mercury in which it is volatilized and escape into the atmosphere.

Similar studies done by M. Thorpe, J. D. Robertson, and C. J. Price (1993) Coincided with the studies done by Montero, Duaerte and Navas (1989)

The study shows that there is large migration of mercury due to the type of clay in the area. Some of the recommendations of the study include: 1) continuous monitoring of the sediments and dissolved oxygen of the affected rivers, 2) characterization of the river sediments, and 3) a high degree of control to stop the impacts.

Discussion of Results

The results obtained indicate that the level of mercury in sediments of Amarilla Creek is in the range of 100 μ g/kg to a maximum of 3000 μ g/kg. It should be noted that this maximum value was found in the region of the mouth of the Amarilla Creek with the Cuyuni River.

The most important data that corresponds to the water analysis is dissolved solids. In the mouth of the Amarilla Creek with the Cuyuni River, the minimum was 0.2 μ g/l or 200 ppb.

3.3 Completed Itinerary Wednesday 3rd May, 2000

Time	Activity
7:30	Breakfast
8:30	Depart Hotel for Airport
10:00	Depart Airport, fly to Puerto Ordaz
14:00	Drive from Puerto Ordaz to the City El Callao
17:00	Arrive at El Callao and meet with MINERVEN Officials
18:30	Dinner with MINERVEN Officials

3.3.1 Venezuela Trip – Wednesday 3rd May, 2000

The Guyana delegation and CANMET representative departed Caracas (19^P 0719160E, 1173280N) for Puerto Ordaz (20^P526777E, 916386N) on the 3^d of May 2000 at approximately 11:00 hrs. accompanied by the Regional Representative for the Ministry of Energy and Mines of the State of Bolivar.

Representatives of the Ministry of Mines and C.V.G. Director met the delegation. Luis Herrera ,who delivered a joint paper on the 2nd May with Cruz Briceno on the Aspects Legales Da la Pequena Minerars En Venezuela, evolucion, aspects Legales, contribution a la Industria Minera Cooperativas Mineras in Caracas at the Ministry of Mines, also met the delegation at Puerto Ordaz.

At the C.V.G. Minerven Head Quarters (20^N 630987 E, 810500 N) the operation of the organization was unfolded. The C.V.G. known as the Guyana Venezuelan Corporation was formed in 1970 under a joint venture plan between Government and Private interests.

In its present state, it is 100% State owned. Its Mission Statement is to promote and develop areas under their responsibility, and capture investments of private capital for further development of the Sector, in productive exploration and processing. C.V.G. Minerven was given forty-two (42) concessions, which has current individual leases of forty (40) years. The forty-two (42) concessions have a proven reserve of twenty-two thousand (22,000) tonnes of Au and a resource of over two hundred thousand (200,000) tonnes.

Two (2) mines are in existence: -

1. Union-an open pit mine
2. Columbia- an underground mine

Columbia (Photo 6 & 7, App. III) is said to be 495m in depth with six (6) levels developed from the main shaft.

Two productive plants using cyanidation methods are functioning. El Caratal has a productive capacity of 700 t/d as opposed to El Peru with 500 t/d. The main buyer of gold produced is the Central Bank of Venezuela but gold can be sold to international institutions as well

Mining development projects are confined to small and medium scale mines. The twelve (12) concessions of C.V.G. MINERVEN (1-12) cover an area of 42,000 hectares. Mining in these areas dates back to the 1800, and the average grade being mined today ranges from 12-18 g/ton, which is relatively high as an exploitation or mining grade on the international scene. The mines are located on the Greenstone Belt, a major gold and base metal source.

C.V.G. Minerven has a property status map with a key made up of Blocks (for concessions), with colour schemes, numbers, letters, etc. For example, red colour signifies concessions with adequate geological data; yellow signifies areas with limited geological information and opened for prospecting. Square (SQ) 7 represents the Columbian Mine (20^N 63098E, 7810500N) and Caratal Plant. SQ 2, 3 and 8 are subject to the reclamation processes. SQ 11 lies the City of El Callao (20^N 630403 E 813216 N, using Provisional South America 56) with gold grades up to 80 g/ton. The city was literally built on a gold mine. Block A is reserved for natural growth. Block B^b is subject to leases to and from 3rd parties. Block C^b is an undefined area, with no definition given but may be subject to conditions similar to A or B. Under Block B^b there are mines abandoned due to technological problems, and the demands for high quality and mineral processing treatment methods may have been reasons for their closure. These mines may reach depths of up to 100m.

Assigned mineral rights to prospective companies, the geology, and compensation packages (royalties, taxes, etc) and any other relevant information are decided by

C.V.G.. Under C.V.G. control areas, the cost of production for small miners averages at \$70US per ozs and for large scale the cost of production averages at \$290 US per oz.

