



**Council for Geoscience**

# **ANNUAL REPORT**

OF THE COUNCIL FOR GEOSCIENCE 2006/07



**LEADING EARTH-SCIENCE SOLUTIONS**

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Council for Geoscience

# MANAGEMENT BOARD

OF THE COUNCIL FOR GEOSCIENCE



**Prof. P E Ngoepe**  
Chairperson of the Board  
*University of Limpopo*



**Mr T Ramontja**  
Chief Executive Officer  
*Council for Geoscience*



**Prof. J M Barton Jr**  
*Geological Society of  
South Africa*



**Dr D G Clarke**  
*Department of Land Affairs*



**Mr R W Hieber**  
*Chamber of Mines*



**Mr K Hodges**  
*Industrial Development  
Corporation*



**Ms T R Mbassa**  
*Department of Water Affairs  
and Forestry*



**Mr A P Nkuna**  
*Mineworkers Investment  
Company*



**Ms N D Ntombela**  
*Department of Minerals and  
Energy*



**Ms T Xaso**  
*Independent Consultant*

## Alternate Members

**Ms S Bansi**  
*Department of Minerals and Energy*  
Alternate to Ms N D Ntombela

**Mr M Riba**  
*Department of Land Affairs*  
Alternate to Dr D G Clarke

**Mr M Smith**  
*Chamber of Mines*  
Alternate to Mr R W Hiebert



**Prof. P E Ngoepe**  
Chairperson of the Board



**Mr T Ramontja**  
Chief Executive Officer

## REVIEW

### CHAIRPERSON OF THE BOARD AND THE CHIEF EXECUTIVE OFFICER OF THE COUNCIL FOR GEOSCIENCE

The past year was once again very successful for the Council for Geoscience (CGS) in terms of its scientific research programmes and general business activities. The success is attributed to the implementation of the short- to medium-term strategy of the CGS in 2003/04. The strategy sought to realign the research programmes of the organisation to contribute towards addressing national imperatives, such as economic growth, development of Africa, transformation, advancement of research and development, rural development and poverty eradication. However, the Management Board has recognised the need to propel the CGS to higher levels of performance, ensuring that it continues to be a world-class research institution. In this regard the Board and the Executive Management have compiled a ten-year strategy document for the CGS. The strategy is aimed primarily at addressing future human-resource needs in geosciences for the CGS and South Africa, and at enhancing South Africa's geological infrastructure.

As part of the process of addressing future geoscience human-resource needs against the backdrop of a shortage of rare skills, the CGS has implemented several initiatives. One of the initiatives, known as *AfricaArray*, involves collaboration with the Pennsylvania State University and the University of the Witwatersrand. This collaboration aims to establish an interlinked seismic network on the African continent and to train

young geophysicists. Two CGS geoscientists are already benefiting from the initiative and are currently pursuing PhD degrees through the Pennsylvania State University and the University of the Witwatersrand. The CGS has also initiated a Geological Field Mapping School to train young scientists in geological mapping. The school is fast becoming a national asset and discussions are currently taking place with the University of Fort Hare and the University of Pretoria to collaborate in the training of young geoscientists in this regard.

As part of the strategy to contribute towards poverty eradication, the CGS and the Department of Minerals and Energy have, during the past financial year, provided assistance to 90 small-scale mining projects.

During the year under review, the CGS continued to play a strategic role in the generation of geoscience knowledge in the Southern African Development Community (SADC) and on the African continent. With regard to SADC, the compilation of a seamless geological map for SADC countries is at an advanced stage and should be completed in 2008. This represents a benchmark geoscience product for the region and will contribute considerably in terms of minerals and ground-water exploration. This map for SADC countries shows the value and importance of geoscience organisations working in collaboration on a common geoscience theme. A collaborative geological

programme has also been initiated between the CGS and the Geological Surveys of Botswana and Namibia. The programme involves the correlation of the Karoo rocks across the common borders, which could have important economic implications for the countries involved, as these rocks host a variety of minerals, such as coal and industrial minerals, and have potential for ground-water resources. In addition, the CGS is collaborating with other geoscience institutions through the African Mining Partnership, which is a ministerial forum of African mining ministers. In this regard, the CGS has completed compiling a series of reports for African countries that could potentially claim extensions of their offshore territories. The CGS also contributed towards the establishment of the Organisation of African Geological Surveys in order to foster partnership amongst geoscience institutions.

On the international front, the CGS continues to be involved in assisting the Comprehensive Test-Ban Treaty Organisation (CTBTO) by ensuring continuous data flow and availability from the seismograph and infrasound facilities at Boshof to the CTBTO. The CGS has also concluded discussions to conduct collaborative innovative research with the Norwegian Institute for Water Research in developing passive water samplers. An important international development is the CGS's involvement with the United States Geological Survey's Global Mineral Resource Assessment Programme. This programme is aimed at outlining principal land areas in the world that have the potential for selected undiscovered mineral resources and at estimating the size of such resources to a depth of 1 km below the earth's surface.

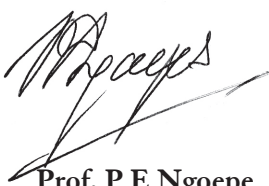
The South Africa–India collaboration in geoscience research has advanced considerably during the past year. CGS scientists and their counterparts in India are involved in the correlation of Karoo and Gondwana strata between the two countries. The project aims to improve the understanding of economic deposits, particularly of coal, on which both countries are dependent for power generation and for use in steel manufacture. This is the first attempt to correlate Karoo-type strata between east and west 'Gondwanaland'.

As part of a programme to increase exploration activities in South Africa's mining industry and thereby contributing to the accelerated economic growth targets for South Africa, the CGS is expediting its geoscience survey programmes in respect of airborne geophysics and geochemical surveys. These programmes, which aim at identifying mineral target areas, have already borne fruit and, during the year under review, a number of potential mineralised targets were identified.

The project to address water-related contamination, associated with more than 100 years of gold mining in the greater Gauteng area, has also progressed satisfactorily. The aim of the project is to, amongst others, reduce the ingress of surface water into mine workings in order to reduce pumping subsidies paid by Government to certain mines. The project also aims at addressing the impact of decanting polluted mine water. During the year, preliminary recommendations in respect of required geohydrological models were finalised. In addition, the Department of Science and Technology and the CGS have initiated a research programme on the apportionment of liability to polluting mines.

The Board and Executive Management of the CGS is highly appreciative of the staff for their dedication and commitment to the organisation. Despite the many challenges and the competitive environment in which the CGS operates, the organisation has, once again, increased its commercial earnings to unprecedented levels, exceeding previous expectations. Performance on statutory research projects has also maintained its high performance levels. The Board is confident that the strategy currently being implemented will propel the CGS to higher levels during the 2007/08 financial year and thereafter. The Board also believes that recent achievements and gains made by the organisation have placed the CGS in a much stronger position to face future challenges and provide geoscientific solutions to the people of South Africa.

The Board and Management of the CGS would like to thank the Ministers and staff of the Departments of Minerals and Energy and of Science and Technology for their unwavering support and advice during the past financial year.



**Prof. P E Ngoepe**

Chairperson: Management Board of the CGS



**Mr T Ramontja**

Chief Executive Officer

# ABRIDGED BOARD CHARTER

PER PFMA AND PROTOCOL ON CORPORATE GOVERNANCE

## Board Charter

A Board Charter, which sets out the responsibilities of the Board, was developed and established for the Management Board of the CGS, and includes the Board's Code of Conduct. The Board is fully committed to maintaining the standards of integrity, accountability and openness required to achieve effective corporate governance.

The Charter confirms the Board's

- accountability
- fiduciary duties and responsibilities
- appointment of committees
- governance and meeting procedures
- duty to declare conflict of interests
- responsibility for the adoption of strategic plans
- monitoring of operational performance and management
- determination of policy and processes to ensure the integrity of the CGS's risk management and internal controls
- communications policy
- director selection, orientation and evaluation.

The Board Charter is reviewed when necessary to ensure that it remains relevant to the business objectives of the CGS.

## Council For Geoscience

### Management Board's Responsibility for the Annual Financial Statements

The Board Members are responsible for the monitoring, preparation and the integrity of the financial statements and related information included in this annual report.

In order for the Board to discharge its responsibilities, Management has developed and continues to maintain a system of internal controls. The Board has the ultimate responsibility for the system of internal controls and reviews its operation primarily through management structures.

The internal controls include a risk-based system of internal accounting and administrative controls designed to provide reasonable, but not absolute assurance that assets are safeguarded and that transactions are executed and recorded in accordance with generally accepted business practices and the Council for Geoscience's policies and procedures. These controls are implemented by trained, skilled personnel with an appropriate segregation of duties and are monitored by Management. It includes a comprehensive budgeting and reporting system operating within strict deadlines and an appropriate control framework.

The external auditors are responsible for reporting on the financial statements. These financial statements are prepared in accordance with South African Statements of Generally Accepted Accounting Practices and incorporate disclosure in line with the accounting philosophy of the company. The financial statements are based on appropriate accounting policies, consistently applied and supported by reasonable and prudent judgements and estimates.

The Board Members believe that the organisation will be a going concern in the year ahead. For this reason they continue to adopt the going-concern basis in preparing the financial statements of the Council for Geoscience.

The Board Members are not aware of any matter or circumstance arising since the end of the financial year, not otherwise dealt with in the Council for Geoscience's annual financial statements that would affect the operations of the Council for Geoscience or the results of its operations significantly.

The annual financial statements for the year 2006/07 were approved by the Accounting Authority in terms of section 51.(1)(f) of the Public Finance Management Act on 31 July 2007 and are signed on its behalf by:



**P E Ngoepe**

Chairperson: Management Board of the CGS



**N D Ntombela**

Member: Management Board of the CGS

Date: 31 July 2007  
Pretoria

# REPORT OF THE AUDITOR-GENERAL TO PARLIAMENT ON THE FINANCIAL STATEMENTS AND PERFORMANCE INFORMATION OF THE COUNCIL FOR GEOSCIENCE FOR THE YEAR ENDED 31 MARCH 2007

## REPORT ON THE FINANCIAL STATEMENTS

### Introduction

1. I have audited the accompanying financial statements of the Council for Geoscience which comprise the statement of financial position as at 31 March 2007, value added statement, statement of financial performance, statement of changes in net assets and cash flow statement for the year then ended, and a summary of significant accounting policies and other explanatory notes, as set out on pages 24 to 50.

### Responsibility of the accounting authority for the financial statements

2. The accounting authority is responsible for the preparation and fair presentation of these financial statements in accordance with South African Statements of Generally Accepted Accounting Practice and Generally Recognised Accounting Practice, and in the manner required by the Public Finance Management Act, 1999 (Act No. 1 of 1999) (PFMA). This responsibility includes:
  - designing, implementing and maintaining internal control relevant to the preparation and fair presentation of financial statements that are free from material misstatement, whether due to fraud or error
  - selecting and applying appropriate accounting policies
  - making accounting estimates that are reasonable in the circumstances.

### Responsibility of the Auditor-General

3. As required by section 188 of the Constitution of the Republic of South Africa, 1996, read with section 4 of the Public Audit Act, 2004 (Act No. 25 of 2004), my responsibility is to express an opinion on these financial statements based on my audit.
4. I conducted my audit in accordance with the International Standards on Auditing and *General Notice 647 of 2007*, issued in *Government Gazette No. 29919 of 25 May 2007*. Those standards require that I comply with ethical requirements and plan and perform the audit to obtain reasonable assurance whether the financial statements are free from material misstatement.
5. An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditor's judgement, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the entity's preparation and fair presentation of the financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control.
6. An audit also includes evaluating the:
  - appropriateness of accounting policies used
  - reasonableness of accounting estimates made by management
  - overall presentation of the financial statements.
7. I believe that the audit evidence I have obtained is sufficient and appropriate to provide a basis for my audit opinion.

### Basis of accounting

8. The public entity's policy is to prepare financial statements in accordance with South African Statements of Generally Accepted Accounting Practice and Generally Recognised Accounting Practice, as set out in note 1.1 to the financial statements.

## Opinion

9. In my opinion the financial statements present fairly, in all material respects, the financial position of the Council for Geoscience as at 31 March 2007 and its financial performance and cash flows for the year then ended, in accordance with the identified basis of accounting as described in note 1.1 and in the manner required by the PFMA.

## OTHER REPORTING RESPONSIBILITIES

### Reporting on performance information

10. I have audited the performance information as set out on pages 19 to 21.

### Responsibilities of the accounting authority

11. The accounting authority has additional responsibilities as required by section 55(2)(a) of the PFMA to ensure that the annual report and audited financial statements fairly present the performance against predetermined objectives of the public entity.

### Responsibility of the Auditor-General

12. I conducted my engagement in accordance with section 13 of the Public Audit Act, 2004 (Act No. 25 of 2004) read with *General Notice 646 of 2007*, issued in *Government Gazette No. 29919 of 25 May 2007*.
13. In terms of the foregoing my engagement included performing procedures of an audit nature to obtain sufficient appropriate evidence about the performance information and related systems, processes and procedures. The procedures selected depend on the auditor's judgement.
14. I believe that the evidence I have obtained is sufficient and appropriate to provide a basis for the audit findings.

### Audit findings

15. No audit findings came to the fore.

## APPRECIATION

16. The assistance rendered by the staff of the Council for Geoscience during the audit is sincerely appreciated.



B R Wheeler for Auditor-General

Pretoria

30 July 2007



A U D I T O R - G E N E R A L

### Mandate of the Council for Geoscience

The Council for Geoscience (CGS) is mandated to gather, compile, interpret and disseminate geoscience knowledge for South Africa. This mandate is captured in the Geoscience Act (Act No. 100 of 1993) and includes the following:

- a. Carry out the systematic geoscience (geological, geophysical, geochemical, metallogenic, etc.) mapping of the onshore and offshore territories of South Africa, compile the information into products and publish the information for public use.
- b. Collect, archive and arrange access to all geoscience data and information on South Africa. These data and information include the data from the CGS, universities and private companies.
- c. Conduct basic geoscience research in order to understand geoscience processes, both present and past.
- d. Manage a number of national geoscience facilities on behalf of the country. These resources include the National Geoscience Museum, the National Borehole Core Library, the National Geoscience Library, the National Seismograph Network and the South African Infrasound Observatory.
- e. Provide ad hoc advice to Government on geoscience matters.
- f. Provide geoscience data and products to external clients, both nationally and internationally. These services are to be rendered on a full cost-recovery basis.

### Legislative and Corporate Governance Requirements

The CGS was established in terms of the Geoscience Act (Act No. 100 of 1993). This Act also established the

mandate and national responsibilities of the CGS. The CGS was listed as a schedule 3A Public Entity in terms of the Public Finance Management Act (Act No. 1 of 1999), as amended by Act No. 29 of 1999.

### Overview of Business Operations

In the past year the CGS has continued its large international projects, procured through the Economic Development Fund of the European Union and the World Bank. The CGS plays a dual role in some of these programmes as it executes the work as well as supervises other consultants involved in the projects.

The national and international projects that the CGS is undertaking enabled the organisation to exceed its commercial income target for the year. This is also attributed to the implementation of the strategic direction the CGS took, which focusses on enhancing partnerships with government departments, such as the Departments of Minerals and Energy, Science and Technology, and Water Affairs and Forestry. The key objective of the enhanced partnerships is to ensure that the CGS is well positioned to deliver essential geoscience services to relevant departments as well as local authorities.

However, there is also the realisation that a business model that is placing a growing emphasis on commercial activities in response to budgetary constraints is significantly detracting from the organisation's role in addressing the national growth-related needs of the country. In essence, the CGS is facing critical challenges with regard to its ability to contribute to the country's economy. This is largely related to the many years of underinvestment in the organisation, which necessitated the focus on commercial activities. Consequently, the CGS Management developed a national strategy to transform the CGS into a geoscience organisation that focusses on national growth issues. The need for this strategic endeavour was based on the realisation that the CGS is facing critical challenges with regard to its operation and its ability to contribute to the country's economy and, accordingly, requires serious and urgent interventions if it is to be relevant to the needs of the country.

## Highlights of Financial Results

	2006 R'000	2007 R'000
Government grant – core funding	86,078	93,100
Grant – earmarked funding	105	265
Government grant recognised	-	2,849
Contracting revenue	70,401	97,701
Publication revenue	624	595
Other operating income	6,944	12,556
Total revenue	164,152	207,066
Total expenses	147,376	190,839
Surplus for the year	16,776	16,227

Although the CGS has a clear mandate, as given in the Geoscience Act (Act No. 100 of 1993), it realises that the organisation is only partially delivering on this mandate of producing geoscience knowledge, infrastructure and the development of geoscience-related solutions that address the growth challenges facing the country. Based on a technical proposal in this longer term strategy, the CGS secured an additional R50 million as part of the Medium-Term Expenditure Framework process. This funding will be used over the next three years in the identification of priority mineral targets through national geophysical and geochemical surveys.

On innovation and geoscience research, important advances were made in respect of geohazards, environmental geosciences, geophysics and mineral resources assessment. In particular, new geological maps have been produced for portions of the Limpopo Province showing the distribution of clay deposits that can be exploited for a variety of ceramic products such as bricks and tiles. It is anticipated that these maps will stimulate small-scale mining in the region. With regard to environmental geosciences, important contributions were made in the fields of sustainable mining and ground-water pollution research. In geophysics, the CGS completed the first phase of establishing the first test site in Africa for ground geophysical techniques. In addition, the CGS is involved in the assessment of South Africa's mineral resources.

The importance of the geological environment in South Africa is highlighted through a project that is capturing information on unique areas in a Geosites database.

The CGS, in close cooperation with the Department of Minerals and Energy, forms part of the Small-Scale Mining Board (SSMB). This Board is responsible for assessing and approving the various small-scale mining

project proposals. Significant progress has been made during the past year with the registration and execution of several new projects.

Geoscience mapping and research programmes of the CGS, which are financed by state funds appropriated by Parliament, have made good progress in terms of achieving targets and improving performance. In this regard, performance in the past year has increased to 84,9%.

## Strategic Objectives

The CGS developed its current strategy in response to the various mandates it operates under and the primary directive of the State, namely to free the potential of individuals by improving the quality of life of all citizens, assisting in the growth and wealth of South Africa and eradicating poverty, especially in the rural areas of the country.

In realising the urgent need for the CGS to address the national imperatives, its technical and social programmes address the following strategically defined focus areas of the organisation:

- **Growth of the CGS and development of the first economy** (ensuring that the CGS grows as an organisation and also contributes to economic development – people, sciences and finances)
- **Regulatory systems and stakeholder compliance** (ensuring CGS compliance with legislative requirements, development of CGS regulatory systems and alignment with national mandates)
- **Rural development and poverty eradication** (ensuring that the CGS contributes to the development of the second economy)
- **Innovation** (development of products, systems and services)

- **Africa development** (CGS assistance in the development of Africa and its people by upgrading the continent's geoscience infrastructure)
- **Skills development** (building capacity in respect of scientific, administrative and managerial/leadership skills)
- **Transformation** (business and people).

The CGS's objectives are achieved through continuously improving and enhancing the quality of its geoscience research, products and services. The strategic research priorities of the CGS are based on the following six scientific and business thrusts:

- Geoscience research and mapping
- Geoscience applicable to engineering and construction industries and the mitigation of geoscience-related physical hazards
- Geoscience applicable to water
- Geoscience education and information management
- Mineral and energy resources development and poverty alleviation
- Geoscience research applicable to the environment and chemical hazards.

## Board of the Council for Geoscience

The Management Board of the CGS approves the mission, strategies, goals, operating policies and priorities of the organisation and monitors compliance with the policies and achievements with respect to the scientific, administrative and financial objectives.

The Management Board is appointed by the Minister in accordance with the provisions of Section 4 of the Geoscience Act (Act No. 100 of 1993). Other than the CEO, all the Board Members are non-executive members. The Board Members are continuously and actively involved in, and bring independent counsel and judgement to bear on all Board discussions and decisions. Board Members are fully conversant with their fiduciary duties as are outlined in Section 50 of the PFMA, which, amongst others, requires them to declare their interests when a potential conflict of interest may arise. The Board meets quarterly, in February, May, August and November.

The Board had the following active Committees:

- Audit and Risk
- Finance
- Technical
- Personnel, Remuneration and Transformation.

