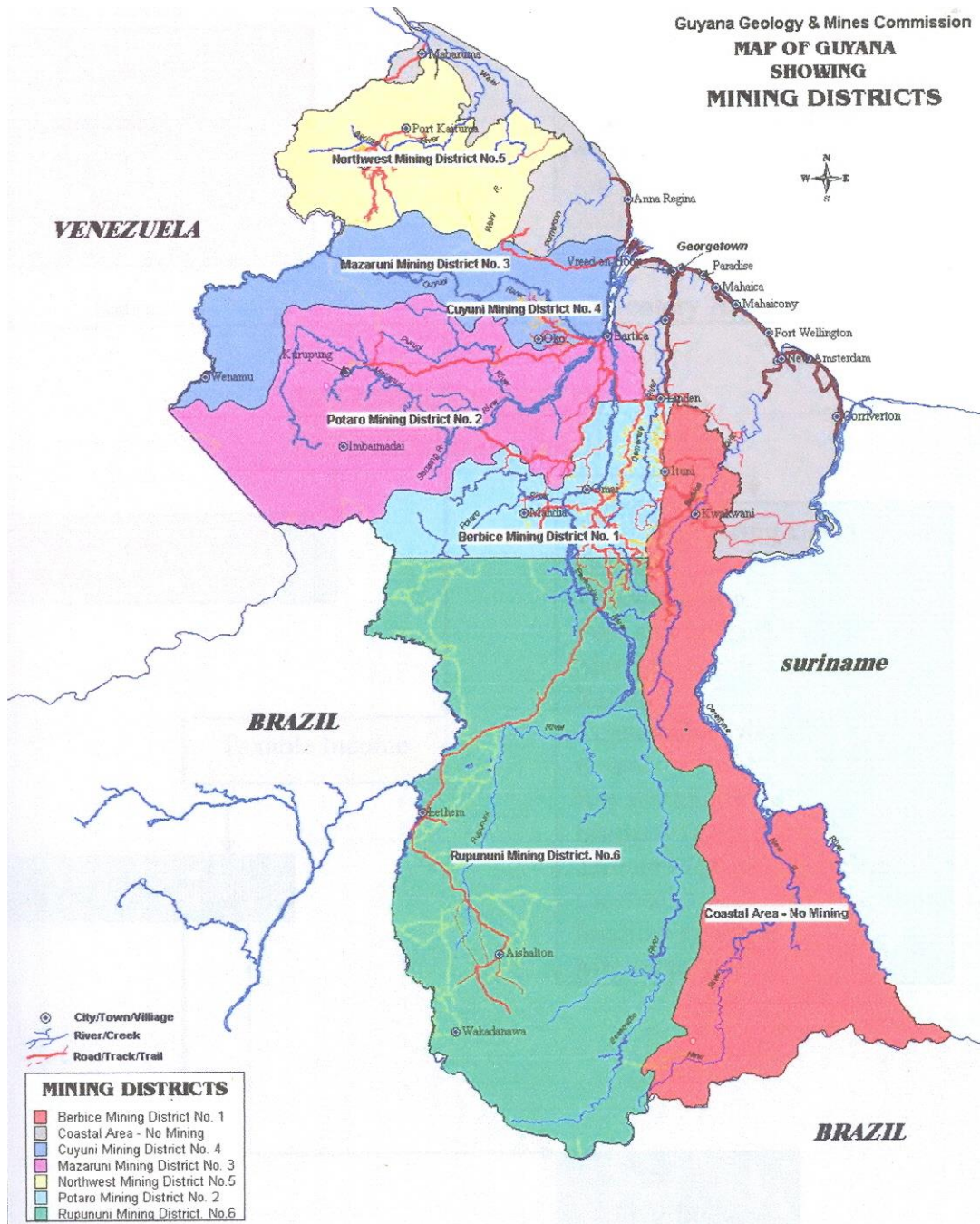




# **Guyana Geology & Mines Commission Annual Report 2011**



Guyana Geology & Mines Commission  
**MAP OF GUYANA  
 SHOWING  
 MINING DISTRICTS**



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## EXECUTIVE SUMMARY

Overall, 2011 was a successful year for the Guyana Geology and Mines Commission (GGMC) and the Mining and Petroleum Industries in Guyana. It was also a year of significant changes in leadership in the Commission, on the Board and at the Ministerial level. With prevailing high prices for gold and strong interest in exploration for a range of minerals that included gold, diamonds, manganese, base metals, bauxite and uranium minerals, there was much investment and activities in the Mining Industry, in Large Scale exploration as well as new and ongoing gold mining activities at the Medium and Small Scale. Similar interest was experienced in the Petroleum Industry. This translated into strong growth in the revenues of the GGMC to attain \$7.5047 b, an increase of 52% over 2010 and 139% of the 2011 budget.

For the seventh consecutive year, from 2005 to 2011, gold production from Small and Medium Scale producers attained another record, at 363,083 oz, and mineral production continued to be the premier source of export earnings for the country while contributing significantly to the GDP. Gold production was entirely from Small and Medium Scale producers. Sand, stone and bauxite production also exceeded budget. Firm plans for advanced exploration and mine development were encapsulated in the signing of four Mineral Agreements for manganese, gold, gold-copper and bauxite; and a Memorandum of Understanding and a new product, mullite, from refractory bauxite.

National infrastructure projects and the housing boom promoted by the government created a demand for sand that raised concerns about the ability of the Sand sub-sector to supply. Interest in petroleum exploration also grew, with newcomers including prominent international exploration and production company, Anadarko Petroleum Corporation, who expressed interest in exploring in the ultra deep waters. Licensed Petroleum companies carried out active exploration programmes, including drilling or activities preparatory to drilling. One exploratory well (Apoteri K2 well) was drilled at Meritezero in the inland Takutu Basin, and preparatory work was started for drilling two wells, Jaguar 1 and Eagle 1, offshore. Although the Apoteri K2 well was dry, useful information was generated for the company, Takutu Oil and Gas Inc. (TOGI). In response to concerns expressed by the communities about the closure of the Apoteri K2 well, a community consultation was held at Annai, facilitated by the North Rupununi District Development Board (NRDDB).

While GGMC benefitted financially from the vibrancy and growth in the Mining and Petroleum sectors, it was challenged by the need for increased monitoring and especially for increased field staff, vehicles and equipment for field monitoring and regulation. Greater legal compliance in environmental management is required under the Low Carbon Development Strategy and the Joint Concept Note and Memorandum of Understanding between the governments of the Kingdom of Norway and Guyana, both of which emphasize Reduced Emissions from Deforestation and Degradation. Hence, on these grounds also, increased monitoring, as well as prediction and measurement of forest cleared for mining, are required.

The Commissioner, Mr. Woolford, retired in March 2011 and Mrs. K. Livan was appointed to act as Commissioner. A new Chairman was appointed, Major General retired, Joe Singh, and several of the Directors were also new. There were further changes in December 2011, when Honourable Robert Persaud was appointed as Minister of Natural Resources and the Environment, and GGMC, as a natural resource agency, fell under the Ministry's ambit. There were two Board-Management Retreats where Prime Minister, Samuel Hinds, the Minister responsible for Mining, participated. The first Retreat on May 20, served to familiarize new Board Members with GGMC's Functions, Operations and Five-Year Strategic Plan, while the second, on September 23, reviewed performance for the year to date and gave guidance for the remainder of the year.

GGMC was pleased to attain international ISO 9001:2008 Certification for its Quality Management System (QMS) encompassing the six processes for the processing of applications and issuance of Prospecting and Mining Permits and Licences, Quarry Licences and reconnaissance scale Permissions for Geological and Geophysical Surveys. This was a signal achievement. The customer-centred ISO certified QMS brought to miners the benefits of transparency, efficiency, reliability and the ability to track applications, and provided staff with training, participation, leading to the development of competency. GGMC gained further recognition nationally, being conferred with the 2011 Public Service Award of Excellence by the Georgetown Chamber of Commerce and Industry at its annual Dinner and Awards on December 9, 2011.

The main event for promoting the Mining and Petroleum Sectors was the Annual Mining Week which took place from August 21-27 under the theme: “Evolving Methods, Embracing Excellence, Enjoying Success”. Highlights were a Mining Week Walk, Biennial Conference, Exhibition, Porkknocker Day at Bartica, special Panel Discussions on television and a Newspaper Supplement.

Other significant promotional features for the Mining and Petroleum sectors were the production of a Special Mining Journal Supplement on Guyana in June 2011, a GGMC Mining Supplement 2011 Booklet produced by GGMC, an information Calendar, a newspaper supplement, and participation in the Prospectors and Developers of Canada annual Trade Show and GUYEXPO. Mineral Promotion was not limited to attracting investment, but was also extended to promoting better efficiency, environmental management and sustainability in the Small and Medium Scale gold and diamond mining sectors, in cognizance of the requirements of the LCDS, the Guyana-Norway forest agreement and the imminent ban on the international trade on mercury.

In the area of IT, significant investment was made in advancing an Integrated Management Information System for GGMC, moving from the Systems Requirement Specifications to the first stage in system design. The IT focus in the Commission was also aimed at providing and supporting LAN and WAN networking, the latter to link the Mining Stations in the Mining Districts with Headquarters in real time.

Training continued to have prominence, and staff members at different levels were trained in a number of areas, both technical and non technical. Training included two three-week courses in China and the pursuit of the Masters of Science degree at the University of Queensland, Australia, through government of Guyana scholarships awarded in 2010 to two staff members by the Public Service Ministry.

## GEOLOGICAL SERVICES DIVISION

The Geological Services Division consists of the Geology Department and the Chemical, Bullion Assay, Fire Assay and Petrological Laboratories. The Geology Department undertakes geological fieldwork throughout Guyana to investigate the geology and mineral resources and produces geological data, maps and reports. The Geology Department continued to pursue a programme for the compilation of a Geochemical Atlas for Guyana as a key part of its activities, and from 2009, Technical Assistance to Small and Medium Scale gold mining operations was expanded to include basic geological assessments of mining pits, sampling and analysis of free gold that is recoverable by gravity-based recovery systems, including the sluice box.

Under a Scientific and Technical Cooperation agreement between the governments of Brazil and Guyana, a “Geological – Geodiversity Mapping on the Brazil-Guyana Border” was initiated.

The Geology Department continued to play an important role in the promotion and development of Large Scale prospecting and mining of gold, diamond, bauxite and non-traditional minerals through its participation in the processing of applications for Prospecting, Mining and Quarry Licences and Permissions for Geological and Geophysical Surveys (PGGS), and monitoring and review of annual Exploration Programmes and Budgets for Prospecting Licence (PL) and PGGS properties. In the processing of Licences and PGGS applications, the Geological Services participates in the ISO certified 9001:2008 Quality Management System of the GGMC.

With the recruitment of three GGMC scholars, UG graduates with the B.Sc. in Geotechnical and Mineral Resource Engineering in 2011, the complement of Geologists in Geological Services Division rose to eleven, including two Senior Geologists, Dr. Serge Nadeau and Dr. D. C. Kantharaja. However, only four of these officers were graduates in Mineral Resources Engineering or Geology.

## FIELD PROJECTS

### BRAZIL - GUYANA GEOLOGICAL AND GEO-DIVERSITY MAPPING PROJECT

Following an agreement for Scientific and Technical Cooperation between the Governments of Brazil and Guyana signed on September 14, 2009, the first phase of the project “Geological – Geodiversity Mapping on the Brazil-Guyana Border” was initiated by the Geological Survey of Brazil (CPRM) and the Guyana Geology and Mines Commission (GGMC) in October 2011. Several collaborative activities were planned for 2011-12. These are: 1) ARC-GIS Training; 2) Field geological and geodiversity mapping and sampling of rocks along the Brazil-Guyana border area; 3) Chemical analysis and age dating of rock samples; 4) Meetings and data compilation in Belem and Georgetown; and 5) Final report and map presentation to the Governments of Brazil and Guyana, and to the public.