3.4 Completed Itinerary - Thursday May 4, 2000

Time	Activity
7:30 a.m.	Breakfast
8:00 a.m.	Meeting with MINERVEN officials
9:00 a.m.	Visit to small scale mining operations
10:30 a.m.	Travel to Concession Minera La Camorra
12:00 noon	Lunch
2:00 pm.	Visit illegal small-scale mining sites
3:30 p.m.	Travel to indigenous community, small-scale mining operation of CVG
4:30 p.m.	Visit small-scale operations
6:00 p.m.	Travel to Placer Dome Las Cristinas (Km 88)
7:30 p.m.	Arrival at Las Cristinas camp
8:00 p.m.	Dinner
8:30 p.m.	Meeting with Las Cristinas official

Thursday evening was spent at the Placer Dome Las Cristinas' campsite.

3.4.1 Meeting with Minerven Officials in El Callao

At this meeting, MINERVEN officials continued to appraise (Photo 8, App. III) the delegation on the organization's authority and responsibilities of CVG-MINERVEN. Some highlights of these discussions were:

- MINERVEN, a state owned company, holds authority over twelve (12) Concessions which were over two (2) geological orientations referred to as the N and S structures.
- The North was a narrow structure that was being used to pilot organized small-scale mining.
- These areas were well populated and the population advanced to zones with mining potential.
- The areas were divided into blocks of five (5) hectares (sometimes 10 to 20 hectares). These were legalized through a contract arrangement after negotiations with interested miners, on the terms for administrations of the titles.
- In this arrangement, MINERVEN is accountable to the Ministry of Mines and in turn miners to them. Officials saw the benefits to be:
 1. The removal of corruption through intermediary dealings,
 2. the legality of any small-scale mining ventures in this arrangement had,
 3. a reduction in confusion and uncertainty within the industry, and
 4. a higher efficiency in tax collection.
- MINERVEN, which was a part of CVG, held all governmental attributes and responsibilities to administer, regulate and monitor these contract agreements with miners.
- MINERVEN guarantees permanent technical assistance to miners on contract.
- Miners have to pay professional fees for any project document (e.g. mine) prepared by MINERVEN.
- Within the arrangement, all geological information is made available to the miner and under MINERVEN's supervision, each contracted mine project was done in an organized manner.
- Established industrial safety norms for each project, with proper exploitation and environmental management procedures in place.
- The contract signed between MINERVEN and the miner is a Lease contract. In this arrangement, the miner is required to prepare a prospecting program within one (1) month of signing and then six (6) months is given to prepare an exploitation plan.

- The miner also pays a tax of fifty thousand Bolivar (BS50, 000) at the beginning of the exploitation phase and 0.5% of the gold produced goes to MINERVEN.
- There is also a 3% exploitation tax to be paid in keeping with the Venezuelan Mining Law.
- The miner has to produce an Exploitation Plan as well as an Infrastructure Plan.
- The scale of the contract operation depends on both equipment and production capacity.
- Capacity averaging 500 – 700t/d is considered medium scale, while operations with hydraulic equipment and production capacity <500 t/d is deemed small-scale. These small-scale holdings are for persons born in Venezuela only.
- Environmental provisions are also in place and at the beginning of the project, the miner has to post a compliance bond of one million (BS1,000,000), 1\$US = ~13000 BS, and if found culpable, the contract would be withdrawn.
- Small-scale miners' representatives provide the monthly reports on their operation and receive daily help technically, which has shown improvement in the operations.
- Here the need to improve mining has a negative impact, but the push is to increase employment so that monitoring and provision of reports by both large and small - scale are necessary.
- MINERVEN's interest is to ensure both the social and economic success of these projects.
- MINERVEN's returns come through the 0.5% royalty and the cost of the lease from the miner.
- MINERVEN also benefits from the treatment of the miners' tailings (black sands), The tailings are treated at MINERVEN's plants. Here 70% of the profit goes to miners while 30% goes to MINERVEN.
- CVG-MINERVEN is a joint venture government owned holding company; CVG- Government.; MINERVEN – private. The joint venture was formed in 1970.

3.4.2 Meeting with Mining Cooperative (Bochiucha - Botanamo – Louis Omaro – Cooperative Spokesman - at Tumeremo

During this visit, the actual operations of the cooperative could not be visited because no work was being done. Instead, there was a meeting with some of the principal members who shared their experiences with the visiting delegation.

The cooperative was classified as a medium size one, where administratively, it deals directly with the Ministry of Energy and Mines and the Ministry of Environment.

The cooperative was faced with:

1. Difficult accessibility,
2. Wavering possibility of obtaining a government loan, and
3. The need of setting up an affordable yet sophisticated plant to process tailings.