The composition of the Board during the 2006/07 financial year was as follows:

### **Prof. P E Ngoepe**

(Chairperson)

Re-appointed on 1 October 2006

### **Mr T Ramontja**

(Chief Executive Officer – Ex Officio)

Appointed on 1 November 2003

### **Prof. J M Barton Jr**

Geological Society of South Africa

Re-appointed on 1 October 2006

### **Dr D G Clarke**

Department of Land Affairs

Re-appointed on 1 October 2006

### **Mr A P Nkuna**

Mineworkers Investment Company

Re-appointed on 1 October 2006

### **Ms N D Ntombela**

Department of Minerals and Energy

Re-appointed on 1 October 2006

### **Ms T Xaso**

Independent Consultant

Re-appointed on 1 October 2006

### **Mr R W Hieber**

Chamber of Mines

Appointed on 1 October 2006

### **Mr K Hodges**

Industrial Development Corporation

Appointed on 1 October 2006

### **Ms T R Mbassa**

Department of Water Affairs and Forestry

Appointed on 1 October 2006

### **Mr L L Makibinyane**

Export Credit Insurance Corporation

Appointed on 1 October 2003

Term ended on 30 September 2006

### **Ms L McCourt**

Department of Environmental Affairs and Tourism

Appointed on 1 February 2006

Term ended on 30 September 2006

### **Mr J K Mollo**

Chamber of Mines

Appointed on 2 November 2004

Term ended on 30 September 2006

## Alternate Members

### Ms S Bansi

Department of Minerals and Energy  
Alternate to Ms N D Ntombela  
Re-appointed on 1 October 2006

### Mr M Riba

Department of Land Affairs  
Alternate to Dr D G Clarke  
Re-appointed on 1 October 2006

### Mr M Smith

Chamber of Mines  
Alternate to Mr R W Hieber  
Appointed on 1 October 2006

### Ms D de Nooy

Mintek  
Alternate to Prof. J M Barton Jr  
Appointed on 1 February 2006  
Resigned on 10 August 2006

## Attendance register of Board meetings

### Seven meetings held

	1 Jun 06	Special 20 Jun 06	Special 7 Aug 06	31 Aug 06	Special 28 Sept 06	30 Nov 06	1 Mar 07	Total Attendance
P E Ngoepe	Present	Apology	Present	Present	Present	Present	Present	6
T Ramontja	Present	Present	Present	Present	Present	Present	Present	7
J M Barton Jr	Present	Present	Present	Present	Present	Present	Present	7
D G Clarke	Present	Apology	Apology	Present	Apology	Present	Present	4
A P Nkuna	Present	Apology	Present	Present	Present	Apology	Present	5
N D Ntombela	Apology	Present	Apology	Apology	Apology	Present	Apology	2
T Xaso	Apology	Apology	Present	Apology	Apology	Apology	Present	2
R W Hieber	Not yet appointed	Not yet appointed	Not yet appointed	Not yet appointed	Not yet appointed	Present	Present	2
K Hodges	Not yet appointed	Not yet appointed	Not yet appointed	Not yet appointed	Not yet appointed	Apology	Apology	0
T R Mbassa	Not yet appointed	Not yet appointed	Not yet appointed	Not yet appointed	Not yet appointed	Present	Present	2
L L Makibinyane	Present	Present	Present	Present	Present	No longer member	No longer member	5
L McCourt	Present	Present	Apology	Present	Present	No longer member	No longer member	4
J K Mollo	Present	Present	Present	Present	Present	No longer member	No longer member	5
Alternate Members								
S Bansi	Present	Main member present	Apology	Present	Apology	Main member present	Apology	2
M Riba	Main member present	Apology	Apology	Main member present	Apology	Main member present	Main member present	0
M Smith	Not yet appointed	Not yet appointed	Not yet appointed	Not yet appointed	Not yet appointed	Present	Main member present	1
D de Nooy	Main member present	Main member present	No longer member	No longer member	No longer member	No longer member	No longer member	0

## Audit and Risk Committee

The Audit and Risk Committee of the CGS evaluates the annual internal and external audit plans, the internal and external audit reports and the financial statements. The Audit and Risk Committee also assesses the effectiveness of the internal audit function and the risk mitigation procedures, which are in place.

In addition, the Audit and Risk Committee, from time to time, assesses its mandate and charter in order to deal with emerging risks.

The composition of the Audit and Risk Committee as at 31 March 2007 was:

Mr B Hawksworth (Chairperson)  
Mr R W Hieber  
Ms S J Mbongo  
Ms N D Ntombela  
Ms N G Jiyane  
Ms S Bansi (Alternate to Ms N D Ntombela)

### Attendance register of the Audit and Risk Committee

Five meetings held

	19 May 06	Special 26 May 06	27 Jul 06	Special 16 Aug 06	14 Feb 07	Total Attendance
B Hawksworth	Present	Present	Present	Present	Present	5
R W Hieber (From 11/2006)	Not yet appointed	Not yet appointed	Not yet appointed	Not yet appointed	Present	1
S J Mbongo (From 11/2006)	Not yet appointed	Not yet appointed	Not yet appointed	Not yet appointed	Present	1
N D Ntombela	Present	Apology	Present	Apology	Apology	2
N G Jiyane (From 03/2007)	Not yet appointed	Not yet appointed	Not yet appointed	Not yet appointed	Not yet appointed	0
S Bansi (Alternate)	Main member present	Apology	Main member present	Apology	Apology	0
L L Makibinyane (Till 09/2006)	Present	Present	Present	Present	No longer member	4
J Mollo (Till 09/2006)	Present	Present	Present	Present	No longer member	4
T Xaso (Till 09/2006)	Apology	Present	Present	Present	No longer member	3

## Finance Committee

The Finance Committee of the CGS deals with a range of corporate financial issues of the CGS, such as the recommendation for the approval of the Budget, the recommendation for major capital expenditure, the writing off of bad debts and assets and any other financial matters as are referred to it by the Board for recommendations.

The composition of the Finance Committee as at 31 March 2007 was:

Mr M Smith (Chairperson)  
Ms N D Ntombela  
Mr T Ramontja  
Ms S Bansi (Alternate to Ms N D Ntombela)

### Attendance register of the Finance Committee

Three meetings held

	19 May 06	16 Aug 06	14 Feb 07	Total Attendance
M Smith (From 11/2006)	Not yet appointed	Not yet appointed	Present	1
N D Ntombela	Present	Apology	Apology	1
T Ramontja	Present	Present	Present	3
S Bansi (Alternate)	Main member present	Apology	Present	1
L L Makibinyane (Till 09/2006)	Present	Present	No longer member	2
J K Mollo (Till 09/2006)	Present	Present	No longer member	2

## Technical Committee

The Technical Committee of the CGS deals with the annual scientific and technical programme of the CGS, evaluates the scientific and technical output, oversees the annual technical audit and recommends on such scientific and technical matters as are referred to it by the Board.

The composition of the Technical Committee as at 31 March 2007 was:

Prof. J M Barton Jr (Chairperson)  
Ms S Bansi  
Mr K Hodges  
Ms T R Mbassa  
Dr K Pietersen  
Mr T Ramontja

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## Attendance register of the Technical Committee

Four meetings held

	19 May 06	15 Aug 06	15 Sept 06	14 Feb 07	Total Attendance
J M Barton Jr	Present	Present	Present	Present	4
S Bansi	Apology	Present	Apology	Present	2
K Hodges (From 11/2006)	Not yet appointed	Not yet appointed	Not yet appointed	Present	1
T R Mbassa (From 11/2006)	Not yet appointed	Not yet appointed	Not yet appointed	Apology	0
K Pietersen	Present	Present	Apology	Apology	2
T Ramontja	Present	Present	Present	Present	4
J Blaine (Till 09/2006)	Apology	Present	Present	No longer member	2
D de Nooy (Till 08/2006)	Present	No longer member	No longer member	No longer member	1
L L Makibinyane (Till 09/2006)	Present	Present	Present	No longer member	3

## Personnel, Remuneration and Transformation Committee

The Personnel, Remuneration and Transformation Committee determines the human resources strategies and policies of the CGS. The Committee approves the remuneration structure and salary changes in the CGS and evaluates and makes recommendations on the payment of production bonuses. The Committee also decides upon the remuneration of the Executive Management.

The composition of the Personnel, Remuneration and Transformation Committee as at 31 March 2007 was:

Mr A P Nkuna (Chairperson)  
Ms S Bansi  
Prof. J M Barton Jr  
Mr T Ramontja

## Attendance register of the Personnel, Remuneration and Transformation Committee

Two meetings and one teleconference held

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	19 May 06	4 Jul 06 Teleconference	16 Aug 06	Total Attendance
A P Nkuna	Present	Present	Apology	2
S Bansi (From 11/2006)	Not yet appointed	Not yet appointed	Not yet appointed	0
J M Barton Jr	Present	Present	Present	3
T Ramontja	Present	Present	Present	3
P E Ngoepe (Till 03/2007)	Present	Apology	Present	2
L L Makibinyane (Till 09/2006)	Present	Present	Present	3
N D Ntombela (Till 09/2006)	Apology	Apology	Apology	0

### Financial and Operational Factors

#### *Post-balance-sheet events*

No material facts or circumstances have arisen, between the date of the balance sheet and the production of this report, which will affect the financial position of the CGS as is reflected in the financial statements.

#### *Major changes in respect of fixed assets*

An amount of R2,7m was invested in the acquisition of new field-work vehicles. Scientific equipment acquired amounted to R8m, and computer software and hardware to R3,6m.

### Losses Incurred or Recovered

#### *Material losses incurred*

The Management Board of the CGS has developed a Materiality and Significance Framework for the CGS. The Board has approved that any expenditure in excess of approximately 1% of the annual operating expenditure budget, which is an amount of R400 000 for 2006/07, and/or the writing off and disposal of any asset in excess of approximately 2% of the value of property and equipment as indicated in the annual financial statements of the year 2005/06, which is an amount of R3,1m individually or in aggregate, would be deemed material and significant. The CGS has thus accepted the above-mentioned threshold figures of materiality for its financial framework.

### Performance management criteria and performance targets of the Council for Geoscience

The Council for Geoscience (CGS) has developed a number of measures that are used to evaluate the performance of the organisation against a set of predetermined targets. These measures were designed as a means to evaluate the performance of the CGS with respect to three levels of accountability. These include the measurement of:

- collective scientific and technical output during a specific financial year
- the performance of the different business units
- corporate performance.

The overall evaluation of corporate performance is based on aspects such as business growth, investment into organisational excellence, customer and client relationships, operational best practices, investing into people and stakeholder interaction. All of the above performance targets are set annually by the CGS and are, at the end of the financial year, audited by a team of external auditors.

In line with the new strategy developed by the CGS Management, the organisation has adopted a Balanced

Scorecard (BSC) approach to its performance measurement. The corporate BSC, which measures the performance of the organisation at corporate, business unit and individual level was approved and accepted by the Management Board of the CGS. The BSC incorporates the current performance measures into the following evaluation perspectives:

- Stakeholder and customer satisfaction
- Economic growth
- Organisational systems
- Scientific excellence and human capital development.

The BSC was implemented on 1 April 2005.

### Corporate performance targets of the Council for Geoscience

In order to evaluate the corporate performance of the CGS, the organisation has developed a range of performance indicators, which cover the entire spectrum of activities within the CGS. The range of performance indicators, together with the performance targets for the period 2006/07 are summarised in the table below.

#### Corporate Scorecard for 2006/07

Market (Stakeholder/Customer) Perspective		To drive stakeholder and customer satisfaction by the development of world-class products and services	
Objectives	Measures	Target 2006/07	Performance 2006/07
Develop a Stakeholder- and Customer-Focussed Organisation	- Status of Annual Technical Programme throughout the Year	On Schedule	On Schedule
	- % Completion of Annual Technical Programme	68%	84,9%
	- Percentage Satisfied Customers	>85%	85,7%

Market (Stakeholder/Customer) Perspective		To drive stakeholder and customer satisfaction by the development of world-class products and services	
Objectives	Measures	Target 2006/07	Performance 2006/07
Dissemination of Information to Users	- No. of Maps and Publications Published	30	50
Promotion of CGS to Stakeholder/Customer	- No. of Small-Scale Mining Initiatives	4	90
	- No. of Repeat Clients	220	144
	- No. of New Clients	25	36
To Create Wealth and Ensure Rural and Regional Development	- No. of Geoscientific Projects	18	37
	- No. of Rural Development Projects	18	33
	- No. of Regional and African Development Projects	9	36
Develop Strategic Partnerships	- No. of Partners	15	34
	- No. of Active BEE/HDI Partners	4	8

Economic/Financial Growth		To achieve sustainable revenue and profit growth	
Objectives	Measures	Target 2006/07	Performance 2006/07
Generate Revenue	- Total Revenue (Rands)	R140m	R207,1m
	- Government Grant	R93m	R93,1m
	- Contract Revenue (Rands)	R40m	R98,3m
	- Sundry Income	R6,5m	R15,7m
	- Commercial Surplus	R4,9m	R16,2m
	- Ratio of Contract Revenue to Total Revenue	29%	47,5%
	- Ratio of External Revenue to Total Revenue	33%	55,0%
Overhead Efficiency	- Ratio of Overheads to Total Cost	60%	48,2%
	- Ratio of Personnel Cost to Total Cost	60%	53,7%

<b>Effective Systems (Organisational)</b>		<b>To develop and maintain effective and streamlined processes, using appropriate tools and methodologies</b>	
<b>Objectives</b>	<b>Measures</b>	<b>Target 2006/07</b>	<b>Performance 2006/07</b>
To Develop and Implement Effective Policies and Procedures	- % Policies reviewed, approved and developed	10%	17%
To Drive Preferential Procurement	- Preferential Procurement as a % of Total Procurement	35%	39,44%
To Implement Corporate Planning and Reporting	Regulatory Compliance - PFMA	100%	100%

<b>World-Class People Perspective</b>		<b>To develop a world-class geoscience organisation where our people can grow and perform</b>	
<b>Objectives</b>	<b>Measures</b>	<b>Target 2006/07</b>	<b>Performance 2006/07</b>
To Attract and Retain a Skilled Workforce	- Turnover (Management) - Turnover (Scientists) - Turnover (Technical Staff)	10% 10% 10%	4,76% 4,5% 1,18%
Promote Scientific and Innovation Excellence	- No. of Innovation Projects - No. of Staff studying - No. of Staff and Students enrolled for MSc and PhD degrees - No. of Papers and Articles published - Proportion of Researchers to Total Staff - % of Scientific Staff with PhD and MSc degrees	6 37 25 64 38% 59%	14 53 33 62 41,82% 42%
To Build a Positive Organisational Culture	- % Satisfied Staff Members	70%	53,8%
To Reflect and Embrace RSA Diversity	% Overall EE Targets in the CGS (W-B) % EE Targets Senior Officials and Management (W-A-I-C) % EE Targets Professionals (W-A-I-C) % EE Targets Technicians (W-A-I-C) % EE Targets Administrators (W-A-I-C) % Overall EE Targets by Gender (M-F) % Overall EE Targets for Disabled People	60:40 62:33:0:5 63:29:5:3 46:45:3:6 44:32:12:12 62:38 1%	51:49 66:29:0:5 61:30:5:4 45:50:1:4 31:61:3:5 58:42 2%
To Build and Maintain External Relations	- No. of Projects with External Collaborators - No. of Publications with External Collaborators - No. of International Awards - No. of Keynote Addresses	17 21 1 3	57 42 3 6

### Responsibilities

The Management Board of the CGS has the overall responsibility to ensure that the organisation has and maintains effective, efficient and transparent systems of risk management and internal control. The responsibility to ensure the adequacy and effectiveness of these systems is delegated to the Audit and Risk Committee. The Audit and Risk Committee is an advisory committee of the Board, operating as overseer with an independent and objective stance.

The Audit and Risk Committee has adopted formal terms of reference, which have been confirmed by the Board, as its Charter, and is satisfied that it has discharged its duties and responsibilities as set out in the Charter. In performing its responsibilities the Audit and Risk Committee has reviewed the following:

- The functioning of the internal control system
- The functioning of the internal audit programme
- The risk areas of the entity's operations to be covered in the scope of the internal and external audits
- The reliability and accuracy of the financial information provided to Management and other users
- The accounting or auditing concerns identified as a result of the internal or external audits
- The entity's compliance with legal and regulatory provisions.

### Governance

The Board appointed the following members of the Audit and Risk Committee:

Mr B Hawksworth (Chairperson)

Mr R Hieber

Ms N Jiyane

Ms S Mbongo

Ms N D Ntombela

The Audit and Risk Committee met six times during the period under review.

### Internal Control Systems

The members of the Audit and Risk Committee believe that the system of internal controls is adequately designed to cover organisational risks, financial risks and operational risks. The control system provides reasonable, but not absolute, assurance that the organisation's assets are safeguarded, transactions are authorised and recorded properly, and that material errors and irregularities are either prevented or detected timeously. These controls are monitored throughout the organisation by the Management and employees with the necessary segregation of authority and duties.

The Operational Risk Management Committee, which reports to the Audit and Risk Committee on a quarterly basis, continuously evaluates and monitors the effectiveness of all internal control systems in respect of all areas of risk that have been identified.

Having reviewed the effectiveness of the organisation's system of internal controls, and based on detailed reports provided by the Internal Auditors, the members of the Audit and Risk Committee are not aware of any significant weakness or deficiency in the organisation's system of internal controls.

## Internal Auditing

Internal auditing was outsourced during the year under review and provides a supportive role to Management and the Audit and Risk Committee to achieve their objectives by identifying and evaluating significant exposures to risk and contributing to the empowerment of risk management and control systems.

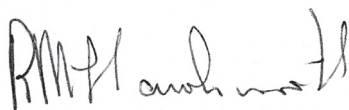
The internal audit function is responsible for independently and objectively evaluating the organisation's system of internal controls at a detailed level and to bring any significant business risks and exposures to the attention of Management and the Audit and Risk Committee through the provision of comprehensive internal audit reports.

## Financial Statements

The Audit and Risk Committee has reviewed and discussed the financial statements of the Council for Geoscience for the year ended 31 March 2007 with the Auditor-General and the Accounting Officer. The Audit and Risk Committee also reviewed the management letter of the Auditor-General and the responses of Management thereto. The members of the Audit and Risk Committee believe that the financial statements comply, in all material respects, to the requirements of the Public Finance Management Act (Act No. 1 of 1999, as amended) and South African Statements of Generally Accepted Accounting Practices (GAAP) and Generally Recognised Accounting Practices (GRAP). The Audit and Risk Committee agrees that the adoption of the going-concern premise is appropriate in preparing the annual financial statements.

The Audit and Risk Committee, at its meeting held on 18 July 2007, recommended the adoption of the annual financial statements by the Board of Directors.