Training in ARC-GIS mapping software was held in Belem (Brazil) on February 18-22, 2011 to facilitate the harmonization of map production, since GGMC uses MapInfo. Geological and geodiversity mapping and rock sampling were undertaken from October 8-28, 2011. The CPRM and GGMC geologists had a preparatory meeting in Boa Vista, Roraima (Fig.1), prior to the field mapping exercise. The field mapping team of geologists consisted of: Dr. M. Faraco, CPRM Team Leader, L. Fraga, N. Reis and L. Betiollo and Dr. S. Nadeau, GGMC Team Leader, J. Reece, D. Lachhman and R. Ault.

## TECHNICAL ASSISTANCE TO THE MINING SECTOR PROGRAMME (TAMSP)

Under the Technical Assistance to the Mining Sector Programme, GGMC Geologists assist Small and Medium Scale miners by generating geological, mineralogical and gold recovery information, which is intended to lead to improved and more efficient methods of mining. In 2011, projects were conducted in Puruni, Cuyuni, Baramita, Mazaruni, Frenchman Creek, Omai, Siparuni, Kumaka West, Mahdia, Semang and Blue Creek, in four Mining Districts. Samples were analysed for free gold by the Chemical Laboratory by amalgamation and parting.

### REPORTS COMPLETED

- ❖ Three reports for Phases I, II and III of the Technical Assistance to the Mining Sector conducted in Omai and its environs were completed and submitted by Geologist, J Reece.
- ❖ Preliminary field report for the Brazil-Guyana Geological and Geo-diversity Mapping Project was completed and submitted by Senior Geologists, Dr Nadeau, and J. Reece, and Geologists, D. Lachhman and R. Ault.
- ❖ Three final reports on Technical Assistance to Mining Sector, Phases I, II and III conducted in the Upper Mazaruni area, completed and submitted by Dr Kantharaja.

### Compilation of Standard Operating Procedures (SOPs) for the Integrated Management Information System

The Geological Services Division compiled and submitted nineteen Standing Operating Procedures to be incorporated into the IMIS system. The SOPs covered: Monitoring visits to Prospecting Licence properties; External Analyses; Budget Preparations for Regional Geochemical Surveys; Technical Assistance to Miners Projects; Editing, reading, updating and deletion of geological data; Data Management and backup; Data Orders – external requests; Data Orders – internal requests re Geology and Mineralization; Data Orders – internal requests re Lottery and Auctions; Fieldwork – Regional Geochemical Surveys and Geological Mapping; Field Work for the Technical Assistance for Miners Projects; Generation of new maps; Project Report – Regional Geochemical Surveys; Project Report – Technical Assistance for Miners Projects; Regional Geochemical Maps; Maps for Technical Assistance to Miners Projects; Updating of existing maps; Technical Assistance to Miners Projects – Samples Template; and Technical Assistance to Miners Projects – Sampling Methodology.

### ADVANCED EXPLORATION ON PROSPECTING LICENCE PROPERTIES

Advanced exploration is a necessary step to unlocking the mineral potential of Guyana, being the means of finding, defining, assessing and developing new mines and diversifying mineral production. In 2011, there were six companies with Large Scale Prospecting Licences (PLs) that were conducting advanced exploration, delineation and evaluation of mineral resources and in two instances, feasibility assessment. Accordingly, significant benchmarks achieved in 2011 were:

**Reunion Manganese Company - Matthews Ridge Manganese Exploration Project:** Reunion Manganese Company signed a Mineral Agreement in March 2011 for exploration, feasibility assessment and mining at their Matthews Ridge property. Exploration, including drilling, continued in 2011, as the company worked towards defining a (Canadian) NI 43-101 category resource.

**Guyana Goldfields - Aurora Gold Mining Project:** A Mineral Agreement was signed in November 2011 for the construction and operation of six open pit and underground gold mines at Aurora. The Feasibility Study was due to be submitted to GGMC in January 2012, and construction of the access road, mine site facilities and mill were expected to start in 2012. It is planned that the mine and mill will be fully operational by the first quarter of 2014.

**First Bauxite Corporation and Guyana Industrial Minerals Inc- Bonasika Bauxite Mining Project:** A Mineral Agreement was signed in November 2011 for mining refractory grade bauxite based on the Bonasika Mining Licences, extant and prospective, processing the ore, and producing and shipping refractory bauxite products from Sand Hills, Demerara River. The NI 43-101 category resource estimate report for the project was completed in 2011.

**Sandspring Resources Ltd. - Toroparu Gold-Copper Exploration Project:** A Mineral Agreement was signed in November 2011 for the continued exploration, mine development and operation of an open pit mine.

**Prometheus Resources (Guyana) Inc. - Aricheng Uranium Exploration Project:** Drilling continued at Aricheng West, encountering significant mineralization. An NI 43-101 category resource estimate is expected to be released in March 2012.

**Stronghold Metals Inc. - Eagle Mountain Gold Exploration Project:** Stronghold Metals Inc continued its drilling programme at Eagle Mountain with a view to completing the NI 43-101 resource estimate of the prope

## LABORATORIES

1. **Bullion and Fire Assay Laboratories:** Total Income generated for the year 2011 was G\$16,371 million. The main customer was the Guyana Gold Board for whom determination of gold purity was done.
2. **Fire Assay Laboratory - Summary of Analytical Work done in 2011:** Ore samples received 175 , Samples completed 175. Internal customers accounted for 111 of the samples, and external customers accounted for 64.
3. **Chemical Laboratory** - *(See Annex 1 for details)*

The majority of the samples analysed in 2011 were tested by Amalgamation and Parting and these were for the Technical Assistance to Miners Projects.

4. **Petrological Laboratory** – *(See Annex 1 for details)*

One thousand, three hundred and twelve (1,312) primary and secondary students collected rock samples and related information for school assignments including School Based Assessments (SBAs) for the CXC syllabus.

## LAND MANAGEMENT DIVISION

Land Management Department operated under the Office of the Commissioner. The Objectives of the Land Management Department were to promote and support increased and diversified mineral exploration and development and mineral resource assessment, while meeting standards; to optimize revenues and to provide quality service to customers and liaise with key stakeholders.

In March 2011, GGMC attained the signal achievement of certification under the international ISO 9001:2008 scheme for its Quality Management System (QMS) for the processing and grant of applications for its six processes for Medium Scale Prospecting and Mining Permits; Large Scale Prospecting and Mining Licences; Quarry Licences and reconnaissance scale Permissions for Geological and Geophysical Surveys. Land Management Department is the principal user of the Quality Management System, with significant parts being played by Finance, Audit and Geological Services Divisions and the Information and Documentation Officer. The Special ISO Team, Land Management Staff and Quality Coordinator are to be especially congratulated, and the work and invaluable guidance of the ISO Consultant is hereby acknowledged.



The main tasks carried out by Land Management Department are processing applications and issuance of Permits, Licences and Permissions under the Quality Management System and with Geological Services and Mines Divisions, and the administration and regulation of the terms and conditions of such Permits, Licences and Permissions. This included the application of GIS technology to verify the availability of areas under application and updating the Stock Maps, databases and ledgers to reflect the status of new applications, applications being processed and cancelled properties (mainly Prospecting Permit Medium Scale (PPMS) blocks). Land Management Department also administered the processing of applications for fiscal concessions by Small, Medium and Large Scale operators in prospecting and mining and holders of Petroleum Prospecting Licenses.

The GIS Officer was responsible for the execution of four projects for the development of the Integrated Management Information System; Enhancement of Field Verification of Claims and River Locations for the processing and issuance of Claim and River Location Licences; Dredge and Asset and Tracking by the use of GPS; and the establishment of a modernized Geodetic Infrastructure for Guyana, in collaboration with Guyana Lands and Surveys Commission. Claim verification using GPS facilitated the systematic creation of a Claims Database, which will aid in the planned integration of the Claims application and licensing process into the GIS in the Land Management Department.

## PERMITS, LICENCES AND PERMISSIONS

Interest and growth in the Mining Industry in 2011 was reflected in the number of applications for Medium and Large Scale prospecting properties, Prospecting Permit Medium Scale (PPMS) and Prospecting Licence (PL) respectively, and also for Mining Permits (MP), Medium Scale and Permission for Geological and Geophysical Surveys (PGGS). Minerals applied for were gold, diamonds, precious stones, sand, stone, iron ore and ores uranium, chromium, base metals, bauxite and rare earth elements. (*See Annex 2 for “Applications, Grants, Renewals and cancellations of Mineral Properties in 2011”*)

There was one application for a Mining Licence, and four Mineral Agreements were signed between GGMC and Large Scale property holders Reunion Manganese for exploration and development of a manganese prospect; ETK Inc and Sandspring Resources for exploration, assessment and development of the Toroparu Copper-Gold prospect; Guyana Goldfields for the development of their Aurora prospect; and First Bauxite Corporation and Guyana Industrial Minerals Inc (GINMIN) for the development of their Bonasika Bauxite prospects.

In October 2011, the Government of Guyana, Bosai Minerals Group Co. Ltd, Bosai Minerals Group (Guyana Inc), Guyana Geology and Mines Commission and National Industrial and Commercial Investments Ltd signed a Memorandum of Agreement for development of bauxite prospect Block 37 on the right bank of Demerara River, investment in a third kiln to produce 150,000 tonnes of refractory bauxite per year and development of a new product, mullite, with construction starting in mid 2013.

## MAPS AND INFORMATION

Maps and information were prepared on request for external customers, mainly miners, and GGMC technical staff. CDs were also prepared with information requested by the mining public.

## CLOSED AREA COMMITTEE

The Closed Area Committee appointed by the Honourable Samuel Hinds, Prime Minister, Minister responsible for mining, managed the process of rescinding cancelled Prospecting and Mining Permit blocks and recommending alternative blocks to miners whose blocks occurred within Amerindian Titled Lands and their proposed extensions. Lotteries were held to a limited extent in 2011 and these were facilitated by the Closed Area Committee. Lotteries

were held in Lukabuna – 50 Blocks at Imbaimadai, 11 blocks for sand mining, and Kaburi – 48 blocks in two sets of 24 blocks, to accommodate miners who were ordered to relocate from Omai Bone Yard Area.

## **MINERAL PROPERTIES IN AMERINDIAN TITLED AREAS AND PROPOSED EXTENSIONS**

During 2011, requested extensions were plotted for eighteen Amerindian Villages. The Honourable Samuel Hinds, Prime Minister, minister responsible for mining directed that alternative Blocks should be awarded upon request to miners with Mineral Properties in areas proposed for extensions of Amerindian Titled Lands, and that rentals should not be accepted for such properties. In October 2011, the Honourable Prime Minister articulated government policy for mining in Amerindian Titled Land and areas proposed for extension. However, the policy was silent on the award of mining title within Amerindian Villages, some of whom are mining and/or allowing mining in their Titled Land.

## **SPECIAL PROJECTS UNIT**

Special Projects Unit has responsibility for oversight of the building, repairs and maintenance of roads in mining areas to facilitate mining, under the direction of the Minister responsible for mining, and with technical guidance of the Works Services Group of the Ministry of Works. The Unit is also responsible for the supervision of the construction of the office and stores buildings at GGMC Head Office, and several new buildings in the Mining Districts, for offices and staff accommodation, to upgrade current facilities and to provide additional accommodation for the planned expansion of field staff in the Mines Division. (*See Annex 3 for 2011 Projects on Roads, Bridges and Airstrip Construction and Maintenance*)

## **MINES DIVISION**

Mines Division consists of four sections: Mines Technical Unit, Inspectorate, Mineral Processing Unit and Clerical Section. Mines Division is responsible for regulating (including monitoring and inspections), and recording mineral production from Small, Medium and Large Scale mining and quarrying operations, including the technical terms and requirements of Quarry and Large Scale Mining Licenses and the collection of revenues, including royalties, payable under the Mining Act. The Division provides Technical Assistance to Small and Medium Scale operators in mining, mineral processing and tailings management and facilitates the implementation of internationally acceptable mining standards. Mines Division and Land Management Department jointly administered the application and issuance of Claim and River Location Licenses for Small Scale mining.