This cooperative evolved from a group of graduate engineers who developed a small-scale cyanidation plant, utilizing wooden tanks that were covered with polythene.

The investment cost of the plant is forty million Bolivar (BS40,000,000), compared to five hundred million Bolivar (BS500,000,000) for a traditional cyanidation plant.

The group initially obtained a partial permit for eight (8) months in 1992 and the plant should have begun work. However, the “Terms of Reference” from the Ministry of Environment was very vague, incomplete and when the time for renewal came, it was never renewed, thus its operation was stopped. The cooperative sighted corruption for their permit misfortunes.

The plan was that the plant would be self-financed by returns from initial efforts. This however, fell through because of the nightmare.

The position with the Venezuelan authorities is that small-scale cyanidation plants should be forbidden.

This cooperative had forty two (42) members and was regulated by laws that cover cooperatives.

Some other pertinent points which came out of the continued discussion were:

- The cyanidation plant consisted of solution tanks.
- There was a twenty (20) days cycle before returns are to be made.
- Zinc (Zn) is used to precipitate gold from a saturated Au-cyanide solution.
- Imataka zone has not been defined.
- Migration of miners to zones which are defined.
- Nine hundred (900) miners are still waiting for clarity which includes areas where large companies have signed and have concessions.
- Cyanidation plants are allowed based on operation type but cyanide is forbidden at a small-scale level.
- For the cooperative, according to what they are allowed to produce is considered small-scale but according to production, they are medium scale and the Ministry of Environment grants only up to 25 hectares in that area.
- Production would reach levels of 10-17 g/t but minimum requirement for their viability is 10 g/t.
- Lead (Pb) is also used in the extraction process.
- Ag and copper are also extracted.
- Deposit type previously exploited was alluvial and now underground deposits are processed.
- Tailings reprocessed through the cyanide solution have a 40 – 60% recovery but there is still a percentage by this small-scale that cannot be recovered.
- No clear policy for small miners.

3.4.3 Visit to a Legal Small Scale Mine (Corina Mine)

This was a short visit to a legal small-scale underground operation. This mine is located on the Nacupay fault. Current operators utilized previous development structures, from an exploration phase, to build the operations.

A winch (Photo 9 and 10, App. III) is used to lower workers (Photo 12, App. III) down a 70m-production shaft. Material is brought up in sacks, about 30 kg per sack. The material has a grade of 20 g/t - 40 g/t Au.

- Movable materials consists of quartz veins, quartz slates/schists with prominent euhedral sulphide crystals.
- Technical assistance (including blasting, transportation, etc) by CVG-MINERVEN officials was free.
- There were work crews of four (4) persons in the shaft – one (1) Foreman, two (2) Drillers and one (1) Helper, along with the winch operator, worked two (2) shifts – twelve (12) hours each.
- Each shift produced thirty to fifty (30 – 50) bags of feed material that was processed at a central processing plant.

3.4.4 Discussion on Small-Scale Cyanidation Plant - Type found on Wilmot Chan's claim in Wenamu, Guyana

On the way to Tumerimo, a Venezuelan official in charge of the region had a look at the plant plan submitted by Mr. W. Chan to the Commission and purportedly related that they were in widespread use in Venezuela.

The official related that there was only one (1) such example, the same one that was exported to Guyana.

The Venezuelan authorities stopped this plant due to the lack of a tailings treatment facility. Inspections revealed that the tailings from the operation had a very high

concentration of cyanide and would therefore require treatment before being released into the environment.

3.4.5 Visit to an Illegal Small-Scale Mine Operation and Small Scale Processing Plant

This illegal mine was visited on the way to Tumeremo, it was located on the La Camora Concession and the operation was more primitive than those at the Corina mine.

At this site, the operators had three (3) production shafts, which were all visited. The crew at the third shaft was twelve (12) and this crew worked fourteen (14) hours per day (5 a.m. to 9.p.m.).

The mined material was taken to privately owned, central processing plants that took 15% of the gold content as payment.

Here the Venezuelan authorities indicated that they wanted to build a Central Gravity Plant and Cyanidation Plant, which would effectively shut down the small-scale privately owned gravity plants that use mercury (See Photos 25 – 35, App. III). This was because the processing procedures in these small-scale plants were not environmentally safe.

3.4.6 Visit to an Indigenous Community, Small-Scale Mine Operation - Cooperativa Mixta Chicanan San Antonio – km 33 Edu Bolivar

The indigenous people visited were from the Ponome tribe in the San Antonio Town. This settlement has a population of eight hundred (800) persons, with two hundred (200) as a part of the mining cooperative referred to as the Chicanan Cooperative.

This cooperative gradually relinquished their traditional background, as they got deeper in mining.