Approved



Mr B Hawksworth  
Chairperson: Audit and Risk Committee

31 July 2007  
Pretoria

## COUNCIL FOR GEOSCIENCE

# STATEMENT OF FINANCIAL POSITION

## AS AT 31 MARCH 2007

	Notes	2007 R'000	2006 R'000
<b>Assets</b>			<b>Restated</b>
<b>Non current assets</b>			
Property, plant and equipment	2	161,281	66,979
Intangible assets	3	896	1,417
Post employment benefit asset	4	1,062	5,200
<b>Current assets</b>		229,379	190,661
Trade and other receivables	5	72,141	45,820
Cash and cash equivalents	6	157,238	144,841
<b>Total assets</b>		<b>392,618</b>	<b>264,257</b>
<b>Net assets and liabilities</b>			
<b>Net assets</b>			
Accumulated surplus		183,972	175,175
<b>Non current liability</b>			
Government grant	7	97,098	-
<b>Current liabilities</b>		111,548	89,082
Trade and other payables	8	24,745	18,503
Deferred income	9	82,748	68,222
Provisions	10	4,055	2,357
<b>Total net assets and liabilities</b>		<b>392,618</b>	<b>264,257</b>

## COUNCIL FOR GEOSCIENCE

# STATEMENT OF FINANCIAL PERFORMANCE FOR THE YEAR ENDED 31 MARCH 2007

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	Notes	2007 R'000	2006 R'000
			Restated
<b>Revenue</b>	11	194,510	157,208
<b>Cost of contracts</b>	11	( 75,787)	( 47,740)
<b>Gross surplus</b>		118,723	109,468
Other operating income	11	5,994	1,168
Administrative expenses		( 114,017)	( 99,322)
Other operating expenses	11	( 985)	( 307)
Interest received	12	6,562	5,776
<b>Surplus from operations</b>		16,277	16,783
Finance cost	13	( 50)	( 7)
<b>Net surplus for the year</b>		16,227	16,776

## STATEMENT OF CHANGES IN NET ASSETS FOR THE YEAR ENDED 31 MARCH 2007

	Notes	Revaluation Reserve R'000	Accumulated Surplus R'000	Total R'000
<b>Balance at 31 March 2005</b>		22,232	143,875	166,107
Revaluation of fixed assets		486	-	486
Amortisation		( 7,708)	-	( 7,708)
Prior period error	14	( 7,094)	7,094	-
Prior period error	14	( 486)	486	-
Net surplus for the year		-	16,290	16,290
<b>Balance at 31 March 2006</b>		7,430	167,745	175,175
Prior period error	14	( 7,430)	-	( 7,430)
Net surplus for the year		-	16,227	16,227
<b>Balance at 31 March 2007</b>		-	183,972	183,972

## COUNCIL FOR GEOSCIENCE

# CASH FLOW STATEMENT FOR THE YEAR ENDED 31 MARCH 2007

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	Notes	2007 R'000	2006 R'000
			Restated
<b>Cash inflow from operating activities</b>		27,741	22,669
Cash receipts from customers		165,340	133,224
Cash paid to suppliers and employees		( 144,111)	( 116,324)
Cash generated from operations	15	21,229	16,900
Interest received	12	6,562	5,776
Interest paid	13	( 50)	( 7)
<b>Cash outflow from investing activities</b>		( 15,344)	( 17,319)
Acquisition of:			
Property, plant and equipment	16.1	( 14,509)	( 16,395)
Intangible assets	16.2	( 835)	( 924)
<b>Net increase in cash and cash equivalents</b>		12,397	5,350
<b>Cash and cash equivalents at beginning of year</b>	6	144,841	139,491
<b>Cash and cash equivalents at end of year</b>	6	157,238	144,841

## COUNCIL FOR GEOSCIENCE

## VALUE ADDED STATEMENT FOR THE YEAR ENDED 31 MARCH 2007

	2007 R'000	% Value added	2006 R'000	% Value added
<b>Value added</b>				
Government Grant - Core funding	93,100	70.9%	86,078	81.4%
Government Grant - Earmarked funding	265	0.2%	105	0.1%
Government grant recognised	2,849	2.2%	-	0.0%
Contracting revenue	97,701	74.4%	70,401	66.6%
Publication revenue	595	0.4%	624	0.6%
Revenue	194,510	148.1%	157,208	148.7%
Paid to suppliers for material and services	( 75,739)	( 57.7%)	( 58,444)	( 55.3%)
Interest earned	6,562	5.0%	5,776	5.5%
Other income	5,994	4.6%	1,168	1.1%
	131,327	100.0%	105,708	100.0%
	% Distributed		% Distributed	

**Distributed as follows -**

Employees	100,040	76.2%	75,511	71.4%
- Staff costs	83,433	63.5%	63,757	60.3%
- Employer contributions	13,910	10.6%	9,623	9.1%
- Bursary and training	2,697	2.1%	2,131	2.0%
Finance cost	50	-	7	-
Central and local government	1,548	1.2%	2,296	2.2%
Retention for expansion and growth	29,689	22.6%	27,894	26.4%
- Depreciation	13,462	10.3%	11,118	10.5%
- Retained surplus for the year	16,227	12.4%	16,776	15.9%
	131,327	100.0%	105,708	100.0%

**Value added ratios**

- Number of employees	319	292
- Revenue per employees	R610	R538
- Wealth created per employees	R412	R362

## COUNCIL FOR GEOSCIENCE

# NOTES TO THE FINANCIAL STATEMENTS FOR THE YEAR ENDED 31 MARCH 2007

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## 1 Accounting policies

### 1.1 Basis of preparation

The financial statements have been prepared in accordance with the South African Statements of Generally Accepted Accounting Practices (GAAP) including any interpretations of such statements issued by the Accounting Practices Board, with the prescribed Standards of Generally Recognised Accounting Practices (GRAP) issued by the Accounting Standards Board replacing the equivalent GAAP statement as follows:

#### Standard of GRAP

GRAP 1: Presentation of financial statements  
GRAP 2: Cash flow statements  
GRAP 3: Accounting policies, changes in accounting estimates and errors

#### Replaced statement of GAAP

AC101: Presentation of financial statements  
AC118: Cash flow statements  
AC103: Accounting policies, changes in accounting estimates and errors

The recognition and measurement principles in the above GRAP and GAAP statements do not differ or result in material differences in items presented and disclosed in the financial statements. The implementation of GRAP 1, 2 and 3 has resulted in the following significant changes in the presentation of the financial statements:

#### 1. Terminology differences:

#### Standard of GRAP

Statement of financial performance  
Statement of financial position  
Statement of changes in net assets  
Net assets  
Surplus/deficit for the period  
Accumulated surplus/deficit  
Contributions from owners  
Distributions to owners

#### Replaced statement of GAAP

Income statement  
Balance sheet  
Statement of changes in equity  
Equity  
Profit/loss for the period  
Retained earnings  
Share capital  
Dividends

#### 2. The cash flow statement can only be prepared in accordance with the direct method.

#### 3. Specific information such as:

- (a) receivables from non-exchange transactions, including taxes and transfers;
- (b) taxes and transfers payable;
- (c) trade and other payables from non-exchange transactions; must be presented separately on the statement of financial position.

#### 4. The amount and nature of any restrictions on cash balances are required to be disclosed.

## NOTES TO THE FINANCIAL STATEMENTS FOR THE YEAR ENDED 31 MARCH 2007

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### 1 Accounting policies *(continued)*

Paragraphs 11–15 of GRAP 1 has not been implemented as the budget reporting standard is in the process of being developed by the international and local standard setters. Although the inclusion of budget information would enhance the usefulness of the financial statements, non-disclosure will not affect fair presentation.

#### 1.2 Prior-year figures

Prior-year figures were adjusted due to the implementation of IAS16 and prior-period errors. Prior-period errors are omissions from, and misstatements in the entity's financial statements for one or more prior periods arising from a failure to use, or misuse of reliable information that: (a) was available when financial statements for those periods were authorised for issue; and (b) could reasonably be expected to have been obtained and taken into account in the preparation and presentation of those statements. Such errors include the effects of mathematical mistakes, mistakes in applying accounting policies, oversights or misinterpretation of facts, and fraud.

#### 1.3 Revenue

Revenue comprises the annual government grant recognised as income in the current year, contract income and sales of publications.

#### 1.4 Revenue recognition

##### 1.4.1 Recognition of income

The Council for Geoscience measures revenue at the fair value of the consideration received or receivable. Revenue is recognised only when it is probable that the economic benefits associated with a transaction will flow to the Council for Geoscience, and the amount of revenue and associated costs incurred or to be incurred, can be measured reliably.

##### 1.4.2 Government grant

The Council for Geoscience received grants in the form of assets and baseline allocation from government departments.

Government grants are recorded as deferred income when they become receivable and are then recognised as income on a systematic basis over the period necessary to match the grants with the related costs which they are intended to compensate. The conditions for the use of each grant are stated in contractual agreements. Government refers to

## COUNCIL FOR GEOSCIENCE

## NOTES TO THE FINANCIAL STATEMENTS FOR THE YEAR ENDED 31 MARCH 2007

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### 1 Accounting policies *(continued)*

government, government agencies and similar bodies whether local, national or international.

#### 1.4.3 Recognition of income from contracts

Revenue from contracts represents the invoiced value of goods supplied by the Council for Geoscience. Income from contracts is recognised by means of progress payments over the duration of the contracts. Income for contracts in progress is recognised when it can be invoiced. When the outcome of a contract can be estimated reliably, revenue is recognised by reference to the stage of completion of the contract activity.

#### 1.5 Interest received

Interest is recognised on a time proportionate basis with reference to the principal amount receivable and the effective interest rate applicable.

#### 1.6 Property, plant and equipment

The cost of an item of fixed assets is recognised as an asset when:

- it is probable that future economic benefits associated with the item will flow to the company; and
- the cost of the item can be measured reliably.

Costs include costs incurred initially to acquire or construct an item of fixed assets and costs incurred subsequently to add to, replace part of, or service it. If a replacement cost is recognised in the carrying amount of an item of fixed assets, the carrying amount of the replaced part is derecognised.

Fixed assets are carried at cost less accumulated depreciation and any impairment losses.

Depreciation is provided on all fixed assets other than freehold land, to write down the cost, less residual value, by equal instalments over their useful lives as follows:

Land	Not depreciated
Buildings	30 years
Motor vehicles	5 years
Equipment	5 years
Aircraft - Body	10 years
Aircraft - Engine	Useful hours
Aircraft - Propeller	Useful hours

## NOTES TO THE FINANCIAL STATEMENTS FOR THE YEAR ENDED 31 MARCH 2007

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### 1 Accounting policies *(continued)*

Office furniture	10 years
Computer equipment	3 years
Computer software	2 years

The depreciation charges for each period is recognised in profit or loss, unless it is included in the carrying amount of another asset.

The useful lives and residual values are reviewed on an annual basis and changes are reflected as change in accounting estimates on a prospective basis.

### 1.7 Foreign currency

Transactions in foreign currencies are accounted for at the rates of exchange ruling on the date of the transactions. Gains and losses arising from the settlement of such transactions are recognised in the statement of financial performance.

Monetary assets and liabilities denominated in foreign currencies are translated at the rates of exchange ruling at the reporting date. Unrealised differences on monetary assets and liabilities are recognised in the statement of financial performance in the period in which they occur.

### 1.8 Research and development

Expenditure on research activities is recognised as an expense in the period in which it is incurred.

An internally generated intangible asset arising from research and development is recognised only if all of the following conditions are met:

- An asset is created that can be identified;
- It is probable that the asset created will generate future economic benefits;
- The development cost of the asset can be measured reliably;
- It is technically feasible to complete the intangible asset so that it will be available for use or sale;
- The ability to use or sell the intangible asset; and
- It is the intention to complete the intangible asset so that it will be available for use or sale.

Where no internally generated intangible asset can be recognised, development expenditure is recognised as an expense in the period in which it is incurred. Internally generated assets are amortised on a straight-line basis over their useful lives.

## NOTES TO THE FINANCIAL STATEMENTS FOR THE YEAR ENDED 31 MARCH 2007

### 1 Accounting policies (continued)

#### 1.9 Deferred income

Deferred income is recognised using the accrual basis and is accounted for in the statement of financial performance in the period in which it satisfies the recognition criteria to be recognised as revenue.

#### 1.10 Retirement benefit costs

The Council for Geoscience operates both a defined contribution pension and provident fund and a defined benefit plan in respect of post-retirement medical aid contributions. For the defined benefit plan, the defined benefit obligation and the related current service, cost is determined by using the projected unit credit method. The defined benefit plan is subject to an annual actuarial valuation.

A portion of the actuarial gains and losses is to be recognised as income or expense, provided the net cumulative actuarial gains and losses at the end of the previous reporting period exceeds the greater of -

- 10% of the present value of the defined benefit obligation at that date, or
- 10% of the fair value of any plan assets at that date.

The portion of actuarial gains and losses to be recognised is equal to the excess calculated using the above limits, divided by the expected average remaining working lives of the employees participating in the plan.

The actuarial gains or losses are further limited to the extent that the net cumulative unrecognised actuarial gains or losses (before recognition of that actuarial gain or loss) exceeds the unrecognised part of the transactional liability. Payments to defined contribution retirement benefit plans are charged to the statement of financial performance in the year to which they relate.

#### 1.11 Provisions

Provisions are recognised when a present legal or constructive obligation arises as a result of past events, and it is probable that an outflow of resources will be required to settle the obligation, and a reliable estimate of the amounts can be made.

#### 1.12 Financial instruments

##### Recognition

A financial instrument, being a contract that gives rise to a financial asset of one entity and a financial liability or equity instrument of

## NOTES TO THE FINANCIAL STATEMENTS FOR THE YEAR ENDED 31 MARCH 2007

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### 1 Accounting policies *(continued)*

another entity, is recognised when the company becomes a party to the contractual provisions of the instrument.

#### Measurement

Financial instruments are initially measured at fair value which includes transaction costs. Subsequent to initial recognition, these instruments are measured as set out below.

#### Trade and other receivables

Trade and other receivables originated by the enterprise are treated as loans and receivables and are carried at amortised cost, using the effective interest rate method.

#### Cash and cash equivalents

Cash and cash equivalents are measured at fair value with changes in fair value being recognised in profit and loss.

#### Trade and other payables

Trade and other payables are measured at amortised cost, using the effective interest method.

### 1.13 Cash and cash equivalents

Cash and cash equivalents are short-term, highly liquid investments that are readily convertible to known amounts of cash and are subject to insignificant risk in change in value.

### 1.14 Operating leases

Leases of assets under which all the risk and rewards of ownership are effectively retained by the lessor are classified as operating leases. Lease payments under an operating lease are recognised as an expense on a straight-line basis over the lease term.

### 1.15 Impairment

At each reporting date, the Council for Geoscience reviews the carrying amounts of its assets to determine whether there is any indication that those assets may be impaired. If any such indication exists, the recoverable amount of the asset is estimated in order to determine the extent of the impairment loss, if any. If the recoverable amount of an asset is estimated to be less than its carrying amount, the carrying amount of the asset is reduced to its recoverable amount. A reversal of an impairment loss is recognised as income immediately. The recoverable amount is the higher of an asset's or cash-generating unit's fair value less cost to sell and its value in use. Value in use is the present

## COUNCIL FOR GEOSCIENCE

## NOTES TO THE FINANCIAL STATEMENTS FOR THE YEAR ENDED 31 MARCH 2007

### 1 Accounting policies (continued)

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value of cash flows expected to be derived from an asset or cash-generating unit. If an impairment loss subsequently reverses, the carrying amount of an asset (or cash-generating unit) is increased to the revised estimate of its recoverable amount, but limited to the carrying amount that would have been determined had no impairment loss been recognised in prior years. A reversal of an impairment loss is recognised in profit or loss.

#### 1.16 Judgements made by Management

There were no material judgements made by Management that could have significant effect on the amounts recognised in the financial statements.

#### 1.17 Sources of estimation uncertainty

There are no key assumptions concerning the future and other key sources of estimation uncertainty at the balance sheet date that could have a significant risk of causing material adjustment to the carrying amounts of assets and liabilities within the next financial year.

### 2 Property, plant and equipment

2007	Land R'000	Buildings R'000	Equipment R'000	Office furniture R'000	Aircraft R'000	Motor vehicles R'000	Computer equipment R'000	Total R'000
Gross carrying amount	3,081	32,362	64,431	12,548	13,493	6,543	14,971	147,429
Accumulated depreciation at the beginning of the year	-	( 4,472)	( 46,778)	( 10,011)	( 1,760)	( 5,890)	( 11,539)	( 80,450)
<b>Opening net carrying amount at 31 March 2006</b>	3,081	27,890	17,653	2,537	11,733	653	3,432	66,979
Movements during the year:								
Acquisitions	-	249	8,034	13	967	2,738	2,508	14,509
Acquired through government grant	15,150	80,613	-	-	-	-	-	95,763
Disposals	-	-	( 866)	( 2,426)	-	( 12)	( 459)	( 3,763)
Depreciation	-	( 1,078)	( 7,157)	( 20)	( 1,541)	( 159)	( 2,252)	( 12,207)
<b>Closing net carrying amount at 31 March 2007</b>	18,231	107,674	17,664	104	11,159	3,220	3,229	161,281
Gross carrying amount	18,231	113,224	67,261	250	14,460	9,210	14,279	236,915
Accumulated depreciation	-	( 5,550)	( 49,597)	( 146)	( 3,301)	( 5,990)	( 11,050)	( 75,634)

## NOTES TO THE FINANCIAL STATEMENTS FOR THE YEAR ENDED 31 MARCH 2007

### 2 Property, plant and equipment (continued)

2006	Land R'000	Buildings R'000	Equipment R'000	Office furniture R'000	Aircraft R'000	Motor vehicles R'000	Computer equipment R'000	Total R'000
Gross carrying amount	3,081	29,592	59,198	12,453	6,391	6,543	13,776	131,034
Accumulated depreciation at the beginning of the year	-	(3,519)	(37,481)	(7,819)	(242)	(5,195)	(8,794)	(63,050)
<b>Opening net carrying amount at 31 March 2005</b>	3,081	26,073	21,717	4,634	6,149	1,348	4,982	67,984
Movements during the year:								
Acquisitions	-	2,770	5,233	95	7,102	-	1,195	16,395
Depreciation on revaluation reserves	-	-	(4,427)	(2,145)	-	(2)	(954)	(7,528)
Depreciation	-	(953)	(4,870)	(47)	(1,518)	(693)	(1,791)	(9,872)
<b>Closing net carrying amount at 31 March 2006</b>	3,081	27,890	17,653	2,537	11,733	653	3,432	66,979
Gross carrying amount	3,081	32,362	64,431	12,548	13,493	6,543	14,971	147,429
Accumulated depreciation	-	(4,472)	(46,778)	(10,011)	(1,760)	(5,890)	(11,539)	(80,450)

The transfer of the following land and buildings as stipulated under section 26 of the Geoscience Act (Act No. 100 of 1993), has not yet been completed.

The Council for Geoscience is currently awaiting the transfer of the Head Office building in Pretoria from the Department of Public Works to the Council for Geoscience.

Location	Fair value
280 Pretoria Street, Silverton, Pretoria	R 94,000,000
474 Carl Street, Town Lands 351JR, Pretoria West	R 2,800,000
Portion of stand 110, 21 Schoeman Street, Polokwane	R 350,000

The fair value of these properties has been included in the carrying amount of land and buildings as at 31 March 2007.

Details regarding land and buildings are kept at the Council for Geoscience head office and will be supplied upon written request.

## COUNCIL FOR GEOSCIENCE

# NOTES TO THE FINANCIAL STATEMENTS FOR THE YEAR ENDED 31 MARCH 2007

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## 3 Intangible assets

### Computer software

	2007 R'000	2006 R'000
Gross carrying amount	4,670	3,746
Accumulated amortisation	( 3,253)	( 1,827)
<b>Opening net carrying amount at 31 March 2005</b>	1,417	1,919
Movements during the year:		
Acquisitions	835	924
Disposals	( 101)	-
Amortisation on revaluation reserves	-	( 180)
Amortisation	( 1,255)	( 1,246)
<b>Closing net carrying amount at 31 March 2006</b>	896	1,417
Gross carrying amount	4,844	4,670
Accumulated amortisation	( 3,948)	( 3,253)

## 4 Retirement benefit

### 4.1 Medical aid scheme

The Council for Geoscience has made provision for the medical aid scheme covering substantially all employees. All eligible employees are members of the defined benefit scheme administered by the Council. The assets of these schemes are held in administered trust funds separate from the Council's assets. Scheme assets primarily consist of listed shares and property trust units, and fixed income securities.

The defined benefit scheme administered by the Council is valued actuarially using the projected unit credit method. The scheme was last actuarially valued during the year ended 31 March 2007. At that time the scheme was certified by the reporting actuary as being in a sound financial position. In arriving at his conclusion, the actuary took into account the following assumptions at reporting date (expressed as weighted averages)

Key assumptions		
Discount rate	8.25%	8.00%
Expected return on plan assets	8.25%	8.00%
Future salary increases	N/A	N/A
Medical inflation rate	6.75%	6.00%

The actual return on plan assets are:

Expected return on plan assets	2,217	1,852
Actuarial gain on plan assets	1,890	2,493
Actual return on plan assets	4,107	4,345

## NOTES TO THE FINANCIAL STATEMENTS FOR THE YEAR ENDED 31 MARCH 2007

### 4 Retirement benefit *(continued)*

The amount included in the statement of financial position arising from the Council for Geoscience's obligation in respect of the post-retirement medical aid contributions to staff members is as follows:

	2007 R'000	2006 R'000
Present value of fund obligations	28,618	20,919
Fair value of plan assets	( 31,277)	( 27,716)
Unrecognised actuarial loss/(gain)	1,597	1,597
Asset recognised in the statement of financial position	( 1,062)	( 5,200)

Movements in the net liability in the current period were as follows:

Net liability at the beginning of the year	( 5,200)	( 3,480)
Amounts charged to income	4,138	1,267
Contributions paid to the Post-Retirement Medical Fund	-	( 2,987)
Net asset at the end of the year	( 1,062)	( 5,200)

The post retirement medical benefit was found to have a funded actuarial projected asset totalling R1,062,000 (2006: R5,200,000). The Council for Geoscience stopped contributions until such time that the existing assets have been absorbed by the liability.