## **MINES TECHNICAL UNIT**

Mines Technical Unit worked closely with Mines Inspectorate and Environmental Division. As District Mining Engineers and District Environmental Officers, the Unit's six Mining Engineers and Environmental Officers provided supervision and oversight for the Mines Inspectorate staff in the Mining Districts, as the latter regulate, monitor and enforce legal compliance on the Small and Medium Scale mining operations that constitute the great majority of mining operations in Guyana. Officers of Mines Technical Unit also monitor and inspect quarry operations, sand pits and Large Scale Bauxite mining operations; provided technical assistance and guidance to Small and Medium Scale operators; enforced compliance with safe mining and environmental management practices and legal requirements; carried out quarterly quantity surveys of quarries and sand pits to calculate

material removed and royalty payable; and undertook research and studies into technical and economic issues affecting or that would provide guidance to the Mining and Quarrying Industry.

Mines Technical Unit planned twenty Technical Inspections, twelve Quantity Surveys and two Research Projects. The Technical inspections comprised quarterly visits to five of the Mining Districts, while the twelve Quantity Surveys comprised quarterly visits to Essequibo, Demerara and Berbice to survey all operating sand and loam pits, stone quarries and clay pits. The Unit completed the twenty planned Technical Inspections and eight out of twelve Quantity Surveys and Sand Pit Inspections. Two research presentations were done and presented at the biennial National Mining Conference held during Mining Week.

## MINERAL PRODUCTION

### Quarterly Gold Production (ounces) by Mining District

MINING DISTRICT	1ST QTR	2ND QTR	3RD QTR	4TH QTR	TOTAL
1 – Berbice	0	0	0	0	0
2- Potaro	14,406	18,017	18,037	18,425	68,885
3 - Mazaruni	21,653	27,392	31,010	30,561	110,616
4 – Cuyuni	23,893	22,743	27,333	25,192	99,161
5 – North West	12,796	14,769	16,040	15,704	59,309
6 - Rupununi	5,161	4,327	7,165	8,459	25,112
<b>TOTAL</b>	<b>77,909</b>	<b>87,248</b>	<b>99,585</b>	<b>98,341</b>	<b>363,083</b>
<b>BUDGETED PRODUCTION</b>	<b>79,500</b>	<b>80,100</b>	<b>80,100</b>	<b>80,300</b>	<b>320,000</b>
<b>% VARIANCE</b>	-2%	+9%	+24%	+22%	+13%

### Quarterly Diamond Production (metric carats) by Mining District

DISTRICT	1ST QTR	2ND QTR	3RD QTR	4TH QTR	TOTAL	Royalty
1 – Berbice	0	0	0	0	0	0
2- Potaro	3,419	3,362	3,415	3,420	13,616	\$7,983 m
3 - Mazaruni	5,539	4,608	7,759	4,556	22,462	\$13,169 m
4 – Cuyuni	3,468	3,224	5,555	3,948	16,195	\$9,495 m
5 – North West	0	0	0	0	0	0

DISTRICT	1ST QTR	2ND QTR	3RD QTR	4TH QTR	TOTAL	Royalty
6 - Rupununi	0	0	0	0	0	0
<b>TOTAL</b>	<b>12,426</b>	<b>11,194</b>	<b>16,729</b>	<b>11,924</b>	<b>52,273</b>	<b>\$30,647 m</b>
<b>BUDGETED PROD.</b>	<b>15,000</b>	<b>15,000</b>	<b>15,000</b>	<b>15,000</b>	<b>60,000</b>	
<b>%VARIANCE</b>	<b>-17%</b>	<b>-25%</b>	<b>+12%</b>	<b>-26%</b>	<b>-13%</b>	

Source: Guyana Geology and Mines Commission

**Sand, Loam and Stone Production (metric tonnes)**

MINERAL	NET PRODUCTION	BUDGET	% VARIANCE
Sand	674,880	600,000	+12
Loam	12,133	1,500	-
Stone	534,058	400,000	+36

Source: Guyana Geology and Mines Commission

**Bauxite Production (metric tonnes)**

Company	Budgeted \$	Actual \$	% Variance
BCGI	1,346,000	1,337,057	-0.66
BMGGI	366,163	490,498	33.96
<b>Total</b>	<b>1,712,163</b>	<b>1,827,555</b>	<b>6.74</b>

Source: Guyana Geology and Mines Commission

### Income for 2011

Income	2011 Budget	2011 Actual	Variance %
- Royalties (Total)	\$3,245.508m	\$5,276.230m	+63%
- Rentals and Licences	\$1,575.341m	\$1,741.334m	+10%
- Other	\$401.451m	\$364.112m	-9%
<b>Total</b>	<b>\$5,222.300m</b>	<b>\$7,381.676m</b>	<b>+39%</b>
- Royalties (Gold)	\$2,988.160m	\$5,123.175m	+71%
- Gold as % of all Royalties			92%

#### Inspection Tours and Field Trips by Mines Technical Unit

- (a) **Technical Inspections in Mining Districts** - namely Cuyuni, Mazaruni, Potaro, North West and Rupununi – twenty inspections were planned and twenty were completed for the purposes of monitoring and assisting miners in technical matters
- (b) **Quantity Surveys** - Stone Quarries, Sand and Loam Pits in Demerara, Essequibo and Berbice. – twelve were planned but only eight completed due to unavailability of the surveyor in the 3<sup>rd</sup>. Quarter

### MINES INSPECTORATE

Mines Inspectorate principally represents the public face and reach of the GGMC in the Mining Districts where overwhelmingly, the majority of mining operations are Small and Medium Scale gold and diamond mining operations. With prevailing high gold prices in 2011, averaging US\$1,568/oz and 37% above the average price in 2010, there was heightened growth and activity in the Small and Medium Scale gold mining sub sector. While this translated into increased gold production on the one hand, on the other hand, it led to increased demand for Small and Medium Scale mining properties, and also to increasing incidences of conflict and complaints of mining without lawful approval or authority.

In spite of staffing limitations, Mines Inspectorate succeeded in reaching out to all of the major mining areas. For most of the year, there were fifty field officers operating in Mines Inspectorate, nineteen of whom were Assistant Mines Officers and eleven were Community Mines Rangers. The others were: Environmental and Mines Officers, Mines, Environmental and Survey Technicians, Mines Rangers and Clerks, including the District Mines Clerk who manned the Bartica Mines Office. In November 2011, the process was initiated for the recruitment fifteen Assistant Mines Officers and four Surveyors (out of a planned 50 new field staff) with in-house training at the Omai Training Centre on the Essequibo River. As the second phase of the training they were deployed to the Mining Districts where they boosted the staff of Mines Inspectorate, bringing the number of field officers to sixty nine.

Under the supervision of the Mines Manager, Chief Mines Officer, Deputy Chief Mines Officer, District Mining Engineers and District Environmental Officers, Mines Inspectorate carried out the day to day regulation, enforcement of legal compliance and administration of Small and Medium Scale gold and diamond mining operations in the Mining Districts, working from the permanent Mining Stations, and Sub-Stations set up in response to level of mining activity. Through its work of administering and regulating Small and Medium Scale gold and diamond mining operations, Mines Inspectorate covered most mining operations in Guyana. Mines Inspectorate played a significant role in the laying of charges, procedures for out of court settlement and prosecution of offences under the Mining Act and Regulations, and worked closely with Environmental Division in the Mining Districts for environmental management and compliance enforcement.

In 2011, twenty Mining Stations and Sub-Stations were operated in Mining Districts 2 to 6, as well as the Mines Station at Ogle Airport. The Check Point at Itaballi was manned together with ranks of the Guyana Police Force. Duties carried out included inspections of Goldsmiths' premises, and in the Mining Districts: inspection of Small and Medium Scale gold and diamond mining (dredging) operations and shops including dredge Licences, registration of specified machinery (such as excavators and bulldozers) and daily production and transaction records; issuance of Licences to trade in Gold or Precious Stones (Trading Licences), Business and Residential Permissions; issuance and monitoring of Mining Privileges, Certificates of Registration, and for foreigners, checking Work Permits; Verification of Claims and River Locations; and monitoring and enforcing compliance for environmental management, notably, turbid tailings discharges into rivers and creeks and use and handling of mercury. Importantly, officers from Mines Inspectorate attended to disputes and mining related incidents in the Mining Districts.

A major objective of the Inspections of dredging operations, dredges and specified machinery, shops, Mining Privileges and Certificates of Registration was the monitoring and protection of revenue and promotion of lawful operations. Verification of Claims and River Locations promotes orderly mining and reduces opportunity for raiding or unlawful working of Claims, River Locations and Medium and Large Scale Prospecting and Mining properties surrounding Claims.

In 2011, mining by Small Scale mines at Omai Bone Yard area proved to be particularly challenging, as well as mining in several Prospecting Licence properties, some of which reportedly occurred in collusion with members of the security staff of the company owning the Prospecting Licence. Mining in Medium Scale Prospecting Permit properties was prohibited from May 2011, and this also proved to be a challenge.

#### **Mining Stations and Sub Stations in 2011**

<b>MINING DISTRICTS &amp; SUB-STATIONS WITHIN EACH DISTRICT</b>					
<b>1 Berbice</b>	<b>2 Potaro</b>	<b>3 Mazaruni</b>	<b>4 Cuyuni</b>	<b>5 North West</b>	<b>6 Rupununi</b>
-	Mahdia	Puruni	Bartica	Five Star	Lethem
-	Omai- Quartzhill	14 Miles Issano	Itaballi	Eclipse Falls	Marudi
-	Frenchman	Olive Creek	Aranka	Ianna	-

-	Mowasi	Kurupung	Ekereku	-	-
-	Amatuk	Imbaimadai	-	-	-
-	Konawaruk	-	-	-	-
<b>Total</b>	<b>6</b>	<b>5</b>	<b>4</b>	<b>3</b>	<b>2</b>

## MINING STATION AT OGLE AIRPORT

A total of 10,785 ozs 10 dwt 5 grains of raw gold and 298,798 diamonds weighting 26,597 metric carats and points were declared from various persons monitored at Ogle Mining Station. Of the 1,002 aliens monitored, 354 or 35% were in possession of valid Work Permits from the Ministry of Home Affairs.

## IMPORTANT STATISTICS

The figures below provide data on important aspects and accomplishments of the regulation of the Small and Medium Scale gold and diamond mining sector in 2011.

### Claims Verified in the Mining Districts in 2011:-

1. **Berbice – 24 Field verification were done**
2. **Potaro – 337 Field verification were done**
3. **Mazaruni - 404 Field verification were done**
4. **Cuyuni - 345 Field verification were done**
5. **North West - 404 Field verification were done**
6. **Rupununi - 37 Field verification were done**

Field Verification of Claims is an important activity that is undertaken as a prerequisite to the grant of Claim Licences, or alternatively, for the publishing the Claim location as being null and void. Further, in order for a dredge to work a Claim that does not belong to the dredge owner, the Claim must be verified and the location must be valid. In December 2011, there were an estimated 276 Claims that were being worked and 160 of these were verified.

There was an ongoing project by a team of Verification Officers to enhance the rate of field verification of Claims and River Locations and subsequently, the processing of applications and issuance of Claim and River Location Licences. In order to promote orderliness in the Mining Districts, Claims that were being worked were accorded the highest priority for field verification, followed by Claims in Prospecting and Mining Permit blocks and Prospecting Licence properties. A Claims Research Officer and Clerk were assigned to completing post verification research after the Field Verification Reports are submitted, allowing the Verification Officers to spend more time in the fields. In 2011, the Verification Team accomplished 90% of the target set for field verification. Additional objectives of the project were to systematically create an electronic database of descriptions of verified Claims and River Locations, reduce the overall time (lead time) taken for granting of Claim and River Location Licences and begin to prepare the Claim Licensing process for inclusion in the Quality Management System and certification under the ISO 9001:2008 scheme.

**Inspection of Goldsmiths and Licensed Traders in 2011:** A total of 163 Goldsmiths were inspected and 143 licences renewed. Twelve new licences were issued. A total of 130 Licensed Traders were inspected and 34 new licences were issued.