The visiting delegation was not allowed to visit the actual mine, because it was reported to be under siege by intruders. However, some members of the cooperative sat with the delegation (Photo 37, App. III) and shared their experiences. The cooperative was fairly organized. Started in 1986, they used hydraulic monitors to mine, processed with the traditional sluicibox and used batel and Hg amalgamation to recover fine gold. They did not receive much technical assistance from CVG.

The community was experiencing problems from an external community of Proons they deemed as old criminals, who invaded part of the concession that was granted to them.

CVG officials confessed that the Venezuelan National Guard was asked to evict the invaders, but they did not take any action.

3.4.7 Meeting with Las Cristinas Officials

The Delegation arrived at Las Cristinas Placer Dome (PD) Mine site at 19:30 hrs. The mine, located at Kilometre 88, was chosen as part of the visit since it represented a novel attempt to regulate and supervise small-mining activity in a large -scale mining concession. Placer Dome has since decided to abolish the development of the Large-scale mine due to many problems; mainly financial (low gold price) and administrative.

The delegation was greeted by Mr. Jeff Davidson (Mine Manager). After accommodations were arranged, Mr. Davidson briefed the delegation (Photo 38, App. III). The main points of his presentation are as follows:

- The older Mineral regime in Venezuela mainly granted concessions to local companies.

- Placer Dome (PD) acquired the property in 1991 when it was presented by CVG on the international market. It was then controlled solely by PD who built a school and hospital situated in the small town nearby.
- Previously, when the gold price rose, over 20,000 people were reported to be on the concession. This included 7-8 established villages with a few thousand people on the concession.
- The property was recovered by CVG (who negotiated a 30% share in the concession, forming MINCA) who moved the majority of the people off the area and terminating all mining activity. These mining operations had included hydraulic monitors, front-end loaders, trucks and individual miners who used mercury (Hg) in open circuit.
- Placer Dome had easily inherited a 70% private share of the concession as other major companies were only interested in completing technical work and not in the significant administrative, political and logistical burden associated with Las Cristinas.
- In late 1991, PD shareholders decided that hydraulicing, individual miners and Hg use would be forbidden on the property.
- CVG, in order to honour their contract obligation, moved the remaining people, setting them up in two neighbouring villages. These two communities have since had many disagreements.
- When Mr. Davidson arrived on location in late 1994, the community was filled with tension.
- In order to gather important investment data, a technical study was completed; this included financial, social and environmental assessments.
- A major study of the social situation revealed that problems existed only with the small-miner situation and not significantly with the indigenous population, as they inhabited areas outside of the influence of the concession.
- While the technical studies were being conducted, MINCA was in full control of the area. During this time, the small miners returned to raid the concession. This occurred because alternative sources of income were not provided to the displaced communities.

- At the end of 1995, a two (2) phase program was implemented by PD to address this situation:
 1. Manual operations were allowed in the areas close to the main ore body once their activity did not interfere with exploration.
 2. Las Rojas (adjacent to main development area) was formed into an "area of accommodation" after consultation with the miners' representatives. No Hg and no pumps were to be allowed.

This program was not properly policed and as a result the deposit was significantly depleted due to unapproved mining practices. The excavated material was removed by pick-up truck and transported to illegal processing centres. This fuelled the illegal processing activity at El Callao.

- In the execution of the program, technical assistance was given in order to regulate and mitigate the possible environmental impacts of the small-scale mining operations.
- This approach was agreed on by CVG with the exploration done by PD in the Las Rojas to facilitate the small-scale activities.
- In 1995, the project was finally launched. PD needed stability to justify the \$ US 500M investment. They therefore decided to launch a unique model allowing small-scale mining to co-exist with the larger mine. This would satisfy the small miners, preventing conflict and allowing the large-scale development to proceed.
- The clear legal path for this process was not defined and it was staggered for a year and a half due to disagreements between the Ministry of Energy and Mines and the Ministry of Environment and Natural Resources over the necessary permits.
- When the final development permit was granted in 1998, intense small-scale mining had depleted most of the easily accessible deposit.
- PD decided not to proceed with the large-scale development due to the complicated situation; administrative and financial coupled with the low gold price.