Changes in the present value of the obligation and in the fair value of the plan assets

Present value of obligation at 1 April	20,919	21,727
Interest cost	1,654	1,881
Current service cost	994	1,122
Benefits paid	( 499)	( 448)
Actuarial (gain)/loss obligation	5,550	( 3,363)
Present value of obligation at 31 March	28,618	20,919
Fair value of plan assets at 1 April	27,715	20,832
Expected return on plan assets	2,217	1,852
Contributions	-	2,986
Benefits paid	( 499)	( 448)
Actuarial gain/(loss) on plan assets	1,844	2,493
Fair value of plan assets at 31 March	31,277	27,715
Fair value of obligation	28,618	20,919
Unrecognised actuarial gain/(loss)	1,597	1,596
Fair value of assets	( 31,277)	( 27,715)
	( 1,062)	( 5,200)

## COUNCIL FOR GEOSCIENCE

# NOTES TO THE FINANCIAL STATEMENTS FOR THE YEAR ENDED 31 MARCH 2007

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	2007 R'000	2006 R'000
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## 4 Retirement benefit *(continued)*

### 4.2 Pension and Provident fund benefits

The Council for Geoscience and its employees contribute to a defined contribution plan. The assets of the scheme are held separately from the Council for Geoscience in funds under the control of trustees. The total cost charged to income of R4,209,919 (2006: R3,385,151) represents equal contributions of 7.5% by the employer and employee.

## 5 Trade and other receivables

Trade receivables	18,252	32,691
Trade receivables - Retention	853	629
Contract customers	52,210	11,526
Other receivables	1,682	1,508
Prepaid expenses	429	6,087
Personnel loans	30	150
	<u>73,456</u>	<u>52,591</u>
Less - Provision for bad debts	( 1,315)	( 6,771)
	<u>72,141</u>	<u>45,820</u>

The Morocco bad debt provision to the amount of R5,456,580 has been reversed since the potential breach of contract due to insurance problems has been averted.

## 6 Cash and cash equivalents

Cash and cash equivalents at the end of the year are represented by the following balances:

Cash at bank	15,524	42,161
Call accounts	141,714	102,680
Cash and cash equivalents at the end of the period	<u>157,238</u>	<u>144,841</u>

## 7 Government grant

Carrying amount at the beginning of year - Refer to note 14.3	7,430	-
Disposals	( 3,246)	-
Recognised as income	( 2,849)	-
Acquired through government grant	95,763	-
Carrying amount at the end of year	<u>97,098</u>	<u>-</u>

## NOTES TO THE FINANCIAL STATEMENTS FOR THE YEAR ENDED 31 MARCH 2007

	2007 R'000	2006 R'000
<b>8 Trade and other payables</b>		
Trade payables	7,996	2,757
Advance clients' billing	232	2,394
Advance European Commission	6,797	9,147
Other payables	9,720	4,205
	<u>24,745</u>	<u>18,503</u>
<b>9 Deferred income</b>		
Deferred income arising as a result of an agreement entered into with the Department of Minerals and Energy to develop and implement various measures to mitigate the effect of mining induced contamination of the ground water in the Witwatersrand area.		
Carrying amount at the beginning of year	4,841	23,135
Amounts received	4,600	-
Interest earned	407	963
Amounts used during the year	( 5,357)	( 19,257)
Carrying amount at the end of year	<u>4,491</u>	<u>4,841</u>
Deferred income arising as a result of an agreement entered into with the Department of Minerals and Energy to develop and implement Small-Scale Mining programmes.		
Carrying amount at the beginning of year	19,518	15,355
Amounts received	21,799	5,465
Amounts used during the year	( 2,236)	( 1,792)
Interest earned	1,396	490
Carrying amount at the end of year	<u>40,477</u>	<u>19,518</u>
Deferred income arising as a result of an agreement entered into with the Department of Minerals and Energy to develop and implement the closing of mine holes.		
Carrying amount at the beginning of year	28,614	13,253
Amounts received	-	15,638
Amounts used during the year	( 10,466)	( 1,012)
Interest earned	1,513	735
Carrying amount at the end of year	<u>19,661</u>	<u>28,614</u>
Deferred income arising as a result of a contract entered into with the Lesotho ARF Project.		

## COUNCIL FOR GEOSCIENCE

# NOTES TO THE FINANCIAL STATEMENTS FOR THE YEAR ENDED 31 MARCH 2007

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## 9 Deferred income (continued)

	2007 R'000	2006 R'000
Carrying amount at the beginning of year	709	1,298
Amounts used during the year	( 358)	( 589)
Carrying amount at the end of year	351	709

Deferred income arising as a result of an agreement with the Department of Minerals and Energy in terms of the Sustainable Development through Mining project.

Carrying amount at the beginning of year	8,050	-
Amounts received	9,300	8,050
Amounts used during the year	( 5,356)	-
Interest earned	587	-
Carrying amount at the end of year	12,581	8,050

Deferred income arising as a result of an agreement with the Department of Science and Technology in terms of the Madagascar Geological Mapping project.

Carrying amount at the beginning of year	3,345	-
Amounts received	1,958	3,880
Amounts used during the year	( 2,717)	( 658)
Interest earned	254	123
Carrying amount at the end of year	2,840	3,345

Deferred income arising as a result of an agreement with the Department of Provincial and Local Government to establish a South African Tsunami Early Warning System.

Carrying amount at the beginning of year	1,950	-
Amounts received	-	1,950
Amounts used during the year	( 427)	-
Carrying amount at the end of year	1,523	1,950

Deferred income arising as a result of an agreement with the Department of Science and Technology to establish an international collaboration research project on the Karoo sequences in South Africa, Botswana and Namibia.

Carrying amount at the beginning of year	1,195	-
Amounts received	-	1,195
Amounts used during the year	( 371)	-
Carrying amount at the end of year	824	1,195
	82,748	68,222

## NOTES TO THE FINANCIAL STATEMENTS FOR THE YEAR ENDED 31 MARCH 2007

### 10 Provisions

#### Provision for leave pay

	2007 R'000	2006 R'000
Carrying amount at the beginning of year	2,357	7,633
Provision current year	2,069	782
Amounts used during the current year	( 371)	( 6,058)
Carrying amount at the end of year	4,055	2,357

The leave pay provision relates to the estimated liabilities as a result of leave days due to employees.

### 11 Surplus from operations

Operating surplus is arrived at after taking the following items into account

#### Revenue

Government grant - core funding	93,100	86,078
Earmarked funding	265	105
Government grant recognised	2,849	-
Contracting revenue	97,701	70,401
Publication revenue	595	624
	194,510	157,208

#### Cost of contracts

Direct cost	53,020	30,554
Personnel expenditure	22,767	17,186
	75,787	47,740

#### Other operating income

Foreign currency gains	5,262	311
Rental income	-	20
Sundry income	732	837
	5,994	1,168

#### Administrative expenses include -

Audit remuneration	621	308
Audit fees		
- Current year	32	49
- Prior year	363	193
- Fee for other services	226	66

## COUNCIL FOR GEOSCIENCE

# NOTES TO THE FINANCIAL STATEMENTS FOR THE YEAR ENDED 31 MARCH 2007

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## 11 Surplus from operations (continued)

	2007 R'000	2006 R'000
Bad debts written off	121	-
Provision for bad debts	(5,455)	5,028
Depreciation - on owned assets	13,462	11,118
- Buildings	1,078	953
- Equipment	7,157	4,870
- Office furniture	20	47
- Motor vehicles	159	693
- Aircraft	1,541	1,518
- Computer software	1,255	1,246
- Computer equipment	2,252	1,791
Rentals in respect of operating leases		
- Land and buildings	322	340
<b>Other operating expenses</b>	985	307
Net loss on disposal of equipment	618	-
Foreign currency losses	367	307
<b>Staff costs</b>	<b>102,411</b>	<b>77,639</b>
Included in staff costs are:		
Defined benefit plan expense for the post-retirement medical aid fund	4,138	1,267
Current service cost	994	1,122
Interest cost	1,654	1,881
Expected return on plan assets	(2,217)	(1,852)
Recognised actuarial loss	3,707	116
- Defined contribution plan expenses for the pension and provident fund	4,210	3,385

## Emoluments

Senior management	2006/2007					2005/2006			
	Pensionable salary R	Provident fund contributions R	Performance bonus R	Other contributions R	Total R	Pensionable salary R	Provident fund contributions R	Other contributions R	Total R
Ramontja T	787,690	63,615	144,510	300,478	1,296,293	685,335	51,400	179,396	916,131
Matsepe L D	367,265	33,913	77,858	213,908	692,944	307,111	23,033	74,878	405,022
Ramagwede L F	550,761	49,047	81,987	285,468	967,263	476,922	36,555	84,672	598,149
Graham G	635,660	49,047	114,484	202,031	1,001,222	514,927	38,620	118,419	671,966
Zawada P K	657,837	47,687	107,329	157,160	970,013	497,750	37,331	110,915	645,996

Management Board member - T. Ramontja  
Performance bonus was introduced in 2006/2007

## NOTES TO THE FINANCIAL STATEMENTS FOR THE YEAR ENDED 31 MARCH 2007

	2007 R'000	2006 R'000
<b>11 Surplus from operations</b> <i>(continued)</i>		
<b>Management Board Emoluments</b>		
<b>Non-executive Board Members</b>		
Ngoepe P E	76,733	41,433
Nkuna A P	19,650	15,215
Barton J M Jr	63,114	35,639
Makibinyane L L	44,948	55,339
Mollo J K	39,300	23,668
Xaso T	31,440	8,453
	<u>275,185</u>	<u>179,747</u>

Details regarding Management Board members service contracts:  
Management Board members representing government departments  
are not included above as they received no emoluments.

The current term of office of the non-executive Management Board  
members expires on 30 September 2009.

### 12 Interest received

Interest received		
- Interest income on call accounts	5,821	5,421
- Interest income on current accounts	741	355
	<u>6,562</u>	<u>5,776</u>

### 13 Finance cost

Interest	<u>50</u>	<u>7</u>
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### 14 Prior-period error

#### 14.1 Useful life of fully depreciated assets

In the 2006 financial year the estimated value (R7,093,000) of the  
extended useful life of fully depreciated assets was incorrectly allocated  
to revaluation reserve instead of accumulated surpluses. The effect of  
the correction of this error on the results of the 2006 financial year is  
as follows:

Decrease in revaluation reserve		
Increase in accumulated surpluses	-	( 7,093)
Adjustment against net assets	-	7,093
	<u>-</u>	<u>-</u>

## COUNCIL FOR GEOSCIENCE

# NOTES TO THE FINANCIAL STATEMENTS FOR THE YEAR ENDED 31 MARCH 2007

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	2007 R'000	2006 R'000
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## 14 Prior-period error *(continued)*

### 14.2 Assets incorrectly expensed

In the 2006 financial year small assets to the amount of R486,651 were incorrectly expensed and formed part of the administrative expenses. The estimated useful lives of these assets were extended and formed part of the revaluation reserve. The effect of the correction of this error on the results of the 2006 financial year is as follows:

Decrease in revaluation reserve	-	( 486)
Increase in accumulated surpluses	-	486
Adjustment against net assets	-	-

### 14.3 Reclassification of revaluation reserve

The Council for Geoscience uses the cost model to account for its assets. In the 2006 financial year assets transferred from government were incorrectly revalued and a revaluation reserve was created. The value of these assets is now recognised as government grant and is reflected as the opening balance in the note to government grant.

### 14.4 Medical Aid Scheme

In the previous financial year the expected return on plan assets assumption was erroneously disclosed at 6% instead of 8%. No financial effect occurred as calculation was done using the correct rate.

## 15 Reconciliation of net surplus for the year to cash generated from operations

Net surplus for the year	16,227	16,776
Adjustments for -		
Interest	50	7
Depreciation on property and equipment	13,462	11,118
Government grant recognised	( 2,849)	-
Net profit on disposal of property and equipment	618	-
Increase in provision for bad debts	( 5,456)	5,028
Interest earned	( 6,562)	( 5,776)
Provision for post-retirement medical aid benefits	4,138	( 1,720)
Operating cash flows before working capital changes	19,628	25,433

## COUNCIL FOR GEOSCIENCE

## NOTES TO THE FINANCIAL STATEMENTS FOR THE YEAR ENDED 31 MARCH 2007

	2007 R'000	2006 R'000
<b>15 Reconciliation of net surplus for the year to cash generated from operations</b> <i>(continued)</i>		
Working capital changes -		
(Decrease)/increase in provision for accumulated leave pay	1,698	( 5,276)
Increase in trade and other receivables	( 20,865)	( 29,012)
Increase in trade and other payables	6,242	10,679
Increase in deferred income	14,526	15,076
Cash generated from operations	<u>21,229</u>	<u>16,900</u>
<b>16 Acquisition of:</b>		
<b>16.1 Property, plant and equipment</b>		
Land and buildings	249	2,770
Equipment	8,034	5,233
Office furniture	13	95
Aircraft	967	7,102
Motor vehicles	2,738	-
Computer equipment	2,508	1,195
	<u>14,509</u>	<u>16,395</u>
<b>16.2 Intangible assets</b>		
Computer software	<u>835</u>	<u>924</u>
<b>17 Contingent liability</b>		
Performance bonds and bid bonds issued for contract work to various financial institutions.	<u>15,669</u>	<u>9,607</u>
<b>18 Taxation</b>		
No provision for income tax was made as the Council for Geoscience is exempted in terms of section 10(1)(Ca)(i) of the Income Tax Act.		
<b>19 Operating lease commitments</b>		
At the reporting date, the outstanding commitments under non cancellable operating leases which fall due, are as follows:		
Up to 1 year	270	389
2 to 5 years	-	70
Total lease commitments	<u>270</u>	<u>459</u>

## COUNCIL FOR GEOSCIENCE

## NOTES TO THE FINANCIAL STATEMENTS FOR THE YEAR ENDED 31 MARCH 2007

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### 19 Operating lease commitments *(continued)*

The Council for Geoscience is leasing office premises from EVN Africa for a period of one year, effective from 1 March 2007. The average lease payments are R22,513 per month, with an extension option.

The Council for Geoscience is leasing office premises and services from the University of KwaZulu-Natal on a monthly basis. The lease payments are R4,023 per month, with no contingent lease payments.

### 20 Financial instruments

Financial instruments consist of cash and cash equivalents, investments with financial institutions, trade and other receivables and trade and other payables.

#### 20.1 Credit risk

Financial assets, which potentially subject the Council for Geoscience to concentrations of credit risk, consist principally of cash, short-term deposits and trade receivables. The Council for Geoscience's cash equivalents and short-term deposits are placed with high credit quality financial institutions. Trade receivables are presented net of the allowance for doubtful debts. Credit risk with respect to trade receivables is limited due to the large number of customers being dispersed across different industries and geographical areas. Accordingly, the Council for Geoscience has no significant concentration of credit risk.

The carrying amounts of financial assets included in the statement of financial position represent the Council for Geoscience's exposure to credit risk in relation to those assets.

Trade and other receivables are controlled by well established policies and procedures which are reviewed and updated on an ongoing basis. The Council for Geoscience does not have any significant exposure to any individual customer or counterparty.

#### 20.2 Interest rate risk

The organisation's exposure to interest rate risk and the effective interest rates on the financial instruments at reporting date are: 31 March 2007

	2007	2006
	Average %	Average %
<b>Assets</b>		
Cash	6.41%	5.50%
Call accounts	7.85%	7.03%

## NOTES TO THE FINANCIAL STATEMENTS FOR THE YEAR ENDED 31 MARCH 2007

2007	2006
R'000	R'000

### 20 Financial instruments (continued)

#### Investments

The risk is perceived to be low due to the following factors:

- Funds are only invested with approved financial institutions according to the policy of the Council for Geoscience, as was approved by the Management Board.
- Investments are only reinvested or invested with Executive Management approval.

### 20.3 Foreign currency risk

The Council for Geoscience undertakes certain transactions denominated in foreign currencies, hence exposures to exchange rate fluctuations arise. It is not policy for the Council for Geoscience to take out cover on these outstanding foreign currency transactions due to the fact that these transactions take place on an ad-hoc basis. The Council for Geoscience exposure at 31 March 2007 is disclosed in note 22.

### 20.4 Airborne operations risk

Risk in respect of the airborne operations of the Council for Geoscience has been identified and transferred to a third party.

### 20.5 Fair value of financial instruments

At 31 March 2007 the carrying amounts of cash and short-term investments, accounts receivable and accounts payable approximated to their fair values due to the short-term maturities of these assets and liabilities. The net fair value of the Council for Geoscience's assets and liabilities are stated below -

#### Assets

Cash and cash equivalents	157,238	144,841
Trade and other receivables	72,141	45,820

#### Liabilities

Trade and other payables	24,745	18,503
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### 21 Capital commitments

Commitments for the alterations of property and equipment

- Approved and contracted for  
Thirteen motor vehicles

2,901	-
2,901	-

## COUNCIL FOR GEOSCIENCE

# NOTES TO THE FINANCIAL STATEMENTS FOR THE YEAR ENDED 31 MARCH 2007

## 22 Foreign currency exposure

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			2007 R'000			2006 R'000
	Exchange rate	Foreign amount	R value	Exchange rate	Foreign amount	R value
<b>22.1 Trade receivables</b>						
Foreign currency						
Ghana Cedi	R0.000750	¢ 59,706	R45	R0.000750	¢ 502,358	R329
Madagascar Ariary	-	-	-	R0.002729	Ar 41,8331	R1,142
Moroccan Dirham	R0.876600	DH 5,869	R5,145	R0.696100	DH 6,966	R4,849
Euro	R9.695200	€ 353	R3,422	R7.528800	€ 1,496	R11,263
US\$	-	-	-	R6.217500	\$ 867	R5,391

## 22.2 Banks

Foreign funds						
Ghana Cedi	R0.00075	¢ 598,061	R449	R0.00066	¢ 528,171	R346
Madagascar Ariary	R0.00359	Ar 4,241	R15	R0.00273	Ar 34,643	R95
Moroccan Dirham	R0.87660	DH 3,390	R2,972	R0.69610	DH 1,162	R809
Euro	R9.69520	€ 835	R8,095	R7.52880	€ 1,034	R7,785

## 23 Related-party transactions

During the year, the following related-party transactions took place between the Council for Geoscience and the Department of Minerals and Energy:

Sales of goods and services

Deferred income	77,210	61,023
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## NOTES TO THE FINANCIAL STATEMENTS FOR THE YEAR ENDED 31 MARCH 2007

### 23 Related-party transactions *(continued)*

During the year, the following related-party transactions took place between the Council for Geoscience and the Department of Science and Technology:

Sales of goods and services

Deferred income	2,840	3,345
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Refer to note 9 for further details regarding deferred income transaction.

The Council for Geoscience offers geoscientific services to government departments.

Government grants:  
Revenue

93,100	86,078
--------	--------

### 24 Change in accounting estimates

The useful life of an aircraft body was estimated in the 2006 financial period at 4 years and has been revised in the 2007 financial period to 10 years.

Depreciation before change	1,797	-
Depreciation after change	719	-
	1,078	-

The amount of R1,078,211 represents the helicopter depreciated for 9 months and the aeroplane for 12 months in the 2007 financial period.

The change of R1,147,257 for a full year will be reflected in future periods.

## LEADING EARTH-SCIENCE SOLUTIONS

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# HIGHLIGHTS OF ACTIVITIES

## OF THE COUNCIL FOR GEOSCIENCE DURING 2006/07

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### AFRICA COLLABORATION

#### African Geological Surveys

The Organisation of African Geological Surveys (OAGS) was launched on 2 February 2007 in Pretoria during the meeting of the African Mining Partnership, and includes representatives from Algeria, Kenya, Ghana, Chad, Zambia, Tanzania, South Africa, Sierra Leone, Nigeria, Mozambique, Mali, Zimbabwe, Angola and Uganda. South Africa was elected to chair and to establish the office of the secretary for the OAGS.