#### Mineral Property Tenure in 2011 and 2010

Year	Small Scale	Medium Scale		Large Scale		Quarry Licence	PGGS	Petroleum Prospecting Licences
	Claims	Prospecting Permits	Mining Permits	Prospecting Licences	Mining Licences			
2011 actual	15,032	5,560	1,074	191	8	5	26	5
2011 budget	15,100	5,879	1,189	188	14	7	5	7
% variance	0%	-5%	-10%	+2%	-43%	-29%		-29%
2010 actual	14,335	4,879	742	136	7	5	-	5
Variance2011/10	+5%	+14%	+45%	+40%	+14%	0%	-	0%

#### Dredges Licensed in 2011, 2010

Suction Intake Diameter	Mining Districts						Total	Total for 2010	% Variance
	1	2	3	4	5	6			
2-5 inches	0	531	617	216	219	38	1,621	1,329	+22
6 inches	4	500	540	428	321	4	1,837	1,533	+20
10-16 ins	1	108	80	60	50	12	311	230	+35
<b>Total</b>	5	1,139	1,237	704	590	94	3,769	3,102	+22
New Licences	5	510	410	248	308	43	1,524	1,045	+46%
Renewed Licence	0	629	829	454	282	51	2,245	2,058	+10%



### Data relating to Mine Workers and Prospectors in 2011, 2010

	Mining Districts							Total	Total for 2010	% Variance
	1	2	3	4	5	6	HQ			
Certificate of Registration	0	0	252	0	0	0	1,515	1,767	1,460	+21
Mining Privilege	0	376	2,233	8	385	0	3,570	6,572	5,425	+21
Prospecting Permit Small Scale	0	11	121	1	17	23	818	991	1,147	-14%

### GPS DREDGE AND ASSET TRACKING PROJECT

This project involves the use of advanced GPS and satellite technologies to track and monitor mining operations and GGMC's vehicle fleet. There was hesitance by miners to participate in the project, nonetheless, two operators volunteered in 2011 and a novel solution was developed for attaching the GPS tracking device to land dredges. The other aspect of this project is the development of mining regulations as a legislative framework for the operation of the dredge tracking system.

### MINERAL PROCESSING UNIT

The Mineral Processing Unit (MPU) has the responsibility for designing, testing and demonstrating improved mineral recovery for Small and Medium Scale gold and diamond mining operations, and gold recovery methods that reduce or eliminate mercury use. Other responsibilities include testing and determining other valuable minerals than can be produced with gold and diamonds as by-products or co-products and testing the potential for utilization of economic minerals found in Guyana. Activities for improving mineral recovery are linked to optimizing tailings management. In 2011, work was done under three broad headings: 1) Improved Gold Recovery Methods aimed at a higher overall recovery, higher recovery of fine gold and reduction or elimination of mercury use; 2) Introduction of Cyanide Technology for selected Medium Scale operations; and 3) Supporting Tailings Management.

Under the Improvement of Gold Recovery, both Chemical and Gravity methods were being tested, the Chemical methods being flotation to recover fine sizes of gold, and cyanidation to recover a high percentage of fine gold, as well as gold from pre-concentrated ore. With the imminent ban on the international trade in mercury, developing alternative processes for gold recovery is of utmost importance.

#### Flotation Trials

At the request of the Prime Minister, Minister responsible for mining, initial testing of the flotation of fine gold was conducted on February 9-16, 2011 led by Canada-based Guyanese Consultant, Khiratt Husein on tailings from the Pereira's property at 9 Mile Issano. That location was chosen since the study involved testing a series of reagents on fine tailings material available from a previous gold mining operation. The consultant recommended that the project

should be moved to a continuous mini pilot plant stage using the mechanical cell and that the concentrate should be used for testing the technique of cyanide leaching, which is expected to recover 90% of the free gold.

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### Building Capacity for Cyanide Leaching of Concentrates

Under a CIDA agreement with GGMC, AcmeMet is provided technical support and training for the establishment of a Cyanidation Technology Laboratory where ore concentrates will be leached to recover fine gold. The Cyanide Leaching Facility complements other facilities for crushing, grinding and pre-concentration of ore using gravity based equipment and flotation, all of which are incorporated into the Mineral Processing Facility at the R and D Building at Linden. In 2011, under the guidance of the AcmeMet Consultants, the facility was refurbished, and equipment was purchased and installed. At the end of 2011, 99% of the equipment was in the country, with 50% delivered to the facility. Ongoing modifications and installations were 90% completed. The preparation of Draft Codes of Practice for Cyanide Use in gold recovery was initiated and three brochures were prepared to educate GGMC staff, miners and the general public on cyanide use in selected Medium Scale gold mining operations.

Technical assistance from AcmeMet is being funded by CIDA to the tune of Cad \$100,000, while all costs associated with the purchase of equipment and setting up of the Mineral Processing Facility are being met by GGMC. When the Facility is fully established, staff will be given practical training by AcmeMet Consultant Trainers in the pre-concentration of ore and cyanide leaching of concentrate to recover gold. Staff will be trained as Trainers, and they will be audited and certified.

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### Knelson Concentrator Plants

In collaboration with Crown Mining Supplies, field demonstrations of the Knelson MD3 concentrator were held in January 2011 in Mahdia, Omai and the North West as well as in Georgetown on the grounds of the Girl Guides Pavilion. About 300 persons participated. A further demonstration was done in the North West at Big Creek in August. These demonstrations, particularly those in the North West, evoked much interest and they provided opportunity for Mineral Processing Unit staff to offer technical advice to operators with gravity processing equipment and to others on equipment selection, and to collect sample materials for processing and testing at the Mineral Processing facility.

Following the directive of the Prime Minister, Minister responsible for mining, two Knelson concentrator plants, with capacity of 20 tonnes/hour, approximating that of a six-inch dredge, were ordered from APT of South Africa. One of the plants is made to process sandy material and one is made to process clayey material. The plants consist of the Knelson MD# concentrator and accessories including shaking tables, dewatering cyclone and a scrubber for washing the clay.

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### Other Gold Recovery Processes

The Mineral Processing Unit was called upon to assist Haber Corporation (a US based company seeking to introduce a revolutionary gold recovery technique to the local industry) by introducing their representatives to members of the local gold mining industry, and facilitating a visit to gold mining sites in Mahdia District and sample collection. Haber Corp. intended at their US laboratories to tailor their technology to the ore samples collected and return for a demonstration of their technology. The company has reported success in the neighboring Republic of Suriname.

MPU was tasked with monitoring and facilitating a “model mine” approach to be employed by Metallica Commodities Corporation (MCC) and Mr. Baboolall at their Medium Scale Mining Permit properties at Omai,

where best practices are to be employed from Exploration to Reclamation. MCC focused on testing enhanced gold recovery, including a Chinese manufactured gold jig. Due to constraining factors, Mr. Baboolall did not get much done. Samples from the third pit on Mr. Baboolall's operation were processed with the Knelson MD3 lab-scale concentrator and sample splits were sent for assay, returning low gold values in more than 60% of the samples. It was recommended that the oversized material should be crushed and assayed for gold.

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## Supporting Tailings Management Activities of GGMC

Initiatives were taken in Tailings Management in testing PUR water treatment flocculant on turbid tailings water from Konawaruk and North West and to research suitable materials for effective tailings dam construction.

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## MINES CLERICAL SECTION

In 2012, Mines Clerical continued to play an important role, both direct and supportive, in the administration and regulation of mining activities and providing direct services to the mining public. Mines Clerical Section was involved in the registration of dredges and specified machinery; issuance and renewal of Dredge, Trading and Goldsmith's Licences, Business and Residential Permissions; keeping records inter alia, on mineral production, gold sold to goldsmiths, dredges and specified machinery including registration, licensing, transfers and production, and mine workers; facilitating legal documentation and permitting for mine workers and Prospectors (Mining Privileges, Certificates of Registration, Prospecting Permits Small Scale and Endorsement of applications for Work Permits), and grant of permission to work on Claims and Mining Permit Properties; updating and maintaining databases on Claims, mineral production, dredges and Kimberley Process Certificate Scheme; carrying out preparatory and supportive tasks to facilitate the work of the Hearing Officer; and processing and issuing of Kimberley Process Certificates for the export of diamonds. GGMC maintained its participation in the international Kimberley Process Certificate Scheme and was represented at the Plenary Meeting in Kinshasa, Republic of Congo in October 2011. In addition, Mines Clerical carried out the functions of a Registry and Secretariat and maintained a stores inventory.

## MINING WEEK 2011

Mining Week is celebrated annually to bring awareness to the nation of developments, the contribution, and opportunities in the Mining and Petroleum Sectors. Mining Week 2011 was celebrated from August 21-27 under the theme "Evolving Methods, Embracing Excellence, Enjoying Success". There was a National Biennial Mining and Petroleum Conference and a Global Energy Outlook Forum, in addition to the annual Mining and Petroleum Exhibition. The Conference, Forum and Exhibition were held at the Conference Centre and grounds of the Ocean View International Hotel at Liliendaal. Except for the Mining Exhibition planned for Bartica on Friday August 26, all of the scheduled activities took place. The Mining Week programme was organized by an in-house Committee headed by the Manager, Petroleum Division.

## ENVIRONMENT DIVISION

Environmental Division bears responsibility for overall environmental management oversight in the Mining Sector, for Small Medium and Large Scale prospecting and mining operations, and has shared responsibility with Mines Division, for Occupational Safety and Health management in mining operations. Environmental Division also takes the lead and works closely with the Human Resources and Administrative Division in Occupational Health and

Safety responsibilities and requirements for GGMC as an employer, and leads the programme of Health Checks for field and laboratory staff.

In 2011, Environmental Division worked with Mines Division in routinely undertaking regulatory and compliance enforcement activities, complementing and extending the reach of the Mines Division, with a strong focus on environmental management and monitoring. This work was undertaken on a common platform, through the use of an adaptive and comprehensive Compliance Enforcement Check List that addresses, inter alia, issues of dredge registration and licensing; obtaining permission to work a dredge on someone else's Claim or Mining Permit property; registration of specified machinery (such as excavators and bulldozers); permission and documentation for mine workers and Tributors (Mining Privileges and Certificates of Registration); Work Permit requirement for aliens; inspection of daily production records; Register of Labourers; safety issues, tailings management, use and handling of mercury; mineral processing and recovery methods, prohibition of mining in buffer and protected areas; turbidity of creeks flowing past communities and amenities, Environmental Bond and Reclamation Fee; hygiene and sanitation (notably garbage disposal and toilets); and measurement of forest clearing for the purposes of the Monitoring, Reporting and Verification activity of the LCDS.

A Database that was developed by Mines Division, when fully operational, will facilitate the storage and application of the Check List information, and aid in the quick preparation of field reports and collection of "metrics" for performance evaluation, to guide and enhance decision making, and facilitate management by fact.

Environmental Division spearheaded the strategic monitoring of turbidity in mining areas by fortnightly water testing for turbidity, with the intent of making GGMC proactive in addressing turbidity issues and also to use the data for environmental effects monitoring. The Division continued to pilot the Mine Site Reclamation Demonstration activities for Small and Medium Scale mining operations, with an established plant nursery at Mahdia and a second one being established at Arakaka, and carried out Water Quality and Sedimentological Surveys of drainage basins and mining areas to obtain background data and information for environmental monitoring as well as provide guidance for decision making and development of policy. In Mahdia, the plant nursery is attached to Mahdia Secondary School, and GGMC has established a School Farm and provides technical assistance to the students in carrying out practical work in Agriculture Science following the School's curriculum.

Environmental Division also played an important role in liaison and participation with stakeholders in mining areas as well as on national, regional and international environmental issues, projects, activities, conventions, plans and strategies that have a bearing on the environment, social issues, environmental safeguards, environmental management, land use, Occupational Safety and Health and the social and environmental impacts of mining.