- Mr. Davidson was then appointed to head a newly formed Dept. of Sustainable Development. This unit was formed by PD to honour its social and economic obligations and promises previously made to the community. The Dept. comprised two groups of the main Indigenous People in the area. The focus was to diversify the economic returns to the people in the absence of a Large-scale development.
- Mr. Davidson also made mention of an important observation; after the small-scale mining activity had depleted all the easily accessible gold, the same small miners who objected to the large scale development as unfair competition and an act of displacement, were in favour of the large mine in order to guarantee their economic survival in the area.
- A pilot processing plant was set-up in 1997 by a group called Pianos. The plant used a gravity concentrating circuit with hammer mills, spirals, sluice boxes and a shaker table. It was upgraded to a full-scale plant which is currently in operation (photo 39-43, App.III). The overall recovery was reported to be 70%.
- The different groups of miners (associations, co-operatives), which are about 3-4 in number, use the plant to process their excavated material up to the pre-amalgamation stage. The material is then taken to an amalgamation centre.
- The various groups dump their tailing into separate portions of the tailings pond that have to be divided into sections by geo-textiles.

3.5 Completed Itinerary - Friday May 5, 2000

Time	Activity
6:00 a.m.	Breakfast
7:30 a.m.	Placer Dome Camp site with Placer Dome official host.
7:30 a.m. - 8:30 a.m.	Tour of Placer Dome Gravity Recovery Pilot Plant
8:30 a.m. - 9:30 a.m.	Visit to small-scale Mining operations on Placer Dome Las Cristinas Concession
9:30 a.m. - 10:15 a.m.	Visit to the Las Rojas project on Placer Dome's Concession
10:30 a.m.	Departure - Puerto Ordaz
2:30 p.m.	Arrive at airport for Puerto Ordz
3:20 p.m.	Flight from Puerto Ordaz to Caracas
4:30 p.m.	Arrive at Airport on Caracas
5:45 p.m.	Depart airport for hotel
6:00 p.m.	Arrive at hotel and prepare for Saturday's return trip to Guyana

3.5.1 Visit to Small-Scale Projects on Place Dome's (PD) Las Cristinas Concession

- PD allows the use of the plant at a cost recovery rate but intends to charge 15% royalty on the gold remaining in the tailings.
- The main ore body at Las Cristinas was estimated at 11 M ozs. at a grade of just over 1 g/t.
- The presentation was concluded at 21:30 hrs. and the following day (Friday May 5th) the party assembled for breakfast at 6:00 hrs and then proceeded on a tour of the Las Cristinas Site and surrounding areas. The tour party comprised all persons from the presentation of the previous evening.

The following highlights the tour:

- PD used excavated material from the original open-pit mine cut to restore and back-fill areas previously mined-out during unregulated small-scale activity. The

creek bank near the processing plant was rebuilt and extensive support provided to the areas surrounding the tailings pond.

- PD has its own nursery that grows plants (Photo 45, App. III) for introduction to the reclaimed areas (Photo 53, App. III) in order to assist and hasten the natural revegetation process.
- Topographically, the tailings pond area is a natural low lying feature, thereby reducing the need for extensive containment dams.
- The mill was constructed by labour from the first legal association in the area with site supervision and equipment provided by PD.
- The associations in the area allow membership based on certain requirements; resident of the area, traditional miner and livelihood dependent mainly on mining.
- The plant was visited when two associations were working simultaneously. The run-of-mine material was brought in bags to the plant by pick-up vehicles. The free gold occurring in quartz, is separated in the gravity circuit which consists of: Jaw crusher → hammer mill → spirals → sluice box (carpet alone, no riffles) → shaker table.
- The plant has a 15 t/day capacity and was established at a cost of \$ US 200,000.
- The main mining association in the area conducts mining by regulated hydraulicing in a contoured open-pit. The material is excavated in a very similar manner to Guyanese “land dredge” practices with the use of two - 4” gravel pumps. The material is then pumped through galvanized pipelines to a wooden sluice box with matting for preliminary concentration. The tailings off the sluice box are backfilled into a mined out area.
- A nearby area was set aside for unrestricted hydraulicing. Here the mining and effluent discharge practices were random and indiscriminate. One operation was observed to be pulverizing the material (Photo 50, App. II) adjacent to the road embankment.
- There are also manual operations in the area that use pumps only for dewatering.
- This area is occupied by about 5 associations (160 households) who live in nearby villages.

- At 10:00 hrs, the visiting delegation bid farewell to Mr. Luis Herrera of CVG MINERVEN and Mr. J. Davidson of PD and departed for Puerto Ordaz.
- Las Cristinas (Km 88) to Puerto Ordaz via road takes 4.5 hrs (four and a half hours). Puerto Ordaz to Caracas via air takes one 1 hr.
- The delegation arrived at the Eurobuilding Hotel at 16:30 hrs.
- The GGMC delegation bid farewell to Ms. Lorenzato (CIDA/GENCAPD) and prepared for departure to Guyana the following morning.

4. Conclusion and Recommendations

In conclusion it must be said that understanding the mining sector and how it operates in Venezuela, in one (1) week, certainly can be a herculean task, but the time spent was very informative and revealing, that certain conclusions can be drawn and recommendations made.