The mandate of the OAGS is to foster and sustain government-supported geoscience endeavours on the African continent in the quest for socio-economic development and poverty alleviation, with special reference to mineral resources assessment, sustainable land use and development, hazard mitigation and environmental protection.

Honourable Minister Buyelwa Sonjica, MP (fourth from right) of the Department of Minerals and Energy and mining ministers from African states attended the African Mining Partnership meeting in Pretoria.



The aims of the organisation include the production of regional and continental promotional maps and documents that will inform decision makers in governments and industries on matters relating to the geosciences.

#### *AfricaArray*

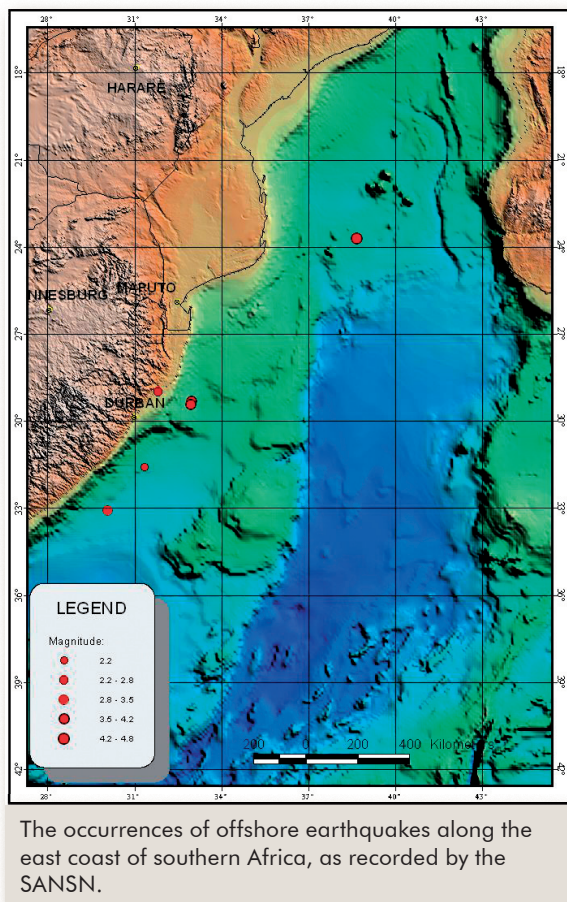
The *AfricaArray* project was initially established by the Pennsylvania State University and the University of the Witwatersrand, and focusses on building geophysics capacity in Africa to create a workforce of highly trained scientists that will meet the long-term manpower requirements of Africa's natural-resource sector.

It is the task of the CGS to install seismic stations in participating countries to form an earthquake-detection network. Technical personnel in each country are trained by the CGS in the operation and maintenance of the seismic stations. To date, the CGS has installed stations in Zambia, Zimbabwe, Malawi and Mozambique, and has provided intensive training to the local technicians.

The CGS has submitted two new proposals for approval to be carried out as subprojects of the *AfricaArray* programme. The first proposal aims to examine data from the mining areas around Carletonville by installing a small network of seismic-monitoring stations above ground and incorporating the information obtained from these with data from the underground networks in mines. While the data will be unique to South Africa, it will be available to students and researchers throughout Africa for use in their studies. The second proposal is a project to examine the interaction of the climate and earth on the African continent.

#### Earthquake Monitoring

The aftershock activity in Mozambique has continued at a high level since the major earthquake of 22 February 2006, which measured 7,3 on the local Richter magnitude scale. The South African National Seismograph



Network (SANSN) has recorded more than 350 seismic events in the area since then; the largest aftershock, which occurred on 14 April 2006, having a local Richter magnitude of 6,5.

The Ceres/Tulbagh area experienced an earthquake of 3,8 on the local Richter magnitude scale one day prior to the 38th anniversary of the devastating 6,3 magnitude event of 29 September 1969.

Five offshore earthquakes were recorded by the SANSN, which raises a concern that these could possibly trigger submarine landslides leading to localised tsunamis along the east coast of South Africa. The largest event, recorded during June 2006, had a magnitude of 4,2 on the local Richter scale and occurred approximately 200 km to the east of Durban. A magnitude 3,9 earthquake occurred in the same area during November 2006. Two other events, with magnitudes of 2,2 and 3,5 respectively, occurred further down the coast at a distance of approximately 120 km from Port St Johns and 140 km from Kei Mouth. The most recent offshore earthquake occurred during January 2007 in the vicinity of Richards Bay.

## Indian Ocean Tsunami Early Warning System

The CGS was designated by the National Disaster Management Committee, on behalf of the South African Government, to act as the scientific and technical point of contact for tsunami-related issues after the devastating earthquake that occurred on 26 December 2004 off the northern tip of Indonesia's Sumatra Island. As the CGS operates and maintains an advanced seismological network, capable of detecting earthquakes that may cause tsunamis, five of the SANSN stations were dedicated to contributing seismic data to an International Data Centre.

Funding was made available by the Department of Provincial and Local Government and the CGS was requested to upgrade the stations with respect to data communications, infrastructure and seismic-recording equipment. This required the complete reconstruction of the Musina station. Several discussions took place between Telkom and the CGS and these resulted in an agreement that Telkom will be responsible for the establishment of a communications network to be maintained and proactively managed by them. The CGS, at the beginning of 2006, commenced with the installation of interim GPRS equipment that is capable of transmitting real-time seismic data to the National Data Centre in Pretoria.

Data from the five dedicated seismograph stations will, for the time being, be made available to the GeoForschungsZentrum (GFZ), Potsdam, Germany which is operating an advanced global seismograph network.

## Seismotectonic Map of Africa

The Seismotectonic Map of Africa will be used to develop a sustainable earthquake-disaster mitigation strategy, with the compilation of all the active faults and the building of a database in cooperation with existing networks, such as *AfricaArray*. The Seismotectonic Map of Africa is a project by the Commission for the Geological Map of the World to gain knowledge of the geology and geodynamics of Africa. This map will accompany the International Geological Map of Africa and the International Tectonic Map of Africa, both on a scale of 1:5 000 000.

Geological hazards, which are very important in northern Africa, have a limited impact in the sub-Saharan area, except in the East African Rift System and the Cameroon volcanic line, where earthquakes are asso-

ciated either with active fault zones or with volcanic activity. Earthquakes have also been experienced in the Cape fold belt and the deep-mining areas of South Africa. A draft map has been produced, and the final product will be completed during 2007/08.

## Mineral Resources for Sustainable Development in the Southern African Context

Countries of the Southern African Development Community (SADC) have worked together on several geoscience projects over the past few years. The development of the mining and mineral industries (in particular the artisanal and small-scale mining sectors) of the respective SADC countries could contribute significantly to NEPAD's current priorities of achieving sustainable development and alleviating poverty.

The African Minerals database was designed for the compilation of the International Metallogenic Map of Africa on a scale of 1:5 000 000, using SAMINDABA (the South African Minerals Database) as a model. To keep the database relevant, it must be updated continually. One way of ensuring sustained relevance of the database is by the innovative manipulation and interrogation of existing and new data, using mathematical and statistical methods to produce prospectivity maps, and to advance knowledge of the origin and evolution of mineral deposits.

The project falls within the African Development focus and represents a new and exciting research direction for the CGS. Good progress has been made on this project, and the team has been expanded to include both junior and senior scientists.

To date, the various relevant data sets have been brought together into a GIS database framework. Where necessary, data were simplified and reclassified to suit the purposes of the project. A data-driven model was selected for the pilot project, which uses known data as a reference set and provides a quantitative method for integrating multiple sources of information. Different approaches will be used for the prediction of undiscovered mineralisation in poorly explored regions with limited data.

## Tri-Nations Karoo Basin Correlation Project

The CGS currently manages a collaborative research project, funded by the Department of Science and Technology, which entails research by employees of

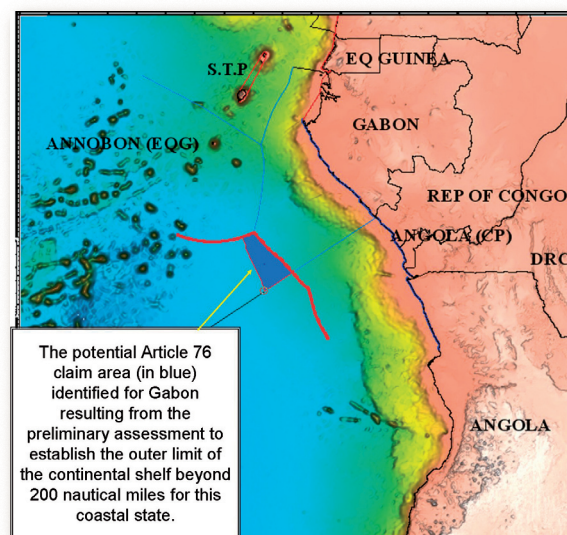
the CGS and the Geological Surveys of Botswana and Namibia. This project investigates and correlates the sedimentary rocks in the Karoo-age basins of southern Africa, which contain all of the region's coal reserves. The primary project research focus is on the Kalahari Karoo basin, which extends from South Africa through Botswana and into Namibia.

To date, the CGS has assigned two geologists to the project, both of whom have visited Botswana and Namibia on several occasions during the past year to collect geological data. On two occasions they specifically visited the Kang Core storage facility in Botswana where geological drill cores were studied. The Geological Survey of Botswana assigned one young geologist to the project on a full-time basis, together with a senior scientist who will act in a supervisory capacity. A post-graduate student at the University of Namibia was also identified to participate in the project and is set to join the Geological Survey of Namibia at a later stage.

In general, scientific research for this project is progressing well. Most of the data collection has been completed and to date good collaboration has been achieved between scientists and other employees of the different science organisations. During the coming year, project activities will focus on integrated analysis and interpretation of research results.

## Surveying and Mapping of the African Shelf (EEZ)

In terms of Article 76 of the United Nations Law of the Sea, coastal states have until 2009 to extend their jurisdiction over certain areas of the legal continental shelf beyond the limits of their present Exclusive Economic Zone (EEZ).



The collaborative African Shelf Project was initiated by Senegal and the CGS; it was subsequently mandated to proceed by the African Mining Partnership in accordance with NEPAD principles, with the objectives of:

- raising awareness of the United Nations Article 76 requirements,
- facilitating dissemination of information,
- offering broad assistance to fellow African states with respect to their continental-shelf claim programmes, and
- by making use of South African and Senegalese experience and skills, building capacity in assisting with the development of programmes for such states.

The Marine Geoscience Unit of the CGS managed the research programme and, through the use of external consultants, prepared preliminary assessment reports for thirteen selected coastal states, namely the Republic of Congo, Democratic Republic of the Congo, Gabon, Guinea, Guinea-Bissau, Kenya, Madagascar, Mozambique, Senegal, Sierra Leone, Somalia, Tanzania and Western Sahara.

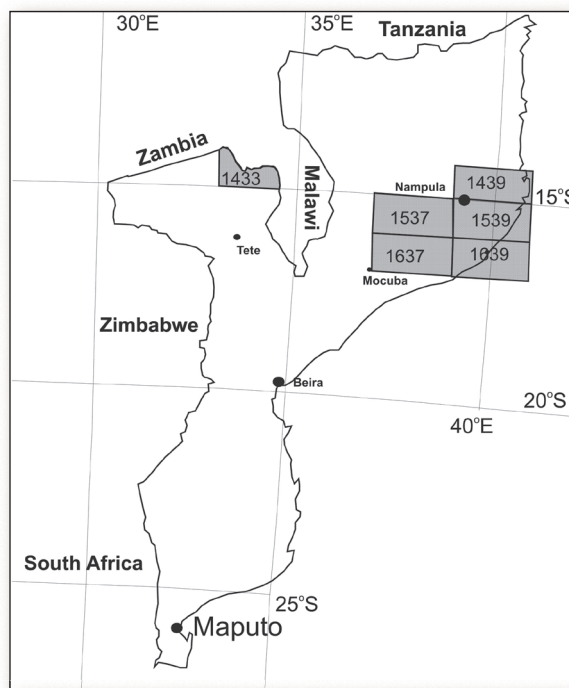
The preliminary assessment reports identify the potential Article 76 claim areas using currently available public-domain data and provide each coastal state with recommendations on how to approach undertaking an Article 76 submission.

The preliminary assessment reports have been completed and are ready to be delivered to the relevant authorities within the selected coastal states. The Kenyan Continental Shelf Task Team has initiated contact to discuss the future role of the CGS in bringing this significant issue to the attention of other African leaders.

## Mapping in Mozambique

South Africa's contributions to the Mineral Resources Capacity Building Project in Mozambique comprise historic and current services rendered by the CGS to the National Directorate of Geology (DNG) of the Ministry of Mineral Resources and Energy (MIREME), in terms of the Geological Infrastructure Development Project. The work was co-funded by the Department of Science and Technology and the CGS to the amount of R11,3 million. Part of the CGS's work in Mozambique involved the geological remapping of six maps on a scale of 1:250 000.

The final maps and accompanying map explanations were completed by the CGS early in 2007. These high-



Mozambique geological mapping project with the study area highlighted.

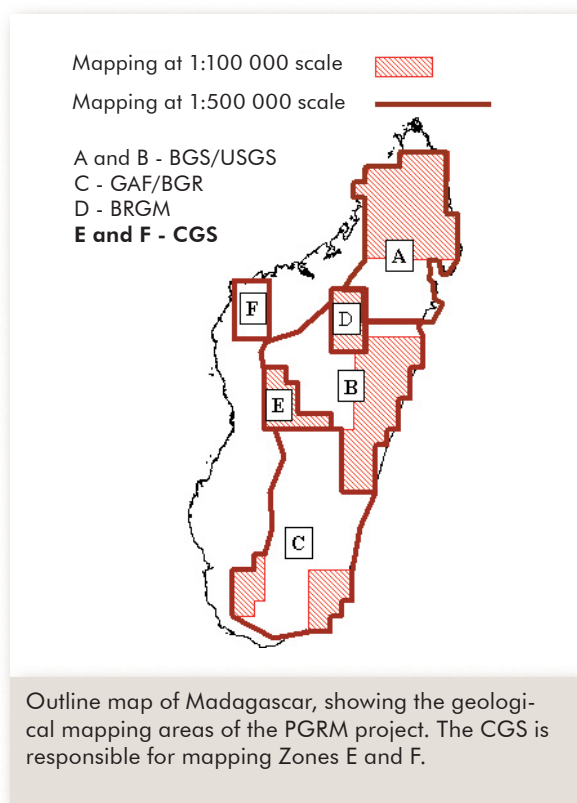
quality products have incorporated 500 whole-rock major- and trace-element analyses of rock units, as well as 32 new SHRIMP U/Pb zircon dates, nine Ar/Ar dates and one Rb/Sr date. The work conducted in Mozambique constitutes a major contribution to the scientific training and development of young geoscientists in the two countries, as well as a greatly improved understanding of the geology of the study area. The results of this project will be highly beneficial to mineral exploration in northern Mozambique.

## Madagascar Mapping Project

The CGS is undertaking a geological mapping and stream-sediment sampling project in Madagascar. This project involves co-funding between the 'Projet de Gouvernance des Ressources Minérales' (PGRM), backed by World Bank funding, and the South African Department of Science and Technology.

There are other international consortiums mapping different zones in Madagascar as part of the overall PGRM project. The CGS is responsible for Zones E and F.

In spite of poor infrastructure and access in places, field work conducted by the CGS was completed on time and within budget. All stream-sediment sampling is now complete, with 3 000 samples having been



collected. Samples will be analysed at the CGS laboratories in Pretoria. Geological mapping is complete, with age dating having been undertaken in Australia in March 2007. The map compilation will take place between March and November 2007, with map production being carried out by the Spatial Data Management Unit in Pretoria.

## Geochemical Map of the Kingdom of Lesotho

The Department of Mines and Geology of Lesotho presented a project proposal to the CGS for the geochemical mapping of Lesotho. The main purpose of this project was to create a knowledge infrastructure of the geology of Lesotho and to stimulate prospecting and exploration. Most of the field work for this project was done during the exploration for diamonds by the Lesotho Government from 1971 to 1981 through the United Nations Development Programme. The stream-sediment samples that were collected during the diamond-exploration programme have never been analysed chemically and hence the full geological data benefit of the already collected samples was never realised. The CGS agreed to analyse the stream-sediment samples for 23 elements on a simultaneous XRF spec-

trimeter and to produce geochemical maps for each element to complement the geological, magnetic (only in the extreme south) and gravity maps that already exist.

A total of 11 375 samples have been prepared and analysed. This brings the analytical phase of the project to an end.

## Kaapvaal Craton Magnetotelluric Project

A research project was initiated by the CGS to study the Kaapvaal craton with the aim of gaining more information on the general structure and the thickness of the continental crust of the craton. By analysing the electrical properties of the craton at depth, the formation and structure of the African continent and the development of minerals may be better understood. The project was also aimed at achieving a transfer of magnetotelluric (MT) knowledge from scientists in Europe to their counterparts in South Africa.

During the year, MT data were collected in Botswana, across the northern parts of the Kaapvaal craton and the contacts with the Rehoboth craton and the Damara mobile belt. Several of the data profiles have already been processed and preliminary results reported.

This project is an extensive collaboration between the CGS and several international and industry partners, including the Dublin Institute of Advanced Science in Ireland, the Woodshole Oceanographic Institute in the United States of America, the Geological Survey of Canada, De Beers, Rio Tinto and BHP Billiton. Several workshops, data-processing and interpretation sessions were held in South Africa and in Ireland. Various presentations and publications have resulted from this project and data will continue to be processed by partners in the consortium.

## INTERNATIONAL COOPERATION

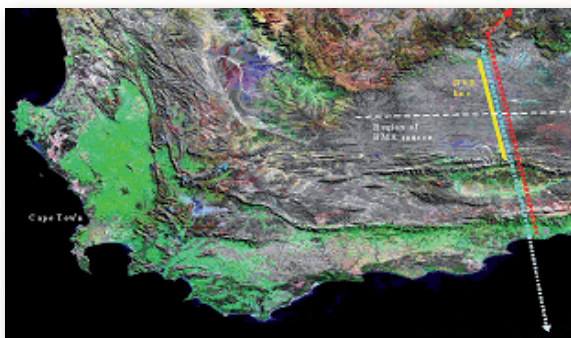
### Sixth Framework Programme (FP6) — EO-Landeg

EO-Landeg is a South African-European research project co-sponsored by the sixth Framework Programme (FP6) and the Department of Science and Technology. The project aims to implement a pilot earth-observation initiative for land degradation and

integrated water management in the Eastern Cape catchment that is characterised by vulnerable ecosystems. This pilot programme includes activities such as assessing the relevance of available earth-observation tools and data sets to support conservation measures and adequate management strategies. Dissemination of the results, education and awareness are major components of the EO-Landeg programme that involves local stakeholders, universities, schools and the community. Young South African researchers are actively involved in the project with the direct benefit of EO-Landeg being the setting up of a training centre that will be supported by international knowledge and expertise.

## Inkaba ye Africa

Inkaba ye Africa is a South African-German collaboration in which the CGS plays a significant part. One of the projects that the CGS is involved in is the Agulhas-Karoo onshore-offshore geoscience transect using deep seismic profiling, which will bring new insights on the earth's crust at the transition between the oceanic and continental crust in South Africa. It may also contribute to new geological interpretation and new geodynamics of mineral deposits and groundwater occurrences. Under this collaboration between the GeoForschungsZentrum (University of Potsdam), the University of Cape Town and the CGS, further geophysical data will be collected. A CGS geoscientist is currently working on the data towards completion of an MSc degree.



The Agulhas-Karoo geoscience transect across the Karoo and Cape fold belt with a MrSID (Multi-resolution Seamless Image Database) satellite image of the Western Cape in the background. The recent experiments comprise Near Vertical Reflection Seismics (NVR) = yellow, Wide Angle Reflection Seismics (WRR) onshore-offshore line = light blue, Magnetotellurics = red; surface projection of the Beattie Magnetic Anomaly source = white line.