## **ENVIRONMENTAL EFFECTS MONITORING**

Water Quality Monitoring, specifically targeting Turbidity in Receiving Waters, was conducted throughout 2011. GGMC had ambitiously targeted to take 300-400 water samples and/or Turbidity results per month from 20 representative areas in the six Mining Districts broadly targeting: Lower, mid and upper Mazaruni and Puruni; Lower and mid Essequibo to Akaiwong and Siparuni; Lower, mid and Upper Cuyuni and Wenamu-Arau; Lower Essequibo, Mazaruni and Cuyuni; Mahdia, Konawaruk and Potaro; North West District – Barima-Kaituma and Barama-Waini; North West District – Noseno-Dukwari; Rupununi –Wakadanawa and Marudi Mt; and Berbice River – Christmas Falls. This would amount to 4,200 samples a year on average. These water samples or Turbidity results were to be taken mainly by Mines Division staff in the field, while Environmental Division staff would cover lower Essequibo to Mazaruni and Cuyuni confluences.

Nine hundred and forty one or 22% of the projected target of surface water samples were measured for turbidity in 2011 from four Mining Districts. The turbidity results or water samples were submitted mainly by Environmental Division, with some samples/results from Mines Division and some from joint Divisional (Mines & Environment) Compliance Enforcement exercises. The sampling programme needs to be revised to make a 75-80% achievement more realistic.

In the summary 527 or (57.0%) of the water sampled was in compliance with the requirement of 30 NTU, the critical turbidity for receiving waters in keeping with the Mining (Amendment) Regulations 2005. The pie chart below illustrates the percentage distribution of turbidity within the ranges stated. Since empirically for up to 50 NTU there would be slight visual impact in the receiving waters, then two thirds of the samples would not have been significantly impacted visually by Turbidity. It should be noted also that in lower Essequibo, under the influence of the ocean tides, background levels of turbidity are higher than 30 NTU.

The areas that consistently had low turbidity levels below the critical limit were: Upper Mazaruni area, Semang area, Olive Creek area and the Lower Mazaruni area below the Puruni River where over 98% of water samples measured below 30 NTU. More data should be collected to present a more holistic picture of the impact of turbid water from mining on waterways.

## **ENVIRONMENTAL RESEARCH TO PROVIDE GUIDANCE FOR TAILINGS MANAGEMENT**

A research project was undertaken in the North West along the Barima River from Five Star landing to Red Hill to determine water, clay and organic content, settlement rates, and grain size distribution of the soils in the area that were being mined, so that strategies could be developed for tailings management.

Sample analysis was done at the R&D facility in Linden where a Sedimentology Laboratory was established. Soil profiles were prepared for the sample sites and these were combined in a map showing the variation of organic content, water content and clay content in soil profile from 0-20 feet (0-7m).

Environmental Division monitored actions being taken by NARIL to mitigate turbidity in their Konawaruk River dredge mining operations, including construction of a dam across Konawaruk River, installation of silt curtain, deployment of a bailer for depositing tailings sand along selected parts of the river bank and installation of flocculent dispensing facilities on each dredge.

## **COMPLIANCE MONITORING AND ENFORCEMENT**

Together with Mines Division field staff, officers of Environmental Division carried out several exercises in Compliance Monitoring and Enforcement throughout 2011. These exercises covered mid and Upper Mazaruni in Mining District No. 3; Upper Cuyuni-Wenamou, Arau, mid Cuyuni – Aranka, Arangoy, Aurora, Lower Cuyuni – Oko, Blackwater, Aremu, Baramalli, Wariri and Quartzstone in Mining District No.4; Mahdia and Konawaruk in Mining District No. 2; Barima-Kaituma in Mining District No. 5 and Lower Essequibo – Groete Creek, Blue Mountain and Omai.

## **RECLAMATION**

Environmental Division maintained three demonstration mine reclamation sites, all in the Mahdia area. Two of these sites were established by GGMC and the third was handed over to GGMC for maintenance. As these sites are maintained and monitored, the information gathered and lessons learnt will inform ongoing reclamation activities and strategies.

GGMC has employed a Field Assistant who is an Agriculture technician by training to maintain the reclamation sites in the Mahdia area.

### **PLANT NURSERY AT PERSEVERANCE, NWD**

Under the UNDP funded Capacity Development and Mainstreaming for Sustainable Land Management Project of the Guyana Lands and Surveys Commission, a (30x80) feet Plant Nursery was constructed at Perseverance in the North West Mining District, completing phase one of a three phase project, at a cost of G\$3.56 million, to be reimbursed to GGMC under the project. The second phase, the furnishing of the nursery, was started in August 2011. The nursery was built to support reclamation of mined out sites and to provide technical support for the teaching of agricultural science in the local schools.

### **DEMONSTRATION RECLAMATION SITE AT NOITGEDACHT, MAHDIA AREA**

This site, which was initiated in 2007 as a five-year project, is considered to be reclaimed to demonstrate different end uses. *Acacia Mangium* trees coexist with different fruit trees and a fish pond was developed for aquaculture. Some landscaping was also done. The site will be prepared and maintained as a field site for Education and Awareness on mine site reclamation for local miners, schools and the public, by tagging of trees with both local and scientific names. The decision to construct a caretaker's house at the site was withdrawn.

### **DEMONSTRATION RECLAMATION SITE AT ST. ELIZABETH, MAHDIA AREA**

This site was established under the GGMC-GENCAPD Project as an area of approximately 5.3 hectares planted with approximately 5,300 *Acacia mangium* plants as well as six pioneering forest species, *Kabukalli*, *Bloodwood*, *Trysil*, *Futui*, *Sand Baromalli* and *Clump Wallaba*, 14 varieties of cassava, and pasture grass, *Brachiaria humidicola*. *Acacia mangium* was selected because it is fast growing, tolerant of low pH conditions found in the mined out area at St. Elizabeth, and has a symbiotic relationship with nitrogen fixing *Rhizobium* bacteria that helps to build the soil.

In 2011, the site was maintained by officers of the Environmental Division. The site also was poised to benefit from a CIDA funded project that is being executed by the Faculty of Agriculture and Forestry of the University of Guyana to research the application of Biochar (Woody Biomass) produced mainly from pruned *Acacia mangium* cuttings for soil mulching to enhance plant growth.

### **DEMONSTRATION RECLAMATION SITE AT BLOCK 27, MAHDIA AREA**

This former WWF/GGDMA Reclamation Project site was handed over to GGMC in July 2011 for maintenance. Fruit trees were planted at this site and only natural fertilisers and mulches – pen manure and grasses - are used. Some fruit trees are more tolerant of the harsh, acidic conditions. The site was maintained and in particular manure and grass as mulch were applied.

### **OCCUPATIONAL SAFETY AND HEALTH (OSH)**

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#### **Accidents**

Fatal mining accidents are reported to the Commission by owners or General Managers (GMs) of mining operations, by Mines Officers at Mining Stations or through the press. Fatal mining accidents are investigated where possible by

GGMC Officers, on occasion in collaboration with officers from the OSH Department of the Ministry of Labour, Human Services and Social Security. In 2011, there were eleven reported incidents of which ten were accidents, six fatal, and one involved a missing person.

There was one reported accident involving an Assistant Mines Officer riding an ATV at Imbaimadai, resulting in the hospitalization of the staff and the other victim, a miner. They both had to be air dashed to Georgetown by night. Two Surveyors, one from GGMC and one from Guyana Lands and Surveys Commission, were in a plane that crash landed at Arau. Fortunately, there were no major injuries.

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### Workers' Health Programme

There are two aspects to this programme – the provision of Medical Checks for field and laboratory staff, and the provision of first line treatment, advice or referrals to staff who fall ill or feel ill on the job. In 2011, medical checks were scheduled for field and laboratory staff, and medical care was accessed from the Medical Room at GGMC Headquarters on 1,534 occasions. Workers' Health Education was facilitated through talks and presentations made by Professional Health Care Personnel during the year.

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### OSH Emphasis

Led by the Environmental Division, GGMC maintained its active participation in OHS Month activities, participating in the National Exhibition and conducting an interactive in-house programme to mark OSH Day. However, the Workplace Joint Safety and Health Committee was not reinstated in 2011. The OSH Officer carried out frequent OSH inspections in the compound and offices during the year.

## LIAISON WITH STAKEHOLDERS

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### Meetings, Workshops and General Collaboration

Liaison with Stakeholders generally took the form of meetings and attendance at Workshops and general collaboration. This allowed GGMC's involvement and participation and raised awareness at GGMC about important trends, issues and concerns. The Environmental Division collaborated in a number of important areas with various stakeholders in 2011. (*See Annex 4 for details*).

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### Mahdia Secondary School and Community Farm Project

This project consists of a Plant Nursery established by GGMC at the compound of the dormitory of Mahdia Secondary School to serve mine site reclamation efforts and the School Farm, which was also established by GGMC. The School Farm has two units, a crop farm with fruit trees and cash crops, and a poultry rearing unit. Additionally, through the Field Assistant who has responsibilities for maintaining the three demonstration reclamation sites, GGMC provides technical assistance to Mahdia Secondary School for practical lessons to satisfy the requirements of the CSEC syllabus for Agriculture Science.

In 2011, preparation of the School Garden, housekeeping and care and maintenance of the Farm and Plant Nursery, including moulding and mulching of the fruit trees, were undertaken. Care and maintenance included weed, termite and pest (Acoushi ants) control and maintenance of the chicken pens and compound. In addition, the Nursery roof was repaired. At the end of the year there were eighty one thriving fruit trees – citrus, cherry, avocado, rambutan, soursop, mamie, malaka cashew and papaw. There were 760 *Acacia mangium* plants in the nursery.

For the poultry unit, at the end of the year there were sixty six layers penned and laying and 200 broiler chicks that were purchased in December to replace those that were slaughtered in November. Trays of eggs were sold to the Mahdia community and donated to the School Dormitory weekly. At the end of November 2011, the total revenue generated in 2011 was \$881,600.

## PETROLEUM DIVISION

Petroleum Division spearheads activities relating to the promotion of petroleum exploration, processing and issuance of Petroleum Prospecting Licences (PPL) and negotiation of associated Agreements, and monitors and regulates the terms, conditions and exploration programmes of such PPLs and Agreements. In addition, the Petroleum Division explores and investigates occurrences of shallow gas and fossil fuels and promotes their use in cottage industries or for domestic purposes.

**Petroleum Division's year 2011 work programme responded to seven key Performance Improvement areas, namely:**

- ❖ Investigation and Promotion of shallow deposits of Gas and Fossil Fuels
- ❖ Technical Assessment of Proposals, Data and Information
- ❖ Forecasting for the Petroleum Exploration Sector
- ❖ Monitoring and Regulation
- ❖ Institutional Continuity – Recruitment and Training of Staff
- ❖ Outreach for Stakeholders' Participation

For Petroleum Division, 2011 was a good year with respect to activities accomplished, although budgeted targets were well under projections for expenditure in particular. Pursuant to the Performance Improvement Areas mentioned, the activities, objectives and deliverables were as follows during 2011.

## INVESTIGATION AND PROMOTION OF SHALLOW DEPOSITS OF FOSSIL FUELS

Two projects were undertaken, for the utilization of shallow gas deposits along the coast, and shallow drilling along the coast to investigate near surface geo-scientific evidence of the occurrence of fossil fuel deposits.

The objective of the Gas Utilization Project is to examine and experiment with safe technology to take advantage of gas encounters by developing working gas capture pilot systems for use of local residents and to generate production information. Gas is found ubiquitously along the Coast and is not related to petroleum deposits. This gas could be utilized at a local level, where it is sufficiently productive. In 2011 the existing pilots for gas utilization at Grove, Friendship Pomeroon and Wakenaam were serviced; locations of gas seep in the Friendship area were mapped; production of electricity powered by gas was contemplated; and scoping was done for a potential project for Wakenaam.

Two shallow holes were drilled at Friendship Pomeroon and thermogenic (related to petroleum occurrence) gas was encountered. A report was completed. Drilling planned at Diamond Estate was not done because official permission was not received. The hole that was formerly drilled at Imbotero in the NWD was revisited for testing the minimal biogenic gas that was encountered. The Geotechnical Engineer conducted a resistivity characterization survey at Diamond, East Bank to complement the activity for drilling shallow gas deposits.