- Firstly, the exchange was a fruitful one and cooperation between the relevant mining and geological agencies should be necessary to facilitate movement of technical information between the two countries.
- Exchange pilot programs between Guyana and Venezuela should be conducted in Cuyuni River using multi-element geochemical techniques in view of the fact that the elevated levels of mercury were discovered in the sediments of tributaries of the Cuyuni River on the Venezuelan side.
- Exchange should be yearly or bi-yearly vocation.
- Practically, there is limited data on mercury pollution in Guyana, this area needs (Cuyuni River) to be addressed.
- Revision of the mining laws should be done to meet modern expectations and requirements of the mining industry.
- Reforestation of mined out areas should be adhered to with severe penalties for perpetrators.
- The environmental bond should take reforestation into consideration. Las Cristinas in Venezuela dealt successfully with the problem of reforestation and illegal mining, reversing the ills created by mining.
- Areas available for auctions should be simultaneously advertised as it is done by CVG MINERVEN. It should be relevant to adopt some of their administrative procedures that deals with packaging of information on mining and geology that would allow simultaneous release of current information on the internet, print or electronic media. This reduces significantly the lapses and bureaucratic procedures for granting of mineral rights.

- Ways should be found to improve revenue collection by removing obstacles that would hinge on mining and investment opportunities, thus, higher efficiency in revenue collections.
- Adapt a system of express processing of applications to give miners the assurance of commitment that their applications (medium, large, etc.) can be processed in three (3) days.
- Preparation for prospecting programs within a month of commitment.
- Then six (6) months for exploration plans as well as infrastructure plans with relevant relinquishment of property to avoid landlord issues within the industry.
- The change of the system from imperial to metric.
- Issuances of Leases in blocks of km² and sizes measured 1 km X 1 km.
- Small-scale operations should be applicable to persons of Guyanese birth to avoid an invasion of economics aliens that have the ability to rapidly alienate Guyanese miners through the system of marriage.
- More vigilance in monitoring to prevent illegal plants, illegal disposal of toxic waste and operations without environmental bonds or impact assessment.
- The purchase of the postmalgam concentrates, used Hg and amalgam tailings should be done by GGMC to avoid contamination of the environment.
- Reference Environment and Impact Assessment requirements and their subsequent applications in a bipartisan way via Guyana Geology and Mines Commission to the Industry.
- Common within the two (2) nations is a resource allocation problem to execute their mandates that affects the ability to perform. The GGMC should be given the resources to allow for technical and timely financial assistance to miners.
- It is known that miners have been offered relief due to falling gold prices but they can also be assisted with the provision of apparatus to improve their mineral production.
- Improve road arteries to productive and prospective sites, and construct processing plants in feasible areas to assist in ore processing.
- The Commission should be prepared to offer technical assistance to miners in the proactive manner providing the mandate is executable within the circumstances of resources availability in the Commission.

- Small-scale miners as well as operators within the mining sector deemed as potential polluters should provide monthly reports of their operations.
- It may not be feasible to set up processing centres in Guyana; however, an amalgamation centre can be set up at strategic mining locations. This will help to control the use of mercury and its release into the environment.
- The delegation wasn't able to visit an amalgamation centre as the one closeby was temporarily closed during the visit. However, from all reports, these centres help to reduce mercury pollution by mining, since no mercury is used at the mining site, but instead at specifically designed, constructed and operated facilities.
- One of the major visual impacts of alluvial mining is sediment pollution. The use of a geo-textile material as seen in the tailings impoundment at Las Cristinas Concession can help to reduce the sediment load of water for recycling or discharging into creeks/rivers.

ACKNOWLEDGEMENT

We thank CANMET, GENCAPD, GGMC, GGDMA, the Venezuelan Government and the Canadian Authorities for behind the scenes participation in making the tour a successful one.

Appendix I - List of Participants: Tuesday 2nd may, 2000 – meeting of Venezuelan mining and environmental officials and visiting delegation

NAME	ORGANISATION	DESIGNATION NUMBERS	TELEPHONE ADDRESS	EMAIL
1. Jose Fernnandez	MEM	Director of Planning & Economics	5075970	JANTONIOFER @YAHOO.COM
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13. Manuel Navas	MEM	Chief Mining Engineer	507 5622	
14. Luis N. Herrera	CVG	Manager- Small Scale Mining	085-27945	