## Radar Interferometry for Mapping Soil Erosion

This is a collaborative project between the CGS and the University of Reunion Island. The research team is developing a new remote-sensing methodology using Radar Interferometry (RI) to measure and compare erosion rates in Reunion Island and the Eastern Cape. Interferometry has very important applications in understanding rates of soil erosion as well as in ground-related subsidences such as sinkhole formation.

## Comprehensive Test-Ban Treaty

Owing to South Africa's commitment to the Comprehensive Test-Ban Treaty, the CGS is designated to act as the technical point of contact with respect to seismological and infrasound matters and also to operate a National Data Centre which functions within the framework as required by the Comprehensive Test-Ban Treaty Organisation (CTBTO). The CGS's obligation is to manage the various components within the project and to ensure continuous data flow and availability from the seismograph and infrasound facilities.

During the last few years of operation and maintenance of the stations, staff from the CGS has gained experience in identifying, isolating and repairing technical failures of the specialised equipment at the stations.

In 2006/07 the following activities were completed:

- Experts from the United States Air Force Technical Application Centre (AFTAC) and from the Global Communications Infrastructure (GCI) visited the CGS and provided training to the CGS staff on the latest upgrades of the equipment for the stations.
- The CGS continued to show its support of the CTBTO through regular attendance of Working Group B meetings.
- The CGS provided its annual training on the operations of the SANAA station in Antarctica to the newly appointed operator from the North West University.

## Collaboration in Water Research with International Partners

The Water Geoscience Unit of the CGS has concluded fruitful discussions with international institutions to conduct collaborative research. Talks with the Norwegian Institute for Water Research (NIVA) have led to the successful securing of research funding for

studies on environmental auditing liability apportionment relating to acid mine water management. Bilateral funding administered through the Norwegian Research Council and the South African National Research Foundation will allow for such research and scientist exchange programmes. NIVA will also play a role in an environmental geochemical forensic-auditing research project to develop a methodology for apportioning environmental liability for polluters and contributors in the gold-mining area of the Witwatersrand central basin that collectively impact negatively on underground mine water quality and volumes that are needed to be pumped to surface and treated before release into the environment. The methodology developed in the pilot study will then, if proven successful, be used in similar investigations in other basins of the Witwatersrand gold-mining area, in other mining areas for different mineral commodities in South Africa, and further afield in the countries of the Southern African Development Community (SADC), and in Africa.

Furthermore, an agreement of intent to collaborate on innovation research to develop and commercialise a range of passive water samplers using diffusive gradients through filters technology (DGT) has been reached between NIVA and the CGS. The modalities and content of a memorandum of agreement to form a joint venture are still to be discussed, formulated and finalised.

Discussions and joint proposal development with the French Geological Survey (BRGM) have led to the securing of funding for research into passive treatment methods and technologies for cooperative studies on decanting acid mine water in two environments – dolomitic karst in the gold-mining area of the Witwatersrand western basin of South Africa, and a fractured rock environment at St Yprien in France. This project also has a scientist exchange component.

An expression of interest for a World Bank GEF-funded project 'Groundwater and Drought Management in SADC' has been submitted to the SADC Water Sector Coordinating Unit, involving a consortium of the BRGM of France as an international partner and a Botswana consulting company as a SADC partner. The documentation of this initial phase of a tendering process is still being evaluated.

## Predictive Discovery of Large Ore Deposits

The CGS was approached to take part in the United States Geological Survey (USGS) Global Mineral

Resource Assessment Programme (GMRAP) in 2003. The GMRAP is a research project, initiated by the USGS and conducted in cooperation with international organisations, to assess the world's undiscovered non-fuel mineral resources. This project is designed to develop and test methods of assessing the undiscovered mineral resources on land, to outline principal land areas that have the potential for selected undiscovered mineral resources and to estimate the probable amounts of those resources to a depth of 1 km below the earth's surface.

After several presentations and meetings between the CGS and the USGS from 2003 to 2005, the CGS made a decision to take an active role in the GMRAP Africa study, and particularly the southern Africa study. The motivation behind the participation was the work being undertaken for the project entitled 'Mineral resources for sustainable development in the southern African context'. This project is designed to ensure sustained relevance of the CGS databases through innovative manipulation and interrogation of the existing and new data and data sets (geochemistry, geophysics, geology, structure, etc.), using mathematical/statistical methods, to produce prospectivity maps and to advance the knowledge of the origin and evolution of mineral deposits (deposit modelling).

This culminated in the co-hosting by the CGS of the southern Africa assessment workshop of GMRAP in Pretoria in March 2006. The workshop, which was attended by a number of leading geoscientists from southern Africa and the USA, had the objective of assembling top geoscience experts from the southern African region to facilitate a detailed scrutiny of available geological data sets and to outline regional locations that hold potential for the occurrence of, as yet, undiscovered resources of copper, platinum-group metals (PGM) and potash to a depth of one kilometre below the surface, and to determine quantitative probabilistic estimates of such undiscovered mineral resources.

The direct benefits of participation in the GMRAP include skills and technology transfer, specifically with regard to the methodology employed, capacity building for junior staff members, publications (over the long term) and knowledge gain, including the delineation of prospective tracts which could then be further investigated using other assessment and target-generating methods (e.g. statistical, neural networks and fuzzy logic, etc.), and will promote further exploration leading to the discovery of potential deposits.

## Precambrian Crustal Evolution and Metallogeny of Peninsular India and Eastern Southern Africa

This project is one of the earth-science collaborative efforts entered into between the Geological Survey of India (GSI) and the CGS as part of a wider programme of cooperation between South Africa and India. The project involves the collaboration of Indian and South African scientists in developing a tectonometallogenic framework for the Precambrian crust part of the Indian and African crustal fragments, which were once amalgamated with the Gondwana Supercontinent.

This study will serve as a basis for the development of future mineral-exploration programmes in the Indo-African region and will lead to a better understanding of the tectonic settings and metallogeny of the Indian and African cratonic areas.

The CGS and GSI data sets have been integrated in the Geographic Information System (GIS) and work on the accompanying explanation is underway. A detailed description of the tectonics and geology in the areas adjacent to one another in the reconstructed Gondwanaland will be included, as well as a brief discussion of the outlying areas.

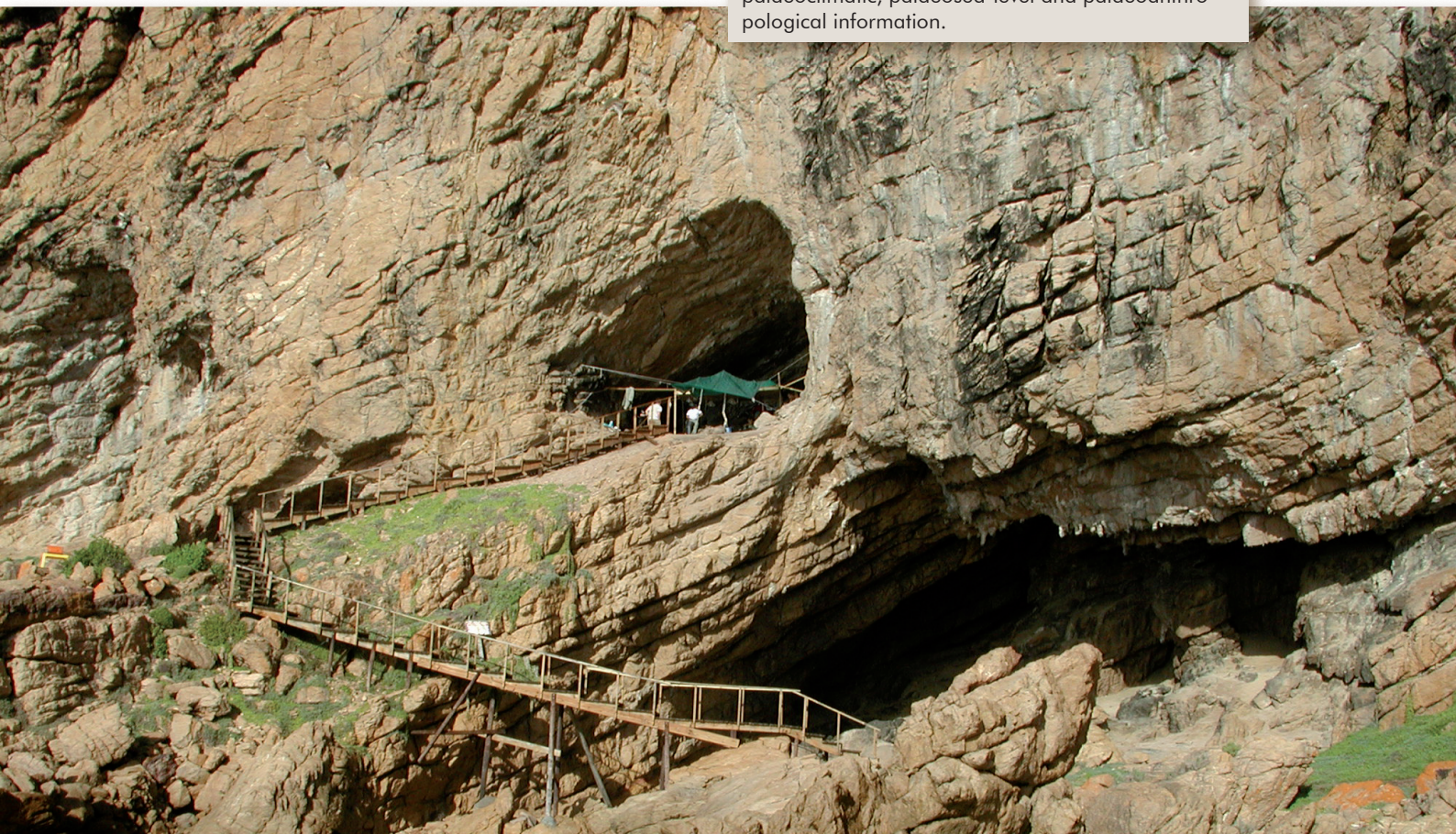
## OTHER GEOLOGICAL AND ASSOCIATED MAPPING AND RESEARCH

In addition to the international geological mapping projects in Mozambique and Madagascar, which have been discussed previously, CGS geologists are also busy mapping in Ghana and within South Africa. As the field work has been completed on the last of the 1:250 000-scale geology maps of South Africa, work has commenced on updating older maps, with the Clanwilliam map sheet being the first. Research work has also been taking place examining the coastal Cenozoic deposits along the Cape coast and their implications for global change and human origins. By examining the ancient sea-level record it is hoped that the observed trends in climate and sea-level changes can be interpolated and used to predict future trends, and calculate how these sea-level changes may impinge on present-day communities and settlements in the future.

A long-term mapping project of the Maputaland coastal plain has been concluded. It was aimed at documenting and interpreting the effects that climate change had on the rising and falling of the sea level, in order

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Wave-cut archaeological caves at Pinnacle Point, Mossel Bay. The caves are an exceptional source of palaeoclimatic, palaeosea-level and palaeoanthropological information.





The Maputaland regolith mapping project has provided insight into the complex relationships between dune systems of many ages forming the coastal plain, which have a strong influence on ecological patterns across the region.

A large rotational palaeolandslide in the Bushmans River valley in the Giant's Castle Nature Reserve, Ukhahlamba-Drakensberg Park, KwaZulu-Natal. The landslide temporarily blocked the river, which has eroded a new course around the toe of the landslide.



to be better able to predict the effects of future climate change. The evidence of falling sea level within the St Lucia lake complex suggests that the present form of the system has developed relatively recently. During the past 3 000 years, the lake system had a more direct link to the sea. Luminescence dating of specific dune patterns, lake sediments and beach deposits has provided an absolute dating framework which can now be applied to correlate significant environmental changes all along the southeastern coast of Africa. On a more local scale, this research highlighted the critical importance of ground-water seepage to the lake system, particularly during dry periods.

Studies have been undertaken of the local bathymetry, oceanography, sea-floor geology and sub-sea-floor geology, both in the mouth of Durban harbour (South Africa's busiest) and in the approach areas to the harbour mouth, as well as of the Aliwal shoal. These allow a better understanding of the sea-floor topography in this area, which is useful information that will allow better planning and enhance the safety of vessels using the harbour. This work has improved the understanding of sea-level and climate changes that have taken place along our coast since the last Ice Age.

In KwaZulu-Natal, where landslides occur frequently, sometimes with devastating results, a project has been instituted by the CGS to apply a holistic approach to regional landslide mapping in an effort to compile a comprehensive landslide inventory and produce a landslide susceptibility map. Researchers have been amazed at both the large size of some of the landslides and their frequency. Most of the recent landslide events commence with small slope failures, triggered by extreme rainfall events and disturbances related to infrastructure developments. The larger landslides appear to be largely older palaeolandslides. The resulting landslide susceptibility map will be particularly useful in guiding planned regional and urban development.

South Africa's Bushveld Complex is the world's richest tract of mineralised ground, containing most of the world's resources of platinum-group metals (PGM), chromite and vanadium, as well as enormous quantities of iron, titanium, nickel, copper and lesser cobalt. It is thus appropriate that the CGS is undertaking structural mapping and research of part of the eastern Bushveld Complex and surrounding metamorphic aureole. The project has entailed detailed geological mapping and documentation of macro- and microfabrics within the sedimentary rocks that the Bushveld Complex rocks have intruded. Metamorphic studies have also been undertaken; all of this aimed at better understanding the evolution of this highly mineralised

suite of intrusive rocks. To date, the project has recognised three major deformation events at the margin of the Bushveld Complex, which have been caused by localised emplacement deformation, regional diapiric deformation and folding and shearing as a result of diapirism. Potential economic spin-offs of this research include the recognition of new exploration targets for both PGM and Ni-Co mineralisation.

## SUSTAINABLE DEVELOPMENT

### Small-Scale Mining Programme

The Small-Scale Mining Programme is aimed at reducing poverty in underdeveloped rural communities through sustainable development and the exploitation of small-scale mining resources. This is to be achieved by extending streamlined institutional support and technical expertise to develop small-scale mining projects through to prefeasibility or feasibility studies. Assistance is rendered by the CGS to lower the geoscientific risk inherent in small-mining ventures by extending financial support, and scientific and managerial expertise to those small-scale miners who can demonstrate a bona fide lack of resources. This approach has distinct advantages as it makes the programme more accessible to mostly poor and needy communities and, therefore, offers a high-impact mechanism of poverty alleviation through minerals development. Hence it is hoped that this assistance will enable aspiring small-scale miners, most of whom lack the scientific knowledge and ability to lower the geoscientific risk inherent in their projects, to acquire a bankable mining proposal that can be used to apply for initial venture capital from traditional lending institutions such as banks.

During the year, 90 projects were approved for technical investigation and purchasing of equipment under the auspices of the Small-Scale Mining Programme. These projects cover a range of commodities from river sand, aggregates, brick and ceramic clay, to sandstone, coal, base metals, alluvial diamonds and gold, whilst some address the upgrading or beneficiation of minerals. Thirteen projects have been completed according to the Small-Scale Mining Board (SSMB) terms of reference, and the remainder of the projects are still in progress.

The CGS recognises the enormous task required to fulfil the objectives of the Small-Scale Mining Programme and achieves this by using external consultants and taking advantage of the institutional

capacity at its provincially based regional offices. These regional offices are ideally positioned to fulfil this task as they are geographically located closer to the sites of the small-scale mining projects in their provinces, thereby enabling the CGS to provide geoscience expertise and overall management of a number of these small-scale mining projects.

The programme is ongoing and will continue into the 2007/08 financial year. Future direction of the programme will be determined in conjunction with the Small-Scale Mining Board.

## TARGET GENERATION

### Carbonatite Characterisation

The discovery of new carbonatite and alkaline complexes may lead to small-scale mining ventures that will alleviate poverty in the rural areas. The Ramakokskraal carbonatite in the Limpopo Province is such a target for possible small-scale mining ventures for commodities such as rare-earth elements, phosphates, lime and base metals.

In order to verify the validity of the Ramakokskraal geochemical target, 117 soil and 15 rock samples were collected across the regional anomaly during the previous financial year. An amount of R3 million was granted to further characterise the Ramakokskraal carbonatite in a six-phased process. The phased approach involves

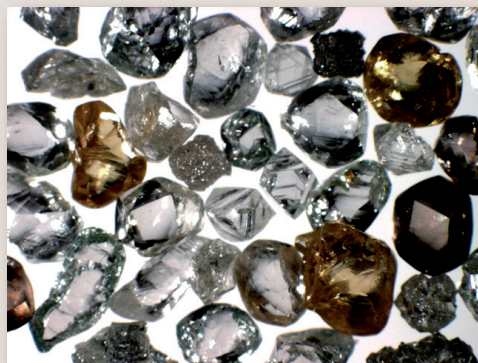
1, and one sample per 50 m and then 25 m successively for phases 2 and 3. Thereafter, if prospects still remain promising, trenching and finally some drilling will be considered. Phase one was completed before the end of the financial year and the results submitted in report format for the attention of the Department of Minerals and Energy.

### New Publication on the Occurrence of Diamonds in South Africa

Diamonds were discovered in South Africa in late 1866 and the first 'diamond rush' in the country occurred along the banks of the Orange and Vaal Rivers in 1869. From 1872 until the outbreak of the First World War, South Africa produced more than 97% of the world's diamonds, making it the home of modern diamond mining. The country continued to dominate world diamond supply, producing more than half of global production until the early 1930s, shortly after the onset of the Great Depression. Though no longer the dominant supplier, South Africa continues to be a significant producer of high-quality gemstones, having been the world's third-largest producer of diamonds by value, in 2005, after Botswana and Russia. Of the estimated 4,13 billion carats of diamonds produced globally, South Africa has produced just less than 15%.

South Africa is the only country in the world where diamonds are mined from kimberlite pipes, dykes (fissures) and blows, as well as from eluvial, alluvial and marine sediments. Indeed, the west coasts of South Africa and Namibia host the only known diamond

Diamonds from the Swartruggens kimberlite, displaying a variety of crystal morphologies and colouration  
(Photograph: N. McKenna).



systematically increasing the investigative detail in which the distribution of the target commodities will be recorded. In this manner, the sample spacing is decreased from the initial single sample per square kilometer to one sample every 100 square metres in phase

mega-placer deposits recognised on earth. All of these factors help make a book on South African diamond deposits of enormous interest to people involved in the broader diamond industry throughout the world. The main aim of this book, which will be published by the



Mining activities in the Venetia Pit, currently South Africa's largest diamond mine (Photograph: De Beers).

CGS within the 2007/08 financial year, is to describe the wide variety of diamond deposits, from the primary kimberlite deposits to the various alluvial and marine deposits that occur in South Africa. Accompanying the book will be two fold-out maps, one of which incorporates the De Beers kimberlite database and shows the diamond deposits and kimberlites of South Africa. The other will be a provisional map, showing currently operating and abandoned alluvial deposits in the North West Province diamond fields, at farm scale.

In order to make this publication as accurate and authoritative as possible, it was conceived as a cooperative endeavour between the CGS and some of the main operators within South Africa's diamond-mining industry, such as De Beers, Trans Hex, Petra Diamonds and Etruscan Diamonds.

The aim of this book and accompanying maps is to assist individuals and companies wanting to invest in South Africa's diamond-mining industry, particularly in the less capital-intensive alluvial diamond-mining sector and, as a result, the authors have made an effort to balance the contributions on the primary and alluvial deposits.



A north-facing view of a 65 m deep sampling trench at Baken Mine on the lower Orange River. The uneven bedrock forms ideal trapsites for diamonds to collect (Photograph: A. van der Westhuizen).

## The Economic Valuation of Pegmatite and Copper Deposits in Namaqualand

In an attempt to promote the minerals industry of Namaqualand, a study was initiated on pegmatites to increase the understanding of pegmatite ore-body genesis and the methods used to mine pegmatites. During the year, this project was expanded to include analyses on the mineral feldspar from selected pegmatites. This was undertaken to ascertain the quality of the mineral, which dictates for which industries and applications the feldspar is suitable, in order to provide further information for small-scale pegmatite miners and to assist them, as well as the Department of Minerals and Energy, in effectively mining these deposits and marketing the product. A comprehensive ore-deposit model will also be developed for the Namaqualand pegmatites.

With the demise of the copper-mining industry in Namaqualand, it was decided to include a desktop study on the copper-mining potential of Namaqualand for small-scale operators as a potential poverty-alleviation programme.