## **MAINTENANCE OF THE ARCHIVE OF PETROLEUM DOCUMENTS, SAMPLES AND RELATED MATERIAL**

These Objectives were:

- ❖ To use archived material to promote petroleum venture opportunities. This was mostly achieved through compiling information and maps for local exhibitions, Mining Week and GUYEXPO and through interactions with international petroleum companies Anadarko, Oil Quest and TOTAL, local company, Nabi Oil & Gas Inc., and service companies Fugro, CGG Veritas and PGS.
- ❖ To continue data capture for user access, by scanning down hole drill cuttings for three wells and scanning vintage reports, completing fifteen of the most used documents. The indexing for retrieval and tracking was not accomplished as anticipated due to “irregularities” in the listings of scanned material.

## **TECHNICAL ASSESSMENTS OF PROPOSALS, DATA AND INFORMATION**

Petroleum Division was able to comment on, analyze and/or review all company information received during 2011 in relation to exploration activities of companies, especially drilling proposals for the anticipated Eagle1, Jaguar 1 and Apoteri K2 exploration wells, proposals for the acquisition of seismic data by CGG Veritas on behalf of Esso, and reported results. These represented more than the 50 percent of such reviews and assessments targeted for 2011.

## **FORECASTING FOR THE PETROLEUM EXPLORATION SECTOR**

This activity was intended to strengthen the capacity of Petroleum Division to prepare available areas for tenure, competitive system (bids) or direct awards. A complementary activity undertaken in 2011 was the assessment and determination of the best proposals and negotiation for award of Petroleum Prospecting Licenses. Proposals were accepted from two new companies, Anadarko Petroleum Corporation and Oil Quest, leading to the commencement of discussions/negotiations.

## **MONITORING AND REGULATION**

The Objectives of these activities are: To ensure that operators fulfill their objectives; To encourage compliance with the legislation; To respond to sightings and queries; To pursue independent interests and observations; To facilitate good relations with stakeholders; and to negotiate new venture contracts.

The major operational achievements in 2011 were: Monitoring the Apoteri K2 well by Takutu Oil and Gas Inc. (TOGI); Monitoring the commercial arrangement for seismic by CGG Veritas; and the partial preparation (40% drafted) of Standard Operating Procedures for petroleum monitoring.

## **INSTITUTIONAL CONTINUITY (STAFF RECRUITMENT AND TRAINING)**

The objective of this activity is to recruit staff and develop skills in petroleum geology, geophysics, petroleum engineering etc, in order to facilitate increased presence in the field, reports, studies and analyses. A Geotechnical Engineer was recruited and he was tutored in petroleum technology fundamentals and introduced to field activities.

## ADMINISTRATION DIVISION

The Human Resources and Administration Division supports the technical divisions of the Commission in the execution of their mandate and provides Human Resources and general support to the entire Commission. This Division is comprised of the Human Resources, Information and Documentation, Services and Security Departments and the Registry. The functions of the Division are: To provide the Commission with an efficient workforce through staff training and development; To provide logistical support for field programmes by the provision, good maintenance and repair of vehicles and equipment; To provide information to the Commission and mining and general public through the maintenance of an effective information system and the Christopher Barron Library; To provide a work environment that is comfortable and conducive to the high performance of staff, and meets up to occupational safety and health standards; To maintain the electrical system and electrical and electronic equipment and provide reliable security for the Commission's assets.

In order to meet the need for increased monitoring occasioned by growth in the Mining Industry and by the requirement for greater legal compliance under the Low Carbon Development Strategy and especially the Monitoring, Reporting and Verification aspect of the Memorandum of Understanding and Concept Note between the governments of Guyana and Norway, more field staff is needed, particularly in the Mines Division. Accordingly the Board of Directors approved for the hiring of fifty additional field staff in the last quarter of 2011 and for the purchase of vehicles, ATVs and relevant field equipment to support their deployment in the fields. This would be the first of three batches of 50 field officers to be hired in 2011 and 2012.

## HUMAN RESOURCES DEPARTMENT

### STAFFING, STAFF TRAINING AND DEVELOPMENT

In 2011, the Guyana Geology and Mines Commission had a total of three hundred and sixteen (316) staff members, excluding staff at Omai) to execute its mandate as articulated by GGMC Act and the Mining Act and Regulations. Twenty-six persons were employed in 2011, including a Deputy Human Resource Manager (Training and Development), a Legal Officer, four Mining Engineers, three Surveyors, four Senior Field Assistants and three Accounts Clerks. There were twenty-three promotions, including seven Geological Technicians, nine resignations, three dismissals, and four persons retired including the Commissioner, Mr. W. Woolford. Consequent upon Mr. Woolford's retirement, Ms. Karen Livan, Environmental Manager, was appointed to act as Commissioner from April 1, 2011 until the position was filled by way of external advertisement. In addition to the Commissioner, two of the other retirees were senior staff, the Senior Petroleum Engineer and the Project Officer, who was the most senior driller.

In compliance with the directive of the Board of Directors, an exercise for the recruitment of 50 Field Staff was implemented. The Plan was to advertise, shortlist, train, deploy in the field, evaluate and then select suitable staff for employment, and this was put in train. However, the responses to the advertisement did not provide the number of candidates at the level required, and sixteen persons were shortlisted and trained.

A comprehensive Training Plan for the year 2011 was developed by the Human Resource Department with input from all of the Divisions and areas within the Commission. Training was done based on the Training Plan and also to take advantage of Training opportunities that arose. (*See Annex 5 for a full list of the Training conducted in 2011*)

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## SPONSORSHIP OF TRAINING AT UNIVERSITY OF GUYANA: MOU AND SCHOLARSHIPS

The Guyana Geology and Mines Commission and the University of Guyana signed a Memorandum of Understanding (MOU) on June 9<sup>th</sup>, 2011, agreeing that the University would execute programmes leading to diploma and degrees in Mineral Resources, Geo-environmental and Geotechnical Geological Engineering and the GGMC would expend the sum of \$25.2M on the programmes through sponsorship of students, payment of lecturers and purchase of capital and other items for use in the conduct of the programmes. An important feature in the MOU was that the University of Guyana would source and engage the services of an accredited and competent University to conduct a Masters' Degree Programme in Mineral Resource Assessment, Mineral Deposit Modeling and Mineral property Evaluation and Valuation. The duration of the MOU was or two years, from September 1, 2010 to September 1, 2012.

For the academic year 2011-12, the Guyana Geology and Mines Commission provided scholarships for a total of ten students reading for the Diploma in Geological Engineering, and Degrees in Mineral Resources Engineering, Environmental Studies and Chemistry. GGMC scholarship for Studies at the University of Guyana are awarded to applicants who meet the Commission's eligibility criteria for advertised scholarships and members of the winning team in the GGMC sponsored Science and Technology Quiz competition for secondary school students.

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## STAFF WELFARE AND DONATIONS

On the occasion of the 32<sup>nd</sup> Anniversary of the GGMC, in a simple ceremony in the courtyard, Long Service Awards were granted to qualifying employees, and six bursaries were awarded to the children of permanent employees, who excelled at the National Grade Six Assessment Examination (formerly Common Entrance). At the end of 2011, there were twenty-five children in the Bursary Scheme. The traditional GGMC Christmas party was not held, since a party for the Ministry of Environment and Natural Resources and the Agencies under the Ministry's ambit was being planned.

**Welfare assistance was provided to staff in the following areas, in accordance with GGMC's approved policies and practices:-**

- ❖ Supply of uniforms and safety gears
- ❖ Christmas vouchers to each member of staff
- ❖ Transportation Services at concessionary rates to staff members residing on the East and West Coasts and West Bank, Demerara, and those residing in Linden and working at the R&D Lab at Nottinghamshire
- ❖ Issuance of loans as provided for by GGMC's rules with respect to medical expenses, death of immediate family members, purchase of motor vehicles, repairs to homes, etc.
- ❖ Grant of monthly Travelling Allowances to eligible staff members, for the use of their personal vehicles in the execution of the Commission's mandate
- ❖ Payment of one month's salary to staff members as vacation allowance as an entitlement, when they proceeded on annual leave; and
- ❖ Support for activities of the Sports Committee, including Indoor Sports Competitions and Inter-organization Basketball Competition.

In fulfillment of GGMC's Corporate Social Responsibility, donations were made to charitable causes on request, on approval of the Commissioner.

## SERVICES DEPARTMENT

### VEHICLES

In 2011, the GGMC owned a fleet of eighty-three vehicles, as follows: 39 ATVs (22 Hondas and 17 Arctic Cats); 10 Motor Cycles (Honda/Jailing); 5 buses; 3 Bedford trucks; 3 cars; 18 pickup jeeps; 5 SUVs

### Information and Documentation Department - Christopher Barron Library

The main activities in 2011 were serving external and internal clients and classifying and cataloguing Library Stock using the Library of Congress Cataloguing System.

There were 5,324 visits in total, the greatest number of visits, 1,105 and 1,106 respectively being in March and April. For the other months, the average number of monthly visits was 311. Books and reports were browsed on 4,023 occasions, averaging 335 occasions per month. April, May and June saw the highest activity in terms of browsing on reports and books, at 609, 813 and 750 occasions compared with a monthly average of 206 occasions per month for the rest of the year.

1,242 publications were classified, 489 were accessioned and 2,018 cards were prepared. 1,292 publications were received, consisting of 600 Official Gazettes, 333 Periodicals, 199 Reports and 160 books.

### CAREER FAIRS AND EXHIBITIONS

Coordinated by the Information and Documentation Department, in 2011, GGMC participated in GUYEXPO and thirteen Career and Science and Technology Fairs. GGMC had a booth at GUYEXPO and an article in the GUYEXPO magazine. GGMC promoted careers in the Mining and Petroleum Industries at Career Fairs held by: University of Guyana, combined with an Open Day; Queens College and Christ Church Secondary School; and Under the Ministry of Culture, Youth and Sport, eight Career Fairs at Wakenaam Secondary School and Uitvlugt Community Centre (Region 3), Guyana National Stadium, Carifesta Sports Complex and Lusignan Community Centre (Region 4), Fort Wellington Secondary School (Region 5), New Amsterdam Technical Institute (Region 6) and Egbert Benjamin Exhibition Centre (Region 10). GGMC also participated in the Science Fair in Region 7, the National Science and Technology Fair held in Region 10, the Durban Park Lions Club Fair, and the National Occupational Safety and Health Fair.

### OTHER

GGMC received the prestigious Georgetown Chamber of Commerce and Industry 2011 Public Service Award of Excellence at its annual Dinner and Awards on December 9, 2011.

## IT DEPARTMENT

The IT Department is responsible for management and support of the technology, architecture, hardware, software, and all of the related computerized resources throughout the Commission. This Department has the responsibility to study, design, develop, implement and support management and staff with regards to all computer-based information systems, particularly software applications and computer hardware.

In 2011, IT Department coordinated the use of electronic computers and computer software throughout the Commission, to convert, store, protect, process, transmit, and securely retrieve information that is relevant to the

needs of the organization. IT staff performed a variety of duties that ranged from installing applications to designing complex computer networks and information databases. These included data management, networking, computer hardware solutions, databases and software applications solutions, as well as the management and administration of the entire computer systems.

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## WIDE AREA NETWORK – INTEGRATION AND PREPARATION

Satellite equipment and internet service were established in 2011 at eight Mining Stations/Sub Stations at Kurupung, Mahdia, Aranka, Eclipse Falls, Lethem, Puruni, Omai and Frenchman Creek, and the Satellite Dishes with additional equipment were all frequently serviced by the IT staff. Preparatory technical work was completed for the introduction of internet service in 2012 at an additional five Mining Stations/Sub Stations at Imbaimadai, Itaballi, Monosse, Issano and Linden. This infrastructure constitutes the framework on which the Virtual Private Network (VPN) will be established in 2012 to give effect to the Wide Area Network (WAN).

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## TRAINING

Specialized Training on Microsoft Certified IT Professional Training (MCTIP) networking software modules was provided for two officers in IT Section. This consisted of instruction in configuring the Windows Server 2008 Active Directory, Network Infrastructure, Applications Infrastructure and Enterprise Administrator. Technical staff members are now equipped to deal with advanced server problems and also give support to WAN when it is installed.

A customized in-house Statistical Training package was further developed to train technical staff members in basic and advanced statistical methods so as to assist in their technical analysis and reporting.