NAME	ORGANISATION	DESIGNATION	TELEPHONE NUMBERS	EMAIL ADDRESS
15. Cruz Briceno Sanchez	CVG	Manager- Mining Promotion	086-661382	
16. Edward A. Shields	GGDMA-Guyana	General Secretary	592-226-3657	
17. Gordon Nestor	GGMC-Guyana	Senior Geologist	592-225-2862/5/7	
18. Carlos Todd	GGMC-Guyana	Mining Engineer	592-225-2862/5/7	
19. Zaeran Ramotor	GGMC-Guyana	Environmental Inspector	592-225-2862/5/7	zramotor@guyanenet.gy
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21. Gustavo E. Sorondo	MEM	Director General – Mining		
22. Angel Franco	MEM	Director – Mining Concession		Angel.franco@usa.net
22. Nestor Duarte	MEM			

Abbreviations:

MEM – Ministry of Energy & Mines

CVG – Corporacion Venezuela de Guyana

GGMC – Guyana Geology & Mines Commission

GGDMA – Guyana Gold & Diamond Miners Association

MRE

Appendix II - List of Places visited

No.	Wp No	Zone	Easting	Northing	Place/Sample No.	Description	Date
1	295	20 ^p	733357	1160364		11:50	2nd May, 2000
2	296	20 ^p	733155	1160376		11:50	3rd May, 2000
3	297	20 ^p	729730	1161411	Caracas	11:55	3rd May, 2000
4	298	20 ^p	52859	916592	Caracas Airport	16:41	3rd May, 2000
5	299	20 ^p	827044	920197		16:44	3rd May, 2000
6	300	20 ^p	528481	920665		16:45	3rd May, 2000
7	301	20 ^p	531882	922208		16:51	3rd May, 2000
8	302	20 ^p	540924	922840	Ciudad Guayana	17:05	3rd May, 2000
9	303	20 ^p	565234	887881		17:48	3rd May, 2000
10	304	20 ⁿ	576328	879585	Manganeso El Palmar	18:02	3rd May, 2000
11	305	20 ⁿ	577599	878390		18:04	3rd May, 2000
12	306	20 ⁿ	580157	875611		18:11	3rd May, 2000
13	307	20 ⁿ	580084	875529	Sta Maria Despaso	18:11	3rd May, 2000
14	308	20 ⁿ	588457	87134		18:18	3rd May, 2000
15	309	20 ⁿ	606324	868025		18:29	3rd May, 2000
16	310	20 ⁿ	615341	842668		18:51	3rd May, 2000
17	311	20 ⁿ	629919	812551		19:20	3rd May, 2000
18	312	20 ⁿ	629083	810935		19:25	3rd May, 2000
19	313	20 ⁿ	627634	808697	CVG - Vanoya	19:29	3rd May, 2000
20	314	20 ⁿ	631250	810563		19:39	3rd May, 2000
21	315	20 ⁿ	630987	810500	CVG-MIINERVEN + Mine cyanidation plant without activation carbon	21:55	3rd May, 2000
22	316	20 ⁿ	630116	811874	EL Callao	21:58	3rd May, 2000
23	317	20 ⁿ	628899	811694		12:04	3rd May, 2000
24	318	20 ⁿ	627455	808368		12:11	4th May, 2000
25	319	20 ⁿ	630320	813001		13:51	4th May, 2000
26	320	20 ⁿ	631452	812919		13:56	4th May, 2000
27	321	20 ⁿ	631318	812904	El Manos – Bollandi	14:03	4th May, 2000

No.	Wp No	Zone	Easting	Northing	Place/Sample No.	Description	Date
28	322	20 ⁿ	630403	813216	El Callao	14:50	4th May, 2000
29	323	20 ⁿ	637677	815681		14:57	4th May, 2000
30	324	20 ⁿ	658247	811288		15:11	4th May, 2000
31	325	20 ⁿ	664989	807676	Cooperative - Bochi - uche Botanamo Tumeremo	15:35	4th May, 2000
32	326	20 ⁿ	664702	806841	Tumeremo-Town Sifontes	17:33	4th May, 2000
33	327	20 ⁿ	659616	789433		17:47	4th May, 2000
34	28	20 ⁿ	659034	787725		17:49	4th May, 2000
35	329	20 ⁿ	655812	778463		17:55	4th May, 2000
36	330	20 ⁿ	653449	762100		18:08	4th May, 2000
37	331	20 ⁿ	654230	752392		18:16	4th May, 2000
38	332	20 ⁿ	667555	750589		18:24	4th May, 2000
39	333	20 ⁿ	659009	749282	Underground mine: No safety shaft -(picture inset: App. III)	18:30	4th May, 2000
40	334	20 ⁿ	654015	752936		19:38	4th May, 2000
41	335	20 ⁿ	653971	752791	Mercury plant Sifontes	20:06	4th May, 2000
42	336	20 ⁿ	653737	743789		20:18	4th May, 2000
43	337	20 ⁿ	653719	742865		20:19	4th May, 2000
44	338	20 ⁿ	653495	740772	El Eldorado State Penitentiary	20:22	4th May, 2000
45	339	20 ⁿ	655997	733723		20:28	4th May, 2000
46	340	20 ⁿ	656375	729720		20:31	4th May, 2000
47	341	20 ⁿ	657190	725860		20:34	4th May, 2000
48	342	20 ⁿ	659863	720132		20:39	4th May, 2000
49	343	20 ⁿ	658660	714938	Cooperativa Mixta Chicanan San Antonio-km 33 Edu Bolivar	20:51	4th May, 2000
50	344	20 ⁿ	670091	685152	Las Cristinas (Km 88)	20:51	5th May, 2000
51	345	20 ⁿ	671101	684895		11:11	5th May, 2000
52	346	20 ⁿ	671944	685385	Gravity Concentration Recovery Plant	11:15	5th May, 2000