## Quantitative Pressure-Temperature (P-T) Study of Metamafic Rocks in the Tugela Terrane, Natal Belt, South Africa

The rocks constituting the Tugela terrane are a heterogeneous assemblage of highly metamorphosed and folded rocks that represent continental and oceanic crust forced together during the development of a high mountain chain, following a plate tectonic-collision event. The Tugela terrane has traditionally been described as a series of four slabs of oceanic crust thrust onto the continental crust. However, new data have shown that the Tugela terrane is best interpreted as an assemblage of discrete, oceanic-arc-related tectonic elements, including a minor oceanic-crust ophiolite component rather than a tectonised ophiolite suite.

Detailed whole-rock geochemistry, geochronology and petrological studies were carried out on selected rocks. The study aims to test interpreted metamorphic conditions based on petrographic studies for each of the tectonic events documented, in order to compare and contrast the respective conditions of formation.

Fold interference pattern showing two sets of co-axial folds deforming the regional fabric.



The electron-microprobe-based geothermobarometric (pressure-temperature, or P-T) studies provide a precise quantification of the depth and pressure affecting the Tugela terrane rocks during peak metamorphism.

The results of the study reveal that the entire terrane experienced the same P-T conditions. This new understanding of the P-T regimes contributes to a better understanding of the Natal belt, thereby contributing to an improvement in palaeogeographic reconstructions prior to the final assembly of Gondwana, which plays a major role in the distribution of mineralisation and in this way is important to mineral exploration.

## RECAPITALISATION

### New CGS Helicopter

The Squirrel B2 helicopter that was purchased in the previous financial year arrived in Gauteng early in the year under review. It was subsequently fitted out with surveying avionics, geophysics crystals, and booms and wires, amounting to a total additional attachment mass of 360 kg. With these attachments it underwent its final CAA test flight. After the issuing of the license papers, the helicopter was flown to the Botanical Gardens, adjacent to the CGS head office in Pretoria, for staff members to see and inspect. Thereafter, it was flown back to its base at Grand Central Airport in Midrand, to be prepared for contractual obligations in Gabon and elsewhere.

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The Squirrel B2 helicopter will be used to fly high-density geophysics in mountainous terrains, and for geochemical sampling and support for field mapping during national and international contracts.



The new helicopter of the CGS is equipped with the latest geophysical equipment needed for airborne surveys.



## Newly Acquired Laboratory Equipment

The Laboratory Unit of the CGS acquired some new instrumentation and was also able to upgrade existing instruments during the year. These include a new carbon and sulphur analyser to replace an old instrument that had become increasingly difficult to maintain; the placement of an order for a new state-of-the-art X-ray diffractometer (XRD) and an upgrade for the electron microprobe. The carbon and sulphur analyser will be suited for determining sulphur in soil and rock samples and will therefore be ideal for both geochemical exploration work and for environmen-

JR-6A dual-speed spinner magnetometer.



MMTD80 thermal demagnetiser.

tal applications. The new XRD will have the latest Rietveld-based quantification software and generation fast-detectors to increase quality and speed of service delivery to the rest of the organisation and its clients. The microprobe upgrade will bring tremendous relief to the internal users, add scientific value to projects and improve the CGS's laboratory service in general.



Early in the year, the Physical Properties Laboratory acquired several new instruments for the study of rock-magnetic and palaeomagnetic properties. These instruments include:

- The JR-6A dual-speed spinner magnetometer for the measurement of the remanent magnetisation of rocks using classical (i.e. non-quantum, non-cryogenic) operating principles.
- The MFK1-FA multi-function kappabridge for the measuring of the anisotropy of magnetic susceptibility of rocks, as well as in-phase and out-of-phase bulk magnetic susceptibility in weak variable fields and at three different operating frequencies. This instrument can even measure the anisotropies of diamagnetic and near-zero susceptibility samples.

- The CS-3 furnace apparatus that is attached to the MFK1-FA model and measures the high-temperature variations of magnetic susceptibility, which enable the determination of Curie transition temperatures. The Curie temperature can be used as a diagnostic tool to identify magnetic mineralogy. This tool has, until now, not been available at the CGS.
- The MMTD80 thermal demagnetiser which has the capacity to demagnetise 80 samples simultaneously. The necessary attachments for the MMTD80 to enable Thellier experiments have also been acquired.

## Geochemical Sample Relocation

The Geochemistry Sample Store Shed at the Donkerhoek national borehole core storage facility will be equipped with bins and pallets required for the storage of rock and soil samples. All in all, some 2 000 tonnes of samples need to be moved to Donkerhoek.

MFK1-FA multi-function kappabridge.



Field school leaders and participants on the Sand River gneisses near Musina.

## GEOLOGICAL FIELD MAPPING SCHOOL

A Geological Field Mapping School, designed to train junior geologists in practical field-mapping techniques, was conducted over a period of three weeks during July and August 2006. A total of seven participants from five mapping units attended the course. Areas that are geologically diverse in terms of rock types, metamorphic grade and tectonic style were chosen in the vicinities of Tzaneen, Musina–Alldays and Polokwane, and these formed the background in developing the techniques required to successfully undertake regional geological mapping.

Geological mapping, like many environmental, surveying and engineering disciplines, is becoming more digitally orientated, and the participants were exposed to the principles of digital mapping, using data loggers. Here data acquisition via a GPS-integrated PDA-based system allows the data to be reviewed and analysed in real time in the field, rather than only later at the post-production phase.



In the vicinity of Lebowakgomo, work within the platiniferous Bushveld Complex invariably attracted the interest of local community members.

Mapping on a scale of 1:50 000 was centred on the map sheet around Lebowakgomo, the residence of the Limpopo Provincial Legislature. This area, which geologically covers the northern margin to the Bushveld Complex and the adjacent sedimentary lithologies of the Pretoria Group, reveals some structural complexity with dome and large-scale wrench tectonics in evidence. These have had an effect on the distribution of rocks of possible economic interest.



'Stay Out, Stay Alive' campaign, used to educate local residents in the greater Johannesburg area of the dangers of abandoned mine openings.

## CLOSURE OF UNSAFE MINE OPENINGS

At the request of the Department of Minerals and Energy, the CGS was tasked to identify all unsafe, abandoned mine openings in the Witwatersrand mining basins with the objective of sealing those that pose the most significant risk to residents living nearby. Many of these holes are exceptionally deep (>1 000 m) and some have also been used for criminal activities.

To date, nearly 700 holes have been identified in the greater Johannesburg area, nearly 100 of which are considered the most dangerous and all of these will, by the end of 2007, be sealed with a concrete plug. A solid landmark will be placed on top of each sealed hole to warn nearby residents that a dangerous hole is buried below.

An education campaign has also been conducted, known as the 'Stay Out, Stay Alive' campaign, that was used to warn nearly 100 000 residents in the greater Johannesburg area of the dangers posed by these old mine openings.

## DEVELOPMENT OF THE CGS GEOPORTAL

Over a period of two decades, the CGS has made a huge investment, in terms of time, funds and human resources, in the development and implementation of spatial and non-spatial geoscientific databases and in capturing and validating the data to populate these databases. Although this process is ongoing, these systems have reached the stage where many of the business processes of the CGS, and also users in the public domain, are largely dependent on them.

In light of this, the CGS embarked on the development of an Internet-based geospatial portal that will support business processes countrywide and provide a platform for content management and data dissemination across the Internet.

### Geoportal

The Geoportal is a framework of policies, standards, technology and human resources that supports and facilitates the management and use of geographic information. Geospatial portal implementations provide users with a set of tools to easily discover, query and access information on geospatial data and services, including the ability to interactively display and query the data and services. This structure provides a set of tools to publish metadata (information about a data set) to the geospatial portal, search metadata in the geospatial metadata catalogue, and distribute data and services to users through customised applications. The following applications were developed:

#### **SAMINDABA search application**

SAMINDABA is the South African Mineral Deposits Database, which stores a large variety of data on mines, mineral deposits and occurrences within the borders of South Africa. The application that was developed

allows the user to search and locate mineral commodities based on several criteria: map number, farm name and number, location (geographic coordinates) and unique reference number.

#### **Geohazards application**

This application provides access to the engineering-geology database in a structured way. It allows the user to locate an area using topographic features, and then to assess the geohazard potential of that particular area. The user is provided with a report on the potential hazards present and the steps that can be taken to mitigate these hazards.

#### **Limpopo Department of Local Government and Housing (DLGH) application**

An application was developed to provide the Limpopo DLGH with an Internet-based tool to quickly locate and assess areas that have been undergoing geotechnical investigation by consultants of the DLGH. Reports on the investigations have been evaluated by the CGS and the summary results are stored in the CGS's Geode database. Locations of the areas and of test pits drilled on the properties are recorded spatially, together with images of the test-pit profiles.

#### **Geology of the Republic of South Africa**

This application presents geological maps of the Republic of South Africa at two different scales (1:1 000 000 and 1:250 000).

#### **Geohydrological Data Access System**

This web application comprises information from the CGS and the Department of Water Affairs and Forestry databases and map services, that are designed as a facility for users to interactively view and query geohydrologically and geologically relevant data, some of which have been generated under the NORAD-assisted programme on Sustainable Development of Groundwater Sources under the Community Water and Sanitation Programme in South Africa.

## PROMOTIONS

### Representation at exhibitions and other events

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The CGS was represented at numerous exhibitions and mining, geoscience and educational events during the year, including:

- 3–7 April 2006: DME Learners Focus Week in Energy, Cape Town.
- 20–21 April 2006: 3<sup>rd</sup> Annual BPH Billiton Career Centre Exhibition, Sci-Bono Discovery Centre, Newtown.
- 13–20 May 2006: National Science Week 2006, Sci-Bono Discovery Centre, Newtown. Theme: 'Tomorrow's Science and Technology is in our Youth's Hands'.
- 15–20 May 2006: National Science Week 2006, University of Limpopo, Turfloop Campus, Sovenga.
- 25 May 2006: Exhibit at Parliament, Cape Town (The Minister of Minerals and Energy, Ms Lindiwe Hendricks, MP delivered her Maiden Budget Vote Speech).
- 13–15 June 2006: Wampex 2006 Exhibition, Ghana.
- 22–23 June 2006: GEOFORUM 2006, Exhibition Area and Foyer, Eskom Convention Centre, Johannesburg.
- 25–30 June 2006: DME Learners Focus Week, Phalaborwa-Hoedspruit – Limpopo Province.
- 3–6 July 2006: South African Association of Science and Technology Educators (SAASTE), National Conference and 3<sup>rd</sup> Biennial General Meeting. Theme: New Frontiers in School Science and Technology, University of KwaZulu-Natal, Durban.
- 22–28 July 2006: SET Week, University of North West, Mafikeng Campus.
- 29 July 2006: Exhibition at the DME's Workshop, Kouga Cultural Centre, Humansdorp Municipality, Eastern Cape.
- 11–12 August 2006: Soweto Career Expo — 'Investing in our future leaders'. Makhoarane Primary School, Dobsonville.
- 21–25 August 2006: SASOL TECHNO X, Sasol Science and Technology Exhibition, Sasolburg.
- 25 August 2006: 50<sup>th</sup> Anniversary of National Women's Month: Age of Hope: Through Struggle to Freedom. Union Buildings, Pretoria.
- September 2006: UNISA — Opening of new Environmental Earth Sciences School.
- 11–15 September 2006: Electra Mining Africa 2006, Expo Centre, NASREC, Johannesburg.
- 15–16 September 2006: University of Fort Hare Science Exhibition hosted by the Science and Agricultural Society of Fort Hare.
- 24–27 September 2006: Insite 2006, Sandton Convention Centre, Johannesburg.

6–8 February 2007: Mining Indaba 2007, Cape Town International Conference Centre.

16 February 2007: Student Symposium, University of the Free State, Bloemfontein.

28 February to 2 March 2007: SABC Career Fair, Pietermaritzburg Show Grounds.

4–7 March 2007: PDAC Trade Show and Expo, International Conference Centre, Toronto, Canada.

### National Science Week 2006, Sci-Bono Discovery Centre, Newtown and University of Limpopo, Turfloop Campus, Sovenga

This exhibition with the theme 'Tomorrow's Science and Technology is in our Youth's Hands' focussed on the importance of the geosciences in everyday life and the role that the CGS plays in the geoscience activities in South Africa.

Learners from various schools in these areas attended the exhibitions which are a national initiative of the Department of Science and Technology. Talks highlighting the career of a geoscientist were also presented to the learners.

### Wampex 2006 Exhibition, Ghana

The CGS was represented at this biennial event and occupied an exhibition stand, where the general activities of the CGS were highlighted. Special emphasis was given to the current World Bank-funded geological and geochemical mapping project of the CGS in Ghana.

### South African Association of Science and Technology Educators (SAASTE) National Conference and 3<sup>rd</sup> Biennial General Meeting

SAASTE held a national conference and hosted an exhibition with the theme 'New Frontiers in School Science and Technology', at the University of KwaZulu-Natal, Durban. The CGS stand at the exhibition focussed on the geosciences as an important science for the youth in South Africa and a possible career choice which is worth pursuing.

### Electra Mining Africa 2006

This biennial exhibition was held at the Expo Centre, NASREC, Johannesburg. A special section of the exhi-

bition, named 'Mining Week', was organised by the Department of Minerals and Energy.

The exhibition was well attended and interest in the CGS stand was excellent. It transpired that most of the visitors were interested in mining opportunities in Africa and many queries were received in this regard. The SADC Mineral Deposits series published by the CGS was in high demand. Visitors were also interested in mining opportunities regarding diamond deposits in South Africa, especially alluvial diamonds.

## Mining Indaba 2007



The CGS stand at Mining Indaba 2007.

The 12<sup>th</sup> Mining Indaba was held at the Cape Town International Conference Centre, between 6 and 8 February 2007.

This is Africa's most important mining event and the world's leading gathering of global policy makers and international finance, attracting more than 2 000 delegates from fifty countries and hosting over 100 exhibitors. It is the continent's best resource for financing, new business, and industry news, and has spawned the African Mining Partnership and many new government mining policies and initiatives.

The theme for this year's event was 'Prosperity is the Mission. Mining Indaba is the Means'. The CGS stand

received 66 potential business visitors and a vast number of other visitors.

## Student Symposium

The Geology Department of the University of the Free State, Bloemfontein, held an information symposium for its geology students during which a number of potential employers presented the activities of their organisations and elaborated on the work of geoscientists after completing their studies.

The CGS was allowed the opportunity to present a talk on the activities and infrastructure of the organisation, not only to portray the job opportunities at the CGS, but to also provide students with an insight into the geoscience information available from the organisation.

More than 300 students attended the symposium and a large number of CGS promotional items, including metallogenic map posters, bursary information pamphlets and general contact information were distributed.

## PDAC Exhibition

The Prospectors and Developers Association of Canada (PDAC) Annual Convention was held from 4 to 7 March 2007 in Toronto, Canada. Two staff members of the CGS attended to the CGS stand in the South African Pavilion. On average 300 visitors per day visited the stand.

Mr Ramagwede, Executive Manager, represented the CGS at most of the seminars and sessions, including the Investing in Africa Seminar.

The CGS was also invited to a function during which the Chinese representatives presented their strategy for the Mining in China exhibition, scheduled to take place in November 2007 in China. The CGS will also participate in this event.

## PUBLICATIONS

### The following publications were released during the year:

- Bulletin 138: A palaeomagnetic study of selected formations in the Waterberg Group, South Africa by L.P. Maré
- Explanation of sheet 2626 (Scale 1:250 000): The metallogeny of the West Rand by H.L. King, I.C. Pringle, W.R. Oosterhuis and D.L. Ehlers
- Explanation of sheet 2820 (Scale 1:250 000): The geology of the Upton area by H.F.G. Moen
- Explanation of sheet 2918 (Scale 1:250 000): The geology of the Pofadder area by A.L.D. Agenbacht
- Explanation of sheets 2429BA, 2429BB and 2430AA (Scale 1:50 000): The geology of the country between Chuniespoort and The Downs, Limpopo Province by G. Brandl and N. Baglow
- Explanation of sheet 2628AB (Scale 1:50 000): The geology of the Benoni area by C. Lubbe, P.J.A. Bosch, A.W.C. Marais and M.C. du Toit
- Explanation of sheet 2931CA (Scale 1:50 000): The geology of the Verulam area by B.M. Clarke, P. Schoeman and M.W. Kota
- Seismological Series of the Council for Geoscience 39: Catalogue of earthquakes in southern Africa and surrounding oceans for 2003 by E. Hattingh and D.L. Roblin
- SADC: Copper and cobalt deposits in the SADC region by G. Henry and M.G.C. Wilson
- SACS: Lithostratigraphy of the Koeris Formation (Bushmanland Group). Lithostratigraphic Series No. 41 by H.E. Prackelt, W.P. Colliston and A.E. Schoch
- SACS: A revised stratigraphic framework for the Witwatersrand Supergroup. Lithostratigraphic Series No. 42
- SACS: Lithostratigraphy of the Sekororo Formation (Wolkberg Group). Lithostratigraphic Series No. 43 by P.J.A. Bosch
- SACS: Lithostratigraphy of the Abel Erasmus Formation (Wolkberg Group). Lithostratigraphic Series No. 44 by P.J.A. Bosch
- SACS: Lithostratigraphy of the Schelem Formation (Wolkberg Group). Lithostratigraphic Series No. 45 by P.J.A. Bosch
- SACS: Lithostratigraphy of the Selati Formation (Wolkberg Group), including the Anlage, Manoutsa and Mametjas Members. Lithostratigraphic Series No. 46 by P.J.A. Bosch
- SACS: Lithostratigraphy of the Mabin Formation (Wolkberg Group). Lithostratigraphic Series No. 47 by P.J.A. Bosch
- SACS: Lithostratigraphy of the Sadowa Formation (Wolkberg Group). Lithostratigraphic Series No. 48 by P.J.A. Bosch

### The following maps were released during the year:

#### 1:250 000 Geological Maps

2818 Onseepkans  
2918 Pofadder

#### 1:50 000 Geological maps

2628BC Endicott  
3227DD Cambridge  
3228CC Gonubi  
3327BA&BC Kidd's Beach  
2531AC White River  
3327BB East London  
3327DC Berlin  
2228DD Raditshaba (Taaiboschgroet)  
2229CC Ga-Mabelebele  
2429BA Ga-Maja  
2430AA Serala  
2628AD Springs  
2628AB Benoni

#### 1:250 000 Metallogenic Maps

2626 West Rand  
2726 Kroonstad

#### 1:50 000 Geotechnical Maps

3118CD Melkbosstrand  
3318CD Cape Town  
3318DA Philadelphia  
2329CD Polokwane  
2429AB Tshwene  
2930CB Pietermaritzburg

#### 1:250 000 Geological Maps of Mozambique

1537 Alto Molocue  
1538 Murrupula  
1539 Nampula  
1540 Mogincual  
1637 Errego  
1638 Gile  
1639-40 Angoche  
1439 Meconta  
1440 Nacala  
1433 Furancungo  
1434 Ulongue

### The following Total Field Magnetic Data Maps (High-Resolution Series) were released during the year:

2526DB Moedwil  
2526DC Grootpan  
2526DD Koster  
2526DA Swartruggens

2726AA Leeudoringstad  
 2529CD Middelburg  
 2528BB Makometsane  
 2528DD Balmoral  
 2529CC Witbank  
 2525DC Mafikeng

## Publications in academic journals and books

- Andreoli, M.A.G., Hart, R.J., Ashwal, L.D. and Coetzee, H. 2006. Correlations between U, Th content and metamorphic grade in the Western Namaqualand Belt, South Africa, with implications for radioactive heating of the crust. *Journal of Petrology*, 47(6), pp. 1095–1118.
- Armitage, S.J., Botha, G.A., Duller, G.A.T., Wintle, A.G., Rebelo, L.P. and Momade, F.J. 2006. The formation and evolution of the barrier islands of Inhaca and Bazaruto, Mozambique. *Geomorphology*, 82, pp. 295–308.
- Bejaichund, M. and Kijko, A. 2006. Book review. The use of historical data. *In* *Natural Hazard Assessments* (T. Glade, P. Albini and F. Frances, eds). Vol. 163, pp. 247–251.
- Bisnath, A., Frimmel, H.E., Armstrong, R.A. and Board, W.S. 2006. Tectono-thermal evolution of the Maud Belt: New SHRIMP zircon data from Gjelsvikfjella, Dronning Maud Land, East Antarctica. *Precambrian Research*, 150(1–2), pp. 95–121.
- Bosman, C. 2006. The marine geology of the Aliwal Shoal. *In* *Aliwal Shoal Dive Guide* (J. Goldberg, ed.). The Green Trust Publications, RSA, pp. 82–86.
- Cole, D.I. 2006. Impact of mining on the Knersvlakte flora — past, present and future. *Aloe*, 41(2 & 3), pp. 40–44.
- Grantham, G.H., Armstrong, R.A. and Moyes, A.B. 2006. The age, chemistry and structure of mafic dykes at Roerkulten, H.U. Sverdrupfjella, western Dronning Maud Land, Antarctica. *In* *Dyke Swarms — Time Markers of Crustal Evolution. Proceedings of the Fifth/Fourth International Dyke Conference (IDC5)*, Rovaniemi, Finland. A.A. Balkema Press, pp. 213–224.
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- Hamilton, M.P., Jones, A.G., Evans, R.L., Evans, S.F., Fourie, C.J.S., Garcia, X., Mountford, A., Spratt, J.E. and the SAMTEX Team. 2006. Anisotropy structure of the lithosphere derived from magnetotelluric and seismic shear-wave splitting analyses in southern Africa.