### Compilation of GGMC 2012 Budget and Reporting

IT Department compiled all of the electronic data in the preparation of the 2012 Budget, and for amendments to the 2011 Budget. IT Department also coordinated the reorganization of financial data into the reporting format required by the Ministry of Finance.

### Scanning Project

A project was designed to scan, digitize and digitally store the Commission's repository of historical information, which was generated and accumulated over a century. This store of information is estimated to consist of over 79,000 reports and file documents and over 68,000 maps and aerial photographs.

Providing this information in digital format will also enhance the integration, application and use of the information, and its assimilation into the Integrated Management Information System that is being developed for GGMC.

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## INTEGRATED MANAGEMENT INFORMATION SYSTEM PROJECT

The Integrated Management Information System (IMIS) for GGMC was conceptualized in 2010 as a result of a System Requirement Specifications report that was done for GGMC by local consulting firm, eSure. Approval was received in 2011 to engage a consultant for the delivery of a Systems Design for the entire system. As a result, based on their proposal, GAF AG was selected from four applicants and they signed a Memorandum of Agreement with GGMC to elaborate a system design in close collaboration with the GGMC. The project started in September 2011 and is scheduled to be completed in April 2012.

By the end of 2011, GAF had produced a draft Assessment report of the ICT findings and analysis of their first mission. The report highlighted key areas with specific recommendation recommendations for GGMC related to training, data cleansing and implementation priorities. The highest priority has been assigned to: Mineral Property Management; Mineral Assets and Infrastructure; Petroleum and gas property management; Compliance monitoring – mines and machinery; Compliance monitoring – environment and OSH; Accounting/Finance and Geo-portal and geo-web services. The report was reviewed by GGMC and additional information relating training needs was requested. The second mission to finalize priority areas for the system design was scheduled to start early in January 2012.

## FINANCE & AUDIT DIVISION

The Finance Division provides services to the other Divisions, Departments, Projects and customers. The Division consists of the Accounts, Stores and Procurement Sections.

In 2011, the Accounts Section carried out functions in the following areas: Processing Receipts, Payments and Advances to facilitate all expenditures – for activities and projects in the field and activities at Headquarters, the Lapidary and the Mineral Processing Facility at the R and D Building in Linden; Sub-Imprest Accounts; Preparing and maintaining records including Books, Ledgers and Registers; Monthly Reconciliation of Bank Accounts; Quarterly Statements of Current Expenditure by Divisions and Departments; Monthly Reports of Income and Other Receipts and Expenditure and Other Outflows, with Explanations of Variances; Preparation of Annual Financial Statements for the Commission; Collaboration with Internal and External Auditors; Collaboration with Statutory and other organizations in the fulfillment of statutory and other obligations of the Commission; Checks and evaluation of Suppliers of goods and services, including in Mining Districts; and visits to Mining Stations to check on assets, and accounting records.

The Stores functioned in the following areas: Custodial responsibility for the various categories of stock items and equipment; Record keeping with respect to stock items in field locations, assigned to projects and at Headquarters; Ensuring that adequate supplies were available for field stations, projects and Head Quarters; and prepared monthly reports of supplies, materials and equipment mobilized and consigned to field operations and projects.

The Procurement/Purchasing Section was responsible for purchasing stock items and items for immediate use, as approved for the Commission's operations and liaised with suppliers.

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### SIGNIFICANT ACHIEVEMENTS

The Accounts Section prepared and submitted to the Office of the Auditor General, GGMC's Financial Accounts for the year ended 31<sup>st</sup> December, 2009. The Audit Office completed the Audit of the said Accounts, however, the Audit Opinion and Final Management Letter were not yet issued at the end of the year. Recommendations were made to the Board of Directors to treat with most of recurring queries in the Management Letter.

The Accounts Section installed a Point of Sale receipts printer, which, applying software written by a local I.T. Consultant, allowed for the generation of receipts electronically with simultaneous updating of the Commission's Receipts Cash Book. The installation of the printer and software resulted in improved efficiency in the processing of receipts and also a more effective and efficient service to customers.

The administrative structure of the Finance Division was revised to include positions of Cost Accountants. This will enable the Accounts Section to provide cost and management accounting information to Managers and Heads of

Departments that are accurate, timely and complete. The revision of the structure anticipated the installation of AccPac Accounting Modules, including the Inventory Control module, the latter with the capability of accounting for the receipt and issue of Stocks in the General Ledger and the creation of reports that incorporate the cost of items issued to projects, special events, Divisions and Departments. Accounting for the receipt and issue of Stocks in the General Ledger will address one of the recurrent queries of the External Auditors.

The work environment was improved and enhanced significantly by the installation of cubicles, which allowed work space for each employee and accommodated the necessary work aids and tools.

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## AUDIT

The Audit Division ensures that the Commission's goals are achieved through effective monitoring of internal controls with a view to strengthen such when necessary. Audit Division is responsible for conducting audits and reviews of the Commission's system of accounting and operational control for financial and non-financial activities; conducting audits of the work of the Technical Divisions, conducting physical verifications of the Commission's assets to ensure that they are properly safeguarded, conducting special investigations, ensuring that the Commission's operations are in accordance with the Commission and Mining Act and Regulations and all other applicable legislation. Audit Division operated in 2011 with four of the fourteen planned staff.

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## WORK COMPLETED

Field inspections were completed at Mahdia and Bartica, seven Financial Systems audit were done in the areas of: Sub Imprests, Royalty paid by the Guyana Gold Board, Royalty projected for sand, Petty Cash, Stock Taking, Cash Count and Debtors. Six Administrative Systems audits were done in the areas of: Mechanical, Electrical and Carpentry Workshop, Use of the Commission's vehicles, Lapidary Sale and Travelling Overseas on Official Business. Twenty-five audits of various aspects of the Quality Management System were conducted over a five month period. Four ad hoc audits were conducted. Several Technical Audits were done with emphasis on quality assurance/quality control within the Sample Preparation, Chemical and Fire Assay Laboratories.

## LEGAL DIVISION

Provision of legal services from all standpoints remained the principal focus of the Legal Division in 2011. Advice, both written and verbal, was provided on a day-to-day basis. Additionally, other types of support were provided to all Divisions as required. Work and responsibilities of the Division included services to the Board of Directors and related logistical arrangements.

## STAFFING

In consonance with the structure and organization chart of the Commission there was 90% staffing of the Division. There is currently no Confidential Secretary. There are two (2) in-house Attorneys-at-Law (Legal Adviser/Secretary and Legal Officer), a Research Officer and an Administrative Assistant I.

There is currently a significant constraint in space that makes for not altogether comfortable kinesics. To its credit, however, the Legal Officer and other staff are to be commended for infinite patience in these less than desirable surroundings.

## LITIGATION

GGMC was involved in a total of twelve (12) actions initiated in the High Court. Only in the case of three (3) matters were the results known (even in part) in the said year. The causes of action for all of the matters concerned challenges to ownership of mineral properties, with one matter being for wrongful dismissal, and another for injunction with respect to construction of offices.

GGMC also in 2011 initiated several charges against alleged defaulters under the Mining laws. These totaled twelve (12) and are in various stages in the legal process. Charges are brought in the interior courts of Bartica, Mahdia, Mabaruma, Kurupung and Kamarang. Service of summonses remains a challenge, but it is being vigorously addressed with greater efforts on officers' parts. Substituted systems are being examined (involving amendments to the Mining Act and regulations), to deal with the considerable bottlenecks that continue to arise. Amendments are already in draft. Out-of-Court settlements were also proceeded with successfully.

The sum of \$20 million was placed in escrow with the High Court pursuant to terms of discharge of an injunction against GGMC in Courtney Benn Construction Services Ltd. v. GGMC.



## ANNEX 1

### CHEMICAL LABORATORY - Summary of Analytical Work done in 2011

Type of Analysis	Sample Type	Location	No. of Samples	Remarks
Major Oxides, Base Metals	Rocks , Gravel	Omai , Baramita	32	Three internal customers, one external customer
Dry, weigh, concentrate; Free gold determination by Amalgamation and Parting	Soil, Black Sands, Gravel, Concentrates, Tailings, Head samples	Puruni, Cuyuni, Baramita, Mazaruni, Frenchman, Omai, Siparuni, Kumaka West, Mahdia, 9 Mile Issano, Semang, Blue Creek, North West District	2,502	Eleven internal customers, three external customers
Dry at 60°C, crush, concentrate, repackage	Soil, Sand , Drill Samples, Saprolite, Silver Sludge	Georgetown, Takatu , Friendship, Essequibo	435	Four internal customers, one external customer
Au - Geochemical	Rock, Gravel	Lower Cuyuni, Baramita	8	Two internal customers
Loss on Ignition (L.O.I.)	Soil	9 Mile Issano, Omai	6	Two internal customers
Particle Size Distribution - Wet and Dry Sieve Analysis	Gravel , Sand, Bauxite	Mazaruni, Itaballi, 9 Mile Issano, Linden, Berbice, Leguan	208	Four internal customers, seven external customers
Preparation for Au analysis by Fire Assay	Sand, Clay, Rock	Barama, 9 Mile Issano, Mahdia	225	Three internal customers, eleven external

Type of Analysis	Sample Type	Location	No. of Samples	Remarks
Weight & Carat/ Purity	Yellow Metal, Jewellery, Raw Gold	-	11	customers Police Force; 4 external customers
Crushing	Slag, glass, crucibles, rock	-	224.129 kg	Guyana Gold Board , one external customer
Bulk Density, Specific Gravity	Soil, Rocks, Minerals	GGMC Museum	28	Two internal customers, one external customer
Pulverize	Cb-Ta grains, White Sand	-	12	One internal customer
		Total No. of Samples	3,467 + 224.129 kg	

**PETROLOGICAL LABORATORY:** Summary of Activities in 2011 - Examination and Sealing of Samples to be sent abroad for Analyses

Name	Container	Sample Type	Destination
Acme	3,740 Pails	Pulverized	Peru, Chile, Canada
BLT	6 containers	Mud	USA
GINMIN	12 Pails, 24 Drums	Bauxite	USA
GGMC	4 Pails	Sand	USA

<b>Name</b>	<b>Container</b>	<b>Sample Type</b>	<b>Destination</b>
<b>DiaGino</b>	4 Container	Cores	Canada
<b>Bosai Minerals Group (Guyana) Inc</b>	53 Pails	Bauxite	France, Germany, Venezuela, USA, Poland, Spain
<b>G. Walrond</b>	1 Container	Sand	UK
<b>Prometheus</b>	14 Containers	Cores	Canada, USA
<b>Actlabs</b>	892 Containers	Pulverized	Peru, Chile, Canada
<b>Reunion Manganese</b>	96 Pails	Manganese	Suriname, S. Africa
<b>L. Barker</b>	3 Pails	Stream, Soil	USA
<b>Custom Grinders Sales Inc.</b>	1 Pail	Bauxite	USA
<b>Guycomb Minerals Inc.</b>	18 Drums, 14 Pails	Columbite-Tantalite	Canada, Netherlands
<b>H. Tewari</b>	1 Pail	Sand	USA
<b>C. De Freitas</b>	1 pail, 3 Drums	Soil, Rock	USA
<b>S. Nokta</b>	1 Cooler	Sand	Trinidad and Tobago
<b>Guy. Sand Port</b>	2 Pails	Sand	Panama, USA
<b>Takatu Oil and Gas</b>	2 Pails	Gravel	Canada
<b>L. Thomas</b>	4 Pails	Manganese	Trinidad and Tobago
<b>Guyana Gold Fields</b>	<b>23 Pails</b>	<b>Rock</b>	Canada, Australia

## ANNEX 2

### Applications, Grants, Renewals and cancellations of Mineral Properties in 2011

	PPMS	MP	PL	ML	QL	PGGS
<b>Applications</b>						
- Actual	1,703	494	56	1	1	3
- Budgeted	1,612	260	52	-	3	4
- Variance %	+6%	+90%	+8%	-	-67%	-25%
- Actual 2010	1,359	345	32	0	0	-
<b>Grants</b>						
- Actual	1,101	330	41	-	0	3
- Budgeted	-	-	-	-	-	-
- Variance %	-	-	-	-	-	-
<b>Renewals</b>						
- Actual	4,465					
- Budgeted	-					
- Variance %	-					
<b>Cancellations</b>						
- Actual	711					