No.	Wp No	Zone	Easting	Northing	Place/Sample No.	Description	Date
53	347	20 ⁿ	672256	685526	Gravity Concentration Recovery Plant	11:34	5th May, 2000
54	348	20 ⁿ	672058	685563		12:06	5th May, 2000
55	349	20 ⁿ	672225	685832	Monitor Pits	12:09	5th May, 2000
56	350	20 ⁿ	671837	685551	Gravitation plant	12:24	5th May, 2000
57	351	20 ⁿ	672065	685553		12:50	5th May, 2000
58	352	20 ⁿ	671281	684884		12:53	5th May, 2000
59	353	20 ⁿ	671929	684679	Crystal Ex Company	12:54	5th May, 2000
60	354	20 ⁿ	673581	685153	Tailings-Santo Domingo Nuevas Claritas 7 stars	12:58	5th May, 2000
61	355	20 ⁿ	672645	686383		13:04	5th May, 2000
62	356	20 ⁿ	673443	686233	Las Cristinas Mining Town	13:22	5th May, 2000
63	357	20 ⁿ	673757	686533		13:39	5th May, 2000
64	358	20 ⁿ	673206	687113		13:41	5th May, 2000
65	359	20 ⁿ	673646	686331		13:43	5th May, 2000
66	360	20 ⁿ	673273	605863		13:45	5th May, 2000
67	361	20 ⁿ	673615	684229		13:49	5th May, 2000
68	362	20 ⁿ	674339	684350		13:51	5th May, 2000
69	363	20 ⁿ	674938	683734		13:54	5th May, 2000
70	364	20 ⁿ	686504	695907		14:08	5th May, 2000
71	365	20 ⁿ	674498	706325		14:17	5th May, 2000
72	366	20 ⁿ	656403	728800		14:33	5th May, 2000
73	367	20 ⁿ	653709	750472		14:47	5th May, 2000
74	368	20 ⁿ	653651	759375		14:53	5th May, 2000
75	369	20 ⁿ	629764	813761		15:53	5th May, 2000
76	370	20 ⁿ	622535	824896	Guiasipati	16:02	5th May, 2000
77	371	20 ⁿ	621397	828125		16:14	5th May, 2000
78	372	20 ⁿ	617551	835707		16:20	5th May, 2000
79	373	20 ⁿ	615318	851664	Sta Rosa	16:31	5th May, 2000
80	374	20 ⁿ	574321	881667		17:13	5th May, 2000
81	375	20 ^p	569886	883989	Upata-Control Point	17:17	5th May, 2000
82	376	20 ^p	552744	912259		17:38	5th May, 2000

No.	Wp No	Zone	Easting	Northing	Place/Sample No.	Description	Date
83	377	20 ^p	548600	975336	Toll Station	17:41	5th May, 2000
84	378	20 ^p	535597	918263	Hydropower Dam	17:57	5th May, 2000
85	379	20 ^p	526777	916386	Puerto Ordaz	18:10	5th May, 2000
86	380	20 ^p	477573	957308		19:37	5th May, 2000
87	381	20 ^p	416080	999643		19:43	5th May, 2000
88	382	20 ^p	246517	1116259		19:57	5th May, 2000
89	383	20 ^p	207022	1143452		20:00	5th May, 2000
90	384	20 ^p	719160	1173280	Caracas	20:18	5th May, 2000
91	385	20 ^p	750968	1177919		15:49	5th May, 2000
92	386	20 ^p	228664	1168638		16:09	5th May, 2000
93	387	20 ^p	414863	1166045		16:31	5th May, 2000
94	388	20 ^p	617443	1164390		16:55	5th May, 2000
95	389	20 ^p	681752	1171988		17:07	5th May, 2000
96	390	20 ^p	232091	888123		18:28	5th May, 2000
97	391	20 ^p	360217	717598		18:48	5th May, 2000
98	392	20 ^p	362289	719910		18:50	5th May, 2000