*Physics of the Earth and Planetary Interiors*, 158, pp. 226–239.

- Koravos, G.Ch., Tsapanos, T.M. and Bejaichund, M. 2006. Probabilistic seismic hazard assessment for Japan. *Pure and Applied Geophysics*, 163, pp. 137–151.
- McCarthy, T.S. and Venter, J.S. 2006. Increasing pollution levels on the Witwatersrand recorded in the peat deposits of the Klip River wetland. *South African Journal of Science*, 102, pp. 27–34.
- McCourt, S., Armstrong, R.A., Grantham, G.H. and Thomas, R.J. 2006. Geology and evolution of the Natal belt, South Africa. *Journal of African Earth Sciences*, 46, pp. 71–92.
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- Shanthi De Silva, C. and Hohne, S. 2006. Groundwater vulnerability assessment and protection measures — an example from Sweden. *Journal of the National Science Foundation (Sri Lanka)*, 34(1), pp. 43–51.
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- Cole, D.I. 2007. A review of sandstone-hosted uranium deposits in South Africa. Abstracts, Uranium Exploration and Exploitation in Africa, Geological Society of South Africa Professional Programmes, Johannesburg, 23 February 2007, p. 6.
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# SOCIAL RESPONSIBILITY

## OF THE COUNCIL FOR GEOSCIENCE DURING 2006/07

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### EXHIBITIONS

#### Third BPH Billiton Career Centre Exhibition

The 3<sup>rd</sup> BPH Billiton Career Centre Exhibition at the Sci-Bono Discovery Centre in Johannesburg took place on 20 and 21 April 2006. The concept and the format of this annual event is a blend of the traditional exposition

attended the event. The CGS career exhibition focussed on the awareness of geology and geosciences, and opened a window to learners and educators for career opportunities in these fields.

#### Annual Youth Celebration

CGS collaboration with Government is continually growing, especially regarding youth development. During the Annual Youth Celebration that was held at the Sammy Marks Square in Pretoria on 23 June 2006, youth from all walks of life, as well as the general public, were informed on different alternatives in terms of career development within the energy and mining sector. The Minister of Minerals and Energy, the Honourable Ms Buyelwa Sonjica, MP visited the exhibitions. This event supported the national theme of 'Deepening Youth Participation to Fight Poverty and Create Work'.

#### Soweto Career Exposition

The Soweto Career Exposition took place on 11 and 12 August at the Dobsonville Makhoarane Primary School and was organised by Investec Bank Limited. Learners from schools around Soweto attended this exposition in large numbers. It was very encouraging to see that some teachers and learners were attending many other CGS career exhibitions throughout the year. These learners continued returning for more

answers on career opportunities in the geosciences. It is the social responsibility of the CGS to visit as many schools as possible and to target remote areas where information hardly reaches schools and learners.

#### DST Insite Exposition

The DST Insite Exposition, that took place from 24 to 27 September at the Sandton Convention Centre, is one of the biggest knowledge-sharing platforms and exten-



Learners admiring the fossils and rocks at one of the many CGS career exhibitions.

and the breakaway sessions. Learners were channeled along the path of motivational talks by role models in the fields of science, engineering and technology, as well as by guest lecturers, industry representatives and key motivational speakers from the community. Talks covered topics such as bursaries and learnership sector/industry-specific career opportunities.

The CGS was amongst 12 exhibitors during this event. Some 1 378 learners and 42 educators from 22 schools

sive career exhibitions in the country and is initiated by the Department of Science and Technology to promote science and technology to South African communities.

There were international exhibitors from as far afield as Japan, with the previous Minister of Arts, Culture, Science and Technology, Dr Ben Ngubane, who is currently the South African ambassador to Japan, accompanying them. The current Minister of Science and Technology, the Honourable Mr Mosibudi Mangena, opened the event, followed by a tour of the exhibitions.

Various international speakers presented talks on topics such as the 'African origin' and the international importance of South Africa's remarkable fossil heritage, advanced manufacturing technology and the continental margins of southern Africa. There were speakers from the National Laser Centre focussing on the world of laser technology, the differences between laser and normal light, and laser applications.

## Education Information

Geologists of the Information and Collections Management Unit continued with a series of six articles on the wonderful world of minerals, the history of mining, gold, platinum, iron and steel, as well as an article on the new solar system in MiniMag, a monthly magazine aimed at teenage learners.

## MUSEUM EXHIBITIONS

The Geoscience Museum hosted a major exhibition of O'okiep copper deposits, donated by Prof. Tom Clifford, an Emeritus Professor of the University of the Witwatersrand, to the Museum. A cocktail function was held on 17 May 2006, with Mr Thibedi Ramontja, the CEO of the CGS, officially opening the exhibition. The rock collection has been accumulated over a period of more than 40 years of research.

Mr Thibedi Ramontja and Prof. Tom Clifford at the opening ceremony of the O'okiep Copper Exhibition at the Geoscience Museum.

## COURSES ORGANISED BY THE CGS

### The evaluation and valuation of mineral projects

The CGS organised and co-hosted a course entitled 'The evaluation and valuation of mineral projects — a course on feasibility studies' that took place from 30 October to 1 November 2006 at its head office in Pretoria. This course is specifically designed as an intensive practical and learning experience that supports the small-scale mining programme of the government.

### One-day consultation session on tsunamis

A one-day consultation session on tsunamis was held on 13 July 2006 at the CGS in Pretoria. Owing to the impressive attendance of representatives from a number of African countries, the session was a perfect opportunity to discuss the progress of the Indian Ocean Tsunami Warning System (IOTWS) in the different countries. Experts from countries such as Germany and Austria voiced their interest in assisting with the IOTWS.



The CGS and the South African National Disaster Management Centre compiled an information leaflet, specifically aimed at informing the public, and especially schools, on tsunamis and the appropriate actions to be taken, should a tsunami occur. A wealth of data is available from the various networks operating the different stations in Africa that can also be used for the IOTWS.

## VISITS OF MINISTERS TO THE CGS

The Organisation of African Geological Surveys, a NEPAD initiative, was launched on 2 February 2007 in Pretoria during the African Mining Partnership meeting. The organisation consists of representatives from various African countries and the mandate is to foster



The ministerial delegation visiting the Laboratory Unit of the CGS.



The Minister of Science and Technology, the Honourable Minister Mosibudi Mangena, MP, accompanied by Mr Ramontja, the CEO.

and sustain government-supported geoscience endeavours and excellence on the African continent. During this meeting, mining ministers from the African states had the opportunity to visit the CGS head office in Pretoria, where they toured the Geochemistry, Geophysics, Seismology, Environmental Geoscience and Spatial Data Management Units.

The Minister of Science and Technology, the Honourable Mr Mosibudi Mangena, MP visited the CGS on 18 January as part of his programme to visit key science and technology institutions in the country.

## EDUCATIONAL AWARENESS

### Seismology in Schools

The Seismology Unit is actively involved in promoting the awareness of geophysics and seismology amongst pupils at high schools in South Africa in order to increase the number of students choosing these sub-



An exhibition of the map products of projects undertaken by the CGS in Africa.



Learners from the Blue Mountain Primary School during an educational outreach event of the CGS.

jects at university level. The Unit has managed to reach schools in Ceres, Port Elizabeth, Welkom, Klerksdorp and Carletonville through this project and aims to involve other schools as well.

## Education in the Western Cape

Education and information forms part of the research and development activities of the CGS, and the Western Cape Unit has been approached by teachers, schools and parents to explain the role of Geographic Information Systems (GIS) in earth observation and the new avenues for future careers for their children.

In response to the demand of the teaching community, the Western Cape Unit organised several educational promotional events at schools. A hands-on GIS presentation and demonstration was organised at Chesterhouse International in Durbanville, a school making their resources available for an adopted rural school, Blue Mountain Primary School. This launch was followed by another event in one of the region's most poverty-stricken areas at Heideveld High School, where a similar demonstration was done.

These visits highlighted the differences between backgrounds, environments and infrastructure at various schools. It was realised that computer-based GIS was not applicable everywhere and there was a need for an

Dr Andrzej Kijko with one of the three trophies he received in India.

educational tool kit that could be used in a more practical manner and adapted to specific disadvantaged schools. The concept to develop a manual GIS tool kit was discussed and a formal CGS project was formulated and accepted in this regard.

## AWARDS

During the year, Dr Andrzej Kijko was invited to represent the CGS at lectures in five different countries, namely Bangkok (June 2006), Iran (August 2006), London (August 2006), Pakistan (November 2006) and India (January 2007). Dr Kijko was presented with three trophies after his keynote lecture in India; one trophy for his contribution to the investigation of seismic hazards in India, another for his keynote lecture presented at the 94th Indian Science Congress and the third for his contribution to science.

The National Science and Technology Forum honoured its achievers in science and technology, amongst others, Prof. P E Ngoepe, Chairperson of the Management



Board of the CGS. Winners were announced from 110 nominations, and elegant hand-made trophies were presented to them by the Minister of Science and Technology.

## University Roadshow 2006

The CGS initiated a roadshow to universities in the previous year with the aim of introducing the geosciences as a career option to university students and to encourage students to consider the CGS as a future employer.

The table outlines visits to universities during September and October 2006.

University	Date	CGS Representative
University of Cape Town	19 Sept 06	Dr Zawada
University of Zululand	19 Sept 06	Mr Ramagwede
University of Stellenbosch	20 Sept 06	Dr Zawada
University of the Free State	21 Sept 06	Mr Ramagwede
Rhodes University	5 Oct 06	Mr Kota
University of Fort Hare	6 Oct 06	Mr Kota
University of the Western Cape	10 Oct 06	Dr Graham
Cape Peninsula University of Technology	12 Oct 06	Mr Wilkinson
Nelson Mandela Metropolitan University	19 Oct 06	Dr Graham

# FUTURE OUTLOOK

## OF THE COUNCIL FOR GEOSCIENCE

The CGS has been using a business model that resulted in a growing emphasis on commercial activities after its establishment in 1993. This model is largely a reaction to the many years of underinvestment in the organisation, which necessitated the focus on commercial activities. However, it is significantly detracting from the organisation's role in addressing the national growth-related needs of the country and, although the CGS has a clear mandate, as given in the Geoscience Act (Act No. 100 of 1993), the current model resulted in the organisation only partially delivering on this mandate of producing geoscience knowledge, infrastructure and the development of geoscience-related solutions that address the growth challenges facing the country.

The key challenges facing the CGS are:

- Insufficient investment in the production of geological knowledge
- Ageing scientific equipment
- Inadequate geoscience information to address rapid urbanisation and sustainable development
- Insufficient geoscience information to address economic growth
- Declining innovation, research and development
- Challenges in capacity building and transformation.

The CGS is already addressing some of the above-mentioned problems by presenting a series of, what are regarded as fundamental geoscience programmes that need to be implemented and executed over the next 10 years, to Government. These programmes are all aimed at producing geoscience knowledge that directly affects the growth challenges facing the country by increasing mineral-exploration investment and assisting in land-use and environmental planning. It is the protection and rehabilitation of the environment we live in that will require special attention in years to come. Climate change has far-reaching implications and the CGS has taken the first steps in the direction of establishing a framework for the necessary research into the use of particular geological regimes for the long-term stor-

age of carbon dioxide. No infrastructure development should proceed without considering natural hazards and the risk these could pose. In this regard, the CGS is actively seeking to develop the subdiscipline of geohazards in the organisation.

Organisational excellence can only be achieved if the CGS can acquire and retain high-quality and experienced staff with the appropriate qualifications and knowledge; however, parallel to this, the development of junior staff must be addressed.

It is also recognised that modern equipment will attract good scientists and will lead to high-quality products. In this regard, the CGS will continue to reinvest some of its surpluses into capital equipment. The areas where the most investment would be required include marine mapping, geophysical mapping and analytical equipment. In some areas, research equipment in the country has become obsolete or ageing, rendering it dysfunctional, and this aspect is also receiving attention. Strategic partnerships will have to be forged to address this problem more comprehensively. This endeavour would not simply focus on establishing the required laboratory environment or acquiring the necessary equipment, but also on the training and development of an adequate staff component that would be able to operate the equipment correctly and would gain experience and the necessary confidence to embark on high-level research activities.

In light of the shortage of critical skills in the country, the CGS aims at recruiting scientists from countries such as India and selected European countries.

The CGS has invested considerable funds and time in the development and implementation of spatial and non-spatial geoscientific databases and in capturing and validating the data to populate these databases. Although this process is still ongoing, these systems have reached the stage where many of the business processes of the CGS are largely dependent on them. Much of the data is still only directly available to CGS personnel based in the Pretoria office. In order to sup-

port the businesses, the CGS has created a portal to provide a platform for content management and data dissemination over the Internet.

From the expenditure trends of the CGS over the past five years, it is clear that the expenditure of the CGS on its mandated research programme exceeds its annual MTEF allocation by an ever-increasing margin, and it is foreseen that this trend will continue into the future. The annual shortfall is made up from the profits generated by the CGS through the rendering of commercial services to clients and agency work for government departments.

The balance between commercial and statutory programmes is a growing concern in the organisation. It is not foreseen that the need for additional funding will change in the short term. However, to ensure that the CGS's activities are re-focussed back to South Africa it will be necessary to replace projects that are purely commercially motivated with projects that have

a national impact. The latter mostly fall in the so-called agency work category, and this is the area that the CGS will be exploring. The steps to be taken to achieve this goal will be three-pronged, i.e. a national strategy that fully underpins the Geoscience Act, long-term strategy driven through national projects to be proposed to Government and an annual technical programme in which the approved projects can be entrenched.

No buildings were donated to the CGS at the time of its establishment as a science council. This is particularly problematic as the CGS had to buy most of its current buildings from own sources. However, it is essential that the organisation is housed in an appropriate office and laboratory environment. Planning is underway to upgrade and extend existing offices over the next two years. Work on the CGS head office, especially, would have to be funded through an additional appropriation, as this cannot be financed through the reprioritisation of the current MTEF.

# SUSTAINABILITY REPORT

## OF THE COUNCIL FOR GEOSCIENCE

## EXECUTIVE REMUNERATION

### Chief Executive Officer

In terms of Section 18(5) of the Geoscience Act (Act No. 100 of 1993), the *'Executive Officer shall be appointed on such conditions, including conditions relating to payment of remuneration, allowances, subsidies and other benefits as the Management Board may determine in accordance with a system approved from time to time by the Minister with the concurrence of the Minister of State Expenditure'*.

### Executive Management Team

The remuneration of the Executive Management team is determined by the Management Board of the CGS and is reviewed from time to time.

### Transformation

The CGS adheres to equal opportunity and affirmative action principles as promulgated in the Employment Equity Act (Act No. 55 of 1998).

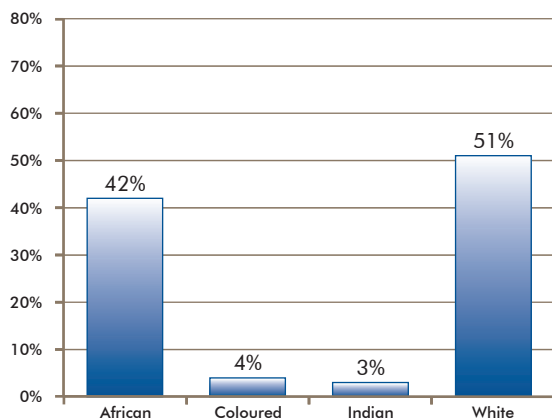
The Personnel, Remuneration and Transformation Committee of the Management Board is responsible for monitoring and evaluating progress on transformation and skills development.

The CGS operates in a labour market characterised by a scarcity of geoscientific skills and a market that is highly competitive. Positive measures are in place to address the attraction of potential scientific skills from designated groups. A bursary scheme was put in place, and the programme is used as a feeder pipeline to attract potential and developing scientists from designated groups into the field of geoscience.

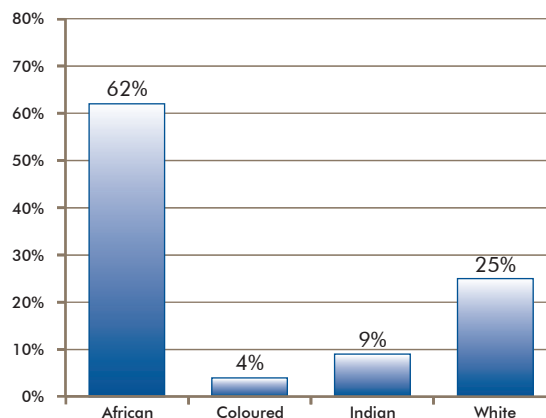
It is worth noting that as at 31 March 2007, the CGS absorbed 100% of the students who completed their studies in 2006 into the permanent staff corps of the CGS. These students include 31% Whites and 69% Blacks.

The following tables illustrate the demographic composition of the staff and bursars of the CGS.

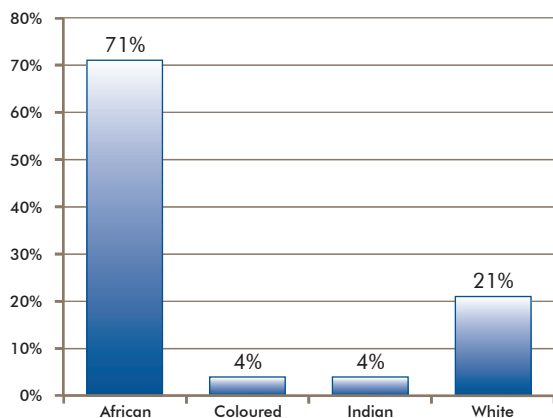
**Demographic Composition of Staff  
as at 31 March 2007**



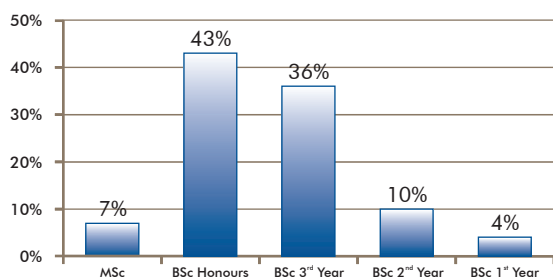
**Overall Staff Appointments  
as at 31 March 2007**



### Demographic Composition of Bursars as at 31 March 2007



### Qualification Spread of Bursars as at 31 March 2007



## ETHICAL MANAGEMENT

### Adherence to code of ethics

The CGS has developed and adopted a Code of Conduct for the CEO, Executive Managers and staff. The code of conduct links to the CGS values and requires all employees to maintain the highest ethical standards, ensuring that business practices are conducted in a manner that, in all reasonable circumstances, is beyond reproach.

## HEALTH, SAFETY AND ENVIRONMENTAL MANAGEMENT

The CGS has a Health and Safety Committee that is established in accordance with the Occupational Health and Safety Act (Act No. 85 of 1993). This Committee meets on a quarterly basis to discuss work-related health and safety issues identified at the CGS. Expert advice is given to various Unit Managers regarding health at work and safe working practices. The following policies have been developed by the Committee:

- Field Work Policy for Geologists and Technicians
- Smoking Policy
- General Health and Safety Policy.