## ANNEX 3

### 2011 Projects on Roads, Bridges and Airstrip Construction and Maintenance

	<b>Roads, Bridges and Airstrips Building, Repairs and Maintenance in 2011</b>	<b>Started</b>	<b>Performance Status</b>
1.	Pott Falls-Kuwaima MD #2, construction of 69 miles of road and 9 bridges by Berthas Mining Inc.	May 2001	Completed
2.	Matthews Ridge-Powis Bridge MD #5, maintenance of 15.1 miles of road and 13 bridges by North West Investments Inc.	January 2010	Completed
3.	Fifth leg Mora Swamp to Baramita MD #5, (Phase 1 of 2) of 3.9 miles of road and 10 bridges by North West Investments Inc.	March 2010	Completed
4.	Devil's Hill MD #3, realignment of 1.5 miles of road by Mekdeci Machinery and Construction Inc.	March 2010	70% completed.
5.	Mile 188.7, repairs to bridge by Rodger King	June 2010	Completed
6.	Puruni-Paposhou MD #3, maintenance of 14 miles of road by Mekdeci Machinery and Construction Inc.	January 2011	Completed
7.	12 Miles from Itaballi Landing to Itaballi MD #3, rehabilitation of 12 miles of road, Mekdeci Machinery and Construction Inc.	March 2011	75% completed
8.	Itaballi Road from Duck Pond to 12 Miles before Itaballi Landing MD #3; Rehabilitation of 12 miles of road from Itaballi Landing to Itaballi, by Mekdeci Machinery and Construction Inc.	March 2011	Completed 85% completed
9.	73 Miles Bartica-Issano Rd MD #3, rehabilitation of bridge by Maurice Balgobin	June 2011	Completed
10.	Konawaruk Trail MD #2, rehabilitation of one mile of road and 3 bridges by North American Resources Inc	Reimbursement contract. April 2011	Completed
11.	Noseno to Dukwari Trail MD #5, alignment and building of 38 miles of ATV trail, by Winslow Higgins	Reimbursement contract.	Completed

	<b>Roads, Bridges and Airstrips Building, Repairs and Maintenance in 2011</b>	<b>Started</b>	<b>Performance Status</b>
12.	73 Miles to 9 Miles Issano MD #3, repairs to 12 miles of road, by Maurice Balgobin		90% completed
13.	Tamakay Landing to Ottomung Head MD #3, <i>alignment and building 55 miles of ATV trail by Vincent Primus</i>	Reimbursement contract.	Completed
14.	Tamakay Landing to Ottomung Head MD #3, building 55 miles of road, essentially based on the widening of the ATV trail above, by Vincent Primus	December 2011	40% completed
15.	Enachu MD #2, construction of bridge at Puruni Road by Mekdeci Machinery and Construction Inc.	Emergency work, completed in December 2010.	Completed
16.	Baramita MD #4, rehabilitation of airstrip (3,200 ft of runway) by North West Investments Inc	July 2011	Completed (first phase)
17.	Matthews Ridge to Baramta MD #5, maintenance of 28.7 miles of road by North West Investments Inc		60% completed

## PROJECTS AT HEADQUARTERS

### Status of Projects at Headquarters

	<b>Projects at Headquarters in 2011</b>	<b>Performance Status</b>
1.	Construction of new Stores and Office Buildings Issue between GGMC and the contractor sent for Arbitration by the court.	On hold Preliminary Activities
2.	Construction of Car Parking Facility opposite GGMC on Brickdam	Completed in January 2011.
3.	Construction of Drainage and Walkway along the Western Perimeter of GGMC on Brickdam	Completed in May 2011

## ANNEX 4

### Stakeholder Collaboration by Environmental Division of GGMC

	Topic	Stakeholder Agency	Month
1.	Effluent Discharge	GNBS	March
2.	Climate Change and Meteorology	Ministry of Agriculture	March
3.	Invasive Species	EPA	March
4.	Planning activities for OSH Month	Ministry of Labour	April
5.	Paying for Environmental Services	GFC	April
6.	Climate Change and Sustainable Forest Management	Iwokrama Rain Forest Programme	April
7.	Stakeholders Meeting on Closure of the Apoteri K2 exploration well	NRDDB	May
8.	GAP Analysis of the LCDS and REDD+ Funds	GFC/European Forest Institute	June
9.	Launch of UG's International Centre for Biodiversity Research and Low Carbon Development	UG	June
10.	Forest Protection	French Guiana representatives	June
11.	EIA Scoping meeting at Annai	EPA	June
12.	Environmental Statistics	Statistics Bureau	September
13.	EIA Scoping meeting in Georgetown	EPA	September
14.	Inception Workshop for Stockholm Convention on Persistent Organic Pollutants – development of a National Plan	Ministry of Agriculture	September

	<b>Topic</b>	<b>Stakeholder Agency</b>	<b>Month</b>
15.	Global Environment Fund Small Grants Programme	UNDP	September
16.	Regional Exhibition on Mercury Free Gold Mining	Orgening Goud Sector of Suriname	October
17.	Rehabilitation of mined out areas by Consultant Forester, B. Pollock	GGDMA	November
18.	Protected Areas Management	EPA	November
19.	Integrated Database Management	GFC	December



## ANNEX 5

### Training conducted in 2011

Name of Course	Date Conducted	Facilitator	Target Group
<b>TECHNICAL</b>			
<b>IT</b> - ArcGIS - Microsoft Certified IT Professional (MCITP) - Foundation Stage – Microsoft Publisher, Internet & Word 2010 (first batch) - Microsoft Excel 2010 (first batch) - Advanced Microsoft Word 2010 (second batch) - Foundation Stage – Microsoft Publisher 2010 (second batch) - Energy Balance and Information System	February 18-22 April 11- November 30 May 19-June 28 July 11-27 July 25 & August 9 July 27 & August 2 July 11-15	CPRM (Brazilian Geological Survey) Global Technology Computer World Computer World Computer World Computer World The Latin American Energy Organisation	Geologists, GIS Technician III IT Staff – Network Technicians & Programmer All Staff All Staff All Staff All Staff Economist and Legal Officer
<b>Petroleum</b> - Off Shore Oil and Gas Management: The US Model	May 10-12	US Department of the Interior Bureau of Ocean Energy Management; Regulation & Enforcement	Economist, Geologists, Senior Petroleum Engineer, Petroleum Technician, Manager Petroleum, Legal Adviser/Secretary, Legal

Name of Course	Date Conducted	Facilitator	Target Group
<ul style="list-style-type: none"> <li>- Use of Seismic Interpretation Software and “Stock Pipe Issues”</li> <li>- Preparing for Offshore Energy, The Atlantic Canada’s Oil and Gas Experience</li> </ul>	<p>July 12, 13, 15, 25, 26, 27 &amp;28</p> <p>November 21</p>	<p>(BOEMRE)</p> <p>Liam Hunt – Geophysicist from Fugro Geospec Research International</p> <p>Governments of Newfoundland and Labrador, Canada</p>	<p>Officer, Manager Environmental Division &amp; Lab Technician</p> <p>Geologists</p> <p>Chairman, Commissioner, Manager, Petroleum Division, Legal Adviser, Economist, senior staff</p>
<p><b>Geological Services</b></p> <ul style="list-style-type: none"> <li>- Geological and Mineral Resource Management</li> <li>- Proficiency Testing – A tool for Laboratory Improvement</li> <li>- Remote Sensing</li> <li>- Mineral Resources, MSc. Programme</li> </ul>	<p>May 9-29</p> <p>June 9</p> <p>June 15-17</p> <p>Jan-Aug 2012</p>	<p>Chinese Government</p> <p>Guyana National Bureau of Standards</p> <p>Guyana Forestry Commission</p> <p>University of Queensland, Australia</p>	<p>Mines &amp; Geological Managers, Environmental Officer</p> <p>Senior Chemist</p> <p>GIS Officer and Programmer</p> <p>Geo-environmental Engineer, Geotechnical Engineer</p>
<p><b>Mining and Regulation</b></p> <ul style="list-style-type: none"> <li>- Mercury Free Mining</li> <li>- In House Training of Field Staff for Mines Division</li> <li>- World Accreditation Day – Accreditation Supporting the</li> </ul>	<p>May 31-June 2</p> <p>October 17-28</p>	<p>World Wildlife Fund in collaboration with Surinamese Authorities</p> <p>In House Training Team</p> <p>Guyana National Bureau of</p>	<p>Manager Environmental Division, Senior Mining and Mineral Processing Engineers</p> <p>Prospective Field Staff for Mines Division</p> <p>Senior Mineral Processing Engineer</p>

Name of Course	Date Conducted	Facilitator	Target Group
work of Regulators	June 9	Standards	
<b>Environmental and OSH Management</b> <ul style="list-style-type: none"> <li>- Forest Protection</li> <li>- Environmental Management for Senior Officials from Developing Countries</li> <li>- OSH in the Workplace</li> </ul>	June 27-July 1  August 25-September 16  July 13-14	French Authorities  Government of the People's Republic of China  Consultative Association of Guyanese Industry Ltd.	Engineers and Environmental Officers – Environmental Div.  Senior Environmental Officer  Industrial Nurse
<b>Geodesy</b> <ul style="list-style-type: none"> <li>- Attendance at the 3<sup>rd</sup> SIRGAS School of Reference Frames and 2011 Meeting in Costa Rica</li> </ul>	August 3-10	School of Topography, Cadastre and Geodesy, National University of Costa Rica	GIS Officer
<b>Library Science</b> <ul style="list-style-type: none"> <li>- Library of Congress Classification (LCC)</li> </ul>	April 9 and 16	University of Guyana - Librarian	Library Staff
<b>MANAGEMENT AND ADMINISTRATION</b>			
<ul style="list-style-type: none"> <li>- Supervisory Management Module 1</li> <li>- Supervisory Management Module 11</li> <li>- Administrative Professionalism</li> <li>- Office Procedure Administration</li> </ul>	April 5–8  June 28-July 1	Public Service Ministry – Training Division  Public Service Ministry – Training Division  Zoywin's Consultancy	Supervisors  Supervisors  Administrative Assistants,

<b>Name of Course</b>	<b>Date Conducted</b>	<b>Facilitator</b>	<b>Target Group</b>
<ul style="list-style-type: none"> <li>- Performance Management</li> <li>- The Practice of Human Resource Management</li> <li>- Human Resource Management and Auditing</li>   <li>- Strategic Human Resource Management</li> </ul>	April 20	Institute of Private Enterprise Development (IPED)	Confidential Secretaries Administrative Assistant
	April 14-September 30	Corporate Advocates – Training Consultant,	Supervisors
	May 12	CAGI	Human Resource Staff
	June 29-30	Institute of Internal Auditors Guyana Chapter	Human Resource, Audit and Finance Divisions
	July 20-21		Deputy Human Resource Manager, Admin. Assistant,
	September 12-13	Arthur Lok Jack Training Centre	Human Resources Department Human Resources Department
Audit Report Writing and Interview Techniques	April 27-28	Institute of Internal Auditors Guyana Chapter	Audit Staff, Administrative Assistants, Confidential Secretaries
<b>LEGAL</b>			
- Environmental Legislative Drafting with Specific Emphasis on Multilateral Environmental Agreements (MEAs)	August 2-5	Caribbean Community Secretariat	Legal Adviser/Secretary
<b>CUSTOMER RELATIONS</b>			
Customer Care (Internal & External)	June 7-9	Public Service Ministry – Training Division	Staff who have to interface with customers on a daily basis. LMD, Mines Clerical
<b>GENERAL</b>			
Report Writing	June 24-25	Ruth Lee – Training Consultant	Geologists, Environmental Officers, Mines Officers, Supervisors ( all staff who have

<b>Name of Course</b>	<b>Date Conducted</b>	<b>Facilitator</b>	<b>Target Group</b>
			to write reports)